Paleoproterozoic metamorphism, deformation and exhumation of mid-crustal rocks of the Trans-Hudson Orogen on Hall Peninsula, Baffin Island

Diane Skipton

Thesis submitted to the
Faculty of Graduate and Postdoctoral Studies
in partial fulfillment of the requirements
for a doctoral degree in Earth Sciences

Department of Earth and Environmental Sciences
Faculty of Science
University of Ottawa

© Diane Skipton, Ottawa, Canada, 2016

Abstract

In the Paleoproterozoic Trans-Hudson Orogen, a well exposed section of mid-crust on Hall Peninsula, southeastern Baffin Island, offers an opportunity to improve our understanding of mid-crustal tectonothermal processes in hot, collisional orogens. Additionally, more robust age constraints on the tectonic history of Hall Peninsula are important for plate tectonic reconstructions of the North Atlantic region. Recent mapping shows that the section comprises Archean crystalline basement overlain by Paleoproterozoic supracrustal rocks, which host felsic plutons on the western peninsula. There is a westward increase in peak metamorphic grade, from amphibolite- to granulite-facies, and three regional deformation events are recognized ($D_{1, 2, 3}$). Equilibrium phase diagram modeling constrained by garnet compositions in pelite indicates peak conditions of ~720–740°C on the eastern peninsula and ~850°C further west, with pressures of ~6.25–7.35 kbar. Modeling and petrographical evidence suggest subsequent cooling, decompression, growth of retrograde biotite and, on the eastern peninsula, retrograde muscovite. *In situ* U-Pb monazite dating (~450 analyses) and U-Pb zircon depth profiling (~90 analyses) resolve the timing of regional metamorphism and crustal shortening between ca. 1860–1820 Ma, coincident with the accretion of crustal blocks and arc terranes during the amalgamation of the orogenic upper (Churchill) plate. Regionally-occurring ca. 1800–1750 Ma monazite domains and zircon rims are interpreted to result from fluid-assisted dissolution-reprecipitation. They likely record the terminal collision with the lower-plate Superior craton and post-orogenic thermal activity, possibly related to the emplacement of pegmatitic syenogranite dykes. The new data strengthen formerly tentative correlations with southern Baffin Island, West Greenland and northern Labrador. $^{40}Ar/^{39}Ar$ thermochronology on muscovite, biotite and phlogopite suggests that Hall Peninsula underwent slow cooling at rates of ~1–2.5ºC/Myr after peak metamorphism, remaining hotter than ~400°C until ca. 1670–1660 Ma. Analogous thermochronological ages from elsewhere in the Trans-

Hudson Orogen imply orogen-wide slow cooling. Despite significant crustal thickening and elevated paleotemperatures, the Hall Peninsula crustal section does not record evidence of orogenic collapse, implying that it may not be a hallmark of all hot, thickened orogens.

Acknowledgements

I will always be grateful for significant contributions from many people who gave their time, knowledge and encouragement, without whom this thesis would not have been possible and I would not have learned nearly as much as I did.

Above all, I thank my supervisor, David Schneider, whose vision and expertise enabled me to work on a project that met my expectations for learning, challenge, variety and adventure. Dave provided a balance of dedicated guidance with enough space to explore different ideas. I will be forever grateful to him for sharing his knowledge, for his contributions to all aspects of the thesis and for his mentorship over the past few years.

I also thank Marc St-Onge for his guidance, mentorship and contributions during fieldwork and throughout the thesis. I am especially grateful to Marc for his generous instruction on equilibrium phase diagram modeling and for sharing his expertise on interpreting P-T-d histories and Trans-Hudson tectonics.

I thank Dawn Kellett for sharing her expertise in $^{40}Ar/^{39}Ar$ thermochronology and for many important discussions on tectonic processes. I am fortunate to have run my $^{40}Ar/^{39}Ar$ samples under the instruction of Dawn Kellett and Nancy Joyce. Many thanks are due to Nancy for several helpful discussions (and funny ones, which seemed to make data analysis go faster).

I am grateful to Chris McFarlane for welcoming me to his lab on several occasions to collect data, for his assistance with U–Pb data collection/processing and for providing detailed explanations of analytical processes. I also thank Chris for fitting in several chemical maps and U–Pb analyses on short notice.

I thank Simon Jackson for his help in acquiring trace element data on zircon and for his thorough replies to my inquiries about data processing and trace element behaviour, among other things.

I am grateful to Glenn Poirier for his instruction and assistance in using the SEM and EMPA on numerous occasions.

Thanks are extended to Ashley Millette for her important contribution to the collection, processing and interpretation of zircon U–Pb and trace element depth profiling data, which formed her B.Sc. honours thesis.

I thank the Canada-Nunavut Geoscience Office (CNGO) for funding this thesis through the Hall Peninsula Integrated Geoscience Project (HPIGP). Mapping and studying Hall Peninsula was an experience of a lifetime. Special thanks go out to David Mate for his support throughout the thesis, to Holly Steenkamp and Gabriel Machado for their leadership and logistical support during fieldwork, and to Celine Gilbert for managing the Hall Peninsula GIS database (and providing access to grad students).

To the HPIGP members for many great memories traversing and camping on Hall Pen and for fruitful discussions of Hall Peninsula geology (and geology in general). Special thanks to Holly S., Nicole R., Cam M., Zoe B., Gabe C., Rich F., Brendan D., Julie L., Patricia P., Candice S., Erin B., Kim M. and the late Manasie Qillaq.

I’m thankful for the UOttawa grad students from 2012–2016, who are the source of countless happy memories. I’m especially grateful for the organizers of the Friday informal seminars without a name (ISWAN), the weekly hub of activity in the department. Conversations with fellow grad students made every day better. Special thanks to office-, coffee- and lunch-buddies over the years: Liz A., Jeremy P., Matt H., Maeve M., Khalhela Z., Anne W., David D. and Ben W.

I would also like to thank my family for their encouragement and support. Finally, my most heartfelt appreciation goes to my husband, Justin Emberley, for his unwavering support in all things and for bringing joy to every day, especially over the past 4.5 years of Piled Higher and Deeper.

Table of Contents

1. Introduction.....1
References 9
Figures 14

2. Tectonothermal evolution of the middle crust in the Trans-Hudson Orogen, Baffin Island, Canada: evidence from petrology and sillimanite-bearing migmatites 17
Abstract.....18
1. Introduction 19
2. Tectonic setting 20
3. Geology of Hall Peninsula based on mapping (2012–2013).....21
3.1. Lithotypes.....21
3.2. Mineral assemblages and metamorphic map 22
3.3. Structural geology.....24
3.4. Previous metamorphic geochronology.....26
4. Sample descriptions and petrography.....27
4.1. Sample F122B: Biotite-muscovite-sillimanite-garnet pelite.....27
4.2. Sample S89A: Biotite-muscovite-sillimanite-garnet pelite 28
4.3. Sample F28A: Garnet-sillimanite-K-feldspar psammite 30
4.4. Sample S145A: Garnet-sillimanite-K-feldspar-cordierite pelite 31
5. Mineral chemistry (major elements) 32
5.1. Analytical methods 32
5.2. Garnet chemistry.....32
6. Phase diagram modeling.....35
6.1. Methodology 35
6.2. Phase diagram models.....36
7. Monazite geochronology.....42
7.1. Analytical methods 42
7.2. *In situ* U–Pb geochronology results.....43
8. Discussion.....45
8.1. Interpretation of metamorphism and mineral-fabric relationships 45
8.2. Interpretation of geochronology.....46
8.3. Tectonic implications.....48
9. Conclusions 53
References 54
Tables 63
Figures 65
Appendix 1. Supplementary text, figures and tables.....82
Appendix 2. Mineral chemistry (EMPA) 109
Appendix 3. U–Pb monazite data (LA-ICP-MS) 114

3. Multi-stage zircon and monazite growth revealed by depth-profiling and *in situ* U-Pb geochronology: resolving the Paleoproterozoic tectonics of the Trans-Hudson Orogen on southeastern Baffin Island, Canada 120
Abstract 121
1. Introduction 122
2. Tectonic setting 124
3. Geology of Hall Peninsula 126
3.1. Lithologies 126
3.2. Metamorphism 127
3.3. Deformation and mineral-fabric relationships 128
3.4. Previous geochronological studies 129
4. Methodology 131
5. *In situ* U-Pb monazite geochronology results 132
5.1. Matrix monazite 133
5.2. Monazite inclusions in garnet 135
6. Zircon U-Pb geochronology results 137
6.1. Calculation of zircon rim U-Pb ages from depth profiles 137
6.2. Classification of zircon U-Pb depth profiles 138
6.3. Zircon U-Pb results 139
7. Zircon trace element results 142
8. Discussion 146
8.1. Interpretation of *in situ* U-Pb monazite geochronology 146
8.2. Interpretation of U–Pb zircon geochronology and trace element analyses 150
8.3. Tectonothermal events 155
9. Conclusions 160
References 163
Tables 175
Figures 182
Appendix 1. Supplementary text, figures and tables 200
Appendix 2. U–Pb monazite data (LA-ICP-MS) 235
Appendix 3. U–Pb zircon depth profiling data (SIMS) 253
Appendix 4. U–Pb zircon data (LA-ICP-MS) 307
Appendix 5. Zircon trace element depth profiling data (LA-ICP-MS) 316

4. Deciphering the Paleoproterozoic cooling history of the northeastern Trans-Hudson Orogen, Baffin Island (Canada), using $^{40}Ar/^{39}Ar$ step-heating and UV laserprobe thermochronology 325
Abstract 326
1. Introduction 327
2. Tectonic setting 330
3. Geology of Hall Peninsula 331
4. Methodology 334
4.1. Sampling strategy 334
4.2. Compositional maps (EMPA) 335
4.3. $^{40}Ar/^{39}Ar$ step-heat and UV laserprobe analyses 336
5. Microstructure and petrogenesis of biotite, muscovite and phlogopite 339
5.1. Biotite 339
5.2. Muscovite 340
5.3. Phlogopite 342
6. Results 343
6.1. Biotite and muscovite compositional maps 343
6.2. $^{40}Ar/^{39}Ar$ step-heating results 343
6.3. $^{40}Ar/^{39}Ar$ UV laserprobe results 347
7. Numerical diffusion modeling 348
7.1. Methodology, rationale and assumptions 348
7.2. Results 353
8. Discussion 357
8.1. Late- to post-orogenic thermal evolution 357
8.2. Tectonic implications 363
9. Conclusions 369
References 371
Tables 381
Figures 384
Appendix 1. Supplementary text, figures and tables 397
Appendix 2. $^{40}Ar/^{39}Ar$ step-heating data (biotite, muscovite and phlogopite) 427
Appendix 3. $^{40}Ar/^{39}Ar$ UV laserprobe data (muscovite) 487

5. Conclusions 493
5.1. Tectonothermal evolution of Hall Peninsula 494
5.2. Implications for tectonic plate configuration 501
5.3. Trans-Hudson Orogen: large and hot, but with no collapse? 503
References 507
Figure 511

CHAPTER 1

Introduction

The Trans-Hudson Orogen (THO) is a large and well-preserved Paleoproterozoic collisional belt that formed during the amalgamation of the ancient North American continent (Laurentia) and presently extends from the western United States to northeastern Canada (Fig. 1; Hoffman, 1988). The orogenic history of the THO (ca. 1920–1795 Ma) records continental growth through collision/accretion of Archean to Paleoproterozoic microcontinents and arc terranes followed by the terminal collision of the upper-plate Churchill domain with the lower-plate Superior craton at ca. 1820–1795 Ma (Figs. 1, 2; Lewry and Collerson, 1990; St-Onge et al., 2007). With extensive high-grade metamorphism including granulite terranes (e.g., St-Onge et al. 2007) and peak orogenic crustal thickness estimates of at least ~52–58 km (Corrigan et al., 2009 and references therein), the THO may conform to the definition of a large, hot orogen of Beaumont et al. (2006). The THO has been likened to the Himalayan Orogen (St-Onge et al., 2006) and considered an analog for modern accretionary processes (Corrigan et al., 2009). On southern Baffin Island, excellent exposure of a mid-crustal section on Hall Peninsula offers a window into Paleoproterozoic metamorphic and deformational processes affecting Archean basement orthogneisses and Paleoproterozoic supracrustal sequences in the internal zone of the THO.

Prior to 2012, geological studies of Hall Peninsula comprised reconnaissance-scale mapping (Blackadar, 1967), smaller-scale mapping and U–Pb geochronology along a narrow transect east of Iqaluit (Scott, 1999), and K–Ar ages on widely dispersed samples (e.g., Lowdon, 1960). The lithological, structural and metamorphic evolution remained poorly understood. The discovery of diamond-bearing kimberlites in the 2000s (Peregrine Diamonds Ltd.) sparked interest in Hall Peninsula's potential to host additional economic mineral deposits. To improve the geological knowledge-base and reduce exploration risks, the Canada-Nunavut Geoscience Office (CNGO)

initiated the Hall Peninsula Integrated Geoscience Project, which involved 1:100 000-scale bedrock mapping in 2012–2013 together with collaborative research studies between the CNGO, Geological Survey of Canada (GSC) and Canadian universities. This thesis represents a product of that synergy, with the main goal of resolving the tectono-metamorphic history through structural analysis, quantitative petrology and isotopic dating.

Resolving the tectono-metamorphic evolution of Hall Peninsula is important for resolving the controversial tectonic evolution of the Quebec–Baffin segment of the THO. The peninsula forms part of the upper-plate Churchill domain, and is located in the internal zone of the THO, ~350 km northeast of Superior cratonic margin. In the region surrounding Hall Peninsula, the Churchill domain is comprised of several Archean to Paleoproterozoic cratonic blocks, microcontinents and arc terranes that amalgamated between ca. 1.90 and 1.84 Ga (Fig. 2). Southern Baffin Island is dominantly comprised of the Archean basement and Paleoproterozoic supracrustal rocks of the Meta Incognita microcontinent (MIM), which accreted to the Rae craton during ca. 1.88–1.87 Ga, along a subduction zone that was probably north-dipping (Fig. 2; St-Onge et al., 2007). The Archean crystalline Sugluk block is narrowly exposed on the southern coast of Baffin Island, and is interpreted from geophysical data to extend southwestward toward Hudson Bay (Corrigan et al., 2009). Accretion and north-dipping underthrusting of the Sugluk block beneath the MIM is interpreted to have occurred at ca. 1.90 Ga (Wodicka et al., 2010; Whalen et al., 2010), or as late as ca. 1.865–1.85 Ga (Corrigan et al., 2009). Existing tectonic models suggest that regional metamorphism and crustal shortening on the MIM at ca. 1849–1835 Ma occurred in response to the north-dipping subduction and eventual accretion of an intra-oceanic arc terrane to the southern MIM margin at ca. 1.84 (St-Onge et al., 2007; Berman et al., 2013), or possibly of the Sugluk block by ca. 1.85 Ga (Corrigan et al., 2009). Heat advection from the ca. 1865–1848

Ma Cumberland Batholith also contributed to granulite-facies metamorphism on the MIM (St-Onge et al., 2007). Emplaced into the MIM and the Rae craton, the Cumberland Batholith has been interpreted as: (i) an Andean-type continental arc batholith that was produced above a north-dipping subduction system along the southern margin of the MIM (St-Onge et al., 2006, 2007, 2009); or (ii) a post-accretion batholith resulting from lithospheric mantle delamination and upwelling of asthenospheric mantle, following the accretion of the MIM to the Rae craton (Whalen et al., 2010). The docking of the lower-plate Superior craton to the upper-plate Churchill collage at ca. 1.820–1.795 Ga represents the terminal collision of the THO (Scott and Wodicka, 1998; Wodicka and Scott, 1997; St-Onge et al., 2007).

Some studies infer a crustal suture through central Hall Peninsula, apparently separating Archean basement on eastern Hall Peninsula from the MIM (e.g., Whalen et al., 2010). This interpretation is supported by preliminary U–Pb zircon crystallization ages of Archean basement on Hall Peninsula of ca. 2.92–2.7 Ga (Scott, 1999), which are generally older than those of exposed MIM basement (ca. 2.68–2.6 Ga; St-Onge et al., 2007; Wodicka et al., 2010). On a magnetic susceptibility map, the east and west portions of the peninsula have distinct signatures separated by linear features, implying a regional shear zone such as a crustal suture (Fig. 3). Despite this, preliminary U–Pb studies of Hall Peninsula indicate strong lithological similarities with the Paleoproterozoic cover rocks (Lake Harbour Group) and Cumberland Batholith intrusions of the MIM (Scott, 1999). Several proposed Paleoproterozoic crustal suture zones appear to converge on Hall Peninsula when extrapolated from the Torngat Orogen of northern Labrador and the Nagssugtoqidian Orogen of West Greenland (Fig. 1; e.g., St-Onge et al., 2009). Correlations have been proposed between the Archean basements of Hall Peninsula and the central Nagssugtoqidian Orogen (Aasiaat domain; St-Onge et al., 2009), and between the Paleoproterozoic cover rocks on

Hall Peninsula and those of the Aasiaat domain (St-Onge et al., 2009) or the Tasiuyak gneiss of northern Labrador (Scott, 1999). Constraining the structural and metamorphic evolution of Hall Peninsula is therefore an important contribution to understanding the tectonic evolution of the northeastern THO.

Another outstanding question is whether the THO was a large, hot orogen (LHO) as defined by Beaumont et al. (2006), comparable in heat content and orogenic crustal thickness (~70 km) to the Grenvillian and Himalayan orogens. Prolonged heating in large, hot orogens results in the development of an orogenic plateau underlain by thermally weakened, low-viscosity crust that flows laterally under gravitational or tectonic forcing (Beaumont et al., 2006; Jamieson et al., 2011). This mid-crustal flow can occur in a channel structure bounded by a thrust-sense lower boundary and a normal-sense upper boundary, as in the Himalayan Orogen ("channel flow"; e.g., Grujic et al., 2002). Another hallmark of large, hot orogens is orogenic collapse, whereby thickening and thermal weakening results in gravitational instability, extension and rapid exhumation (e.g., Leech, 2001; Rivers, 2008).

The THO has been considered similar to the Himalayan Orogen in scale, type and duration (St-Onge et al., 2007). Widespread amphibolite–granulite-facies metamorphism and voluminous batholiths suggest an overall high heat content for the THO, comparable to LHOs. Although predominant crustal thicknesses of the THO during peak orogenesis are estimated at ~52–58 km, which is moderate relative to the ~70–80 km-thick crust of LHOs (Corrigan et al., 2009), pressure estimates of ~8–9 kbar suggest thicker crust in the Quebec–Baffin region (e.g., St-Onge et al., 2007). Despite these features, large-scale ductile lateral flow of mid-crust beneath an orogenic plateau has not been documented in the THO (St-Onge et al., 2006). Apart from localized rapid cooling rates in the Manitoba–Saskatchewan portion of the THO (Schneider et al., 2007), existing

data suggest orogen-wide slow cooling and no large extensional faults have been identified. Thus, there is no data to support orogenic collapse of the THO (Corrigan et al., 2009). However, Whalen et al. (2010) proposed that the Cumberland Batholith (ca. 1865–1848 Ma) resulted from large-scale lithospheric mantle delamination beneath the amalgamated MIM and Rae craton. Teleseismic profiles reveal a relatively flat Moho at a depth of ~40 km beneath Hall Peninsula (Snyder, 2010), which is consistent with Moho depths in most of the THO, implying delamination of an orogenic root. Since large-scale orogenic root or lithospheric mantle delamination can lead to orogenic collapse (e.g., Leech, 2001), this evidence seems to contradict the apparent absence of extensional structures and rapid exhumation. New structural, petrological and geo/thermochronological data from Hall Peninsula will help to quantify orogen-wide heat content and crustal thickness, and to understand mid-crustal deformation mechanisms, enabling comparisons with LHOs. New thermochronological data are important for determining whether the THO underwent gravitational collapse.

Deciphering the tectono-metamorphic history of Hall Peninsula from peak metamorphic conditions to subsequent cooling and exhumation is key to understanding the tectonic evolution of the northeastern THO. It also contributes to our knowledge of the broader THO, as well as the structural and thermal evolution of hot collisional orogens in general. This thesis contains three chapters that are presented independently but are connected by the shared themes outlined in this Introduction (Chapter 1).

Chapter 2 presents the results of geological mapping, structural analysis, metamorphic petrology and *in situ* U–Pb monazite dating. The aim of this study was to develop a structural and petrological framework for Hall Peninsula and preliminary U–Pb age constraints on the tectonothermal evolution. This framework is used as the basis for in-depth geochronological and

thermochronological work in Chapters 3 and 4. Geological mapping was led by the CNGO, with myself as participant, and U–Pb dating of principal map lithologies (plutonic and depositional ages) was conducted by the GSC/CNGO. This study therefore presents a summary of lithologies, metamorphism and structural events interpreted from mapping and preliminary geochronology as presented in CNGO publications. Within this summary, new contributions of this thesis include: a metamorphic map of Hall Peninsula that shows the regional pattern in peak metamorphic grade based on mineral assemblages in pelite; detailed documentation of key structural relationships; and stereonets of structural fabrics for each deformation event. New contributions in Chapter 2 also include petrographical descriptions of four metasedimentary rocks and a discussion of mineral-fabric relationships. For the first time on Hall Peninsula, the pressure-temperature (P–T) history is interpreted using petrography, mineral chemistry and phase diagram modeling. This analysis highlights the challenges involved in P–T modeling of high-grade, partially melted rocks and presents feasible solutions for obtaining the most reliable results. Monazite is dated *in situ* to provide age constraints for the interpreted P–T–deformation (P–T–d) path. The results of this study contribute to understanding the role of Hall Peninsula in the tectonic evolution of the THO, and provide insights on metamorphic and deformational processes in the mid-crust of hot collisional orogens. This manuscript is published in the *Journal of Petrology* (Skipton et al., 2016a). Elements of this work, including field-based interpretations of metamorphism and deformation, are published in CNGO reports (Skipton et al., 2013; Skipton and St-Onge, 2014). In addition to supervision/guidance provided by Dr. Schneider, the main co-author contributions to Chapter 2 include: assistance with equilibrium phase diagram modeling and petrographical interpretations from Dr. St-Onge; garnet and monazite chemical maps and help with U–Pb data acquisition from Dr. McFarlane.

Chapter 3 is an in-depth geochronological study that provides robust age constraints on the P–T–d evolution developed in Chapter 2 using *in situ* U–Pb monazite and U–Pb zircon depth profiling geochronology. Monazite is analyzed *in situ* in 10 additional metasedimentary rocks distributed across the peninsula to date regional metamorphism and deformation events, as well as post-thermal peak tectonism. Six samples are analysed using the recently developed U–Pb zircon depth profiling method, which enables dating of ultrathin rims on unpolished zircon surfaces. This work is complemented by trace element depth profiling analyses of the same unpolished zircon grains to help corroborate interpretations of zircon rim ages. The regional tectono-metamorphic framework that results from this study is used to evaluate tectonic correlations in the northeastern THO. It also illustrates the long-lived orogenic and late- to post-orogenic evolution of the THO and sets the stage for thermochronological investigations in Chapter 4. This work is published in *Precambrian Research* (Skipton et al., 2016b). Together with supervision/guidance from Dr. Schneider, co-author contributions are as follows: assistance with U–Pb LA-ICP-MS monazite and zircon data acquisition from Dr. McFarlane; input on linking U–Pb ages with tectonic history from Dr. St-Onge; assistance with zircon trace element data collection (LA-ICP-MS) and data processing from Dr. Jackson.

Chapter 4 presents $^{40}Ar/^{39}Ar$ thermochronology data on samples distributed throughout Hall Peninsula with the goal of deciphering the regional cooling and unroofing history. Biotite, muscovite and phlogopite were analyzed using the conventional step-heating method, and UV laserprobe analysis transects were conducted across selected muscovite grains to investigate intragrain variations in apparent $^{40}Ar/^{39}Ar$ age. Chemical maps were obtained on muscovite in these samples to help evaluate age interpretations. Several possible cooling scenarios were defined using numerical diffusion models of Ar in muscovite with comparisons to core-to-rim apparent

age profiles determined using UV laser analyses. The resultant proposed cooling model for Hall Peninsula enables comparisons with the post-orogenic evolution of the broader THO and other orogens and has implications for the question of orogenic collapse in the THO. This manuscript has been submitted for publication to *Lithos* (Skipton et al., in review). Elements of this work, including UV laser probe ages of muscovite, are published in a CNGO report (Skipton et al., 2015). In addition to Dr. Schneider's supervision, the main co-author contributions to Chapter 4 are as follows: assistance with $^{40}Ar/^{39}Ar$ data collection and modeling from Dr. Kellett; assistance with $^{40}Ar/^{39}Ar$ data collection from Ms. Joyce.

References

Beaumont, C., Nguyen, M.H., Jamieson, R.A., Ellis, S., 2006. Crustal flow modes in large hot orogens, in: Law, R.D., Searle, M.P., Godin, L. (Eds) *Channel flow, Ductile Extrusion and Exhumation in Continental Collision Zones*. Geological Society, London, Special Publications 268, 91–145.

Berman, R.G., Sanborn-Barrie, M., Rayner, N., Whalen, J., 2013. The tectonometamorphic evolution of Southampton Island, Nunavut: Insight from petrologic modeling and in situ SHRIMP geochronology of multiple episodes of monazite growth. Precambrian Research 232, 140–166.

Blackadar, R.G., 1967. Geological reconnaissance, southern Baffin Island, District of Franklin. Geological Survey of Canada, Paper 66–47.

Corrigan, D., Pehrsson, S., Wodicka, N., de Kemp, E., 2009. The Palaeoproterozoic Trans-Hudson Orogen: a prototype of modern accretionary processes. Geological Society, London, Special Publication 327, 457–479.

Dumont, R., Dostaler, F. 2010a. Geophysical Series, NTS 25-I/SE and part of 25-I/SW, Aeromagnetic Survey Hall Peninsula, Nunavut; Geological Survey of Canada Open File 6413, scale 1: 100 000.

Dumont, R., Dostaler, F., 2010b. Geophysical Series, NTS 25-I/NE, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6414, scale 1:100 000.

Dumont, R., Dostaler, F., 2010c. Geophysical Series, NTS 25-I/NW, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6415, scale 1:100 000.

Dumont, R., Dostaler, F., 2010d. Geophysical Series, NTS 25-J/NE, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6416, scale 1:100 000.

Dumont, R., Dostaler, F., 2010e. Geophysical Series, NTS 25-O/SE, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6417, scale 1:100 000.

Dumont, R., Dostaler, F., 2010f. Geophysical Series, NTS 25-O/SW, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada, Open File 6418, scale 1: 100 000.

Dumont, R., Dostaler, F., 2010g. Geophysical Series, NTS 25-O/NE, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6419, scale 1: 100 000.

Dumont, R., Dostaler, F., 2010h. Geophysical Series, NTS 25-O/NW, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6420, scale 1: 100 000.

Dumont, R., Dostaler, F., 2010i. Geophysical Series, NTS 25-P/SE, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6421, scale 1: 100 000.

Dumont, R., Dostaler, F., 2010j. Geophysical Series, NTS 25-P/SW, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6422, scale 1: 100 000.

Dumont, R., Dostaler, F., 2010k. Geophysical Series, NTS 25-P/NE, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6423, scale 1: 100 000.

Dumont, R., Dostaler, F., 2010l. Geophysical Series, NTS 25-P/NW, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6424, scale 1: 100 000.

Dumont, R., Dostaler, F., 2010m. Geophysical Series, NTS 26-A/SE, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6425, scale 1:100 000.

Dumont, R., Dostaler, F., 2010n. Geophysical Series, NTS 26-A/ SW, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6426, scale 1:100 000.

Dumont, R., Dostaler, F., 2010o. Geophysical Series, NTS 26-A/NW and part of 26 A/NE, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada, Open File 6427, scale 1:100 000.

Dumont, R., Dostaler, F., 2010p. Geophysical Series, NTS 26-B/ SE, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6428, scale 1:100 000.

Dumont, R., Dostaler, F., 2010q. Geophysical Series, NTS 26-B/NE, Aeromagnetic Survey Hall Peninsula, Nunavut. Geological Survey of Canada Open File 6429, scale 1:100 000.

Grujic, D., Hollister, L., Parrish, R., 2002. Himalayan metamorphic sequence as an orogenic channel: insight from Bhutan. Earth and Planetary Science Letters 198, 177–191.

Hoffman, P.F., 1988. United Plates of America, the birth of a craton: Early Proterozoic assembly and growth of Laurentia. Annual Review of Earth and Planetary Sciences 16, 543–603.

Jamieson, R.A., Unsworth, M.J., Harris, N.B.W., Rosenberg, C.L., Schulmann, K., 2011. Crustal melting and the flow of mountains. Elements 7, 253–260.

Leech, M.L., 2001. Arrested orogenic development: eclogitization, delamination, and tectonic collapse. Earth and Planetary Science Letters 185, 149–159.

Lewry, J.F., Collerson, K.D., 1990. The Trans-Hudson Orogen: extent, subdivisions and problems, in: Lewry, J.F. & Stauffer, M.R. (Eds.), The Early Proterozoic Trans-Hudson Orogen of North America, Geological Association of Canada, Special Paper 37, 1–14.

Lowdon, J.A., 1960. Age determinations by the Geological Survey of Canada, Report 1 – isotopic ages. Geological Survey of Canada, Paper 60-17, 5–40.

Pilkington, M., Oneschuk, D., 2007. Aeromagnetic and gravity, in: Digital Geoscience Atlas of Baffin Island (south of 70°N and east of 80°W), Nunavut. Geological Survey of Canada Open File 5116.

Rivers, T., 2008. Assembly and preservation of lower, mid, and upper orogenic crust in the Grenville Province – Implications for the evolution of large hot long-duration orogens. Precambrian Research 167, 237–259.

Schneider, D.A., Heizler, M.T., Bickford, M.E., Wortman, G.L., Condie, K.C., Perilli, S. Timing constraints of orogeny to cratonization: Thermochronology of the Paleoproterozoic Trans-Hudson orogen, Manitoba and Saskatchewan, Canada. Precambrian Research 153, 65–95.

Scott, D.J., Wodicka, N., 1998. A second report on the U-Pb geochronology of southern Baffin Island. Geological Survey of Canada Paper 1998-F, 47–57.

Scott, D.J., 1999. U-Pb geochronology of the eastern Hall Peninsula, southern Baffin Island, Canada: a northern link between the Archean of West Greenland and the Paleoproterozoic Torngat Orogen of northern Labrador. Precambrian Research 93, 5–26.

Skipton, D.R., Schneider, D.A., Kellett, D., Joyce, N. (in review). Deciphering the Paleoproterozoic cooling history of the northeastern Trans-Hudson Orogen, Baffin Island (Canada), using $^{40}Ar/^{39}Ar$ step-heating and UV laserprobe thermochronology. Lithos.

Skipton, D.R., Schneider, D.A., Kellett, D. & Joyce, N., 2015. New insights on the cooling history of Hall Peninsula, southern Baffin Island, Nunavut, using $^{40}Ar/^{39}Ar$ thermochronology on muscovite, in: Summary of Activities 2014, Canada-Nunavut Geoscience Office, 17–30.

Skipton, D.R., Schneider, D.A., McFarlane, C.R.M., St-Onge, M.R., Jackson, S. (2016b) Multi-stage zircon and monazite growth revealed by depth-profiling and in situ U-Pb geochronology: resolving the Paleoproterozoic tectonics of the Trans-Hudson Orogen on southeastern Baffin Island, Canada. Precambrian Research 285, 272–298.

Skipton, D.R., Schneider, D.A., St-Onge, M.R., 2013. Preliminary observations on Archean and Paleoproterozoic metamorphism and deformation of the southern Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2012, Canada-Nunavut Geoscience Office, 29–42.

Skipton, D.R., St-Onge, M.R., 2014. Paleoproterozoic deformation and metamorphism in metasedimentary rocks west of Okalik Bay: a field template for the evolution of eastern Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 63–72.

Skipton, D.R., St-Onge, M.R., Schneider, D.A., McFarlane, C.R.M. (2016a) Tectonothermal evolution of the middle crust in the Trans-Hudson Orogen, Baffin Island, Canada: evidence from petrology and monazite geochronology of sillimanite-bearing migmatites. Journal of Petrology 57(8), 1437–1462.

Snyder, D.B., 2010. Mantle lithosphere structure beneath southeast Baffin Island, Nunavut, from teleseismic studies. Geological Survey of Canada Current Research 2010-8, 6 pp.

St-Onge, M.R., Searle, M.P., Wodicka, N., 2006. Trans-Hudson Orogen of North America and Himalaya–Karakorum–Tibetan Orogen of Asia: structural and thermal characteristics of the lower and upper plates. Tectonics 25, 1–22.

St-Onge, M.R., Van Gool, J.A.M., Garde, A.A., Scott, D.J., 2009. Correlation of Archaean and Palaeoproterozoic units between northeastern Canada and western Greenland: constraining the pre-collisional upper plate accretionary history of the Trans-Hudson Orogen. Geological Society of London Special Publication 318, 193–235.

St-Onge, M.R., Wodicka, N., Ijewliw, O., 2007. Polymetamorphic evolution of the Trans-Hudson Orogen, Baffin Island, Canada: integration of petrological, structural and geochronological data. Journal of Petrology 48, 271–302.

Whalen, J.B., Wodicka, N., Taylor, B.E., Jackson, G.D., 2010. Cumberland Batholith, Trans-Hudson Orogen, Canada: Petrogenesis and implications for Paleoproterozoic crustal and orogenic processes. Lithos 117, 99-118.

Wodicka, N., Scott, D.J., 1997. A preliminary report on the U–Pb geochronology of the Meta Incognita Peninsula, southern Baffin Island, Northwest Territories. Geological Survey of Canada Paper 1997-C, 167–178.

Wodicka, N., Whalen, J., St-Onge, M.R., Corrigan, D., 2010. Meta Incognita microcontinent revisited: insights from U–Pb geochronology and Nd isotopes. Geological Association of Canada – Mineralogical Association of Canada Abstract Volume 35.

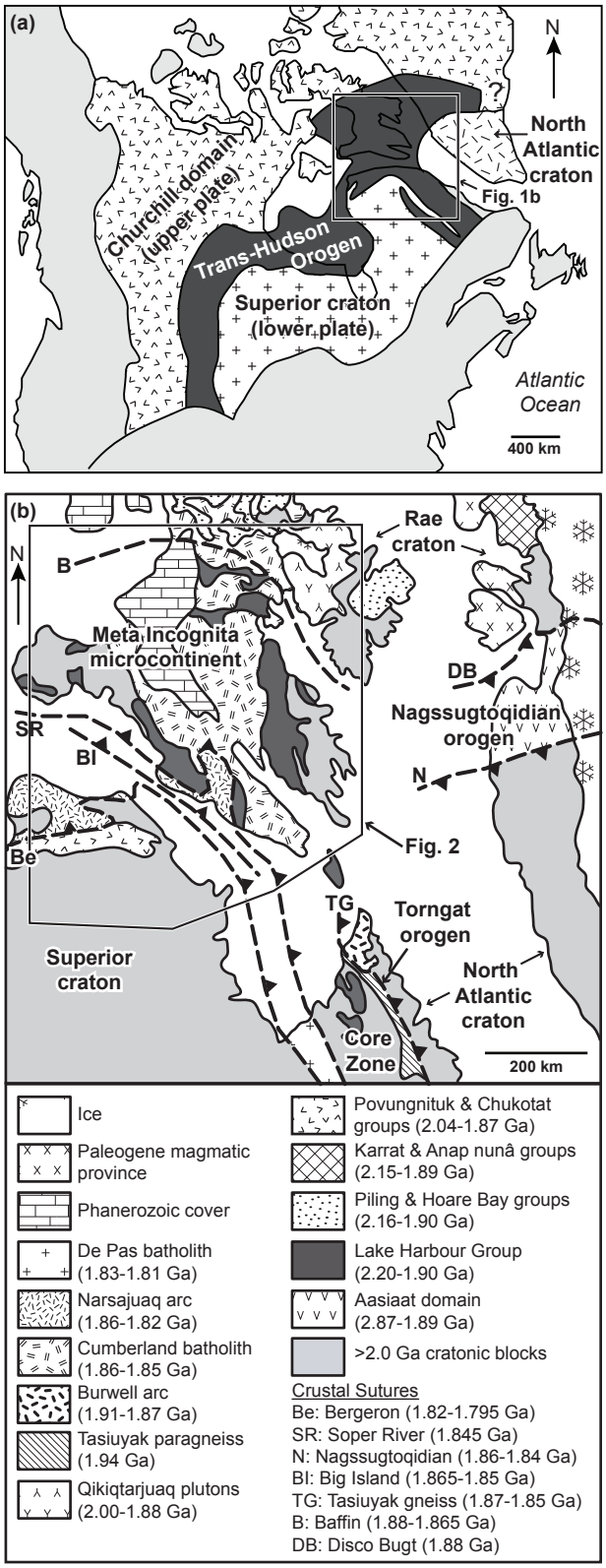


Fig. 1: (a) Simplified map of the Trans-Hudson Orogen (modified from Hoffman, 1998; St-Onge et al., 2007). (b) Generalized map of the northeastern Trans-Hudson Orogen (modified from St-Onge et al., 2009; Berman et al., 2013; Skipton et al., 2016a). The appoximate location of the inset map in Fig. 2 is indicated.

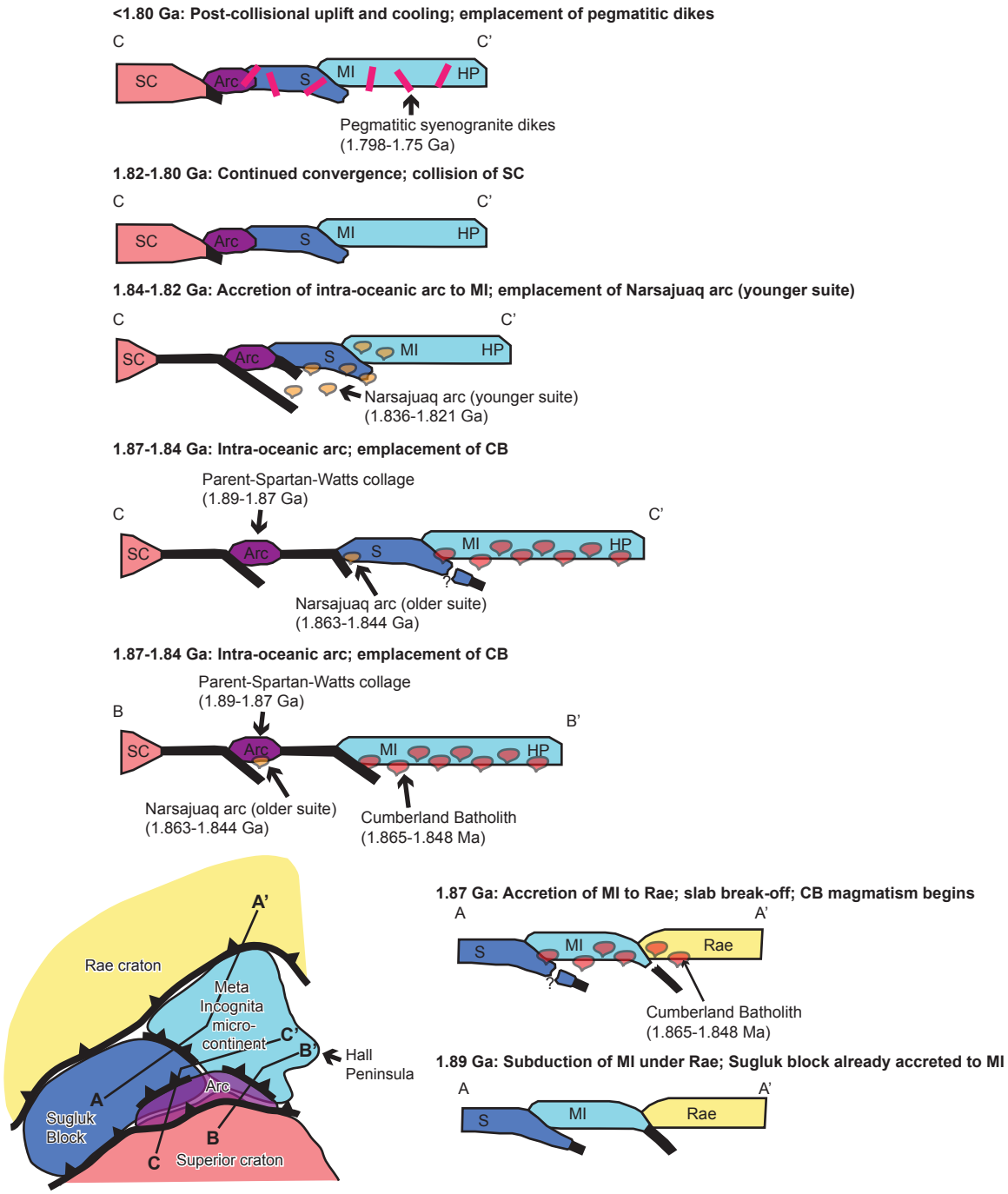


Fig. 2: Schematic cross-sections illustrating the tectonic history of southern Baffin Island, modified after St-Onge et al. (2007), Corrigan et al. (2009) and Berman et al. (2013). The inset map (bottom right) shows the locations of the cross-sections and the approximate present-day configuration of cratonic blocks, including the lower plate Superior craton and the upper plate Rae craton, Meta Incognita microcontinent and Sugluk block. The Sugluk block is narrowly exposed on the SW coast of Baffin Island, and geophysical data suggests that it extends southwestward toward Hudson Bay (Corrigan et al., 2009). Note the difference in Narsajuaq arc nomenclature/location between cross-section B-B' (St-Onge et al., 2007) and C-C' (Berman et al., 2013). Note that the accretion of the Sugluk block to the Meta Incognita microcontinent is proposed at 1.9 Ga in some studies (Wodicka et al., 2010; Berman et al., 2013), but at 1.865-1.85 Ga by Corrigan et al. (2009). All known models agree with the accretion of an intra-oceanic arc terrane (Narsajuaq arc and/or Parent-Spartan-Watts collage) to the Meta Incognita microcontinent at ca. 1.84 Ga. Abbreviations: S, Sugluk Block; MI, Meta Incognita microcontinent; Rae, Rae craton; CB, Cumberland Batholith; HP, Hall Peninsula; SC, Superior Craton.

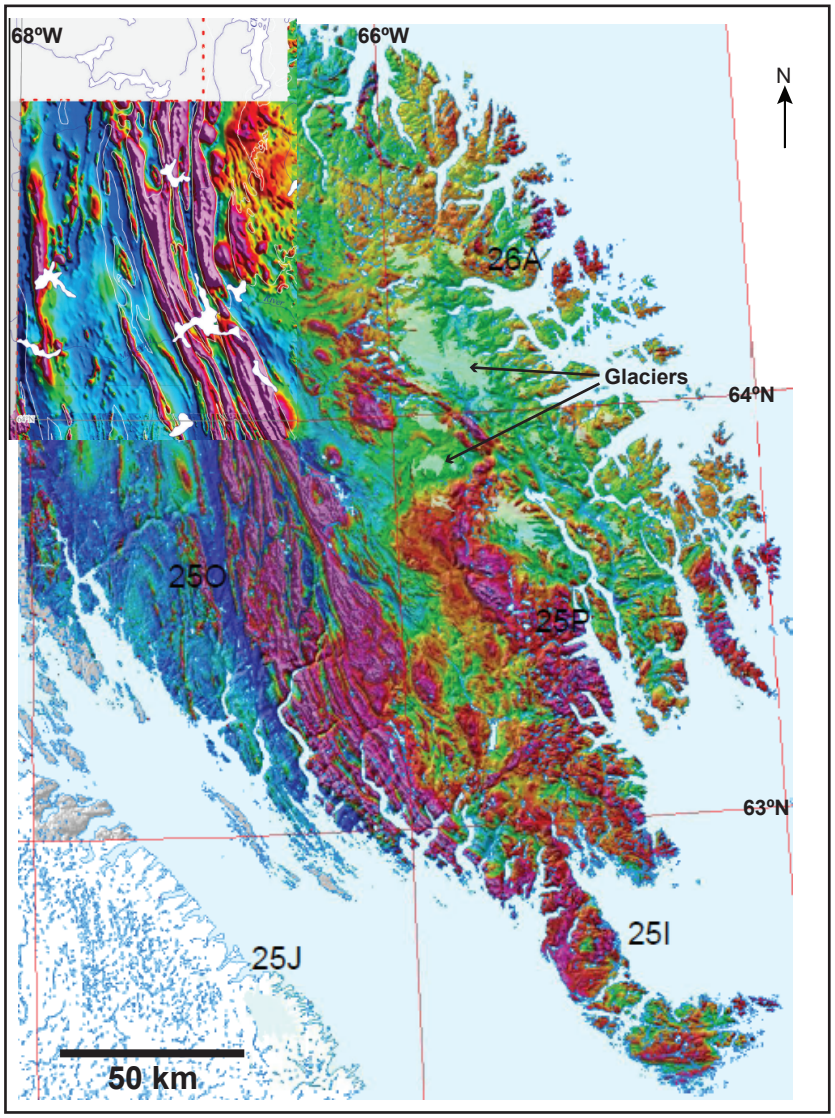


Fig. 3: Total-field magnetic susceptibility of Hall Peninsula, Baffin Island (Pilkington and Oneschuk, 2007; Dumont and Dostaler, 2010a-q).

CHAPTER 2

Tectonothermal evolution of the middle crust in the Trans-Hudson Orogen, Baffin Island, Canada: evidence from petrology and monazite geochronology of sillimanite-bearing migmatites

Diane Skipton[1*], M.R. St-Onge[2], D.A. Schneider[1], C.R.M. McFarlane[3]

[1]*Department of Earth and Environmental Sciences, University of Ottawa, Ottawa, ON, K1N 6N5, Canada*

[2]*Geological Survey of Canada, Natural Resources Canada, Ottawa, ON, K1A 0E8, Canada*

[3]*Department of Earth Sciences, University of New Brunswick, Fredericton, NB, E3B 5A3, Canada*

Abstract

Hall Peninsula, on southeast Baffin Island, Canada, exposes a lithologically diverse mid-crustal section of the Paleoproterozoic Trans-Hudson Orogen that features Paleoproterozoic supracrustal strata overlying Archean crystalline basement. Recent mapping, combined with petrology and U-Pb monazite dating, provides new insights into the tectonothermal history of the internal zone of the orogen, as well as mid-crustal orogenic processes in general. Peak metamorphic grade is constrained to progressively increase westward from mid-amphibolite- to granulite-facies conditions and three regional deformation events are recognized, including: east-directed thin-skinned crustal shortening (D_1), east-vergent, thick-skinned thrusting and folding (D_2) and late-orogenic, north-south-directed, thick-skinned folding (D_3). Equilibrium phase diagram modeling constrained by garnet compositional transects in pelite indicates peak mid-amphibolite-facies conditions on the eastern peninsula of ~720-740°C and 6.25-7.25 kbar, followed by cooling and late muscovite growth. In accordance with field evidence of extensive

biotite-dehydration melting, peak metamorphic conditions of granulite-facies pelite on the western peninsula are estimated at ~810-890°C and ~6.1-7.35 kbar. *In situ* U-Pb monazite geochronology (LA-ICP-MS) constrains the timing of peak metamorphism and concurrent D_1 deformation throughout the peninsula between ca. 1850-1825 Ma, coincident with the accretion of crustal blocks and arc terranes during the amalgamation of the orogenic upper plate. A younger population of ca. 1800 Ma monazite implies fluid-assisted dissolution-reprecipitation of older monazite, possibly related to the terminal collision of the amalgamated upper-plate Churchill domain with the lower-plate Superior craton. Combined with published observations, the integrated geochronological and petrological data suggest that the crustal section exposed on Hall Peninsula remained at elevated temperatures (>550°C) for ~100 m.y. after thermal peak. Despite significant crustal thickening and sustained high temperatures that are comparable with those of large, hot orogens, the crustal section records no evidence of mid-crustal ductile (channel) flow or rapid exhumation during orogenic collapse.

1. Introduction

The Trans-Hudson Orogen (THO) is a collisional belt that extends along-strike for ~3000 km from the western United States to Greenland and has a long-lived accretionary/collisional history between ca. 1920-1800 Ma (Fig. 1; Hoffman, 1988; Lewry & Collerson, 1990). Characterized by significant crustal thickening and high-grade metamorphism, the THO conforms in many ways to the definition of a large, hot orogen (Beaumont *et al.*, 2006). It has been likened to the Himalayan Orogen (St-Onge *et al.*, 2006), and is considered a prototype for modern accretionary processes (Corrigan *et al.*, 2009; St-Onge *et al.*, 2009). The tectonic history of the Quebec-Baffin segment of the THO has been well-documented by previous studies (e.g. Lucas,

1989; St-Onge *et al.*, 2007; Corrigan *et al.*, 2009), but tectono-metamorphic investigations of Hall Peninsula (Figs. 1, 2), southeast Baffin Island, have been limited by the lack of comprehensive field and geochronological studies. The peninsula provides a well-exposed oblique section of thrust imbricated supracrustal cover sequences and crystalline basement, and an opportunity to compare mid-crustal tectono-metamorphic processes in the internal zone of the THO with those of similarly large and/or hot orogens. In this contribution, we integrate the results of recent mapping, petrography and mineral analyses, equilibrium phase diagram modelling and *in situ* U-Pb monazite geochronology (LA-ICP-MS) to decipher the Paleoproterozoic tectono-metamorphic history of the internal zone of the THO. Our results indicate that this segment of the orogen reached peak metamorphism at mid-amphibolite- to granulite-facies conditions under moderate pressures at ca. 1850-1825 Ma, with concurrent east-vergent crustal shortening. The data suggest a regional, late-orogenic tectonothermal event at ca. 1800 Ma, and together with previous geochronology (Scott, 1999), imply elevated temperatures (>550°C) until ca. 1730 Ma. The apparent absence of channel flow and orogenic collapse suggests large-scale rheological/tectonic differences between the THO and similar large and/or hot orogens, which may have implications for understanding the development of these processes.

2. Tectonic setting

The THO separates the lower-plate Superior craton from an upper-plate collage of Archean crustal blocks (Churchill Plate; Hoffman, 1988; Lewry & Collerson, 1990). The Churchill Plate in the Quebec–Baffin segment of the THO (Fig. 2) consists of the Rae craton and several microcontinents that accreted to the Rae margin between ca. 1880–1840 Ma, prior to the collision of the Churchill Plate with the Superior craton at 1820–1795 Ma (St-Onge *et al.*, 2009). The Meta

Incognita microcontinent (MIM; Fig. 2), which includes much of southern Baffin Island, accreted to the Rae margin between ca. 1883 and 1865 Ma (St-Onge *et al.*, 2006). The orthogneissic basement of the MIM is overlain by the Paleoproterozoic Lake Harbour Group, a clastic-carbonate-shelf succession, and both basement and cover are intruded by ca. 1865–1848 Ma monzogranite to quartz-diorite plutons (Cumberland Batholith; Scott & Wodicka, 1998; St-Onge *et al.*, 2000, 2007; Corrigan *et al.*, 2009; Whalen *et al.*, 2010). Different cratonic origins have been proposed for the basement of the MIM and Hall Peninsula, including: the Superior, Rae or North Atlantic craton, the Aasiaat domain in West Greenland, the Core Zone in northern Labrador or a separate cratonic block (St-Onge *et al.*, 2000; Jackson *et al.*, 1990; Scott, 1999; St-Onge *et al.*, 2009). Several proposed suture zones, when projected, appear to converge on Hall Peninsula, including: the east-striking Baffin Suture; the east-striking Disko Bugt and Nagssugtoqidian sutures; and the northwest-striking Abloviak Shear Zone (Fig. 2; Corrigan *et al.*, 2009; St-Onge *et al.*, 2009; and references therein).

Granulite-facies metamorphism and fabric development on the MIM at ca. 1849-1835 Ma has been attributed to the accretion of the Narsajuaq terrane (Fig. 2) at ca. 1845 Ma and Cumberland Batholith magmatism at ca. 1865-1848 Ma (St-Onge *et al.*, 2007) or, in a different tectonic model, the subduction of the Archean crystalline Sugluk Block beneath the MIM along the Big Island Suture (Fig. 2; Corrigan *et al.*, 2009; Whalen *et al.*, 2010). Metamorphic monazite and zircon growth with no associated fabric is also documented in the MIM at ca. 1833-1829 Ma (Scott & Gauthier, 1996; Wodicka & Scott, 1997; St-Onge *et al.*, 2007).

3. Geology of Hall Peninsula based on mapping (2012-2013)

3.1. Lithotypes

Eastern Hall Peninsula is dominated by Archean tonalite and monzogranite gneisses (Fig. 3; Blackadar, 1967; From *et al.*, 2014; Steenkamp & St-Onge, 2014) ranging from ca. 2920 to 2701 Ma in age (Scott, 1999; Rayner, 2014, 2015). The Archean orthogneisses are unconformably or tectonically overlain/interleaved with supracrustal sequences of variable thicknesses (10 m to 10 km) (Machado *et al.*, 2013; Steenkamp & St-Onge, 2014). The cover sequences comprise basal quartzite overlain by interbedded pelite and psammite or interlayered semi-pelite, meta-calcsilicate, meta-ironstone and amphibolite. The strata have an estimated maximum depositional age of ca. 1960 Ma (Rayner, 2014, 2015). The western peninsula consists of Paleoproterozoic strata and plutonic rocks, with no exposed Archean basement (Fig. 3). The western strata comprise psammite, semi-pelite and quartzite, with rare marble horizons (Machado *et al.*, 2013; Steenkamp & St-Onge, 2014), and have maximum depositional ages of ca. 2100-1906 Ma (Rayner, 2014, 2015). The metasedimentary rocks host leucogranite bodies up to ~100 m thick that contain enclaves of pelite, one of which crystallized at 1867 ± 8 Ma (U-Pb zircon; Rayner, 2014). The western strata also host orthopyroxene-bearing intrusions, including monzogranite and granodiorite, with lesser diorite and mafic tonalite (Steenkamp & St-Onge, 2014) that range in age from ca. 1890 Ma to ca. 1852 Ma (Scott, 1999; Rayner, 2014, 2015).

3.2. Mineral assemblages and metamorphic map

Metamorphic mineral assemblages in pelite were utilized to compile a new metamorphic map for Hall Peninsula (Appendix 1, Fig. A1.1), combining both field observations and petrography. The mineral assemblages and map document three metamorphic mineral zones that reflect a westward increase in peak metamorphic grade from mid-amphibolite- to granulite-facies. Representative field photos are provided in Appendix 1 (Figs. A2.1, A2.2).

The eastern metamorphic zone is characterized by the mid-amphibolite-facies assemblage biotite + muscovite ± garnet ± sillimanite ± K-feldspar ± quartzofeldspathic lenses (Fig. 3). The metamorphic S_1 foliation is defined by aligned biotite, sillimanite, quartzofeldspathic lenses and, in some cases, muscovite. Sillimanite occurs as fibrolite that is surrounded by quartz ± K-feldspar, forming faserkiesel texture (Appendix 1, Fig. A2.1a). Muscovite and biotite have similar grain sizes and habits within S_1. In some localities, muscovite also forms larger grains that cross-cut the S_1 foliation and is interpreted as retrograde and post-D_1. Discontinuous lenses (≤10 cm long) of quartz + plagioclase ± K-feldspar comprising <15 vol% are interpreted as crystallised melt, following the criteria of Sawyer (1999). Melt and sillimanite become progressively less abundant towards the east and S_1-aligned muscovite is more common.

The central metamorphic zone is characterized by the upper amphibolite-facies assemblage biotite + garnet + sillimanite + K-feldspar + quartzofeldspathic lenses and contains no muscovite (Fig. 3). Whereas sillimanite usually forms fine-grained fibrolite (in faserkiesel clots), it is locally coarse-grained and quartzofeldspathic lenses, interpreted as melt, are more voluminous (~10-20 vol%) (Appendix 1, Fig. A2.1b, c).

The western metamorphic zone features granulite-facies assemblages that include garnet + sillimanite + K-feldspar + quartzofeldspathic lenses ± cordierite ± orthopyroxene ± biotite (Fig. 3). The S_1 foliation is defined by biotite and compositional banding, comprising garnet- and sillimanite-rich bands alternating with quartzofeldspathic bands (Appendix 1, Fig. A2.1d-f). K-feldspar, sillimanite and quartzofeldspathic lenses are ubiquitous, and sillimanite is coarse-grained. Biotite is scarce and, where present, rims garnet porphyroblasts. Quartzofeldspathic lenses, interpreted as melt, comprise ≥15 vol%, and leucogranite dykes and sills are interpreted as segregated melt (Dyck & St-Onge, 2014). Leucogranite parallel to S_1 contains garnet ± biotite ±

cordierite (Appendix 1, Fig. A2.1g, h), whereas rare leucogranite dykes that cross-cut S_1 contain muscovite–sillimanite ± garnet (Dyck & St-Onge, 2014). The Paleoproterozoic monzogranite-to-tonalite intrusions on west-central Hall Peninsula contain biotite–orthopyroxene ± magnetite ± clinopyroxene ± garnet. Some intrusions contain euhedral orthopyroxene phenocrysts, and/or euhedral, twinned K-feldspar megacrysts that suggest an igneous origin. However, most of the orthopyroxene is subhedral to anhedral and aligned with the regional metamorphic foliation (S_1), suggesting that it is mostly metamorphic.

3.3. Structural geology

Three regional deformation events are recognized, including: east-directed shortening (D_1), thick-skinned (basement-involved) east-directed shortening (D_2) and thick-skinned north-south shortening (D_3) (Steenkamp & St-Onge, 2014). These events are summarized in Table 1, illustrated in Figs. 4-6 and field photos and stereonets are provided in Appendix 1 (Figs. A2.1, A2.2, A3.1). The oldest regional structural elements are east-vergent, isoclinal folds (F_{1a}) of bedding and a west-dipping metamorphic foliation (S_{1a}) that is axial planar to F_{1a} (Fig. 4; Appendix 1, Figs. A2.1, A2.2, A3.1). The S_{1a} foliation is defined by peak mineral assemblages (Figs. 5d-h, 6, 7; Appendix 1, Figs. A2.1, A2.2). A lineation (L_{1a}) that is parallel to F_{1a} fold axes is defined by elongate mineral growth, including sillimanite on western Hall Peninsula and faserkiesel clots farther east (Appendix 1, Figs. A2.1a, A2.2b). Locally, the D_{1a} fabric has been re-folded by east-vergent, isoclinal-to-open F_{1b} folds with an axial planar S_{1b} foliation and an L_{1b} mineral lineation parallel to F_{1b} fold hinges (Dyck & St-Onge, 2014). The D_{1b} structures have the same orientations as D_{1a} structures, are defined by the same minerals and are indistinguishable without clear field evidence of two fold generations (F_{1a} and F_{1b}). As such, S_{1a} and S_{1b} are treated as equivalent in this study, and both are referred to as S_1. S_1 foliation planes can contain a lineation defined by elongate or

stretched minerals that plunges approximately down-dip (Appendix 1, Fig. A3.1), which is interpreted as an L_1 lineation that developed during west-over-east shearing along F_1 fold limbs.

East-directed, basement-involved shortening is evidenced by imbricate thrusts (T_2) on northeastern Hall Peninsula (Figs. 3b, 4b), whereby panels of Archean orthogneiss overlie Paleoproterozoic supracrustal rocks (Steenkamp & St-Onge, 2014; Rayner, 2015; Chadwick *et al.*, 2015). Thick-skinned folds (F_2) are associated with T_2 thrusts (Fig. 5a), and the west-over-east kinematics of T_2 and F_2 are shown by rotated porphyroblasts and east-vergent F_2 folds in outcrop. Although 3D exposure of T_2 thrusts and F_2 folds is limited to the east coast, ≤10 km-thick panels of Paleoproterozoic supracrustal rocks structurally bound by Archean orthogneiss occur throughout the eastern peninsula (Steenkamp & St-Onge, 2014).

A west-plunging lineation (L_2) associated with T_2 thrusts and F_2 fold limbs is defined by stretched aggregates of quartz and feldspar (Appendix 1, Fig. A2.2c) (Steenkamp & St-Onge, 2014). With the exception of mylonitization along T_2 thrust contacts (Appendix 1, Fig. A2.2d-f), the S_1 fabric is preserved and no S_2 metamorphic foliation has been recognized, even in F_2 fold hinges. Given the similarly east-vergent kinematics of D_1 and D_2, S_2 fabric development cannot be entirely ruled out, but all foliations defined by peak assemblages are designated S_1 in this study.

T_2 thrusting contributed significantly to crustal thickening and to the overall architecture of Hall Peninsula (Fig. 3b). T_2 thrusts juxtapose higher-grade rocks over lower-grade rocks, resulting in an inverted metamorphic zonation (field gradient), suggesting that T_2 thrusting was post-thermal-peak on the scale of individual thrusts. However, it is also likely that crustal thickening resulting from T_2 thrusting contributed to peak metamorphic conditions in footwall rocks. This is supported by cross-cutting leucogranite in the western granulite-facies zone, as described by Dyck & St-Onge (2014). Cordierite-garnet leucogranite that is interpreted to be a

product of biotite-dehydration melting is aligned with S_1, whereas less common muscovite-sillimanite leucogranite, inferred as the retrograded product of muscovite-dehydration melting, cross-cuts S_1 (Dyck & St-Onge, 2014). Consequently, D_2 is interpreted to be broadly syn- to post-thermal peak.

D_1 and D_2 structures are locally folded by post-thermal-peak thick-skinned folds (F_3) up to several kilometres wide with west-striking axial planes. S_1 in pelite is overprinted by centimetre-to-decimetre scale F_3 crenulations and a west-striking crenulation cleavage (S_3; Fig. 5b; Appendix 1, Figs. A2.2g, h, A3.1) (Skipton & St-Onge, 2014). The geometry of F_3 crenulations imply that D_3 is associated with south-vergent shortening. Rare leucosomes (Qz+Pl) oriented parallel to S_3 (Appendix 1, Fig. A2.2g) suggest that minor melting occurred during D_3 (Skipton & St-Onge, 2014).

3.4. Previous metamorphic geochronology

Previous geochronological studies on Hall Peninsula indicate a protracted thermal history, although there is no apparent trend between published U-Pb or Ar ages and their respective location, structural setting or metamorphic grade. These geochronological data are described in detail in Appendix 1. Zircon rims from the three metamorphic zones described above have a range of U-Pb ages from ca. 1886-1759 Ma (Scott & Gauthier, 1996; Scott, 1999; Rayner, 2014), and U-Pb monazite analyses (ID-TIMS) on four samples from the upper amphibolite- and granulite-facies zones yield ages of ca. 1877-1856 Ma (Scott, 1999). A garnet-bearing leucogranite that is interpreted as a melt product of granulite-facies metamorphism crystallized at 1867 ± 8 Ma (U-Pb zircon; Rayner, 2014). Three U-Pb titanite ages range from ca. 1742-1730 Ma (Scott, 1999) in the mid-amphibolite-facies zone, and ^{40}Ar-^{39}Ar ages of muscovite from the eastern peninsula range from ca. 1690-1657 Ma (Skipton *et al.*, 2015). Potassium-Ar ages on minerals from six samples

distributed across the peninsula include: biotite (ca. 1700–1507 Ma; Wanless *et al.*, 1968), muscovite (ca. 1610 Ma; Lowdon, 1960) and hornblende (ca. 1670 Ma; Wanless *et al.*, 1979). The age of D_1 deformation is broadly constrained between ca. 1873 Ma, the age of a deformed monzogranite dyke, and ca. 1830 Ma, the age of an undeformed monzogranite that cross-cuts S_1 (Rayner, 2014, 2015). Minimum ages for D_2 and D_3 are not determined, as no intrusion cross-cutting D_2 or D_3 structures has been identified.

4. Sample descriptions and petrography

The metamorphic history of the THO internal zone on Hall Peninsula was investigated using mineral chemistry, equilibrium phase diagram modeling and *in situ* U-Pb monazite geochronology of four metasedimentary rocks (Table 2; Figs. 3, 4).

4.1. Sample F122B: Biotite-muscovite-sillimanite-garnet pelite

Sample F122B was collected from a sequence of pelite and psammite that overlies Archean tonalitic gneiss in the eastern mid-amphibolite-facies zone (Figs. 3, 4a). S_1 in the metasedimentary sequence is folded by south-vergent F_3 crenulations (Fig. 5b). Sample F122B comprises biotite, muscovite, sillimanite (fibrolite), garnet (Fig. 5c), plagioclase and quartz. S_1 is defined by aligned biotite, fibrolite, plagioclase and minor muscovite. Plagioclase and quartz are concentrated in ≤1 cm thick bands aligned parallel to S_1 (Fig. 5d) that also contain rare K-feldspar (<2% of sample). Biotite and muscovite grains that define S_1 are medium-grained. However, most (~85%) muscovite cross-cuts S_1 and is coarse-grained (Fig. 5c-f), including muscovite crystals that engulf fibrolite knots (Fig. 5c, e, f), as well as less common muscovite grains with symplectic quartz intergrowths located in plagioclase- and quartz-rich bands (Fig. 5d). The post-S_1 muscovite grains that engulf fibrolite are often, but not always, oriented axial planar to F_3 crenulations (Fig. 5f). Garnet

porphyroblasts (~2%) are ≤2 mm wide and are wrapped by S_1. Garnet cores contain inclusions of plagioclase (albite) and biotite, whereas garnet rims are inclusion-free and their irregular shape suggests partial resorption (Fig. 5c). Most biotite grains are S_1-aligned, and a later generation of biotite cross-cuts S_1, including most grains that are adjacent to resorbed garnet rims.

Leucosome bands of plagioclase-quartz ± K-feldspar that comprise ~15% of sample F122B are interpreted as melt, with sillimanite and K-feldspar comprising the peritectic products of the vapour-absent muscovite dehydration melting reaction (Ms + Pl + Qz = Sil + Kfs + melt; Spear *et al.*, 1999; Gardien *et al.*, 1995; White *et al.*, 2001). Since S_1 is defined by fibrolite bands, plagioclase and leucosome, as well as S_1-aligned muscovite and biotite, S_1 is inferred as syn-thermal peak (Fig. 7). Post-S_1 biotite growth likely accompanied partial resorption of garnet rims.

Muscovite aligned with S_1 is interpreted as prograde (e.g., Tyler & Ashworth, 1982). The more abundant muscovite grains that cross-cut S_1 are interpreted as post-D_1 and -thermal peak. Since this later muscovite occurs as porphyroblasts that engulf fibrolite or as grains with symplectic quartz intergrowths, it is interpreted to have formed through rehydration of K-feldspar following melt crystallization (e.g., Evans & Guidotti, 1966; Ashworth, 1975; Palin *et al.*, 2014). Thus, despite petrographic evidence of muscovite dehydration melting, K-feldspar is rare while muscovite is abundant. Since many post-D_1 muscovite grains are axial planar to F_3 crenulations and some cross-cut F_3 crenulations, post-D_1 muscovite probably grew as a syn- to post-D_3 phase (Fig. 7).

4.2. Sample S89A: Biotite-muscovite-sillimanite-garnet pelite

Sample S89A, from the mid-amphibolite-facies zone, was collected from a ~500 m thick, northwest-dipping supracrustal sequence that is structurally bounded by Archean orthogneiss (Fig.

4b). The strata and their underlying basement form one of several T_2 thrust imbricates mapped on the northern margin of Ptarmigan Fjord (Fig. 4b; Chadwick *et al.*, 2015).

Sample S89A has a northwest-dipping S_1 that is defined by bands of fine-grained muscovite ± sillimanite alternating with bands of coarser-grained biotite, muscovite, quartz, plagioclase and garnet (Fig. 5g, h). Muscovite grains in biotite-rich bands are S_1-aligned and medium-grained, similar to biotite, and comprise ~25% of muscovite in the sample. Within the bands of fine-grained muscovite, many muscovite grains occur at high angles to S_1 (Fig. 5h). Sillimanite (~6%) is present as fine needles in quartz and garnet and infrequently as fine-grained aggregates in muscovite bands (Fig. 5h). Garnet (~2%) forms elongate, S_1-aligned grains up to 3 mm wide with randomly-oriented inclusions of quartz, biotite and sillimanite (Fig. 5g). Garnet grains typically have irregularly-shaped rims that are in contact with biotite.

Coarse-grained sillimanite occurs locally in outcrop, as well as coarse-grained leucogranite dykes that are suggestive of partial melting, and the mineral assemblage in sample S89A suggests that it achieved vapour-absent muscovite dehydration melting. However, K-feldspar is absent and only ~5% leucosome occurs in hand sample. The absence of K-feldspar may be due to the occurrences of large muscovite grains that are non-S_1-aligned and surround sillimanite aggregates (Fig. 5h), possibly representing the retrograde replacement of K-feldspar (e.g., Evans & Guidotti, 1966; Ashworth, 1975; Palin *et al.*, 2014). S_1-aligned bands of muscovite ± sillimanite (Fig. 5h) are interpreted as retrograde pseudomorphs of sillimanite + quartz ± K-feldspar (faserkiesel) that grew parallel to S_1 during muscovite breakdown at peak conditions. Minor S_1-aligned, medium-grained muscovite that occurs with S_1-aligned biotite may represent prograde muscovite (e.g., Tyler & Ashworth, 1982). Irregularly-shaped garnet rims with adjacent biotite may represent partial resorption of garnet accompanied by late biotite growth (Fig. 5g).

4.3. Sample F28A: Garnet-sillimanite-K-feldspar psammite

Sample F28A, from the central upper-amphibolite-facies zone, was collected from the margin of a 1 km thick, west-dipping package of pelite and psammite that is structurally bounded by tonalite orthogneiss basement, and is ~2 km east of the ~25 km wide belt of orthopyroxene-bearing granitoids on the central peninsula (Figs. 3, 4c). The supracrustal rocks are characterized by a west-southwest-dipping S_1 fabric and the western contact with orthogneiss basement is interpreted as a T_2 thrust.

Sample F28A comprises quartz, K-feldspar, plagioclase, garnet, biotite and sillimanite. The S_1 foliation is defined by compositional banding, in which bands of coarse-grained quartz (35%), plagioclase (30%) and K-feldspar (35%) alternate with finer-grained bands of biotite, garnet and sillimanite (Fig. 6a, b; Appendix 1, Fig. A2.1b, c). Biotite (~15%) and sillimanite are S_1-aligned, and garnet (~4%) forms anhedral, S_1-aligned porphyroblasts up to 1.5 cm long, as well as a lesser population of smaller, equant grains (Fig. 6a). Garnet contains S_1-aligned inclusion trails of biotite, plagioclase and quartz.

Bands of coarse-grained quartz, plagioclase and K-feldpsar are interpreted as crystallised melt. Based on the presence of leucosome and sillimanite, the abundance of K-feldspar and the absence of muscovite, the sample likely reached temperatures upwards of ~650°C, enabling vapour-absent muscovite dehydration melting and consumption of muscovite. With increased temperatures to ~750°C, biotite dehydration melting may have occurred by the continuous reaction Bt + Sil + Pl = Grt + Kfs + Sil (Spear & Parrish, 1996; Spear *et al.*, 1999). The textures imply that peak metamorphism and partial melting were accompanied by S_1 development.

4.4. Sample S145A: Garnet-sillimanite-cordierite-K-feldspar pelite

Sample S145A, from the western granulite-facies zone (Fig. 3), was collected from a ~10 km thick sequence of pelite, psammite and quartzite that contains ≤1 km-thick foliation-parallel intrusions of orthopyroxene tonalite and clinopyroxene gabbro (Fig. 4d). The sequence is folded by F_1 and has a west-southwest-dipping, axial planar S_1 fabric.

Sample S145A contains garnet, cordierite, sillimanite, quartz, K-feldpsar, plagioclase, ilmenite and minor biotite (Fig. 6c-e). S_1 is defined by compositional banding, whereby garnet-, cordierite- and sillimanite-rich bands alternate with bands (~10 vol%) of coarse-grained K-feldspar (~35%), plagioclase (25%) and quartz (40%) (Appendix 1, Fig. A2.1e, f). S_1 is also defined by aligned garnet, sillimanite, ilmenite, cordierite, quartz, plagioclase and K-feldspar. Garnet (~20% of the rock) forms 3-15 mm wide porphyroblasts that are elongate parallel to S_1 (Fig. 6c). Garnet contains inclusions of biotite and plagioclase, and fine sillimanite inclusions are concentrated in the rims of large garnet crystals (Fig. 6d). Sillimanite inclusions are locally oriented parallel to the garnet rim, but are mostly aligned with the S_1 foliation in the matrix. Matrix sillimanite forms prismatic crystals defining S_1 (Fig. 6c). Cordierite generally occurs with garnet and sillimanite, and locally appears to have embayed garnet rims (Fig. 6d). Biotite (~5%) forms S_1-aligned grains that are concentrated in garnet- and sillimanite-rich bands. A second biotite generation cross-cuts S_1 and is often adjacent to garnet (Fig. 6c).

Bands of coarse-grained plagioclase, K-feldspar and quartz are interpreted as melt (e.g., Sawyer, 1999). The mineral assemblage and textures suggest peak conditions at granulite-facies temperatures of at least ~825-850°C, enabling biotite dehydration melting (Bt + Pl + Qz + Sil = Grt/Crd + Kfs + melt; LeBreton & Thompson, 1988; Gardien *et al.*, 1995; Spear *et al.*, 1999). The peak mineral assemblage is interpreted as sillimanite, garnet, cordierite, ilmenite, plagioclase, K-

feldspar, quartz and melt. Peak metamorphism was likely accompanied by D_1 (Fig. 7), and S_1 probably began to develop during garnet growth and sillimanite nucleation before the thermal peak. Post-S_1 biotite grains that embayed garnet rims (Fig. 6c) may reflect the replacement of garnet by biotite during cooling, potentially via the reversal of the biotite dehydration melting reaction. Cordierite located along embayments of garnet (Fig. 6d) may represent replacement of garnet by cordierite during decompression (Grt + Sil + Qz = Crd; Bhattacharya, 1993).

5. Mineral chemistry (major elements)

5.1. Analytical methods

Major element analyses were conducted on polished thin sections of each sample using the JEOL JXA-8230 Superprobe at the University of Ottawa (Canada). Analytical methods and a summary of matrix mineral chemistry are given in Appendix 1. Representative compositions are presented in Appendix 2.

5.2. Garnet chemistry

Garnet compositional profiles are shown in Fig. 8, and transect locations and compositional maps (Fe, Mg, Mn, Ca, Y) are provided in Appendix 1 (Figs. A7.1-4). In samples F122B and S89A, garnet rims demonstrate decreases in Fe and Mg and increases in Mn and Fe/Fe+Mg ratios. Garnet in sample S89A has a relatively homogeneous Ca content, whereas the garnet core in sample F122B is enriched in Ca relative to rims. In sample F28A, garnet exhibits relatively homogeneous Fe and Mg contents, but there is a slight overall increase in the Fe/Fe+Mg ratio towards one garnet rim. The garnet core is slightly enriched in Ca and the Mn content is fairly homogeneous, although there is a small increase in Mn in the rims. In sample S145A, garnet rims have higher Fe/Fe+Mg ratios than the garnet core, particularly where in contact with matrix biotite.

The Mn and Ca profiles are relatively flat, but show small variations, including slight Mn increases in the rims and near biotite-filled fractures in the garnet interior.

As discussed above, peak mineral assemblages and textural evidence of dehydration melting suggest that all samples reached temperatures upwards of ~650°C. Therefore, any prograde zoning recorded by Fe, Mg and Mn in garnet was likely homogenized in all samples by intra-crystalline volume diffusion, which is effective in garnet above temperatures of ~600°C (Woodsworth, 1977; Florence & Spear, 1991). This explains the fairly flat Fe, Mg and Mn profiles in sample F28A and Ca and Mn profiles in sample S145A. In samples F122B, S89A and F28A, the relatively flat Ca profiles across garnet imply some homogenization of Ca due to intracrystalline diffusion above ~600°C, although garnet cores exhibit slight Ca-enrichment compared to rims. This may suggest that prograde, bell-shaped Ca profiles (e.g. St-Onge, 1987; Spear *et al.*, 1990; Florence & Spear, 1993) were incompletely homogenized due to the slower diffusivity of Ca (Florence & Spear, 1991; Chernoff & Carlson, 1997).

In all samples, increases in Fe/Fe+Mg toward garnet rims are attributed to a combination of retrograde net transfer reactions and retrograde Fe-Mg exchange with adjacent matrix biotite (Kohn & Spear, 2000; Spear, 2004). Strongly elevated Fe/(Fe+Mg) ratios in garnet rims that are in contact with biotite suggests retrograde Fe-Mg exchange between the two minerals, which is also supported by increases in Mg in biotite towards contacts with garnet (Spear, 2004), particularly in samples F28A and S145A. However, Mn-enriched garnet rims and high Fe/(Fe+Mg) ratios in garnet rims that are not in contact with biotite imply that Fe-Mg diffusion with biotite was not the only cause of the high Fe/(Fe+Mg) ratios (e.g. Spear, 2004). In samples F122B and S89A, enrichment of Mn in garnet rims is interpreted as the result of retrograde garnet resorption - possibly by the net transfer reaction Grt + Ms = Bt + Pl - and back-diffusion of Mn

into the remaining garnet (Kohn & Spear, 2000). Garnet resorption through retrograde net-transfer reactions is suggested by the non-euhedral shape of garnet porphyroblasts and irregularly-shaped rims (Fig. 5c, g). In samples F28A and S145A, retrograde net transfer reactions may have occurred via the reversal of biotite dehydration melting reactions during cooling (e.g. Spear, 2004). However, Mn enrichment in garnet rims in samples F28A and S145A is much less pronounced than in lower-grade samples, despite petrographic evidence of embayed garnet boundaries suggesting retrograde resorption (Fig. 6c, d; Figs. A7.3, A7.4). This may be attributed to the lower overall X_{Sps} in F28A and S145A and, potentially, because water loss during melting and melt extraction hindered retrograde net transfer reactions, resulting in lower volumes of resorbed garnet and relatively minor back-diffusion of Mn.

Prograde growth zoning patterns in garnet have been effectively erased due to compositional homogenization at peak conditions followed by retrograde Fe-Mg exchange with biotite and retrograde net transfer reactions. Following the approach of Weller *et al.* (2013) for estimating the composition of homogenized garnet at the thermal peak in sillimanite-grade pelites, the maximum value of pyrope is interpreted to represent the closest approximation of the syn-D_1 peak garnet composition. This composition is in the interior of each garnet (arrows in Fig. 8), inboard of rims that are affected by retrograde Fe-Mg exchange or Mn-enrichment. However, homogenization of Ca was incomplete in some samples and the degree of homogenization of Fe, Mg and Mn is uncertain because the 'peak' profiles have been modified during cooling. It is also possible that the Mg content of garnet rims during the thermal peak may have been higher than the Mg content of the garnet interior after homogenization. Furthermore, the maximum-pyrope composition coincides with slightly elevated X_{Grs} cores in some samples, which may record prograde metamorphism at higher pressures than those of the thermal peak. Despite uncertainties,

the maximum-pyrope composition is still considered the best possible approximation of the 'peak' garnet composition.

6. Phase diagram modeling

6.1. Methodology

To constrain the stability fields of mineral assemblages from the three metamorphic zones and document the *P-T* evolution of different pelitic samples, equilibrium phase diagrams were constructed for four samples (F122B, S89A, F28A & S145A) using TheriakDomino v.01.08.09 (De Capitani & Brown, 1987; De Capitani & Petrakakis, 2010; http://titan.minpet.unibas.ch/minpet/theriak/theruser.html). Modeling was conducted in the 11-component system MnO-Na_2O-CaO-K_2O-FeO-MgO-Al_2O_3-SiO_2-H_2O-TiO_2-Fe_2O_3 (MnNCKFMASHTO) using the internally consistent thermodynamic data set tc-db55 of Holland & Powell (1998; updated August, 2004). Whole-rock geochemistry (Appendix 1, Table A8.1) was determined using ICPMS (Activation Laboratories Ltd., Canada). The methodology used to construct phase diagram models is described in Appendix 1.

Garnet compositional isopleths of grossular and pyrope were contoured on each phase diagram in an attempt to track a portion of the *P-T* history as recorded by the garnet end-member compositions. As per above, diffusive homogenization of prograde growth zoning at peak conditions, followed by retrograde reactions (Fig. 8), precludes the use of core-to-rim garnet compositions for interpreting the *P-T* conditions coincident with garnet growth. Instead, the analysis with the highest pyrope value is considered the best estimate of the composition of syn-D_1 garnet at the thermal peak (arrows in Fig. 8; e.g., Weller *et al.*, 2013). The garnet compositions used to estimate peak *P-T* are presented in Appendix 2. The thermal peak conditions are also constrained using peak assemblages interpreted from petrography. The vol% of solid phases at the

estimated peak conditions were calculated using Theriak and compared to modal abundances estimated in thin section (Appendix 1, Table A10.1). The Ti-in-biotite geothermometer (Henry *et al.*, 2005) is calibrated for graphitic, ilmenite- or rutile-bearing, peraluminous pelites that equilibrated at ca. 4-6 kbar, and was applied to sample S145A since it is the only sample that meets the calibration criteria. The Ti-in-biotite geothermometer was applied to five matrix biotite grains, including some in contact with garnet.

For any *P-T* point on the phase diagram models, the 1σ uncertainty is suggested to be ±0.5 kbar and ±25°C (Powell & Holland, 2008). These are minimum estimates of error, particularly given the uncertainty involved in estimating the composition of garnet at the thermal peak. Although the maximum-pyrope compositions coincide with enriched-X_{Grs} cores that may reflect prograde conditions, variations in X_{Grs} from core to rim in three samples (~0.005 cation mole fraction) are beyond the resolution of phase diagram models and have negligible effects on our P-T estimates. The more pronounced grossular zoning in sample F122B only slightly affects our estimated peak conditions (see below).

6.2. Phase diagram models

6.2.1. Sample F122B: Mid-amphibolite-facies pelite

The composition of syn-D_1 garnet at the thermal peak, estimated at the highest pyrope value, corresponds to intersecting grossular (0.05) and pyrope (0.14) isopleths at ~6.25 kbar and ~740°C, constraining the thermal peak above the onset of muscovite dehydration melting (point P, Fig. 9). The modeled thermal peak plots in a stability field defined by the peak assemblage interpreted from petrography (dark grey shaded field, Fig. 9a). Additionally, petrographical evidence of ~15 vol% leucosome containing Pl + Qz ± Kfs, interpreted as melt (Fig. 5d), substantiates the estimated thermal peak above temperatures required to initiate melting. Elevated

grossular (~0.06) in garnet cores suggests a clockwise, prograde path at higher pressures (~7-8 kbar), although Ca in garnet may have been modified during peak conditions. Lower grossular in garnet rims (~0.04) implies lower pressures (~5.1 kbar) at the thermal peak, although within the same stability field. The abundance of post-D_1 muscovite in sample F122B (Fig. 5c-f), along with the rarity of K-feldspar, suggest subsequent cooling below the solidus and the retrograde reversal of muscovite breakdown reactions. Partially resorbed garnet rims and late adjacent biotite growth (Fig. 5c) may also be consistent with a retrograde overprint. The vol% of phases modeled in Theriak (Appendix 1, Table A10.1) at the estimated peak conditions (740°C, 6.25 kbar) is in agreement with vol% estimated from petrography when retrograde growth of muscovite at the expense of K-feldspar is accounted for.

6.2.2. Sample S89A: Mid-amphibolite-facies pelite

The highest-Mg garnet composition coincides with grossular (0.04) and pyrope (0.14) isopleths at ~7.25 kbar and 715°C (point P, Fig. 10). These *P-T* conditions are in a narrow, K-feldspar-absent stability field containing Grt-Ms-Bt-Sil-Qz-Liq, at sufficient temperatures to enable K-feldspar- absent muscovite breakdown. However, within 1σ uncertainty (±0.5 kbar and 25°C; Powell & Holland, 2008), the modeled thermal peak could be up to ~740°C, hot enough to enable muscovite dehydration melting and produce the peak assemblage interpreted from petrography (grey shaded field, Fig. 10a). Partial melting is substantiated by lenses of coarse-grained leucogranite in outcrop, as well as ~5 vol% leucosome in hand sample. Muscovite breakdown is also in accordance with sillimanite inclusions in garnet and fine-grained sillimanite aggregates, as well as coarse-grained sillimanite in outcrop. In particular, textures suggest that post-D_1 muscovite formed from rehydration of K-feldspar, a product of muscovite dehydration melting. Subsequent cooling across the solidus into a muscovite-bearing, sillimanite-absent

stability field is inferred from the replacement of K-feldspar by late muscovite, as well as S_1-parallel bands of fine-grained muscovite that are interpreted to represent retrograde pseudomorphs of faserkiesel (fibrolite+Qz±Kfs; Fig. 5g, h). Furthermore, the vol% of phases (modeled in Theriak) at 715°C and 7.25 kbar do not correspond to vol% of phases in thin section; in particular, Theriak calculates <1 vol% sillimanite at these conditions. The modeled vol% of phases for temperatures of 730-740°C and 7.25 kbar include ~11% sillimanite and align more closely with modal abundances observed in thin section when retrograde replacement of K-feldspar by muscovite is accounted for.

6.2.3. Sample F28A: Upper-amphibolite-facies psammite

In the modelled phase diagram for sample F28A, the grossular (0.034) and pyrope (0.30) contents of the peak garnet composition correspond to conditions of ~7.1 kbar and 810°C in a stability field containing Grt-Kfs-Bt-Liq-Sil-Qz (point P in Appendix 1, Fig. A11.1). The modelled thermal peak is at sufficiently high temperatures to allow muscovite dehydration melting, as interpreted from petrography. However, sample F28A contains approximately equal amounts of K-feldspar and plagioclase. On the phase diagram, the peak assemblage interpreted from petrography (Grt-Pl-Kfs-Bt-Liq-Sil-Qz; grey shaded field in Appendix 1, Fig. A11.1) has a higher *P-T* range (7-9 kbar and ~810-850°C) than the thermal peak estimated from the peak garnet composition. The discrepancy between the modelled thermal peak and the observed peak assemblage may be due to intra-grain diffusion in garnet; if the pyrope content of garnet during the thermal peak was higher than the estimated 0.30 (point P), the garnet composition may correspond to intersecting isopleths in the modelled peak assemblage field. In addition, the discrepancy may be attributed to the effect of melt loss on the modelled bulk composition. If significant melt loss occurred, a phase diagram constructed using the measured bulk rock

composition only allows investigation of the post-melt loss history (e.g., Indares *et al.*, 2008; Guilmette *et al.*, 2011).

6.2.4. Considerations of melt loss

Melt loss is not considered to have significantly affected the phase diagram models of samples F122B and S89A because of the lack of connected melt channel networks and low leucosome volume (~5-10%) in outcrop, and the presence of ~5-15 vol% leucosome in the analyzed bulk rock samples. Furthermore, the modelled phase diagrams predict the observed peak assemblages and vol% of phases at reasonable *P-T* ranges that correspond to peak garnet compositions.

Petrographical evidence suggests that muscovite in sample F28A was consumed by vapour-absent muscovite dehydration melting, and that some biotite dehydration melting may have occurred, however the sample only contains ~5-10% *in situ* leucosome. It is likely that a portion of melt was extracted along connected melt networks observed in outcrop (Appendix 1, Fig. A2.1b, c). To explore the *P-T* history of sample F28A prior to melt loss, 10 vol% of melt was integrated into the measured bulk composition, using the melt composition calculated by White *et al.* (2001) that would be generated from an average pelite at 740°C. The melt-integrated model is built on two major assumptions, representing significant sources of uncertainty: that the melt generated in sample F28A had the same composition as melt generated from the average pelite of White *et al.* (2001) at 740°C, and that 10 vol% melt was subsequently lost. The 740°C estimate of melt production was chosen due to petrographic evidence of muscovite consumption during dehydration melting above ~650°C, as well as possible biotite dehydration initiating at ~750°C. The sample contains no orthopyroxene or cordierite, suggesting that it did not cross biotite dehydration reactions that occur at ~825°C along a typical orogenic medium P/T gradient. In

addition, a volume of 10% melt was chosen because muscovite dehydration melting typically produces up to ~15 vol% melt (Patiño-Douce & Johnston, 1991), and the sample contains ~5-10 vol% *in situ* leucosome. The peak garnet composition, estimated from the highest-Mg value, was plotted on the melt-integrated phase diagram with garnet compositional isopleths in an attempt to infer the peak *P-T*. This method assumes that melt loss occurred after the compositional equilibration of garnet, which is plausible since most melt loss typically occurs during decompression after the thermal peak (e.g., Brown, 2004, 1994).

6.2.5. Sample F28A with melt integration

The melt-integrated phase diagram model of sample F28A more accurately reflects the observed mineral phases, including both K-feldspar and plagioclase, but has a large built-in degree of uncertainty due to the assumptions used in melt-integration. The peak composition of garnet corresponds to intersecting isopleths at ~7.2 kbar and 810°C (point P, Fig. 11), in a Grt-Pl-Kfs-Bt-Liq-Sil-Q stability field. The melt-integrated phase diagram model predicts peak conditions sufficient for vapour-absent muscovite dehydration melting, consistent with petrographic observations of coarse-grained leucosomes, abundant K-feldpsar and sillimanite, and the absence of muscovite. The modeled thermal peak conditions are also consistent with Opx- and Crd-absent biotite dehydration melting, a continuous reaction that occurs above ~750°C (Spear & Parrish, 1996; Spear *et al.*, 1999). At the estimated peak conditions (point P), the vol% of phases modeled in Theriak generally agree with modal abundances observed in thin section, although Theriak suggests less biotite at the thermal peak (6%) than the observed ~15 vol%. Some retrograde biotite may have formed during melt crystallization. Given the significant inherent assumptions with the melt-integrated model (as discussed above), we consider ~7.2 kbar and 810°C (point P, Fig. 11) as a reasonable but semi-quantitative thermal-peak *P-T* estimate of sample F28A.

6.2.6. Sample S145A: Granulite-facies pelite

On the phase diagram model, the interpreted peak mineral assemblage for sample S145A (Grt-Crd-Kfs-Sil-Pl-Qz-Ilm-Liq) spans ~810-890°C and 6.1-7.35 kbar (dark grey shaded field, Fig. 12a). The modelled peak *P-T* conditions are consistent with field and petrographical evidence of biotite-dehydration melting at granulite-facies conditions. However, the grossular and pyrope isopleths do not intersect over the compositional range of garnet (Fig. 12b), and the estimated 'peak' garnet composition (pyrope=0.33; grossular=0.03) cannot be plotted. Since >40 vol% melt can be generated after biotite dehydration melting (Patiño-Douce & Johnston, 1991), sample S145A probably underwent significant melt loss. This is supported by the restitic nature of S145A, which is dominated by garnet, cordierite and sillimanite, with only ~10 vol% *in situ* melt in hand sample, whereas a stromatic, interconnected melt network occurs in outcrop (Appendix 1, Fig. A2.1e, f). Melt-integration modeling was not attempted given the large volumes of melt that would need to be considered. The phase diagram model for sample S145A is considered to be non-quantitative, but it yields helpful information about peak and post-peak metamorphism. The vol% of phases modeled in Theriak over the *P-T* range of ~850-890°C and 7-7.35 kbar are close to the vol% of phases estimated in thin section when retrograde biotite growth is accounted for.

Using the Ti-in-biotite geothermometer (Henry *et al.*, 2005), five matrix biotite grains yielded consistent temperature estimates of 771-794°C, including biotite in contact with garnet and grains surrounded by feldspar and quartz. The average temperature of 782 ± 12°C corresponds to stability fields where biotite is stable (e.g. light grey shaded field, Fig. 12a), suggesting that sample S145A underwent the reversal of biotite-dehydration melting reactions during cooling. Cooling to a biotite-bearing stability field is supported by observations of ~5% biotite in thin section, often concentrated along embayed garnet rims (Fig. 6c), in addition to high Fe/Fe+Mg in garnet rims.

The consumption of garnet rims by cordierite (Fig. 6d) may have occurred during cooling, possibly by the reaction Grt + Kfs + Liq = Crd + Bt (Spear *et al.*, 1999), or during decompression post-thermal peak, potentially by the reaction Grt + Sil + Qz = Crd (Bhattacharya, 1993). Cooling and decompression are illustrated by the possible retrograde *P-T* path depicted in Fig. 12.

7. Monazite geochronology

7.1. Analytical methods

Monazite was dated *in situ* in four metasedimentary rocks to resolve the timing of metamorphism and fabric development. In each sample, 15-30 monazite grains were dated using LA-ICP-MS at the University of New Brunswick (Canada) following the analytical methods in Appendix 1. Monazite grains were dated in several microstructural contexts, including along grain boundaries, as well as inclusions in matrix minerals and in garnet, and monazite aligned with S_1. Grains of sufficient size were analyzed using 2-4 analytical spots with a 10-13 µm spot diameter to date prospective age domains. The corresponding U-Pb analytical data are provided in Appendix 3. For each sample, all analyses were initially plotted on a Concordia diagram using Isoplot v4 (Ludwig, 2003), but no single age could be resolved due to the single spot age scatter. For each sample, statistical evaluation of Concordia diagrams and weighted average plots of $^{206}Pb/^{238}U$, $^{207}Pb/^{235}U$ and $^{207}Pb/^{206}Pb$ ages were used to identify groups of three or more analyses that cluster on Concordia and yield a statistically valid Concordia age with a combined MSWD (of concordance and X-Y equivalence) of <2. The Concordia age is reported for each sample in this study at 2σ uncertainty, representing the weighted mean age of "n" number of analyses on a Concordia diagram (Ludwig, 2003). Discordant (≥10%) monazite analyses were not included in the analysis clusters that were used to calculate ages. In samples F122B, S89A and S145A, two or

three monazite grains with multiple age domains were selected for trace element mapping using LA-ICP-MS (University of New Brunswick, Canada). Analytical methods and compositional maps are presented in Appendix 1 (Figs. A13.1-3).

7.2. In situ U-Pb geochronology results

7.2.1. Sample F122B: Mid-amphibolite-facies pelite

In sample F122B, monazite typically forms subhedral, 40-100 µm-long grains that are concentrated in syn-S_1 biotite. No monazite was found in garnet, plagioclase, quartz or leucosomes. Twenty-one analyses of 15 monazite grains form a concordant cluster at 1831 ± 5 Ma (MSWD=0.72; Fig. 13a). Most monazite grains are S_1-aligned and five grains have multiple analyses that plot in the ca. 1831 Ma age cluster, with no other apparent age domains (Fig. 14a, b). The cluster also includes an analysis from a grain that contains several <10 µm-long aluminosilicate inclusions aligned parallel to S_1, as well as a grain that has two additional discordant analyses at ca. 1900 Ma. Some grains exhibit patchy, irregular zoning in BSE images, but there is no clear relationship between dark- or light-BSE domains and age.

7.2.2. Sample S89A: Mid-amphibolite-facies pelite

In sample S89A, monazite forms 20-50 µm, subhedral, subequant grains, and less common elongate, S_1-aligned grains up to 200 µm long. Seventeen analyses from 12 grains yield an age of 1808 ± 4 Ma (MSWD=1.2; Fig. 13b), which includes analyses from S_1-aligned matrix monazite (Fig. 14c), as well as one analysis from an inclusion in a garnet rim (Fig. 14d, e). Certain grains have multiple analyses that are all included in the ca. 1808 Ma cluster (or are younger and discordant), with no other apparent age domains. These comprise subequant grains in biotite or along grain boundaries, as well as subhedral-to-anhedral, elongate monazite grains that appear intergrown with fine-grained muscovite that is interpreted as post-D_1, retrograde muscovite (Fig.

14f). Six analyses from six grains form an additional concordant cluster at 1852 ± 7 Ma (MSWD=1.5), including analyses from subequant monazite grains in the matrix, from monazite aligned with S_1 in biotite (Fig. 14c) and one analysis from a monazite inclusion in a garnet rim (Fig. 14d, e). Most analyses in the ca. 1852 Ma cluster are from grains with additional analyses that are included in the ca. 1808 Ma group (Fig. 14c-e) or are younger and discordant. Zoning in BSE is rare, but the older and younger age domains generally correspond to grain interiors and edges, respectively.

7.2.3. Sample F28A: Upper-amphibolite-facies psammite

In sample F28A, monazite forms 20-60 µm grains that are mostly subhedral and equant, and are concentrated in garnet- and biotite-rich bands. Monazite grains occur in matrix biotite, quartz and feldspar, along grain boundaries and also define S_1-aligned inclusion trails in garnet (Fig. 14g). Ten analyses from five grains form a cluster on Concordia that yields an age of 1825 ± 8 Ma (MSWD=0.74; Fig. 13c), which includes two analyses from an elongate monazite in an S_1-parallel inclusion trail in garnet (Fig. 14g). Four additional ca. 1880-2000 Ma dates are from single-analysis monazite grains in the matrix and in inclusion trails in garnet.

7.2.4. Sample S145A: Granulite-facies pelite

Monazite in sample S145A forms 30-100 µm, subhedral, equant grains. Thirty-five analyses from 22 grains yield an age of 1830 ± 4 Ma (MSWD=1.5; Fig. 13d), including analyses from monazite in S_1-parallel matrix minerals (plagioclase, K-feldspar, cordierite, quartz; Fig. 14h). Several ca. 1830 Ma monazite grains occur in S_1-aligned inclusion trails in garnet, along with sillimanite and biotite (Fig. 14i, j). A second concordant cluster is formed by nine analyses from eight matrix monazite grains at 1799 ± 6 Ma (MSWD=0.86). Several grains have two or more analyses with different ages that typically correspond to grain interiors/edges and/or BSE zoning.

For example, eight grains have ca. 1830 Ma cores and are typified by dark BSE structure, surrounded by ca. 1799 Ma rims that are light BSE structure (Fig. 14k). Three grains contain domains of variable BSE shades that are ca. 1850 Ma or older, surrounded by ca. 1830 Ma rims. In other grains, multiple analyses all plot within the ca. 1830 Ma age cluster, despite apparent zonation in BSE.

7.2.5. Monazite trace element mapping results

Compositional zoning patterns of monazite in each sample range from concentric core-to-rim zonation to complex, patchy patterns. In mid-amphibolite-facies sample F122B, ca. 1800 Ma monazite domains are generally Y- and Yb-enriched relative to ca. 1850-1830 Ma cores (Appendix 1, Fig. A13.1). In granulite-facies sample S145A and mid-amphibolite-facies sample S89A, ca. 1800 Ma domains are depleted in Y, Yb, Eu (±Gd) relative to ca. 1850-1830 Ma cores (Appendix 1, Figs. A13.2, A13.3).

8. Discussion

8.1. Interpretation of metamorphism and mineral-fabric relationships

The mineral-fabric relationships, mineral chemistry and modelled *P-T* estimates strongly support the field-based interpretation of a metamorphic field gradient (Fig. 3) characterized by a westward increase in peak metamorphic grade from mid-amphibolite-facies (~720-740°C) to granulite-facies (~850-890°C) at medium pressures (~6-7 kbar). Since D_1 fabrics are defined by peak metamorphic minerals and leucosomes are also parallel with S_1 (Figs. 5, 6, 7; Appendix 1, Figs. A2.1, A2.2), peak metamorphism and partial melting are interpreted as concurrent with D_1 east-vergent crustal shortening.

Post-D_1 retrograde micas occur in each metamorphic zone, including post-D_1 biotite that occupies embayments in garnet rims. Post-D_1 muscovite in the eastern mid-amphibolite-facies zone is considered to represent the retrograde reversal of muscovite breakdown reactions following cooling below the solidus after the syn-D_1 thermal peak. Because most post-D_1 retrograde muscovite grains in sample F122B are axial planar to F_3 crenulations, but some cross-cut F_3 crenulations, post-D_1 retrograde muscovite growth likely continued as late as post-D_3 (Fig. 7).

Although the pre- and post-thermal peak *P-T* history is not constrained quantitatively, grossular-rich garnet cores and decompression textures in some samples may be reflections of clockwise *P-T* paths. This might suggest that Hall Peninsula followed an overall clockwise *P-T* evolution with peak metamorphism ranging from mid-amphibolite- to granulite-facies, followed by cooling and decompression (Fig. 15).

8.2. Interpretation of geochronology

Significant monazite growth can occur during amphibolite- to granulite-facies metamorphism pre-thermal peak, at thermal peak, during melt crystallization and during retrograde garnet consumption (Pyle & Spear, 2003; Mahan *et al.*, 2006; Spear & Pyle, 2010). Together, the *in situ* U-Pb monazite and petrological data suggest that the dominant ca. 1831-1825 Ma monazite population records the timing of regional amphibolite- to granulite-facies metamorphism, concurrent with east-directed D_1 shortening. This is conclusively demonstrated by the abundance of S_1-aligned ca. 1831-1825 Ma monazite in the matrices of all samples, as well as ca. 1831-1825 Ma monazite that occurs with prograde-to-peak mineral assemblages in S_1-aligned inclusion trails in garnet (Fig. 14). In each sample, analysis clusters that yield ages of ca. 1831-1825 Ma include analyses that are ca. 1850-1840 Ma in age (Figs. 13, 14a-e, g-k). The subordinate population of ca. 1852 Ma monazite in sample S89A possibly records prograde-to-peak metamorphism since it

includes analyses from S_1-aligned matrix grains (Fig. 14c) and an inclusion in garnet (Fig. 14d, e). Therefore, the data imply that regional high-grade metamorphism and concomitant D_1 deformation span ca. 1850 to 1825 Ma.

Petrographical relationships of ca. 1800 Ma age domains suggest that monazite formation at ca. 1800 Ma post-dates peak metamorphism by at least 25 m.y. Samples with ca. 1800 Ma monazite also contain ca. 1850-1825 Ma monazite, with the younger population commonly forming domains adjacent to ca. 1850-1825 Ma domains (Fig. 14b-e, i-k), which are interpreted as coincident with thermal peak conditions. The ca. 1800 Ma monazite domains appear to postdate garnet growth and D_1 because they are mostly in the matrix, but do not clearly define a structural fabric. Rare occurrences of ca. 1800 Ma monazite included in garnet are typically close to microfractures in garnet rims (Fig. 14d).

Monazite trace element maps indicate that the Y, Yb and Eu (±Gd) compositions of ca. 1800 Ma domains are distinct from ca. 1850-1820 Ma interiors. Evidence of garnet resorption in sample F122B supports garnet breakdown as a possible source for the Y-rich ca. 1800 Ma domains (e.g. Pyle & Spear, 1999; Foster *et al.*, 2002), but Y-depleted ca. 1800 Ma domains in other samples suggest that variable trace element compositions in ca. 1800 Ma monazite resulted from a more complex process. The petrological data indicate post-D_1 retrograde muscovite growth, retrograde reversal of biotite dehydration reactions and Fe-Mg exchange between garnet and biotite. Limited petrographic evidence (sample S89A) suggests that post-thermal peak monazite formation was coeval with retrograde muscovite growth (Fig. 14f). Since fluids are essential for retrograde mineral growth (Vernon & Ransom, 1971), monazite may have undergone fluid-assisted coupled dissolution-reprecipitation (Seydoux-Guillaume *et al.*, 2002; Harlov & Hetherington, 2010; Williams *et al.*, 2011). The complex BSE zoning patterns exhibited by many

monazite grains with within-grain age variation (e.g. Fig. 14b, c, e, j, k) are similar to those formed by fluid-assisted dissolution-reprecipitation in natural and experimentally-altered monazite (Harlov & Hetherington, 2010; Williams *et al.*, 2011). The trace element maps of monazite with ca. 1800 Ma and older domains reveal concentric core-to-rim compositional zoning in some grains and patchy, irregular zoning in others, which may also be consistent with coupled dissolution-reprecipitation. Considering the catalyzing effect of strain on dissolution-reprecipitation (Wawrzenitz *et al.*, 2012), monazite formation at ca. 1800 Ma may have been triggered by post-thermal peak deformation.

Given the range of monazite ages identified in our four samples, the monazite geochronology presented here provides preliminary age constraints on the P-T-d evolution, which would be improved by additional comprehensive *in situ* monazite analyses on regionally-distributed samples. Nonetheless, when combined with previously published geochronology, the data enable preliminary interpretations of the regional tectonothermal history (see below).

8.3. Tectonic implications

8.3.1. Regional metamorphism and crustal shortening (D_1 & D_2)

Based on the integrated structural-petrological-geochronological data presented above, the study area underwent east-directed crustal shortening (D_1) and regional metamorphism at ca. 1850-1825 Ma (Fig. 15). The minimum age of D_1 is provided by the 1830 ± 3 Ma age of a monzogranite dike that cross-cuts S_1 in metasedimentary host rocks (Rayner, 2015). Thick-skinned, east-vergent D_2 thrusts and folds are interpreted as syn- to post-thermal peak, and are therefore estimated to have occurred during or after ca. 1850-1825 Ma.

High-grade metamorphism in the study area at ca. 1850-1825 Ma is coeval with granulite-facies metamorphism and deformation on the southern MIM, which has been attributed to the

collision of the Narsajuaq terrane and emplacement of the Cumberland Batholith (St-Onge *et al.*, 2007) or the impingement of the Archean crystalline Sugluk Block beneath the MIM (Corrigan *et al.*, 2009; Whalen *et al.*, 2010). These events on the MIM are coeval with north-south accretion of the composite Rae craton and Aasiaat domain with the North Atlantic craton in West Greenland, and with the collision of the North Atlantic craton with the MIM in Labrador and Quebec (St-Onge *et al.*, 2009 and references therein). This strengthens the proposed correlations between the eastern MIM and the Aasiaat domain of West Greenland (e.g., St-Onge *et al.*, 2009), and with the Core Zone in north-central Labrador (e.g., Corrigan *et al.*, 2009; St-Onge *et al.*, 2009).

Heat flow from concurrent orthopyroxene-bearing intrusions (Cumberland Batholith) may have contributed to ca. 1850-1825 Ma granulite-facies metamorphism in the study area. However, elevated radioactive heat production in thickened crust (e.g., England & Thompson, 1984; Jamieson *et al.*, 1998; Brown 2006; Clark *et al.*, 2011), or increased heat flow in a former back-arc basin setting (e.g., Brown 2006; Clark *et al.*, 2011) may have played significant roles. The Cumberland Batholith represents continental, Andean-type arc magmatism that was emplaced into the accreted MIM and Rae craton margin (Hoffman, 1990; Thériault *et al.*, 2001; St-Onge *et al.*, 2006, 2007), or was largely derived from post-accretion lithospheric mantle delamination and melting of the subducted Sugluk Block from beneath the MIM (Whalen *et al.*, 2010). In either scenario, the study area on the eastern MIM would likely have been in a back-arc setting, which is in accordance with: (1) attainment of granulite-facies conditions; (2) derivation of mafic sills in supracrustal sequences from partial melting of a subduction-modified mantle (MacKay & Ansdell, 2014); (3) northeast-dipping teleseismic discontinuities in the upper mantle beneath the southern MIM that may represent the underthrust Narsajuaq arc and Sugluk Block (Snyder, 2010); and (4) mantle xenoliths in kimberlite containing garnet with oceanic and continental sources, which imply

that subducted material extends northeastwards beneath the study area (Snyder, 2010). Peak metamorphism and crustal shortening at ca. 1850-1825 Ma could plausibly reflect subduction (of Narsajuaq arc/Sugluk block?) beneath the MIM and the progressive closure of a back-arc basin on Hall Peninsula. The eastward decrease in metamorphic grade may be attributed to a greater inboard distance from the Andean-style margin, resulting in lower heat flow as well as thinner, more distal supracrustal cover sequences and less crustal thickening.

8.3.2. Late-orogenic activity

As discussed above, monazite formation at ca. 1800 Ma is probably the result of fluid-assisted dissolution-reprecipitation that occurred at least 25 m.y. after the thermal peak, possibly activated by a late-orogenic deformation event. Significantly, regional monazite formation at ca. 1800 Ma is coeval with the 1820-1795 Ma docking of the Superior craton with the Churchill plate, considered to represent the terminal collision of THO (St-Onge *et al.*, 2007, 2009; Corrigan *et al.*, 2009 and references therein). This resulted in amphibolite-facies metamorphism at ca. 1820-1810 Ma and localized shear zones on the MIM (St-Onge *et al.*, 2007). Potentially, ca. 1800 Ma monazite in the study area may be related to the THO terminal collision, and the lack of associated shear zones and a distinct amphibolite-facies overprint might be explained by its greater northward distance from the Bergeron suture (Fig. 2). Considering that the overall kinematics of the THO terminal collision were north-to-south in the Québec-Baffin segment, it is possible that the south-vergent, late-orogenic F_3 folds developed during the THO terminal collision.

8.3.3. Implications for tectonic processes in large, hot orogens

The Hall Peninsula crustal section records ca. 25 m.y. of crustal shortening and high-grade metamorphism, and U-Pb titanite ages (ca. 1742-1730 Ma; Scott, 1999) suggest that elevated temperatures (>550°C) persisted for at least ca. 95 m.y. after thermal peak. Maximum pressures

of ~6.1-7.35 kbar estimated using phase diagram models correspond to mid-crustal depths of ~20-25 km, based on an assumed crustal density of 2700 kg/m^3. Teleseismic profiles through southern Baffin Island indicate a Moho depth of 35-46 km (Snyder, 2010). Assuming that the area was underlain by the same crustal material as it is now, the crust reached a maximum thickness of at least 55-71 km, similar to the estimated maximum thicknesses in the Grenville (Mezger *et al.*, 1991) and Himalayan orogens (Tiwari *et al.*, 2006). Elevated temperatures over ca. 100 m.y. and crustal thickening on Hall Peninsula are in accordance with the THO as a large, hot, long-duration orogen (e.g., Beaumont *et al.*, 2006). However, the detailed tectonothermal evolution documented here highlights some differences that set the THO apart from the Grenville and Himalaya, and from the similarly hot Variscan.

The Himalaya exhibits subhorizontal ductile flow of melt-weakened mid-crust in a channel between a thrust-sense lower boundary and a normal-sense upper boundary (e.g., Grujic *et al.*, 2002; Beaumont *et al.*, 2006). Although evidence for similar mid-crustal flow in the Grenville is equivocal, several hallmarks have been recognized in the hinterland, including subhorizontal fabrics and possible shear zones bounding a mid-crustal channel (Rivers, 2008 and references therein). In the Variscan, subhorizontal fabrics and thermal re-equilibration record the lateral flow of the mid-to-lower crust in response to the indentation of a continental block into the orogenic root (Schulmann *et al.*, 2008). In contrast to subhorizontal fabrics in the mid-crusts of comparable orogens, the regional metamorphic foliation (S_1) in the study area is moderately-dipping. Although we cannot rule out the possibility that S_1 was originally subhorizontal prior to D_2, there is insufficient evidence of lateral flow in a channel structure. There are no known regional structures or bounding shear zones that may indicate channel flow in the THO (St-Onge *et al.*, 2006), suggesting that the necessary rheological conditions were not met, including a laterally-continuous

layer with sufficiently low viscosity bound by more rigid crust. This has previously been attributed to the lower volume of pelitic lithologies in the THO relative to other large, hot orogens (St-Onge *et al.*, 2006). In addition, the Cumberland Batholith and coeval orthopyroxene-bearing intrusions in the study area mostly pre-date the main phase of compression during ca. 1850-1825 Ma. Even if not fully crystallized, the dominantly granitic intrusions may have contributed to the rheological heterogeneity of the mid-crust, impeding the development of a laterally-continuous, flowing layer.

Collapse in the Grenville orogen is manifested by normal-sense shear zones extending >25 km into the mid-crust (Rivers, 2008; Mezger *et al.*, 1991), rapid exhumation and cooling (Cosca *et al.*, 1992; Busch *et al.*, 1997; Schneider *et al.*, 2013). Rivers (2008) suggested a form of ductile flow beneath an orogenic plateau, followed by collapse once compressive stresses ceased and reworking of the former channel as a normal-sense detachment system. In contrast, no normal-sense faults are recognized in the eastern MIM. U-Pb titanite ages of ca. 1742-1730 Ma (Scott, 1999) may suggest that temperatures remained above ~550°C (Cherniak, 1993; Hawkins & Bowring, 1999) for ~100 m.y. after the thermal peak. Muscovite ^{40}Ar-^{39}Ar ages of ca. 1690-1657 Ma may imply that the study area remained hotter than ~420-450°C (Harrison *et al.*, 2009) for at least 140 m.y. post-thermal peak (Skipton *et al.*, 2015). K-Ar ages of muscovite (ca. 1610 Ma; Lowdon, 1960), hornblende (ca. 1670 Ma; Wanless *et al.*, 1979) and biotite (ca. 1700–1507 Ma; Wanless *et al.*, 1968), although variable, also support prolonged high temperatures. Thorough investigation of the cooling history requires more comprehensive thermochronological data and thermal modeling, but the available data suggest slow cooling. Similarly slow cooling rates and the absence of extensional tectonics are characteristic of the THO and particularly the Quebec-Baffin segment (Wanless, 1970; Corrigan *et al.*, 2009).

9. Conclusions

1. Field observations, petrography, mineral chemistry, equilibrium phase diagram modelling and *in situ* U-Pb monazite geochronology indicate that the dominant regional deformation event in internal zone of the northeast segment of THO was east-directed crustal shortening (D_1) at ca. 1850-1825 Ma, concurrent with the thermal peak of metamorphism that reached mid-amphibolite-facies conditions of ~720-740°C and ~6.25-7.25 kbar in the east, and granulite-facies conditions of ~810-890°C and ~6.10-7.35 kbar in the west.
2. Syn- to post-thermal-peak thick-skinned folds and thrusts (D_2) played an important role in crustal thickening and the overall crustal architecture of the eastern MIM by juxtaposing higher-grade thrust sheets eastwards over lower-grade rocks.
3. Metamorphism and east-directed shortening (D_1, D_2) during ca. 1850-1825 Ma represent an accretionary/collisional event in the upper Churchill plate collage of the THO, potentially Andean-margin-style subduction of the Narsajuaq arc (or Sugluk block?) beneath the MIM.
4. U-Pb monazite geochronology suggests that the study area was regionally affected by a post-thermal-peak tectonothermal episode at ca. 1800 Ma. Monazite formation was probably due to fluid-assisted dissolution-reprecipitation and appears concomitant with retrograde muscovite growth and south-directed crustal shortening (D_3).
5. The ca. 1800 Ma event recorded on Hall Peninsula is synchronous with the terminal collision of the THO at ca. 1820-1795 Ma, when the lower-plate Superior craton collided with the upper Churchill plate.

6. Significant crustal thickening and elevated temperatures for ca. 100 m.y. on Hall Peninsula are consistent with the THO as a large, hot, long-duration orogen, however mid-crustal ductile (channel) flow or orogenic collapse features have not been identified.

Funding

This work was funded by the Canada-Nunavut Geoscience Office (CNGO) Hall Peninsula Integrated Geoscience Project (HPIGP) and additional support was provided by National Science and Engineering Research Council grants to DAS and DRS.

Acknowledgements

We thank D. Mate and H. Steenkamp of the CNGO for their unwavering scientific and logistical support of this project. The HPIGP team is thanked for their enthusiastic and high quality field mapping and for many valuable discussions. In particular, this manuscript benefitted from discussions with H. Steenkamp, G. Machado, N. Rayner, M. Young, A. Camacho, B. Dyck, R. From, C. MacKay and Z. Braden. We thank G. Poirier for his assistance in the acquisition of electron microprobe data and SEM images, and Y. Luo for her help in acquiring LA-ICPMS ages. Thanks are extended to O. Weller for reviewing an earlier version of this manuscript and for several helpful discussions. K. Dorfler, V. Gardien, J. Majka and an anonymous reviewer are thanked for thorough reviews that helped clarify the arguments presented in this paper. This is Earth Sciences Sector Contribution number 20150310.

References

Ashworth, J.R. (1975). The sillimanite zone of the Huntly-Portsoy area in the north-east Dalradian, Scotland. *Geological Magazine* **112**, 113-136.

Beaumont, C., Nguyen, M.H., Jamieson, R.A. & Ellis, S. (2006). Crustal flow modes in large hot orogens. In: Law, R.D., Searle, M.P. & Godin, L. (eds) *Channel flow, Ductile Extrusion and Exhumation in Continental Collision Zones*. Geological Society, London, Special Publications **268**, 91-145.

Bhattacharya, S. (1993). Refinement of geothermobarometry for cordierite granulites. *Proceedings of the Indian Academy of Sciences – Earth and Planetary Sciences* **102**, 537-545.

Blackadar, R.G. (1967). Geological reconnaissance, southern Baffin Island, District of Franklin. *Geological Survey of Canada, Paper 66–47*.

Brown, M. (1994). The generation, segregation, ascent and emplacement of granite magma: the migmatite-to-crustally derived granite connection in thickened orogens. *Earth Science Reviews* **36**, 83-130.

Brown, M. (2004). The mechanism of melt extraction from lower continental crust of orogens. *Transactions of the Royal Society of Edinburgh: Earth Sciences* **95**, 35-48.

Brown, M. (2006). Duality of thermal regimes is the distinctive characteristic of plate tectonics since the Neoarchean. *Geology* **34**, 961-964.

Busch, J.P., Mezger, K. & van der Pluijm, B.A. (1997). Suturing and extensional reactivation in the Grenville orogen, Canada. *Geology* **25**, 507-510.

Chadwick, T.C., St-Onge, M.R., Weller, O.M., Carr, S.D. & Dyck, B.J. (2015) Ptarmigan Fiord basement-cover thrust imbricates, Baffin Island, Nunavut. In: *Summary of Activities 2015, Canada-Nunavut Geoscience Office*, 61-72.

Cherniak, D.J. (1993). Pb diffusion in titanite and preliminary results on the effects of radiation damage on Pb transport. *Chemical Geology* **110**, 177-194.

Chernoff, C. & Carlson, W.D. (1997). Disequilibrium for Ca during growth of pelitic garnet. *Journal of Metamorphic Geology* **15**, 421-438.

Clark, C., Fitzsimons, I.C.W., Healy, D. & Harley, S.L. (2011). How does the continental crust get really hot? *Elements* **7**, 235-240. doi: 10.2113/gselements.7.4.235

Corrigan, D., Pehrsson, S., Wodicka, N. & de Kemp, E. (2009). The Palaeoproterozoic Trans-Hudson Orogen: a prototype of modern accretionary processes. *Geological Society, London, Special Publication* **327**, 457–479.

Cosca, M.A., Essene, E.J., Kunk, M.J. & Sutter, J.F. (1992). Differential unroofing within the Central Metasedimentary Belt of the Grenville Orogen: constraints from $^{40}Ar/^{39}Ar$ thermochronology. *Contributions to Mineralogy and Petrology* **110**, 211-225.

De Capitani, C. & Brown, T.H. (1987). The computation of chemical equilibrium in complex systems containing nonideal solutions. *Geochimica et Cosmochimica Acta* **51**, 2639 – 2652.

De Capitani, C. & Petrakakis, K. (2010). The computation of equilibrium assemblage diagrams with Theriak/Domino software. *American Mineralogist* **95**, 1006–1016.

Dyck, B.J. & St-Onge, M.R. (2014). Dehydration-melting reactions, leucogranite emplacement and the Paleoproterozoic structural evolution of Hall Peninsula, Baffin Island, Nunavut. In: *Summary of Activities 2013, Canada-Nunavut Geoscience Office*, 73–84.

England, P.C. & Thompson, A.B. (1984). Pressure-temperature-time paths of regional metamorphism: I, Heat transfer during the evolution of regions of thickened continental crust. *Journal of Petrology* **25**, 894-928.

Evans, B.W. & Guidotti, C.V. (1966). The sillimanite-potash feldspar isograd in Western Maine, U.S.A. *Contributions to Mineralogy and Petrology* **12**, 25-62.

Florence, F.P. & Spear, F.S. (1991). Effects of diffusional modification of garnet growth zoning on P-T calculations. *Contributions to Mineralogy and Petrology* **107**, 487-500.

Florence, F.P. & Spear, F.S. (1993). Influences of reaction history and chemical diffusion on P-T calculations for staurolite schists from the Littleton Formation, northwestern New Hampshire. *American Mineralogist* **78**, 345-359.

Foster, G., Gibson, H.D., Parrish, R.R., Horstwood, M., Fraser, J. & Tindle, A. (2002). Textural, chemical and isotopic insights into the nature and behaviour of metamorphic monazite. Chemical Geology 191, 183–207.

From, R.E., St-Onge, M.R. & Camacho, A.L. (2014). Preliminary characterization of the Archean orthogneiss complex of Hall Peninsula, Baffin Island, Nunavut. In: *Summary of Activities 2013, Canada-Nunavut Geoscience Office*, 53–62.

Gardien, V., Thompson, A.B., Grujic, G. & Ulmer, P. (1995). Experimental melting of biotite + plagioclase + quartz +/- muscovite assemblages and implications for crustal melting. Journal of Geophysical Research **100**, 15581-15591.

Grujic, D., Hollister, L. & Parrish, R. (2002). Himalayan metamorphic sequence as an orogenic channel: insight from Bhutan. *Earth and Planetary Science Letters* **198**, 177-191.

Guilmette, C., Indares, A. & Hébert, R. (2011). High-pressure anatectic paragneisses from the Namche Barwa, Eastern Himalayan Syntaxis: Textural evidence for partial melting, phase equilibria modeling and tectonic implications. *Lithos* **124**, 66-81.

Harlov, D.E. & Hetherington, C.J. (2010). Partial high-grade alteration of monazite using alkali-bearing fluids: Experiment and nature. *American Mineralogist* **95**, 1105-1108.

Harrison, M.T., Célérier, J., Aikman, A.B., Hermann, J. & Heizler, M.T. (2009). Diffusion of ^{40}Ar in muscovite. *Geochimica et Cosmochimica Acta* **73**, 1039-1051.

Hawkins, D.P. & Bowring, S.A. (1999). U-Pb monazite, xenotime and titanite geochronological constraints on the prograde to post-peak metamorphic thermal history of Paleoproterozoic migmatites from the Grand Canyon, Arizona. *Contributions to Mineralogy and Petrology* **134**, 150-169.

Henry, D.J., Guidotti, C.V. & Thomson, J.A. (2005). The Ti-saturation surface for low-to-medium pressure metapelitic biotites: implications for geothermometry and Ti-substitution mechanisms. *American Mineralogist* **90**, 316-328.

Hoffman, P.F. (1988). United Plates of America, the birth of a craton: Early Proterozoic assembly and growth of Laurentia. *Annual Review of Earth and Planetary Sciences* **16**, 543–603.

Hoffman, P.F. (1990). Dynamics of the assembly of northeast Laurentia in geon 18 (1.9-1.8 Ga). *Geoscience Canada* **17**, 222-226.

Holcombe, R.J. (2009). GEOrient. Retrieved from http://www.holcombe.net.au/software/georient.html.

Holland, T.J.B. & Powell, R. (1998). An internally consistent thermodynamic data set for phases of petrological interest. *Journal of Metamorphic Geology* **16**, 309–343.

Indares, A., White, R.W. & Powell, R. (2008). Phase equilibria modelling of kyanite-bearing anatectic paragneisses from the central Grenville Province. *Journal of Metamorphic Geology* **26**, 815-836.

Jackson, G.D., Hunt, P.A., Loveridge, W.D., Parrish, R.R. (1990). Reconnaissance geochronology of Baffin Island, N.W.T. Radiogenic Age and Isotopic Studies: Report 3, Geological Survey of Canada, Paper 89-2, pp. 123-148.

Jamieson, R.A., Beaumont, C., Fullsack, P. & Lee, B. (1998). Barrovian regional metamorphism: where's the heat? In: Treloar, P.J. & O'Brien, P.J. (eds) *What Drives Metamorphism and Metamorphic Reactions? Geological Society of London Special Publications* **138**, 23-51.

Kohn, M.J. & Spear, F. (2000). Retrograde net transfer reaction insurance for pressure-temperature estimates. *Geology* **28**, 1127-1130.

LeBreton, N. & Thompson, A.B. (1988). Fluid-absent (dehydration) melting of biotite in pelites in the early stages of crustal anatexis. *Contributions to Mineralogy and Petrology* **99**, 226-237.

Lewry, J.F. & Collerson, K.D. (1990). The Trans-Hudson Orogen: extent, subdivisions and problems. In: Lewry, J.F. & Stauffer, M.R. (eds) *The Early Proterozoic Trans-Hudson Orogen of North America*. *Geological Association of Canada, Special Paper* **37**, 1–14.

Lowdon, J.A. (1960). Age determinations by the Geological Survey of Canada, Report 1 – isotopic ages; Geological Survey of Canada, Paper 60-17, 5–40.

Lucas, S.B. (1989). Structural evolution of the Cape Smith thrust belt, and the role of out-of-sequence faulting in the thickening of mountain belts. *Tectonics* **8**, 655-676.

Ludwig, K. (2003). User's Manual for Isoplot/Ex rev. 3.00: a Geochronological Toolkit for Microsoft Excel. *Berkeley Geochronology Center Special Publications* **4**.

Machado, G., Bilodeau, C. & St-Onge, M.R. (2013). Geology, southern part of Hall Peninsula, south Baffin Island, Nunavut, Geological Survey of Canada Canadian Geoscience Map 135 (preliminary). Canada-Nunavut Geoscience Office, Open File Map 2013-1, scale 1:250 000. doi:10.4095/292443

MacKay, C.B. & Ansdell, K.M. (2014). Geochemical study of mafic and ultramafic rocks from southern Hall Peninsula, Baffin Island, Nunavut. In: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 85-92.

Mahan, K.H., Goncalves, P., Williams, M.L. & Jercinovic, M.J. (2006). Dating metamorphic reactions and fluid flow: application to exhumation of high-P granulites in a crustal-scale shear zone, western Canadian Shield. . *Journal of Metamorphic Geology* **24**, 193–217.

Mezger, K., Van Der Pluijm, B.A., Essene, E.J. & Halliday, A.N. (1991). Synorogenic collapse: A perspective from the middle crust, the Proterozoic Grenville Orogen. *Science* **254**, 695-698.

Palin, R.M., Searle, M.P., St-Onge, M.R., Waters, D.J., Roberts, N.M.W., Horstwood, M.S.A., Parrish, R.R., Weller, O.M., Chen, S. & Yang, J. (2014). Monazite geochronology and petrology of kyanite- and sillimanite-grade migmatites from the northwestern flank of the eastern Himalayan syntaxis. *Gondwana Research* **26**, 323-347.

Patiño Douce, A.E. & Johnston, A.D. (1991). Phase equilibria and melt productivity in the pelitic system: implications for the origin of peraluminous granitoids and aluminous granulites. *Contributions to Mineralogy and Petrology* **107**, 202-218.

Powell, R. & Holland, T.J.B. (2008). On thermobarometry. *Journal of Metamorphic Geology* **26**, 155-179.

Pyle, J.M. & Spear, F.S. (1999). Yttrium zoning in garnet: coupling of major and accessory phases during metamorphic reactions. Geological Materials Research 1, 1–49.

Pyle, J.M. & Spear, F.S. (2003). Four generations of accessory-phase growth in low-pressure migmatites from SW New Hampshire. *American Mineralogist* **88**, 338-351.

Rayner, N.M. (2014). New U-Pb geochronological results from Hall Peninsula, Baffin Island, Nunavut. In: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 39–52.

Rayner, N.M. (2015). New (2013-2014) U-Pb geochronological results from northern Hall Peninsula, southern Baffin Island, Nunavut. In: Summary of Activities 2014, Canada-Nunavut Geoscience Office, 31-44.

Rivers, T. (2008). Assembly and preservation of lower, mid, and upper orogenic crust in the Grenville Province – Implications for the evolution of large hot long-duration orogens. *Precambrian Research* **167**, 237-259.

Sawyer, E.W. (1999). Criteria for the recognition of partial melting. *Physics and Chemistry of the Earth (A)* **24**, 269-279.

Schneider, D.A., Cope, N. & Holm, D.K. (2013). Thermochronology of the Mont Laurier terrane, southern Canadian Grenville Province, and its bearing on defining orogenic architecture. *Precambrian Research* **226**, 43-58.

Schulmann, K., Lexa, O., Štípská, P., Racek, M., Tajčmanová, L., Konopásek, J., Edel, J.-B., Peschler, A. & Lehmann, J. (2008). Vertical extrusion and horizontal channel flow of orogenic lower crust: key exhumation mechanisms in large hot orogens? *Journal of Metamorphic Geology* **26**, 273-297.

Scott, D.J. (1999). U-Pb geochronology of the eastern Hall Peninsula, southern Baffin Island, Canada: a northern link between the Archean of West Greenland and the Paleoproterozoic Torngat Orogen of northern Labrador. *Precambrian Research* **93**, 5–26.

Scott, D.J. & Gauthier, G. (1996). Comparison of TIMS (U-Pb) and laser ablation microprobe ICP-MS (Pb) techniques for age determination of detrital zircons from Paleoproterozoic metasedimentary rocks from northeastern Laurentia, Canada, with tectonic implications. *Chemical Geology* **131**, 127-142.

Scott, D.J. & Wodicka, N. (1998). A second report on the U-Pb geochronology of southern Baffin Island. Geological Survey of Canada, Paper 1998-F, 47–57.

Seydoux-Guillaume, A.-M., Paquette, J.L., Wiedenbeck, M., Montel, J.-M. & Heinrich, W. (2002). Experimental resetting of the U-Th-Pb systems in monazite. *Chemical Geology* **191**, 165-181.

Skipton, D.R. & St-Onge, M.R. (2014). Paleoproterozoic deformation and metamorphism in metasedimentary rocks west of Okalik Bay: a field template for the evolution of eastern Hall Peninsula, Baffin Island, Nunavut. In: *Summary of Activities 2013, Canada-Nunavut Geoscience Office*, 63–72.

Skipton, D.R., Schneider, D.A., Kellett, D. & Joyce, N. (2015) New insights on the cooling history of Hall Peninsula, southern Baffin Island, Nunavut, using $^{40}Ar/^{39}Ar$ thermochronology on muscovite. In: *Summary of Activities 2014, Canada-Nunavut Geoscience Office*, 17-30.

Snyder, D.B. (2010). Mantle lithosphere structure beneath southeast Baffin Island, Nunavut, from teleseismic studies. *Geological Survey of Canada Current Research* **2010-8**, 6 pp.

Spear, F.S., Kohn, M.J., Florence, F.P. & Menard, T. (1990). A model for garnet and plagioclase growth in pelitic schists: implications for thermobarometry and P-T path determinations. *Journal of Metamorphic Geology* **8**, 683-696.

Spear, F.S, Kohn, M.J. & Cheney, J.T (1999). P-T paths from anatectic pelites. *Contributions to Mineralogy and Petrology* **134**, 17-32.

Spear, F.S. (2004). Fast cooling and exhumation of the Valhalla metamorphic core complex, southeastern British Columbia. *International Geology Review* **46**, 193-209.

Spear, F.S. & Parrish, R.R. (1996). Petrology and cooling rates of the Valhalla complex, British Columbia, Canada. *Journal of Petrology* **37**, 733-765.

Spear, F.S. & Pyle, J.M. (2010). Theoretical modeling of monazite growth in a low-Ca metapelite. *Chemical Geology* **273**, 111-119.

St-Onge, M.R. (1987). Zoned poikiloblastic garnets: P-T paths and syn-metamorphic uplift through 30 km of structural depth, Wopmay Orogen, Canada. *Journal of Petrology* **28**, 1-21.

St-Onge, M.R., Scott, D.J. & Lucas, S.B. (2000). Early partitioning of Quebec: microcontinent formation in the Paleoproterozoic. *Geology* **28**, 323–326.

St-Onge, M.R., Searle, M.P. & Wodicka, N. (2006). Trans-Hudson Orogen of North America and Himalaya–Karakorum–Tibetan Orogen of Asia: structural and thermal characteristics of the lower and upper plates. *Tectonics* **25**, 1–22. doi:10.1029/2005TC001907

St-Onge, M.R., Wodicka, N. & Ijewliw, O. (2007). Polymetamorphic evolution of the Trans-Hudson Orogen, Baffin Island, Canada: integration of petrological, structural and geochronological data. *Journal of Petrology* **48**, 271–302.

St-Onge, M.R., Van Gool, J.A.M., Garde, A.A. & Scott, D.J. (2009). Correlation of Archaean and Palaeoproterozoic units between northeastern Canada and western Greenland: constraining the pre-collisional upper plate accretionary history of the Trans-Hudson Orogen. *Geological Society of London Special Publication* **318**, 193–235.

Steenkamp, H.M. & St-Onge, M.R. (2014). Overview of the 2013 regional bedrock mapping program on northern Hall Peninsula, Baffin Island, Nunavut. In: *Summary of Activities 2013, Canada-Nunavut Geoscience Office*, 27–38.

Thériault, R.J., St-Onge, M.R. & Scott, D.J. (2001). Nd isotopic and geochemical signature of the Paleoproterozoic Trans-Hudson Orogen, southern Baffin Island, Canada: implications for the evolution of eastern Laurentia. *Precambrian Research* **108**, 113-138.

Tiwari, V.M., Vyghreswara Rao, M.B.S., Mishra, D.C. & Singh, B. (2006). Crustal structure across Sikkim, NE Himalaya from new gravity and magnetic data. *Earth and Planetary Science Letters* **247**, 61-69.

Tyler, I.M. & Ashworth, J.R. (1982). Sillimanite-potash feldspar assemblages in graphitic pelites, Strontian Island, Scotland. *Contributions to Mineralogy and Petrology* **81**, 18-29.

Vernon, R.H. & Ransom, D.M. (1971). Retrograde schists of the amphibolite facies at Broken Hill, New South Wales. *Journal of the Geological Society of Australia* **18**, 267-277.

Wanless, R.K. (1970). Isotopic age map of Canada. Geological Survey of Canada, "A" Series Map 1265A, doi:10.4095/108982.

Wanless, R.K., Stevens, R.D., Lachance, G.R. & Edmonds, C.M. (1968). Age determinations and geological studies. In: *K-Ar isotopic ages, Report 8, Geological Survey of Canada, Paper 67-2A*, 11–141.

Wanless, R.K., Stevens, R.D., Lachance, G.R. & Delabio, R.N. (1979) Age determinations and geological studies. In: *K-Ar isotopic ages, Report 14, Geological Survey of Canada, Paper 79-2*, 1–67.

Wawrzenitz, N., Krohe, A., Rhede, D. & Romer, R.L. (2012). Dating rock deformation with monazite: The impact of dissolution precipitation creep. *Lithos* **134-135**, 52-74.

Weller, O.M., St-Onge, M.R., Waters, D.J., Rayner, N., Searle, M.P., Chung, S.-L., Palin, R.M., Lee, Y.-H. & Xu, X. (2013). Quantifying Barrovian metamorphism in the Danba Structural Culmination of eastern Tibet. *Journal of Metamorphic Geology* **31**, 909-935.

Whalen, J.B., Wodicka, N., Taylor, B.E. & Jackson, G.D. (2010). Cumberland Batholith, Trans-Hudson Orogen, Canada: Petrogenesis and implications for Paleoproterozoic crustal and orogenic processes. *Lithos* **117**, 99-118.

Williams, M.L, Jercinovic, M.J., Harlov, D.E., Budzyń, B. & Hetherington, C.J. (2011). Resetting monazite ages during fluid-related alteration. *Chemical Geology* **283**, 218-225.

White, R.W, Powell, R. & Holland, T.J.B. (2001). Calculation of partial melting equilibria in the system Na_2O-CaO-FeO-MgO-Al_2O_3-SiO_2-H_2O (NCKFMASH). *Journal of Metamorphic Geology* **19**, 139-153.

Wodicka, N. & Scott, D.J. (1997). A preliminary report on the U-Pb geochronology of the Meta Incognita Peninsula, southern Baffin Island, Northwest Territories. *Geological Survey of Canada Paper* **1997-C**, 167-178.

Woodsworth, G.J. (1977). Homogenization of zoned garnets from pelitic schists. *Canadian Mineralogist* **15**, 230-242.

Table 1: Summary of structural rock fabrics from metamorphic rocks on Hall Peninsula, Baffin Island*****.

Structural fabric	**Description**	**Mean orientation†**
D_1: east-west shortening		
F_{1a}	isoclinal folds	AP: 159°/64°; FA: 19°-335°
S_{1a}	metamorphic foliation axial planar to F_{1a}	164°/63°
F_{1b}	isoclinal to open folds of S_{1a}	AP: 159°/64°; FA: 19°-335°
S_{1b}	metamorphic foliation axial planar to F_{1b}	164°/63°
$L_{1a,b}$	elongate metamorphic mineral growth	parallel to $F_{1a,b}$ fold hinges, or approximately down-dip
D_2: east-west shortening		
T_2	thick-skinned reverse faults	SSE-striking, NNE-dipping
L_2	mineral stretching and elongate growth	30°-265°
F_2	thick-skinned folds, E-vergent	AP: SSE-striking, NNE-dipping; FA: subhorizontal, trending SSE or NNW
D_3: north-south shortening		
F_3	thick-skinned folds; crenulations	AP: 269°/51°; FA: 37°-269°
S_3	crenulation cleavage axial planar to F_3	269°/51°

* Fabric orientations are plotted on stereonets in Appendix 1.

† Calculated using GEOrient v.9.4.4 (Holcombe, 2009). In plunge-trend notation for linear fabrics and in strike/dip (right hand rule) notation for planar fabrics; AP=axial plane; FA=fold axis.

Table 2: Summary of samples from Hall Peninsula, Baffin Island analyzed in this study.

Sample	UTM[a] Easting	UTM[a] Northing	Rock type	Peak metamorphic assemblage[b]	Peak metamorphic grade[c]	Structures[d]
F122B	656326	7096385	pelite	Bt Sil Qz Pl Grt Kfs Melt*	MA	D_1, F_2, F_3
S89A	623387	7195722	pelite	Qz Bt Pl Sil Grt Melt*	MA	D_1, T_2
F28A	649369	7011627	psammite	Qz Pl Kfs Grt Sil Melt**	UA	D_1, T_2
S145A	591234	7127541	pelite	Qz Grt Pl Crd Kfs Sil Ilm Melt**	G	D_1

[a]NAD83 Zone 19N (Canada)

[b]minerals listed from most to least abundant; *contains retrograde (post-D_1) Ms and minor S_1-aligned Ms inferred as prograde; **contains retrograde (post-D_1) biotite and minor S_1-aligned Bt inferred as prograde

[c]MA=mid-amphibolite; UA=upper amphibolite; G=granulite

[d]Refer to Table 1, Fig. 4 and text for details.

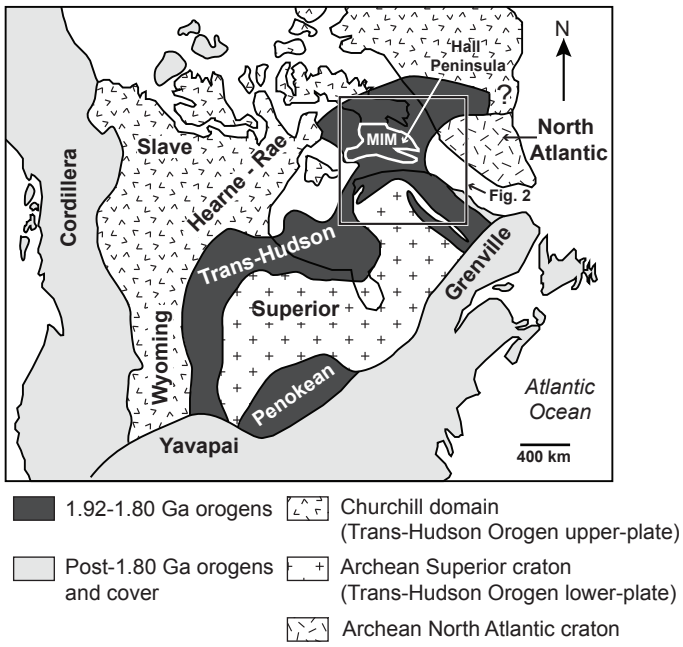


Fig. 1: Simplified tectonic map of North America showing the extent of the Trans-Hudson Orogen, the Superior craton and the Churchill domain, including the Hearne, Rae, Wyoming and Slave cratons. Hall Peninsula on Baffin Island is indicated on the Meta Incognita microcontinent (MIM), outlined in white. Modified after Hoffman (1988) and St-Onge et al. (2007).

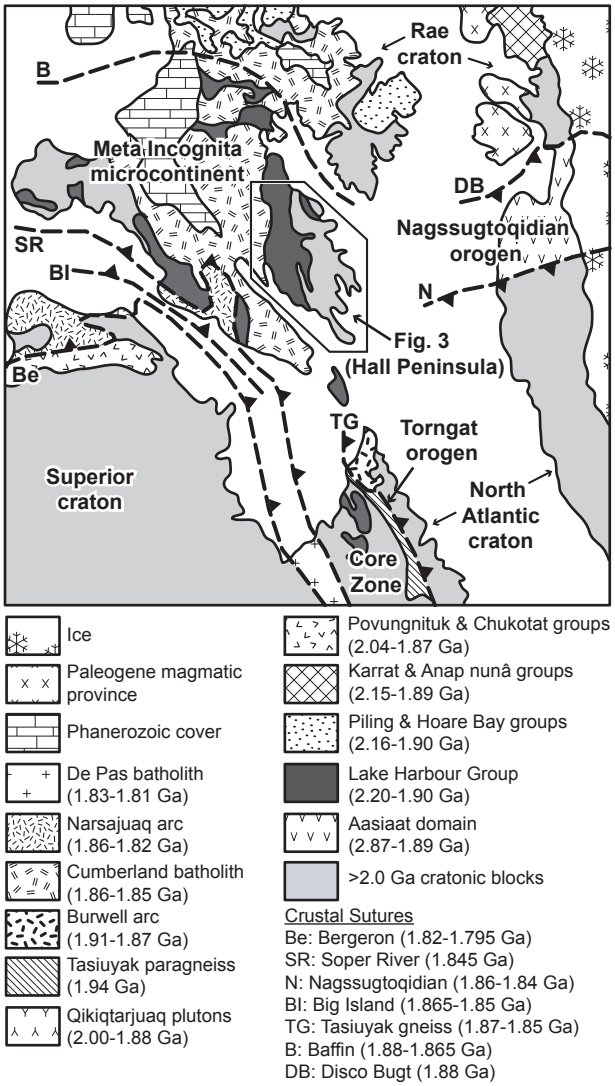


Fig. 2: Generalized geological map of the northeastern portion of the Trans-Hudson Orogen, showing the main lithological units, Archean cratons and crustal sutures proposed by previous studies. Modified after St-Onge et al. (2009).

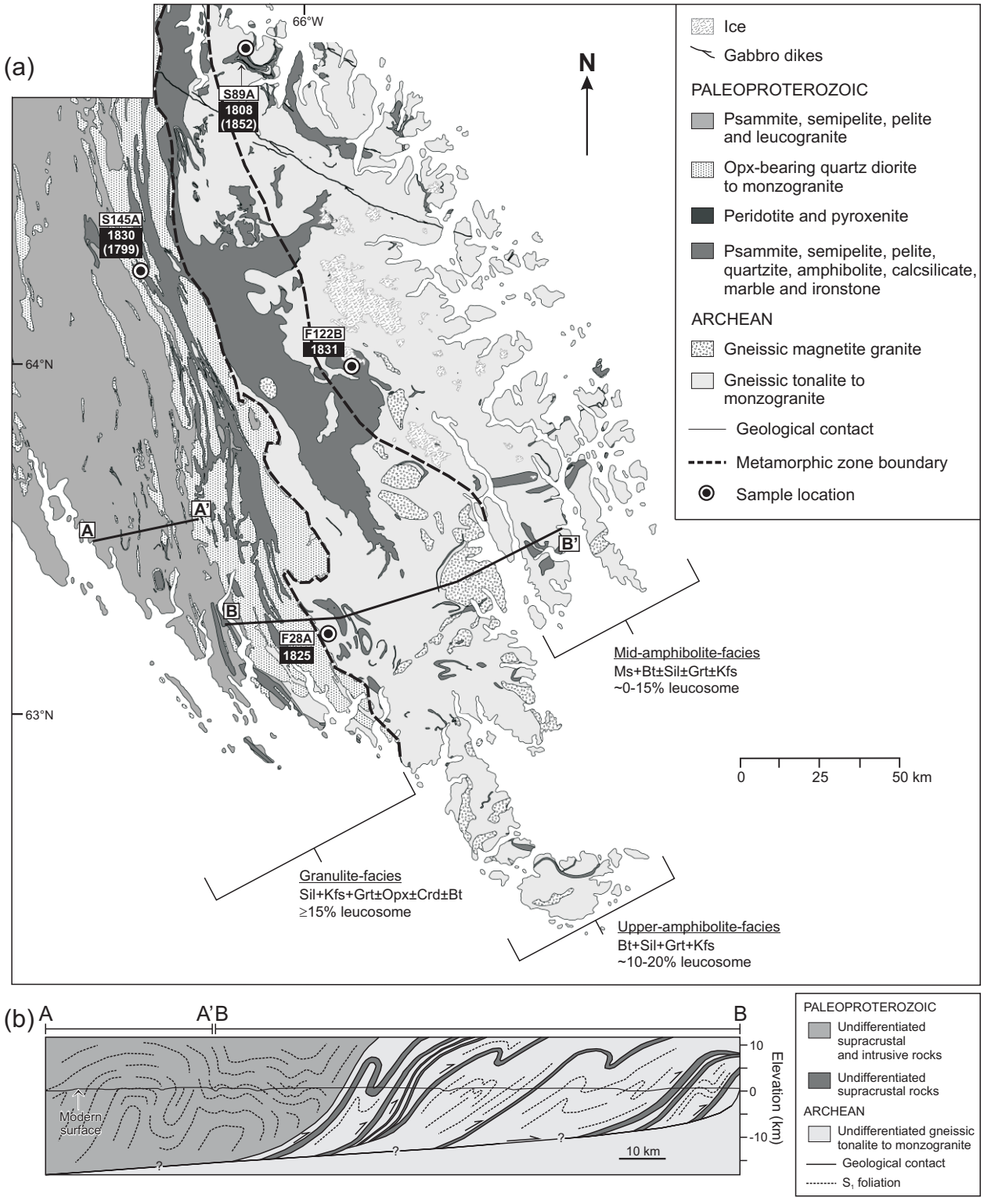

(a)
66°W
64°N
63°N
N
S89A
1808
(1852)
S145A
1830
(1799)
F122B
1831
F28A
1825
A
A'
B
B'
Ice
Gabbro dikes
PALEOPROTEROZOIC
Psammite, semipelite, pelite and leucogranite
Opx-bearing quartz diorite to monzogranite
Peridotite and pyroxenite
Psammite, semipelite, pelite, quartzite, amphibolite, calcsilicate, marble and ironstone
ARCHEAN
Gneissic magnetite granite
Gneissic tonalite to monzogranite
Geological contact
Metamorphic zone boundary
Sample location
Mid-amphibolite-facies
Ms+Bt±Sil±Grt±Kfs
~0-15% leucosome
0
25
50 km
Granulite-facies
Sil+Kfs+Grt±Opx±Crd±Bt
≥15% leucosome
Upper-amphibolite-facies
Bt+Sil+Grt+Kfs
~10-20% leucosome
(b)
A
A'B
B
Modern surface
10 km
10
0
-10
Elevation (km)
PALEOPROTEROZOIC
Undifferentiated supracrustal and intrusive rocks
Undifferentiated supracrustal rocks
ARCHEAN
Undifferentiated gneissic tonalite to monzogranite
Geological contact
S1 foliation

Fig. 3 (previous page): (a) Generalized lithological map of Hall Peninsula (Fig. 2), modified after Machado *et al.* (2013) and Steenkamp & St-Onge (2014). The map shows sample locations (circles) and the *in situ* U-Pb monazite ages (in Ma) determined in this study within black boxes as dominant age populations and subordinate age populations in parentheses. The three metamorphic zones are outlined (black dashed lines) and labelled with metamorphic grade and characteristic pelitic mineral assemblages. (b) Interpretive cross-section of southern Hall Peninsula through lines A-A' and B-B' in (a). The cross-section was constructed across-strike through a well-exposed portion of southern Hall Peninsula with continuous 1:100 000-scale bedrock mapping along its length and well-constrained lithological and structural relationships. The supracrustal rocks, leucogranite intrusions and monzogranite plutons on the western peninsula are undifferentiated for simplicity and to highlight the overall structure. Archean orthogneisses on the eastern peninsula are undifferentiated. All geological contacts and structures on the cross-section are constrained by surface measurements, and have been projected above and below the surface with an interpreted fault geometry. The principal basement detachment on the cross-section is an interpretation with an assumed depth and geometry.

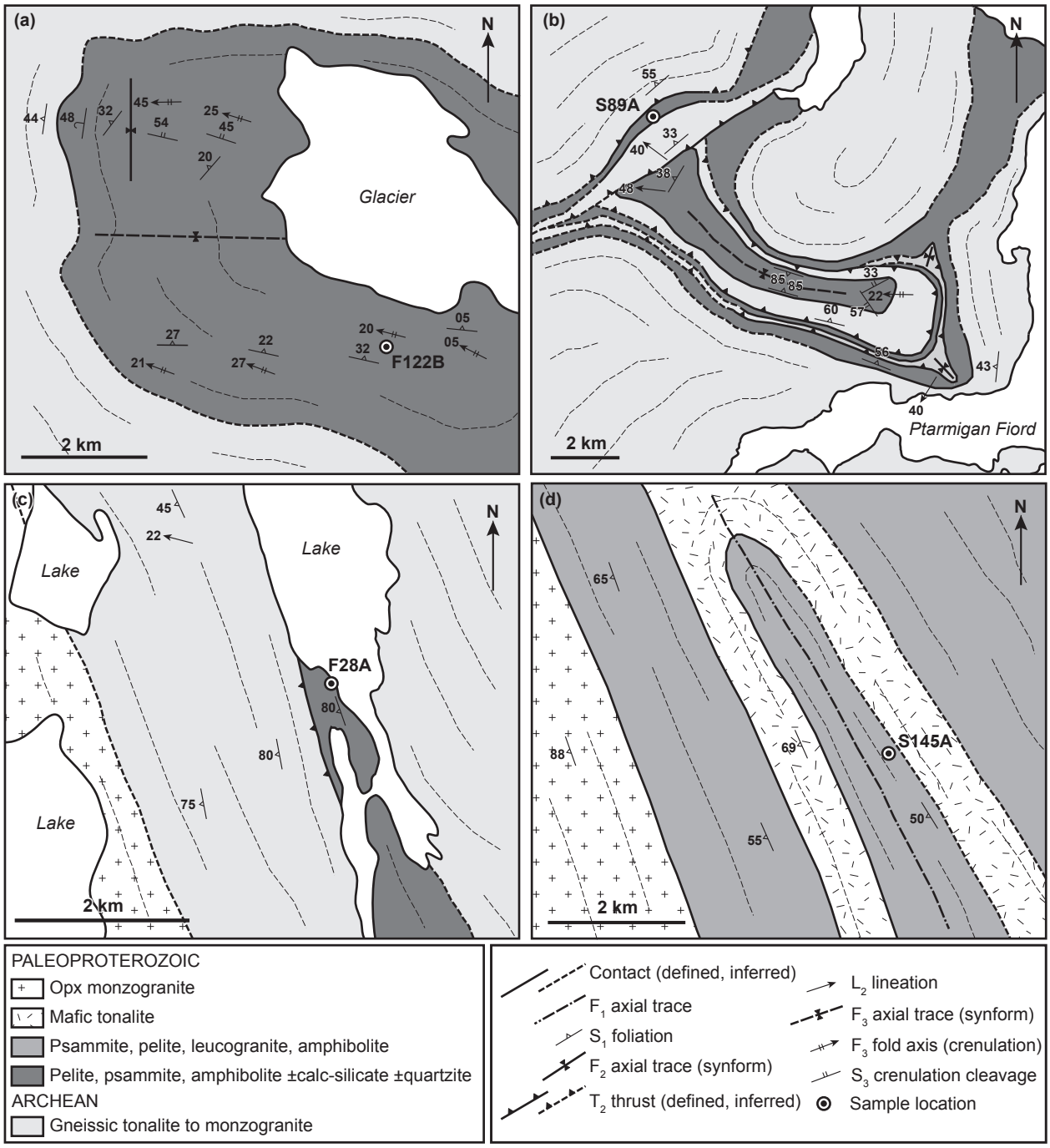


Fig. 4: Detailed geological maps of the sample locations in this study, as indicated in Fig. 3a: (a) F122B; (b) S89A (modified after Chadwick et al., 2015); (c) F28A; (d) S145A. Thin dashed lines represent approximate traces of S_1 foliation.

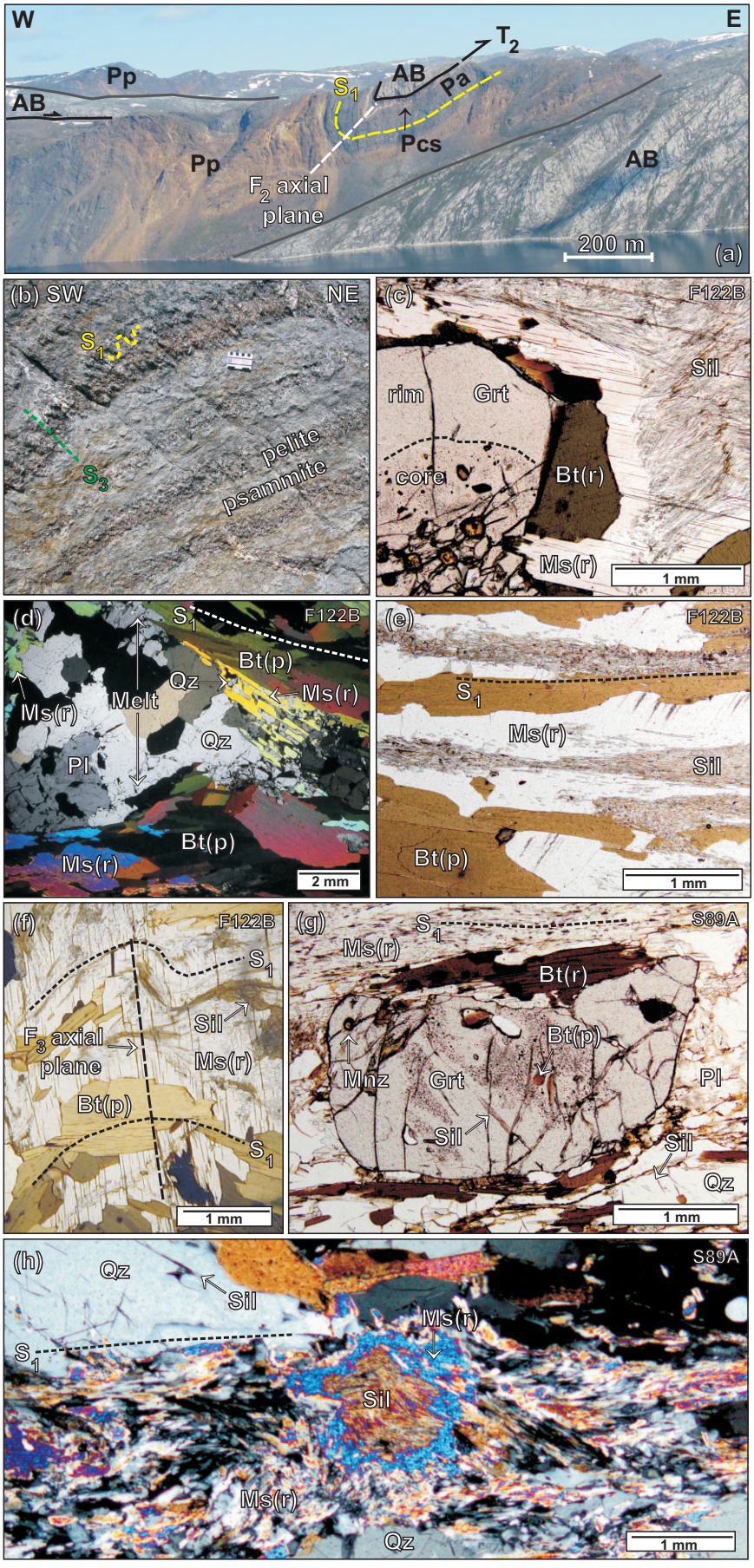

W
E
Pp
AB
T_2
S_1
AB
Pa
Pcs
Pp
AB
F_2 axial plane
200 m
(a)
(b) SW
NE
S_1
S_3
pelite
psammite
(c)
F122B
Sil
rim
Grt
core
Bt(r)
Ms(r)
1 mm
(d)
S_1
F122B
Bt(p)
Qz
Ms(r)
Ms(r)
Melt
Qz
Pl
Bt(p)
Ms(r)
2 mm
(e)
F122B
S_1
Ms(r)
Sil
Bt(p)
1 mm
(f)
F122B
S_1
Sil
F_3 axial plane
Ms(r)
Bt(p)
S_1
1 mm
(g)
S_1
S89A
Ms(r)
Bt(r)
Bt(p)
Mnz
Grt
Pl
Sil
Sil
Qz
1 mm
(h)
Qz
S89A
Sil
Ms(r)
S_1
Sil
Ms(r)
Qz
1 mm

Fig. 5 (previous page): (a) Photo of the northeast coast of Hall Peninsula, near the location of sample S89A, showing east-directed T_2 thrusting of Archean orthogneiss basement over Paleoproterozoic cover, and F_2 folding of S_1 fabric in cover and basement. AB=Archean basement; Pa, Pp, Pcs=Paleoproterozoic amphibolite, pelite and meta-calc-silicate, respectively. (b) Interbedded pelite and psammite near the location of sample F122B, showing S_1 fabric folded by F_3 crenulations, forming a NNE-dipping crenulation cleavage (S_3). (c) to (h) Photomicrographs of samples F122B and S89A from thin sections cut perpendicular to S_1 and parallel to L_1, unless otherwise indicated; for micas, "(p)" denotes prograde, syn-D_1 growth whereas "(r)" denotes retrograde, post-D_1 growth: (c) Partially resorbed garnet poikiloblast surrounded by biotite, muscovite and fibrolite. The fibrolite knot is oriented parallel to S_1, however, fibrolite needles are locally at high angles to muscovite cleavage planes (F122B; PPL; section is axial planar to F_3). (d) Band of coarse-grained plagioclase, quartz and rare K-feldspar, interpreted as crystallised melt. Muscovite with symplectic quartz intergrowths in the melt phase may represent retrograde replacement of K-feldspar by muscovite and quartz (F122B; XPL; section is axial planar to F_3). (e) Fibrolite bands in biotite, and overgrown by muscovite that is elongate parallel to S_1 but has cleavage planes oriented axial planar to F_3, suggesting post-S_1 replacement of a pre-existing mineral by muscovite (F122B; PPL; section is axial planar to F_3). (f) Coarse-grained muscovite overgrows an F_3 crenulation, with muscovite cleavage planes oriented axial planar to F_3 (F122B; PPL; section is perpendicular to the F_3 axial plane). (g) S_1-aligned garnet poikiloblast surrounded by biotite, plagioclase and quartz. A band of fine-grained muscovite occurs at the top of the photomicrograph, and quartz contains sillimanite needles (S89A; PPL). (h) S_1-aligned band of fine-grained muscovite with quartz. Sillimanite needles occur in quartz and form an aggregate surrounded by a large muscovite crystal at high angle to S_1 (S89A; XPL).

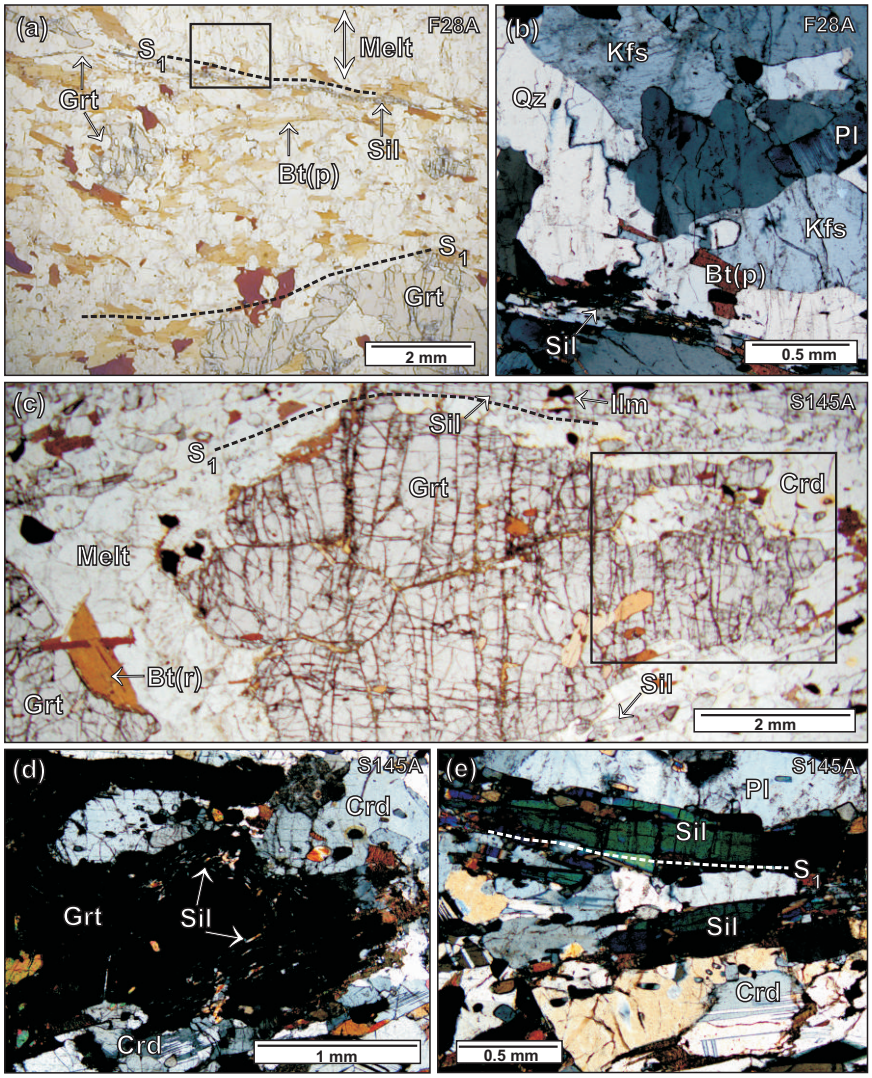
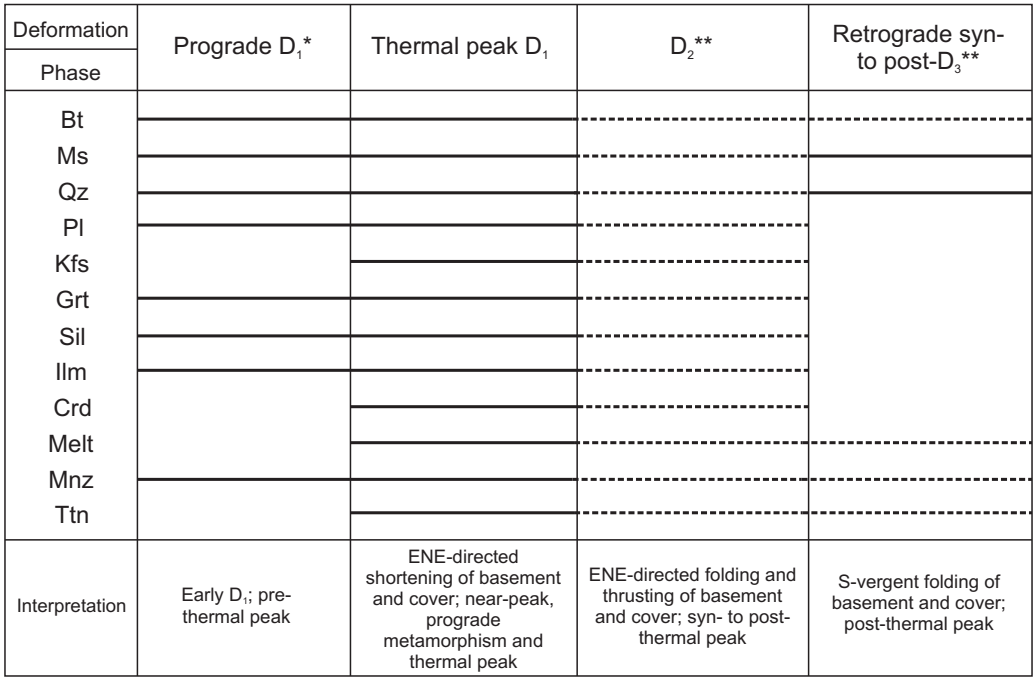


Fig. 6: Photomicrographs of samples F28A and S145A from thin sections cut perpendicular to S_1 and parallel to L_1; for micas, "(p)" denotes prograde, syn-D_1 growth whereas "(r)" denotes retrograde, post-D_1 growth: (a) S_1-aligned compositional banding defined by garnet- and biotite-rich bands alternating with bands of coarse-grained quartz, plagioclase and K-feldspar, interpreted to be melt. (F28A; PPL). (b) Detail of area outlined in (a) (F28A; XPL). (c) Elongate garnet, sillimanite, cordierite, ilmenite and minor biotite oriented parallel to S_1. Coarse-grained quartz, plagioclase and K-feldspar are interpreted as melt (S145A; PPL). (d) Detail of area outlined in (c), showing a garnet rim containing fine-grained sillimanite needles. Embayments in the garnet rim (top right) suggest replacement of garnet by cordierite (S145A; XPL). (e) Prismatic sillimanite aligned with S_1, surrounded by cordierite, plagioclase and quartz (S145A; XPL).



*in Grt inclusion trails in some samples

**dashed lines indicate suspected but unproven relationship

Fig. 7: Summary of mineral-fabric relationships on Hall Peninsula, Baffin Island.

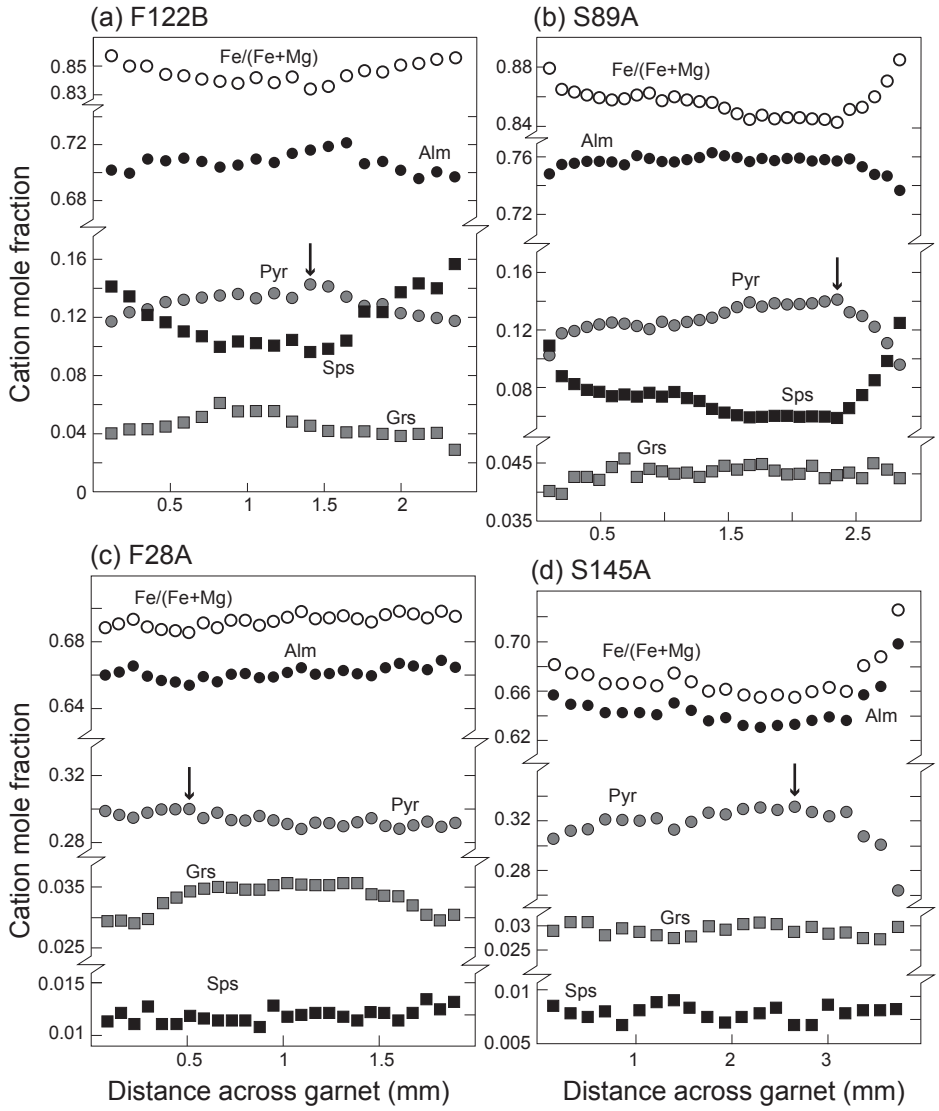


Fig. 8: Compositional transects through garnet porphyroblasts from electron microprobe analyses. Analyses with maximum pyrope values, which are used to estimate P-T conditions at the thermal peak on equilibrium phase diagram models (Figs. 9-12), are indicated with arrows. Alm = almandine = $Fe^{2+}/(Fe^{2+}+Mg+Ca+Mn)$; Pyr = pyrope = $Mg/(Fe^{2+}+Mg+Ca+Mn)$; Sps = spessartine = $Mn/(Fe^{2+}+Mg+Ca+Mn)$; Grs = grossular = $Ca/(Fe^{2+}+Mg+Ca+Mn)$.

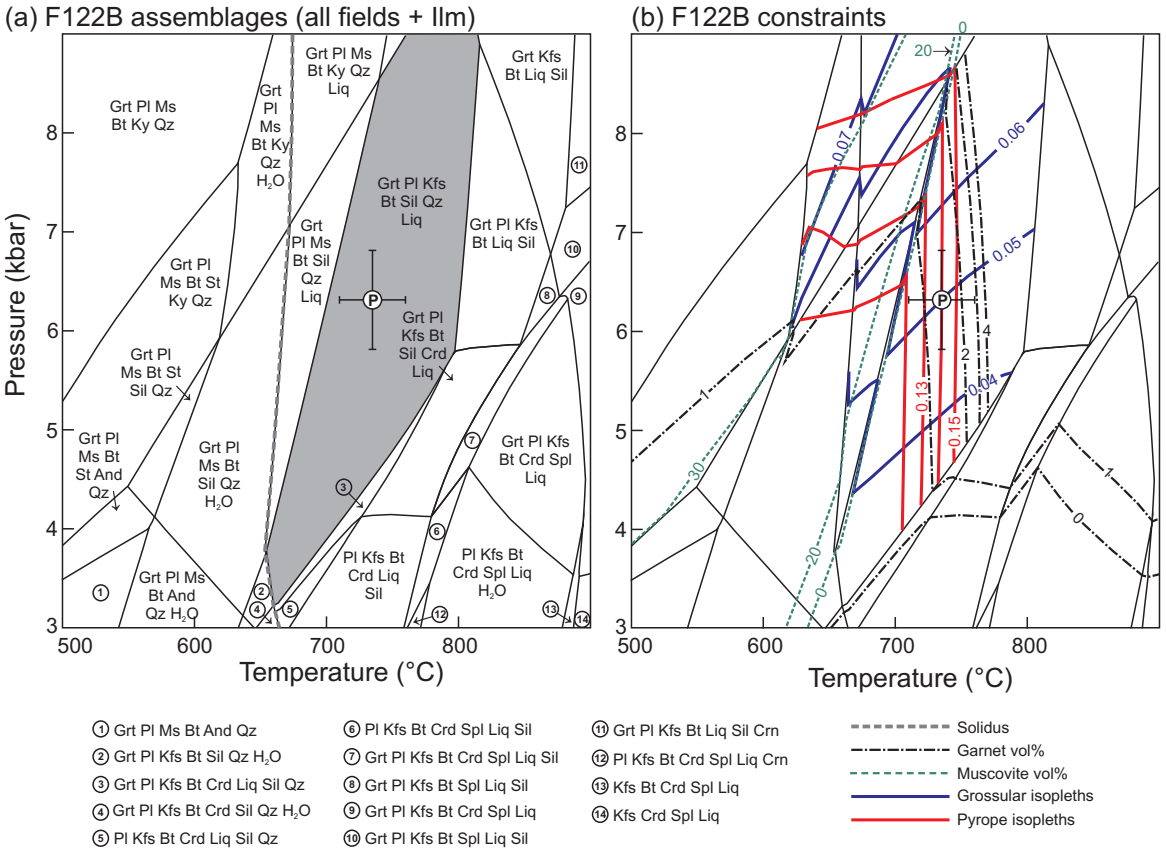


Fig. 9: Equilibrium phase diagram models for sample F122B (see Table A8.1 in Appendix 1 for bulk composition). Point "P" corresponds to modelled thermal peak conditions (±1σ) based on the estimated composition of garnet at the thermal peak (arrow in Fig. 8) and corresponding pyrope and grossular isopleths. (a) F122B model with all assemblage fields labelled. The peak assemblage field is shaded grey. (b) F122B model with isopleths for pyrope and grossular in garnet and for vol% garnet and muscovite.

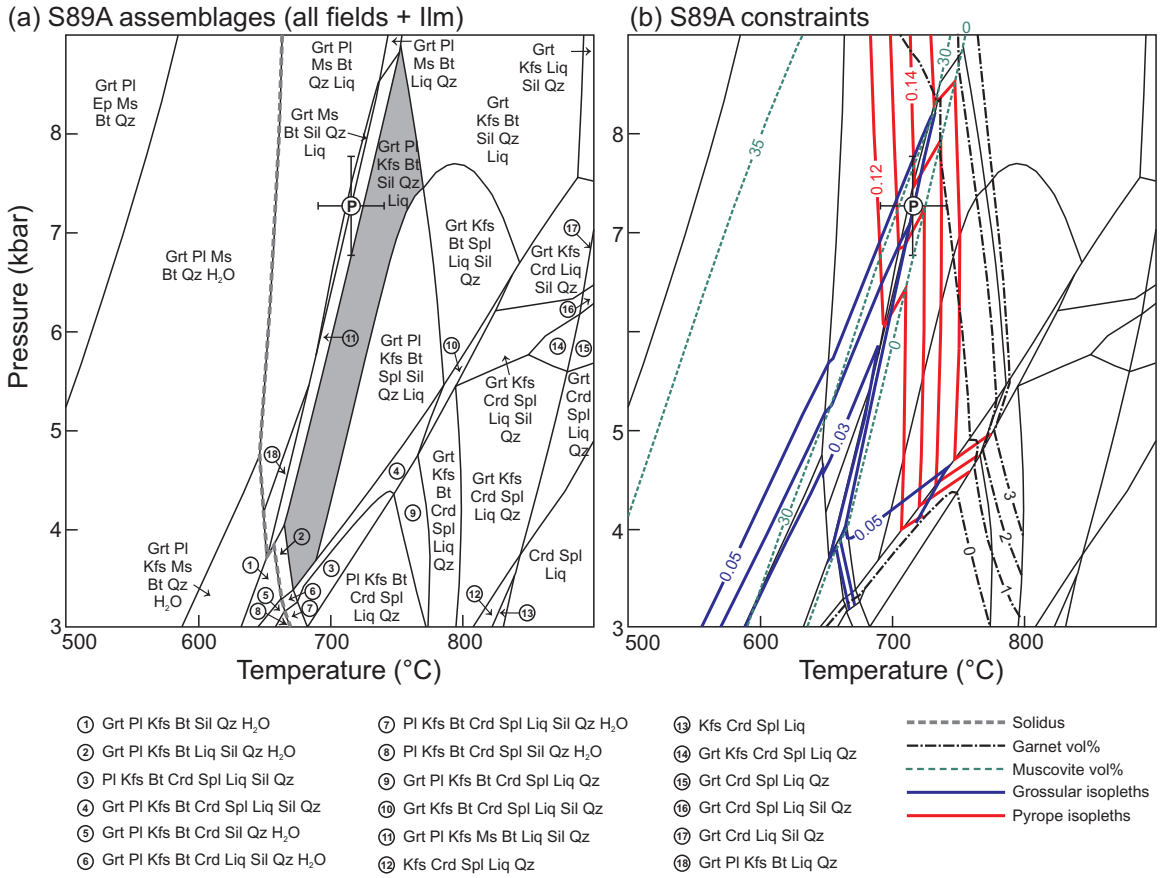


Fig. 10: Equilibrium phase diagram models for sample S89A (see Table A8.1 in Appendix 1 for bulk composition), with modeled thermal peak conditions, peak assemblage field and isopleths shown as in Fig. 9.

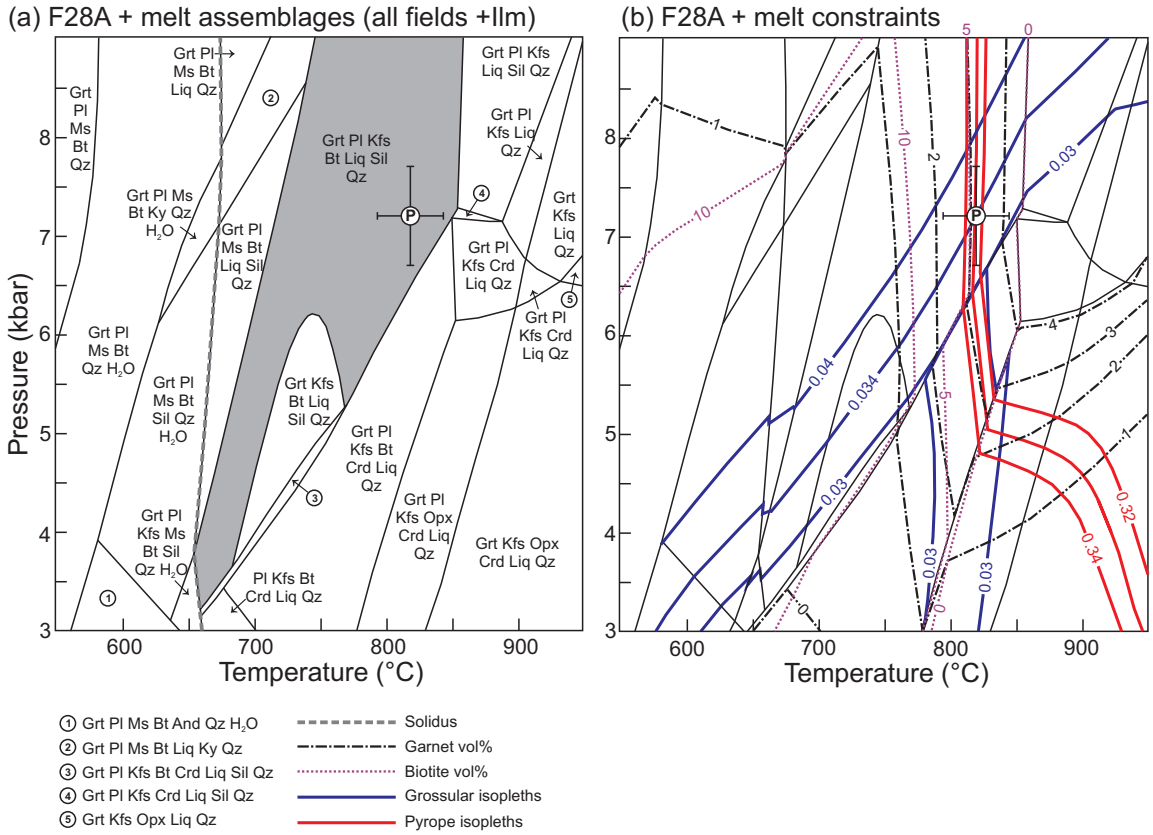


Fig. 11: Equilibrium phase diagram models for sample F28A with 10% melt integrated into the bulk composition (see Table A8.1 in Appendix 1 for bulk composition). Refer to text for details of melt integration methodology. Point "P" corresponds to modelled thermal peak conditions (±1σ) based on the estimated composition of garnet at the thermal peak (arrow in Fig. 8) and corresponding pyrope and grossular isopleths. (a) Model using bulk composition of F28A+melt, with all assemblage fields labelled and the peak assemblage field shaded grey. (b) F28A model with isopleths for pyrope and grossular in garnet and for vol% garnet and biotite.

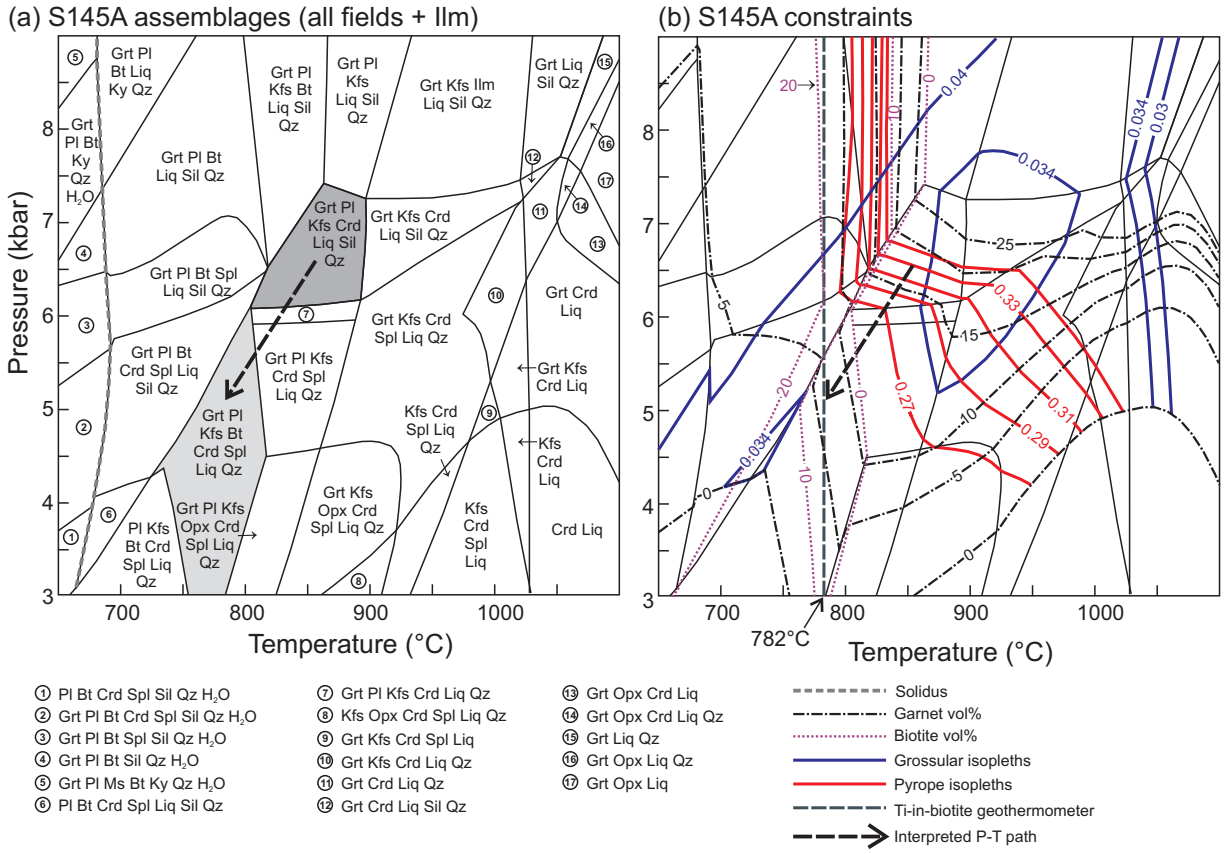


Fig. 12: (a) Equilibrium phase diagram model for sample S145A (see Table A8.1 in Appendix 1 for bulk composition), with all assemblage fields labelled and with an interpreted decompressive cooling path (dashed arrow) from the stability field of the peak assemblage (shaded dark grey) to a stability field with stable biotite (shaded light grey). (b) S145A model with isopleths for pyrope and grossular in garnet and for vol% garnet and biotite, and showing the temperature calculated from the Ti-in-biotite geothermometer.

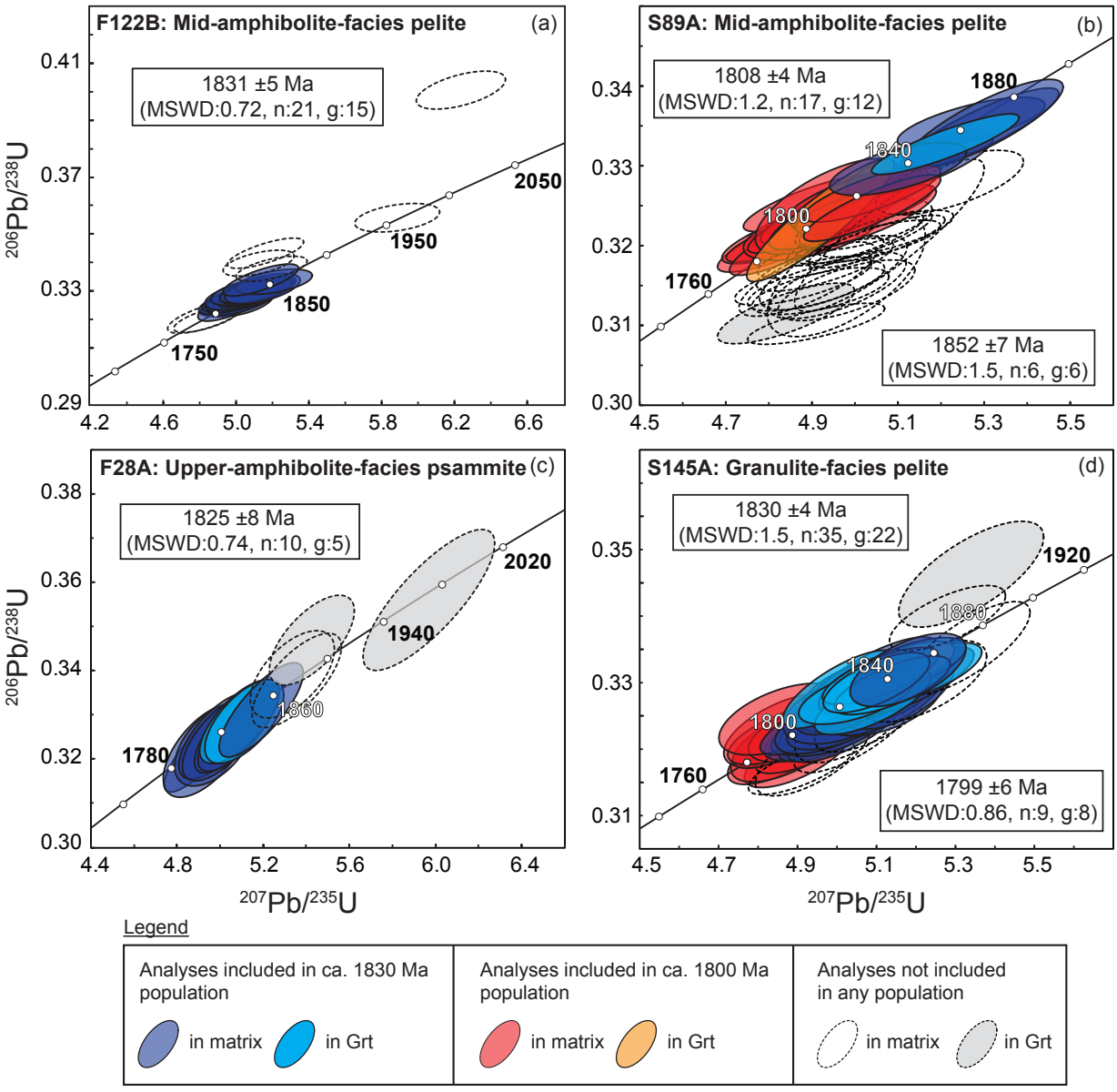


Fig. 13: Concordia plots of *in situ* U-Pb monazite analyses in samples (a) F122B, (b) S89A, (c) F28A and (d) S145A, showing calculated concordia ages (±2σ Ma). In sample F28A, one concordant ellipse at ~3000 Ma is not shown. Abbreviations: n, number of analyses included in calculated age; g, number of monazite grains included in calculated age.

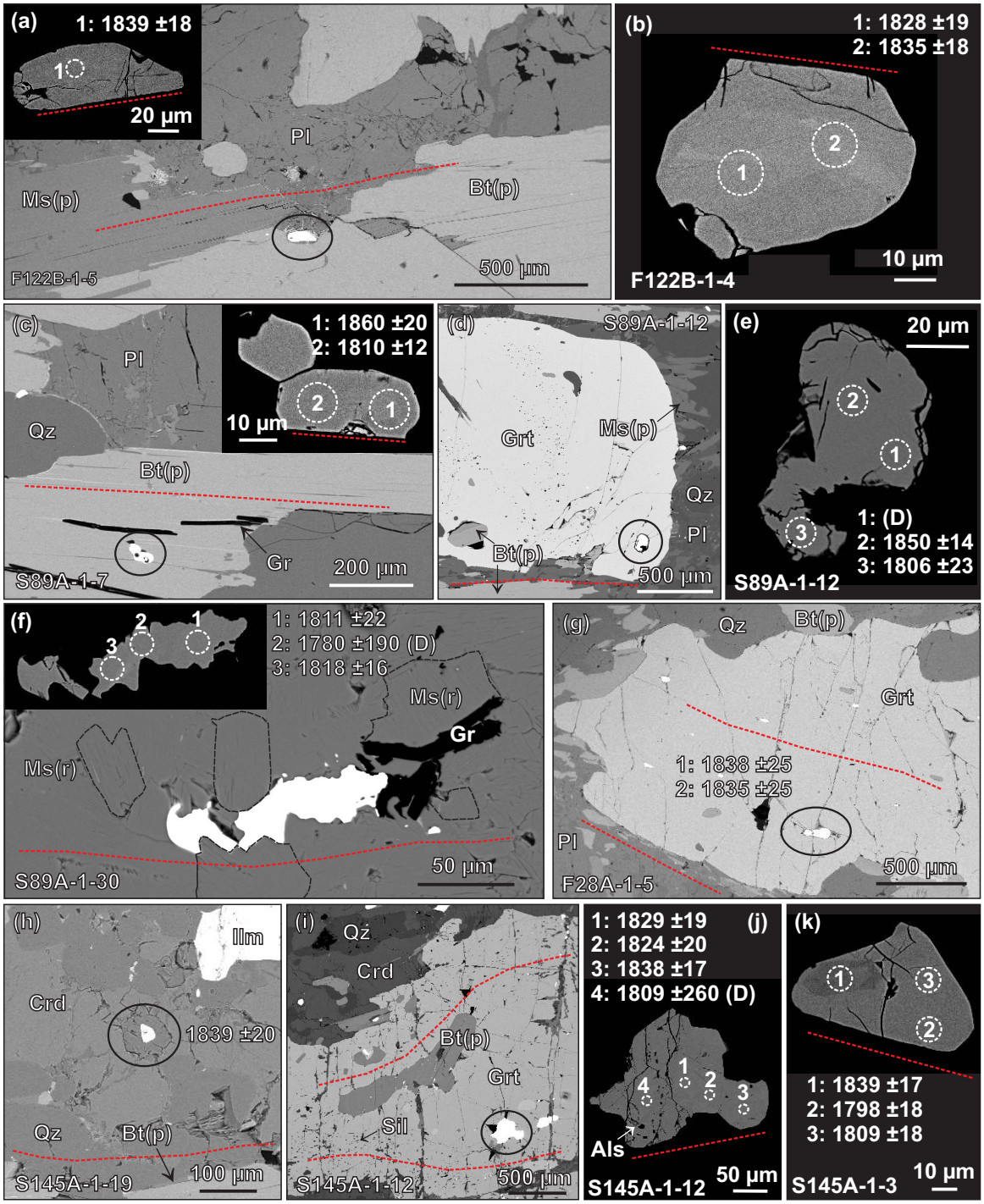


Fig. 14: Representative SEM back-scattered electron (BSE) images of monazite dated from Hall Peninsula. Monazite images are labelled where x=sample number, y=thin section number and z=grain number (e.g. F122B-1-5). Red dashed lines indicate S_1 fabric orientation. Laser pit locations are circled in white and labelled with analysis number and Concordia age (±2σ) in Ma; "(D)" denotes discordant analyses. (a-b) Examples of ca. 1830 Ma monazite aligned with S_1 in the matrix of F122B; (c-e) Examples of monazite in S89A with ca. 1850 Ma and ca. 1800 Ma domains aligned with S_1 in the matrix (c) and in Grt (d, e); (f) A monazite grain that appears intergrown with post-D_1 retrograde Ms in S89A; (g) A ca. 1830 Ma monazite grain in an S_1-aligned inclusion trail in Grt in F28A; (h-k) Examples of ca. 1830 Ma monazite in S145A in S_1-aligned Crd (h), in an S_1-aligned inclusion trail in Grt (i, j) and containing ca. 1800 Ma domains (j, k).

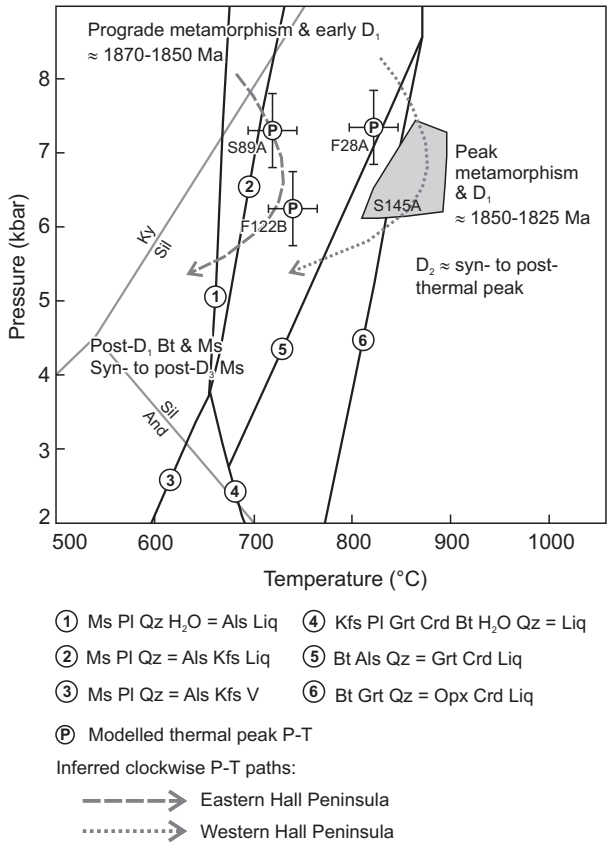


Fig. 15: Summary of the pressure-temperature-deformation evolution of the metamorphic rocks on Hall Peninsula interpreted from the modeled thermal peak *P-T* conditions and *in situ* U-Pb monazite ages in this study. Clockwise P-T paths are inferred from grossular-enriched garnet cores and decompression textures, although the prograde and retrograde evolution is not constrained quantitatively. The muscovite and biotite breakdown/dehydration reactions for the Na_2O-K_2O-FeO-MgO-Al_2O_3-SiO_2-H_2O system from Spear *et al.* (1999) are shown for context.

Appendix 1 to:

Tectonothermal evolution of the middle crust in the Trans-Hudson Orogen, Baffin Island, Canada: evidence from petrology and monazite geochronology of sillimanite-bearing migmatites

Diane Skipton[1], M.R. St-Onge[2], D.A. Schneider[1], C.R.M. McFarlane[3]

[1]Department of Earth and Environmental Sciences, University of Ottawa, Ottawa, ON, K1N 6N5, Canada

[2]Geological Survey of Canada, Natural Resources Canada, Ottawa, ON, K1A 0E8, Canada

[3]Department of Earth Sciences, University of New Brunswick, Fredericton, NB, E3B 5A3, Canada

Table of contents

A1. Metamorphic map 84

A2. Supplementary field photos 85

A3. Stereonets 88

A4. Previous geochronology 89

A5. Analytical methods for mineral chemistry (major elements) 90

A6. Summary of matrix mineral chemistry (EMPA) 90

A7. Garnet compositional maps, images and EMPA transect locations 91

A8. Whole-rock geochemistry 97

A9. Methodology for phase diagram modeling 97

A10. Modal abundances 99

A11. Phase diagram model of sample F28A using measured bulk composition 100

A12. Analytical methods for *in situ* U-Pb monazite geochronology 101

A13. Monazite trace element maps 101

A14. References 106

A1. Metamorphic map

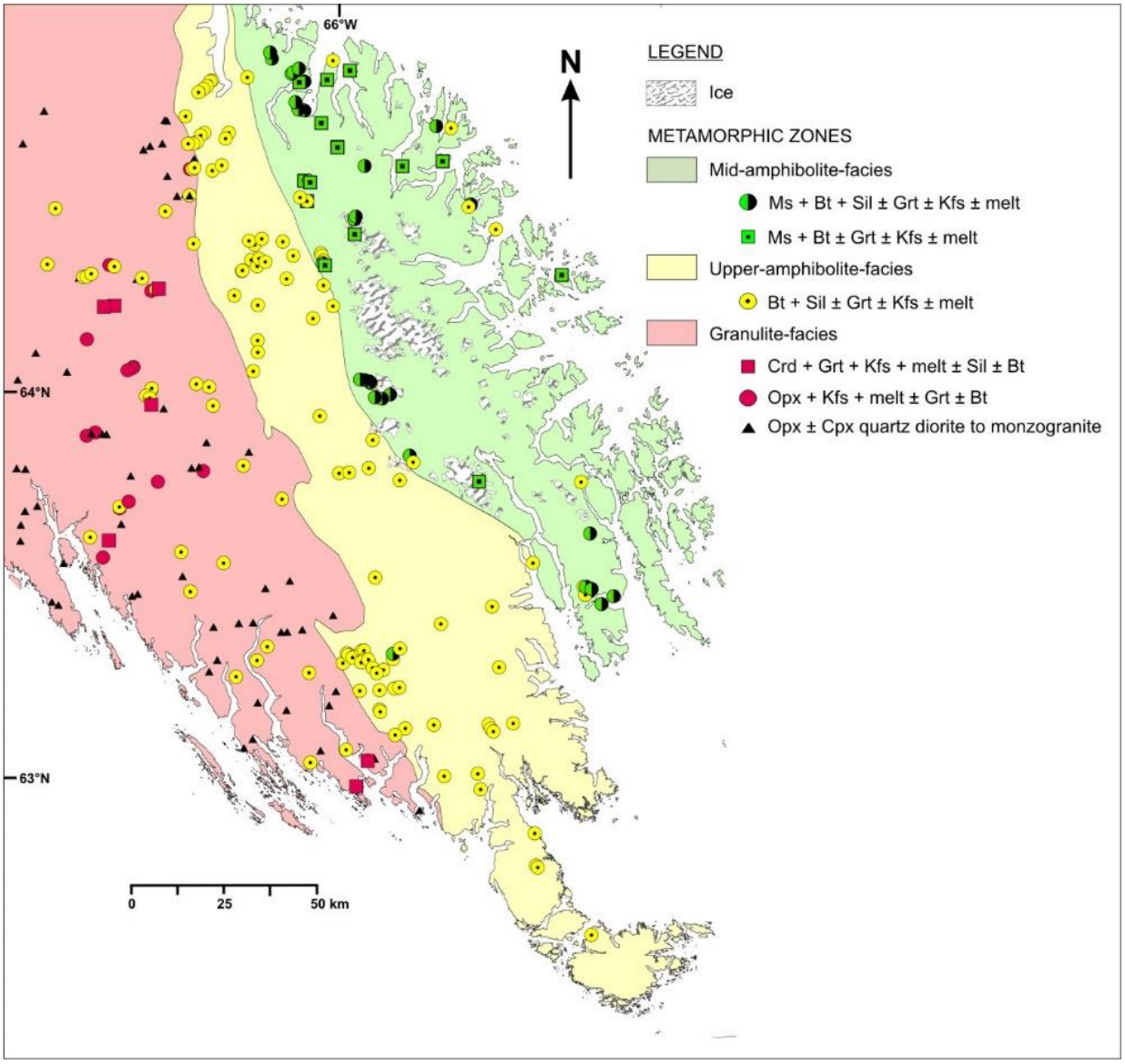


Fig. A1.1: Map of Hall Peninsula showing the three metamorphic zones that are defined by peak metamorphic assemblages in pelites. Each symbol on the map corresponds to the peak metamorphic mineral assemblage in pelite at that location, following the legend above. Where pelites were not mapped on the west-central peninsula, the boundary of the granulite-facies metamorphic zone was inferred along the eastern limit of orthopyroxene-bearing quartz diorite-to-monzogranite intrusions.

A2. Supplementary field photos

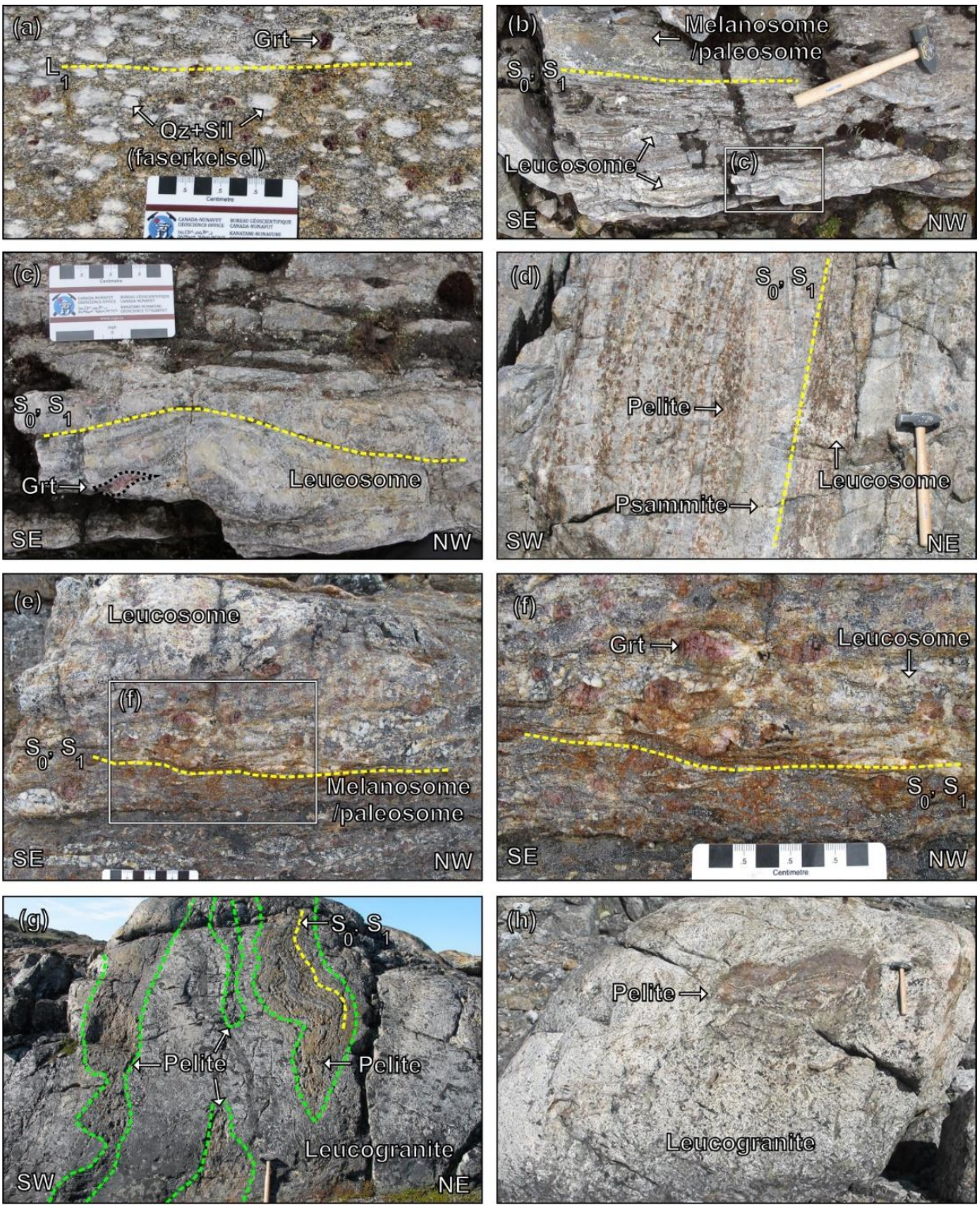


Fig. A2.1: Representative field photos of pelite and leucogranite on Hall Peninsula. (a) Pelite in the mid-amphibolite-facies zone with quartz surrounding knots of fibrolite, forming faserkeisel texture, aligned parallel to L_1. (b) Psammite from the upper-amphibolite-facies zone where

(Fig. A2.1 continued) sample F28A was collected, showing distinct leucosome and melanosome/paleosome aligned with S_1. (c) Detail of (b) showing lozenge-shaped Grt porphyroblast in leucosome oriented parallel to S_1. (d) Interbedded pelite and psammite in the granulite-facies zone, with southwest-dipping, bedding-parallel S_1. (e) Pelite in the granulite-facies zone, where sample S145A was collected, with leucosome and melanosome/paleosome oriented parallel to S_1. (f) Detail of (e) showing lozenge-shaped, S_1-aligned Grt porphyroblasts and leucosome. (g) Pelite (outlined in green) intruded by Grt+Crd leucogranite in the granulite-facies zone. (h) Grt±Crd leucogranite containing a block of pelite in the granulite-facies zone.

Fig. A2.2 (next page): Representative field photos of structural fabrics on Hall Peninsula. (a) Interbedded psammite and pelite with leucosome aligned with west-dipping, bedding-parallel S_1 (granulite-facies zone). (b) NW-plunging L_1 lineation defined by coarse-grained sillimanite on a SW-dipping foliation plane in pelite (granulite-facies zone). (c) West-dipping L_2 lineation defined by stretched quartz and K-feldspar in monzogranite orthogneiss basement near a T_2 thrust contact (mid-amphibolite-facies zone). (d) West-dipping mylonite zone in monzogranite orthogneiss basement near a T_2 thrust contact (mid-amphibolite-facies zone). (e) Archean (A) monzogranite thrusted eastwards over Paleoproterozoic (P) supracrustal rocks by T_2 and folded by F_2. Location of (f) is indicated on the western, overturned limb of the F_2 fold. (f) Detail of Archean monzogranite in (e), showing stretched K-feldspar megacrysts near the T_2 thrust contact. (g) Interbedded psammite and pelite with S_1 defined by muscovite, biotite and faserkeisel. S_1 is folded by F_3 crenulations, forming S_3 crenulation cleavage. Leucosome (Qz+Pl) is S_3-aligned. (h) Interbedded psammite with S_1 defined mainly by aligned faserkeisel and leucosome. S_1 is folded by a south-vergent F_3 fold.

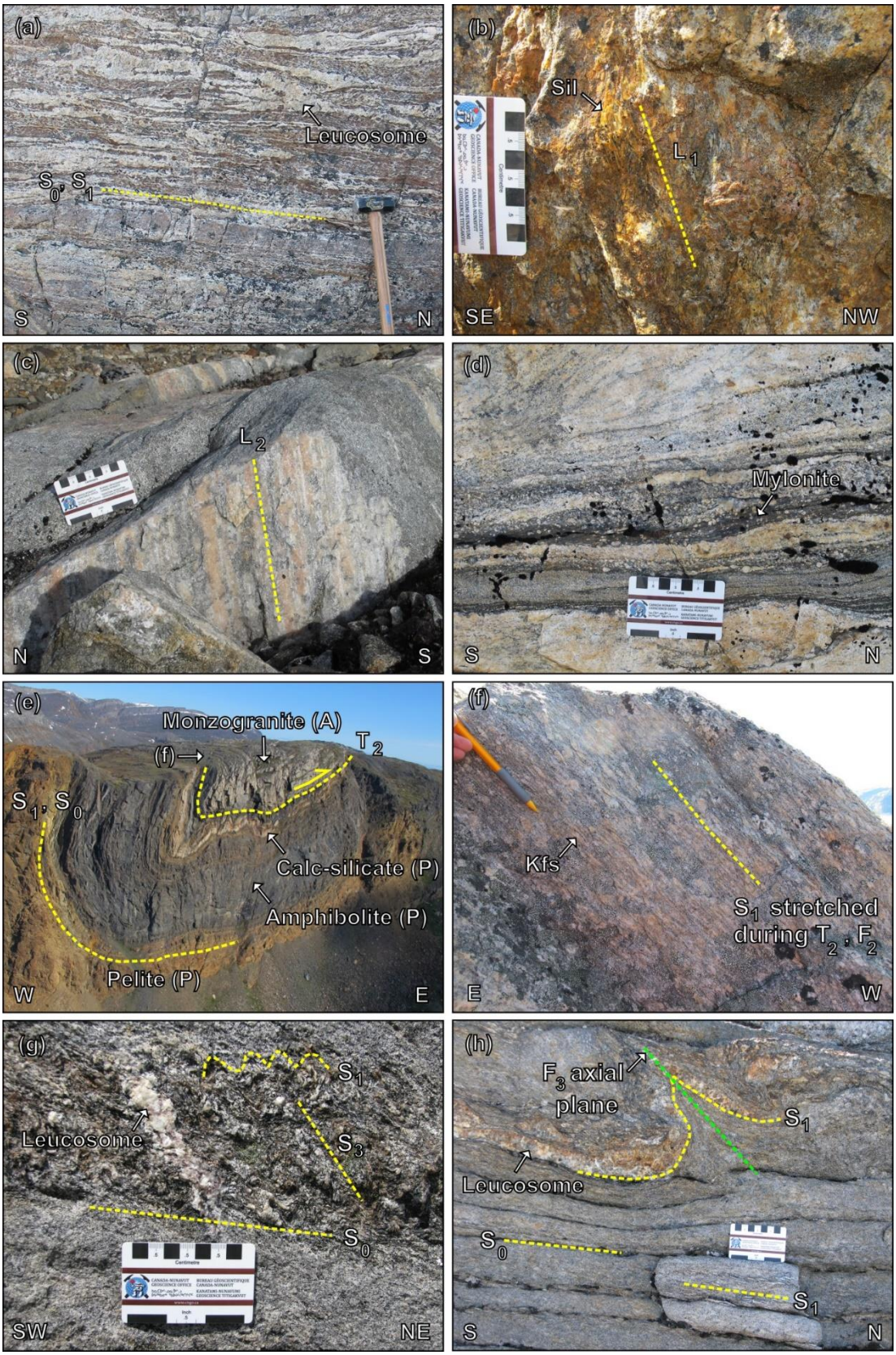


Fig. A2.2: Refer to caption on previous page.

A3. Stereonets

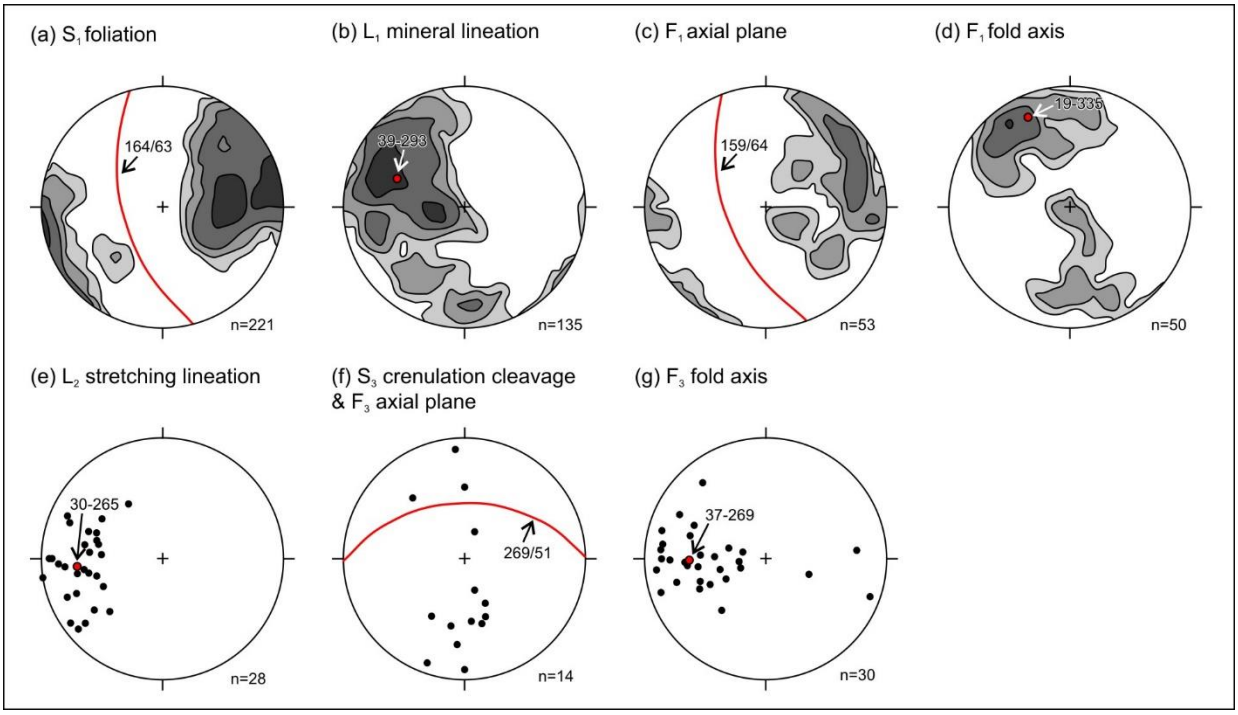


Fig. A3.1: (a) to (g) Structural fabric measurements from Hall Peninsula plotted on equal-area stereonets. Planar measurements are plotted as poles to planes, contoured by density in (a) to (d) due to large datasets. Mean orientations were calculated using GEOrient v.9.4.4. (R. Holcombe, 2009) and are plotted in red and labelled on each stereonet. Measurements for S_1, L_1 and F_1 have an approximately even spatial distribution across Hall Peninsula. Measurements for L_2 are from mapped thrust contacts along the east coast and measurements for F_3 and S_3 are from selected areas on the eastern peninsula. Some structural data were obtained from Machado *et al.* (2013) and the Canada-Nunavut Geoscience Office (2015).

A4. Previous geochronology

Previous geochronological studies using conventional (non-*in situ*) SHRIMP and ID-TIMS U-Pb dating methods on zircon, monazite and titanite indicate a protracted thermal history for Hall Peninsula. In samples of Archean basement orthogneisses from the central and eastern peninsula, Scott (1999) and Rayner (2014) reported zircon rim ages that range from ca. 1856 to 1800 Ma (SHRIMP and ID-TIMS), which they interpret as metamorphic overgrowths. In addition, zircon rims from an Archean orthogneiss on the east coast yielded an age of ca. 1759 Ma (ID-TIMS; Scott, 1999). Zircon rim ages from metasedimentary rocks include, from east to west: ca. 1870-1790 Ma, in psammite from the mid-amphibolite-facies zone (SHRIMP; Rayner, 2014); ca. 1877-1852 Ma, in metasedimentary rocks from the upper-amphibolite-facies zone (ID-TIMS; Scott, 1999; Scott & Gauthier, 1996); and ca. 1886-1832 Ma, in quartzite from the granulite-facies zone (SHRIMP; Rayner, 2014). A garnet-bearing leucogranite hosted by the granulite-facies strata crystallized at 1867 ± 8 Ma (SHRIMP; Rayner, 2014) and is comparable to the garnet-leucogranites interpreted by Dyck & St-Onge (2014) as products of biotite-dehydration melting. Therefore, the crystallization age of the leucogranite may provide an estimate of the age of granulite-facies conditions in the western strata. Limited U-Pb monazite (ID-TIMS) geochronology by Scott (1999) yielded ages that overlap with zircon rim ages, including: ca. 1877 ±3 Ma and ca. 1862 ±3 Ma monazite from two metasedimentary rocks and ca. 1843 ±3 Ma monazite in a monzogranite pegmatite on the central peninsula; and ca. 1862 ±3 Ma and ca. 1856 Ma monazite from two monzogranites in the western granulite-facies zone.

Scott (1999) also reported U-Pb titanite ages (ID-TIMS) ranging from ca. 1742-1730 Ma from three samples of Archean tonalite from the mid-amphibolite-facies zone. Previous studies have determined K-Ar total fusion ages on minerals from six samples distributed across the peninsula, including: biotite (ca. 1700–1507 Ma; Wanless *et al.*, 1968), muscovite (ca. 1610 Ma; Lowdon, 1960) and hornblende (ca. 1670 Ma; Wanless *et al.*, 1979). Additional ^{40}Ar-^{39}Ar step-heating analyses of three muscovite samples from the eastern peninsula yielded ages of ca. 1690-1657 Ma (Skipton *et al.*, 2015).

Broad timing constraints on regional deformation events are provided by U-Pb SHRIMP crystallization ages of deformed units and cross-cutting intrusions. The youngest known units that are deformed by D_1 are, from east to west: a ca. 1852 ± 7 Ma quartz-diorite layer in a metasedimentary package (Rayner, 2014) in the mid-amphibolite-facies zone on the eastern

peninsula; a ca. 1873 ± 6 Ma monzogranite dike hosted by metasedimentary strata (Rayner, 2014) in the upper-amphibolite-facies zone; and a ca. 1872 ± 5 Ma orthopyroxene monzogranite in the granulite-facies zone (Rayner, 2015). On the southeastern peninsula in the mid-amphibolite-facies zone, Rayner (2015) reported an undeformed biotite monzogranite emplaced at ca. 1830 ± 3 Ma that cross-cuts the S_1 fabric in its metasedimentary host rocks, and may therefore provide a minimum age for D_1 deformation. The minimum ages of D_2 and D_3 are unknown, as no intrusions that cross-cut D_2 and D_3 structures have been identified.

A5. Analytical methods for mineral chemistry (major elements)

Major element analyses were conducted on polished thin sections of samples F122B, S89A, F28A and S145A using the JEOL JXA-8230 Superprobe at the University of Ottawa (Canada). The microprobe was operated with a voltage of 20 kV and a beam current of 20 nA. The following spot sizes were used: 5 µm for feldspar, amphibole and cordierite, 10 µm for micas, and 1 µm for garnet. A total counting time of 40 s was used for unknowns, including 20 s on the peak and 10 s on either side of the peak. For background measurements, a counting time of 10 s was used on peaks, plus 10 s on each side of the peak, for a total counting time of 30 s. A combination of natural and synthetic standards were used for calibration and analyses were corrected using a ZAF matrix correction routine. Chemical formulas were calculated using the AXWin software (Holland, 2014).

A6. Summary of matrix mineral chemistry (EMPA)

Representative mineral compositions for samples F122B, S89A, F28A and S145A are presented in Appendix 2.

A6.1. Sample F122B

Biotite conforms to the annite-phlogopite chemical formula ($K_2(Fe, Mg)_6(Si_6Al_2O_20)(OH)_4$), with Fe/(Fe+Mg) ratios of ~0.56-0.57. Muscovite conforms to the muscovite chemical formula ($K_2Al_4(Si_6Al_2O_{20})(OH, F)_4$), with a range of K contents from 0.864-0.879 (mol% cations). There is no apparent difference in composition between syn-D_1 and post-D_1 micas. Where biotite is in contact with garnet, biotite becomes slightly enriched in Fe^{2+} closer to garnet, with Fe/(Fe+Mg) increasing from ~0.56 to 0.57 towards garnet. Matrix plagioclase is about An_{20}, whereas plagioclase inclusions in garnet cores are pure albite.

A6.2. Sample S89A

Plagioclase is An_{25}, and biotite conforms to the annite-phlogopite chemical formula with Fe/(Fe+Mg) ratios of ~0.60-0.62 for matrix biotite and ~0.45-0.53 for biotite inclusions in garnet. Muscovite conforms to the muscovite chemical formula, with a range of K contents from 0.871-0.896 (mol% cations). There is no apparent difference in composition between syn-D_1 and post-D_1 micas in the matrix.

A6.3. Sample F28A

Matrix plagioclase is An_{20-28}, with the low An values tending to occur in plagioclase adjacent to garnet. Biotite is phlogopite-annite, and is more Mg-rich than in samples F122B and S89A. The Fe/(Fe+Mg) ratios in matrix biotite range from ~0.43-0.46, whereas biotite inclusions in garnet have lower Fe/(Fe+Mg) ratios of ~0.29-0.33. Matrix biotite becomes slightly enriched in Mg adjacent to garnet, with Fe/(Fe+Mg) ratios decreasing from ~0.45 to 0.43 closer to garnet.

A6.4. Sample S145A

Plagioclase is An_{30} and cordierite conforms to its formula ($(Mg, Fe)_2(Si_5Al_4O_{18})H_2O$) but is Mg-rich, with Fe/(Fe+Mg) ratios of ~0.15-0.20. Biotite is phlogopite-annite, and matrix biotite has Fe/(Fe+Mg) ratios of ~0.27-0.32, whereas biotite inclusions in garnet and matrix biotite grains adjacent to garnet have lower Fe/(Fe+Mg) ratios of ~0.20-0.29. There is no apparent difference in composition between syn-D_1 and post-D_1 biotite in the matrix. Matrix biotite in contact with garnet has Fe/(Fe+Mg) ratios that decrease by ~0.02 towards garnet, reflecting Mg-enrichment in biotite towards the contact.

A7. Garnet compositional maps, images and EMPA transect locations

A7.1. LA-ICP-MS garnet mapping methodology

The compositions of Fe, Mg, Mn, Ca and Y were mapped in garnet in samples F122B, S89A and S145A. Maps were constructed using the LA-ICP-MS method at the University of New Brunswick (Fredericton, Canada) using a Resonetics M-50 193nm excimer laser system connected to an Agilent 7700x quadrupole ICPMS. Laser raster scans were defined within a rectangular area using laser ablation software (GeoStar v.6.23) following the details of McFarlane & Luo (2012) and McFarlane & McKeough (2013). Each linear raster scan used a crater size between 45 to 90 µm (depending on the size of the garnet) with a scan speed between 20 and 45 µm/s and a laser pulse rate of 10 Hz. Fluence was regulated at 3 J/cm^2. Concentration (NIST612) and quality control

glass standards (BCR2-G) were ablated periodically throughout the map acquisition to monitor and correct instrumental drift over the course of the 2 hour acquisitions. The garnet compositional maps represent semi-quantitative concentrations that were calculated from the analyte intensity in the unknown compared to the same analyte intensity in the concentration standard (NIST612). The calculated values are within 20-30% of the true concentrations (based on reproducibility of BCR2-G) and reasonably represent different compositional domains.

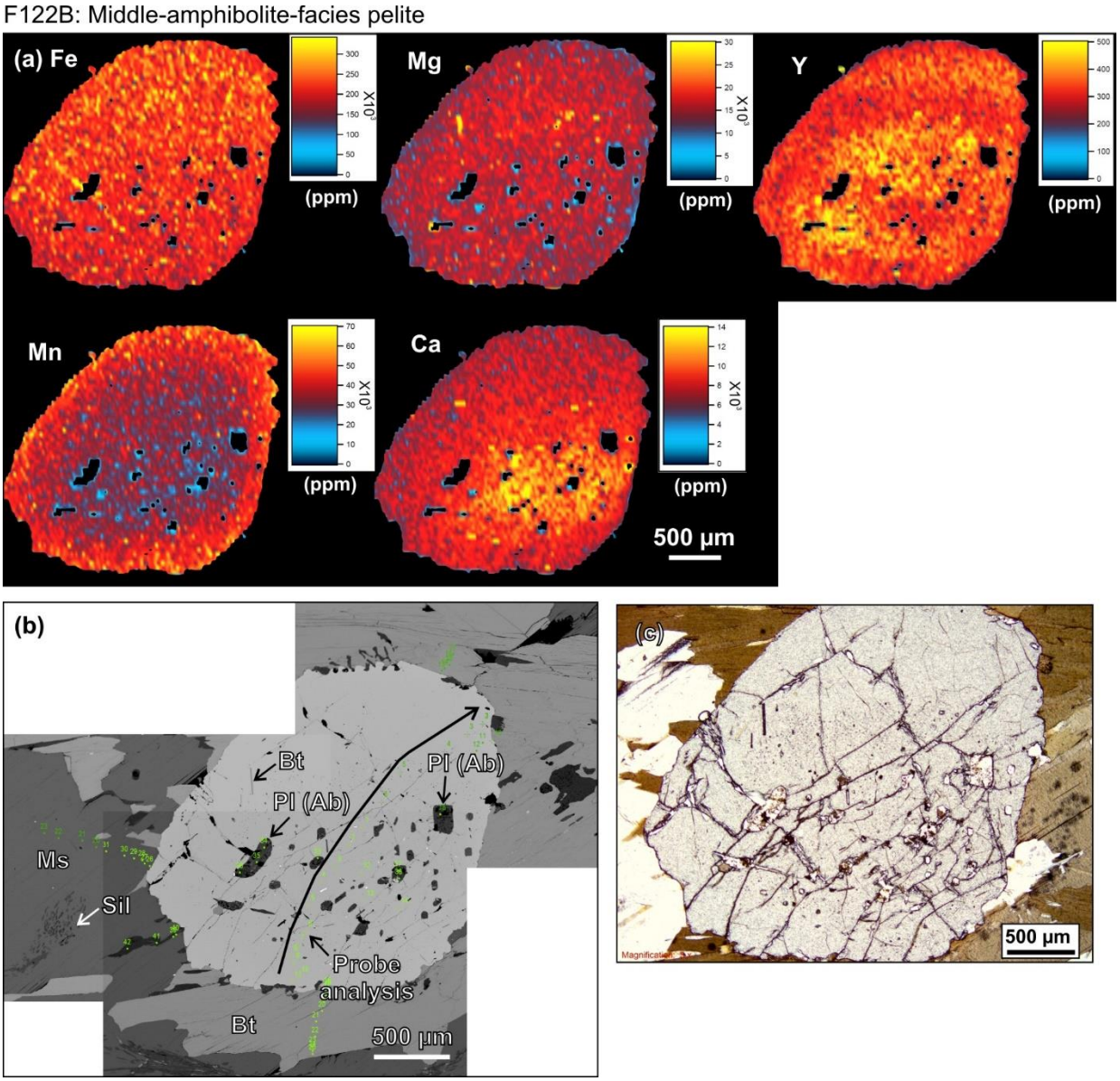


Fig. A7.1: Maps and images of the garnet analyzed in sample F122B. (a) Compositional maps (LAICPMS) of major cations and Y. (b) BSE image showing the location of the electron microprobe analysis transect (black arrow) and inclusions of biotite and plagioclase. (c) Garnet in plane polarized light.

S89A: Middle-amphibolite-facies pelite

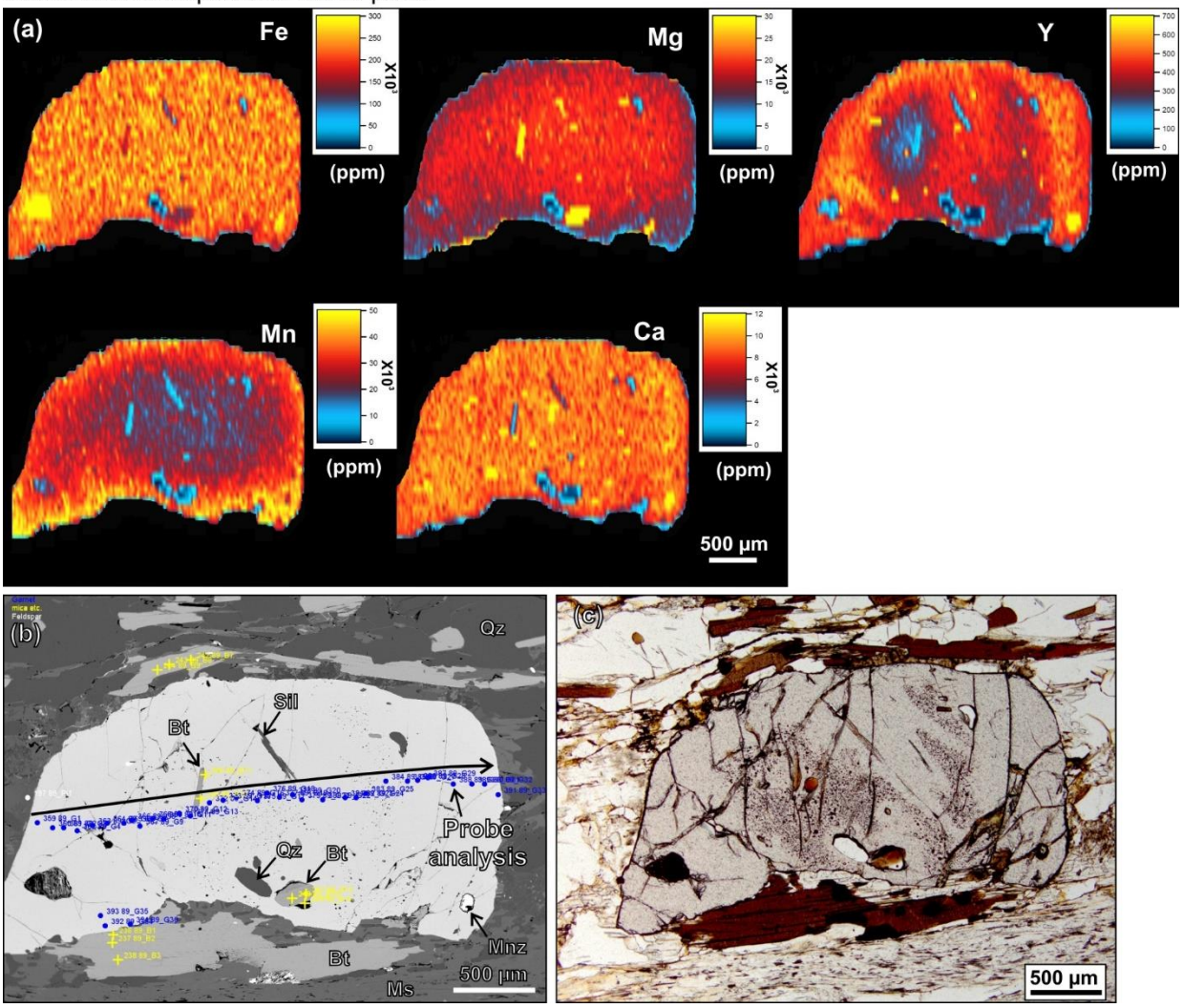


Fig. A7.2: Maps and images of the garnet analyzed in sample S89A. (a) Compositional maps (LAICPMS) of major cations and Y. (b) BSE image showing the location of the electron microprobe analysis transect (black arrow) and inclusions of biotite, sillimanite and quartz. (c) Garnet in plane polarized light.

F28A: Upper-amphibolite-facies psammite

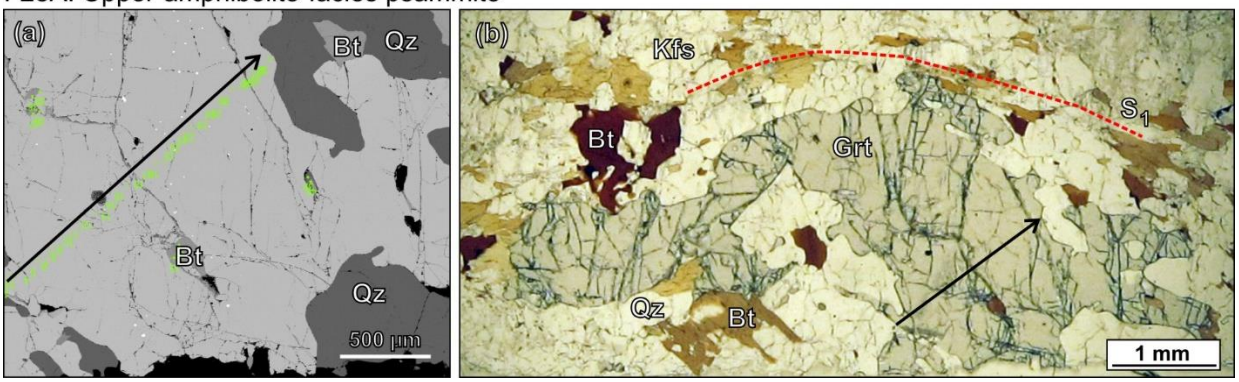


Fig. A7.3: Images in BSE (a) and plane polarized light (b) of garnet analyzed in sample F28A, showing the location of the electron microprobe analysis transect (black arrow).

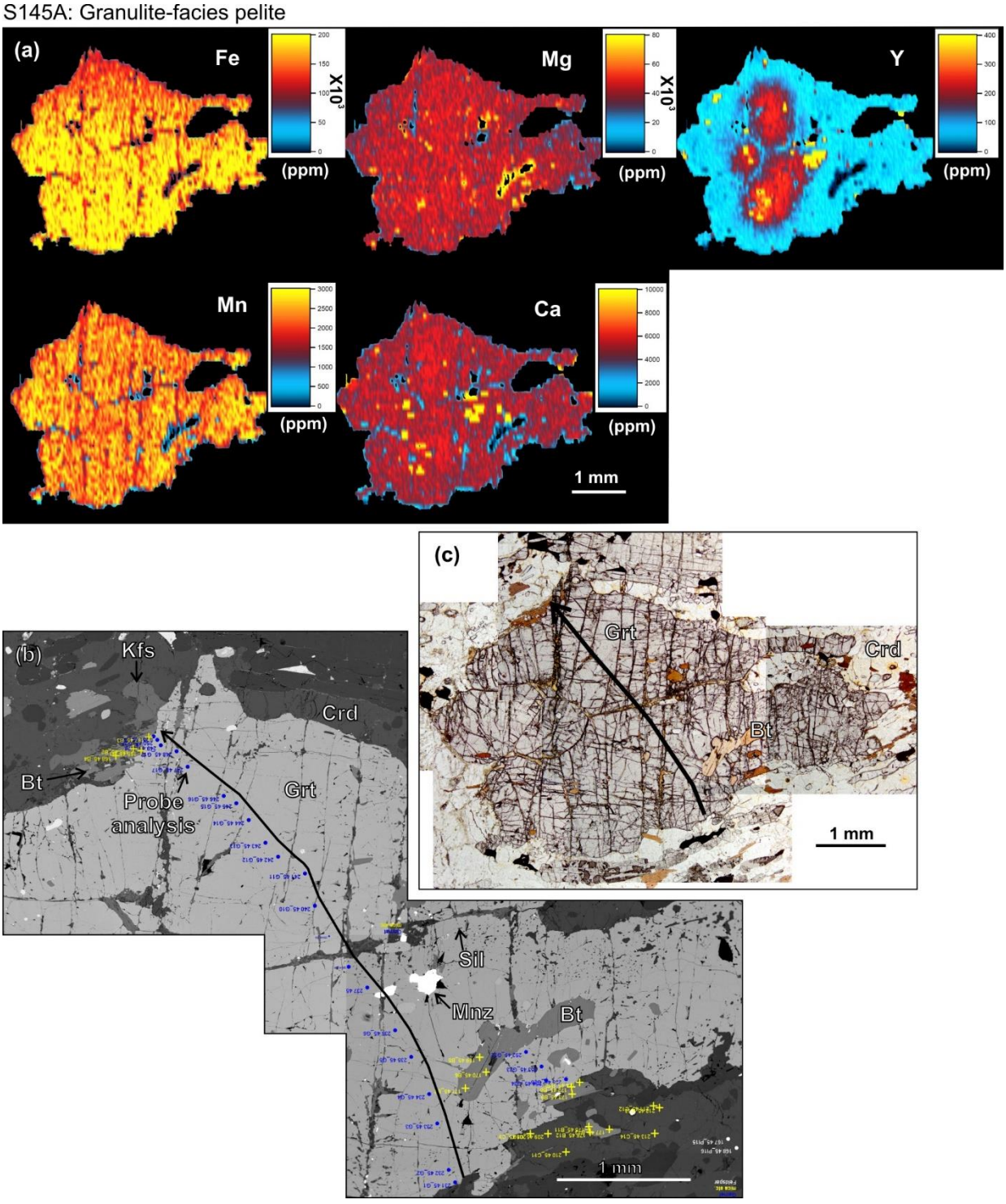


Fig. A7.4: Maps and images of the garnet analyzed in sample S145A. (a) Compositional maps (LAICPMS) of major cations and Y. (b) BSE image showing the location of the electron microprobe analysis transect (black arrow) and inclusions of biotite, sillimanite and monazite. (c) Garnet in plane polarized light.

A8. Whole-rock geochemistry

Table A8.1: Whole-rock geochemistry used for phase-diagram modeling of samples from Hall Peninsula, Baffin Island†

Sample	SiO_2	Al_2O_3	FeO	Fe_2O_3	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	LOI	Total	Mnz or Ap
F122B	51.15	25.48	-	8.74*	0.084	2.98	0.7	1.46	5.58	0.859	0.08	2.77	99.89	Mnz
S89A	65.02	16.89	5	0.76	0.053	2	0.33	0.84	5.38	0.662	0.08	2.26	99.87	Ap + Mnz
F28A	77.36	11.15	-	3.77*	0.036	1.3	1.66	2.46	1.3	0.419	0.07	0.66	100.2	Ap + Mnz
S145A	62.35	19.45	7.1	0.89	0.078	3.03	1.58	1.88	2.53	0.757	0.06	-0.72	99.78	Ap + Mnz

†Determined by ICPMS. All values in wt%. *Total iron as Fe_2O_3.

A9. Methodology for phase diagram modeling

To constrain the stability fields of mineral assemblages from the three metamorphic zones in the study area, investigate potential metamorphic reactions and document the *P-T* evolution of different pelitic samples, equilibrium phase diagrams were constructed for four samples (F122B, S89A, F28A & S145A) using TheriakDomino v.01.08.09 (De Capitani & Brown, 1987; De Capitani & Petrakakis, 2010; http://titan.minpet.unibas.ch/minpet/theriak/theruser.html). Modeling was conducted in the 11-component system MnO-Na_2O-CaO-K_2O-FeO-MgO-Al_2O_3-SiO_2-H_2O-TiO_2-Fe_2O_3 (MnNCKFMASHTO) using the internally consistent thermodynamic data set tc-db55 of Holland & Powell (1998; updated August, 2004). Solid-solution models were used for the following phases: muscovite (Coggon & Holland, 2002); garnet and biotite (White *et al.*, 2007); silicate melt (White *et al.*, 2007); cordierite, staurolite and chlorite (Mahar *et al.*, 1997; Holland & Powell, 1998); chloritoid (Mahar *et al.*, 1997; White, 2000); K-feldspar and plagioclase (Holland & Powell, 2003); epidote (Holland & Powell, 1998); and magnetite (White *et al.*, 2007). Additional phases were treated as pure, including H_2O, quartz, andalusite, kyanite, sillimanite and rutile.

Whole-rock geochemistry was determined using the lithium metaborate/tetraborate fusion ICPMS technique (Activation Laboratories Ltd., Ancaster, Canada). For samples S89A and S145A, the FeO content was determined by titration to enable accurate consideration of both ferric and ferrous iron in modelled phase diagrams. In samples F122B and F28A, for which FeO was not determined by titration, total iron as Fe_2O_3 was converted to total iron as FeO using the conversion factor $FeO(T) = Fe_2O_3(T)*0.8998$, and the models were run with undefined mole % of oxygen (O(?) in the THERIN file).

For input into Theriak/Domino, the measured weight % oxide values of all samples were converted to mole % cations (the proportion of cations to total oxides) and corrections were applied to remove P_2O_5, including subtracting a proportional amount of CaO to correct for P in apatite

($Ca_5(PO_4)_3(F, Cl, OH)$). For samples F28A, S89A and S145A, which each contain approximately equal amounts of monazite and apatite, the subtracted amount of CaO was equal to [(5/3)*(mole% cations of P)*0.5]. Sample F122B contains monazite but no apatite, therefore no CaO correction was made. For each sample, the normalized mole % cations were modelled in Theriak to determine the minimum amount of water (moles of H) necessary to just initiate melting, such that free water is consumed by the melt producing reaction over a small temperature interval of 1°C.

A10. Modal abundances

Table A10.1: Vol% of solid phases in each sample estimated from petrography and modeled in Theriak.

Estimation method[a]	Vol% of solid phases								
	Grt	**Kfs**	**Pl**	**Ilm**	**Bt**	**Sil**	**Qz**	**Ms**	**Crd**
Sample F122B									
Petrography	2	1	7	<1	42	15	13	20	0
Theriak (740°C, 6.25 kbar)*	2	14	12	<1	39	20	13	0	0
Theriak (740°C, 5.1 kbar)	2	12	12	<1	40	22	12	0	0
Theriak (765°C, 6.25 kbar)	4	15	10	<1	38	22	11	0	0
Theriak (715°C, 6.25 kbar)	<1	14	12	<1	39	21	14	0	0
Theriak (740°C, 6.75 kbar)	2	14	12	<1	38	21	13	0	0
Sample S89A									
Petrography	2	0	7	<1	21	6	42	22	0
Theriak (715°C, 7.25 kbar)*	1	0	7	<1	20	<1	43	29	0
Theriak (740°C, 7.25 kbar)	1	21	1	<1	23	11	43	0	0
Theriak (730°C, 7.25 kbar)	1	21	2	<1	23	11	42	0	0
Theriak (720°C, 7.25 kbar)	1	8	4	<1	21	4	43	19	0
Theriak (690°C, 7.25 kbar)	1	0	7	<1	18	0	43	31	0
Theriak (715°C, 7.75 kbar)	1	0	7	<1	19	0	43	30	0
Theriak (715°C, 6.75 kbar)	1	17	2	<1	23	9	42	6	0
Sample F28A+melt									
Petrography	4	5	25	<1	15	2	49	0	0
Theriak (810°C, 7.2 kbar)*	4	4	29	<1	6	1	56	0	0
Theriak (835°C, 7.2 kbar)	6	6	28	<1	3	1	56	0	0
Theriak (785°C, 7.2 kbar)	3	2	30	<1	8	1	56	0	0
Theriak (810°C, 7.7 kbar)	4	4	29	<1	6	1	56	0	0
Theriak (810°C, 6.7 kbar)	4	4	29	<1	6	1	56	0	0
Sample S145A									
Petrography	20	9	19	2	5	8	25	0	12
Theriak (850°C, 7 kbar)*	22	10	21	2	0	6	26	0	13
Theriak (825°C, 6.5 kbar)	16	13	20	2	0	2	24	0	23
Theriak (890°C, 7 kbar)	26	2	23	2	0	8	27	0	12
Theriak (850°C, 6.5 kbar)	17	10	21	2	0	2	24	0	24
Theriak (860°C, 7.35 kbar)	27	9	21	2	0	10	29	0	2

Notes:
[a]Models were run in Theriak at selected pressure and temperature conditions to investigate the vol% of phases at thermal peak conditions modeled in Domino (denoted by *) at 1σ uncertainty levels (±0.5 kbar and 25°C).

A11. Phase diagram model of sample F28A using measured bulk composition

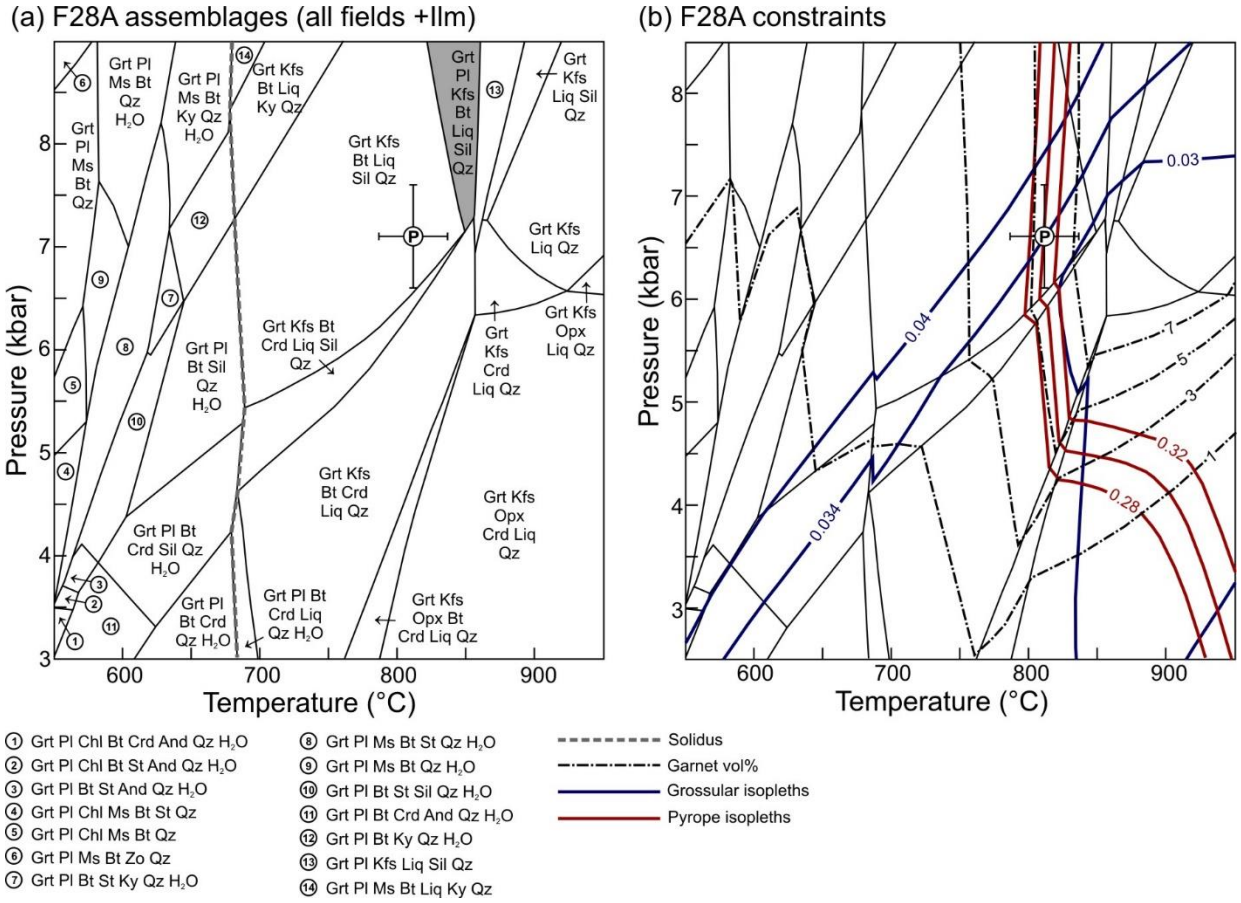


Fig. A11.1: Equilibrium phase diagram models for sample F28A (see Table A8.1 for bulk composition). Point "P" corresponds to modelled thermal peak conditions (±1σ) based on the estimated composition of garnet at the thermal peak (arrow in Fig. 8 in manuscript) and corresponding pyrope and grossular isopleths. (a) Model using bulk composition of F28A, with all assemblage fields labelled and the peak assemblage field shaded grey. (b) F28A model with isopleths for pyrope and grossular in garnet and for vol% garnet.

A12. Analytical methods for *in situ* U-Pb geochronology

Monazite was dated *in situ* in 4 metasedimentary rocks to resolve the timing of metamorphic mineral growth and fabric development. For each sample, 15-30 monazite grains were identified and BSE images were taken of selected grains using a JEOL 6610LV SEM (University of Ottawa, Canada). Monazite was dated in several microstructural contexts, including along grain contacts as well as inclusions in matrix minerals and in garnet, and monazite aligned with S_1. Monazite U-Pb dating using the LA-ICP-MS method was performed at the University of New Brunswick (Canada) using a Resonetics M-50 193nm excimer laser system connected to an Agilent 7700x quadrupole ICP-MS. Grains of sufficient size were analyzed using 2-4 laser spots with a 10-13 µm crater diameter to date prospective age domains. Monazite was analyzed using a 30 s ablation time following 30 s of background collection, with a laser fluence of 2 J/cm^2 and a repetition rate of 3.5 Hz. In each ablation sequence (of 1–2 samples), at least four analyses of NIST610 reference glasses were interspersed throughout the sequence, as well as at least 15 analyses of monazite U-Pb age standards 44069 (425 ± 3 Ma; Aleinikoff et al., 2006) and 8153 (506 ± 8 Ma; Williams et al., 2006; Reno et al., 2012). The ages of U-Pb standards were reproduced to within 1% of the accepted ages. The 3-year reproducibility for the 44069 monazite standard in the University of New Brunswick LA-ICP-MS laboratory is within 1% of the accepted age. The down-hole U-Pb fractionation was consistent among the U-Pb monazite standards, and was presumed to be similar for the unknowns. All sources of error are propagated, but it was ensured that the MSWD of the standards was less than 1.2 so that no excess error is propagated from the external standard. Additional details of the analytical method are described in McFarlane & Luo (2012) and McFarlane (2015). All data were reduced offline using a combination of Iolite v2.15 (Paton *et al.*, 2011) and ViszualAge v2011-08-29 (Petrus & Kamber, 2012) running under Wavemetrics IgorPro v6.22™. The final data were plotted using Isoplot v.4.15 (Ludwig, 2003).

A13. Monazite trace element maps

A13.1. LA-ICP-MS monazite mapping methodology

To investigate possible links between monazite U-Pb ages and trace element compositions, trace element mapping (LA-ICP-MS) was conducted on two or three monazite grains in two samples (S89A, F122B) from the mid-amphibolite-facies zone and in sample S145A from the granulite-facies zone. Monazite trace element mapping was performed at the University of New

Brunswick (Canada) using a Resonetics M-50 193nm excimer laser system connected to an Agilent 7700x quadrupole ICP-MS. The laser ablation software (GeoStar v. 6.23) was used to define linear raster scans within a rectangular area following the details in McFarlane & McKeough (2013) and McFarlane & Luo (2012). Each linear raster was programmed with a crater size of 5 µm, a scan speed of 3 µm/s and a laser pulse rate of 10 Hz. Concentration and quality control standards were ablated before and after each map using the same analytical conditions. The resultant trace element maps show semi-quantitative concentrations that were calculated based on the analyte intensity in the unknown compared to its intensity in the NIST610 concentration standard. The calculated concentrations are within 20-30% of the true values and are therefore reasonable visual representations of different compositional domains.

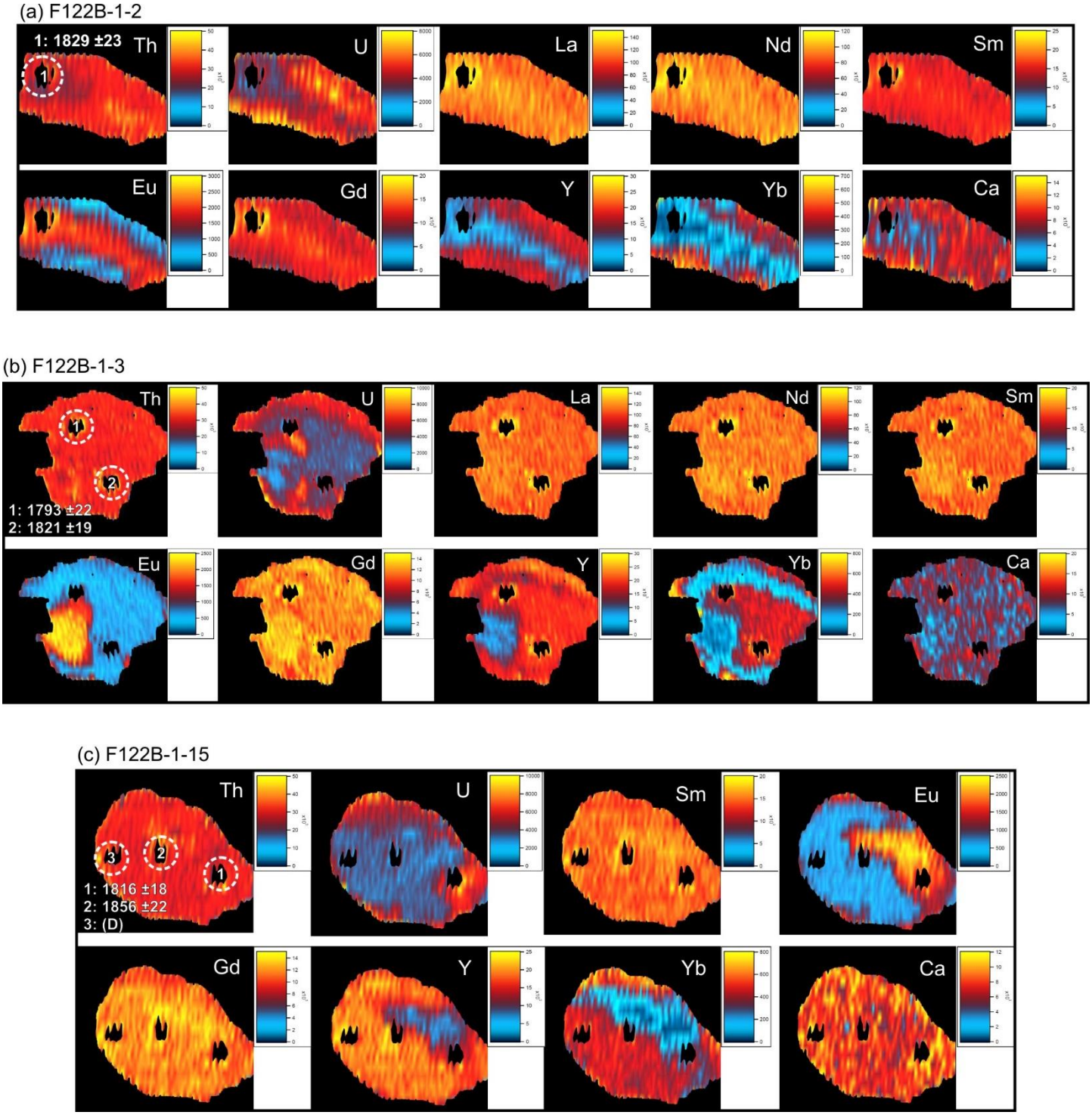


Fig. A13.1: LA-ICP-MS trace element maps of matrix monazite grains from sample F122B, including: (a) F122B-1-2 (in which F122B=sample number, 1=thin section number and 2=grain number); (b) F122B-1-3; and (c) F122B-1-15. White circles are 10 μm wide and represent the locations of U-Pb laser spot analyses. Ages that correspond to spot locations are reported as Concordia ages in Ma (±2σ). (D) denotes a strongly discordant age.

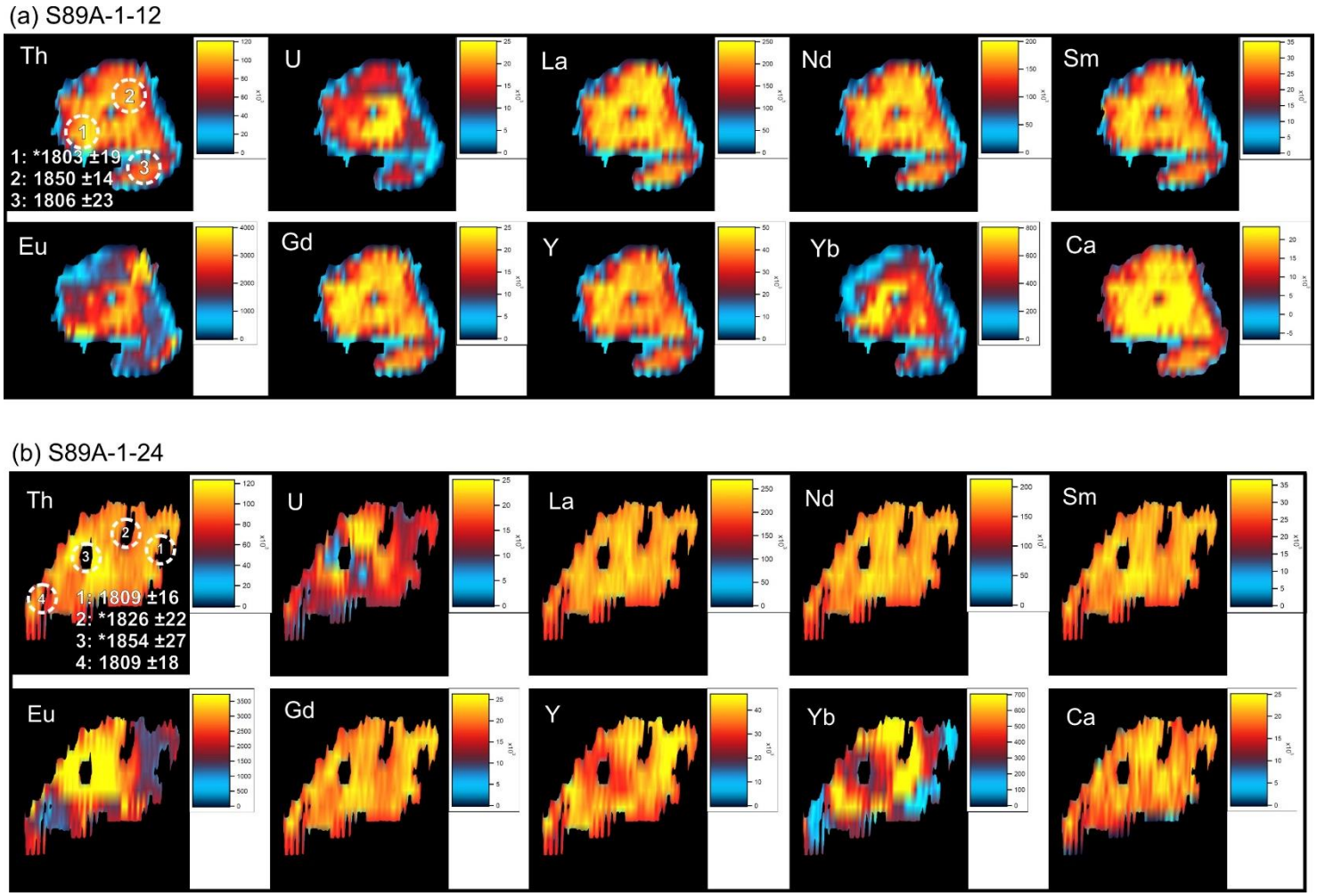
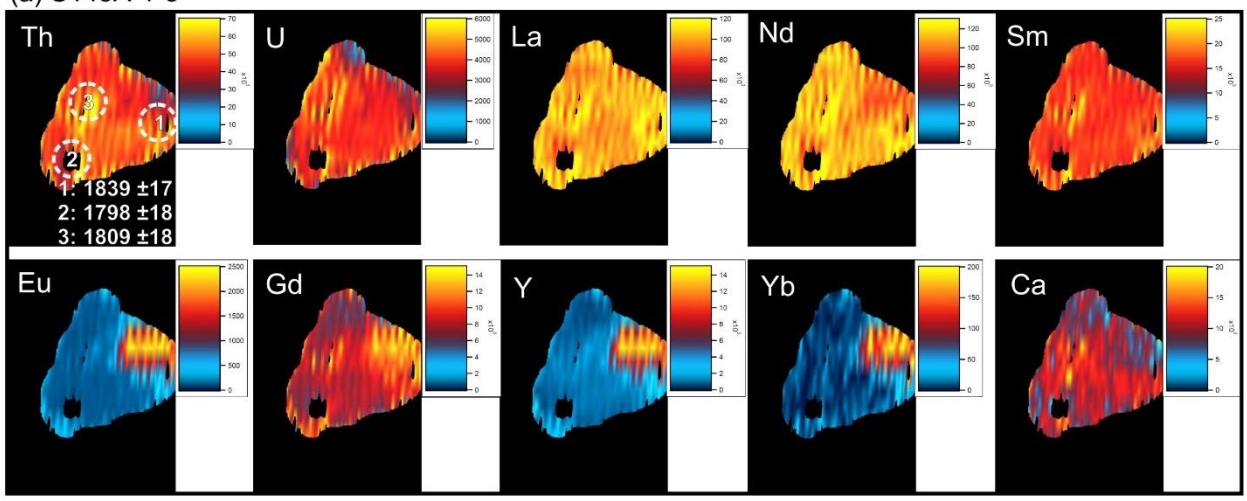
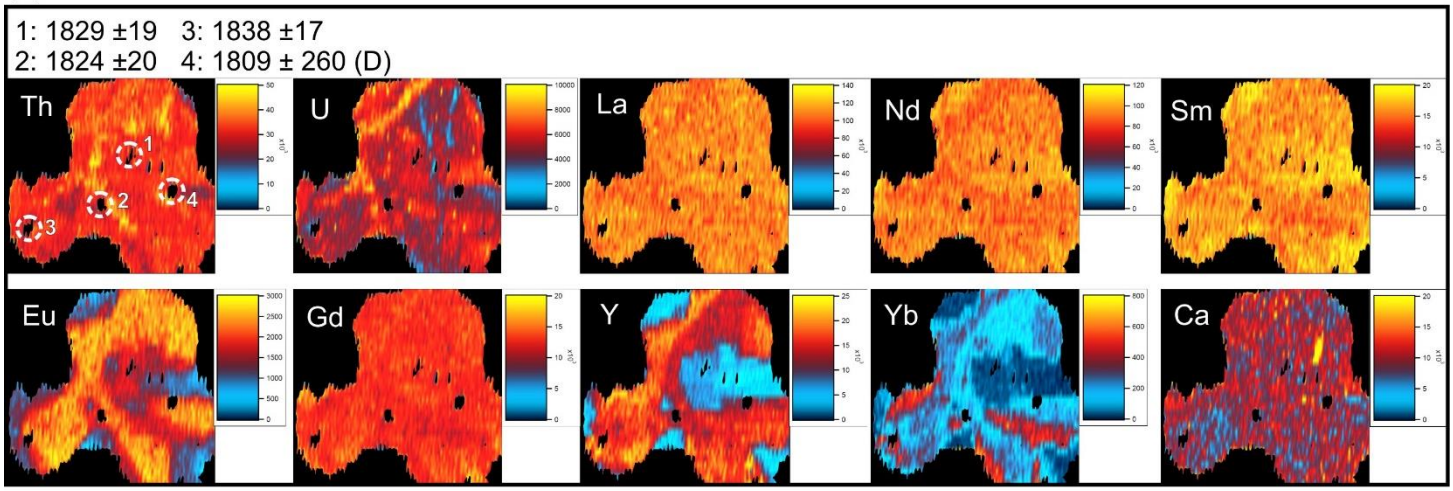


Fig. A13.2: LA-ICP-MS trace element maps of monazite grains from sample S89A, including: (a) S89A-1-12 (in which S89A=sample number, 1=thin section number and 12=grain number), an inclusion in a garnet rim; and (b) matrix monazite grain S89A-1-24. White circles are 10 µm wide and represent the locations of U-Pb laser spot analyses. Ages that correspond to spot locations are reported as Concordia ages in Ma (±2σ), except for those preceded by an asterisk (*), which are ^{207}/Pb/^{206}Pb ages of discordant analyses.

(a) S145A-1-3



(b) S145A-1-12



(c) S145A-1-16

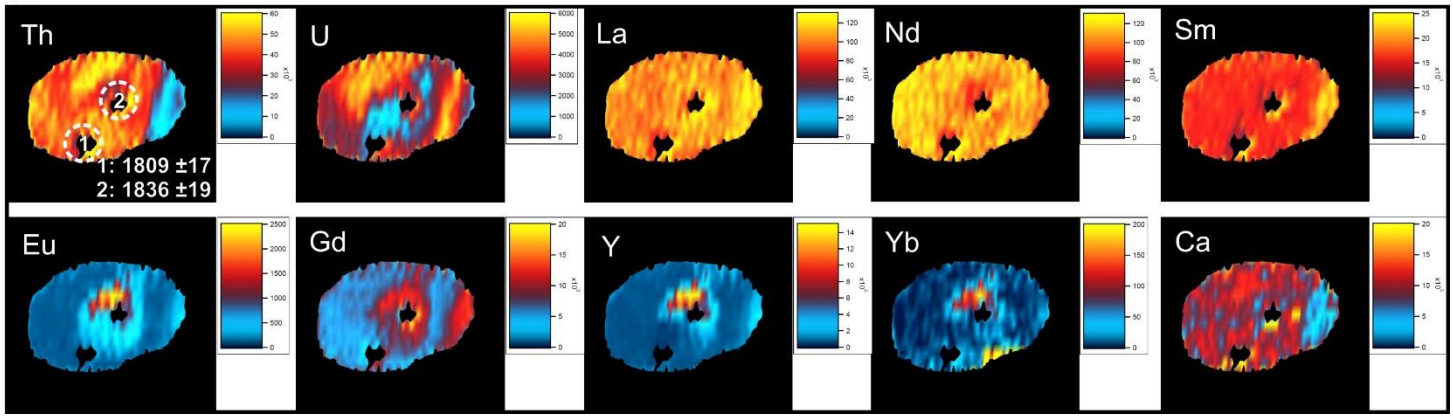


Fig. A13.3 (on previous page): LA-ICP-MS trace element maps of monazite grains from sample S145A, including: (a) matrix monazite grain S145A-1-3 (in which S145A=sample number, 1=thin section number and 3=grain number); (b) S145A-1-12, an inclusion in garnet; and (c) matrix monazite grain S145A-1-16. White circles are 10 µm wide and represent the locations of U-Pb laser spot analyses. Ages that correspond to spot locations are reported as Concordia ages in Ma (±2σ). (D) denotes a discordant age.

A14. References

Aleinikoff, J.N., Schenck, W.S., Plank, M.O., Srogi, L., Fanning, C.M., Kamo, S.L. & Bosbyshell, H. 2006. Deciphering igneous and metamorphic events in high-grade rocks of the Wilmington Complex, Delaware: morphology, cathodoluminescence and backscattered electron zoning, and SHRIMP U–Pb geochronology of zircon and monazite. Geological Society of America Bulletin 118, 39–64.

Coggon, R. & Holland, T.J.B. (2002). Mixing properties of phengitic micas and revised garnet phengite thermobarometers. *Journal of Metamorphic Geology* **20**, 683–696.

De Capitani, C. & Brown, T.H. (1987). The computation of chemical equilibrium in complex systems containing nonideal solutions. *Geochimica et Cosmochimica Acta* **51**, 2639 – 2652.

De Capitani, C. & Petrakakis, K. (2010). The computation of equilibrium assemblage diagrams with Theriak/Domino software. *American Mineralogist* **95**, 1006–1016.

Dyck, B.J. & St-Onge, M.R. (2014). Dehydration-melting reactions, leucogranite emplacement and the Paleoproterozoic structural evolution of Hall Peninsula, Baffin Island, Nunavut. In: *Summary of Activities 2013, Canada-Nunavut Geoscience Office*, 73–84.

Holland, T. (2014). AXWin Software. *University of Cambridge*, www.esc.cam.ac.uk/research/research-groups/research-projects/tim-hollands-software-pages/ax

Holland, T.J.B. & Powell, R. (1998). An internally consistent thermodynamic data set for phases of petrological interest. *Journal of Metamorphic Geology* **16**, 309–343.

Holland, T.J.B. & Powell, R. (2003). Activity–composition relations for phases in petrological calculations: an asymmetric multicomponent formulation. *Contributions to Mineralogy and Petrology* **145**, 492–501.

Lowdon, J.A. (1960). Age determinations by the Geological Survey of Canada, Report 1 – isotopic ages; Geological Survey of Canada, Paper 60-17, 5–40.

Machado, G., Bilodeau, C. & St-Onge, M.R. (2013). Geology, southern part of Hall Peninsula, south Baffin Island, Nunavut, Geological Survey of Canada Canadian Geoscience Map 135 (preliminary). Canada-Nunavut Geoscience Office, Open File Map 2013-1, scale 1:250 000. doi:10.4095/292443

Mahar, E., Baker, J., Powell, R., Holland, T.J.B. & Howell, N. (1997). The effect of Mn on mineral stability in pelites. *Journal of Metamorphic Geology* **15**, 223–238.

McFarlane, C.R.M. (2015). A geochronological framework for sedimentation and Mesoproterozoic tectono-magmatic activity in lower Belt-Purcell rocks exposed west of Kimberley, BC. *Canadian Journal of Earth Sciences* **52**, 444-465.

McFarlane, C.R.M & Luo, Y. (2012). U-Pb geochronology using 193 nm Excimer LA-ICP-MS optimized for *in situ* accessory mineral dating in thin sections. *Geoscience Canada* **39**, 158-172.

McFarlane, C.R.M & McKeough, M. (2013). Petrogenesis of the Kulyk Lake monazite-apatite-Fe(Ti)-oxide occurrence revealed using in-situ LA-(MC)-ICP-MS trace element mapping, U-Pb dating, and Sm-Nd isotope systematics on monazite. *American Mineralogist* **98**, 1644-1659.

Petrus, J.A. & Kamber, B.S. (2012) VizualAge: A novel approach to laser ablation ICP-MS U-Pb geochronology data reduction. *Geostandards and Geoanalytical Research* **36**, 247-270.

Paton, C., Hellstrom, J., Paul, B., Woodhead, J. & Hergt, J. (2011). Iolite: Freeware for the visualisation and processing of mass spectrometric data. *Journal of Analytical Atomic Spectrometry* **26**, 2508-2518.

Rayner, N.M. (2014). New U-Pb geochronological results from Hall Peninsula, Baffin Island, Nunavut. In: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 39–52.

Rayner, N.M. (2015). New (2013-2014) U-Pb geochronological results from northern Hall Peninsula, southern Baffin Island, Nunavut. In: Summary of Activities 2014, Canada-Nunavut Geoscience Office, 31-44.

Reno, B.L., Piccoli, P.M., Brown, M. & Trouw, R., 2012. In situ chemical dating of monazite from the Southern Brazilia Belt, Brazil. Journal of Metamorphic Geology 30, 81–112.

Scott, D.J. (1999). U-Pb geochronology of the eastern Hall Peninsula, southern Baffin Island, Canada: a northern link between the Archean of West Greenland and the Paleoproterozoic Torngat Orogen of northern Labrador. *Precambrian Research* **93**, 5–26.

Scott, D.J. & Gauthier, G. (1996). Comparison of TIMS (U-Pb) and laser ablation microprobe ICP-MS (Pb) techniques for age determination of detrital zircons from Paleoproterozoic metasedimentary rocks from northeastern Laurentia, Canada, with tectonic implications. *Chemical Geology* **131**, 127-142.

Skipton, D.R., Schneider, D.A., Kellett, D. & Joyce, N. (2015) New insights on the cooling history of Hall Peninsula, southern Baffin Island, Nunavut, using $^{40}Ar/^{39}Ar$ thermochronology on muscovite. In: *Summary of Activities 2014, Canada-Nunavut Geoscience Office*, 17-30.

Wanless, R.K., Stevens, R.D., Lachance, G.R. & Edmonds, C.M. (1968). Age determinations and geological studies. In: *K-Ar isotopic ages, Report 8, Geological Survey of Canada, Paper 67-2A*, 11–141.

Wanless, R.K., Stevens, R.D., Lachance, G.R. & DiLabio, R.N. (1974). Age determinations and geological studies. In: *K-Ar isotopic ages, Report 12, Geological Survey of Canada, Paper 74-2*, 6-63.

Wanless, R.K., Stevens, R.D., Lachance, G.R. & Delabio, R.N. (1979) Age determinations and geological studies. In: *K-Ar isotopic ages, Report 14, Geological Survey of Canada, Paper 79-2,* 1–67.

White, R.W. (2000). The effect of TiO2 and Fe2O3 on metapelitic assemblages at greenschist and amphibolite facies conditions: mineral equilibria calculations in the system K2O-FeO-MgO-Al2O3-SiO2-H2O-TiO2-Fe2O3. *Journal of Metamorphic Geology* **18**, 497–511.

White, R.W., Powell, R. & Holland, T.J.B. (2007). Progress relating to calculation of partial melting equilibria for pelites. *Journal of Metamorphic Geology* **25**, 511–527.

Williams, M.L., Jercinovic, M.J., Goncalves, P. & Mahan, K., 2006. Format and philosophy for collecting, compiling, and reporting microprobe monazite ages. Chemical Geology 225, 1–15.

Appendix 2: Representative mineral chemistry data from rock samples (F122B, S89A, F28A and S145A) from Hall Peninsula, Baffin Island.

Sample	**F122B**	**F122B**	**F122B**	**F122B**	**F122B**	**F122B**	**F122B**	**F122B**
Mineral[a]	**Grt (peak)**	**Grt**	**Grt**	**Grt**	**Bt(p)**	**Bt(r)**	**Ms(r)**	**Ms(r)**
Location[b]	**core**	**core**	**outer core**	**rim adj Bt**	**matrix**	**matrix adj Grt**	**matrix**	**matrix adj Grt**
SiO_2[c]	36.83	36.77	36.67	36.59	35.33	35.05	46.70	46.48
TiO_2	0.01	0.03	0.02	0.00	2.12	2.18	0.48	0.34
Al_2O_3	20.85	21.04	21.17	21.19	20.31	19.61	34.64	35.19
Cr_2O_3	0.04	0.02	0.01	0.00	0.02	0.04	0.00	0.02
FeO	32.84	32.42	32.62	31.63	20.31	20.44	1.50	1.19
MnO	4.18	4.32	4.78	6.07	0.18	0.18	0.03	0.02
MgO	3.53	3.33	3.25	2.87	8.57	8.78	0.81	0.61
CaO	1.55	2.09	1.63	1.36	0.00	0.01	0.00	0.01
Na_2O	0.00	0.02	0.00	0.03	0.19	0.19	0.59	0.65
K_2O	0.00	0.00	0.00	0.00	9.26	8.99	10.22	10.27
Totals	99.820	100.04	100.19	99.74	96.57	95.73	95.08	94.78
Oxygens	12	12	12	12	11	11	11	11
Si[d]	2.97	2.95	2.95	2.96	2.67	2.67	3.11	3.10
Ti	0.00	0.00	0.00	0.00	0.12	0.13	0.02	0.02
Al	1.98	1.99	2.01	2.02	1.81	1.76	2.72	2.77
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.09	0.10	0.10	0.07	0.00	0.00	0.00	0.00
Fe^{2+}	2.12	2.08	2.09	2.07	1.28	1.30	0.08	0.07
Mn	0.29	0.29	0.33	0.42	0.01	0.01	0.00	0.00
Mg	0.42	0.40	0.39	0.35	0.96	1.00	0.08	0.06
Ca	0.13	0.18	0.14	0.12	0.00	0.00	0.00	0.00
Na	0.00	0.00	0.00	0.01	0.03	0.03	0.08	0.08
K	0.00	0.00	0.00	0.00	0.89	0.87	0.87	0.87
Sum	8.00	8.00	8.00	8.00	7.77	7.77	6.97	6.98
Pyrope	0.14	0.14	0.13	0.12				
Grossular	0.05	0.06	0.05	0.04				
Almandine	0.72	0.70	0.71	0.70				
Spessartine	0.10	0.10	0.11	0.14				
Fe/(Fe+Mg)	0.83	0.84	0.84	0.86				

Sample	**F122B**	**F122B**	**S89A**	**S89A**	**S89A**	**S89A**	**S89A**	**S89A**
Mineral[a]	**Pl**	**Pl**	**Grt (peak)**	**Grt**	**Grt**	**Grt**	**Bt(p)**	**Bt(r)**
Location[b]	**matrix**	**incl in Grt**	**core**	**core**	**outer core**	**rim**	**matrix**	**matrix adj Grt**
SiO_2[c]	62.67	67.42	36.91	37.03	37.22	36.80	33.94	34.36
TiO_2	0.00	0.01	0.02	0.02	0.02	0.01	2.13	2.52
Al_2O_3	23.42	19.39	21.00	20.81	20.87	21.11	18.99	18.86
Cr_2O_3	0.00	0.00	0.02	0.00	0.00	0.03	0.02	0.05
FeO	0.00	0.19	33.64	33.44	33.37	32.61	20.59	20.87
MnO	0.00	0.01	2.57	2.58	3.08	4.70	0.15	0.14
MgO	0.00	0.00	3.50	3.46	3.13	2.50	7.94	7.81
CaO	4.48	0.06	1.48	1.54	1.46	1.37	0.00	0.00
Na_2O	9.25	11.49	0.00	0.01	0.00	0.00	0.16	0.16
K_2O	0.18	0.05	0.00	0.00	0.00	0.00	9.21	9.19
Totals	100.17	98.60	99.12	98.88	99.18	99.12	93.37	94.17
Oxygens	8	8	12	12	12	12	11	11
Si[d]	2.78	2.99	2.99	3.01	3.02	3.00	2.67	2.68
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.15
Al	1.22	1.01	2.01	1.99	1.99	2.03	1.76	1.73
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.00	0.00	2.26	2.27	2.26	2.22	1.35	1.36
Mn	0.00	0.00	0.18	0.18	0.21	0.32	0.01	0.01
Mg	0.00	0.00	0.42	0.42	0.38	0.30	0.93	0.91
Ca	0.21	0.00	0.13	0.13	0.13	0.12	0.00	0.00
Na	0.80	0.99	0.00	0.00	0.00	0.00	0.03	0.02
K	0.01	0.00	0.00	0.00	0.00	0.00	0.92	0.91
Sum	5.02	5.00	8.00	8.00	7.99	7.99	7.80	7.78
Pyrope			0.14	0.14	0.13	0.10		
Grossular			0.04	0.04	0.04	0.04		
Almandine			0.76	0.76	0.76	0.75		
Spessartine			0.06	0.06	0.07	0.11		
Fe/(Fe+Mg)			0.84	0.84	0.86	0.88		

Sample	**S89A**	**S89A**	**S89A**	**S89A**	**F28A**	**F28A**	**F28A**	**F28A**
Mineral[a]	**Ms(p)**	**Ms(r)**	**Pl**	**Pl**	**Grt (peak)**	**Grt**	**Grt**	**Grt**
Location[b]	**matrix adj Grt**	**matrix**	**matrix adj Grt**	**matrix**	**core**	**core**	**rim**	**rim adj Bt**
SiO_2[c]	45.48	45.68	60.76	60.90	37.24	37.35	37.39	35.82
TiO_2	0.16	0.21	0.00	0.00	0.01	0.01	0.02	0.03
Al_2O_3	35.28	35.58	24.05	23.73	22.05	21.95	22.06	22.80
Cr_2O_3	0.00	0.02	0.00	0.00	0.02	0.03	0.00	0.03
FeO	1.14	0.99	0.02	0.03	31.32	31.64	31.52	33.59
MnO	0.00	0.01	0.01	0.01	0.51	0.51	0.50	0.67
MgO	0.61	0.47	0.00	0.00	7.48	7.30	7.51	5.42
CaO	0.00	0.00	5.29	5.12	1.20	1.24	1.03	1.01
Na_2O	0.67	0.76	8.68	8.61	0.02	0.00	0.00	0.02
K_2O	10.19	10.13	0.10	0.15	0.00	0.00	0.00	0.00
Totals	93.55	93.86	98.93	98.55	99.84	100.02	100.02	99.67
Oxygens	11	11	8	8	12	12	12	12
Si[d]	3.08	3.08	2.73	2.74	2.91	2.92	2.92	2.85
Ti	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Al	2.81	2.83	1.27	1.26	2.03	2.02	2.03	2.14
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.15	0.14	0.13	0.16
Fe^{2+}	0.06	0.06	0.00	0.00	1.90	1.93	1.93	2.07
Mn	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.05
Mg	0.06	0.05	0.00	0.00	0.87	0.85	0.87	0.64
Ca	0.00	0.00	0.26	0.25	0.10	0.10	0.09	0.09
Na	0.09	0.10	0.76	0.75	0.00	0.00	0.00	0.00
K	0.88	0.87	0.01	0.01	0.00	0.00	0.00	0.00
Sum	6.99	6.99	5.02	5.01	8.00	8.00	8.00	8.00
Pyrope					0.30	0.29	0.30	0.23
Grossular					0.03	0.04	0.03	0.03
Almandine					0.65	0.66	0.66	0.73
Spessartine					0.01	0.01	0.01	0.02
Fe/(Fe+Mg)					0.69	0.69	0.69	0.76

Sample	**F28A**	**F28A**	**F28A**	**F28A**	**S145A**	**S145A**	**S145A**	**S145A**
Mineral[a]	**Bt(p)**	**Bt(p)**	**Pl**	**Pl**	**Grt (peak)**	**Grt**	**Grt**	**Grt**
Location[b]	**matrix adj Grt**	**matrix**	**matrix adj Grt**	**matrix**	**core**	**core**	**rim**	**rim adj Bt**
SiO_2[c]	36.27	36.08	63.51	61.34	38.36	38.36	38.34	37.99
TiO_2	4.53	4.72	0.02	0.00	0.04	0.06	0.02	0.04
Al_2O_3	18.18	18.07	23.27	24.37	21.84	21.84	21.74	21.40
Cr_2O_3	0.07	0.08	0.00	0.00	0.03	0.02	0.05	0.03
FeO	15.97	16.88	0.19	0.00	29.06	28.97	29.77	31.34
MnO	0.00	0.03	0.00	0.00	0.31	0.35	0.37	0.35
MgO	11.64	11.06	0.01	0.00	8.54	8.52	7.77	6.64
CaO	0.04	0.00	4.57	5.69	1.03	1.10	1.02	1.05
Na_2O	0.04	0.04	9.46	8.54	0.00	0.01	0.02	0.01
K_2O	9.39	9.79	0.13	0.22	0.00	0.00	0.00	0.00
Totals	96.59	97.10	101.16	100.33	99.24	99.23	99.12	98.84
Oxygens	11	11	8	8	12	12	12	12
Si[d]	2.69	2.68	2.78	2.72	2.99	2.99	3.01	3.01
Ti	0.25	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Al	1.59	1.58	1.20	1.28	2.01	2.01	2.01	2.00
Cr	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Fe^{2+}	0.99	1.05	0.00	0.00	1.89	1.89	1.95	2.08
Mn	0.00	0.00	0.00	0.00	0.02	0.02	0.03	0.02
Mg	1.29	1.22	0.00	0.00	0.99	0.99	0.91	0.78
Ca	0.00	0.00	0.22	0.27	0.09	0.09	0.09	0.09
Na	0.01	0.01	0.80	0.74	0.00	0.00	0.00	0.00
K	0.89	0.93	0.01	0.01	0.00	0.00	0.00	0.00
Sum	7.71	7.73	5.02	5.02	8.00	8.00	7.99	7.99
Pyrope					0.33	0.33	0.31	0.26
Grossular					0.03	0.03	0.03	0.03
Almandine					0.63	0.63	0.66	0.70
Spessartine					0.01	0.01	0.01	0.01
Fe/(Fe+Mg)					0.66	0.66	0.68	0.73

Sample	**S145A**	**S145A**	**S145A**	**S145A**	**S145A**	**S145A**
Mineral[a]	**Bt* (r)**	**Bt(r)**	**Pl**	**Pl**	**Crd**	**Crd**
Location[b]	**matrix**	**matrix adj Grt**	**matrix**	**matrix adj Grt**	**matrix**	**matrix adj Grt**
SiO_2[c]	36.69	37.91	59.51	59.55	47.99	48.32
TiO_2	4.40	3.31	0.00	0.02	0.00	0.00
Al_2O_3	16.06	15.61	25.00	25.20	32.95	33.27
Cr_2O_3	0.10	0.10	0.00	0.00	0.02	0.00
FeO	11.82	9.04	0.08	0.07	5.19	4.60
MnO	0.00	0.02	0.00	0.00	0.01	0.01
MgO	14.98	18.02	0.03	0.00	10.09	10.54
CaO	0.00	0.00	6.37	6.47	0.00	0.00
Na_2O	0.05	0.06	7.90	8.11	0.02	0.03
K_2O	9.56	9.69	0.18	0.19	0.00	0.01
Totals	94.52	94.97	99.07	99.62	96.31	96.79
Oxygens	11	11	8	8	18	18
Si[d]	2.75	2.80	2.68	2.67	4.97	4.96
Ti	0.25	0.18	0.00	0.00	0.00	0.00
Al	1.42	1.36	1.33	1.33	4.02	4.03
Cr	0.01	0.01	0.00	0.00	0.00	0.00
Fe^{3+}	0.00	0.00	0.00	0.00	0.05	0.06
Fe^{2+}	0.74	0.56	0.00	0.00	0.40	0.33
Mn	0.00	0.00	0.00	0.00	0.00	0.00
Mg	1.67	1.98	0.00	0.00	1.56	1.61
Ca	0.00	0.00	0.31	0.31	0.00	0.00
Na	0.01	0.01	0.69	0.70	0.01	0.01
K	0.91	0.91	0.01	0.01	0.00	0.00
Sum	7.75	7.80	5.01	5.02	11.00	11.00
Pyrope						
Grossular						
Almandine						
Spessartine						
Fe/(Fe+Mg)						

[a](peak) indicates garnet analyses used to estimate P-T conditions of the thermal peak; * denotes biotite analysis used in Ti-in-Bt geothermometry for sample S145A; for Bt and Ms, (p) denotes syn-D_1 prograde; (r) denotes post-D_1 retrograde.

[b]adj=adjacent to; incl=inclusion

[c]Oxide values are given in weight % as measured by electron microprobe.

dCation values were calculated using the AX Win program developed by T. Holland (University of Cambridge). The assumptions used by AX in deriving the mineral end-member activities and in the estimation of ferric iron are described in downloadable format at: www.esc.cam.ac.uk/research-groups/holland/ax

Appendix 3: LA-ICP-MS U-Pb monazite data from Hall Peninsula, Baffin Island.

Analysis[a]	Grain location[b]	U (ppm)	Th (ppm)	^{204}Pb (cps)	2 s.e.	^{206}Pb/^{204}Pb (cps)	%Pb*	Isotopic ratios ^{207}Pb/^{206}Pb	2 s.e.	^{207}Pb/^{235}U	2 s.e.
F122B-1-1-1	in Ms	16040	16510	24	14	10896	100.00	0.1089	0.0021	4.842	0.150
F122B-1-3-1	in Ms	10960	12750	-19	20	-9789	100.01	0.1087	0.0023	4.836	0.170
F122B-1-15-1*	**in Bt**	**25200**	**17740**	**7**	**12**	**56286**	**99.98**	**0.1106**	**0.0021**	**4.999**	**0.160**
F122B-1-12-2*	**in Bt**	**16140**	**19780**	**11**	**15**	**22473**	**100.02**	**0.1105**	**0.0022**	**5.009**	**0.160**
F122B-1-12-1*	**in Bt**	**15030**	**13680**	**19**	**14**	**12779**	**100.00**	**0.1101**	**0.0021**	**5.014**	**0.160**
F122B-1-17-1*	**in Bt**	**18570**	**16010**	**-8**	**16**	**-36913**	**100.01**	**0.1100**	**0.0022**	**4.990**	**0.160**
F122B-1-3-2*	**in Ms**	**15320**	**18860**	**10**	**15**	**24530**	**100.00**	**0.1107**	**0.0021**	**4.995**	**0.160**
F122B-1-14-1*	**in Bt**	**18150**	**19080**	**21**	**18**	**13376**	**100.00**	**0.1105**	**0.0022**	**5.043**	**0.160**
F122B-1-6-3*	**in Bt**	**26920**	**22100**	**61**	**21**	**7231**	**100.00**	**0.1111**	**0.0022**	**5.012**	**0.160**
F122B-1-18-2*	**in Bt**	**19650**	**19500**	**14**	**13**	**22079**	**99.97**	**0.1107**	**0.0021**	**5.059**	**0.160**
F122B-1-4-1*	**in Bt**	**15150**	**17090**	**11**	**13**	**22473**	**100.01**	**0.1105**	**0.0021**	**5.026**	**0.160**
F122B-1-18-1*	**in Bt**	**16180**	**16900**	**8**	**13**	**31500**	**100.00**	**0.1117**	**0.0021**	**5.075**	**0.160**
F122B-1-2-1*	**in Ms**	**10420**	**12750**	**16**	**21**	**11156**	**99.98**	**0.1111**	**0.0023**	**5.049**	**0.170**
F122B-1-16-1*	**in Bt**	**15990**	**19370**	**18**	**19**	**14206**	**100.01**	**0.1106**	**0.0023**	**5.027**	**0.160**
F122B-1-12-3*	**in Bt**	**24750**	**17020**	**15**	**20**	**26693**	**100.00**	**0.1115**	**0.0021**	**5.111**	**0.170**
F122B-1-17-2*	**in Bt**	**11650**	**16510**	**5**	**11**	**37300**	**100.01**	**0.1113**	**0.0022**	**5.113**	**0.160**
F122B-1-4-2*	**in Bt**	**20050**	**19810**	**-21**	**17**	**-15229**	**99.99**	**0.1097**	**0.0022**	**5.057**	**0.160**
F122B-1-13-1*	**in Bt**	**10980**	**14050**	**-13**	**17**	**-14115**	**100.00**	**0.1111**	**0.0022**	**5.132**	**0.160**
F122B-1-5-1*	**b/w Bt, Pl**	**11500**	**15080**	**-13**	**11**	**-14423**	**99.99**	**0.1116**	**0.0022**	**5.114**	**0.160**
F122B-1-11-1*	**in Bt**	**15870**	**19520**	**-4**	**15**	**-61125**	**99.99**	**0.1109**	**0.0022**	**5.106**	**0.160**
F122B-1-7-1*	**b/w Ms, Bt**	**13740**	**19980**	**3**	**16**	**70333**	**99.99**	**0.1114**	**0.0022**	**5.146**	**0.170**
F122B-1-15-2*	**in Bt**	**13250**	**18420**	**78**	**21**	**2691**	**100.01**	**0.1128**	**0.0023**	**5.210**	**0.170**
F122B-1-9-1*	**b/w Bt**	**18260**	**22190**	**-5**	**18**	**-57700**	**100.00**	**0.1103**	**0.0022**	**5.138**	**0.170**
F122B-1-10-1	in Bt	15130	15740	14	18	17464	100.02	0.1106	0.0021	5.195	0.160
F122B-1-6-2	in Bt	18900	19640	45	16	7231	100.00	0.1098	0.0021	5.124	0.160
F122B-1-6-1	in Bt	14630	19980	73	14	3511	100.09	0.1091	0.0021	5.164	0.170
F122B-1-8-1	in Bt	11370	14470	132	27	1511	100.03	0.1190	0.0025	5.885	0.190
F122B-1-1-2	in Ms	12090	9640	70	20	3661	100.11	0.1117	0.0023	6.236	0.200
S89A-1-22-2	in Bt	22582	21196	36	13	10942	98.34	0.1108	0.0024	4.910	0.130
S89A-1-12-1	in Grt rim	30317	34009	5	18	79380	99.00	0.1104	0.0024	4.840	0.130
S89A-1-20-1	b/w Bt, Qz	21799	29145	30	17	11667	98.83	0.1119	0.0025	4.980	0.130
S89A-1-9-1	in Qz	24632	31569	12	16	30475	99.81	0.1108	0.0025	4.920	0.130
S89A-1-13-1	b/w Ms, Qz	28970	31177	3	14	129667	99.35	0.1106	0.0024	4.910	0.130
S89A-1-6-2	in Qz	34194	29380	9	21	60756	99.53	0.1121	0.0026	4.960	0.130
S89A-1-5-1	in Qz	25401	25977	-16	14	-26588	99.53	0.1103	0.0024	4.880	0.130
S89A-1-17-1	b/w Ms	13853	15766	44	30	4755	99.10	0.1144	0.0031	4.980	0.150
S89A-1-3-1	b/w Bt, Qz	23941	27990	23	21	17000	99.53	0.1109	0.0025	4.890	0.130
S89A-1-6-1	in Qz	18825	28216	3	24	101167	99.15	0.1109	0.0026	4.950	0.140
S89A-1-15-1	b/w Qz, Gr	32368	29540	5	15	91600	99.64	0.1118	0.0024	4.930	0.130
S89A-1-30-2	b/w Ms	29952	23820	11	15	42182	99.71	0.1116	0.0024	4.920	0.120
S89A-1-29-2	b/w Ms	24878	22395	2	13	193000	99.64	0.1109	0.0024	5.040	0.130
S89A-1-24-2	b/w Ms	25061	19063	-8	13	-58263	99.53	0.1119	0.0024	5.050	0.130
S89A-1-27-1*	**b/w Ms, Bt**	**25198**	**24666**	**28**	**24**	**14607**	**99.92**	**0.1102**	**0.0025**	**4.840**	**0.130**
S89A-1-29-1	b/w Ms	19546	23941	14	14	21764	100.00	0.1098	0.0024	5.000	0.130
S89A-1-16-1*	**b/w Bt, Qz**	**20597**	**25454**	**24**	**15**	**12542**	**99.88**	**0.1100**	**0.0024**	**4.880**	**0.140**
S89A-1-24-3	b/w Ms	13642	31342	10	24	24110	99.15	0.1137	0.0028	5.080	0.180
S89A-1-28-1*	**in Bt**	**15604**	**17106**	**34**	**19**	**7432**	**99.98**	**0.1099**	**0.0024**	**4.850**	**0.130**
S89A-1-8-1	in Qz	22392	24662	17	14	21000	99.71	0.1103	0.0024	5.020	0.130
S89A-1-11-1	in Bt	26670	26604	13	14	28462	99.72	0.1116	0.0024	5.070	0.130
S89A-1-16-3*	**b/w Bt, Qz**	**22455**	**24702**	**40**	**14**	**8818**	**99.90**	**0.1093**	**0.0024**	**4.860**	**0.130**
S89A-1-17-2*	**b/w Ms**	**23766**	**27593**	**3**	**18**	**127367**	**99.87**	**0.1094**	**0.0025**	**4.900**	**0.130**
S89A-1-10-1	b/w Ms	23077	30797	13	20	26115	99.87	0.1100	0.0025	5.020	0.130
S89A-1-12-3*	**in Grt rim**	**20072**	**27268**	**-12**	**19**	**-23333**	**99.80**	**0.1098**	**0.0025**	**4.920**	**0.140**
S89A-1-25-2*	**b/w Ms**	**17111**	**20547**	**30**	**13**	**10100**	**99.76**	**0.1104**	**0.0024**	**4.910**	**0.130**
S89A-1-16-2*	**b/w Bt, Qz**	**20283**	**28864**	**4**	**21**	**76500**	**99.88**	**0.1107**	**0.0024**	**4.940**	**0.130**
S89A-1-22-2*	**in Bt**	**19114**	**18737**	**22**	**18**	**15800**	**99.84**	**0.1098**	**0.0024**	**5.030**	**0.130**
S89A-1-24-4*	**b/w Ms**	**21263**	**21783**	**16**	**19**	**24463**	**99.77**	**0.1104**	**0.0024**	**4.960**	**0.130**
S89A-1-24-1*	**b/w Ms**	**17099**	**20481**	**9**	**13**	**35111**	**99.81**	**0.1101**	**0.0024**	**5.040**	**0.130**

Analysis[a]	Isotopic ratios			Ages					
	$^{206}Pb/^{238}Pb$	2 s.e.	Err. Corr.	$^{206}Pb/^{238}U$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{207}Pb/^{206}Pb$	2 s.e.
F122B-1-1-1	0.3201	0.0038	0.70778	1790	19	1792	26	1780	19
F122B-1-3-1	0.3206	0.0046	0.70477	1792	22	1792	28	1781	24
F122B-1-15-1*	**0.3255**	**0.0036**	**0.70357**	**1816**	**18**	**1819**	**26**	**1809**	**22**
F122B-1-12-2*	**0.3260**	**0.0042**	**0.47011**	**1819**	**21**	**1820**	**27**	**1815**	**25**
F122B-1-12-1*	**0.3261**	**0.0041**	**0.70465**	**1819**	**20**	**1821**	**27**	**1799**	**20**
F122B-1-17-1*	**0.3257**	**0.0052**	**0.74611**	**1820**	**25**	**1819**	**28**	**1798**	**23**
F122B-1-3-2*	**0.3265**	**0.0039**	**0.67098**	**1821**	**19**	**1818**	**27**	**1808**	**20**
F122B-1-14-1*	**0.3270**	**0.0045**	**0.66592**	**1823**	**22**	**1826**	**27**	**1809**	**17**
F122B-1-6-3*	**0.3272**	**0.0039**	**0.63153**	**1824**	**19**	**1821**	**27**	**1815**	**22**
F122B-1-18-2*	**0.3276**	**0.0037**	**0.67308**	**1828**	**18**	**1829**	**26**	**1814**	**20**
F122B-1-4-1*	**0.3279**	**0.0038**	**0.72276**	**1828**	**18**	**1823**	**27**	**1807**	**20**
F122B-1-18-1*	**0.3279**	**0.0039**	**0.67101**	**1828**	**19**	**1831**	**27**	**1818**	**20**
F122B-1-2-1*	**0.3281**	**0.0047**	**0.70184**	**1829**	**23**	**1827**	**29**	**1822**	**18**
F122B-1-16-1*	**0.3283**	**0.0042**	**0.54070**	**1830**	**21**	**1825**	**28**	**1805**	**23**
F122B-1-12-3*	**0.3293**	**0.0041**	**0.76804**	**1835**	**20**	**1837**	**28**	**1825**	**24**
F122B-1-17-2*	**0.3295**	**0.0039**	**0.68434**	**1836**	**19**	**1839**	**26**	**1819**	**16**
F122B-1-4-2*	**0.3296**	**0.0038**	**0.53884**	**1836**	**19**	**1828**	**27**	**1803**	**18**
F122B-1-13-1*	**0.3299**	**0.0042**	**0.68674**	**1838**	**21**	**1841**	**27**	**1817**	**23**
F122B-1-5-1*	**0.3302**	**0.0037**	**0.62747**	**1839**	**18**	**1838**	**27**	**1825**	**17**
F122B-1-11-1*	**0.3302**	**0.0039**	**0.56386**	**1841**	**18**	**1837**	**27**	**1818**	**20**
F122B-1-7-1*	**0.3308**	**0.0044**	**0.56749**	**1842**	**21**	**1846**	**27**	**1824**	**23**
F122B-1-15-2*	**0.3332**	**0.0037**	**0.50238**	**1854**	**18**	**1854**	**27**	**1845**	**23**
F122B-1-9-1*	**0.3339**	**0.0046**	**0.74755**	**1857**	**22**	**1842**	**28**	**1810**	**24**
F122B-1-10-1	0.3377	0.0036	0.61468	1876	17	1851	27	**1814**	**25**
F122B-1-6-2	0.3397	0.0038	0.55772	1885	18	1841	26	**1792**	**19**
F122B-1-6-1	0.3433	0.0043	0.74245	1904	21	1846	27	1777	23
F122B-1-8-1	0.3557	0.0041	0.39810	1961	19	1958	28	1941	34
F122B-1-1-2	0.4007	0.0055	0.55717	2172	25	2009	28	**1823**	**22**
S89A-1-22-2	0.3102	0.0021	0.74610	1742	10	1803	22	1817	20
S89A-1-12-1	0.3115	0.0031	0.75461	1748	15	1792	22	1803	19
S89A-1-20-1	0.3144	0.0031	0.66459	1762	15	1815	22	1836	26
S89A-1-9-1	0.3143	0.0024	0.62269	1762	12	1805	22	1813	23
S89A-1-13-1	0.3150	0.0026	0.68336	1765	13	1804	22	1806	24
S89A-1-6-2	0.3150	0.0034	0.67657	1765	17	1811	23	1832	20
S89A-1-5-1	0.3156	0.0025	0.73077	1769	13	1799	22	1807	25
S89A-1-17-1	0.3163	0.0063	0.62936	1771	31	1815	26	1860	35
S89A-1-3-1	0.3158	0.0038	0.76051	1771	18	1801	22	1820	20
S89A-1-6-1	0.3166	0.0038	0.70088	1773	18	1810	24	1822	22
S89A-1-15-1	0.3176	0.0027	0.74862	1778	13	1808	21	1824	24
S89A-1-30-2	0.3186	0.0022	0.67806	1783	11	1806	22	1823	21
S89A-1-29-2	0.3205	0.0022	0.74178	1792	11	1826	22	1816	22
S89A-1-24-2	0.3205	0.0027	0.82995	1793	14	1827	22	1826	22
S89A-1-27-1*	**0.3206**	**0.0032**	**0.82893**	**1793**	**16**	**1792**	**22**	**1804**	**27**
S89A-1-29-1	0.3208	0.0027	0.80711	1793	13	1819	22	1797	25
S89A-1-16-1*	**0.3213**	**0.0041**	**0.87280**	**1795**	**20**	**1799**	**24**	**1799**	**23**
S89A-1-24-3	0.3213	0.0078	0.87739	1795	38	1831	29	1854	27
S89A-1-28-1*	**0.3214**	**0.0030**	**0.80285**	**1796**	**14**	**1793**	**22**	**1795**	**25**
S89A-1-8-1	0.3210	0.0027	0.80147	1796	13	1822	22	1807	24
S89A-1-11-1	0.3215	0.0024	0.74268	1797	12	1831	22	1823	21
S89A-1-16-3*	**0.3215**	**0.0029**	**0.85076**	**1797**	**14**	**1795**	**22**	**1789**	**21**
S89A-1-17-2*	**0.3217**	**0.0029**	**0.55897**	**1798**	**14**	**1805**	**21**	**1790**	**32**
S89A-1-10-1	0.3226	0.0026	0.61762	1802	13	1822	22	1795	25
S89A-1-12-3*	**0.3232**	**0.0063**	**0.90322**	**1804**	**30**	**1807**	**26**	**1792**	**22**
S89A-1-25-2*	**0.3231**	**0.0033**	**0.85612**	**1804**	**16**	**1802**	**22**	**1809**	**22**
S89A-1-16-2*	**0.3238**	**0.0031**	**0.76494**	**1808**	**15**	**1809**	**23**	**1807**	**24**
S89A-1-22-2*	**0.3237**	**0.0032**	**0.78995**	**1808**	**16**	**1824**	**23**	**1800**	**23**
S89A-1-24-4*	**0.3239**	**0.0036**	**0.79682**	**1808**	**18**	**1815**	**22**	**1801**	**25**
S89A-1-24-1*	**0.3247**	**0.0034**	**0.85701**	**1812**	**16**	**1826**	**22**	**1799**	**22**

Analysis[a]	Grain location[b]	U (ppm)	Th (ppm)	^{204}Pb (cps)	2 s.e.	^{206}Pb/^{204}Pb (cps)	%Pb*	Isotopic ratios ^{207}Pb/^{206}Pb	2 s.e.	^{207}Pb/^{235}U	2 s.e.
S89A-1-30-1*	**b/w Ms**	**15833**	**16980**	**31**	**21**	**7968**	**99.46**	**0.1099**	**0.0026**	**4.940**	**0.140**
S89A-1-7-2*	**in Bt**	**25841**	**27231**	**16**	**18**	**26763**	**99.98**	**0.1098**	**0.0024**	**5.020**	**0.130**
S89A-1-25-1*	**b/w Ms**	**20097**	**19460**	**10**	**13**	**37400**	**99.83**	**0.1100**	**0.0024**	**4.900**	**0.130**
S89A-1-1-2*	**b/w Bt, Pl**	**19555**	**24463**	**15**	**15**	**22533**	**99.83**	**0.1109**	**0.0024**	**5.000**	**0.130**
S89A-1-30-3*	**b/w Ms**	**29690**	**29463**	**28**	**16**	**16000**	**99.86**	**0.1106**	**0.0025**	**5.010**	**0.130**
S89A-1-15-2*	**b/w Qz, Gr**	**26935**	**25868**	**0**	**14**	**-**	**99.79**	**0.1115**	**0.0024**	**5.040**	**0.130**
S89A-1-21-1	b/w Qz	18052	22994	21	22	14414	99.97	0.1122	0.0026	5.220	0.140
S89A-1-1-1**	**b/w Bt, Pl**	**22657**	**24876**	**17**	**14**	**23447**	**99.92**	**0.1120**	**0.0025**	**5.100**	**0.130**
S89A-1-10-2**	**b/w Ms**	**29359**	**29940**	**18**	**16**	**23944**	**99.97**	**0.1105**	**0.0025**	**5.150**	**0.140**
S89A-1-12-2**	**in Grt rim**	**27690**	**28707**	**9**	**14**	**42667**	**99.97**	**0.1108**	**0.0024**	**5.210**	**0.140**
S89A-1-7-1**	**in Bt**	**16656**	**19038**	**21**	**22**	**13433**	**99.93**	**0.1125**	**0.0025**	**5.290**	**0.150**
S89A-1-4-1**	**b/w Qz, Bt**	**19197**	**19928**	**2**	**16**	**175000**	**99.97**	**0.1124**	**0.0025**	**5.270**	**0.140**
S89A-1-13-2**	**b/w Ms, Qz**	**18199**	**30388**	**25**	**17**	**10160**	**100.02**	**0.1124**	**0.0026**	**5.300**	**0.150**
F28A-1-8-1*	**in Bt**	**17620**	**22920**	**-6**	**19**	**-43350**	**100.05**	**0.1095**	**0.0045**	**4.932**	**0.160**
F28A-2-1-1*	**b/w Grt, Pl**	**23500**	**15920**	**-2**	**12**	**-171000**	**99.98**	**0.1097**	**0.0043**	**4.925**	**0.150**
F28A-1-7-1*	**in Qz**	**8660**	**18060**	**12**	**12**	**11500**	**99.99**	**0.1104**	**0.0044**	**4.971**	**0.150**
F28A-2-1-2*	**b/w Grt, Pl**	**22310**	**20830**	**-3**	**13**	**-106500**	**100.00**	**0.1100**	**0.0043**	**5.008**	**0.150**
F28A-2-1-3*	**b/w Grt, Pl**	**16510**	**21280**	**9**	**13**	**26644**	**100.02**	**0.1105**	**0.0044**	**4.994**	**0.150**
F28A-1-10-3*	**in Qz**	**8550**	**17670**	**-24**	**9**	**-5519**	**99.99**	**0.1111**	**0.0044**	**5.063**	**0.150**
F28A-1-10-1*	**in Qz**	**13910**	**18320**	**25**	**9**	**8579**	**100.00**	**0.1118**	**0.0044**	**5.082**	**0.150**
F28A-1-5-2*	**in Grt**	**19140**	**17550**	**9**	**11**	**33244**	**99.98**	**0.1114**	**0.0044**	**5.090**	**0.150**
F28A-1-5-1*	**in Grt**	**20790**	**19920**	**0**	**12**	**-**	**99.99**	**0.1120**	**0.0044**	**5.113**	**0.150**
F28A-1-10-2*	**in Pl**	**16330**	**19070**	**8**	**16**	**30688**	**99.99**	**0.1129**	**0.0045**	**5.190**	**0.160**
F28A-2-3-1	b/w Qz, Kfs	7060	13100	-6	14	-18133	100.01	0.1133	0.0045	**5.356**	**0.170**
F28A-1-6-1	b/w Qz	13670	17480	28	13	7893	100.01	0.1128	0.0044	**5.335**	**0.160**
F28A-1-1-1	in Grt	10760	19370	8	10	22513	100.08	0.1120	0.0044	**5.426**	**0.160**
F28A-1-11-1	in Grt	3950	3110	17	21	3853	99.52	0.1168	0.0052	5.970	0.250
F28A-2-7-1	in Bt	372	42	8	13	1259	99.94	0.2073	0.0095	18.010	0.830
S145-1-26-1	in Pl	12565	26622	39	16	5387	99.75	0.1106	0.0013	4.910	0.110
S145-1-30-1	in Crd	17229	17740	-28	18	-10004	99.70	0.1101	0.0016	4.940	0.120
S145-1-20-2**	**in Pl**	**11940**	**25050**	**25**	**19**	**8100**	**99.87**	**0.1103**	**0.0014**	**4.900**	**0.110**
S145-1-11-1**	**in Bt**	**12842**	**10877**	**25**	**22**	**8792**	**99.96**	**0.1090**	**0.0016**	**4.870**	**0.120**
S145-1-4-2**	**b/w Pl, Kfs**	**7747**	**22183**	**-5**	**16**	**-26140**	**99.85**	**0.1092**	**0.0014**	**4.940**	**0.120**
S145-1-1-1**	**b/w Grt, Pl**	**8042**	**17830**	**6**	**24**	**23567**	**99.93**	**0.1085**	**0.0017**	**4.890**	**0.130**
S145-1-22-2**	**in Pl**	**6625**	**27320**	**-10**	**15**	**-11150**	**99.83**	**0.1088**	**0.0014**	**4.910**	**0.110**
S145-1-5-2**	**b/w Pl**	**8309**	**25785**	**14**	**20**	**10493**	**99.83**	**0.1091**	**0.0014**	**4.870**	**0.120**
S145-1-3-2**	**b/w Grt, Pl**	**12867**	**24372**	**10**	**14**	**22500**	**99.84**	**0.1088**	**0.0014**	**4.870**	**0.110**
S145-1-12-4*	**in Grt core**	**14500**	**15419**	**13**	**17**	**18969**	**99.96**	**0.1109**	**0.0014**	**5.000**	**0.120**
S145-1-4-1*	**b/w Pl, Kfs**	**12560**	**26827**	**15**	**19**	**14527**	**99.92**	**0.1097**	**0.0014**	**4.950**	**0.110**
S145-1-8-2**	**b/w Ilm, Pl**	**9769**	**19241**	**1**	**20**	**172000**	**99.96**	**0.1092**	**0.0017**	**4.860**	**0.120**
S145-1-4-3	b/w Pl, Kfs	12226	25600	28	27	7246	99.74	0.1099	0.0017	5.050	0.130
S145-1-10-1*	**in Crd**	**11097**	**22634**	**-1**	**18**	**-188300**	**99.77**	**0.1106**	**0.0015**	**5.020**	**0.120**
S145-1-5-1*	**b/w Pl**	**11610**	**29401**	**6**	**20**	**33217**	**99.90**	**0.1102**	**0.0015**	**5.000**	**0.120**
S145-1-16-1*	**in Pl**	**8741**	**25043**	**7**	**18**	**21014**	**99.97**	**0.1092**	**0.0013**	**4.980**	**0.120**
S145-1-3-3*	**b/w Grt, Pl**	**11936**	**26452**	**-1**	**17**	**-209400**	**99.91**	**0.1093**	**0.0013**	**4.940**	**0.110**
S145-1-23-1*	**in Crd**	**7900**	**27624**	**-20**	**20**	**-6650**	**99.96**	**0.1097**	**0.0015**	**4.990**	**0.120**
S145-1-7-1	b/w Pl	9339	21805	4	28	39500	99.98	0.1092	0.0017	5.040	0.120
S145-1-22-1**	**in Pl**	**5472**	**19077**	**16**	**20**	**5919**	**99.81**	**0.1091**	**0.0016**	**4.860**	**0.130**
S145-1-5-3*	**b/w Pl**	**7813**	**27406**	**13**	**18**	**10415**	**99.86**	**0.1093**	**0.0015**	**5.020**	**0.120**
S145-1-30-2	in Crd	13754	20385	6	25	37667	99.88	0.1107	0.0016	5.090	0.120
S145-1-20-1*	**in Pl**	**3228**	**20275**	**0**	**16**	**-**	**99.78**	**0.1092**	**0.0017**	**5.010**	**0.120**
S145-1-6-1*	**b/w Bt, Qz**	**15833**	**12871**	**31**	**15**	**8916**	**99.99**	**0.1104**	**0.0013**	**5.060**	**0.110**
S145-1-12-1*	**in Grt core**	**17182**	**16538**	**-1**	**16**	**-298200**	**99.93**	**0.1107**	**0.0015**	**5.090**	**0.120**
S145-1-17-1*	**in Crd**	**3585**	**26259**	**-11**	**16**	**-5627**	**99.82**	**0.1107**	**0.0015**	**5.060**	**0.130**
S145-1-16-2*	**in Pl**	**12608**	**21253**	**14**	**18**	**15143**	**99.78**	**0.1115**	**0.0015**	**5.130**	**0.120**
S145-1-20-3*	**in Pl**	**3321**	**23098**	**17**	**18**	**3341**	**99.74**	**0.1117**	**0.0019**	**5.110**	**0.130**
S145-1-6-2*	**b/w Bt, Qz**	**9591**	**20100**	**-2**	**15**	**-84250**	**99.91**	**0.1100**	**0.0014**	**5.050**	**0.120**
S145-1-15-2*	**in Grt rim**	**11011**	**18203**	**-9**	**15**	**-21333**	**99.96**	**0.1106**	**0.0014**	**5.050**	**0.120**

Analysis[a]	Isotopic ratios			Ages					
	$^{206}Pb/^{238}Pb$	2 s.e.	Err. Corr.	$^{206}Pb/^{238}U$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{207}Pb/^{206}Pb$	2 s.e.
S89A-1-30-1*	**0.3249**	**0.0049**	**0.67094**	**1813**	**24**	**1810**	**24**	**1803**	**27**
S89A-1-7-2*	**0.3246**	**0.0026**	**0.74709**	**1813**	**13**	**1822**	**22**	**1800**	**21**
S89A-1-25-1*	**0.3253**	**0.0029**	**0.81750**	**1816**	**14**	**1803**	**23**	**1796**	**22**
S89A-1-1-2*	**0.3260**	**0.0030**	**0.74205**	**1818**	**15**	**1819**	**22**	**1811**	**25**
S89A-1-30-3*	**0.3259**	**0.0033**	**0.75538**	**1818**	**16**	**1821**	**22**	**1811**	**25**
S89A-1-15-2*	**0.3265**	**0.0029**	**0.80090**	**1822**	**14**	**1826**	**22**	**1822**	**22**
S89A-1-21-1	0.3279	0.0033	0.65147	1828	16	1857	22	1841	20
S89A-1-1-1**	**0.3296**	**0.0027**	**0.63565**	**1836**	**13**	**1835**	**22**	**1832**	**23**
S89A-1-10-2**	**0.3303**	**0.0034**	**0.77029**	**1839**	**16**	**1843**	**23**	**1803**	**23**
S89A-1-12-2**	**0.3327**	**0.0031**	**0.87689**	**1852**	**15**	**1854**	**23**	**1815**	**21**
S89A-1-7-1**	**0.3346**	**0.0042**	**0.87049**	**1860**	**20**	**1868**	**25**	**1841**	**27**
S89A-1-4-1**	**0.3354**	**0.0026**	**0.70283**	**1864**	**13**	**1863**	**22**	**1842**	**21**
S89A-1-13-2**	**0.3352**	**0.0046**	**0.83190**	**1868**	**21**	**1867**	**25**	**1838**	**22**
F28A-1-8-1*	**0.3220**	**0.0086**	**0.60469**	**1799**	**42**	**1807**	**27**	**1792**	**49**
F28A-2-1-1*	**0.3226**	**0.0082**	**0.83547**	**1804**	**39**	**1805**	**26**	**1797**	**42**
F28A-1-7-1*	**0.3233**	**0.0077**	**0.52193**	**1806**	**38**	**1815**	**26**	**1807**	**44**
F28A-2-1-2*	**0.3248**	**0.0079**	**0.66391**	**1813**	**39**	**1820**	**25**	**1805**	**43**
F28A-2-1-3*	**0.3252**	**0.0080**	**0.68623**	**1814**	**39**	**1821**	**25**	**1805**	**43**
F28A-1-10-3*	**0.3269**	**0.0082**	**0.74941**	**1823**	**40**	**1832**	**27**	**1815**	**41**
F28A-1-10-1*	**0.3271**	**0.0080**	**0.74483**	**1824**	**39**	**1833**	**25**	**1830**	**39**
F28A-1-5-2*	**0.3285**	**0.0078**	**0.69584**	**1831**	**38**	**1835**	**25**	**1827**	**37**
F28A-1-5-1*	**0.3285**	**0.0078**	**0.63751**	**1831**	**38**	**1838**	**25**	**1832**	**40**
F28A-1-10-2*	**0.3311**	**0.0087**	**0.78406**	**1843**	**42**	**1850**	**26**	**1842**	**40**
F28A-2-3-1	**0.3378**	**0.0087**	**0.71366**	1875	42	1878	26	1856	40
F28A-1-6-1	**0.3392**	**0.0081**	**0.57672**	1883	39	1874	25	1840	51
F28A-1-1-1	**0.3469**	**0.0083**	**0.64981**	1920	40	1890	25	1835	47
F28A-1-11-1	0.3560	0.0130	0.80418	1963	64	1970	37	1919	40
F28A-2-7-1	0.6140	0.0200	0.68594	3090	80	2983	44	2901	45
S145-1-26-1	0.3172	0.0033	0.74168	1776	16	1803	19	1811	11
S145-1-30-1	0.3191	0.0050	0.68458	1785	24	1809	21	1806	17
S145-1-20-2**	**0.3190**	**0.0039**	**0.68026**	**1786**	**19**	**1803**	**20**	**1798**	**11**
S145-1-11-1**	**0.3202**	**0.0045**	**0.71092**	**1790**	**22**	**1799**	**20**	**1790**	**15**
S145-1-4-2**	**0.3210**	**0.0038**	**0.75420**	**1794**	**19**	**1808**	**20**	**1790**	**12**
S145-1-1-1**	**0.3213**	**0.0051**	**0.65982**	**1796**	**25**	**1800**	**22**	**1778**	**19**
S145-1-22-2**	**0.3222**	**0.0034**	**0.51112**	**1800**	**16**	**1805**	**20**	**1782**	**15**
S145-1-5-2**	**0.3222**	**0.0037**	**0.66840**	**1800**	**18**	**1797**	**20**	**1780**	**13**
S145-1-3-2**	**0.3219**	**0.0039**	**0.72913**	**1801**	**19**	**1798**	**19**	**1779**	**13**
S145-1-12-4*	**0.3229**	**0.0039**	**0.76354**	**1803**	**19**	**1818**	**20**	**1819**	**12**
S145-1-4-1*	**0.3226**	**0.0035**	**0.68187**	**1803**	**17**	**1810**	**19**	**1795**	**10**
S145-1-8-2**	**0.3228**	**0.0045**	**0.61105**	**1803**	**22**	**1797**	**20**	**1779**	**15**
S145-1-4-3	0.3232	0.0055	0.75624	1805	27	1826	23	1803	14
S145-1-10-1*	**0.3233**	**0.0043**	**0.72770**	**1807**	**21**	**1823**	**20**	**1805**	**13**
S145-1-5-1*	**0.3236**	**0.0038**	**0.60980**	**1807**	**18**	**1821**	**20**	**1802**	**12**
S145-1-16-1*	**0.3235**	**0.0036**	**0.69978**	**1808**	**18**	**1815**	**20**	**1794**	**13**
S145-1-3-3*	**0.3238**	**0.0038**	**0.75866**	**1808**	**18**	**1809**	**20**	**1789**	**13**
S145-1-23-1*	**0.3242**	**0.0040**	**0.60894**	**1810**	**20**	**1818**	**20**	**1790**	**14**
S145-1-7-1	0.3242	0.0051	0.63638	1810	25	1828	21	1793	14
S145-1-22-1**	**0.3245**	**0.0044**	**0.52478**	**1811**	**22**	**1799**	**20**	**1783**	**17**
S145-1-5-3*	**0.3247**	**0.0039**	**0.63441**	**1812**	**19**	**1823**	**20**	**1793**	**14**
S145-1-30-2	0.3252	0.0046	0.67298	1815	22	1833	20	1814	13
S145-1-20-1*	**0.3258**	**0.0041**	**0.43993**	**1817**	**20**	**1822**	**20**	**1802**	**14**
S145-1-6-1*	**0.3269**	**0.0033**	**0.61523**	**1823**	**16**	**1829**	**19**	**1807**	**10**
S145-1-12-1*	**0.3272**	**0.0041**	**0.71121**	**1824**	**20**	**1836**	**19**	**1820**	**12**
S145-1-17-1*	**0.3275**	**0.0040**	**0.65699**	**1825**	**20**	**1829**	**21**	**1809**	**14**
S145-1-16-2*	**0.3276**	**0.0045**	**0.68781**	**1826**	**22**	**1841**	**19**	**1825**	**12**
S145-1-20-3*	**0.3275**	**0.0045**	**0.45091**	**1826**	**22**	**1836**	**21**	**1828**	**16**
S145-1-6-2*	**0.3276**	**0.0035**	**0.61005**	**1827**	**17**	**1829**	**19**	**1797**	**14**
S145-1-15-2*	**0.3279**	**0.0034**	**0.59865**	**1828**	**17**	**1829**	**20**	**1811**	**14**

Analysis[a]	Grain location[b]	U (ppm)	Th (ppm)	^{204}Pb (cps)	2 s.e.	^{206}Pb/^{204}Pb (cps)	%Pb*	Isotopic ratios ^{207}Pb/^{206}Pb	2 s.e.	^{207}Pb/^{235}U	2 s.e.
S145-1-21-1*	**b/w Pl, Kfs**	**3118**	**21899**	**19**	**17**	**2837**	**99.59**	**0.1103**	**0.0016**	**5.100**	**0.120**
S145-1-1-2*	**b/w Grt, Pl**	**11452**	**31118**	**0**	**20**	**-**	**99.96**	**0.1106**	**0.0017**	**5.150**	**0.120**
S145-1-12-2*	**in Grt core**	**12736**	**12688**	**41**	**26**	**5617**	**100.01**	**0.1110**	**0.0015**	**5.010**	**0.120**
S145-1-22-3*	**in Pl**	**6332**	**23121**	**-10**	**16**	**-10860**	**99.89**	**0.1100**	**0.0015**	**5.060**	**0.120**
S145-1-7-2*	**b/w Pl**	**6024**	**22127**	**15**	**25**	**7247**	**99.95**	**0.1109**	**0.0019**	**5.080**	**0.150**
S145-1-12-3*	**in Grt core**	**15502**	**17229**	**38**	**16**	**7079**	**99.95**	**0.1118**	**0.0014**	**5.140**	**0.120**
S145-1-9-1*	**in Crd**	**12947**	**16354**	**13**	**17**	**17477**	**99.96**	**0.1109**	**0.0014**	**5.140**	**0.120**
S145-1-9-3*	**in Crd**	**11154**	**14293**	**-4**	**21**	**-49725**	**99.96**	**0.1104**	**0.0015**	**5.080**	**0.120**
S145-1-8-1*	**b/w Ilm, Pl**	**5404**	**24879**	**7**	**19**	**13657**	**99.70**	**0.1115**	**0.0017**	**5.110**	**0.120**
S145-1-10-2*	**in Crd**	**10752**	**14449**	**19**	**19**	**10116**	**99.95**	**0.1117**	**0.0015**	**5.100**	**0.120**
S145-1-28-1*	**in Grt core**	**12783**	**17236**	**-7**	**15**	**-31043**	**99.91**	**0.1116**	**0.0014**	**5.100**	**0.110**
S145-1-3-1*	**b/w Grt, Pl**	**9577**	**18233**	**-10**	**14**	**-16880**	**99.94**	**0.1110**	**0.0014**	**5.120**	**0.120**
S145-1-18-2	in Qz	6343	30469	-12	23	-8942	99.85	0.1124	0.0019	5.220	0.130
S145-1-19-1*	**in Crd**	**13705**	**19077**	**11**	**17**	**21291**	**99.95**	**0.1110**	**0.0014**	**5.200**	**0.120**
S145-1-7-3*	**b/w Pl**	**5052**	**22873**	**8**	**15**	**11275**	**99.42**	**0.1109**	**0.0015**	**5.130**	**0.120**
S145-1-13-2*	**in Grt core**	**10816**	**18500**	**30**	**17**	**6337**	**99.93**	**0.1108**	**0.0013**	**5.110**	**0.120**
S145-1-13-1*	**in Grt core**	**12471**	**21439**	**-2**	**13**	**-108250**	**99.96**	**0.1127**	**0.0013**	**5.220**	**0.120**
S145-1-18-1*	**in Qz**	**5911**	**24955**	**-3**	**16**	**-33967**	**99.73**	**0.1121**	**0.0016**	**5.180**	**0.120**
S145-1-15-1*	**in Grt rim**	**9162**	**16556**	**-12**	**16**	**-13383**	**99.90**	**0.1112**	**0.0014**	**5.150**	**0.120**
S145-1-28-2*	**in Grt core**	**12351**	**16714**	**-15**	**14**	**-14240**	**99.95**	**0.1115**	**0.0014**	**5.180**	**0.120**
S145-1-27-1	in Bt	12305	14588	-40	25	-5218	99.92	0.1120	0.0016	5.330	0.130
S145-1-9-2	in Crd	7216	25641	-5	14	-25740	100.00	0.1098	0.0014	5.280	0.120
S145-1-24-2	in Grt core	5591	9201	-8	24	-11975	99.93	0.1105	0.0019	5.340	0.150

Analysis[a]	Isotopic ratios			Ages					
	$^{206}Pb/^{238}Pb$	2 s.e.	Err. Corr.	$^{206}Pb/^{238}U$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{207}Pb/^{206}Pb$	2 s.e.
S145-1-21-1*	**0.3284**	**0.0039**	**0.43803**	**1830**	**19**	**1834**	**20**	**1815**	**15**
S145-1-1-2*	**0.3290**	**0.0049**	**0.54022**	**1833**	**24**	**1846**	**20**	**1804**	**13**
S145-1-12-2*	**0.3290**	**0.0048**	**0.75864**	**1833**	**23**	**1823**	**21**	**1815**	**11**
S145-1-22-3*	**0.3291**	**0.0038**	**0.56289**	**1833**	**19**	**1829**	**20**	**1798**	**13**
S145-1-7-2*	**0.3295**	**0.0060**	**0.75672**	**1835**	**29**	**1838**	**25**	**1813**	**20**
S145-1-12-3*	**0.3296**	**0.0036**	**0.72189**	**1836**	**18**	**1842**	**19**	**1827**	**10**
S145-1-9-1*	**0.3297**	**0.0037**	**0.72110**	**1836**	**18**	**1842**	**20**	**1815**	**12**
S145-1-9-3*	**0.3296**	**0.0039**	**0.57063**	**1836**	**19**	**1833**	**19**	**1811**	**15**
S145-1-8-1*	**0.3294**	**0.0044**	**0.60671**	**1837**	**21**	**1837**	**21**	**1832**	**13**
S145-1-10-2*	**0.3301**	**0.0041**	**0.67021**	**1838**	**20**	**1835**	**20**	**1825**	**13**
S145-1-28-1*	**0.3300**	**0.0037**	**0.67898**	**1838**	**18**	**1835**	**19**	**1827**	**13**
S145-1-3-1*	**0.3300**	**0.0037**	**0.63647**	**1838**	**18**	**1838**	**20**	**1815**	**11**
S145-1-18-2	0.3302	0.0050	0.61427	1839	24	1859	21	1837	13
S145-1-19-1*	**0.3303**	**0.0041**	**0.77115**	**1839**	**20**	**1851**	**20**	**1819**	**11**
S145-1-7-3*	**0.3299**	**0.0045**	**0.71119**	**1839**	**22**	**1841**	**21**	**1811**	**13**
S145-1-13-2*	**0.3310**	**0.0035**	**0.73273**	**1844**	**17**	**1838**	**19**	**1810**	**13**
S145-1-13-1*	**0.3316**	**0.0036**	**0.68000**	**1846**	**18**	**1854**	**19**	**1845**	**11**
S145-1-18-1*	**0.3319**	**0.0045**	**0.58913**	**1846**	**22**	**1848**	**20**	**1828**	**12**
S145-1-15-1*	**0.3318**	**0.0036**	**0.71274**	**1847**	**18**	**1844**	**19**	**1819**	**12**
S145-1-28-2*	**0.3326**	**0.0034**	**0.65131**	**1850**	**17**	**1850**	**20**	**1825**	**12**
S145-1-27-1	0.3352	0.0057	0.76645	1863	28	1873	21	1830	17
S145-1-9-2	0.3397	0.0040	0.68605	1885	19	1865	20	1803	14
S145-1-24-2	0.3463	0.0065	0.69911	1916	31	1875	24	1807	23

[a]Analyses are given in the format w-x-y-z, where w=sample #, x=thin section #, y=monazite grain #, z=analysis (laser spot) #

*Denotes analyses used in age calculations (largest cluster of analyses)

**Denotes analyses used in age calculations (smaller cluster of analyses)

[b]Mineral abbreviations as in Whitney & Evans (2010, Amer. Min., 95, 185-187); "b/w"=between

CHAPTER 3

Multi-stage zircon and monazite growth revealed by depth profiling and *in situ* U-Pb geochronology: resolving the Paleoproterozoic tectonics of the Trans-Hudson Orogen on southeastern Baffin Island, Canada

Diane Skipton[1], D.A. Schneider[1], C.R.M. McFarlane[2], M.R. St-Onge[3], S.E. Jackson[3]

[1]*Department of Earth and Environmental Sciences, University of Ottawa, Ottawa, ON, K1N 6N5, Canada*

[2]*Department of Earth Sciences, University of New Brunswick, Fredericton, NB, E3B 5A3, Canada*

[3]*Geological Survey of Canada, Natural Resources Canada, Ottawa, ON, K1A 0E8, Canada*

Abstract

Understanding the growth and recrystallization of zircon and monazite during regional metamorphism is important for identifying the nature and timescales of tectonic processes in continental crust. We present extensive *in situ* U-Pb monazite geochronology and U-Pb zircon depth profiling analyses from the mid-crust exposed on southeastern Baffin Island, Canada, in the internal zone of the Paleoproterozoic Trans-Hudson Orogen. *In situ* LA-ICP-MS U-Pb monazite dating on ten metasedimentary rocks (totalling >300 analyses) from different paleodepths reveals a dominant ca. 1860-1820 Ma monazite population that records regional mid-amphibolite- to granulite-facies metamorphism with coeval fabric development. Subordinate monazite with ages between ca. 1800-1750 Ma are interpreted to have formed through dissolution-reprecipitation. The SIMS U-Pb depth-profiling technique allowed dating of ca. 1861-1833 Ma zircon rims and less abundant ca. 1800-1764 Ma zircon rims that would be unresolvable using conventional spot dating. Trace element depth profiling via LA-ICP-MS shows that zircon rims typically have lower Th/U

values, higher Hf contents and different REE compositions than zircon interiors. Zircon rim compositions are highly variable, with no apparent link to U-Pb age, and are interpreted as the combined result of metamorphic zircon growth and dissolution-reprecipitation. Our data demonstrate that the timing of peak metamorphism is recorded by both monazite and zircon, and that they are both sensitive to U-Pb age resetting at lower temperatures during late-orogenic tectonism. Regional mid-amphibolite- to granulite-facies metamorphism and east-directed crustal shortening are bracketed between ca. 1860–1820 Ma. These events are interpreted to result from the accretion of cratonic blocks in the internal zone of the Trans-Hudson Orogen. The integrated geochronological approach on regionally-distributed samples enabled us to document ca. 1800-1750 Ma monazite domains and zircon rims, which we interpret to result from the terminal collision with the lower-plate Superior craton followed by late- to post-orogenic tectonothermal activity that continued for at least 70 Myr after thermal peak. This prolonged history is characteristic of the northeastern Trans-Hudson Orogen, and implies that orogenic collapse may not be a hallmark of all hot, thickened orogens.

1. Introduction

U-Pb ages of zircon and monazite are extensively used to resolve the timing of regional amphibolite- to granulite-facies metamorphism in collisional orogens (Schaltegger et al., 1999; Catlos et al., 2001; Rubatto et al., 2001; Williams et al., 2007). *In situ* U-Pb dating of structurally aligned monazite is often used to date metamorphic fabric development (Berman et al., 2005, 2013; Štípská et al., 2015). These mineral phases can grow over a broad range of prograde P-T conditions through amphibolite- to granulite-facies (Schaltegger et al., 1999; Möller et al., 2002; Pyle and Spear, 2003; Kohn and Malloy, 2004; Mahan et al., 2006; Spear and Pyle, 2010; Kohn et al., 2015)

and eclogite-facies (Terry et al., 2000; Marsh and Culshaw, 2014). Isotopic compositions of monazite and zircon can be affected by coupled dissolution-reprecipitation over the same P-T range and potentially at even lower grade, particularly in the presence of fluids or strain (Schaltegger et al., 1999; Hoskin and Black, 2000; Seydoux-Guillaume et al., 2002; Geisler et al., 2007; Williams et al., 2007; Wawrzenitz et al., 2012). Studies that employ both U-Pb zircon and monazite geochronological methods to date high-grade metamorphism seem to disagree on which mineral is the more robust geochronometer and which is more susceptible to age resetting at lower temperatures (e.g., Schaltegger et al., 1999; Ayers et al, 2002; Högdahl et al., 2012). These factors may result in uncertainty when linking U-Pb ages to tectonic events along metamorphic P-T-d paths, particularly in large, hot orogens with protracted histories. Trace element compositions of dated domains in zircon and monazite are increasingly used to elucidate the effective bulk chemical composition during metamorphic growth or dissolution-reprecipitation (Rubatto, 2002; Pyle and Spear, 2003; Harley & Kelly, 2007; Rubatto and Hermann, 2007; Štípská et al., 2015; Marsh and Stockli, 2015).

We present an integrated geochronological study of tectonothermal events in the mid-crust of the Paleoproterozoic Trans-Hudson Orogen exposed on Hall Peninsula, Baffin Island, Canada (THO; Figs. 1, 2, 3). This allows us to evaluate the isotopic behavior of zircon and monazite in a hot, thickened orogen. To fully capture and elucidate the tectonothermal history, we conducted comprehensive *in situ* U-Pb monazite dating and high-spatial-resolution U-Pb zircon dating using the depth profiling method in conjunction with trace element analyses. The mid-crustal section experienced peak amphibolite- to granulite-facies metamorphism and concurrent crustal shortening, with subsequent post-thermal peak deformation and mineral growth (Steenkamp and St-Onge, 2014; Dyck and St-Onge, 2014; Chadwick et al., 2015; Skipton et al., 2016). Previous

geochronological studies estimate the timing of regional deformation and metamorphism between ca. 1880 and 1760 Ma (Table 1; Appendix 1, Fig. A1.1; Scott, 1999; Rayner, 2014, 2015; Skipton et al., 2016). More robust age constraints are needed for understanding the tectonic history of the THO and for evaluating correlations with neighboring crustal domains (e.g. Scott, 1999; St-Onge et al., 2009). Within an established framework that links mineral-fabric relationships to metamorphism and deformation (Skipton et al., 2016), *in situ* U-Pb monazite geochronology on ten metasedimentary rocks provides age constraints on the P-T-d evolution. The SIMS U-Pb depth profiling method enables dating of ultra-thin zircon rims (≤4 μm) that reveal a more complete story of zircon growth/dissolution-reprecipitation events. LA-ICP-MS trace element depth profiles of the same zircon grains help to corroborate our U-Pb age interpretations. Our data reveal strikingly similar metamorphic U-Pb ages recorded in both zircon and monazite, including extensive late- to post-orogenic U-Pb ages. The data chronicle a long-lived tectonothermal history and improve our understanding of the collisional/accretionary history of the THO.

2. Tectonic setting

Extending from the western United States to northeastern Canada, the THO has an accretionary-collisional history from ca. 1920 Ma to 1800 Ma (Fig. 1; Lewry and Collerson, 1990; Hoffman, 1998; St-Onge et al., 2006, 2009; Corrigan et al., 2009). The THO has significantly elevated metamorphic temperatures and a thick crust, and is comparable to the Himalayan Orogen (St-Onge et al., 2006). Extensive exposure at mid- to lower crustal levels, makes the orogen a useful natural example for investigating deep orogenic processes (e.g., Corrigan et al., 2009). The THO records the early accretion of several microcontinents to form the upper-plate Churchill domain at ca. 1920-1840 Ma, and the terminal collision with the lower-plate Superior craton at ca.

1820-1795 Ma (Lewry and Collerson, 1990; Hoffman, 1998; St-Onge et al., 2006). One of the accreted terranes in the Churchill domain, the Meta Incognita microcontinent (MIM), accreted to the Rae cratonic margin at ca. 1883-1865 Ma and now forms most of southern Baffin Island (Fig. 2; St-Onge et al., 2006, 2009). The Archean orthogneiss basement of the MIM is overlain by a Paleoproterozoic clastic-carbonate succession, the Lake Harbour Group, and both basement and cover are intruded by ca. 1865-1848 Ma monzogranite to quartz-diorite plutons of the Cumberland Batholith (Scott and Wodicka, 1998; St-Onge et al., 2000, 2007; Whalen et al., 2010). The dominant structural fabric is NNW-striking, with WSW-verging folds and thrusts (St-Onge et al., 2007, 2015). Granulite-facies metamorphism and fabric development affecting the MIM at ca. 1849-1835 Ma are attributed to the subduction and accretion of the Paleoproterozoic Narsajuaq arc at ca. 1845 Ma and to coeval Cumberland Batholith magmatism (St-Onge et al., 2007). It has been alternatively attributed to the "impingement" of the Archean crystalline Sugluk Block beneath the MIM and eventual accretion between ca. 1865–1850 Ma (Corrigan et al., 2009; Whalen et al., 2010). Younger thermal activity with no attendant deformation is suggested by ca. 1833-1829 Ma monazite and zircon, possibly related to intrusion of felsic dykes at ca. 1834–1831 Ma (Scott and Gauthier, 1996; Wodicka and Scott, 1997; St-Onge et al., 2007).

In the eastern MIM, Hall Peninsula (Fig 1, 2) consists of Paleoproterozoic clastic-carbonate sequences and granitic plutons underlain by Archean crystalline basement (Blackadar, 1967; Scott, 1996, 1999; Machado et al., 2013; Steenkamp and St-Onge, 2014). In contrast to the MIM elsewhere, the peninsula is characterized by E-vergent folds and thrust faults (Machado et al., 2013; Steenkamp and St-Onge, 2014), suggesting complex tectonic interactions between cratonic blocks in the THO internal zone (St-Onge et al., 2015). Several cratonic affinities have been proposed for the basement of the MIM and Hall Peninsula, including: the Rae craton, the Superior

craton, the North Atlantic craton, the Aasiaat domain in West Greenland, the Core Zone in Labrador and/or a unique origin (Fig. 2; Jackson et al., 1990; Scott, 1999; St-Onge et al., 2009).

3. Geology of Hall Peninsula

3.1. Lithologies

Most of eastern Hall Peninsula comprises Archean tonalitic-to-monzogranitic orthogneisses with enclaves of amphibolite and ultramafic rocks (ca. 2920-2701 Ma; Scott, 1999; From et al., 2014; Rayner, 2014, 2015). The Archean basement is unconformably overlain by Paleoproterozoic supracrustal sequences up to 10 km thick. Slices of basement and overlying supracrustal rocks are locally imbricated by east-vergent thrusts (discussed below), resulting in panels of supracrustal rocks intercalated between Archean orthogneiss (Steenkamp and St-Onge, 2014). The supracrustal strata on the eastern peninsula comprise quartzite, psammite, pelite, amphibolite and lesser meta-calcsilicate and meta-ironstone (Steenkamp and St-Onge, 2014; MacKay and Ansdell, 2014). The estimated maximum depositional age for the eastern supracrustal sequences is ca. 1960 Ma (Rayner, 2014, 2015).

The western peninsula comprises Paleoproterozoic plutonic rocks and strata with estimated maximum depositional ages of ca. 2100-1906 Ma (Machado et al., 2013; Steenkamp and St-Onge, 2014; Rayner, 2014, 2015), with no exposed Archean basement. The western Paleoproterozoic sequences include psammite, semi-pelite and quartzite with minor marble. They host garnet leucogranite bodies up to ~100 m thick that commonly contain pelitic enclaves, and one leucogranite has been dated at ca. 1867 Ma (Rayner, 2014; Table 1; Appendix 1, Fig. A1.1). Intrusions of orthopyroxene monzogranite, granodiorite and diorite (ca. 1890–1852 Ma; Scott, 1999; Rayner, 2014, 2015) occur extensively throughout the western peninsula, forming 5 m to

~10 km thick bodies oriented parallel to compositional layering in the host strata (Steenkamp and St-Onge, 2014). Pegmatitic syenogranite-to-monzogranite dykes and plugs occur across the study area and are common on the eastern peninsula, cross-cutting the regional foliation (Bigio and Lentz, 2015).

3.2. Metamorphism

The bedrock of Hall Peninsula exposes a metamorphic gradient, with a progressive westward increase in peak conditions from mid-amphibolite- to granulite-facies (Steenkamp and St-Onge, 2014; Dyck and St-Onge, 2014; Skipton et al., 2016). Metamorphic assemblages and the interpreted P–T history are presented in a separate article (Skipton et al., 2016) and a summary is given here. Based on peak assemblages in pelite, there are three SSE-striking metamorphic zones (Fig. 3). Estimated peak metamorphic conditions in the eastern mid-amphibolite-facies zone are ~720–740ºC and 6.25–7.25 kbar, and peak temperatures increase progressively toward the western granulite-facies zone to conditions of ~810–890ºC and ~6.1–7.35 kbar (Skipton et al., 2016). In the eastern mid-amphibolite-facies zone, the peak metamorphic assemblage in pelite contains biotite + muscovite ± garnet ± sillimanite ± K-feldspar ± melt. Sillimanite forms fine-grained aggregates (fibrolite). Melt (up to 15%) forms discontinuous lenses of quartz + plagioclase ± K-feldspar, and is mostly interpreted as the product of vapour-absent muscovite dehydration melting (e.g., Spear et al., 1999). Foliation (S_1) is defined by aligned biotite, muscovite, sillimanite aggregates and melt lenses. Locally, coarser-grained muscovite that cross-cuts S_1 suggests retrograde, post-S_1 muscovite growth at the expense of K-feldspar (e.g., Ashworth, 1975; Palin et al., 2014).

Pelite in the central upper-amphibolite facies zone contains more melt (10-20%), coarser-grained sillimanite and no muscovite, and is characterized by the assemblage biotite + garnet +

sillimanite + K-feldspar ± melt. Melt is interpreted as the product of vapour-absent muscovite dehydration melting and, possibly, orthopyroxene/cordierite-absent biotite dehydration melting (e.g., Spear and Parrish, 1996). Further west, in the granulite-facies zone, pelite contains garnet + sillimanite + K-feldspar ± cordierite ± orthopyroxene, along with extensive melt (≥15%) that is consistent with biotite dehydration melting (e.g., Spear et al., 1999). S_1 is defined by aligned peak metamorphic minerals, melt bands and minor amounts of S_1-aligned biotite. Granulite-facies strata host S_1-parallel leucogranite bodies that contain garnet ± biotite ± cordierite, as well as uncommon leucogranite dykes that cross-cut S_1 and contain sillimanite ± muscovite ± garnet. The two suites of leucogranite are likely products of muscovite and biotite dehydration melting (Dyck and St-Onge, 2014). Voluminous Paleoproterozoic plutonic rocks in the granulite-facies zone that contain S_1-aligned orthopyroxene also contain S_1-aligned biotite ± magnetite ± clinopyroxene ± garnet. In both metasedimentary and plutonic rocks, S_1-aligned biotite is inferred as prograde, whereas biotite that cross-cuts S_1 is considered post-S_1 and retrograde. Garnet rims embayed by retrograde biotite, and by cordierite in the granulite-facies zone, are interpreted to have formed during cooling and decompression.

3.3. Deformation and mineral-fabric relationships

Hall Peninsula records three regional deformation events (Table 2): ENE-vergent shortening and folding (D_1); thick-skinned E-vergent thrusting and folding (D_2); and thick-skinned N-S folding (D_3) (Steenkamp and St-Onge, 2014; Skipton and St-Onge, 2014; Skipton et al., 2016). The regional metamorphic foliation, S_1, dips moderately to the WSW except where re-oriented by D_2 or D_3 structures, and is generally bedding-parallel in metasedimentary rocks. D_1 is interpreted as syn-thermal peak because S_1 is defined by peak metamorphic mineral assemblages, as described above. On the eastern peninsula, which is dominated by Archean crystalline basement, east-

vergent D_2 thrusts transported slices of basement orthogneiss over Paleoproterozoic supracrustal rocks. D_2 does not have an associated distinct metamorphic foliation, although mylonitization and/or re-alignment of S_1 in footwall and hanging wall units occur at T_2 thrust contacts (Chadwick et al., 2015). As D_1 and D_2 are characterized by the same east-vergent kinematics, an S_2 foliation may be indistinguishable from S_1 if also defined by peak metamorphic minerals. In this study, the penetrative foliation defined by peak metamorphic minerals is considered S_1 due to the apparent absence of a distinct D_2 thrust/fold-related fabric. D_1 and D_2 are considered to represent two phases of the same east-vergent shortening event: D_1 includes east-vergent, syn-thermal peak shortening and folding of supracrustal cover sequences (± Archean basement); D_2 involves subsequent, basement-involved, east-vergent thrusting and folding. As D_2 thrusts juxtaposed high-grade thrust imbricates eastward over lower-grade rocks (Dyck and St-Onge, 2014), D_2 is post-thermal peak on the scale of individual thrusts. On the regional scale, D_2 contributed to crustal thickening and the thermal peak of metamorphism, and D_2 is therefore interpreted as syn- to post-thermal peak (Skipton et al., 2016).

D_2-imbricated Paleoproterozoic supracrustal rocks and Archean basement are folded by km-scale F_3 folds with E-W-striking axial planes. F_3 crenulations occur in micaceous pelites, and the northward dip of most F_3 axial planes suggests that D_3 represents S-directed vergence. In areas of F_3 folds, post-D_1 muscovite is typically oriented axial planar to F_3 crenulations but some muscovite cross-cuts F_3 crenulations, suggesting that retrograde muscovite grew syn- to post-D_3. Post-D_1 retrograde biotite is generally randomly oriented, as is most retrograde post-D_1 muscovite on the eastern peninsula (Skipton et al., 2016).

3.4. Previous geochronological studies

Previous dating of metamorphism in the study area (Table 1; Appendix 1, Fig. A1.1) includes SHRIMP analyses of zircon rims and ID-TIMS analyses of zircon rim fragments. Ages were obtained from samples of Archean orthogneiss and Paleoproterozoic metasedimentary rocks and felsic intrusions. These zircon rims and fragments yielded a range of ages spanning ca. 1886-1759 Ma that were interpreted to be metamorphic (Scott and Gauthier, 1996; Scott, 1999; Rayner, 2014, 2015). Preliminary monazite U-Pb dating of felsic plutons and metasedimentary rocks yielded ages of ca. 1877-1855 Ma (ID-TIMS; Scott, 1999). *In situ* U-Pb monazite geochronology of four additional metasedimentary rocks in a separate study (Skipton et al., 2016) identified dominantly ca. 1850–1800 Ma monazite, the younger (ca. 1800 Ma) ages apparently post-dating much of the tectonism. Prolonged elevated temperatures are suggested by U-Pb titanite ages of ca. 1742-1730 Ma (ID-TIMS; Scott, 1999) and K-Ar ages of biotite (ca. 1704-1507 Ma; Lowdon, 1960; Wanless et al., 1968, 1974), muscovite (ca. 1610 Ma; Lowdon, 1960) and hornblende (ca. 1670 Ma; Wanless et al., 1979). $^{40}Ar/^{39}Ar$ step heating ages of three muscovite samples on the eastern peninsula range from ca. 1690–1657 Ma (Skipton et al., 2015).

Ages of zircon rims were resolved in only nine of 18 samples previously dated by the SHRIMP method, and just three of these samples yielded concordant clusters of analyses, each comprising ≤6 analyses (ca. 1861-1828 Ma; Rayner, 2014, 2015). This is likely due to the lateral dimensions of the primary ion beam, making zircon rims <10 μm difficult to resolve. In the ID-TIMS studies (Scott and Gauthier, 1996; Scott, 1999), each metamorphic zircon rim age (ca. 1869–1759 Ma) was either calculated from 2-3 concordant analyses of overgrowth material or estimated from the intercept of a discordia line formed by ~3 analyses of individual crystals, overgrowth fragments or multi-grain fractions. Considering the ~150 Myr range of reported metamorphic ages,

the published U-Pb zircon rim ages likely only capture a small portion of the larger protracted history. The few published monazite U-Pb ages, which include ID-TIMS ages without petrographical context, are not likely representative of the 30 000 km^2 area (Table 1; Appendix 1, Fig. A1.1) and additional age populations are likely.

4. Methodology

Ten metasedimentary rocks were selected for *in situ* U-Pb monazite dating, including samples from each metamorphic zone (Table 3, Fig. 3). Bulk rock compositions, field and petrographic observations of each sample are presented in Appendix 1, together with interpreted metamorphic history. In each sample, 15-30 monazite grains were identified for *in situ* U-Pb dating in polished thin sections using a scanning electron microscope (SEM). Monazite grains are mostly 30-100 μm long and were dated in several microstructural contexts: along mineral boundaries, inclusions in matrix minerals and in garnet, and aligned with S_1. Monazite U-Pb dating was performed at the University of New Brunswick (Canada) using the LA-ICP-MS method with a 10-13 μm lateral spot size, following the analytical methodology described in Appendix 1.

To further resolve the timing of thermal events, U-Pb depth profiling (SIMS) was undertaken at the University of California – Los Angeles (USA) on zircon separated from five metasedimentary rocks and one tonalite orthogneiss from the mid- and upper-amphibolite-facies zones (Table 3; Fig. 3). The field relationships, petrography and bulk rock chemistry of each sample are presented in Appendix 1. For each sample, 15 zircon grains from the 100-300 μm-size fraction were pressed into indium mounts. The unpolished zircon grains were imaged using an SEM. Surface compositions were analyzed semi-quantitatively using energy dispersive X-ray spectroscopy (EDS) to verify zircon composition and to screen for outgrowths or inclusions of

other minerals. During U-Pb depth profiling, an ion beam was focused directly onto the unpolished zircon surface and U-Pb data were measured throughout the analysis crater depth, enabling U-Pb dating of zircon rims as thin as ~1 µm (e.g., Breeding et al., 2004; Schneider et al., 2011, 2012).

Zircon trace element depth profiling (LA-ICP-MS) was conducted at the Geological Survey of Canada (Ottawa). The laser beam was directed onto the unpolished surface of each zircon, adjacent to the location of the SIMS U–Pb depth profiling crater. The depths of analysis craters formed by U–Pb and trace element depth-profiling were measured using a profilometer at the University of California – Los Angeles (USA) to determine rim thicknesses.

Following acquisition of the U-Pb and trace element depth profiling analyses of unpolished zircon surfaces, the indium mounts were polished to reveal zircon interiors. Backscattered electron imaging was conducted on the polished zircon interiors using an SEM. To confirm the presence of older zircon domains, LA-ICP-MS U-Pb spot ages were obtained on zircon cores and, if space allowed, on the grain edge or rim. Details of sample preparation and analytical methodology for zircon U-Pb depth profiling, trace element depth profiling, profilometer measurements and U-Pb dating of zircon interiors are provided in Appendix 1.

5. *In situ* U-Pb monazite geochronology results

In each sample, the single spot U-Pb monazite analyses were classified based on the petrographical context of the analysed grains (colour-coded in Figs. 4–7), forming the following textural groups: matrix monazite grains that are not aligned with fabric; S_1-aligned matrix grains; inclusions in garnet that are not aligned with fabric; inclusions in garnet that are aligned with S_1 (parallel to S_1 in the matrix); and inclusions in garnet that define non-S_1-parallel or spiral-shaped inclusion trails. These inclusion trails are defined by peak or near-peak metamorphic assemblages

and are interpreted to record an early stage of S_1 fabric development. S_1-aligned monazite grains are elongate-parallel to S_1 or have crystal faces that are clearly aligned with S_1. Round grains or those with ambiguous relationships to fabric are considered non-S_1-aligned.

Every sample yields a ca. 60–120 Myr dispersion of single spot monazite ages that form a continuous spread on concordia between ca. 1750 and 1860 Ma (Figs. 4–6). Due to the scatter in single spot analyses, no single concordia age could be resolved for any sample or for any petrographical group of analyses. In each sample, a weighted average $^{207}Pb/^{206}Pb$ age was calculated for each petrographical group of analyses and a "total" weighted average $^{207}Pb/^{206}Pb$ age was calculated from all analyses (Table 4; Figs. 4–6) using Isoplot v. 4.15 (Ludwig, 2003). Uncertainties on ages of individual spot analyses are propagated uncertainties reported at the 2σ level. Calculated weighted average $^{207}Pb/^{206}Pb$ ages are given at the 95% confidence (~2σ) level. Some samples contain analyses that are discordant or reversely discordant, which typically have $^{207}Pb/^{206}Pb$ ages of ca. 1880–2700 Ma or, less commonly, younger than 1750 Ma. Analyses with ≥10% discordance are not included in the quoted weighted average $^{207}Pb/^{206}Pb$ ages. Due to the high volume of data (303 single spot analyses), the U-Pb analytical data are provided in Appendix 2 and the results of individual samples are described in Appendix 1. A summary of U-Pb monazite geochronology results is given below.

5.1. Matrix monazite

Matrix monazite occurs along grain boundaries and within matrix minerals, including: quartz, plagioclase, biotite and muscovite in mid-amphibolite-facies rocks; and quartz, plagioclase, K-feldspar, cordierite and biotite in granulite-facies rocks. Most matrix monazite ages are between ca. 1860–1800 Ma, with dominant ages of ca. 1840–1820 Ma (Fig. 7). Matrix monazite older than ca. 1860 Ma is extremely rare. Weighted average $^{207}Pb/^{206}Pb$ ages of S_1-aligned and non-S_1-aligned

matrix monazite are within 2σ errors, and have similar ranges of 1759 ± 10 to 1838 ± 8 Ma and 1760 ± 50 to 1849 ± 12 Ma, respectively (Figs. 4–6; Table 4). The weighted average ages of matrix monazite vary similarly in each metamorphic zone on Hall Peninsula, ranging from ca. 1825–1759 Ma in the mid-amphibolite-facies zone, ca. 1837–1760 Ma in the upper-amphibolite-facies zone and ca. 1849–1804 Ma in the granulite-facies zone. The dispersion of matrix monazite ages (mostly between ca. 1850–1750 Ma) commonly results in very high MSWDs (4.9–41) for weighted average $^{207}Pb/^{206}Pb$ ages. Matrix monazite ages are more clustered in some samples (H45A, S92C, F38A 13F122A, S1A), resulting in smaller MSWDs (0.13–2.6) on calculated ages between ca. 1837–1817 Ma.

In addition to single-analysis grains yielding ages of ca. 1860–1820 Ma (Fig. 8e), numerous grains have multiple ca. 1860–1820 Ma analyses that are within 2σ uncertainty, with no detectable intra-grain age variation (Fig. 8f, i, j, l). These include up to four grains in each of samples H45A, S92C, S162A, F38A, 13F122A, S1A and Z1A. Less abundant matrix monazite analyses that are 1800 Ma and younger (Fig. 7) are from single-analysis grains or, in many cases, from crystals with additional older (beyond 2σ errors) ca. 1860–1820 Ma domains (Fig. 8a, f). Compositional zoning in BSE images seems to correspond to different-aged domains in some grains, but generally shows no relationship with age (Fig. 8a, f, i, j, l). A few matrix monazite grains have multiple ca. 1800 Ma and/or younger analyses that are within 2σ uncertainties of each other, and no other apparent age domains (Fig. 8b). These include up to three grains in each of H45A, S92C, S162A, F38A, S1A and S60A. The ca. 1800 Ma and younger ages can be within 2σ errors of the predominant, ca. 1840–1820 Ma monazite in each sample, but they are sometimes distinctly younger. For instance, ca. 1800 Ma monazite in Z1A is markedly younger than the average ca. 1846 Ma monazite age, and in H45A, ca. 1800 Ma domains are distinctly younger than the average ca. 1847

Ma age of monazite included in garnet (Fig. 8b, c). Sample S165B is an exception, as no monazite older than ca. 1800 Ma was encountered during U–Pb analysis. Most matrix monazite grains in S165B yield ages between ca. 1780 and 1740 Ma, including eight grains with multiple ca. 1770–1740 Ma analyses and no other apparent age domains.

5.2. Monazite inclusions in garnet

S_1-aligned monazite inclusions in garnet were dated in five samples (1–9 grains/sample), ranging in grade from mid-amphibolite-facies to granulite-facies (S165B, S162A, F38A, S1A, Z1A). Non-aligned monazite inclusions in garnet were dated in five samples (1–7 grains/sample) from the upper-amphibolite-facies (S162A, F38A, 13F122A) and granulite-facies (S60A, Z1A) zones. The inclusion assemblages are comprised of peak (or near-peak) metamorphic minerals, including quartz, plagioclase and biotite in mid-amphibolite-facies rocks, as well as sillimanite in upper-amphibolite- and granulite-facies samples (+ cordierite in Z1A). Regionally, the most common ages of S_1-aligned and non-aligned monazite inclusions in garnet are ca. 1860–1820 Ma, with less abundant ages of ca. 1820–1790 Ma and ≥1860 Ma (Figs. 4–7). In each sample, the ages are generally more tightly clustered (MSWDs of weighted average ages ≤3.2) than those in matrices. In several samples (S162A, Z1A, 13F122A, S1A), all garnet inclusion ages are ≥1820 Ma. For samples in which both S_1-aligned and non-aligned monazite inclusions were dated, their weighted average ages are within 2σ uncertainties. Weighted average $^{207}Pb/^{206}Pb$ ages of S_1-aligned monazite grains are between 1828 ± 18 and 1820 ± 10 Ma in three samples, whereas S165B yields an age of 1789 ± 8 Ma (determined from one grain) and Z1A produces an older age of 1845 ± 16 Ma. Non-aligned monazite produces similar ages, ranging from 1860 ± 17 to 1826 ± 29 Ma, and S60A yields an age of 1797 ± 10 Ma from a monazite grain in a fractured garnet rim. In several cases, multiple analyses of individual monazite inclusions yield indistinguishable $^{207}Pb/^{206}Pb$ ages

of ca. 1860–1820 Ma, including in 1–3 grains in each of samples S162A, F38A, 13F122A and Z1A. In Z1A, a monazite inclusion intergrown with fine-grained sillimanite and cordierite in an S_1-parallel inclusion trail yields ages of ca. 1839 and 1851 Ma (Fig. 8k). In a single monazite inclusion in each of S165B and F38A, multiple analyses produce similar ages of ca. 1800 Ma, with no other apparent age domains. Intra-grain age variation is uncommon, and occurs in one grain in each of S162A and Z1A, in which a ca. 1830 Ma domain is adjacent to a ≥1900 Ma domain.

Monazite in spiral-shaped, early-S_1 garnet inclusion trail fabrics was dated in three samples (2–6 grains/sample), including an upper-amphibolite-facies pelite (F38A) and two mid-amphibolite-facies metasedimentary rocks (H45A, S165B). In samples F38A and H45A, early-S_1 monazite inclusions in garnet yielded ages ≥1830 Ma, producing equivalent weighted average $^{207}Pb/^{206}Pb$ ages of ca. 1851 ± 16 Ma (MSWD=0.63) and 1847 ± 17 Ma (MSWD=2.0). Early-S_1 inclusion trails in sample F38A are defined mainly by ilmenite and very fine-grained sillimanite. They contain a monazite grain that is intergrown with sillimanite, with four analyses yielding equivalent $^{207}Pb/^{206}Pb$ ages of ca. 1850–1837 Ma (Fig. 8h). Spiral-shaped, early-S_1 garnet inclusion trails in sample H45A are defined mainly by ilmenite and biotite, and contain several single-analysis monazite grains with $^{207}Pb/^{206}Pb$ ages of ca. 1849–1830 Ma (Fig. 8c), as well as a grain with two analyses yielding $^{207}Pb/^{206}Pb$ ages of ca. 1883 and 1870 Ma. Two monazite grains in early-S_1 inclusion trails in sample S165B produced an age of 1760 ± 89 Ma (MSWD=1.5). One of these grains occurs within a multi-phase inclusion of staurolite, plagioclase and ilmenite (Fig. 8d).

6. Zircon U-Pb geochronology results

The U-Pb zircon geochronology results are summarized in Table 5. Due to the high volume of SIMS U-Pb depth profiling data collected (~90 depth profiles), the analytical data are presented in Appendix 3. The analytical data from LA-ICP-MS U-Pb spot analyses obtained on polished zircon interiors are provided in Appendix 4. The notes beneath Table 5 explain the rationale for age reporting and common Pb corrections of LA-ICP-MS U-Pb spot analyses. Zircon crystals analyzed comprise ~100-300 μm-long, 2:1 and 3:1 prismatic crystals that are subhedral to euhedral (Fig. 9). Some zircon grains in each sample have flat, smooth crystal faces whereas others have more uneven, slightly bumpy surfaces (Fig. 9d, f, h). Exceptions to this morphology are zircon grains in sample S162A that form equant, ~100-150 μm-sized crystals with poorly developed crystal faces (Fig. 9g). No inclusions or outgrowths of other minerals were identified during SEM and EDS analysis. Some grains in each sample have mottled or flaky surfaces (Fig. 9b, c, d, f); EDS analyses of these surfaces are high in Fe and Al. Fractures were avoided during U-Pb and trace element depth profiling. Some grain surfaces (especially in sample F28A) have networks of very fine (1-2 μm wide) fractures (Fig. 9h) that were sometimes unavoidable during analysis, and produced U-Pb depth profiles with high ^{204}Pb and discordant ages. Otherwise, there is no apparent relationship between zircon rim age and crystal habit, zircon surface appearance or analysis spot location.

6.1. Calculation of zircon rim U-Pb ages from depth profiles

Using the U-Pb depth profiling technique to date metamorphic zircon rims requires a definition of what constitutes a zircon "rim" on a U-Pb depth profile. For each zircon depth profile, the ^{207}Pb/^{206}Pb age was plotted against depth into the crystal (Fig. 10; Appendix 3). The ^{207}Pb/^{206}Pb ages are reported due to the high yield of radiogenic Pb and because the 1σ errors on ^{207}Pb/^{206}Pb

ages are much lower than on $^{206}Pb/^{238}U$ and $^{207}Pb/^{235}U$ ages. Zircon "rim" ages were determined for intervals of depth profiles that meet the following criteria: (1) $^{207}Pb/^{206}Pb$ ages were younger than 1900 Ma, because older determinations are considered to represent detrital/xenocrystic cores or intervals of mixed core-rim ages based on existing detrital zircon ages of metasedimentary strata (≥1906 Ma; Rayner, 2014, 2015); (2) the analyses had <15% discordance, which was calculated from isotope ratios for each mass using the formula of Petrus and Kamber (2012) and Guitreau and Blichert-Toft (2014; Equation 5); and (3) on a plot of $^{207}Pb/^{206}Pb$ age versus depth, there were ≥5 consecutive analyses (cycles, or mass sweeps) that had a weighted mean $^{207}Pb/^{206}Pb$ age with a >5% probability-of-fit, and the slope of the error-weighted line through the weighted ages was 0 at 5% confidence. For each zircon, the reported rim age (Table 5) is the weighted average (±2σ) of the $^{207}Pb/^{206}Pb$ ages of all mass sweeps included in the rim interval, as defined by the criteria above. The Th/U value of each rim was calculated by averaging the Th/U of all mass sweeps within the rim interval. Some zircon grains (e.g. sample S103A) have a second, thinner plateau of $^{207}Pb/^{206}Pb$ ages that conform to our definition of a rim, and approximate ages of these subordinate (inner or outer) rims are given in Table 5. Consistently, the initial few analyses of the outermost zircon surfaces have highly variable $^{207}Pb/^{206}Pb$ ages (e.g. ~1000-1900 Ma) with large 1σ errors (± ≥100 Ma), have extremely high Th/U values and are mostly discordant. These do not meet our definition of a rim and are excluded from the $^{207}Pb/^{206}Pb$ weighted average age calculations.

6.2. Classification of zircon U-Pb depth profiles

The zircon U-Pb depth profiles are categorized into six different types (Types 1A, 1B, 2A, 2B, 3, 4; Table 5). Half of the depth profiles exhibit an outer rim with concordant U-Pb ages, including: Type 1A profiles (20%) in which a concordant rim is followed by an older, >1900 Ma zircon interior (Fig. 10a); and Type 1B profiles (30%) in which the entire profile is considered to

represent a concordant zircon rim and no >1900 Ma ages were encountered (Fig. 10b). In ~20% of the depth profiles, zircon rims have >15% discordance but otherwise meet the above criteria for defining rims, including: Type 2A profiles (12%) in which a discordant rim precedes an older, >1900 Ma zircon interior (Fig. 10c); and Type 2B profiles (8%) in which the entire profile is interpreted as a discordant zircon rim and no >1900 Ma ages were encountered. Zircon grains with Type 3 profiles (27%) have no identifiable rims (Fig. 10d). Type 4 profiles (3%) are characterized by concordant rims with unusually high 1σ errors on $^{207}Pb/^{206}Pb$ ages (±100-200 Ma), low U concentrations (100-200 ppm) and often contain <98% radiogenic ^{206}Pb. A bulk zircon rim age was calculated for each sample (Fig. 11) from the $^{207}Pb/^{206}Pb$ weighted average ages of all rim material in Type 1A and 1B profiles because they are considered to be the most reliable rim ages.

6.3. Zircon U-Pb results

6.3.1. Sample S36A: Mid-amphibolite-facies pelite

Zircon rims in sample S36A (Type 1A and 1B) yield $^{207}Pb/^{206}Pb$ weighted average ages of ca. 1799-1756 Ma, ca. 1825 Ma and 1848 Ma. Rim thicknesses range from ~0.6 μm to at least ~4 μm. Half of the rims have Th/U values less than 0.01, and the other half have Th/U values of 0.01-0.026. Two bulk rim ages were calculated for the sample, producing $^{207}Pb/^{206}Pb$ weighted average ages of 1779 ±3 Ma (MSWD=0.74) and 1845 ±10 Ma (MSWD=1.15), respectively (Fig 11a). Other zircon grains have discordant rims (Type 2) yielding $^{207}Pb/^{206}Pb$ weighted average ages of ca. 1850-1780 Ma. Zircon cores from analyzing the polished mount range in age from 2606 ±8 to 2084 ±14 Ma. Additional analysis spots of polished zircon grains that targeted what appeared to be rims in BSE images yielded similar ages as zircon cores, except for two rim analyses dated at 1868 ±13 Ma and 1854 ± 52 Ma, which also have younger (ca. 1780 and 1767 Ma) rims identified by depth profiling (Table 5).

6.3.2. Sample S103A: Mid-amphibolite-facies psammite

U-Pb depth profiles in sample S103A only resolved zircon younger than 1900 Ma, and rim material comprises the entire ~4 µm-deep pit in each grain. Twelve grains have Type 1B profiles, including nine grains with rims dated at ca. 1873-1820 Ma and three grains with rim ages of ca. 1724 Ma, 1772 Ma and 1780 Ma. The Th/U value is variable in both sets of rims, ranging from 0.01 to 0.19. The ca. 1724 Ma rim (z13) has a much higher Th/U ratio of 0.35, and the $^{207}Pb/^{206}Pb$ age of the profile becomes older with depth, to ca. 1800-1780 Ma. Two bulk zircon rim ages were calculated: 1833 ±2 Ma (MSWD=1.10) and 1764 ±6 Ma (MSWD=2.3) (Fig. 11b). Two grains with ca. 1849 Ma and ca. 1839 Ma rims have outer, thinner rims with $^{207}Pb/^{206}Pb$ weighted average ages of ca. 1811 Ma and ca. 1814 Ma, respectively. Another grain with a ca. 1780 Ma rim has an inner ca. 1802 Ma rim (Table 5). Three additional grains have discordant rims yielding ages of ca. 1825-1777 Ma. Polished zircon interiors dated by LA-ICP-MS yielded concordant ages between 1932 ±12 Ma and 1880 ±21 Ma, together with a younger, concordant ca. 1841 Ma analysis and a strongly discordant (24%) ca. 1733 Ma analysis. Laser spot analyses targeting polished zircon rims yielded concordant ages of ca. 1933–1845 Ma.

6.3.3. Sample F122A: Mid-amphibolite-facies pelite

Six grains in sample F122A have Type 1A/1B rims that are ca. 1858-1836 Ma, along with one very thin (0.4 µm) ca. 1796 Ma rim. Rim thicknesses range up to at least 4 µm. The Th/U values of the rims range from 0.01-0.09, although two rims have Th/U <0.01. The rims yield a bulk age of 1842 ±5 Ma (MSWD=0.68) for the sample (Fig. 11c). Four additional grains have discordant rims (Type 2) that yielded $^{207}Pb/^{206}Pb$ weighted average ages of ca. 1890-1835 Ma. Zircon interiors in sample F122A have mostly early Paleoproterozoic ages from 2242 ±21 Ma to 2022 ±19 Ma, with one older grain dated at ca. 2898 Ma. Laser spot analyses of what appeared to

be zircon rims in polished zircon grains yielded similar ages of ca. 2189–2028 Ma, as well as one strongly discordant (30%) age of ca. 2782 Ma.

6.3.4. Sample S162A: Upper-amphibolite-facies pelite

Only four grains have depth profiles with concordant rims, including two with ages of ca. 1789 Ma and 1814 Ma (Type 1A) and two with ages of ca. 1694 Ma and 1772 Ma that have large errors (Type 4). The bulk zircon rim age calculated from the two Type 1A rims yielded a $^{207}Pb/^{206}Pb$ weighted average of 1800 ±21 Ma (MSWD=0.62) (Fig. 11d). Rim thicknesses range from 0.9-2.5 µm, and Th/U values are between 0.01 and 0.03. Three additional grains have Type 2 profiles with discordant rims yielding ages of ca. 1844-1789 Ma. Zircon interiors have concordant ages between 2840 ±19 Ma and 2513 ±21 Ma, except for one interior dated at 2050 ±23 Ma. Only two zircon grains were large enough for a second laser spot analysis positioned on the grain rim/edge, which both produced Neoarchean ages.

6.3.5. Sample F28A: Upper-amphibolite-facies psammite

Zircon grains in sample F28A have more surface irregularities than in other samples, including bumpy surfaces and/or networks of fine (≤2 µm-wide) microfractures (Fig. 9h). Five grains have Type 1A/1B rims with $^{207}Pb/^{206}Pb$ weighted average ages of ca. 1883-1825 Ma and ca. 1691 Ma. Rim thicknesses range from 0.7-4 µm, and Th/U values range from 0.01-0.02. The bulk $^{207}Pb/^{206}Pb$ weighted average age of rims in the sample is 1861 ±5 Ma (MSWD=0.67), not including the much younger, ca. 1691 Ma rim (Fig. 11e). Two other grains have discordant rims (Type 2) at ca. 1870 Ma and ca. 1824 Ma, and one zircon rim has an unreliable rim age of 1838 ±93 Ma (Type 4). Rims are absent in the six remaining grains (Type 3). Zircon interiors in sample F28A generally have lower %Pb* and higher %discordance than other samples and yield a spread of ages (Table 5). Most core ages are between ca. 2286 and 2053 Ma, whereas three ages (with 3–

9% discordance) are between ca. 1907 and 1873 Ma, and one ^{204}Pb-corrected age is ca. 3314 Ma. Two additional, discordant (20–29%) zircon cores yield ages of ca. 1797 and 1757 Ma. The four rims analyzed in polished zircon have variable ages, from ca. 2048–1873 Ma.

6.3.6. Sample S106A: Mid-amphibolite-facies tonalite gneiss

Most zircon grains in sample S106A have rim ages (Type 1A/1B) ranging from ca. 1855-1828 Ma, whereas two rims were dated at ca. 1768 Ma and 1766 Ma. The Th/U values of the rims range from 0.01-0.04, and the ca. 1766 Ma rim has a Th/U of 0.13. The rims are between 0.7 and 4 μm thick. Two bulk zircon rim ages were calculated for the sample: 1849 ±4 Ma (MSWD=0.70) and 1767 ±10 Ma (MSWD=0.65) (Fig. 11f). One grain with a ca. 1768 Ma rim has a thin inner rim dated at ca. 1833 Ma. Another grain has a discordant rim yielding an age of ca. 1836 Ma, and the remaining five grains do not have rims (Type 3). Zircon interiors yielded Archean ages between 2907 ±22 and 2553 ±20 Ma, as well as a younger age of ca. 2360 Ma, all with ≤12% discordance. All spot analyses aimed at zircon "rims" that were visible in BSE images of polished grain interiors are also Archean.

7. Zircon trace element results

Trace element compositions of zircon rims and interiors are presented in Appendix 5. For each laser ablation depth profile, trace element concentrations were plotted against crater depth (Fig. 12). The first 1–2 s of ablation (~0.4-0.8 μm) in each analysis yield high concentrations of P and REE for zircon (Fig. 12), and low Zr concentrations. This suggests sub-micrometer outgrowths of another mineral on zircon surfaces, such as apatite or xenotime, as has been documented for other zircon that has witnessed high fluid:mineral interaction and coupled dissolution-reprecipitation processes (Tomaschek et al., 2003; Schneider et al., 2011). Many grains have

bumpy or flaky surface structure (Fig. 9), but P+REE-rich minerals were not identified during EDS analyses of zircon surfaces prior to depth profiling, possibly because they were beyond the limits of EDS detection. These initial high-P+REE LA-ICP-MS values were excluded from the calculated zircon compositions.

Since the purpose of zircon trace element depth profiling in this study is to investigate compositional differences between zircon rims and interiors and between rims of different ages, the trace element compositions were calculated with careful attention to U-Pb depth profiles. Notably, the two profiles are not necessarily comparable because trace element and U-Pb depth profile pits were ablated on different parts of each grain (Fig. 9) and zircon rim material may not form a homogeneous carapace. The trace element compositions of zircon rims and interiors were calculated by averaging the measured concentrations over each depth interval, following the methodology described in Appendix 1.

Zircon rims identified by U-Pb depth profiling are typically compositionally unique from grain interiors. The rim trace element signature may possess the same approximate thickness as the rim identified on the corresponding U-Pb depth profile, but often extends deeper into the crystal (Fig. 12). The rim is followed by a transitional zone of mixed core-rim composition with a similar or lesser thickness, which may represent mixing of sample aerosol from successive laser pulses. Within each sample, zircon rims and interiors generally have the same overall ranges in trace element compositions (Fig. 13). However, systematic chemical differences between rims and interiors are revealed by plots of selected trace element concentrations and ratios relative to $^{207}Pb/^{206}Pb$ age (Fig. 14; Appendix 1, Figs. A6.1–A6.4), and by direct comparisons of rim and interior compositions in individual grains (Appendix 1; Fig. A6.5). Notably, there is no apparent

relationship between the ages of zircon rims (e.g., 1750 Ma vs. 1850 Ma) and their trace element compositions.

In sample S36A, zircon rims and interiors both have broad ranges of La_N/Yb_N (≤0.001–0.031 and ≤0.001–0.034, respectively), but some rims are LREE-enriched or -depleted relative to interiors of the same grains or have higher overall REE concentrations. Rims in S36A have lower Th/U (0.01–0.10) and elevated Hf (9–14 × 10^3 ppm) relative to interiors (Th/U=0.01–0.54; Hf=8–11 × 10^3 ppm; Fig. 14). Rims and interiors both have variable Eu/Eu* (0.13–3.11 and 0.20–2.50, respectively) and mostly positive Eu anomalies (Figs. 13, 14), with an increase in Eu/Eu* from interior-to-rim in most grains (Appendix 1; Fig. A6.5).

Zircon rims and interiors in S103A also have wide ranges of La_N/Yb_N (≤0.001–0.02 and ≤0.001–0.008, respectively), and most rims are LREE-depleted relative to interiors of the same crystals. Rims in S103A generally have lower Th/U (0.01–0.19) and higher Hf (10–18 × 10^3 ppm) than interiors (0.01–0.93 and 9–15 × 10^3 ppm, respectively). Most analyzed domains have negative Eu anomalies, apart from two interiors with slightly positive Eu anomalies and one rim with Eu/Eu*=2.6. The Eu/Eu* values of rims are generally slightly lower than those of interiors in the same grains.

In F122A, REE pattern slopes of zircon rims and interiors are variable (in both, La_N/Yb_N= ≤0.001–0.012), and rims are mostly LREE-enriched relative to interiors of the same grains or have lower REE concentrations. Rims in F122A generally have lower Th/U (mostly 0.01–0.13) and higher Hf (10–12 × 10^3 ppm) than interiors (Th/U=0.04–0.80; Hf=8–13 × 10^3 ppm). Rims and interiors have negative Eu anomalies, except for two rims (Eu/Eu*=1.1–1.3). The positive Ce anomalies of the rims have lower magnitudes than those of interiors.

Zircon rims in S106A exhibit wide-ranging La_N/Yb_N values (0.001–0.148) that are similar to those of interiors (≤0.001–0.132), and are LREE-enriched, LREE-depleted or HREE-enriched relative to interiors of the same grains. Zircon rims in S106A have lower Th/U (mostly 0.02–0.11) and higher Hf (14–20 × 10^3 ppm) relative to interiors (Th/U=0.10–0.63; Hf=9–14 × 10^3 ppm). S106A rims and interiors have negative Eu anomalies, except for four rims with positive Eu anomalies (Eu/Eu*=1.04–7.72). Rims and interiors have positive Ce anomalies, which tend to have smaller magnitudes in rims relative to cores.

In garnet-bearing, upper-amphibolite-to-granulite-facies samples (S162A, F28A), zircon REE patterns have much shallower slopes than those of mid-amphibolite-facies samples, and zircon also exhibits strongly positive Eu anomalies. In S162A, zircon interiors have variable La_N/Yb_N values (0.007–0.137) and rims generally have REE patterns with shallower slopes (La_N/Yb_N=0.018–0.125). Relative to interiors of the same crystals, S162A rims exhibit a wide variety of compositional differences, including: lower total REE concentrations; HREE-enrichment or -depletion; LREE-enrichment or -depletion; or MREE-enrichment. Rims have lower Th/U (mostly ≤0.07) relative to interiors (Th/U=0.01–0.89). Rims and interiors in S162A have strongly positive Eu anomalies (Eu/Eu*=1.45–8.32 and 0.64–9.23, respectively), which have slightly different magnitudes (higher/lower) in rims relative to interiors of the same grains. Both domains also have positive Ce anomalies, and several are smaller in rims than in interiors of the same grains.

In F28A, zircon rims and interiors have relatively shallow-sloping REE patterns with La_N/Yb_N values of 0.006–0.178 and 0.006–0.193, respectively. Compared to interiors of the same crystals, rims have lower concentrations of all REE or are LREE-enriched and/or HREE-depleted. Rims generally have lower Th/U (≤0.01–0.07) and elevated Hf (9–14 × 10^3 ppm) relative to

interiors (Th/U=0.01–0.40; Hf=8–11 × 10^3 ppm). Rims and interiors have positive Ce anomalies and strongly positive Eu anomalies, and both anomalies are generally smaller in rims (Eu/Eu*=1.31–6.53; Ce/Ce*=0.8–1.2) than in interiors.

8. Discussion

8.1. Interpretation of in situ U-Pb monazite geochronology

Metamorphic monazite growth has been documented over a wide range of temperatures, from ≤450°C to >700°C, including along the prograde path, near the thermal peak, during melt crystallization and resulting from retrograde garnet consumption (e.g., Catlos et al., 2001; Pyle and Spear, 2003; Kohn and Malloy, 2004; Mahan et al., 2006; Spear and Pyle, 2010). Furthermore, monazite U-Pb ages can be reset by fluid-assisted coupled dissolution-reprecipitation (recrystallization) at temperatures as low as 450°C (Seydoux-Guillaume et al., 2002; Harlov and Hetherington, 2010; Williams et al., 2011). Considering the ~720°C to ≥850°C peak temperatures attained on Hall Peninsula, evidence for partial melting and post-thermal-peak garnet resorption (Skipton et al., 2016), the widely dispersed monazite ages likely record progressive stages along the regional P-T path and, potentially, the effects of coupled dissolution-reprecipitation. Several key relationships enable the monazite U–Pb ages to be linked to the tectono-metamorphic evolution.

Monazite older than ca. 1860 Ma is rare, largely occurs as inclusions in garnet and often produces discordant ages. Analyses ≥1900 Ma likely reflect a xenocrystic component that is well-documented in the zircon U-Pb ages (Rayner, 2014, 2015; this study). Analyses between ca. 1900–1860 Ma probably represent mixed ages or pre-1860 Ma tectonothermal activity, as inferred from a ca. 1867 Ma garnet leucogranite body that is interpreted as a partial melt of granulite-facies strata

(Rayner, 2014). The scarcity of pre-1860 Ma monazite implies that pre-1860 Ma metamorphism, if present, was localized, did not produce abundant monazite or the monazite was mostly recrystallized.

The majority of monazite analyses on Hall Peninsula have U–Pb ages between ca. 1860 and 1800 Ma, irrespective of metamorphic grade or the petrographic location or structural orientation of monazite (Figs. 4–7). Monazite ages of ca. 1860–1820 Ma are particularly abundant, representing the largest portion of S_1-aligned, early-S_1-aligned and non-aligned monazite in garnets and matrices. Numerous grains have multiple ca. 1860–1820 Ma analyses that are within 2σ uncertainties of each other, with no other apparent age domains, suggesting growth during this time period. As the time needed for all Pb to diffuse out of a 50 µm diameter monazite crystal at 800ºC is on the scale of billions of years (e.g., Gardes et al., 2006), it is unlikely that the ca. 1860–1820 Ma ages from ~20–50 µm monazites on Hall Peninsula resulted from high-temperature Pb diffusion out of ≥1860 Ma monazite. Furthermore, amphibolite-facies zones did not surpass Pb diffusion closure temperatures (~800–900°C; Cherniak et al., 2004; Gardés et al., 2006). It is more probable that the abundant ca. 1860–1820 Ma monazite crystallized during progressive stages of regional amphibolite- to granulite-facies metamorphism and S_1 fabric development.

The older monazite within this age range, dated at ca. 1860–1850 Ma, occurs in rock matrices across the peninsula but is particularly common in garnet. In early-S_1 inclusion trails defined by peak or near-peak (prograde) metamorphic minerals, all monazite is ≥1830 Ma (except in S165B, discussed below), producing weighted average ages of ca. 1850 Ma in mid- and upper-amphibolite-facies samples. Furthermore, in granulite-facies sample Z1A, ca. 1850 Ma monazite intergrown with fine-grained sillimanite and cordierite in an S_1-parallel inclusion trail (Fig. 8k) suggests syn-D_1 nucleation of these minerals at ca. 1850 Ma. Therefore, prograde (near-peak)

regional metamorphism and early S_1 development is interpreted at ca. 1860–1850 Ma. The predominance of ca. 1860–1820 Ma monazite in matrices and garnet in almost all samples, petrographic links with peak metamorphic minerals and the preferred alignment with S_1 constrain syn-S_1 peak metamorphism to within a 40 Myr window.

Monazite U–Pb ages of ca. 1800 Ma and younger are less abundant overall, but occur to some degree in all samples, and are dominant in mid-amphibolite-facies samples S165B and B75A and granulite-facies sample S60A. Importantly, monazite yielding ages of ≤1800 Ma generally lacks structural alignment and forms small, single-analysis crystals or domains adjacent to older zones (≥1820 Ma, beyond 2σ errors) in grains that are sometimes S_1-aligned. Furthermore, monazite of this age is rare within garnet, sometimes occurring proximal to micro-fractures, and only two monazite inclusions have multiple analyses that are ≤1800 Ma with no other apparent age domains (in F38A, S165B). Monazite dated at ca. 1800 Ma and younger is therefore interpreted as post-dating garnet growth, the thermal peak and D_1.

Diffusive resetting of U-Pb systematics in pre-existing monazite is implausible at ca. 1800 Ma for the same reasons mentioned above and due to the very high survival rate of older monazite. Neoblastic monazite can be produced by prograde reactions at temperatures as low as ~450°C (Catlos et al., 2001; Pyle and Spear, 2003). However, regional heat influx causing prograde reactions after the thermal peak is not supported by the well-preserved peak metamorphic assemblages or by the P-T history modelled by Skipton et al. (2016). New monazite can be produced by retrograde reactions during melt crystallization at temperatures of ~600°C (Pyle and Spear, 2003). This is unlikely to have resulted in the wide dispersion of post-thermal peak monazite ages from ca. 1800 to 1720 Ma, particularly because samples dominated by this age of monazite contain the least melt (e.g., B75A, S165B).

It is more likely that monazite U-Pb systematics were reset by fluid-assisted coupled dissolution-reprecipitation (recrystallization), which can operate at temperatures as low as 450°C (Seydoux-Guillaume et al., 2002; Harlov and Hetherington, 2010; Williams et al., 2011). Regional retrograde biotite growth and, on eastern Hall Peninsula, retrograde muscovite growth, as described above, indicate that fluids were not exhausted during peak metamorphism (e.g., Vernon and Ransom, 1971). Fluid availability was minimal, however, since chlorite is absent, feldspar is weakly- to non-sericitized and there is no significant veining. Sufficient intergranular fluids may have remained in the system to facilitate coupled dissolution-reprecipitation of monazite, potentially driven by a late-tectonic event at ca. 1800 Ma (Fig. 15; discussed below). In accordance with this interpretation, irregular, patchy zoning patterns in monazite grains with intra-grain age variations documented here (Fig. 8) are similar to zoning patterns produced from fluid-assisted dissolution-reprecipitation in natural and experimentally-altered monazite (Harlov and Hetherington, 2010; Williams et al., 2011). Coupled dissolution-reprecipitation also explains the relatively low abundance and wide age dispersion of monazite dated between ca. 1800 and 1720 Ma.

U–Pb ages between ca. 1820–1800 Ma are relatively abundant in S_1-aligned and non-aligned monazite in matrices and garnet, but cannot be considered a separate population. They are within 2σ errors of the abundant ca. 1860–1820 Ma metamorphic monazite and the ≤1800 Ma post-thermal peak monazite, and could possibly reflect mixed ages. They are interpreted to record the progressive transition from abundant monazite growth during peak (and near-peak) metamorphism to less prolific monazite formation through retrograde reactions and coupled dissolution-reprecipitation. Often S_1-aligned, the ca. 1820 Ma monazite may record early (near-peak) retrograde monazite formation during the waning stages of D_1. Since basement-involved

folding and thrusting (D_2) are interpreted as syn- to post-thermal peak, ca. 1820 Ma monazite likely also records D_2 (Fig. 15), although the minimum age of D_2 is poorly constrained.

The predominance of ca. 1800 Ma and younger monazite in certain samples (S165B, B75A, S60A) suggests localized, intense post-thermal peak coupled dissolution-reprecipitation. Unlike other samples, all monazite dated in S165B is ≤1800 Ma, and it is commonly S_1-aligned and even occurs in spiral-shaped (early-S_1) inclusion trails in garnet (Fig. 8d). This implies that all pre-existing monazite in this sample may have been reset through dissolution-reprecipitation beginning at ca. 1800 Ma, including monazite inclusions in garnet via microfractures. Localized peak metamorphic conditions accompanied by fabric development starting at ca. 1800 Ma cannot be ruled out, but this is unlikely considering the strong evidence for regional peak metamorphism and S_1 at ca. 1860–1820 Ma.

8.2. Interpretation of U-Pb zircon geochronology and trace element analyses

8.2.1. U-Pb ages of zircon interiors

The U-Pb ages of zircon interiors are interpreted as detrital or, in the sample of tonalite orthogneiss (S106A), as primary igneous because they correspond to the published dates of detrital zircon (ca. 3151–1906 Ma; Scott, 1999; Rayner, 2014, 2015) and of Archean basement crystallization (ca. 2920–2701 Ma; Scott, 1999; Rayner, 2014, 2015). The ages of zircon interiors suggest that the ca. 1861–1764 Ma zircon rims identified by U-Pb depth profiling formed secondarily through tectonothermal activity.

8.2.2. U-Pb ages of zircon rims

U-Pb depth profiling makes it possible to date ultra-thin (≤ 4 μm) zircon rims that are indiscernible or barely visible in BSE images and would be unresolvable using conventional SIMS or LA-ICP-MS methods on polished grain mounts. This is illustrated by U-Pb spot dating of

polished grain interiors whereby ages of cores and apparent "rims" (via BSE images) both produced xenocrystic ages (Fig. 9a, b, i). In rare instances, a single spot analysis targeting a polished zircon rim visible in BSE produced a U-Pb date that is within ~2σ of the rim age calculated from depth profiling (Fig. 9d), which supports U-Pb depth profiling as a reliable technique to obtain reproducible ages at high spatial resolution.

Metamorphic zircon can grow during mid-amphibolite- to granulite-facies metamorphism (Hoskin and Black, 2000; Möller et al., 2002; Kohn et al., 2015), including in the subsolidus stage during prograde metamorphism, during melting near or at the thermal peak (Schaltegger et al., 1999) and as a result of melt crystallization and/or garnet breakdown during cooling and decompression (Fraser et al., 1997; Kohn et al., 2015). Coupled dissolution-reprecipitation of existing zircon is documented at amphibolite- and granulite-facies conditions (Schaltegger et al., 1999; Hoskin and Black, 2000) and is the dominant mechanism of U-Pb age resetting at grades below mid-amphibolite-facies where neoblastic zircon growth is uncommon (Hoskin and Schaltegger, 2003; Geisler et al., 2007; Vorhies et al., 2013). Given the P-T history of Hall Peninsula, the zircon rims identified by U-Pb depth profiling probably formed by a combination of metamorphic zircon growth and coupled dissolution-reprecipitation. The predominance of ca. 1861–1833 Ma zircon rims suggests that they reflect regional high-grade metamorphism, as supported by our ca. 1860–1820 Ma *in situ* monazite dates. The less common ca. 1800–1764 Ma zircon rims overlap in age with similarly less abundant ca. 1800 Ma and younger monazite dates, suggesting that they also represent late- to post-orogenic tectonic/thermal activity. Zircon rim petrogenesis is discussed further below, based on trace element chemistry.

8.2.3. Zircon trace element compositions

Zircon rim compositions are highly variable in each sample, and show no apparent relationship with rim ages (Figs. 13, 14; Appendix 1, Figs A6.1–A6.5). Nonetheless, our results reveal chemical differences between zircon rims and interiors that provide insight into rim petrogenesis. In all samples, zircon rims have lower Th/U ratios and are Hf-enriched relative to interiors (Fig. 14; Appendix 1, Figs A6.1–A6.5). Comparably low Th/U ratios (<0.1) are typical of metamorphic zircon, attributed to the preferential purging of Th during coupled dissolution-reprecipitation (recrystallization; Hoskin and Black, 2000) or equilibration with a Th-depleted fluid or melt (Rubatto, 2002; Hoskin and Schaltegger, 2003). Elevated Hf is also characteristic of metamorphic zircon, including zircon that equilibrated with anatectic melt (Rubatto, 2002) or formed through recrystallization of protolith zircon (Pan, 1997; Tomaschek et al., 2003). Smaller positive Ce anomalies in zircon rims compared to cores may be due to competition for Ce with co-crystallizing monazite during metamorphism or to the purging of Ce during coupled dissolution-reprecipitation. Other changes in REE compositions between interiors and rims are non-systematic, suggesting that growth or recrystallization processes formed rims that did not equilibrate with a homogeneous REE reservoir (e.g., Marsh and Stockli, 2015).

In every sample, some zircon rims have steeply-sloping REE patterns with positive Ce anomalies and negative Eu anomalies that are typical of igneous zircon or metamorphic zircon that grew in equilibrium with melt (Rubatto et al., 2001; Hoskin and Schaltegger, 2003). Other rims in each sample have shallow-sloping REE patterns with positive Ce anomalies that are comparable to zircon that grew in equilibrium with garnet (Rubatto, 2002). Elevated HREE in some rims suggest that they grew as a result of garnet breakdown during post-thermal peak decompression (Fraser et al., 1997). However, only two samples contain garnet (F28A, S162A) and partial melting

is only evident in some samples (≥10 vol.% leucosome in F122A, S162A, F28A; ≤5% leucosome in S36A). Alternatively, highly variable trace element chemistry in zircon rims can result from: zircon growth during prograde, subsolidus metamorphism (Schaltegger et al., 1999); purging of non-essential cations during coupled dissolution-reprecipitation (Hoskin and Black, 2000); concentration of non-essential cations along internal "recrystallization fronts" (Hoskin and Black, 2000; Corfu et al., 2003); and the ability of the zircon to retain a "memory" of the primary zircon chemistry (Hoskin and Black, 2000). In some zircon grains with rims identified by depth-profiles, BSE images reveal an outer rim that truncates oscillatory zoning in the zircon interior (Fig. 9c), interpreted as a "recrystallization front" attributed to dissolution-reprecipitation (e.g., Hoskin and Black, 2000; Corfu et al., 2003).

Positive Eu anomalies in zircon rims and interiors in S162A and F28A—and less commonly in S36A, S103A and S106A—are a unique signature of Hall Peninsula zircon. We are confident that this is not an analytical artefact because the typical interference on Eu is BaO ($^{135}Ba+^{16}O=^{151}Eu$) and the calculated BaO production rate is so low that zircon would have to contain >10 000 ppm Ba to produce an interference of 1 ppm on Eu. Furthermore, the mean measured Eu value of 1.83 ± 0.19 ppm in standard reference material BCR-2G (a high-Ba basalt) was equivalent to the established value (1.97 ppm). Zircon normally exhibits negative Eu anomalies, attributed to either (1) reducing magma/melt conditions, since Eu^{2+} is relatively incompatible in the Zr^{4+} site, or (2) plagioclase fractionation resulting in a Eu-depleted magma/bulk composition (Hoskin and Schaltegger, 2003). Almost all zircon interiors in F28A and S162A have strongly positive Eu anomalies. In F28A, most positive Eu anomalies in zircon rims are smaller than in interiors, possibly indicating Eu loss from the rims during recrystallization of protolith zircon. In S162A, positive Eu anomalies in rims are both greater and smaller than those

in interiors, possibly resulting from analyses of recrystallized zones (Eu-poor) and fronts (Eu-rich). However, some rims with positive Eu anomalies surround interiors with negative Eu anomalies in S36A, S103A and S106A. Therefore, elevated Eu in these rims probably did not originate from the interior of the same grain and may reflect an excess of Eu in the grain boundary network. Excess Eu may have resulted from the purging of Eu from other, Eu-enriched protolith zircon through coupled dissolution-reprecipitation, or from equilibration with an Eu-enriched fluid or melt (from plagioclase breakdown?). These Eu-enriched rims also suggest oxidizing conditions during metamorphism, since zircon incorporates Eu^{3+} more readily than Eu^{2+}. The cause of positive Eu anomalies in zircon interiors is uncertain and additional investigation is needed. Detrital zircon studies (e.g., Scott, 1999; Rayner, 2014, 2015) and our limited dating of zircon interiors imply a mostly Archean source such as local tonalite–granodiorite–monzogranite orthogneiss basement.

Examining the relationship between $^{207}Pb/^{206}Pb$ date and Th/U ratio, the Th/U ratio of zircon interiors generally decreases with age, along the same the linear trend that is defined by the decrease in Th/U from interior to rim (Fig. 14). Similarly, the Hf content of zircon interiors mostly decreases with age. This relationship has been documented in depth profiles of zircon metamorphosed at granulite-facies in the Grenville Orogen (Marsh and Stockli, 2015), attributed to incomplete recrystallization of zircon interiors that partially reset the U–Pb isotopic system.

Relationships of U/Ce versus Th have been successfully used to distinguish between igneous and metamorphic zircon (Wooden et al., 2006; Marsh and Stockli, 2015) and Yb_N/Gd_N versus Th/U have been used to investigate relationships between the compositions of zircon domains and tectono-metamorphic processes (Marsh and Stockli, 2015). In this study, zircon interiors have predominantly igneous compositions in U/Ce-Th space (Fig. 14; Appendix 1, Figs.

S6.1–S6.5). Most rims plot in the "metamorphic" field in U/Ce-Th space, although several rims in each sample overlap compositionally with interiors. On Yb_N/Gd_N vs. Th/U plots (Fig. 14; Appendix 1, Figs. A6.1–A6.5), compositional differentiation between rims and interiors is evident in samples F122A, S106A and especially S36A, in which most rims have lower Th/U and elevated Yb_N/Gd_N. Compositional differentiation is weakest in S162A and F28A. Compositional overlap between rims and interiors strongly implies that rims formed through recrystallization of interiors, and that they retained much of the trace element chemistry of protolith zircon (e.g., Hoskin and Black, 2000; Marsh and Stockli, 2015). Considering the higher peak metamorphic temperatures and more significant melting experienced by S162A and F28A, compositional differentiation between zircon rims and interiors in these samples may have been inhibited by an insufficiency of fluids for effective coupled dissolution-reprecipitation.

The zircon rim trace element chemistry indicates that a variety of equilibrium conditions governed trace element distribution in the ca. 1861–1764 Ma zircon rims, and they are interpreted to record a combination of high-grade metamorphic zircon growth and coupled dissolution-reprecipitation.

8.3. Tectonothermal events

8.3.1. 1860-1820 Ma: Regional metamorphism and crustal shortening (D_1+D_2)

Based on petrographic relationships of monazite dated *in situ*, we interpret the prevalent ca. 1860–1820 Ma monazite and ca. 1861–1833 Ma zircon rims to record regional mid-amphibolite- to granulite-facies metamorphism, from prograde (near-peak) metamorphism at ca. 1860 Ma to thermal peak conditions in the subsequent 40 Myr (Fig. 15). D_1 is constrained between ca. 1860–1820 Ma, concurrent with the thermal peak. Since D_2 is interpreted as syn- to post-

thermal peak (Dyck and St-Onge, 2014; Skipton et al., 2016), ca. 1860 Ma monazite provides a maximum age constraint on D_2. The ca. 1820 Ma monazite may record late D_2 deformation (Fig. 15), as several T_2 thrusts are demonstrably post-thermal peak (Chadwick et al., 2015). Considering that the THO terminal collision occurred between ca. 1820 and 1795 Ma, with an overall north-south compressional direction on southern Baffin Island, the east-vergent D_2 event on Hall Peninsula probably ended by ca. 1820 Ma.

Although the monazite and zircon U-Pb ages are mostly within 2σ uncertainties, the 40 Myr range may result from: (i) differences in bulk rock compositions that control the timing of metamorphic reactions involving the growth or dissolution-reprecipitation of monazite and zircon (cf., Rubatto et al., 2001; Fitzsimons et al., 2005; Kelsey et al., 2008; Kelsey and Powell, 2011); (ii) the combined effects of syn-D_1 metamorphism and syn- to post-thermal peak D_2, which represent progressive orogenic events that are inseparable at our geochronological resolution; or (iii) temporal variations in P-T paths across the peninsula, although this is unlikely because the age variations do not correlate to sample location, metamorphic grade or structural setting (Figs. 3–6). Regardless, 40 Myr is a reasonable timescale for high-grade metamorphism in a Proterozoic orogen (cf., Kelsey and Hand, 2015).

The ca. 1860–1820 Ma monazite and zircon rim populations on Hall Peninsula are coeval with granulite-facies metamorphism and fabric development (ca. 1849-1835 Ma) and with younger monazite and zircon (ca. 1833-1829 Ma) farther south in the MIM on Baffin Island (Fig. 15; Scott and Gauthier, 1996; Wodicka and Scott, 1997; St-Onge et al., 2007). As on that portion of the MIM, high-grade metamorphism and concurrent crustal shortening (D_1+D_2) in the study area may be attributed to the subduction/accretion of the Narsajuaq arc in an Andean-margin-type setting and coeval Cumberland Batholith magmatism (Fig. 15; St-Onge et al., 2007) or, alternatively, the

accretion of the Sugluk Block (Corrigan et al., 2009; Whalen et al., 2010). Unlike the ca. 1833–1829 Ma monazite and zircon on the MIM that does not define a fabric or have associated metamorphic mineral growth (St-Onge et al., 2007), monazite of the same age in our study is S_1-aligned and petrographically linked to peak metamorphic mineral assemblages. Therefore, crustal thickening may have been more prolonged on Hall Peninsula than nearer to the Andean-type margin. The ca. 1860–1820 Ma metamorphism on Hall Peninsula defines a metamorphic gradient, from granulite-facies in the west to mid-amphibolite-facies in the east, whereas synchronous metamorphism on the MIM was granulite-facies. The eastward decrease in peak metamorphic grade may be due to the increasing distance from the Andean-type margin, analogous to the decrease in metamorphic grade from orogenic hinterland to foreland.

Regional metamorphism and deformation in the study area during ca. 1860–1820 Ma overlap temporally with: (i) the Torngat collision between the North Atlantic craton and the MIM in northern Labrador (Core Zone) at ca. 1870-1850 Ma (Figs. 2, 15; Van Kranendonk, 1996); and (ii) granulite-facies metamorphism produced from the collision of the composite Rae craton and Aasiaat domain with the North Atlantic craton in West Greenland at ca. 1860-1840 Ma, forming the Nagssugtoqidian orogen (Figs. 2, 15; Connelly et al., 2000). This study therefore supports previous proposed correlations between the MIM and the Aasiaat domain (Fig. 2; Scott, 1999; St-Onge et al., 2009), which is similarly comprised of tectonically interleaved Archean basement and Paleoproterozoic supracrustal rocks (Connelly et al., 2000). However, the dominant SW-striking structural grain and NW-directed thrusting in the Aasiaat domain (Connelly et al., 2000) and the SW-vergent structures of the MIM farther south on Baffin Island (St-Onge et al., 2007) contrast with the dominant SSE-striking structural grain and east-vergent crustal shortening (D_1+D_2) on Hall Peninsula. Their distinct structural kinematics are probably a result of competing principal

stress directions during synchronous accretionary-collisional events, including: terrane accretion to the southern MIM; and the collision of the North Atlantic craton to the MIM (Torngat Orogen) and to the composite Rae and Aasiaat domains (Nagssugtoqidian Orogen) (Figs. 2, 15; e.g. St-Onge et al., 2009; 2015). Isotopic and geochemical characterization of Archean basement on Hall Peninsula and comparisons with Archean basement on the MIM and Aasiaat domain may help to further confirm the proposed cratonic correlations.

8.3.2. 1800–1750 Ma: Post-thermal peak overprint

The extensive ca. 1800 Ma and younger monazite and zircon dates recorded on Hall Peninsula set this dataset apart from previous geochronological studies on southern Baffin Island. Based on petrographic relationships of monazite dated *in situ*, U–Pb ages of 1800 Ma and younger are interpreted as post-thermal peak with no coeval fabric development, and probably formed largely through coupled dissolution-reprecipitation. Zircon trace element compositions strongly support coupled dissolution-reprecipitation as the dominant formation mechanism. Most post-thermal peak monazite and zircon domains (ca. 1800–1750 Ma) are older than ca. 1742–1730 Ma U–Pb titanite dates of Scott (1999) from three samples of Archean tonalite on the eastern peninsula. Thus, they were likely produced at temperatures above the closure temperature of Pb in titanite, which is ~600°C (Cherniak, 1993) or possibly >700°C (Spencer et al., 2013).

The ca. 1800 Ma monazite domains and zircon rims resolved here are coeval with the docking of the lower-plate Superior craton with the upper-plate Churchill collage between ca. 1820–1795 Ma (Fig. 15; St-Onge et al., 2007). On the MIM on southern Baffin Island, the THO terminal collision resulted in an amphibolite-facies overprint of granulites, localized transposition of pre-existing fabrics and ca. 1820–1813 Ma monazite growth (Fig. 15; St-Onge et al., 2007). The amphibolite-facies overprint produced by the THO terminal collision may have extended to Hall

Peninsula, producing post-D_1 retrograde muscovite and biotite phases. Considering that coupled dissolution-reprecipitation of monazite can be aided by strain (Wawrzenitz et al., 2012), late-orogenic reworking of the study area during the THO terminal collision may have provided sufficient strain - in the presence of fluids and probably at amphibolite-facies temperatures - to generate monazite and zircon domains at ca. 1800 Ma without producing a regional metamorphic fabric. D_3 on Hall Peninsula could possibly be related to the terminal collision because the W-striking F_3 axial planes are perpendicular to the approximately north–south direction of the terminal collision on southern Baffin Island. Based on available evidence, D_3 is estimated to have occurred at ca. 1800 Ma (Fig. 15), although there is no petrographic link between D_3 and ≤1800 Ma monazite.

The dataset presented here suggests that the ca. 1800 Ma (and younger) monazite and zircon is most dominant on the eastern peninsula, particularly in rocks affected by post-thermal peak D_2 and/or D_3 structures (e.g. S165B, B75A, S92C, S162A, S36A). The ≤1800 Ma monazite in these samples is more commonly aligned with S_1 than elsewhere, suggesting that syn-thermal peak, S_1-aligned monazite underwent extensive dissolution-reprecipitation starting at ca. 1800 Ma. Localized, post-1800 Ma metamorphism and fabric development are not ruled out, but are not supported by the regional data. Areas on the eastern peninsula affected by post-thermal peak D_2 structures may have been more susceptible to monazite/zircon dissolution-reprecipitation due to pre-existing structural weakness and somewhat elevated geotherms resulting from thrusts as young as ca. 1820 Ma.

Post-thermal peak monazite and zircon ages of dominantly ca. 1800–1750 Ma suggest prolonged elevated temperatures for at least ca. 70 Myr after the thermal peak. This is supported by syenogranite pegmatite dykes that commonly cross-cut S_1 on eastern Hall Peninsula (Bigio and

Lentz, 2015). The dykes are comparable with post-kinematic syenogranite pegmatite dyke swarms elsewhere on the MIM (ca. 1795–1784 Ma; St-Onge et al., 2007) and along the northern margin of the Superior Craton (ca. 1795–1758 Ma; St-Onge et al., 2006; Fig. 15). Late- to post-kinematic pegmatitic dykes are also common in the Nagssugtoqidian orogen, including ca. 1821–1778 Ma dykes in the central Aasiaat domain (Connelly et al., 2000) and ca. 1800–1750 Ma pegmatites in the northern orogen (Garde and Hollis, 2010; Fig. 15).

Late- to post-orogenic tectonothermal activity on Hall Peninsula strengthens proposed correlations with the Nagssugtoqidian orogen in West Greenland, where Mazur et al. (2012) report localized shearing with amphibolite-facies metamorphism at ca. 1780 Ma (Lu-Hf and Sm-Nd garnet dates; Fig. 15). Orogen-scale sinistral strike-slip high strain zones also occurred in the Nagssugtoqidian orogen at ca. 1775 Ma, along with elevated temperatures indicated by U-Pb titanite ages (Connelly et al., 2000). The Torngat Orogen also experienced late-orogenic tectonothermal activity, where cross-orogen shortening caused crustal-scale folding and shearing during ca. 1798-1770 Ma, attributed to the THO terminal collision with the Superior craton (Fig. 15; Van Kranendonk and Wardle, 1997). Therefore, the data suggest that late- to post-orogenic tectonothermal activity occurred throughout the Québec-Baffin-Greenland segment of the THO, and continued for at least 30 Myr after the terminal collision (Fig. 15).

9. Conclusions

Our results demonstrate the effectiveness of combining *in situ* U-Pb monazite dating and zircon U-Pb depth profiling to improve the reliability and robustness of the geochronological record in long-lived, hot collisional orogens. Dating monazite *in situ* enables interpretation of U–Pb ages in the context of the metamorphic and structural history. U-Pb zircon depth-profiling

allows dating of ultra-thin zircon rims that record important late- to post-orogenic tectonothermal episodes and are often unresolvable using conventional spot analyses of polished crystals. Zircon rims and monazite U–Pb ages are remarkably similar, illustrating that both minerals are robust geochronometers for dating peak metamorphism and post-thermal peak tectonic events. Susceptibility to U–Pb resetting during late-orogenic tectonism probably depends on bulk composition, strain and fluid availability. Based on variable trace element compositions of zircon rims, unrelated to rim ages, the rims are interpreted as the combined result of metamorphic zircon growth and coupled dissolution-reprecipitation during ca. 100 Myr of tectonism.

Protracted formation of zircon and monazite during metamorphism and post-thermal peak has been similarly documented in younger hot, collisional orogens such as the Himalaya, constraining tectono-metamorphic events to within ±1–3 Myr over a ca. 55 Myr orogenic history (Kohn, 2016 and references therein). Lower age resolution in the Proterozoic THO presents challenges for linking U–Pb ages with specific events along P-T-d paths. Nonetheless, our combined geochronological approach resolves the age of regional amphibolite- to granulite-facies metamorphism in the study area between ca. 1860–1820 Ma, concurrent with east-vergent crustal shortening (D_1 and D_2). Syn- to post-thermal peak D_2 thrust and folds are interpreted to have occurred between ca. 1860–1820 Ma, but the minimum age requires additional constraints. The new ages for metamorphism and crustal shortening on Hall Peninsula reinforce correlations with the MIM on southern Baffin Island and the Aasiaat domain in West Greenland.

In situ U–Pb monazite and high spatial resolution zircon dating also reveal dates at ca. 1800 Ma that are inferred to record the THO terminal collision and late- to post-orogenic, thick-skinned D_3 folding (Fig. 15). Age constraints on D_3 deformation may be improved by dating cross-cutting intrusions. Post-1800 Ma monazite and zircon are likely related to prolonged elevated temperatures

and post-kinematic pegmatitic dykes. Similar late- to post-orogenic thermal activity recorded in monazite and zircon is widespread in the northeast THO (Fig. 15). Previous U–Pb titanite and $^{40}Ar/^{39}Ar$ dating on Hall Peninsula (Table 1; Appendix 1, Fig. A1.1) suggests sustained temperatures of >600°C until ca. 1730 and >400°C until ca. 1657 Ma (Scott, 1999; Skipton et al., 2015). Analogous thermochronological ages elsewhere in the THO, together with the apparent absence of extensional tectonics at the exposed structural level, imply orogen-wide slow cooling (Wanless, 1970; Schneider et al., 2007; Corrigan et al., 2009). The likely absence of orogenic collapse distinguishes the THO from similar long-duration, large, hot orogens, such as the Grenville Orogen, in which collapse is recorded by normal faults, rapid exhumation and cooling (Cosca et al., 1995; Rivers, 2008; Schneider et al., 2013). Conducting additional thermochronological studies to resolve the younger cooling history of the study area and the broader THO may have important implications for understanding cooling mechanisms in collisional orogens.

The integrated *in situ* U-Pb monazite and zircon depth-profiling analyses presented here provide new age constraints on high-grade metamorphism, crustal shortening and late- to post-orogenic tectonothermal activity in the internal zone of the northeastern THO, and the data further our understanding of protracted tectonothermal activity and the behaviour of zircon and monazite U-Pb systematics in hot, thickened, long-duration orogens.

Acknowledgements

This work was funded by the Canada-Nunavut Geoscience Office (CNGO) as part of the Hall Peninsula Integrated Geoscience Project (HPIGP). Additional support was provided by NSERC funding to DAS and DRS and a Geological Society of America Student Research Grant

to DRS. D. Mate, H. Steenkamp and G. Machado of CNGO are thanked for their leadership and logistical support during field work and for their support and collaboration throughout this project. The HPIGP bedrock mapping group, in particular H. Steenkamp, C. Bilodeau, N. Rayner, M. Young, A. Camacho, B. Dyck, R. From, C. MacKay and Z. Braden, are thanked for their high-quality mapping and many instrumental discussions. Thanks are due to A. Millette for her help in acquiring U–Pb depth profiling data and processing trace element depth profiling analyses. G. Poirier is thanked for his help with SEM imaging of monazite and zircon. Thanks are extended to Y. Luo and B. Boucher for their assistance in acquiring LA-ICP-MS data and to A. Schmitt and R. Economos for their help in obtaining SIMS data. The ion microprobe facility at UCLA is partly supported by a grant from the Instrumentation and Facilities Program, Division of Earth Sciences, National Science Foundation. We are grateful to J. Marsh, N. Rayner and an anonymous reviewer for their helpful reviews of this manuscript. This paper is ESS Contribution 20160003.

References

Andersen, T., 2002. Correction of common lead in U-Pb analyses that do not report ^{204}Pb. Chemical Geology 192, 59–79.

Ashworth, J.R., 1975. The sillimanite zone of the Huntly-Portsoy area in the north-east Dalradian, Scotland. Geological Magazine 112, 113–136.

Ayers, J.C., Dunkle, S., Gao, S. & Miller, C.F., 2002. Constraints on timing of peak and retrograde metamorphism in the Dabie Shan Ultrahigh-Pressure Metamorphic Belt, east-central China, using U-Th-Pb dating of zircon and monazite. Chemical Geology 186, 315-331.

Berman, R. G., Sanborn-Barrie, M., Rayner, N., Whalen, J., 2013. The tectonometamorphic evolution of Southhampton Island, Nunavut: Insight from petrologic modeling and in situ

SHRIMP geochronology of multiple episodes of monazite growth. Precambrian Research 232, 140–166.

Berman, R.G., Sanborn-Barrie, M., Stern, R. & Carson, C., 2005. Tectonometamorphism at ca. 2.35 and 1.85 Ga in the Rae domain, western Churchill Province, Nunavut, Canada: insights from structural, metamorphic and in situ geochronological analysis of the southwestern Committee Bay belt. Canadian Mineralogist 43, 409-442.

Bertrand, J.-M., Roddick, J.C., Van Kranendonk, M. J. & Ermanovics, I., 1993. U–Pb geochronology of deformation and metamorphism across a central transect of the Early Proterozoic Torngat Orogen, North River map area, Labrador. Canadian Journal of Earth Sciences 30, 1470–1489.

Bigio, A., Lentz, D., 2015. Preliminary lithogeochemistry and geochronology of pegmatites of the Hall Peninsula, Baffin Island, Nunavut: implications for REE mineralization potential, in: Summary of Activities 2015, Canada-Nunavut Geoscience Office, 11-20.

Blackadar, R.G., 1967. Geological reconnaissance, southern Baffin Island, District of Franklin. Geological Survey of Canada, Paper 66–47.

Breeding, C.M., Ague, J.J., Grove, M. & Rupke, A.L., 2004. Isotopic and chemical alteration of zircon by metamorphic fluids: U-Pb age depth-profiling of zircon crystals from Barrow's garnet zone, northeast Scotland. American Mineralogist 89, 1067-1077.

Catlos, E., Harrison, T.M., Kohn, M.J., Grove, M., Lovera, O.M., Ryerson, F.J. & Upreti, B.N., 2001. Geochronologic and thermobarometric constraints on the evolution of the Main Central Thrust, central Nepal Himalaya. Journal of Geophysical Research 106, 16177-16203.

Chadwick, T.C., St-Onge, M.R., Weller, O.M., Carr, S.D. & Dyck, B.J., 2015. Ptarmigan Fiord basement-cover thrust imbricates, Baffin Island, Nunavut, in: Summary of Activities 2015, Canada-Nunavut Geoscience Office, 61-72.

Cherniak, D.J., 1993. Pb diffusion in titanite and preliminary results on the effects of radiation damage on Pb transport. Chemical Geology 110, 177-194.

Cherniak, D.J., Watson, E.B., Grove, M., Harrison, T.M., 2004. Pb diffusion in monazite: A combined RBS/SIMS study. Geochimica et Cosmochimica Acta 68, 829-840.

Connelly, J.N., van Gool, J.A.N., Mengel, F.C., 2000. Temporal evolution of a deeply eroded orogen: the Nagssugtoqidian Orogen, West Greenland. Canadian Journal of Earth Sciences 37, 1121-1142.

Connelly, J. N., 2001. Constraining the timing of metamorphism: U–Pb and Sm–Nd ages from a transect across the northern Torngat Orogen, Labrador, Canada. Journal of Geology 109, 57–77.

Corfu, F., Hanchar, J.M., Hoskin, P.W.O., Kinny, P., 2003. Atlas of zircon textures, in: Hanchar, J.M., Hoskin, P.W.O. (Eds.), Zircon, Reviews in Mineralogy & Geochemistry 53, pp. 469-500.

Corrigan, D., Pehrsson, S., Wodicka, N., de Kemp, E., 2009. The Palaeoproterozoic Trans-Hudson Orogen: a prototype of modern accretionary processes. Geological Society, London, Special Publication 327, 457–479.

Cosca, M.A., Essene, E.J., Mezger, K., van der Pluijm, B.A., 1995. Constraints on the duration of tectonic processes: Protracted extension and deep-crustal rotation in the Grenville orogeny. Geology 23, 361-364.

Dyck, B.J., St-Onge, M.R., 2014. Dehydration-melting reactions, leucogranite emplacement and the Paleoproterozoic structural evolution of Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 73–84.

Fitzsimons, I.C.W., Kinny, P.D., Wetherley, S., Hollingsworth, D.A., 2005. Bulk chemical control on metamorphic monazite growth in pelitic schists and implications for U-Pb age data. Journal of Metamorphic Geology 23, 261-277.

Fraser, G., Ellis, D., Eggins, S., 1997. Zirconium abundance in granulite-facies minerals, with implications for zircon geochronology in high-grade rocks. Geology 25, 607-610.

From, R.E., St-Onge, M.R., Camacho, A.L., 2014. Preliminary characterization of the Archean orthogneiss complex of Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 53–62.

Gardés, E., Jaoul, O., Montel, J.-M., Seydoux-Guillaume, A.-M., Wirth, R., 2006. Pb diffusion in monazite: An experimental study of $Pb^{2+} + Th^{4+} = 2Nd^{3+}$ interdiffusion. Geochimica et Cosmochimica Acta 70, 2325-2336.

Garde. A.A., Hollis, J.A., 2010. A buried Palaeoproterozoic spreading ridge in the northern Nagssugtoqidian Orogen, West Greenland, in: Kusky, T.M., Zhai, M.-G., Xiao, W. (Eds.), The Evolving Continents: Understanding Processes of Continental Growth 338, Geological Society, London, Special Publications, pp. 213-234.

Geisler, T., Schaltegger, U., Tomaschek, F., 2007. Re-equilibration of zircon in aqueous fluids and melts. Elements 3, 43-50.

Guitreau, M., Blichert-Toft, J., 2014. Implications of discordant U-Pb ages on Hf isotope studies of detrital zircons. Chemical Geology 385, 17-25.

Harley, S.H, Kelly, N.M., 2007. The impact of zircon-garnet REE distribution data on the interpretation of zircon U-Pb ages in complex high-grade terrains: an example from the Rauer Islands, east Antarctica. Chemical Geology 241, 62-87.

Harlov, D.E., Hetherington, C.J., 2010. Partial high-grade alteration of monazite using alkali-bearing fluids: Experiment and nature. American Mineralogist 95, 1105-1108.

Hoffman, P.F., 1988. United Plates of America, the birth of a craton: Early Proterozoic assembly and growth of Laurentia. Annual Review of Earth and Planetary Sciences 16, 543–603.

Högdahl, K., Majka, J., Sjöstrom, H., Persson Nilsson, K., Claesson, S. & Konečný, 2012. Reactive monazite and robust zircon growth in diatexites and leucogranites from a hot, slowly cooled orogen: implications for the Paleoproterozoic tectonic evolution of the central Fennoscandian Shield, Sweden. Contributions to Mineralogy and Petrology 163, 167-188.

Hoskin, P.W.O., Black, L.P., 2000. Metamorphic zircon formation by solid-state recrystallization of protolith igneous zircon. Journal of Metamorphic Geology 18, 423-439.

Hoskin, P.W.O, Schaltegger, U., 2003. The composition of zircon and igneous and metamorphic petrogenesis, in: Hanchar, J.M., Hoskin, P.W.O. (Eds.), Zircon, Reviews in Mineralogy & Geochemistry 53, pp. 27-62.

Jackson, G.D., Hunt, P.A., Loveridge, W.D., Parrish, R.R., 1990. Reconnaissance geochronology of Baffin Island, N.W.T. Radiogenic Age and Isotopic Studies Report 3, Geological Survey of Canada, Paper 89-2, 123-148.

Kalsbeek, F., Nutman, A.P., 1996. Anatomy of the Early Proterozoic Nagssugtoqidian Orogen, West Greenland, explored by reconnaissance SHRIMP U–Pb dating. Geology 24, 515–518.

Kelsey, D.E., Clark, C., Hand, M., 2008. Thermobarometric modelling of zircon and monazite growth in melt-bearing systems: examples using model metapelitic and metapsammitic granulites. Journal of Metamorphic Geology 26, 199-212.

Kelsey, D., Powell, R., 2011. Progress in linking accessory mineral growth and breakdown to major mineral evolution in metamorphic rocks: a thermodynamic approach in the Na_2O-CaO-K_2O-FeO-MgO-Al_2O_3-SiO_2-H_2O-TiO_2-ZrO_2 system. Journal of Metamorphic Geology 29, 1, 151-166.

Kelsey, D.E., Hand, M., 2015. On ultrahigh temperature crustal metamorphism: Phase equilibria, trace element thermometry, bulk composition, heat sources, timescales and tectonic settings. Geoscience Frontiers 6, 311-356.

Kohn, M.J., 2016. Metamorphic chronology–a tool for all ages: Past achievements and future prospects. American Mineralogist 101, 25–42.

Kohn, M.J., Molloy, M.A., 2004. Formation of monazite via prograde metamorphic reactions among common silicates: Implications for age determinations. Geochimica et Cosmochimica Acta 68, 101-113.

Kohn, M.J., Corrie, S.L., Markley, C., 2015. The fall and rise of metamorphic zircon. American Mineralogist 100, 897-908.

Lewry, J.F., Collerson, K.D., 1990. The Trans-Hudson Orogen: extent, subdivisions and problems, in: Lewry, J.F. & Stauffer, M.R. (Eds.), The Early Proterozoic Trans-Hudson Orogen of North America, Geological Association of Canada, Special Paper 37, 1–14.

Lowdon, J.A., 1960. Age determinations by the Geological Survey of Canada, Report 1 – Isotopic ages, Geological Survey of Canada, Paper 60-17, 5–40.

Ludwig, K., 2003. User's Manual for Isoplot/Ex rev. 3.00: a Geochronological Toolkit for Microsoft Excel. Berkeley Geochronology Center Special Publications 4.

Machado, N., Scott, D. J., Lamothe, D., Philippe, S. & Gariépy, C. 1993. U–Pb geochronology of the western Cape Smith Belt, Canada: New insights on the age of initial rifting and arc magmatism. Precambrian Research 63, 211–223.

Machado, G., Bilodeau, C. & St-Onge, M.R., 2013. Geology, southern part of Hall Peninsula, south Baffin Island, Nunavut, Geological Survey of Canada Canadian Geoscience Map 135 (preliminary). Canada-Nunavut Geoscience Office, Open File Map 2013-1, scale 1:250 000.

MacKay, C.B., Ansdell, K.M., 2014. Geochemical study of mafic and ultramafic rocks from southern Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 85-92.

Mahan, K.H., Goncalves, P., Williams, M.L., Jercinovic, M.J., 2006. Dating metamorphic reactions and fluid flow: application to exhumation of high-P granulites in a crustal-scale shear zone, western Canadian Shield. Journal of Metamorphic Geology 24, 193-217.

Marsh, J.H., Culshaw, N., 2014. Timing and conditions of high-pressure metamorphism in the western Grenville Province: constraints from accessory mineral composition and phase equilibrium modeling. Lithos 200–201(1), 402–417.

Marsh, J.H., Stockli, D.F., 2015. Zircon U-Pb and trace element zoning characteristics in an anatectic granulite domain: Insights from LASS-ICP-MS depth profiling. Lithos 239, 170-185.

Mazur, S., Anczkiewicz, R., Szczepański, J., van Gool, J.A.M., Thirlwall, M., 2012. Paleoproterozoic metamorphism and cooling of the northern Nagssugtoqidian orogen, West Greenland. Precambrian Research 196-197, 171-192.

Möller, A., O'Brien, P.J., Kennedy, A., Kröner, A., 2002. Polyphase zircon in ultrahigh-temperature granulites (Rogaland, SW Norway): constraints for Pb diffusion in zircon. Journal of Metamorphic Geology 20, 727-740.

Palin, R.M., Searle, M.P., St-Onge, M.R., Waters, D.J., Roberts, N.M.W., Horstwood, M.S.A., Parrish, R.R., Weller, O.M., Chen, S., Yang, J., 2014. Monazite geochronology and petrology of kyanite- and sillimanite-grade migmatites from the northwestern flank of the eastern Himalayan syntaxis. Gondwana Research 26, 323-347.

Pan, Y., 1997. Zircon- and monazite-forming metamorphic reactions at Manitouwadge, Ontario. Canadian Mineralogist 35, 105–118.

Petrus, J.A., Kamber, B.S., 2012. VizualAge: A novel approach to laser ablation ICP-MS U-Pb geochronology and data reduction. Geostandards and Geoanalytical Research 36, 247-270.

Pyle, J.M., Spear, F.S., 2003. Four generations of accessory-phase growth in low-pressure migmatites from SW New Hampshire. American Mineralogist 88, 338-351.

Rayner, N.M., 2014. New U-Pb geochronological results from Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 39–52.

Rayner, N.M., 2015. New (2013-2014) U-Pb geochronological results from northern Hall Peninsula, southern Baffin Island, Nunavut, in: Summary of Activities 2014, Canada-Nunavut Geoscience Office, 31-44.

Rivers, T., 2008. Assembly and preservation of lower, mid, and upper orogenic crust in the Grenville Province – Implications for the evolution of large hot long-duration orogens. Precambrian Research 167, 237-259.

Rivers, T., Mengel, F., Scott, D. J., Campbell, L.M. & Goulet, N., 1996. Torngat Orogen – a Paleoproterozoic example of a narrow doubly vergent collisional orogen. In: Brewer, T. S. (ed.) Precambrian Crustal Evolution in the North Atlantic Region. Geological Society, London, Special Publications 112, 117–136.

Rubatto, D., 2002. Zircon trace element geochemistry: partitioning with garnet and the link between U-Pb ages and metamorphism. Chemical Geology 184, 123-138.

Rubatto, D., Hermann, J., 2007. Experimental zircon/melt and zircon/garnet trace element partitioning and implications for the geochronology of crustal rocks. Chemical Geology 241, 38–61.

Rubatto, D., Williams, I.S., Buick, I.S., 2001. Zircon and monazite response to prograde metamorphism in the Reynolds Range, central Australia. Contributions to Mineralogy and Petrology 140, 458-468.

Schaltegger, U., Fanning, C.M., Günther, D., Maurin, J.C., Schulmann, K., Gebauer, D., 1999. Growth, annealing and recrystallization of zircon and preservation of monazite in high-grade metamorphism: conventional and in-situ U-Pb isotope, cathodoluminescence and microchemical evidence. Contributions to Mineralogy and Petrology 134, 186-201.

Schneider, D.A., Heizler, M.T., Bickford, M.E., Wortman, G.L., Condie, K.C., Perelli, S., 2007. Timing constraints of orogeny to cratonization: Thermochronology of the Paleoproterozoic Trans-Hudson orogen, Manitoba and Saskatchewan, Canada, Precambrian Research 153, 65–95.

Schneider, D.A., Senkowski, C., Vogel, H., Grasemann, B., Iglseder, C., Schmitt, A.K., 2011. Eocene tectonometamorphism on Serifos (western Cyclades) deduced from zircon depth-profiling geochronology and mica thermochronology. Lithos 125, 151-172.

Schneider, D.A., Bachtel, J., Schmitt, A.K., 2012. Zircon alteration in wall rock of Pamour and Hoyle Pond Au deposits, Abitibi Greenstone Belt: constraints on timescales of fluid flow from depth-profiling techniques. Economic Geology 107, 1043-1072.

Schneider, D.A., Cope, N., Holm, D.K., 2013. Thermochronology of the Mont Laurier terrane, southern Canadian Grenville Province, and its bearing on defining orogenic architecture. Precambrian Research 226, 43-58.

Scott, D.J., 1996. Geology of the Hall Peninsula east of Iqaluit, southern Baffin Island. Geological Survey of Canada, Current Research 1996-C, 83–91.

Scott, D. J., 1997. Geology, U–Pb, and Pb–Pb geochronology of the Lake Harbour area, southern Baffin Island: Implications for the Paleoproterozoic tectonic evolution of north-eastern Laurentia. Canadian Journal of Earth Sciences 34, 140–155.

Scott, D.J., 1999. U-Pb geochronology of the eastern Hall Peninsula, southern Baffin Island, Canada: a northern link between the Archean of West Greenland and the Paleoproterozoic Torngat Orogen of northern Labrador. Precambrian Research 93, 5–26.

Scott, D.J., Gauthier, G., 1996. Comparison of TIMS (U-Pb) and laser ablation microprobe ICP-MS (Pb) techniques for age determination of detrital zircons from Paleoproterozoic metasedimentary rocks from northeastern Laurentia, Canada, with tectonic implications. Chemical Geology 131, 127-142.

Scott, D.J., Wodicka, N., 1998. A second report on the U-Pb geochronology of southern Baffin Island. Geological Survey of Canada, Paper 1998-F, 47–57.

Scott, D.J., Machado, N., 1995. U–Pb geochronology of the northern Torngat Orogen, Labrador, Canada: A record of Paleoproterozoic magmatism and deformation. Precambrian Research 70, 169–190.

Seydoux-Guillaume, A.-M., Paquette, J.L., Wiedenbeck, M., Montel, J.-M., Heinrich, W., 2002. Experimental resetting of the U-Th-Pb systems in monazite. Chemical Geology 191, 165-181.

Skipton, D.R., St-Onge, M.R., Schneider, D.A., McFarlane, C.R.M., 2016. Tectonothermal evolution of the middle crust in the Trans-Hudson Orogen, Baffin Island, Canada: evidence from petrology and monazite geochronology of sillimanite-bearing migmatites. Journal of Petrology 57(8), 1437–1462.

Skipton, D.R., Schneider, D.A., Kellett, D., Joyce, N., 2015. New insights on the cooling history of Hall Peninsula, southern Baffin Island, Nunavut, using 40Ar/39Ar thermochronology on muscovite, in: Summary of Activities 2014, Canada-Nunavut Geoscience Office, 17–30.

Skipton, D.R., St-Onge, M.R., 2014. Paleoproterozoic deformation and metamorphism in metasedimentary rocks west of Okalik Bay: a field template for the evolution of eastern Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 63-72.

Spear, F.S, Kohn, M.J., Cheney, J.T, 1999. P-T paths from anatectic pelites. Contributions to Mineralogy and Petrology 134, 17-32.

Spear, F.S., Parrish, R.R., 1996. Petrology and cooling rates of the Valhalla complex, British Columbia, Canada. Journal of Petrology 37, 733-765.

Spear, F., Pyle, J.M., 2010. Theoretical modeling of monazite growth in a low-Ca metapelite. Chemical Geology 273, 111-119.

Spencer, K.J., Hacker, B.R., Kylander-Clark, A.R.C., Andersen, T.B., Cottle, J.M., Stearns, M.A., 2013. Campaign-style titanite U–Pb dating by laser-ablation ICP: Implications for crustal flow, phase transformations and titanite closure. Chemical Geology 341, 84–101.

St-Onge, M.R., Lucas, S.B., Parrish, R.R., 1992. Terrane accretion in the internal zone of the Ungava orogen, northern Quebec: Part 1. Tectonostratigraphic assemblages and their tectonic implications. Canadian Journal of Earth Sciences 29, 746–764.

St-Onge, M.R., Scott, D.J., Lucas, S.B., 2000. Early partitioning of Quebec: microcontinent formation in the Paleoproterozoic. Geology 28, 323–326.

St-Onge, M.R., Searle, M.P., Wodicka, N., 2006. Trans-Hudson Orogen of North America and Himalaya–Karakorum–Tibetan Orogen of Asia: structural and thermal characteristics of the lower and upper plates. Tectonics 25, 1–22.

St-Onge, M.R., Van Gool, J.A.M., Garde, A.A., Scott, D.J., 2009. Correlation of Archaean and Palaeoproterozoic units between northeastern Canada and western Greenland: constraining the pre-collisional upper plate accretionary history of the Trans-Hudson Orogen. Geological Society of London Special Publication 318, 193–235.

St-Onge, M.R., Wodicka, N., Ijewliw, O., 2007. Polymetamorphic evolution of the Trans-Hudson Orogen, Baffin Island, Canada: integration of petrological, structural and geochronological data. Journal of Petrology 48, 271–302.

St-Onge, M.R., Rayner, N.M., Steenkamp, H.M., Skipton, D.R., 2015. Bedrock mapping of eastern Meta Incognita Peninsula, southern Baffin Island, Nunavut, in: Summary of Activities 2014, Canada-Nunavut Geoscience Office, 105-118.

Steenkamp, H.M., St-Onge, M.R., 2014. Overview of the 2013 regional bedrock mapping program on northern Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 27–38.

Štípská P., Hacker, B.R., Racek, M., Holder, R., Kylander-Clark, A.R.C., Schulmann, K. & Hasalová, P., 2015. Monazite dating of prograde and retrograde P-T-d paths in the Barrovian terrane of the Thaya window, Bohemian Massif. Journal of Petrology 56, 1007-1035.

Sun, S.-s., McDonough, W.F., 1989. Chemical and isotopic systematics of oceanic basalts: implications for mantle composition and processes, in: Saunders, A.D., Norry, M.J. (Eds.) Magmatism in the Ocean Basins, Geological Society Special Publication 42, 313–345.

Taylor, P. N. & Kalsbeek, F., 1990. Dating the metamorphism of Precambrian marbles: Examples from Proterozoic mobile belts in Greenland. Chemical Geology 86, 21–28.

Terry, M.P., Robinson, P., Hamilton, M.A., Jercinovic, M.J., 2000. Monazite geochronology of UHP and HP metamorphism, deformation, and exhumation, Nordøyane, Western Gneiss Region, Norway. American Mineralogist 85, 1651–1664.

Tomaschek, F., Kennedy, A.K., Villa, I.M., Lagos, M., Ballhaus, C., 2003. Zircons from Syros, Cyclades, Greece – recrystallization and mobilization of zircon during high-pressure metamorphism. Journal of Petrology 44, 1977-2002.

Van Kranendonk, M.J., 1996. Tectonic evolution of the Paleoproterozoic Torngat Orogen: evidence from P-T-t-d paths in the North River map area, Labrador. Tectonics 15, 843-869.

Van Kranendonk, M. J. & Wardle, R. J., 1996. Burwell domain of the Palaeoproterozoic Torngat orogen, northeastern Canada: Tilted cross-section of a magmatic arc caught between a rock and a hard place, in: Brewer, T.S. (Ed.) Precambrian Crustal Evolution in the North Atlantic Region. Geological Society, London, Special Publications 112, 91–115.

Van Kranendonk, M.J., Wardle, R.J., 1997. Crustal-scale flexural slip folding during late tectonic amplification of an orogenic boundary perturbation in the Paleoproterozoic Torngat Orogen, northeastern Canada. Canadian Journal of Earth Sciences 34, 1545-1565.

Vernon, R.H., Ransom, D.M., 1971. Retrograde schists of the amphibolite facies at Broken Hill, New South Wales. Journal of the Geological Society of Australia 18, 267-277.

Vorhies, S.H., Ague, J.J., Schmitt, A.K., 2013. Zircon growth and recrystallization during progressive metamorphism, Barrovian zones, Scotland. American Mineralogist 98, 219-230.

Wanless, R.K., 1970. Isotopic age map of Canada. Geological Survey of Canada, "A" Series Map 1265A.

Wanless, R.K., Stevens, R.D., Lachance, G.R. & Edmonds, C.M., 1968. Age determinations and geological studies. K-Ar isotopic ages, Report 8, Geological Survey of Canada, Paper 67-2A, 11–141.

Wanless, R.K., Stevens, R.D., Lachance, G.R. & DiLabio, R.N., 1974. Age determinations and geological studies. K-Ar isotopic ages, Report 12, Geological Survey of Canada, Paper 74-2, 6-63.

Wanless, R.K., Stevens, R.D., Lachance, G.R. & Delabio, R.N., 1979. Age determinations and geological studies. K-Ar isotopic ages, Report 14, Geological Survey of Canada, Paper 79-2, 1–67.

Wawrzenitz, N., Krohe, A., Rhede, D., Romer, R.L., 2012. Dating rock deformation with monazite: The impact of dissolution precipitation creep. Lithos 134-135, 52-74.

Whalen, J.B., Wodicka, N., Taylor, B.E., Jackson, G.D., 2010. Cumberland Batholith, Trans-Hudson Orogen, Canada: Petrogenesis and implications for Paleoproterozoic crustal and orogenic processes. Lithos 117, 99-118.

Williams, M.L., Jercinovic, M.J., Hetherington, C.J., 2007. Microprobe monazite geochronology: understanding geologic processes by integrating composition and chronology. Annual Review of Earth and Planetary Sciences 35, 137-175.

Williams, M.L., Jercinovic, M.J., Harlov, D.E., Budzyń, B., Hetherington, C.J., 2011. Resetting monazite ages during fluid-related alteration. Chemical Geology 283, 218-225.

Willigers, B.J.A., Krogstad, E.J. & Wijbrans, J.R., 2001. Comparison of thermochronometers in a slowly cooled granulite terrain: Nagssugtoqidian Orogen, West Greenland. Journal of Petrology 42, 1729-1749.

Wodicka, N., Scott, D.J., 1997. A preliminary report on the U-Pb geochronology of the Meta Incognita Peninsula, southern Baffin Island, Northwest Territories. Geological Survey of Canada Paper 1997-C, 167-178.

Wooden, J.L., Mazdab, F.K., Barth, A.P., Miller, C.F., Lowery, L.E., 2006. Temperatures (Ti) and compositional characteristics of zircon: early observations using high mass resolution on the USGS-Stanford SHRIMP-RG. Third SHRIMP workshop, Rottnest Island, Australia. Program and Abstracts, 64–65.

Table 1: Summary of geochronology data on Hall Peninsula, Baffin Island, reported in previous studies.

Symbol #[a]	Age (Ma)[b]	Rock Type	Rock Age (Ma)[c]	Method	Sample #	Reference
Zircon rims (U-Pb)						
1	1850 +5/-3	tonalite	2920 +8/-6	ID-TIMS	D353A	Scott (1999)
2	1759 ±3	granitic vein in tonalite	2835 ±11	ID-TIMS	D353B	Scott (1999)
3	ca. 1829	granitic vein in tonalite	2768 ±13	ID-TIMS	D354B	Scott (1999)
4	1833 ±47	tonalite	2844 +6/-5	ID-TIMS	D352A	Scott (1999)
5	1842 +4/-2	granitic vein in tonalite	2820 ±5	ID-TIMS	D352B	Scott (1999)
6	1869 +9/-3	monzogranite	1869 +9/-3	ID-TIMS	D108	Scott (1999)
7	1850 +3/-2	Grt monzogranite	1850 +3/-2	ID-TIMS	D107	Scott (1999)
8	1852 ±2	psammite	?	ID-TIMS	D338B	Scott & Gauthier (1996)
9	ca. 1800	tonalite	2841 ±3	SHRIMP	12MBC-F105A	Rayner (2014)
10	ca. 1856-1832	megacrystic granite	2701 ±2	SHRIMP	12MBC-F96A	Rayner (2014)
11	1828 ±3	Opx monzogranite	1892 ±7	SHRIMP	12MBC-B97A	Rayner (2014)
12	ca. 1870-1790	psammite	1959 ±12	SHRIMP	12MBC-F104A	Rayner (2014)
13	1861 ±25	quartzite	2678 ±8	SHRIMP	12MBC-F96B	Rayner (2014)
14	ca. 1886-1832	quartzite	1906 ±9	SHRIMP	12MBC-R15A	Rayner (2014)
15	ca. 1837	quartzite	1907 ±9	SHRIMP	12MBC-B95A	Rayner (2014)
16	1855 ±13	tonalite	2792 ±9	SHRIMP	13SUB-S163A	Rayner (2015)
17	ca. 1776	Qz diorite	1852 ±7	SHRIMP	12MBC-Y48A	Rayner (2015)
Titanite (U-Pb)						
1	1736 ±2	granitic vein in tonalite	2835 ±11	ID-TIMS	D353B	Scott (1999)
2	1742 ±3	tonalite	2848 ±3	ID-TIMS	D354A	Scott (1999)
3	1730 ±3	granitic vein in tonalite	2768 ±13	ID-TIMS	D354B	Scott (1999)
Monazite (U-Pb)						
1	1843 ±3	monzogranite pegmatite	?	ID-TIMS	D324	Scott (1999)
2	1862 ±3	monzogranite	1869 +9/-3	ID-TIMS	D108	Scott (1999)
3	ca. 1856	Grt monzogranite	1850 +3/-2	ID-TIMS	D107	Scott (1999)
4	1877 ±3	quartzite	?	ID-TIMS	D327	Scott (1999)
5	1862 ±2	psammite	1930 ±5	ID-TIMS	D338C	Scott (1999)
Anatectic granite crystallization (U-Pb zircon)						
1	1867 ±8	Grt leucogranite	1867 ±8	SHRIMP	12MBC-B96A	Rayner (2014)
Biotite (K-Ar)						
1	1704 ±100	granitic gneiss	?	K-Ar fusion	202-51	Lowdon (1960)
2	1700 ±42	tonalite (?) gneiss	?	K-Ar fusion	TA-65-T241	Wanless *et al.* (1974)
3	1507 ±50	granitic gneiss	?	K-Ar fusion	BE-65-101	Wanless *et al.* (1968)
n/a*	1546 ±50	granitic gneiss	?	K-Ar fusion	TA-65-T73	Wanless *et al.* (1968)
Muscovite (K-Ar)						
1	1610 ±100	granitic gneiss	?	K-Ar fusion	202-51	Lowdon (1960)
Hornblende (K-Ar)						
1	1670 ±49	amphibolite	?	K-Ar fusion	SR-65-216A	Wanless *et al.* (1979)
Muscovite (Ar-Ar)						
1	1657 ±3	pelite	?	step-heating	12MBC-B75A	Skipton *et al.* (2015)
2	1665 ±2	pelite	?	step-heating	12MBC-S92C	Skipton *et al.* (2015)
3	1690 ±3	pelite	?	step-heating	12MBC-F122B	Skipton *et al.* (2015)

Notes:
[a]Symbol numbers correspond to sample locations in Appendix 1, Fig. A1.1; *located west of map area shown in Appendix 1, Fig. A1.1
[b]Ages and 2σ uncertainties or (if applicable) approximate age ranges are reported as published in the studies indicated above
[c]U–Pb zircon age of crystallization or, for metasedimentary rocks, maximum depositional age, as reported in the studies indicated above

Table 2: Summary of structural rock fabrics from metamorphic rocks on Hall Peninsula, Baffin Island.

Fabric		Mean orientation*
D_1: E-W crustal shortening		
F_{1a}	isoclinal folds	AP: 159°/64°; FA: 19°-335°
S_{1a}	metamorphic foliation axial planar to F_{1a}	164°/63°
F_{1b}	isoclinal to open folds of S_{1a}	AP: 159°/64°; FA: 19°-335°
S_{1b}	metamorphic foliation axial planar to F_{1b}	164°/63°
$L_{1a,b}$	elongate metamorphic mineral growth	parallel to $F_{1a,b}$ fold hinges, or down-dip
D_2: E-W crustal shortening		
T_2	thick-skinned reverse faults	SSE-striking, NNE-dipping
L_2	mineral stretching and elongate growth	30°-265°
F_2	thick-skinned folds, E-vergent	AP: SSE-striking, NNE-dipping; FA: subhorizontal, trending SSE or NNW
D_3: N-S crustal shortening		
F_3	thick-skinned folds; crenulations	AP: 269°/51°; FA: 37°-269°
S_3	crenulation cleavage axial planar to F_3	269°/51°

Modified from Steenkamp & St-Onge (2014) and Skipton et al. (2016)

* In plunge-trend notation for linear fabrics and in strike/dip (right hand rule) notation for planar fabrics. AP=axial plane; FA=fold axis

Table 3: Summary of samples from Hall Peninsula, Baffin Island analyzed in this study.

Sample[a]	UTM[b] Easting	UTM[b] Northing	Rock type	Peak metamorphic assemblage[c]	Peak metamorphic grade[d]	Structures[e]
B75A*	715902	7057019	pelite	Qz Bt Sil Pl Kfs Grt Melt*	MA	D_1, T_2, F_3
S92C*	658933	7022280	pelite	Bt Kfs Pl Qz Sil Mag Melt*	MA	D_1, T_2, F_2
S162A*~	700283	6961179	pelite	Qz Pl Grt Bt Kfs Sil Mag Melt	UA	D_1, T_2, F_3
F38A*	620176	7136270	pelite	Grt Pl Qz Sil Ilm Melt*	UA	D_1
13F122A*	606624	7187696	psammite	Qz Pl Bt Grt Kfs Sil Melt	UA	D_1
S1A*	651595	6991523	pelite	Grt Qz Kfs Pl Sil Ilm Melt**	G	D_1
Z1A*	575390	7122353	pelite	Kfs Pl Qz Grt Crd Sil Ilm Spl Melt**	G	D_1
H45A*	629652	7189559	pelite	Bt Ms Grt Qz Pl Ilm ± Tur	MA	D_1, T_2, $F_{3(?)}$
S165B*	681368	7151854	psammite	Pl Qz Grt Bt St Ilm Rt	MA	D_1, T_2, F_3
S60A*	593562	7040794	psammite	Qz Pl Kfs Grt Ilm Melt**	G	D_1
S36A~	715673	7040261	pelite	Qz Kfs Bt Sil Pl Melt*	MA	D_1, T_2
S103A~	713124	7058907	psammite	Kfs Qz Pl Bt*	MA	D_1, T_2, F_3
F122A~	656326	7096385	pelite	Qz Pl Bt Melt*	MA	D_1, F_2, F_3
F28A~	649369	7011627	psammite	Qz Pl Kfs Grt Sil Mag Melt**	UA	D_1
S106A~	651957	7085472	tonalite	Qz Pl Bt*	MA	D_1

[a]*samples with *in situ* U-Pb monazite dating; ~samples with zircon U-Pb and trace element depth profiling

[b]NAD83 Zone 19N (Canada)

[c]minerals listed from most to least abundant; *contains retrograde (post-D_1) Ms ± minor S_1-aligned, prograde Ms; **contains retrograde (post-D_1) Bt ± minor S_1-aligned, prograde Bt

[d]MA, mid-amphibolite-facies; UA, upper-amphibolite-facies; G, granulite-facies

[e]D_2 structures may affect all samples, but are only indicated where mapped

Table 4: Summary of *in situ* U-Pb monazite geochronology (LA-ICP-MS) results from Hall Peninsula, Baffin Island analyzed in this study.

Sample	Mnz description	Weighted average $^{207}Pb/^{206}Pb$ ages ±2σ (Ma)[a]											
		Matrix (non-aligned)				Matrix (S_1-aligned)				Inclusions in garnet[d]			
		Age	MSWD	n[b]	g[c]	Age	MSWD	n[b]	g[c]	Age	MSWD	n[b]	g[c]
S165B	40-100 µm, subequant, elongate	1762±11	10.2	16	11	1759±10	10.3	20	10	(S_1) 1789±8 (eS_1) 1760±89	0.52 1.5	3 2	1 2
H45A	20-50 µm, subhedral, subequant	1822±9	2.1	17	13	1825±12	2.6	12	6	(eS_1) 1847±17	2.0	7	6
B75A	30-50 µm, equant, sub- to anhedral; minor 30-100 µm elongate	1786±47	41	6	6	1790±30	19	8	7				
S92C	20-60 µm, equant, subhedral	1760±50	22	6	5	1821±17	2.3	6	4				
S162A	30-70 µm, subhedral	1763±43	23	7	2	1802±32	22	10	5	(S_1) 1823±13 (non) 1835±8	0.08 0.91	2 5	1 7
F38A	30-60 µm, equant, sub- to anhedral; minor 30-100 µm elongate	1837±25	0.13	3	2	1817±24	0.42	4	2	(S_1) 1820±10 (non) 1826±29 (eS_1) 1851±16	1.11 0.14 0.63	9 3 7	5 2 3
13F122A	30-50 µm, subhedral, equant	1828±6	1.8	29	21	1825±5	0.86	19	8	(non) 1833±15	0.02	2	1
S1A	20-60 µm, subhedral, elongate	1821±9	0.60	12	7	1825±67	0.20	4	2	(S_1) 1828±18	0.69	4	4
S60A	20-40 µm, equant, subhedral	1804±13	8.4	18	13					(non) 1797±10	n/a	1	1
Z1A	30-50 µm, subequant, subhedral; minor 30-100 µm elongate	1849±12	8.9	14	11	1838±8	4.9	15	8	(S_1) 1845±16 (non) 1860±17	3.2 8.7	4 8	3 6

[a]Ages are calculated using Isoplot v. 4.15 (Ludwig, 2003)

[b]Number of monazite analyses included in calculated age

[c]Number of monazite grains included in calculated age

[d](non)=monazite inclusions not aligned with fabric; (S_1)=monazite inclusions aligned parallel to S_1 in matrix; (eS_1)=monazite inclusions aligned with non-S_1-parallel inclusion trail fabric

Table 5: Summary of SIMS U-Pb zircon depth profiling of unpolished zircon surfaces and LA-ICP-MS U-Pb dating of polished zircon interiors in metamorphic rocks from southern Hall Peninsula, Baffin Island.

	U-Pb SIMS depth profiling (unpolished Zrc surfaces)											U-Pb LA-ICP-MS analyses (polished Zrc interiors)							
		Rim										Core				Rim			
Zrc #	Depth profile type[a]	n[b]	Rim thickness (µm)[c]	$^{207}Pb/^{206}Pb$ age (Ma)[d]			Th/U[e]	% disc.[e]	% $^{206}Pb^{*e}$	% $^{207}Pb^{*e}$	Comment[f]	$^{207}Pb/^{206}Pb$ age (Ma)[g]		%Pb*	% disc.	$^{207}Pb/^{206}Pb$ age (Ma)[h]		%Pb*	% disc.
				Age	2σ	MSWD						Age	2σ			Age	2σ		
Sample S36A: Mid-amphibolite-facies pelite																			
1	1B	56	4.13	1781	6	0.64	0.006	5.5	99.9	99.3	-	2592	12	97.1	10.6	1868	13	98.8	11.6
3	2A	-	-	-	-	-	-	-	-	-	D: 1800	-	-	-	-	-	-	-	-
4	2A	-	-	-	-	-	-	-	-	-	D: 1820	2298	12	100	-3.7	-	-	-	-
5	1A	10	0.63	1799	15	0.54	0.026	8.5	99.9	99.6	-	2329	31	98.8	8.9	-	-	-	-
6	2A	-	-	-	-	-	-	-	-	-	D: 1850	2305	10	99.9	1.7	-	-	-	-
8	1A	25	2.66	1848	9	1.13	0.007	4.4	100	99.9	-	2430	27	99.4	6.3	-	-	-	-
9	1B	43	4.06	1767	7	0.57	0.012	7.7	99.9	99.5	-	2572	22	100	-9.0	1854	52	100	1.0
10	1B	44	4.13	1769	9	0.44	0.017	7.3	99.8	98.6	-	2387	9	99.7	4.3	2536	9	100	-3.1
11	1A	28	2.38	1756	10	0.59	0.010	7.7	100	99.8	-	2589	11	100	-0.9	2542	34	99.5	4.7
13	1B	44	4.13	1784	7	0.41	0.005	5.7	100	99.9	-	2584	14	99.7	2.8	-	-	-	-
14	2A	-	-	-	-	-	-	-	-	-	D: 1780	2084	10	100	-1.7	2120	13	99.9	-0.7
15	1B	52	4.13	1788	6	0.53	0.005	5.6	99.9	99.4	-	2483	14	100	-5.0	2238	9	100	-2.7
16	1B	41	4.20	1780	8	0.70	0.007	10.6	100	99.7	-	2311	190	100	-1.5	2316	8	100	-3.4
17	1A	5	0.56	1825	24	0.79	0.014	5	99.9	99.2	-	2527	22	100	3.1	-	-	-	-
19	2B	-	-	-	-	-	-	-	-	-	D: 1800	2606	8	99.9	1.8	-	-	-	-
Sample S103A: Mid-amphibolite-facies psammite																			
1	1B	39	4.13	1849	7	0.74	0.111	5.3	99.7	97.9	O: 1811	1915	10	100	0.7	1912	12	100	-4.8
2	2B	-	-	-	-	-	-	-	-	-	D: 1777	1921	11	99.7	0.2	1845	8	99.4	6.5
5	2B	-	-	-	-	-	-	-	-	-	D: 1797, 1825	1887	8	98.3	14.2	-	-	-	-
7	1B	28	3.01	1780	6	0.41	0.128	4.2	99.7	97.6	I: 1802	1932	12	98.9	8.8	1913	12	99.7	1.9
8	2B	-	-	-	-	-	-	-	-	-	D: 1819	1914	74	99.9	0.3	1889	11	100	-4.0
9	1B	23	2.52	1772	7	0.62	0.024	7.7	100	99.8	O: 1741	1909	9	100	-0.5	1906	13	98.8	9.6
10	1B	41	4.13	1839	5	0.63	0.079	8.8	100	99.5	O: 1814	1883	12	99.5	3.0	-	-	-	-
11	1B	25	4.13	1831	6	0.56	0.008	6.1	100	100	OD: 1812	1916	12	99.9	0.6	-	-	-	-
12	1B	26	3.22	1873	11	0.41	0.260	8.9	99.7	98.1	-	1880	21	100	-5.0	-	-	-	-
13	1B	31	2.59	1724	8	0.45	0.352	8.6	98.3	89.0	-	1841	13	99.8	-1.1	-	-	-	-
14	1B	30	3.22	1862	8	0.52	0.187	9.3	99.7	97.8	-	1908	12	100	-3.1	1903	14	99.9	0.5
15	1B	37	3.01	1828	6	0.43	0.033	5.9	100	99.6	-	1908	11	99.8	0.0	-	-	-	-
16	1B	32	3.78	1823	6	0.41	0.029	4.8	99.9	99.7	-	1930	11	99.9	1.2	1872	21	100	1.3
17	1B	24	3.50	1828	6	0.51	0.013	6.2	100	99.9	-	1919	32	100	-0.8	1933	14	99.9	-2.6
18	1B	41	3.71	1820	5	0.75	0.080	8.3	99.8	98.8	-	*1733	66	96.4	24.5	-	-	-	-
Sample F122A: Mid-amphibolite-facies pelite																			
1	1A	18	1.54	1839	16	0.82	0.006	2.8	99.7	98.2	-	2058	37	100	2.4	-	-	-	-
2	1A	15	1.40	1850	27	0.42	0.030	6.8	98.2	89.3	-	2092	27	99.3	1.1	-	-	-	-
3	3	-	-	-	-	-	-	-	-	-	-	2219	20	99.9	1.9	2189	19	99.9	-0.8
4	3	-	-	-	-	-	-	-	-	-	-	2079	21	99.9	-0.2	2028	18	100	-7.3
6	2B	-	-	-	-	-	-	-	-	-	D: 1835	2050	18	100	-5.1	2030	22	100	-3.7
7	1B	32	4.13	1836	9	0.35	0.008	6.7	99	93.1	-	2242	21	100	-0.8	2028	19	97.7	16.2

8	2A	-	-	-	-	-	-	-	-	-	D: 1890	2177	26	99.9	-2.2	-	-	-	-
9	1A	5	0.42	1796	28	0.78	0.080	9.8	98.2	88.1	-	2135	23	97.9	12.8	*2782	98	80.6	30.5
10	3	-	-	-	-	-	-	-	-	-	-	2898	18	100	-6.4	-	-	-	-
15	2A	-	-	-	-	-	-	-	-	-	D: 1859	2073	21	99.5	3.5	-	-	-	-
16	3	-	-	-	-	-	-	-	-	-	-	2125	21	99.9	-0.6	-	-	-	-
17	1A	10	1.89	1858	13	0.97	0.090	5.2	99.6	97.5	-	2022	19	99.9	-0.3	-	-	-	-
18	1A	32	2.52	1844	9	0.47	0.011	2.9	99.9	99.0	-	2189	22	99.8	-0.8	-	-	-	-
19	3	-	-	-	-	-	-	-	-	-	-	*2105	26	96.3	15.0	-	-	-	-
20	2A	-	-	-	-	-	-	-	-	-	D: 1877	2016	41	99.9	0.9	-	-	-	-
Sample S162A: Upper-amphibolite-facies pelite																			
1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1A	29	2.73	1789	28	0.63	0.010	7.7	99.3	94.6	-	2675	19	99.9	1.9	-	-	-	-
9	3	-	-	-	-	-	-	-	-	-	-	2840	19	99.9	-0.9	-	-	-	-
10	3	-	-	-	-	-	-	-	-	-	-	2513	21	99.4	3.4	-	-	-	-
12	3	-	-	-	-	-	-	-	-	-	-	2797	19	99.3	-0.1	-	-	-	-
18	3	-	-	-	-	-	-	-	-	-	-	2644	23	100	-1.9	-	-	-	-
19	2B	-	-	-	-	-	-	-	-	-	D: 1812	2556	22	99.9	-1.7	-	-	-	-
22	1A	13	1.89	1814	31	0.54	0.027	9.7	99.5	96.4	-	2050	23	99.6	0.2	-	-	-	-
23	2A	-	-	-	-	-	-	-	-	-	D: 1844	2659	24	100	-1.9	2563	28	99.3	1.8
24	4	14	1.26	1772	54	1.20	0.011	7.6	98.3	88.3	-	-	-	-	-	-	-	-	-
25	4	12	1.05	1694	63	0.28	0.020	8.5	94.8	70.5	-	-	-	-	-	-	-	-	-
26	2A	-	-	-	-	-	-	-	-	-	D: 1789	2627	28	100	2.7	-	-	-	-
27	3	-	-	-	-	-	-	-	-	-	-	2636	21	99.0	4.3	2611	18	97.1	16.4
28	3	-	-	-	-	-	-	-	-	-	-	2627	21	99.0	8.9	-	-	-	-
Sample F28A: Upper-amphibolite-facies psammite																			
4	1A	10	0.91	1825	25	0.63	0.011	7.9	98.1	87.5	-	1873	8	99.2	8.6	-	-	-	-
5	4	10	0.98	1838	93	0.23	0.139	5.2	84.2	45.8	-	2286	44	97.5	15.7	1911	8	98.0	17.0
6	1B	21	2.38	1691	18	0.95	0.013	8.3	96.8	79.5	-	1907	12	99.3	3.4	-	-	-	-
7	3	-	-	-	-	-	-	-	-	-	-	2061	15	99.7	0.7	-	-	-	-
8	3	-	-	-	-	-	-	-	-	-	-	*2219	20	98.1	10.2	-	-	-	-
10	1B	14	1.75	1883	11	0.29	0.014	4.9	99.9	99.2	-	2053	23	98.2	9.4	-	-	-	-
11	3	-	-	-	-	-	-	-	-	-	-	*2211	22	78.5	45.7	-	-	-	-
12	3	-	-	-	-	-	-	-	-	-	-	1874	8	98.9	6.9	*1873	12	95.6	22.9
13	3	-	-	-	-	-	-	-	-	-	-	*3314	48	98.4	4.0	-	-	-	-
16	2A	-	-	-	-	-	-	-	-	-	D: 1870	2113	15	99.8	-2.2	-	-	-	-
17	2B	-	-	-	-	-	-	-	-	-	D: 1824	1797	8	97.7	20.7	-	-	-	-
18	1B	39	4.13	1854	8	0.48	0.013	6.9	99.8	98.5	-	2079	14	100	0.9	1886	8	100	-5.3
20	1B	28	2.52	1859	13	0.46	0.010	10.2	99.7	97.8	-	2066	16	99.9	-1.8	2048	13	100	-2.1
21	3	-	-	-	-	-	-	-	-	-	-	*1757	21	94.3	28.6	-	-	-	-
22	1B	20	3.43	1860	14	0.33	0.021	9.9	96.8	81.0	-	*2069	32	95.6	21.3	-	-	-	-
Sample S106A: Mid-amphibolite-facies tonalite gneiss																			
1	1A	16	1.19	1846	14	0.48	0.011	7.5	99.9	99.1	-	2907	22	99.8	-6.5	-	-	-	-
2	2A	-	-	-	-	-	-	-	-	-	D: 1836	2612	21	98.8	0.4	-	-	-	-
3	1A	14	1.12	1843	14	0.77	0.010	3.9	99.9	99.0	-	2802	26	99.4	-0.9	-	-	-	-
4	3	-	-	-	-	-	-	-	-	-	-	2553	20	98.2	11.7	-	-	-	-
5	1A	20	1.82	1841	10	0.78	0.044	5.1	99.6	97.4	-	2756	18	100	-12.3	-	-	-	-
6	1A	10	0.77	1766	17	0.78	0.128	9.4	99.2	94.7	-	2867	49	100	-4.1	2873	15	99.8	0.1

8	3	-	-	-	-	-	-	-	-	-	-	2907	14	100	-9.6	2916	14	99.9	-9.0
10	1B	36	4.06	1855	6	0.87	0.013	9.7	99.9	99.6	-	2568	57	99.4	-4.3	2664	30	99.1	-0.9
11	3	-	-	-	-	-	-	-	-	-	-	2870	12	100	-9.1	-	-	-	-
12	3	-	-	-	-	-	-	-	-	-	-	*2893	75	99.9	-9.5	-	-	-	-
13	1A	7	0.49	1828	22	0.43	0.02	6.7	99.6	97.4	-	2864	18	99.4	4.4	-	-	-	-
14	3	-	-	-	-	-	-	-	-	-	-	2753	46	99.9	2.2	2601	20	96.8	13.8
15	1B	21	2.45	1846	10	0.34	0.02	11.8	99.8	99.2	-	2768	75	99.2	-5.8	-	-	-	-
16	1B	38	2.80	1768	12	0.64	0.011	4.5	99.9	99.1	D: 1833	2360	43	99.7	-3.8	-	-	-	-
18	1A	25	1.89	1851	9	0.50	0.012	9.4	100	99.7	-	2891	16	99.4	-3.4	2919	16	99.7	-3.6
20	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[a]Profile types: 1A=rim followed by older core; 1B=rim, no core encountered; 2A=discordant rim followed by older core; 2B=discordant rim, no core encountered; 3=no rim; 4=rim, high 1σ errors, low radiogenic Pb. Refer to text for details.

[b]Number of mass sweeps included in the rim $^{207}Pb/^{206}Pb$ weighted average age.

[c]Calculated from the zircon surface to the depth of the deepest mass sweep included in the rim $^{207}Pb/^{206}Pb$ weighted average age (Ma) using an ionization rate of 0.07μm/mass sweep, as calculated from profilometer measurements described in text and Appendix 1.

[d]Weighted average age of the $^{207}Pb/^{206}Pb$ ages of all mass sweeps included in the zircon rim. Refer to text for details of what constitutes a rim.

[e]Average of values measured in each mass sweep included in the zircon rim. Absolute values were used to calculate the average % discordance.

[f]Approximate $^{207}Pb/^{206}Pb$ weighted average ages (Ma), as follows: D=age of discordant rim; O=age of outer, thinner rim; I=age of inner, thinner rim; OD=age of outer, discordant rim.

[g]$^{207}Pb/^{206}Pb$ ages are reported; *denotes a $^{207}Pb/^{206}Pb$ age that is corrected for ^{204}Pb using the methods of Andersen (2002) due to low $^{206}/Pb/^{204}Pb$ ratios (<1200) and high ^{204}Pb (>100 cps). Zircon grains with no ages reported for polished interiors were plucked during polishing.

[h]Zircon "rim" ages here refer to laser spot analyses positioned on zircon edge or rim identified in BSE images of polished grain interiors. $^{207}Pb/^{206}Pb$ ages are reported; *denotes a $^{207}Pb/^{206}Pb$ age that is corrected for ^{204}Pb using the methods of Andersen (2002). Grains with no rim age reported here were too small for this additional analysis.

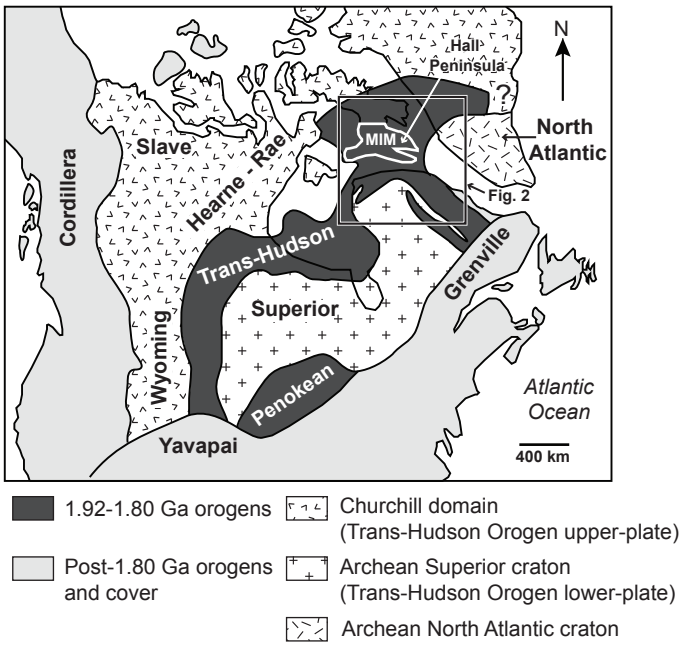


Fig. 1: Map of North America showing the locations of Archean cratons and Paleoproterozoic orogens, the Meta Incognita microcontinent (MIM), the study area (Hall Peninsula) and Fig. 2. Modified from St-Onge et al. (2007) and Skipton et al. (2016).

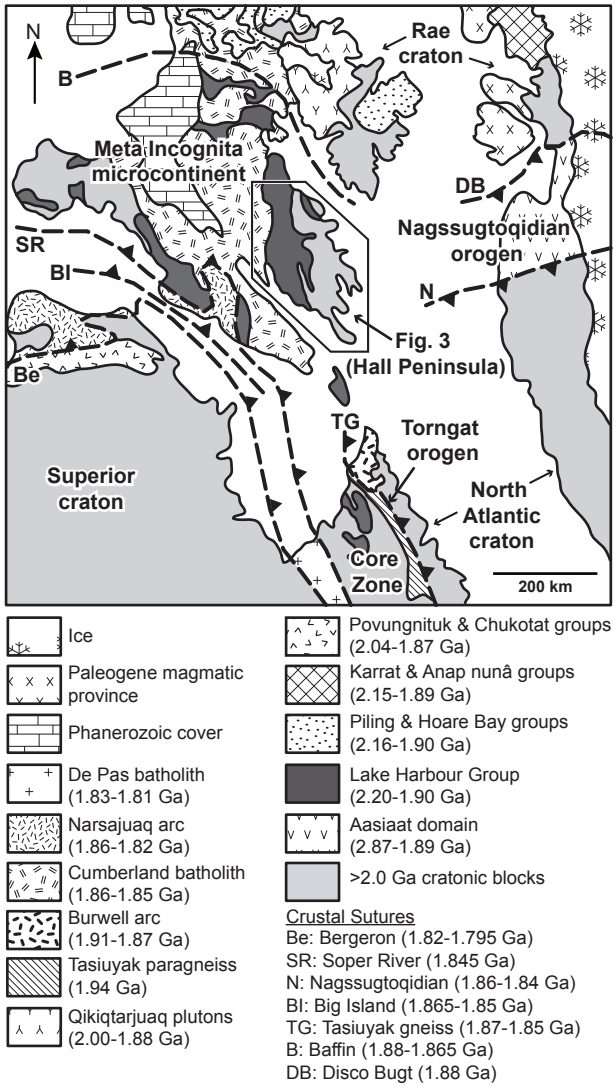


Fig. 2: Map of the Québec-Baffin segment of the Trans-Hudson Orogen, showing the main magmatic and supracrustal units, Archean cratonic blocks and crustal sutures, and the location of Fig. 3. Modified from St-Onge et al. (2009), Berman et al. (2013) and Skipton et al. (2016).

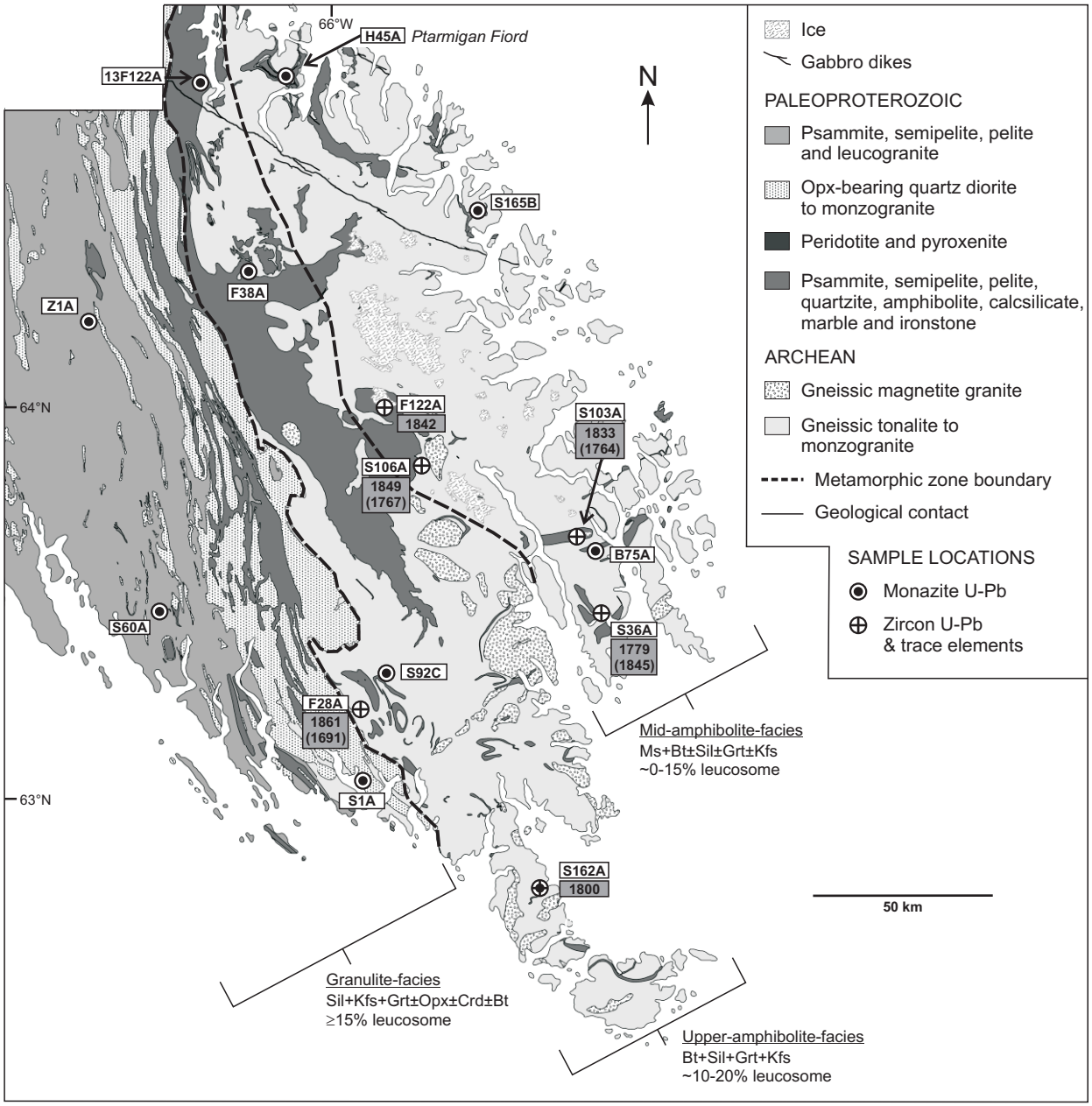


Fig. 3: Generalized geological map of Hall Peninsula, simplified after Machado et al. (2013) and Steenkamp and St-Onge (2014). Bold black dashed lines indicate the boundaries of metamorphic zones, as determined from peak metamorphic mineral assemblages in pelite (Skipton et al., in press). The locations of U-Pb geochronology samples in this study are indicated. Weighted average $^{207}Pb/^{206}Pb$ ages of zircon rims from depth-profiles are shown in gray boxes, with subordinate ages given in parentheses (2σ errors are between 2–21 Myr and MSWDs=0.62–2.3). Monazite ages are presented in Table 4 and Figs. 4–6 due to the wide dispersion of ages in each sample.

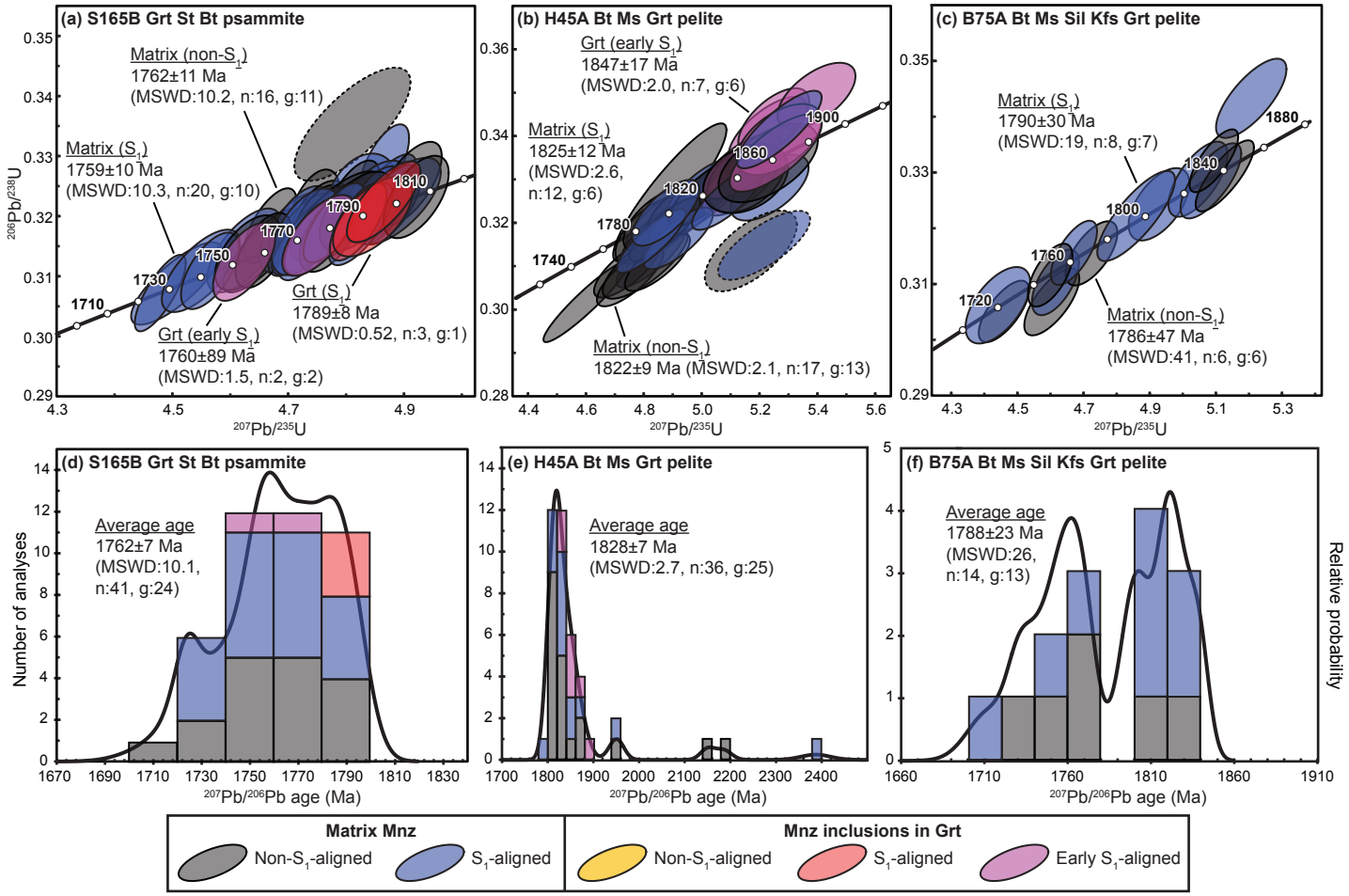


Fig. 4: *In situ* U–Pb monazite ages for mid-amphibolite-facies samples from eastern Hall Peninsula, Baffin Island, plotted on (a–c) Concordia diagrams and (d–f) relative probability and histogram plots of $^{207}Pb/^{206}Pb$ ages. Analyses are color-coded according to petrographical context, following the legend provided. Weighted average $^{207}Pb/^{206}Pb$ ages ages of petrographical groups are presented on Concordia plots. The weighted average $^{207}Pb/^{206}Pb$ ages ages calculated from all monazite analyses in each sample are shown on probability/histogram plots. Ages are reported at 2σ uncertainty; n=number of analyses included; g=number of monazite grains included. Ellipses with dashed outlines represent analyses that are excluded from age calculations. In (b), four ca. 2150–3999 Ma (mostly discordant) analyses are not shown, and were excluded from age calculations.

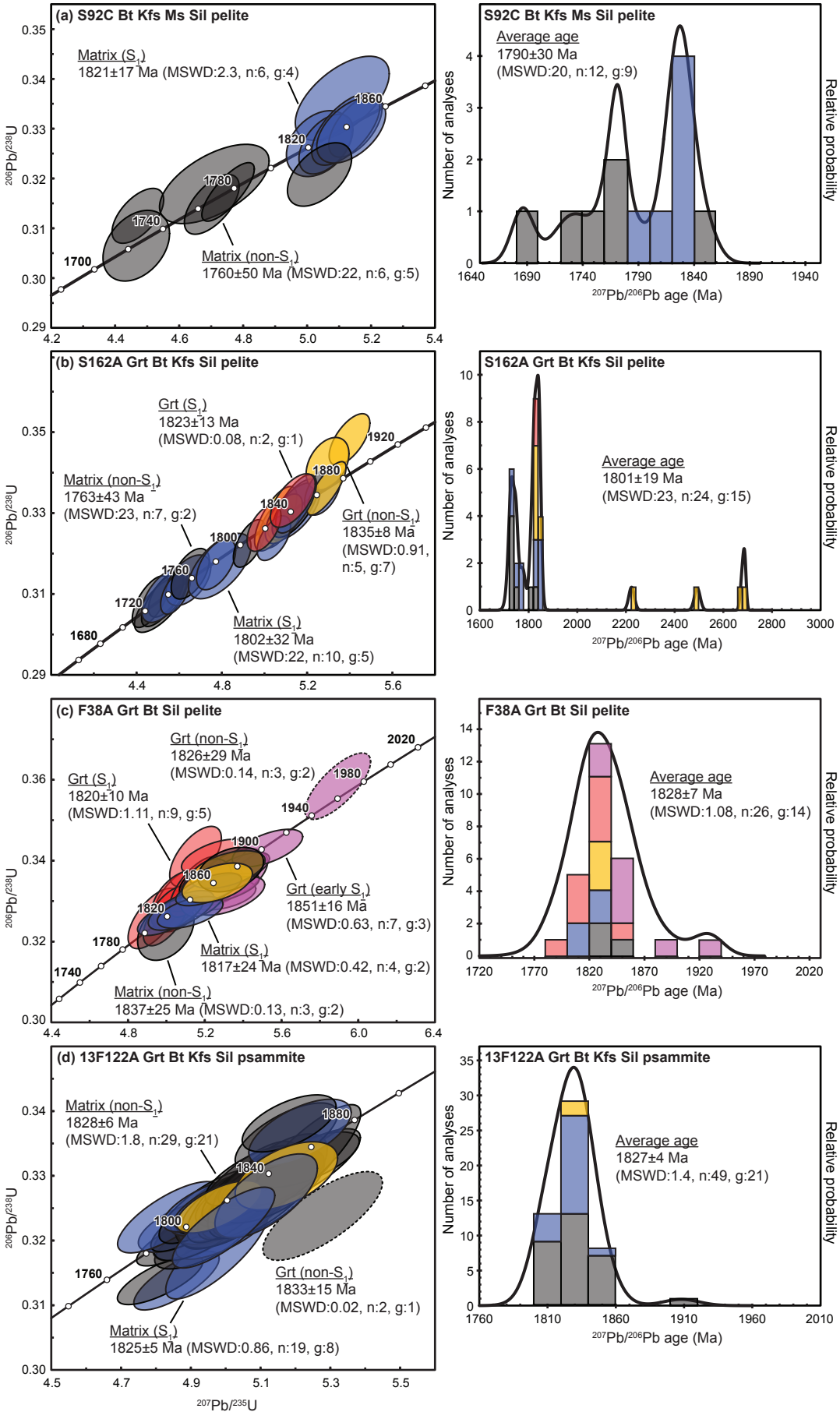

(a) S92C Bt Kfs Ms Sil pelite
Matrix (S1)
1821±17 Ma (MSWD:2.3, n:6, g:4)
Matrix (non-S1)
1760±50 Ma (MSWD:22, n:6, g:5)
S92C Bt Kfs Ms Sil pelite
Average age
1790±30 Ma
(MSWD:20, n:12, g:9)
(b) S162A Grt Bt Kfs Sil pelite
Grt (S1)
1823±13 Ma
(MSWD:0.08, n:2, g:1)
Matrix (non-S1)
1763±43 Ma
(MSWD:23, n:7, g:2)
Grt (non-S1)
1835±8 Ma
(MSWD:0.91,
n:5, g:7)
Matrix (S1)
1802±32 Ma
(MSWD:22, n:10, g:5)
S162A Grt Bt Kfs Sil pelite
Average age
1801±19 Ma
(MSWD:23, n:24, g:15)
(c) F38A Grt Bt Sil pelite
Grt (non-S1)
1826±29 Ma
(MSWD:0.14, n:3, g:2)
Grt (S1)
1820±10 Ma
(MSWD:1.11, n:9, g:5)
Grt (early S1)
1851±16 Ma
(MSWD:0.63, n:7, g:3)
Matrix (S1)
1817±24 Ma (MSWD:0.42, n:4, g:2)
Matrix (non-S1)
1837±25 Ma (MSWD:0.13, n:3, g:2)
F38A Grt Bt Sil pelite
Average age
1828±7 Ma
(MSWD:1.08, n:26, g:14)
(d) 13F122A Grt Bt Kfs Sil psammite
Matrix (non-S1)
1828±6 Ma
(MSWD:1.8, n:29, g:21)
Grt (non-S1)
1833±15 Ma
(MSWD:0.02, n:2, g:1)
Matrix (S1)
1825±5 Ma (MSWD:0.86, n:19, g:8)
13F122A Grt Bt Kfs Sil psammite
Average age
1827±4 Ma
(MSWD:1.4, n:49, g:21)
206Pb/238U
207Pb/235U
207Pb/206Pb age (Ma)
Number of analyses
Relative probability

Fig. 5 (previous page): In situ U–Pb monazite ages for upper-amphibolite-facies samples from Hall Peninsula, Baffin Island, plotted on (left) Concordia diagrams and (right) relative probability and histogram plots of $^{207}Pb/^{206}Pb$ ages, following the logic in Fig. 4. In (b), four ca. 2223–2688 Ma analyses are not shown, and were excluded from age calculations.

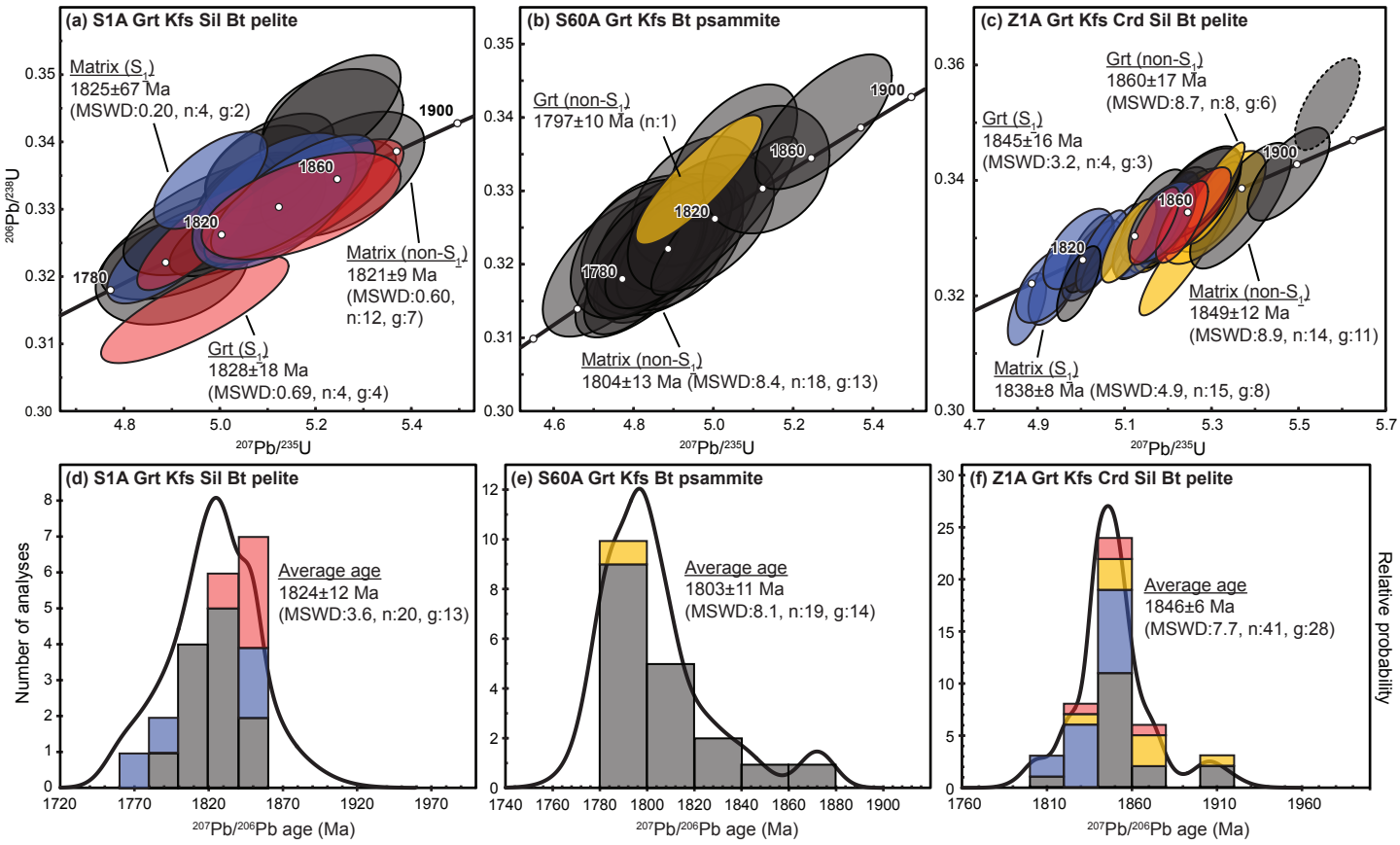


Fig. 6: *In situ* U–Pb monazite ages for granulite-facies samples from western Hall Peninsula, Baffin Island, plotted on (a–c) Concordia diagrams and (d–f) relative probability and histogram plots of $^{207}Pb/^{206}Pb$ ages, following the logic in Fig. 4. In (c), two analyses with >10% discordance and $^{207}Pb/^{206}Pb$ ages of ca. 1840 Ma are not shown, and were excluded from age calculations.

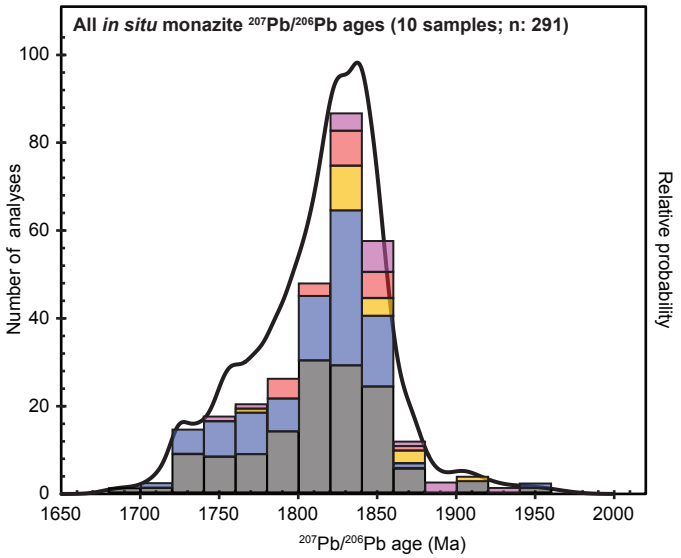


Fig. 7: Relative probability and histogram plot of all $^{207}Pb/^{206}Pb$ ages determined by in situ U–Pb monazite analysis (LA-ICP-MS) in this study, excluding analyses >2 Ga. Histogram columns are colored according to petrographical context of monazite (as in Figs. 4–6), including: matrix monazite that is S_1-aligned (blue) and not aligned with fabric (gray); monazite inclusions in garnet that are S_1-aligned (red), not aligned with fabric (orange) and aligned with early-S_1 fabric (pink).

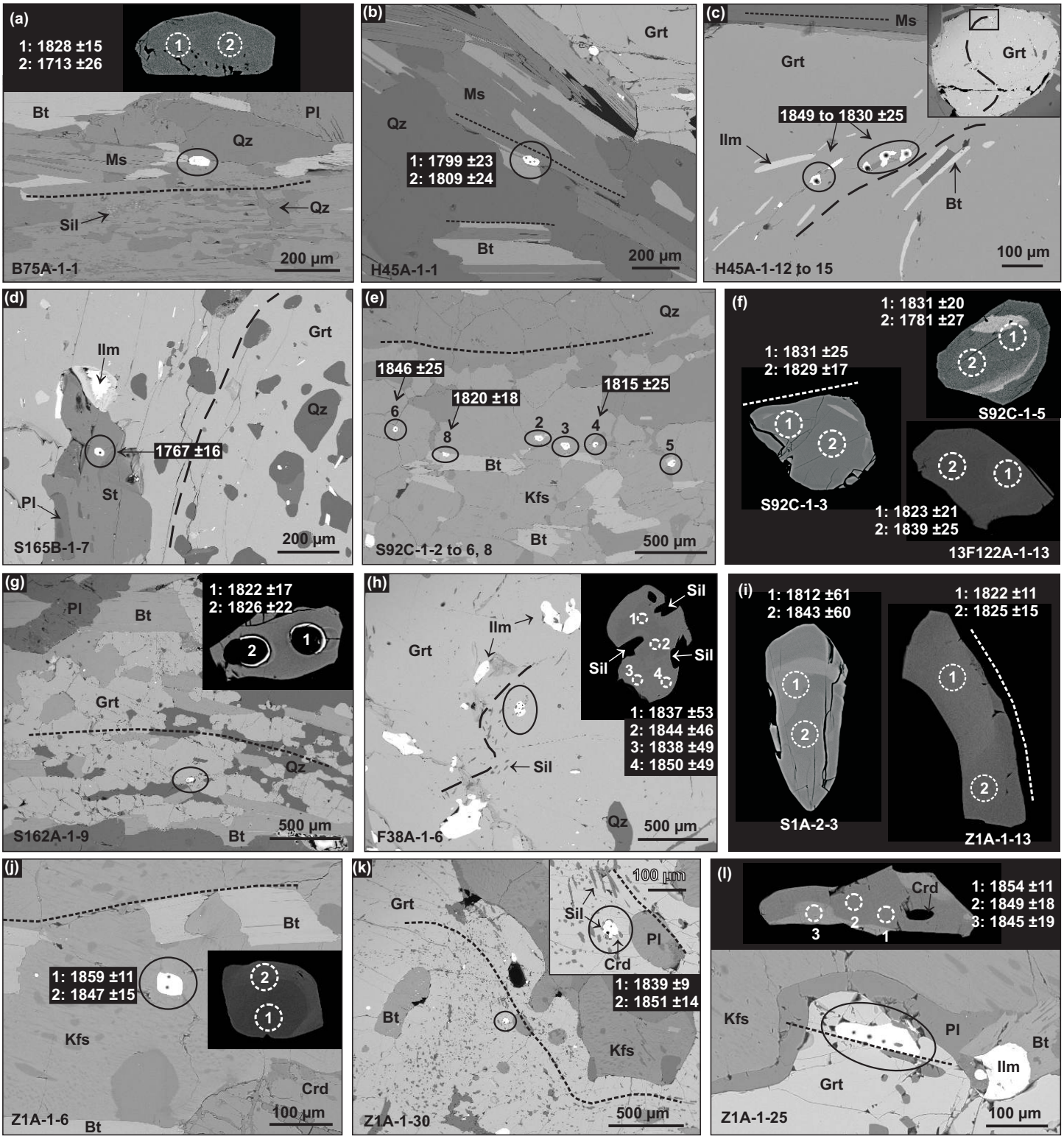
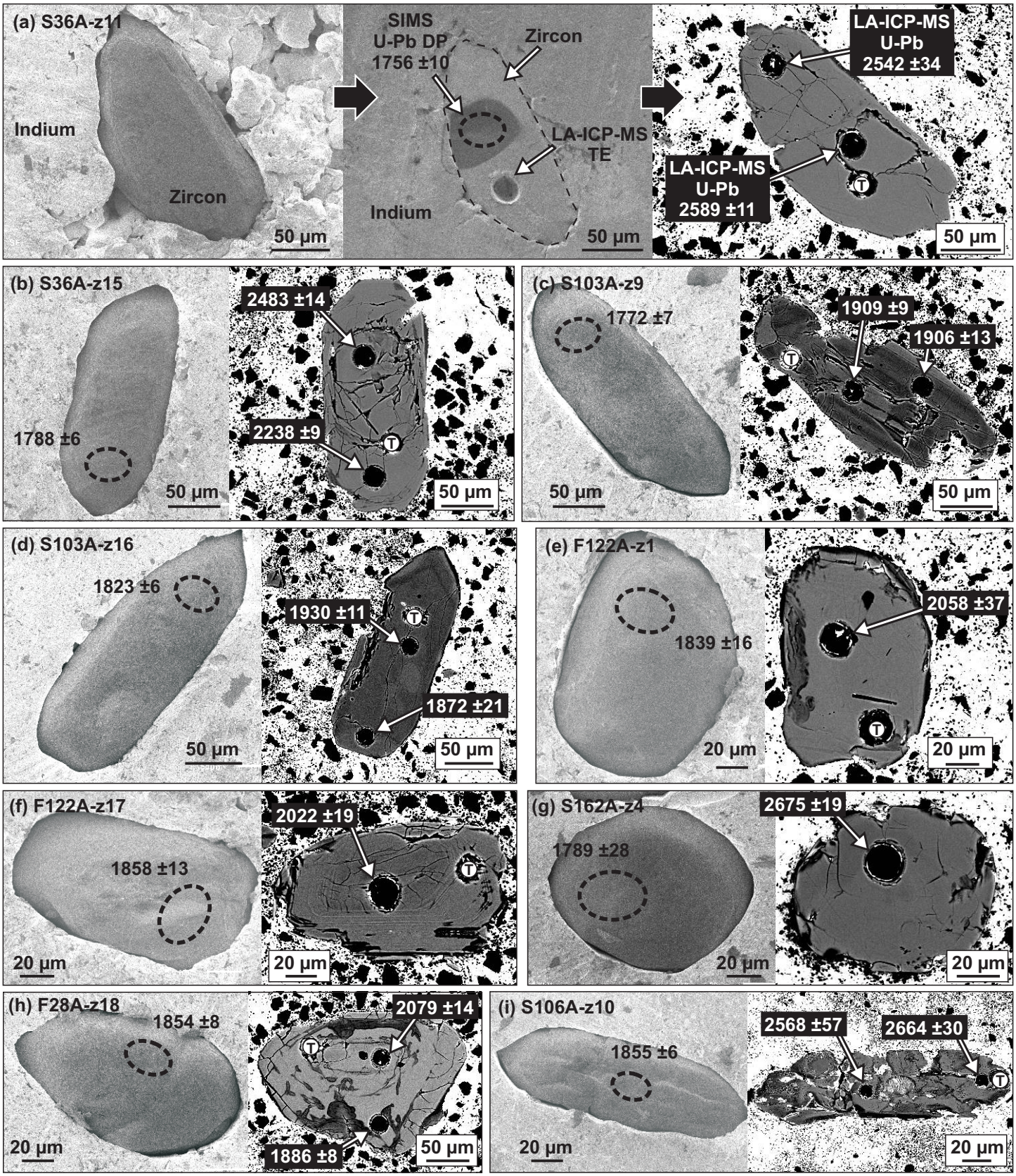

(a)
1: 1828 ±15
2: 1713 ±26
Bt
Pl
Qz
Ms
Sil
Qz
B75A-1-1
200 µm
(b)
Grt
Ms
Qz
1: 1799 ±23
2: 1809 ±24
Bt
H45A-1-1
200 µm
(c)
Ms
Grt
Grt
1849 to 1830 ±25
Ilm
Bt
H45A-1-12 to 15
100 µm
(d)
Ilm
Grt
Qz
1767 ±16
Pl
St
S165B-1-7
200 µm
(e)
Qz
1846 ±25
6
1820 ±18
8
2
3
4
1815 ±25
5
Bt
Kfs
S92C-1-2 to 6, 8
Bt
500 µm
(f)
1: 1831 ±20
2: 1781 ±27
1: 1831 ±25
2: 1829 ±17
S92C-1-5
S92C-1-3
1: 1823 ±21
2: 1839 ±25
13F122A-1-13
(g)
Pl
Bt
1: 1822 ±17
2: 1826 ±22
Grt
Qz
S162A-1-9
Bt
500 µm
(h)
Sil
Ilm
Grt
Sil
Sil
1: 1837 ±53
2: 1844 ±46
3: 1838 ±49
4: 1850 ±49
Sil
Qz
F38A-1-6
500 µm
(i)
1: 1812 ±61
2: 1843 ±60
1: 1822 ±11
2: 1825 ±15
S1A-2-3
Z1A-1-13
(j)
Bt
1: 1859 ±11
2: 1847 ±15
Kfs
Crd
Z1A-1-6
Bt
100 µm
(k)
100 µm
Grt
Sil
Pl
Crd
1: 1839 ±9
2: 1851 ±14
Bt
Kfs
Z1A-1-30
500 µm
(l)
Crd
1: 1854 ±11
2: 1849 ±18
3: 1845 ±19
Kfs
Pl
Bt
Ilm
Grt
Z1A-1-25
100 µm

Fig. 8 (previous page): Representative back-scattered electron (BSE) images of monazite dated *in situ* using LA-ICP-MS. Monazite grains are labelled using the x-y-z system, where x=sample number, y=thin section number and z=grain number. Black or white short-dashed lines indicate S_1 fabric orientation; black long-dashed lines indicate an inclusion trail fabric that is non-parallel to S_1 in the matrix. Laser pit locations are circled in white (10 μm in diameter) and labelled with analysis number and $^{207}Pb/^{206}Pb$ age (±2σ Ma). (a, b) Monazite aligned with S_1 in the matrices of mid-amphibolite samples. (c, d) Monazite in early-S_1 inclusion trails in garnet in mid-amphibolite-facies samples. (e, f) Matrix monazite in upper-amphibolite-facies samples. (g, h) Monazite in inclusion trails in garnet aligned parallel to S_1 in the matrix (g) and defining early-S_1 fabric (h) in upper-amphibolite-facies samples. (i–l) Monazite in matrices and in S_1-parallel inclusion trails in garnet in granulite-facies samples.

Fig. 9 (next page): (a) Images of a zircon grain showing the U–Pb geochronology procedure used in this study. From left to right: SEI image of unpolished zircon mounted in Indium; SEI image of the same unpolished zircon mounted in Indium, following LA-ICP-MS trace element depth-profiling, gold-coating and SIMS U-Pb depth-profiling; BSE image of the same zircon after polishing and dating the grain interior with the LA-ICP-MS U–Pb method. The LA-ICP-MS trace element analysis crater (labelled "T") remains visible after polishing. The black patches in Indium are polishing grit. (b-i) Examples of dated zircon grains from each sample, showing: (left) SEI image of the unpolished grain prior to analysis, with the U-Pb depth-profiling pit location shown by a black dashed circle; and (right) BSE image of the polished zircon interior and the locations of the LA-ICP-MS U–Pb analysis pit(s) and the LA-ICP-MS trace element analysis pit (labelled "T"). Ages reported for U–Pb depth profiles are weighted average $^{207}Pb/^{206}Pb$ ages of zircon rim analyses (±2σ Ma; see text for details). Ages reported for U–Pb LA-ICP-MS analyses of zircon interiors are $^{207}Pb/^{206}Pb$ ages (±2σ Ma). In (g), the trace element analysis spot is not visible because it was fully polished away. The uneven surface of the polished zircon in (i) is due to incomplete polishing as a result of the grain's location near the centre of the grain mount.


(a) S36A-z11
Indium
Zircon
50 µm
SIMS
U-Pb DP
1756 ±10
Zircon
LA-ICP-MS
TE
Indium
50 µm
LA-ICP-MS
U-Pb
2542 ±34
LA-ICP-MS
U-Pb
2589 ±11
50 µm
(b) S36A-z15
1788 ±6
50 µm
2483 ±14
2238 ±9
50 µm
(c) S103A-z9
1772 ±7
50 µm
1909 ±9
1906 ±13
50 µm
(d) S103A-z16
1823 ±6
50 µm
1930 ±11
1872 ±21
50 µm
(e) F122A-z1
1839 ±16
20 µm
2058 ±37
20 µm
(f) F122A-z17
1858 ±13
20 µm
2022 ±19
20 µm
(g) S162A-z4
1789 ±28
20 µm
2675 ±19
20 µm
(h) F28A-z18
1854 ±8
20 µm
2079 ±14
1886 ±8
50 µm
(i) S106A-z10
1855 ±6
20 µm
2568 ±57
2664 ±30
20 µm

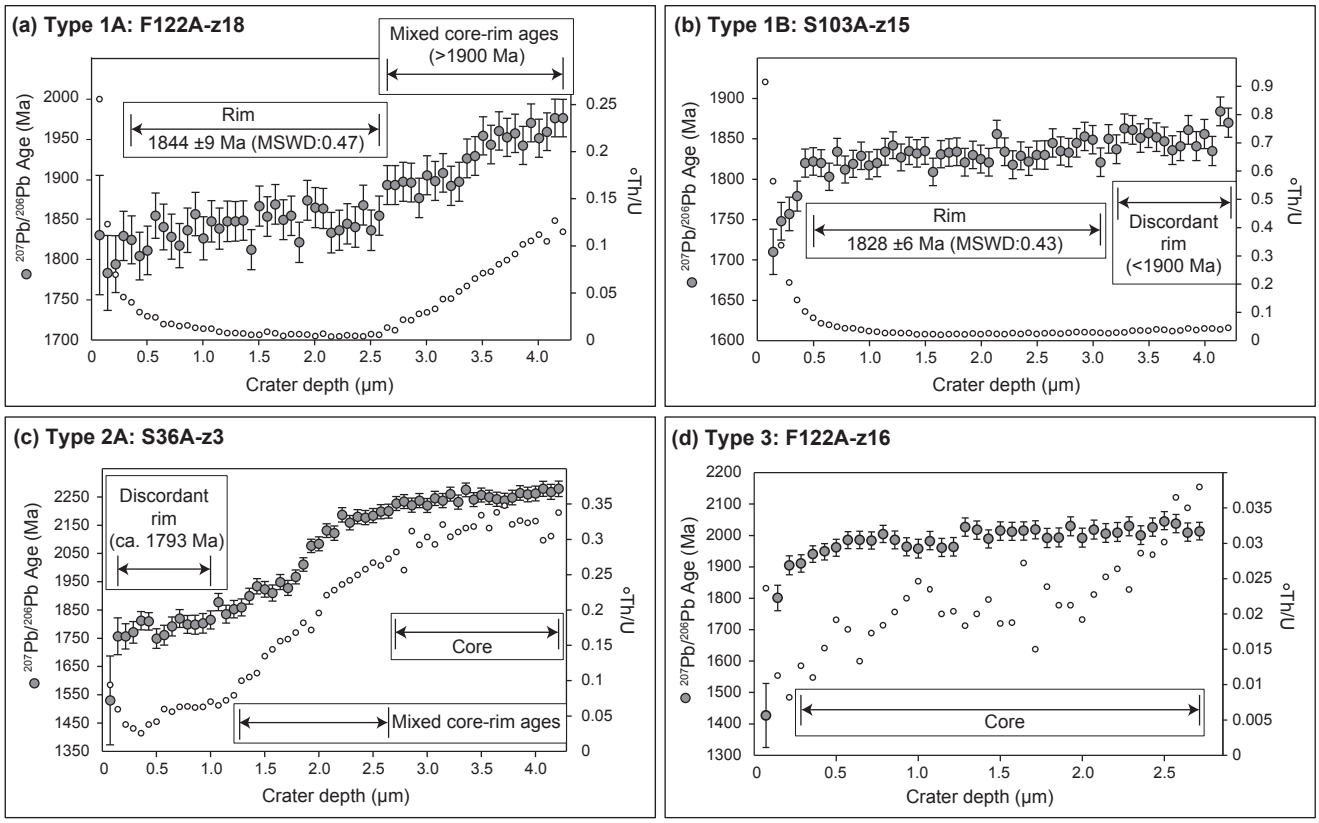


Fig 10: Examples of U–Pb depth profiles of zircon, including: (a) concordant rim followed by a core or mixed core-rim ages (Type 1A); (b) concordant rim with no core encountered (Type 1B); (c) discordant rim followed by a core or mixed core-rim ages (Type 2A); (d) no rim encountered (Type 3). The reported ages are weighted average $^{207}Pb/^{206}Pb$ ages (±2σ).

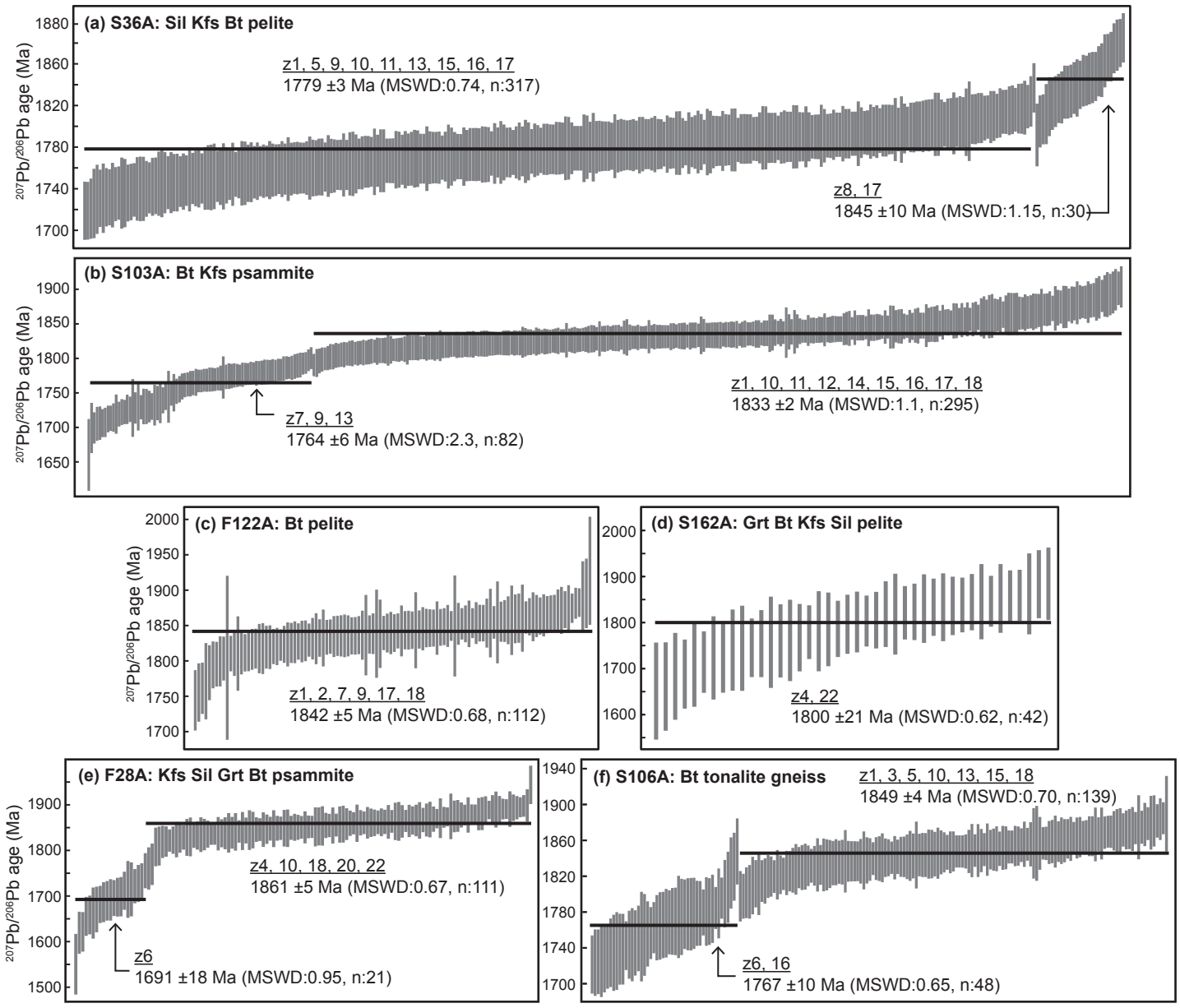


Fig. 11: Weighted average plots of zircon rim analyses identified by U-Pb depth profiling in each sample. The ages are weighted average $^{207}Pb/^{206}Pb$ ages (±2σ), where n=number of individual analyses (mass sweeps) included in the age. Zircon grains included in each reported age are listed by grain number (z#).

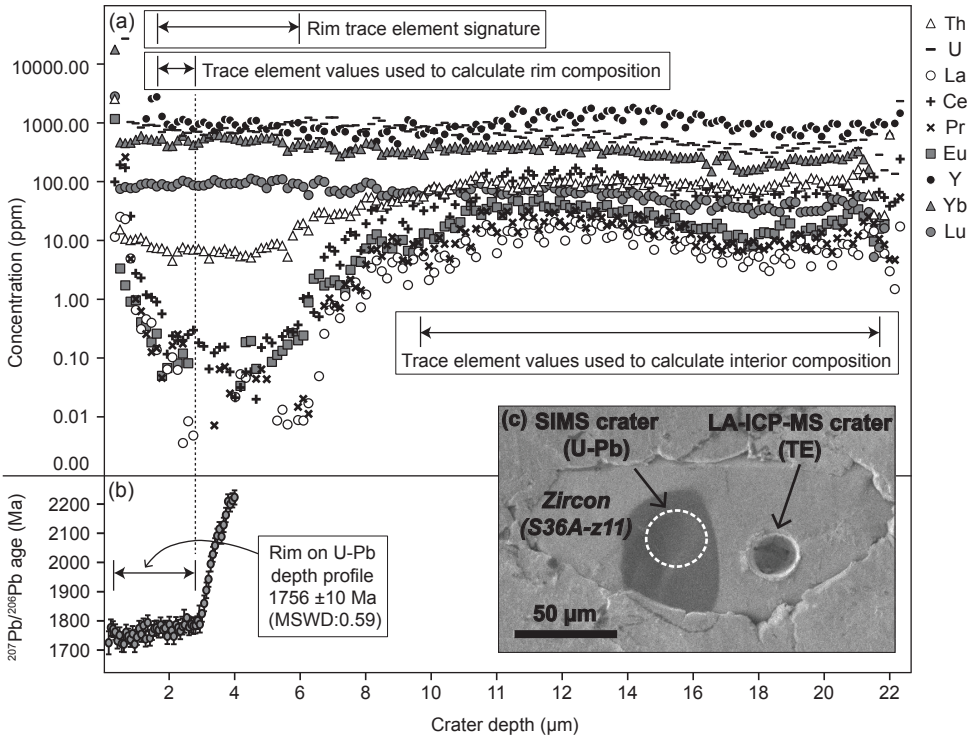


Fig. 12: (a) Example of a trace element depth profile in an unpolished zircon surface measured by LA-ICP-MS, indicating the depth intervals of analyses used to calculate trace element compositions of rims and interiors. (b) The SIMS U–Pb depth profile that corresponds to (a). (c) Image of unpolished zircon grain analyzed in (a) and (b), showing locations of the SIMS and LA-ICP-MS analysis craters.

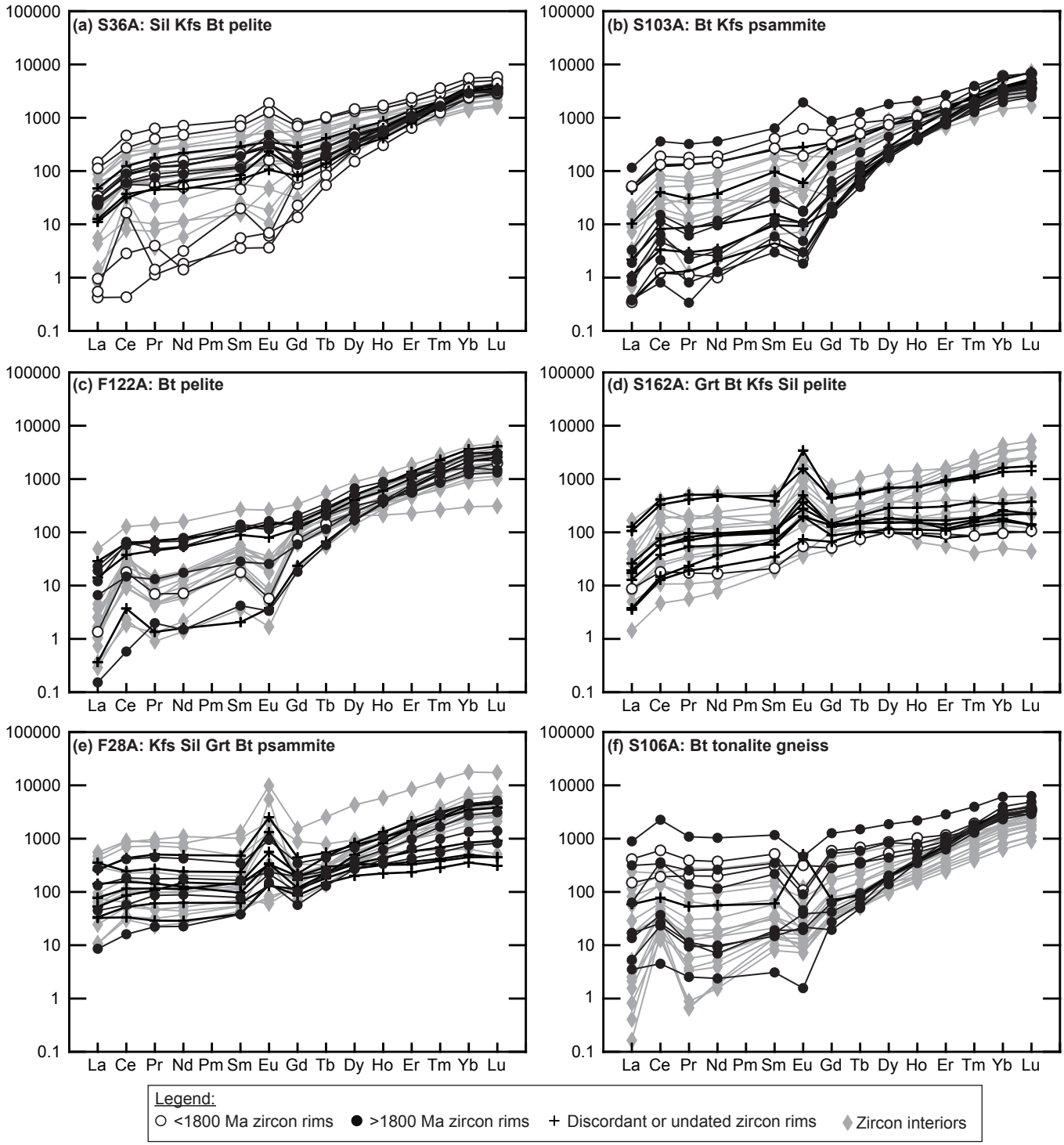


Fig. 13: Multi-element plots of zircon rims (black) and interiors (grey) determined from LA-ICP-MS trace element depth-profiling analysis. Concentrations are normalized to the chondrite values of Sun and McDonough (1989).

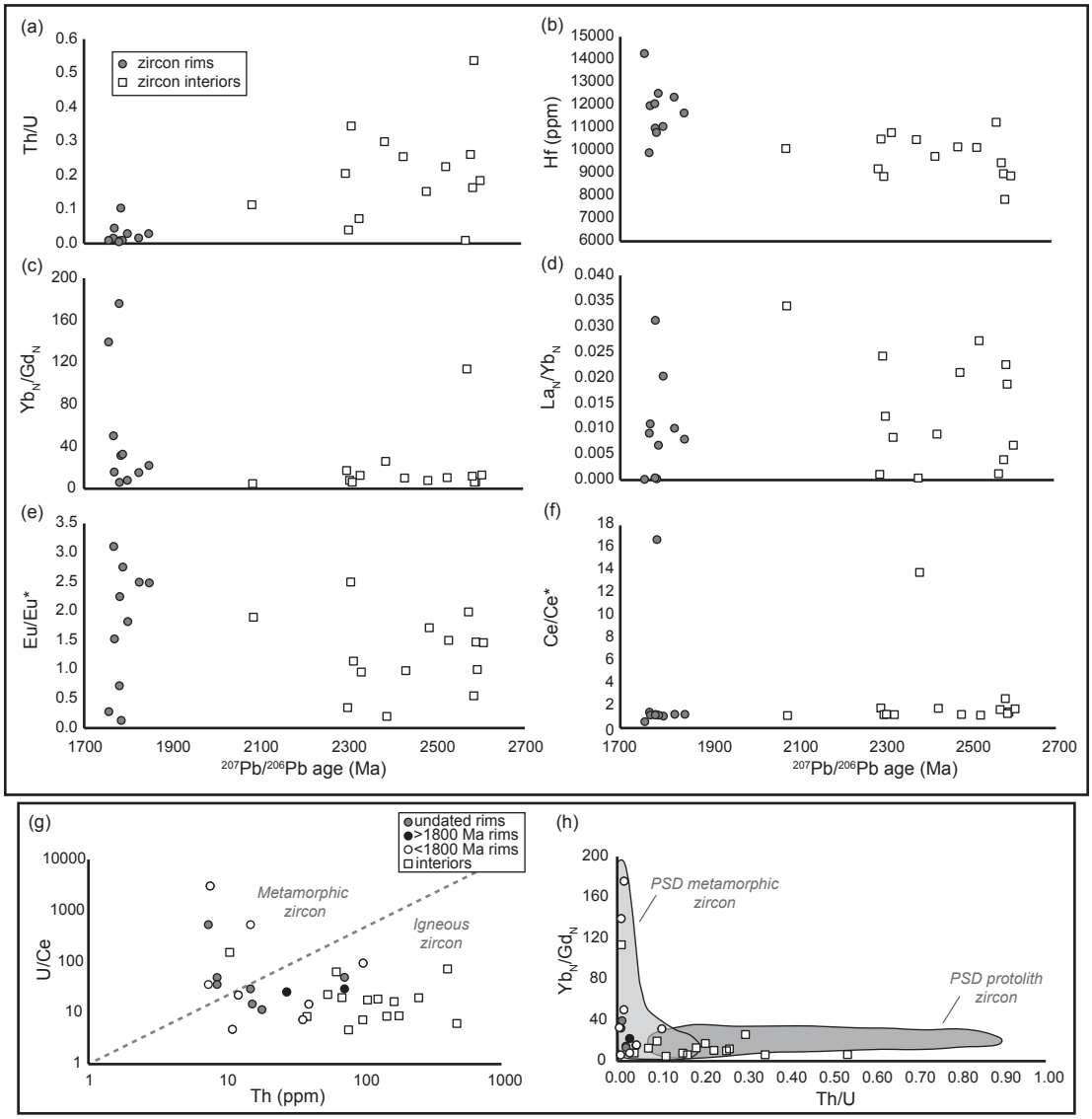
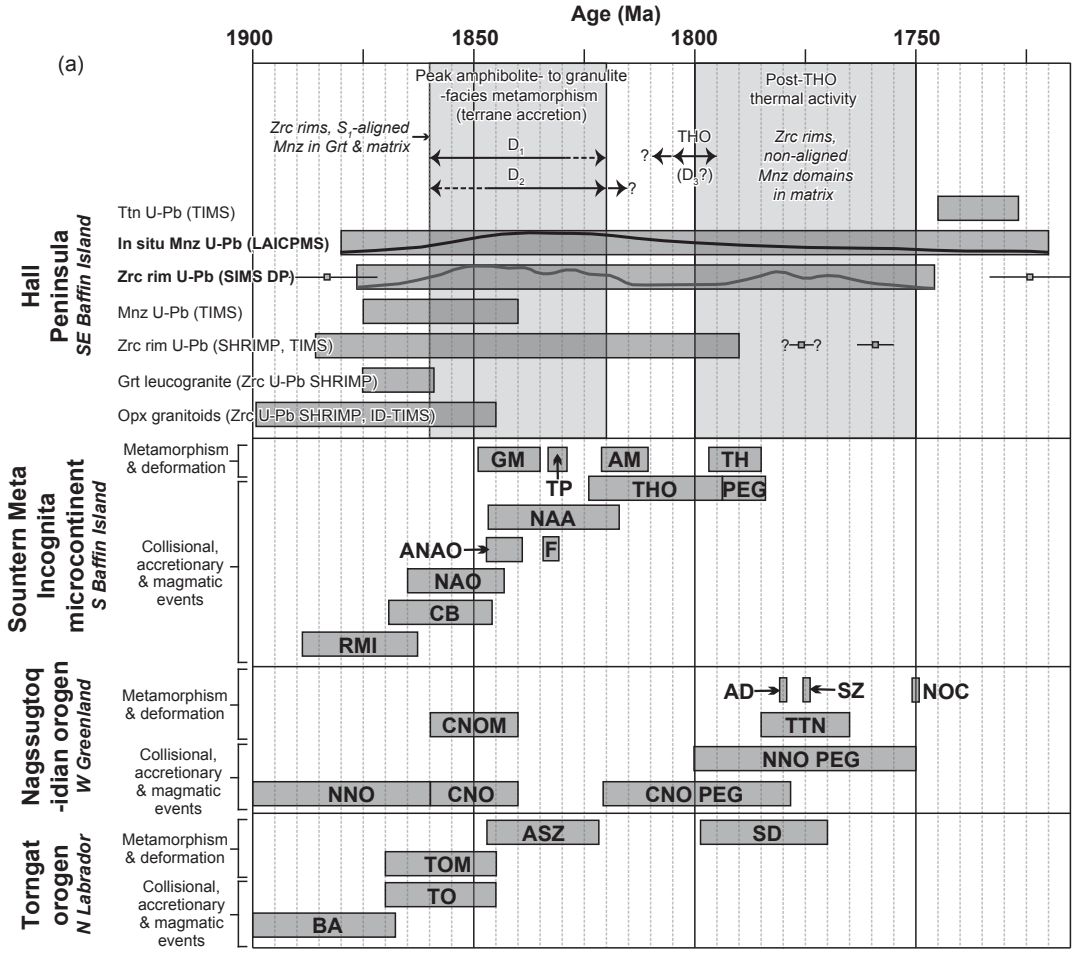


Fig. 14: Geochemical variation diagrams for zircon in sample S36A (refer to Appendix 1 for other samples). (a–f) Ages of zircon rims and interiors plotted against selected geochemical species. Zircon rim ages are weighted average $^{207}Pb/^{206}Pb$ ages determined from SIMS depth profiles. Interior ages are $^{207}Pb/^{206}Pb$ ages obtained from LA-ICP-MS analyses of polished interiors. (g) Zircon rim and interior compositions plotted on a diagram of U/Ce vs. Th (ppm), showing compositional fields of metamorphic and igneous zircon defined by Wooden et al. (2006). (h) Zircon rim and interior compositions plotted on a diagram of Yb_N/Gd_N vs. Th/U. Compositional fields of zircon from the western Grenville Province (from Marsh and Stockli, 2015) are shown for comparison. PSD metamorphic zircon=granulite-facies/anatectic zircon from the Parry Sound domain; PSD protolith zircon=protolith zircon from granulite-facies rocks in the Parry Sound domain.

(a)



(b)

Area	Event	Description	References
Meta Incognita micro -continent, S. Baffin	GM	Granulite-facies metamorphism and fabric development	St-Onge et al. (2007)
	TP	Thermal perturbation with no associated fabric	St-Onge et al. (2007)
	AM	Amphibolite-facies metamorphism; localized modification of pre-existing fabrics	St-Onge et al. (2007)
	TH	Thermal event with no associated fabric	St-Onge et al. (2007)
	RMI	Accretion of Meta Incognita microcontinent to Rae craton	St-Onge et al. (2006)
	CB	Emplacement of Cumberland Batholith	Jackson et al. (1990); Wodicka & Scott (1997); Scott & Wodicka (1998); Scott (1999)
	NAO	Narsajuaq arc "intraoceanic suite" plutonism	St-Onge et al. (1992); Machado et al. (1993)
	ANAO	Accretion of the Narsajuaq arc “intraoceanic suite” to Meta Incognita microcont.	St-Onge et al. (2007)
	F	Post-S_{1a} felsic dykes and plugs	St-Onge et al. (2007)
	NAA	Narsajuaq arc "Andean-margin suite" plutonism	Machado et al. (1993); Scott (1997); Scott & Wodicka (1998)
	THO	Collision of Superior craton with composite Churchill plate (THO terminal collision)	Scott & Wodicka (1998); Wodicka & Scott (1997); St-Onge et al. (2007)
	PEG	Syenogranite pegmatite dykes	Scott (1997); Wodicka & Scott (1997)
Nag. Orogen, W. Greenland	CNOM	Granulite-facies metamorphism in central Nagssugtoqidian Orogen	Taylor & Kalsbeek (1990); Kalsbeek & Nutman (1996); Connelly et al. (2000)
	TTN	U-Pb titanite ages in Archean gneiss in N. Nagssugtoqidian Orogen	Connelly et al. (2000)
	AD	Amphibolite-facies metamorphism; localized deformation in N. Nag. Orogen	Mazur et al. (2012)
	SZ	Orogen-scale strike-slip shear zones	Connelly et al. (2000)
	NOC	Post-orogenic cooling across entire Nagssugtoqidian Orogen	Connelly et al. (2000); Willigers et al. (2001)
	NNO	Accretion of Aasiaat domain to Rae craton	Taylor & Kalsbeek (1990)
	CNO	Accretion of composite Rae craton and Aasiaat domain with North Atlantic craton	Taylor & Kalsbeek (1990); Kalsbeek & Nutman (1996); Connelly et al. (2000)
	CNO PEG	CNO late- to post-kinematic pegmatites; U-Pb zircon and titanite ages	Garde & Hollis (2010)
	NNO PEG	NNO late- to post-kinematic pegmatites	Garde & Hollis (2010)
Torngat Orogen, N. Labrador	TOM	Thrusting and granulite-facies metamorphism	Bertrand et al. (1993); Rivers et al. (1996); Van Kranendonk (1996); Connelly (2001)
	ASZ	Abloviak Shear Zone (sinistral transpression)	Bertrand et al. (1993)
	SD	Reactivation of Torngat Orogen (cross-orogen shortening; folding and shearing)	Van Kranendonk & Wardle (1997)
	BA	Emplacement of the Burwell arc	Scott & Machado (1995); Van Kranendonk & Wardle (1996)
	TO	Collision of North Atlantic craton with Meta Incognita microcontinent in E. Labrador	Bertrand et al. (1993); Rivers et al. (1996); Van Kranendonk (1996); Connelly (2001)

Fig. 15 (previous page): (a) Summary chart of U–Pb zircon, monazite and titanite ages and magmatic events on Hall Peninsula, from this study and previous studies, compared with published ages of metamorphism, deformation, collisional/accretionary and magmatic events from the Meta Incognita microcontinent (S. Baffin Island), Nagssugtoqidian Orogen (W. Greenland) and Torngat Orogen (N. Labrador) (Fig. 2). Vertical gray bars and associated annotation illustrate the main interpretations from this study. The black curve represents the probability density of in situ monazite U–Pb ages presented here. This range of monazite ages does not include uncommon ages that are <1720 Ma and >1860 Ma (refer to Fig. 7). The gray curve represents the probability density of zircon rim U–Pb ages determined from depth profiles in this study. Other geochronological data on Hall Peninsula are from Scott (1999) and Rayner (2014, 2015). (b) Legend and references for acronyms and ages presented in (a).

Appendix 1 to:

Multi-stage zircon and monazite growth revealed by depth-profiling and *in situ* U-Pb geochronology: resolving the Paleoproterozoic tectonics of the Trans-Hudson Orogen, Baffin Island, Canada

Diane Skipton[1], D.A. Schneider[1], C.R.M. McFarlane[2], M.R. St-Onge[3], S.E. Jackson[3]

[1]*Department of Earth and Environmental Sciences, University of Ottawa, Ottawa, ON, K1N 6N5, Canada*

[2]*Department of Earth Sciences, University of New Brunswick, Fredericton, NB, E3B 5A3, Canada*

[3]*Geological Survey of Canada, Natural Resources Canada, Ottawa, ON, K1A 0E8, Canada*

Table of contents

A1. Map of previous geochronology 202

A2. Sample descriptions 203

A3. Whole-rock geochemistry 211

A4. Analytical methodoloy 211

A5. Detailed *in situ* U–Pb monazite results 215

A6. Detailed zircon trace element depth profiling results 220

A7. References 229

A1. Map of previous geochronology

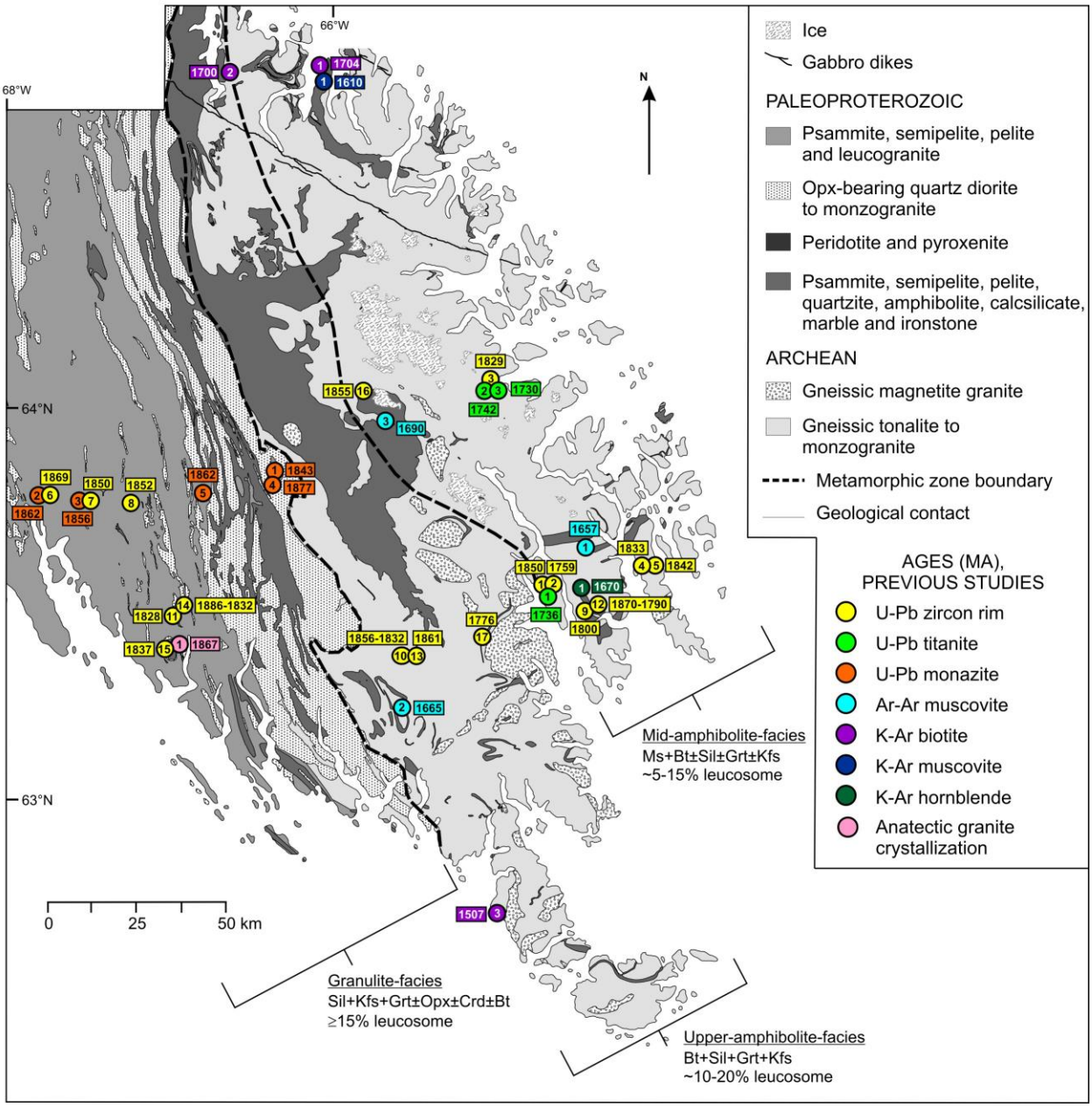


Fig. A1.1: Generalized geological map of Hall Peninsula (modified from Machado et al., 2013; Steenkamp and St-Onge, 2014) showing geochronological data determined by previous studies. Sample locations are indicated by coloured circles, following the legend above. For additional information on each age, including uncertainties, rock types, references and analysis methods, refer to Table 1 in the manuscript.

A2. Sample descriptions

A2.1. Samples with in situ U-Pb monazite geochronology

Samples are described in approximate order of increasing peak metamorphic grade.

A2.1.1. Sample S165B: Garnet biotite staurolite psammite

Sample S165B is from a ~2 km thick sequence of pelite, psammite, calc-silicate and amphibolite on the east coast of Hall Peninsula. Tonalite orthogneiss basement occurs structurally above and below the supracrustal sequence, and the western contact between the supracrustal rocks and the orthogneiss basement is mylonitized, suggesting that the basement was thrusted over the supracrustal rocks during T_2. The supracrustal rocks have a bedding-parallel S_1 fabric. The area has been folded in the north-south direction (F_3), reorienting S_1 so that it dips towards the south-southeast. Sample S165B contains mainly quartz, plagioclase, garnet and biotite, with minor staurolite, ilmenite and rutile. Garnet forms equant porphyroblasts up to 1 cm wide that contain spiral-shaped inclusion trails of quartz, plagioclase, biotite, ilmenite and staurolite. The S_1 fabric in the matrix is mainly defined by biotite. Rutile and staurolite both form fine-grained S_1-aligned tabular crystals in the matrix. The mineral assemblage and mineral-fabric relationships suggest that sample S165B attained peak metamorphism in the staurolite zone at lower- to mid-amphibolite-facies, accompanied by S_1 fabric development. Spiral-shaped inclusion trails defined by the same peak metamorphic minerals that occur in the matrix imply garnet rotation during S_1.

A2.1.2. Sample H45A: Biotite muscovite garnet pelite

Collected from a ~500 m thick sequence of pelite, amphibolite and calc-silicate on the northeast peninsula, this sample has a well-developed S_1 fabric. The supracrustal package and underlying orthogneiss basement comprise one of several imbricated T_2 thrust sheets. Sample H45A is from the second-lowest mapped thrust sheet. In contrast to the west-dipping S_1 fabric that is typical of most of Hall Peninsula, the S_1 fabric of sample H45A strikes east-west with a near-vertical dip, consistent with the orientation of all units in this thrust sheet. The pelite from which sample H45A was collected has a strong southwest-dipping crenulation cleavage defined by west-plunging crenulations of the S_1 fabric. The field evidence suggests that the H45A thrust sheet was folded in the north-south direction following T_2 thrusting. Notably, structurally-higher thrust sheets further west truncate this fold, suggesting that the north-south folding in this area pre-dates younger T_2 thrusts (Chadwick et al., 2015). Therefore, this fold is not classified as an F_3 fold, although it has a similar orientation to F_3 folds elsewhere.

The main components of sample H45A are biotite, muscovite, garnet, quartz, plagioclase, ilmenite and tourmaline. Garnet forms equant porphyroblasts containing spiral-shaped inclusion trails of biotite, ilmenite, quartz and muscovite. The S_1 matrix fabric is defined by biotite and muscovite, and by biotite- and muscovite bands alternating with quartz- and feldspar-rich bands. The S_1 fabric is crenulated due to the map-scale fold with an east-striking axial plane that affects the H45A thrust sheet. Post-S_1 coarse-grained muscovite occurs axial planar to the crenulations. The petrographic evidence suggests that S_1 fabric development accompanied peak metamorphic conditions at lower- to mid-amphibolite-facies, but at insufficient temperatures to initiate muscovite breakdown. Spiral-shaped inclusion trails in garnet defined by the peak assemblage indicate garnet rotation during S_1. Post-S_1 muscovite is interpreted as retrograde muscovite that grew during or after the post-S_1 crenulations.

A2.1.3. Sample B75A: Biotite muscovite sillimanite K-feldspar garnet pelite

Sample B75A occurs in a south-dipping sequence of metasedimentary rocks surrounded by Archean tonalite orthogneiss on southeastern Hall Peninsula. This package of metasedimentary rocks, and the S_1 fabric, dips to the south due to F_3 folding. While the basal contact with Archean basement orthogneiss may represent a stratigraphic unconformity, basement rocks were likely thrust eastward over the metasedimentary rocks during D_2, prior to folding during D_3. The major components of the pelite include biotite, quartz, sillimanite (fibrolite), plagioclase, K-feldspar, muscovite, garnet and tourmaline. Biotite defines a well-developed schistosity (S_1). Muscovite is less abundant than biotite, and some grains are S_1-aligned but most muscovite cross-cuts S_1. Symplectic quartz intergrowths occur locally in both generations of muscovite. Fibrolite forms elongate knots oriented parallel to the S_1 foliation that are surrounded by quartz, and muscovite commonly occurs at the edges of fibrolite+quartz aggregates. The petrographic evidence suggests that sample B75A reached thermal peak conditions at mid-amphibolite facies, with concurrent S_1 fabric development. This enabled vapour-absent muscovite dehydration melting and growth of sillimanite and K-feldspar (e.g. Spear *et al.*, 1999; White *et al.*, 2001), although only ≤5% leucosome occurs in outcrop. Muscovite aligned with S_1 may be prograde muscovite that survived breakdown, whereas muscovite that cross-cuts S_1 represents retrograde muscovite that grew from rehydration of K-feldspar (e.g. Palin et al., 2014).

A2.1.4. Sample S92C: Biotite K-feldspar muscovite sillimanite pelite

This sample was collected from a 3 m wide slice of pelite with tonalite orthogneiss occurring both structurally above and below. It is likely that tonalite basement was thrust eastward over the pelite during D_2, similar to larger-scale thrust imbricates that occur elsewhere in eastern Hall Peninsula. The principal minerals are biotite, muscovite, K-feldspar, plagioclase, quartz and sillimanite. The west-dipping S_1 is defined by aligned biotite and prismatic sillimanite, and a well-developed gneissosity (S_1) is defined by 0.5–2 mm thick bands of K-feldspar, quartz and plagioclase alternating with bands of biotite–muscovite±sillimanite. Leucosome bands of quartz and feldspar are consistent with melt (e.g. Sawyer, 1999). Muscovite occurs as fine grains that cross-cut S_1, and as larger grains that surround aggregates of prismatic, S_1-parallel sillimanite crystals. Some muscovite grains contain sillimanite inclusions or symplectic quartz intergrowths. The mineral assemblage and textures suggest that sample S92C reached peak metamorphism at upper-amphibolite facies, producing abundant K-feldspar and prismatic sillimanite at the expense of muscovite (e.g. Spear *et al.*, 1999; White *et al.*, 2001). It is also possible that limited biotite dehydration melting occurred, producing garnet but no orthopyroxene or cordierite (e.g. Spear & Parrish, 1996; Spear et al., 1999), although the sample is rich in S_1-aligned biotite. The S_1-parallel alignment of peak minerals indicate that S_1 was concurrent with peak metamorphism. Muscovite is considered to be retrograde, since it cross-cuts S_1 and likely formed from rehydration of K-feldspar (e.g. Palin *et al.*, 2014).

A2.1.5. Sample S162A: Garnet biotite K-feldspar sillimanite pelite

Sample S162A is from a ~2 km thick package of pelite, diorite and amphibolite on the southeast coast of the peninsula. The supracrustal rocks have a well-developed, bedding-parallel S_1 foliation. Tonalite orthogneiss basement occurs structurally above and below the supracrustal sequence, suggesting that basement was thrust (T_2) over the supracrustal rocks. The area has been folded by thick-skinned, upright, open, F_3 folds with east-west-striking axial planes, resulting in an overall east-west-striking map pattern for the package of supracrustal rocks. Sample S162A comprises garnet, biotite, quartz, plagioclase, K-feldspar, sillimanite, magnetite and minor pyrite. The S_1 fabric is defined by aligned biotite and elongate garnet porphyroblasts. Garnet porphyroblasts are up to 1 cm wide and contain inclusions of biotite, quartz and sillimanite that form inclusion trails that are parallel to S_1 in the matrix. Sillimanite only occurs in garnet, forming prismatic crystals, and is not apparent in the matrix. Based on the mineral assemblage and textures,

this sample probably experienced peak metamorphism at upper-amphibolite-facies conditions, with coeval S_1 fabric development, enabling abundant K-feldspar and prismatic sillimanite to be produced at the expense of muscovite (e.g. Spear et al., 1999; White et al., 2001). It is possible that limited biotite dehydration melting also occurred, producing garnet but no orthopyroxene or cordierite (e.g. Spear & Parrish, 1996; Spear et al., 1999), although the sample is rich in S_1-aligned biotite that is interpreted as prograde, and ≤10 vol% melt occurs in outcrop.

A2.1.6. Sample F38A: Garnet biotite sillimanite pelite

Sample F38A is from an extensive supracrustal sequence of interbedded pelite, semi-pelite and psammite with minor amphibolite on central Hall Peninsula with a well-developed west-dipping S_1 fabric. Very coarse-grained sillimanite was observed in outcrop and leucogranite lenses and S_1-parallel dikes occur locally. The sample consists of garnet, biotite, plagioclase, sillimanite and ilmenite. The S_1 fabric undulates around garnet porphyroblasts and is mainly defined by aligned biotite, prismatic sillimanite and lenses of plagioclase and quartz that are inferred as melt (e.g. Sawyer, 1999). Garnet forms equant porphyroblasts up to 2 cm wide that are rich in inclusions of quartz, plagioclase and fine-grained sillimanite. The inclusions are aligned parallel to S_1 in the matrix, but locally form non-S_1-parallel, nearly spiral-shaped inclusion trails. Coarse-grained biotite grains surround garnet and cross-cut the S_1 foliation. The petrographic and field relationships suggest that sample F38A attained peak metamorphism at upper-amphibolite- to granulite-facies, enabling muscovite dehydration melting and producing sillimanite and melt (e.g. Spear *et al.*, 1999; White *et al.*, 2001). S_1 is considered to have accompanied peak metamorphism, and non-S_1-parallel inclusion trails in garnet imply garnet rotation during D_1. Biotite that surrounds garnet and cross-cuts S_1 is probably retrograde.

A2.1.7. Sample 13F122A: Garnet biotite K-feldspar sillimanite psammite

Sample 13F122A was collected from a ~5 km thick sequence of interbedded psammite on north-central Hall Peninsula with minor bedding-parallel orthopyroxene monzogranite sills. The area has a well-developed, bedding-parallel, west-dipping S_{1a} foliation and is also affected by east-vergent, F_{1a} (or F_2?) folds that are up to 3 km wide from limb to limb. Coarse-grained to pegmatitic leucogranite lenses and bodies occur locally, and are suggestive of melt (e.g. Sawyer, 1999). Sample 13F122A consists of garnet, quartz, plagioclase, biotite, K-feldspar and sillimanite. The S_{1a} fabric is defined by biotite and by bands of fine-grained, prismatic sillimanite crystals in the matrix. Garnet forms equant poikiloblasts up to 1 cm wide that are rich in quartz inclusions and

contain fine-grained sillimanite needles. Garnet is surrounded by 1-2 mm wide biotite-free haloes composed of quartz ± plagioclase ± K-feldspar. Based on petrographic and field evidence, peak metamorphism in this sample probably occurred at upper-amphibolite-facies, resulting in complete consumption of muscovite through vapour-absent dehydration melting (e.g. Spear *et al.*, 1999; White *et al.*, 2001). Limited biotite dehydration melting may have also occurred, producing garnet but no orthopyroxene or cordierite (e.g. Spear & Parrish, 1996; Spear et al., 1999), although the sample contains abundant S_1-aligned biotite that is probably prograde. S_1-aligned peak metamorphic minerals suggest concurrent S_1 fabric development. Biotite-free haloes surrounding garnet may be depletion haloes, reflecting biotite consumption during garnet growth.

A2.1.8. Sample S1A: Garnet K-feldspar sillimanite biotite pelite

This sample was collected from a ~5 km thick package of interbedded pelite, semi-pelite and psammite on the southwestern peninsula in the granulite-facies zone. The metasedimentary sequence contains extensive leucogranite bodies and is intruded by several orthopyroxene monzogranite sills. The area has a well-developed, bedding-parallel, west-dipping S_1 foliation and several second-generation folds (F_{1b}). Sample S1A contains mainly garnet, K-feldpsar, quartz, plagioclase and sillimanite with lesser biotite (~5%) and ilmenite. The S_1 fabric is defined by aligned garnet porphyroblasts and prismatic sillimanite, as well as lenses of coarse-grained K-feldpsar, quartz and plagioclase, which are interpreted as melt (e.g. Sawyer, 1999). Some matrix biotite grains are S_1-aligned, whereas many are randomly oriented and are often concentrated along garnet rims. Garnet porphyroblasts are up to 1.5 cm wide and contain inclusions of biotite, quartz and fine-grained sillimanite that are generally oriented parallel to S_1 in the matrix. The abundance of K-feldspar, prismatic sillimanite and melt, the absence of muscovite and the scarcity of biotite suggest that sample S1A attained granulite-facies conditions during the thermal peak. It is likely that muscovite was completely consumed through dehydration melting (e.g. Spear et al., 1999; White et al., 2001), and biotite dehydration was probably initiated, producing garnet but not orthopyroxene or cordierite (e.g. Spear & Parrish, 1996; Spear et al., 1999). S_1 is interpreted to have accompanied prograde metamorphism, including early garnet growth, as well as the thermal peak.

A2.1.9. Sample S60A: Garnet K-feldspar biotite psammite

Sample S60A is from an extensive sequence of interbedded psammite, semi-pelite and psammite with minor marble in the granulite-facies zone on the southwestern peninsula. The

metasedimentary package has a well-developed, west-dipping, bedding-parallel S_1 foliation and is folded by a large F_{1b} (or F_2?) fold that measures at least 10 km from limb to limb. The sequence hosts voluminous garnet ± cordierite leucogranite intrusions and several orthopyroxene monzogranite sills. Sample S60A contains garnet, quartz, plagioclase, K-feldspar, biotite, ilmenite and graphite. Garnet forms equant porphyroblasts up to 2 mm wide, and the S_{1a} foliation is mainly defined by aligned biotite. Petrographic and field evidence suggests that sample S60A reached peak metamorphism at granulite-facies conditions with concurrent S_1 fabric development.

A2.1.10. Sample Z1A: Garnet K-feldspar cordierite sillimanite biotite pelite

Sample Z1A is from a sequence of interbedded pelite and psammite in the granulite-facies zone on the northwestern peninsula that contains abundant leucogranite dikes/intrusions and is locally intruded by orthopyroxene monzogranite sills. The area has a strong, bedding-parallel, north-striking sub-vertical S_1 foliation. Sample Z1A contains K-feldspar, plagioclase, quartz, garnet, cordierite, prismatic sillimanite, biotite, ilmenite and spinel. The S_1 fabric in the matrix is defined mainly by aligned biotite, some elongate cordierite grains and by lenses of coarse-grained K-feldspar, plagioclase and quartz, which are interpreted as partial melt (e.g. Sawyer, 1999). Garnet forms equant- to elongate porphyroblasts that contain inclusions of fine-grained sillimanite, cordierite, biotite and quartz. The inclusions are typically aligned parallel to S_1 in the matrix. Based on the mineral assemblage and textures, sample Z1A probably attained peak metamorphism at granulite-facies during D_1, producing abundant melt, K-feldspar, sillimanite, garnet and cordierite through biotite-dehydration melting (e.g. LeBreton & Thompson, 1988; Spear et al., 1999).

A2.2. Samples with zircon U-Pb and trace element depth profiling

Refer to section S2.1.5 for description of sample S162A.

A2.2.1. Sample S36A: Sillimanite K-feldspar biotite pelite

Sample S36A was collected from the eastern mid-amphibolite-facies zone, from a west-dipping sequence of pelite and psammite that is bounded by orthogneiss basement. The supracrustal sequence and its underlying basement are interpreted as a T_2 thrust sheet, and the metasedimentary rocks have a strong, west-dipping, bedding-parallel S_1 fabric. The strata host coarse-grained to pegmatitic leucogranite lenses and bodies that probably represent melt (e.g. Sawyer, 1999). Sample S36A consists of quartz, K-feldspar, biotite, sillimanite (fibrolite) and graphite, along with less abundant plagioclase (~10%) and muscovite (~2-5%). K-feldspar exhibits tartan (microcline) twinning. The S_1 fabric is defined by 1-5 mm thick bands of fibrolite alternating

with bands of fine- to medium-grained quartz, feldspar and biotite. S_1 is also defined by aligned fibrolite needles, biotite and some aligned quartz and feldspar crystals. Muscovite is mostly adjacent to or intergrown with biotite, oriented parallel to biotite cleavage planes and S_1, but also cross-cuts S_1-aligned biotite. Field and petrographic evidence suggests that sample S36A attained peak metamorphism during D_1 at mid-amphibolite-facies conditions, enabling vapour-absent muscovite dehydration (e.g. Spear *et al.*, 1999; White *et al.*, 2001), although <5% leucosome occurs in hand sample. Muscovite is interpreted as retrograde and post-D_1.

A2.2.2. Sample F122A: Biotite pelite

Sample F122A is from a sequence of interbedded pelite and psammite in the mid-amphibolite-facies zone that is underlain by Archean tonalite orthogneiss. The sequence is folded by a map-scale F_3 fold, such that S_1 is north-dipping overall, and S_1 is folded by south-vergent F_3 crenulations in pelite. Sample F122A comprises quartz, plagioclase, biotite and minor (<2%) muscovite. S_1 is defined by aligned biotite grains, and by discontinuous bands of biotite up to 1 mm thick alternating with quartz- and plagioclase-rich bands. Muscovite forms fine grains adjacent to biotite that commonly cross-cut S_1. Quartz and plagioclase are generally fine- to medium-grained. Quartz also forms discontinuous bands of coarse-grained, elongate crystals aligned with S_1, along with lesser plagioclase. These bands are up to 2 cm thick in hand sample and may represent melt (e.g. Sawyer, 1999). Although no sillimanite was observed in sample F122A, it is abundant in nearby pelite that is interpreted to have undergone vapour-absent muscovite dehydration melting. Based on the mineral assemblage and textures, peak metamorphism in sample F122A probably also occurred at mid-amphibolite-facies conditions, with coeval S_1 fabric development. Muscovite is interpreted as a retrograde, post-D_1 phase.

A2.2.3. Sample S103A: Biotite K-feldspar psammite

Sample S103A is from a sequence of pelite, psammite and amphibolite in the eastern mid-amphibolite-facies zone. The sequence is structurally bounded by orthogneiss basement, suggesting that the supracrustal rocks and the underlying basement represent a T_2 thrust slice. Due to subsequent folding during D_3, the supracrustal sequence and S_1 strike east-west with a sub-vertical dip. Sample S103A is fine- to medium-grained and consists of quartz, K-feldspar, plagioclase, biotite, graphite and muscovite. Quartz and feldspar are approximately equigranular and exhibit grain boundary migration and subgrain formation. K-feldspar has tartan (microcline) twinning. S_1 is defined by aligned biotite grains. Muscovite occurs along grain boundaries and

within fractures in K-feldspar. Although sample S103A does not contain sillimanite or garnet, it is interpreted to have reached mid-amphibolite-facies during peak metamorphism and D_1, similar to nearby pelites (e.g. sample S36A). The lack of aluminous phases is probably a result of bulk composition. Muscovite is considered a retrograde phase, and textures suggest that it is replacing K-feldspar.

A2.2.4. Sample F28A: Garnet K-feldspar sillimanite biotite psammite

Sample F28A is from the eastern margin of a 1 km thick, west-dipping package of pelite and psammite that is structurally bounded by tonalite orthogneiss basement in the central upper-amphibolite-facies zone. It was collected from ~2 km east of the ~25 km wide belt of orthopyroxene-bearing granitoids on the central peninsula. The supracrustal rocks have a west-southwest-dipping S_1 fabric and the western contact with orthogneiss basement is interpreted as a T_2 thrust. Sample F28A comprises quartz, K-feldspar, plagioclase, garnet, biotite and sillimanite. The S_1 foliation is defined by compositional banding, in which bands of coarse-grained quartz (35%), plagioclase (30%) and K-feldspar (35%) alternate with finer-grained bands of biotite, garnet and sillimanite. Biotite (~15%) and sillimanite are S_1-aligned, and garnet (~4%) forms anhedral, S_1-aligned porphyroblasts up to 1.5 cm long, as well as a lesser population of smaller, equant grains. Garnet contains S_1-aligned inclusion trails of biotite, plagioclase and quartz. Bands of coarse-grained quartz, plagioclase and K-feldpsar are interpreted as crystallised melt (Sawyer, 1999). Based on the presence of leucosome and sillimanite, the abundance of K-feldspar and the absence of muscovite, the sample likely underwent vapour-absent muscovite dehydration melting and consumption of muscovite at upper amphibolite-facies conditions (e.g. Spear *et al.*, 1999; White *et al.*, 2001). It is possible that biotite dehydration melting occurred with increased temperatures (to ~750°C), producing garnet but not orthopyroxene or cordierite through a continuous reaction (Spear & Parrish, 1996; Spear *et al.*, 1999). The textures imply that peak metamorphism and partial melting were accompanied by S_1 development.

A2.2.5. Sample S106A: Biotite tonalite gneiss

Sample S106A was collected from tonalitic orthogneiss in the eastern mid-amphibolite-facies zone that is inferred as Archean based on crystallization ages of similar basement rocks in the region (Rayner, 2014, 2015). The sample is medium- to coarse-grained and consists of quartz, plagioclase, and biotite with minor (1-2%) muscovite. It has a west-dipping S_1 fabric that is mainly defined by aligned biotite grains. Biotite is concentrated in S_1-parallel clots, and quartz and

plagioclase also form patchy, S_1-aligned aggregates. Quartz exhibits undulose extinction, subgrain formation and sutured grain boundaries, and plagioclase is weakly- to -moderately sericitized. Muscovite occurs as patchy, irregularly-shaped grains that appear intergrown with biotite, and muscovite also forms smaller, patchy grains associated with sericite on plagioclase. Sample S106A is interpreted to have undergone peak metamorphism at mid-amphibolite-facies with synchronous S_1 fabric development, similar to nearby pelites (e.g. sample F122A). Muscovite is interpreted as a post-thermal-peak phase.

A3. Whole-rock geochemistry

Table A3.1: Whole-rock geochemistry (lithium metaborate/tetraborate fusion ICP-MS) of rock samples from Hall Peninsula, Baffin Island, analyzed in Skipton et al. (this study).

Sample[a]	SiO_2	Al_2O_3	FeO[b]	Fe_2O_3[c]	MnO	MgO	CaO	Na_2O	K_2O	TiO_2	P_2O_5	LOI	Total
B75A	66.91	16.02	4.5	0.83	0.08	2.17	1.02	1.64	4.75	0.745	0.18	0.79	100.1
13F122A	78.01	10.84	2.8	0.86	0.043	1.37	1.4	2.12	2.21	0.479	0.1	-0.17	100.4
F122A	86.58	7.24	-	1.72*	0.013	0.51	1.28	1.98	0.81	0.202	0.06	0.23	100.6
F28A	77.36	11.15	-	3.77*	0.036	1.3	1.66	2.46	1.3	0.419	0.07	0.66	100.2
F38A	43.56	20.38	14.6	4.63	0.165	4.02	2.3	2.53	2.65	3.219	0.02	-1.52	98.23
S103A	77.6	12.17	-	1.55*	0.008	0.58	1.04	2.97	3.69	0.168	0.03	0.91	100.7
S106A	74.26	13.33	-	3.14*	0.04	1.41	2.19	3.81	1.64	0.329	0.07	0.57	100.8
S162A	56.31	16.84	-	15.28*	0.105	2.24	1.69	2.81	2.84	0.783	0.06	0.06	99.04
S1A	61.84	18.51	-	8.67*	0.075	3.48	1.01	1.59	4	0.955	0.08	0.26	100.5
S36A	73.49	13.72	-	4.91*	0.03	1.57	0.59	1.04	3.09	0.599	0.04	1.76	100.8
Z1A	55.11	22.11	8.1	1.95	0.139	3.92	1.63	2.08	2.44	0.941	0.04	-1	98.32

[a]Whole-rock geochemistry not available for samples H45A, S165B, S60A, S92C. Whole-rock geochemistry of sample F28A is from Skipton et al. (2016).

[b]FeO determined by Fe titration

[c]*denotes total iron as Fe_2O_3

A4. Analytical methodology

A4.1. In situ U-Pb monazite geochronology

Monazite was dated *in situ* in ten metasedimentary rocks. For each sample, 15-30 monazite grains were identified and BSE images were taken of selected grains using a JEOL 6610LV SEM (University of Ottawa, Canada). Monazite was dated in several microstructural contexts, including along grain contacts as well as inclusions in matrix minerals and in garnet, and monazite aligned with S_1. Monazite U-Pb dating using the LA-ICP-MS method was performed at the University of New Brunswick (Fredericton, Canada) using a Resonetics M-50 193nm excimer laser system

connected to an Agilent 7700x quadrupole ICP-MS. Between 15 and 30 monazite grains were analyzed in each sample, and grains of sufficient size were analyzed using 2-4 laser spots with a 10-13 µm crater size to date prospective age domains following the analytical procedures described in McFarlane and Luo (2012) and McFarlane (2015). Monazite was analyzed with a 30 s ablation time following 30 s of background collection, using a laser fluence of 2 J/cm^2 and a repetition rate of 3.5 Hz. Each ablation sequence (of 1–2 samples) included at least four analyses of NIST610 reference glasses, as well as at least 15 analyses of monazite U-Pb age standards 44069 (425 ± 3 Ma; Aleinikoff et al., 2006) and 8153 (506 ± 8 Ma; Williams et al., 2006; Reno et al., 2012) interspersed throughout the sequence. Ages of U-Pb standards were reproduced to within 1% of the established ages. The long-term (3 year) reproducibility for the 44069 monazite standard in the University of New Brunswick LA-ICP-MS laboratory is within 1% of the accepted age. The down-hole U-Pb fractionation was consistent among the U-Pb monazite standards, and was presumed to be similar for the unknowns. All sources of error are propagated, but it was ensured that the MSWD of the standards was less than 1.2 so that no excess error is propagated from the external standard. All data were reduced offline using a combination of Iolite v2.15 (Paton et al., 2011) and VizualAge v2011-08-29 (Petrus & Kamber, 2012) running under Wavemetrics IgorPro v6.22™. The final corrected data were plotted using Isoplot v. 4.15 (Ludwig, 2003).

A4.2. Zircon U-Pb geochronology and trace element analysis

A4.2.1. Sample preparation

Samples were washed and standard crushing and heavy liquid techniques were used to separate heavy mineral concentrates at the University of Ottawa (Canada). After sieving to isolate the 100-300 µm size fraction, a binocular microscope was used to select zircon grains for analysis. Zircon grains with a variety of crystal habits were chosen from each sample, including mostly 2:1 or 3:1 prismatic crystals that are sub- to euhedral as well as lesser equant and anhedral grains. Some zircon grains selected for analysis have uneven or bumpy surfaces, which may represent outgrowths, but grains with visible cracks or inclusions were avoided. The unpolished grains were pressed into indium metal mounts using a tungsten-carbide anvil, with crystal faces oriented parallel to the mount. To allow optimal location of analysis spots, scanning-electron microscope (SEM) images were obtained using the JEOL6610LV SEM at University of Ottawa (Canada). Energy dispersive X-ray spectroscopy (EDS) was used along with SEM imaging to determine semi-quantitative elemental concentrations on grain surfaces. Prior to analysis, mounts were

ultrasonically cleaned and rinsed with dilute HCl. Polished grains of zircon standard AS3 (U-Pb age: 1099 ± 1 Ma; Paces and Miller, 1993) were pressed onto the indium mount for use as an analytical reference material.

A4.2.2. SIMS U-Pb depth-profiling

The CAMECA ims1270 ion microprobe at the National Ion Microprobe Facility, University of California (USA), was used to date 15 zircon grains from each sample using the U-Pb depth-profiling technique. To date the most recent zircon growth or recrystallization events, the ion beam was focused directly onto the unpolished surface of each grain. A ~20 µm O^- beam was used for the U-Pb analyses, following the analytical methods described in Breeding *et al.* (2004) for U-Pb depth-profiling of unpolished zircons and Schmitt *et al.* (2003) for U-Pb measurements of zircon standards. In most cases, the depth profile analysis was run for 60 mass sweeps (60 minutes), to enable the ion beam to penetrate through the youngest zone on the unpolished surface and into older domains in the zircon interior. In some grains, all, or almost all, mass sweeps yielded $^{207}Pb/^{206}Pb$ ages older than ca. 1900 Ma, coinciding with the known range of detrital zircon ages on Hall Peninsula (≥1906 Ma; Scott, 1999; Rayner, 2014, 2015). This suggests that the detrital zircon did not undergo new zircon growth or recrystallization after deposition or that the rim is extremely thin and unresolvable even using U-Pb depth profiling. In such cases, the depth profile analysis was terminated after 20 mass sweeps with consecutive $^{207}Pb/^{206}Pb$ ages older than 1900 Ma. . Zircon standard AS3 (1099 ± 1 Ma; Paces and Miller, 1993) was analysed after every five analyses of unknowns. Using the ZIPS v.3.0.4 software (C.D. Coath, National Ion Microprobe Facility, University of California, USA), U-Pb isotope ratios and ages were calculated and corrected for ^{204}Pb using the model of Stacey and Kramers (1975). Th/U ratios were estimated by multiplying ion microprobe measurements of $^{232}Th^{16}O^+/^{94}Zr^2O^+$ and $^{238}U^{16}O^+/^{94}Zr^2O^+$ ratios on the unknowns by corresponding relative sensitivity values determined on the zircon standard AS3. The U-Pb depth profiling data are presented in Appendix 3. The Isoplot 4.0 software (Ludwig, 2003) was used to plot isotopic ratios and ages and to calculate weighted mean $^{207}Pb/^{206}Pb$ ages. We choose to report the $^{207}Pb/^{206}Pb$ ages due to the high yield of radiogenic ^{206}Pb and because the 1σ errors on $^{207}Pb/^{206}Pb$ ages are much lower than on $^{206}Pb/^{238}U$ and $^{207}Pb/^{235}U$ ages. Following U-Pb measurements, the profilometer at the National Ion Microprobe Facility, University of California (USA) was used to measure the depth of representative ion microprobe analysis craters. Three grains with different depth profile analysis times (30, 45 and 60 minutes) were selected from

each sample for profilometer measurements, enabling calculation of an average ionization depth per minute (per SIMS mass sweep) of 0.07 µm. This ratio was used to estimate the thicknesses of zircon rims that were identified using U-Pb depth profiling. A complete, 60 minute-long U-Pb depth profile crater has an estimated depth of 4.13 µm.

A4.2.3. LA-ICP-MS trace element depth profiling

Trace element compositions were determined for the same unpolished zircon grains in indium metal mounts that were dated using U-Pb depth profiling. Trace element concentrations were measured at the Geological Survey of Canada (Ottawa) using a Photon-Machines Analyte 193 nm ArF excimer laser ablation system coupled to an Agilent 7700x ICP-MS system equipped with a second interface pump that approximately doubled instrument sensitivity. Following 40 s of background collection for each analysis, the laser beam was focused directly onto the unpolished surface of each zircon grain for 60 s of ablation using a 17 µm-wide crater. The analyses were conducted using a fluence of 5.7 J/cm^2 at a repetition rate of 3 Hz. Concentrations of the rare earth element (REE) were measured, as well as Al, Si, P, Ca, Sc, Ti, Fe, Sr, Y, Zr, Sn, Hf, Th and U. The NIST SRM 612 (Pearce *et al.*, 1997) and BCR-2G (Jochum *et al.*, 2005) reference materials were analyzed every 15 unknown analyses for calibration and quality control, respectively. The Lotus 1-2-3 macro-driven spreadsheet program LAMTRACE (Jackson, 2008) was used to reduce the data, using SiO_2 as an internal standard (32.78% m/m). The depths of four analysis craters were measured using the profilometer at the National Ion Microprobe Facility, University of California, and found to be between 21 and 25 µm, indicating an average drilling rate of 0.39 µm/s or 0.13 µm per laser shot. Appendix 5 shows the trace element compositions of zircon rims and interiors, which were calculated following the methodology described below (section A6.1).

A4.2.4. U-Pb dating of zircon interiors

Following U-Pb and trace element depth profiling (described below), the grain mounts were polished to reveal the zircon interiors. To characterize internal zoning textures and enable optimum placement of analysis spots, the polished grains were imaged using the JEOL6610LV SEM at the University of Ottawa. The polished zircon grains were dated at the University of New Brunswick using a Resonetics RESOlution Series M-50-LR 193 nm excimer laser ablation system coupled with an Agilent 7700x quadrupole ICP-MS equipped with dual external rotary pumps. Analysis spots were positioned on zircon interiors or visible cores, as identified by imaging. Approximately 35% of the zircon grains were large enough to allow a second analysis spot, which

was positioned on the grain edge (or rim, if visible) in an attempt to date the youngest zircon growth or recrystallization event. Zircon was analyzed with a crater size of 17 µm, 4 Hz repetition rate, and with 60 s of ablation time following 30 s of background collection, according to the analytical methods described in McFarlane & Yuo (2012) and McFarlane (2015). For each ablation sequence of up to 100 analyses, analyses of NIST 610 glasses and zircon standards were interspersed throughout the sequence, including: at least 20 analyses of FC-1 (1099 Ma; Paces and Miller, 1993); at least 5 analyses of 91500 (1062 Ma; Wiedenback et al., 1995); and at least 5 analyses of Plesovice (337 ± 0.37 Ma; Sláma et al., 2008). The ICP-MS data file and laser sequence log were combined in Iolite v. 2.5 and ages were calculated using the VizualAge U-Pb geochronology data reduction scheme (Petrus and Kamber, 2012). The full dataset is presented in Appendix 4, which shows the data with no common Pb correction, as well as values corrected for common Pb using the methods of Andersen (2002).

A5. Detailed *in situ* U–Pb monazite results

Results are described in approximate order of increasing peak metamorphic grade of the sample. Individual monazite grains are referred to using the x-y format, where x=thin section number and y=grain number. Ages are reported as $^{207}Pb/^{206}Pb$ ages, where n=number of analyses. Refer to Figs. 4–8 in the manuscript for Concordia plots, probability density/histogram diagrams of $^{207}Pb/^{206}Pb$ ages and images of selected monazite grains.

A5.1. Sample S165B: Garnet biotite staurolite psammite

Monazite has no apparent BSE zoning and forms subequant, 40-100 µm-sized grains, as well as elongate grains that are locally aligned with the matrix foliation. The dated monazite occurs along grain boundaries and in matrix plagioclase and biotite, as well as in inclusion trails in garnet. Unlike any other sample, all monazite analyzed in sample S165B is ca. 1800 Ma or younger, and the analyses form a continuous spread on Concordia between ca. 1800 and 1740 Ma. Matrix monazite that is S_1-aligned (10 grains) and non-S_1-aligned (11 grains) yielded comparable $^{207}Pb/^{206}Pb$ weighted average ages of 1759 ± 10 Ma (MSWD=10.3, n=20) and 1762 ± 11 Ma (MSWD=10.2, n=16), respectively. Two monazite inclusions in garnet in inclusion trails that are at high angles to S_1 in the matrix, interpreted as early S_1 fabric, produced an age of 1760 ± 89 Ma (MSWD=1.5, n=2). One of these grains is a 20 µm-sized (single-analysis) monazite in a multi-phase inclusion that includes staurolite (grain 1-7). An inclusion in an S_1-parallel inclusion trail in

a garnet rim yielded three analyses with equivalent ages, with a weighted average age of 1789 ± 8 Ma (MSWD=0.52, n=3). In many S_1-aligned and non-aligned matrix grains, multiple analyses yielding similar ages (within 2σ uncertainties) between ca. 1770–1740 Ma show no detectable intra-grain age variation (e.g., grains 1-11, 1-12, 1-14, 1-16, 1-17, 1-21, 1-22, 1-4). Certain matrix grains also have multiple analyses between ca. 1787–1783 Ma (grains 1-25, 1-27) with no other apparent age domains. Intragrain age variations are rare, occurring only in two S_1-aligned matrix grains in which multiple analyses revealed ca. 1793–1774 Ma domains adjacent to younger ca. 1732–1720 Ma domains (grains 1-3, 1-26).

A5.2. Sample H45A: Biotite muscovite garnet pelite

Monazite in sample H45A mostly forms subequant, subhedral, 20-50 μm-sized crystals along grain boundaries, within biotite and muscovite in the matrix, and in garnet. The ages form a continuous spread on Concordia between ca. 1880 and 1780 Ma, with the majority of analyses between ca. 1840 and 1800 Ma, and ages older than 1880 Ma are mostly discordant. Matrix monazite grains aligned with S_1 (six grains) and non-aligned with fabric (13 grains) produce similar $^{207}Pb/^{206}Pb$ weighted average ages of 1825 ± 12 Ma (MSWD=2.6, n=12) and 1822 ± 9 Ma (MSWD=2.1, n=17), respectively. Ages obtained from monazite inclusions in garnet are all ≥1830 Ma. Six monazite inclusions in garnet that define spiral-shaped, biotite- and ilmenite-bearing inclusion trails, interpreted as early S_1 fabric, yield an age of 1847 ± 17 Ma (MSWD=2.0, n=7). The total $^{207}Pb/^{206}Pb$ weighted average age for the sample is 1828 ± 7 Ma (MSWD=2.7, n=36). In three matrix grains, multiple analyses yield ages between ca. 1860 and 1820 Ma that are within 2σ uncertainties, whereas other matrix grains exhibit age domains with distinctly different ages, including: ca. 2185 and 1801 Ma (grain 1-26); and ca. 1850 and 1800 Ma (grains 1-28, 1-29). The different age domains do not clearly correspond to cores/rims or BSE zoning patterns, which are rare to non-existent in monazite in sample H45A. Some matrix grains have two analyses with similar ages that are both younger than ca. 1820 Ma (but within 2σ errors), with no other apparent age domains, including: ca. 1799 and 1809 Ma (S_1-aligned grain 1-1); and ca. 1813 and 1814 Ma (grain 1-17).

A5.3. Sample B75A: Biotite muscovite sillimanite K-feldspar garnet pelite

In sample B75A, monazite forms 30-50 μm-sized, subhedral-to-anhedral, equant grains as well subhedral-to-euhedral grains up to 100 μm long, oriented parallel to S_1 foliation. Monazite occurs along grain boundaries and within S_1-parallel biotite, muscovite, quartz and plagioclase.

U–Pb analyses form a continuous spread along Concordia from ca. 1720–1840 Ma. Non-S_1-aligned and S_1-aligned monazite yield similar weighted average $^{207}Pb/^{206}Pb$ ages of 1786 ± 47 Ma (MSWD=41, n=6) and 1790 ± 30 Ma (MSWD=19, n=8). The weighted average $^{207}Pb/^{206}Pb$ age of all analyses in the sample is 1788 ± 23 Ma (MSWD=26, n=14). The most common age of non-aligned monazite is ca. 1780–1760 Ma, whereas the most common age of S_1-aligned monazite is ca. 1820–1800 Ma. Distinct age domains are evidenced by a ca. 1830 Ma analysis adjacent to a ca. 1713 Ma analysis in the same grain. BSE zoning in B75A monazite is weak to nonexistent, and does not appear to be related to patterns in U-Pb ages.

A5.4. Sample S92C: Biotite K-feldspar muscovite sillimanite pelite

Monazite is rare in sample S92C, and generally forms 20-60 µm-sized equant, subhedral crystals located along grain boundaries. The U-Pb analyses form a spread along Concordia between ca. 1850 and 1720 Ma. Analyses of S_1-aligned monazite are clustered on Concordia at ca. 1860–1820 Ma, yielding a weighted average $^{207}Pb/^{206}Pb$ age of 1821 ± 17 Ma (MSWD=2.3, n=6). This group includes a grain with two ca. 1830 Ma analyses and no other apparent age domains (grain 1-3). Analyses of non-S_1-aligned monazite produce an age of 1760 ± 50 Ma (MSWD=22, n=6), and includes two analyses of ca. 1727 and 1751 Ma in the same grain (2-2) with no other apparent age domains.

A5.5. Sample S162A: Garnet biotite K-feldspar sillimanite pelite

In sample S162A, monazite generally forms subhedral, 30-70 µm-sized grains that are unzoned or very weakly zoned in BSE. Monazite occurs along grain boundaries, within matrix minerals and as inclusions in garnet. The U–Pb analyses form a continuous spread along Concordia between ca. 1880–1730 Ma. There are also four concordant to weakly discordant analyses with $^{207}Pb/^{206}Pb$ ages of ca. 2688–2223 Ma, from non-aligned inclusions in garnet rims. Analyses of S_1-aligned and non-aligned matrix monazite yield weighted average $^{207}Pb/^{206}Pb$ ages of 1802 ± 32 Ma (MSWD=22, n=10) and 1763 ± 43 Ma (MSWD=23, n=7), respectively. Certain matrix grains have two or more analyses with $^{207}Pb/^{206}Pb$ ages between ca. 1777 and 1724 Ma and no other apparent age domains (non-aligned grain 1-8; S_1-aligned grains 2-2, 2-10). An S_1-aligned matrix grain has two analyses of ca. 1828 and 1820 Ma (grain 2-11), and another has two ca. 1845 Ma analyses (grain 1-7), with no other apparent age domains in either grain. Analyses of monazite inclusions in garnet are all ≥1820 Ma. Not including analyses >2000 Ma, analyses of non-aligned and S_1-aligned inclusions produce similar weighted average $^{207}Pb/^{206}Pb$ ages of 1835 ± 8 Ma

(MSWD=0.91, n=5) and 1823 ± 13 Ma (MSWD=0.08, n=2), respectively. One S_1-aligned inclusion has two analyses dated at ca. 1826 and 1822 Ma analyses, with no other apparent age domains (grain 1-9). Intra-grain age variation is common in sample S162A, despite weak-to-non-existent compositional zoning in BSE. A non-aligned matrix grain has four analyses with ages ranging from ca. 1836 to 1720 Ma (grain 2-2). An S_1-aligned grain in biotite has two analyses of ca. 1771 and 1842 Ma (grain 2-12), and an inclusion in a garnet rim contains a ca. 1832 Ma domain adjacent to a ca. 2688 Ma domain (grain 2-5).

A5.6. Sample F38A: Garnet biotite sillimanite pelite

In sample F38A, monazite is rare in the matrix but abundant in garnet porphyroblasts. Monazite forms equant, 30-60 µm-sized, subhedral-to-anhedral grains, as well as minor subhedral, 30-100 µm-long grains that are elongate parallel to the S_1 foliation. Analyses of two S_1-aligned and two non-S_1-aligned matrix monazite grains yielded weighted average $^{207}Pb/^{206}Pb$ ages of 1817 ± 24 Ma (MSWD=0.42; n=4) and 1837 ± 25 Ma (MSWD=0.13; n=3), respectively. Five monazite inclusions in garnet that define S_1-parallel inclusion trails yielded an age of 1820 ± 10 Ma (MSWD=1.11; n=9), and two additional monazite inclusions in garnet produced a similar age of 1826 ± 29 Ma (MSWD=0.14; n=3). An S_1-aligned matrix grain has two analyses yielding similar ages of ca. 1807 and 1800 Ma (grain 1-1), with no other apparent age domains. Otherwise, several monazite grains in the matrix and in garnet have multiple analyses yielding ages between ca. 1820 and 1840 Ma, with no other apparent age domains (e.g., grains 1-2, 1-4, 2-29, 2-30). Three monazite grains that define a nearly spiral-shaped inclusion trail in garnet, which is interpreted to represent early S_1, yielded age of 1851 ± 16 Ma (MSWD=0.63; n=7). These grains include an inclusion in the core of a small garnet porphyroblast that is intergrown with sillimanite (grain 1-6), in which four analyses all have similar $^{207}Pb/^{206}Pb$ ages (ca. 1850–1837 Ma) and there are no other apparent age domains. The weighted average $^{207}Pb/^{206}Pb$ age of all analyses is 1828 ± 7 (MSWD=1.08, n=26), not including a concordant ca. 1929 Ma analyses from an inclusion in garnet.

A5.7. Sample 13F122A: Garnet biotite K-feldspar sillimanite psammite

Monazite in sample 13F122A is mostly equant, subrounded and 30-50 µm wide with compositional zoning in BSE. Matrix monazite generally occurs along grain boundaries and within S_1-parallel matrix minerals (biotite, quartz, plagioclase). Twenty-one S_1-aligned and eight non-S_1-aligned matrix monazite grains yielded indistinguishable $^{207}Pb/^{206}Pb$ weighted average ages of

1825 ± 5 (MSWD=0.86, n=19) and 1828 ± 6 (MSWD=1.8, n=29), respectively. Two analyses of a monazite inclusion in garnet that does not define a fabric produced an age of 1833 ± 15 (MSWD=0.02). The total $^{207}Pb/^{206}Pb$ weighted average age of the sample is 1827 ± 4 (MSWD=1.4). The majority of analyses are ca. 1840–1820 Ma, and several S_1- and non-S_1-aligned grains contain numerous analyses in this age bracket but no other apparent age domains (e.g., grains 1-3, 1-10, 1-26) despite, in some cases, exhibiting apparent cores and rims in BSE. In several other monazite grains, multiple analyses reveal different age domains that correspond to BSE patterns or grain interiors and edges. Multiple analyses reveal younger ca. 1800 Ma age domains (e.g., grain 1-1, 1-7, 1-28) or older ca. 1850 Ma domains (e.g., grains 1-1, 6-1), although these apparent within-grain age variations are within 2σ uncertainties of the ca. 1840–1820 Ma analyses within the same grain.

A5.8. Sample S1A: Garnet K-feldspar sillimanite biotite pelite

Monazite in sample S1A forms 20-60 µm-sized, subhedral grains that are often elongate parallel to S_1 foliation and generally exhibit patchy BSE zoning with possible cores and rims. The U–Pb analyses form a narrow spread on Concordia between ca. 1860 and 1800 Ma. Analyses of S_1-aligned and non-aligned matrix monazite yield comparable weighted average $^{207}Pb/^{206}Pb$ ages of 1825 ± 67 Ma (MSWD=0.20, n=4) and 1821 ± 9 Ma (MSWD=0.60, n=12), respectively. The two S_1-aligned matrix grains include one with two ca. 1850 Ma analyses (grain 2-11) and another grain with two distinctly younger ca. 1781 and 1762 Ma analyses (grain 1-14), resulting in a large MSWD and uncertainty on the calculated weighted average age. The non-aligned matrix monazite includes several grains with two or more analyses that yield similar U-Pb ages (within 2σ errors), with no evidence of intra-grain age variation, including: ca. 1797 and 1817 Ma (grain 1-7); ca. 1812 and 1843 Ma (grain 2-3); and ca. 1830–1816 Ma (grain 1-2). Monazite inclusions in garnet help to define S_1 within S_1-parallel inclusion trails, and yields a weighted average $^{207}Pb/^{206}Pb$ age of 1828 ± 18 Ma (MSWD=0.69, n=4).

A5.9. Sample S60A: Garnet K-feldspar biotite psammite

Monazite in sample S60A forms equant, subhedral, 20-40 µm-sized grains that are mostly within matrix K-feldspar, plagioclase, biotite and quartz, between matrix minerals, and are rarely in garnet. As monazite is generally equant, it does not define S_1. The U–Pb analyses form a narrow spread on Concordia between ca. 1860 and 1780 Ma, and most analyses are between ca. 1800 and 1780 Ma. Analyses of matrix monazite yield a weighted average $^{207}Pb/^{206}Pb$ age of 1804 ± 13 Ma

(MSWD=8.4, n=18). The one monazite inclusion in garnet that was dated has a $^{207}Pb/^{206}Pb$ age of 1797 ± 10 Ma. Four matrix grains have multiple analyses with multiple indistinguishable U-Pb ages and no apparent intra-grain age variation, including grain 1-16 (ca. 1790–1780 Ma), grain 1-11 (1798 and 1782 Ma), grain 1-10 (ca. 1820 and 1796 Ma) and grain 1-18 (two analyses dated at ca. 1804 Ma).

A5.10. Sample Z1A: Garnet K-feldspar cordierite sillimanite biotite pelite

In sample Z1A, monazite generally forms 30-50 µm-sized, subhedral, subequant grains, as well as minor elongate grains up to 100 µm long, oriented parallel to S_1 foliation. Monazite occurs along grain boundaries and within garnet, cordierite, plagioclase and K-feldspar. Matrix monazite aligned with S_1 (eight grains) yielded a $^{207}Pb/^{206}Pb$ weighted average age of 1838 ± 8 (MSWD=4.9, n=15), and non-S_1-aligned matrix monazite (11 grains) produced a similar age of 1849 ± 12 (MSWD=8.9, n=14). Monazite inclusions in garnet that are aligned with S_1 (three grains) and those that are not aligned with fabric (six grains) yielded ages of 1845 ± 16 (MSWD=3.2, n=4) and 1860 ± 17 (MSWD=8.7, n=8), respectively. The total $^{207}Pb/^{206}Pb$ weighted average age of the sample is 1846 ± 6 (MSWD=7.7, n=41). Most monazite ages are between ca. 1860 and 1840 Ma, and several grains have multiple analyses that are ca. 1860–1840 Ma with no other apparent age domains, including S_1-aligned matrix monazite (grains 1-6, 1-25, 1-28) and non-S_1-aligned garnet inclusions (grain 1-14). An inclusion in an S_1-parallel, cordierite- and sillimanite-bearing inclusion trail in garnet yielded two ca. 1850 Ma analyses, with no other apparent age domains (grain 1-30). In some cases (e.g., grain 1-25), all analyses are ca. 1850 Ma despite compositional variation implied by BSE imaging. Analyses younger than ca. 1840 Ma are uncommon, and are all from matrix monazite. There are five matrix monazite analyses between ca. 1830–1820 Ma, which are within 2σ error of older ages, and include two S_1-aligned grains with no other distinct age domains (grains 1-8, 1-22). In one matrix grain (1-29), two analyses yield significantly different ages of ca. 1847 and 1804 Ma. Analyses older than 1860 Ma are mostly from inclusions in garnet, one of which has two distinctly different age domains (ca. 1903 Ma, 1838 Ma; grain 1-2).

A6. Detailed zircon trace element depth profiling results

A6.1. Calculation of zircon rim and interior compositions

The trace element compositions of zircon rims and interiors are presented in Appendix 5. The trace element composition of each rim was determined by averaging the trace element values

measured over an equivalent crater depth to that of the rim thickness calculated from the corresponding U-Pb depth profile, not including the surface P+REE-enriched measurements. For grains in which a rim was identified on the U-Pb profile but no compositionally distinct rim was apparent on the trace element profile, it is likely that the trace element profile reflects the composition of the zircon interior and no trace element rim composition was calculated. Conversely, where no rim was identified on the U-Pb depth profile but a distinct compositional rim occurred on the trace element profile, the rim composition was calculated by averaging the values measured over that interval (labeled as "undated" in Appendix 5). The compositions of zircon interiors were calculated by averaging the trace element concentrations of the zircon interior beneath the rim, if present, as well as beneath any possible mixed core-rim zones, down to the maximum crater depth. In some grains with U-Pb depth profiles that did not reveal any >1900 Ma dates, a significant change in trace element composition occurs beneath the rim, which is considered to represent the zircon interior. These zircon interior compositions are labeled "undated" in Appendix 5, as are those of any zircon rim or interior that was not analyzed by U-Pb depth profiling due to insufficient space for multiple analysis spots on small zircon grains. In plots of zircon $^{207}Pb/^{206}Pb$ ages versus selected trace element concentrations and ratios (Fig. 14 in manuscript; Figs. A6.1–4), the $^{207}Pb/^{206}Pb$ ages of zircon interiors are those determined by U–Pb LA-ICP-MS analyses of polished interiors. In most cases, these ages are from domains that are deeper within the crystal than the interior domains that were analysed during trace element depth profiling, but they are the only available ages of zircon interiors.

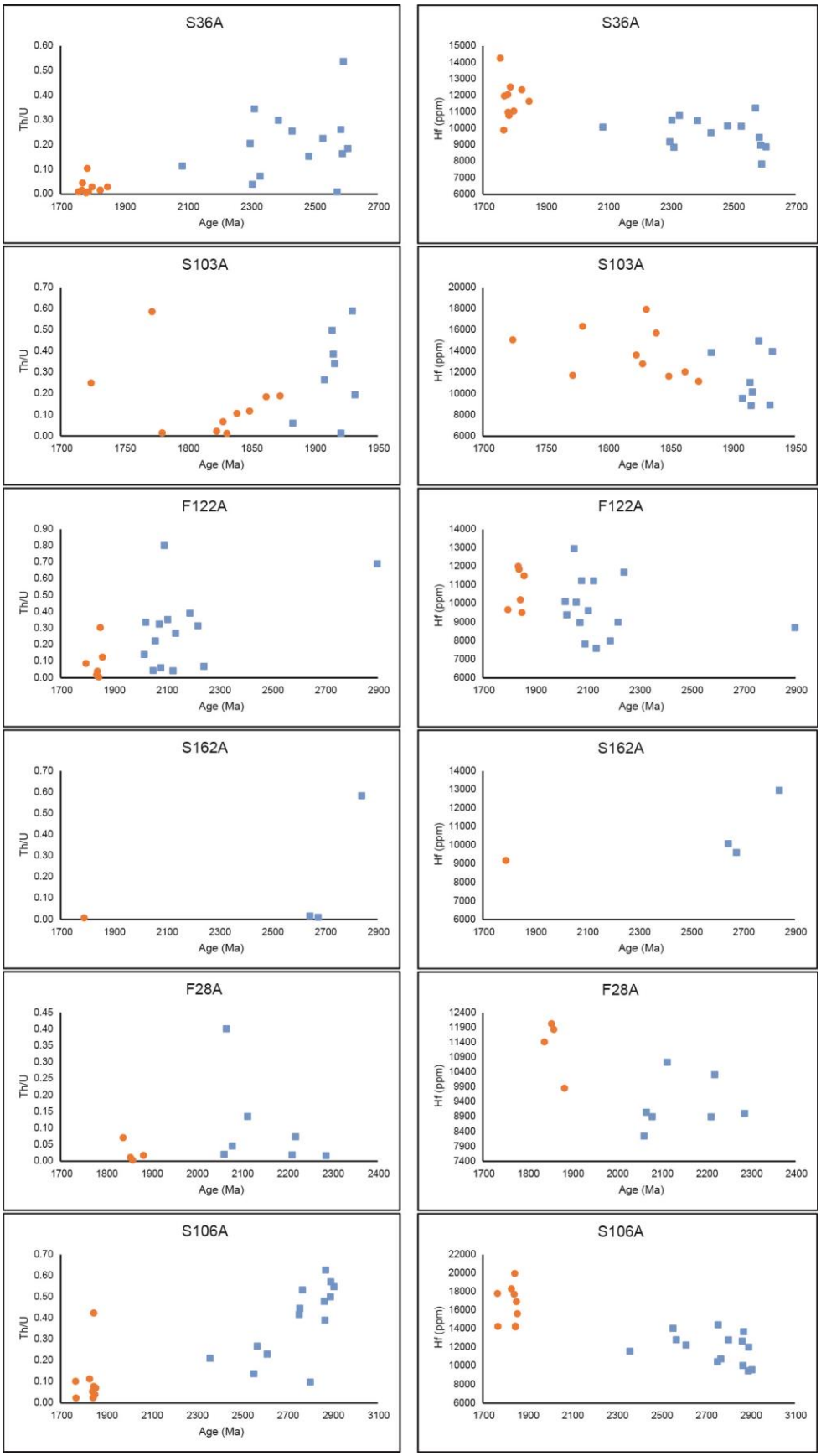


Fig. A6.1: Ages of zircon rims and interiors plotted against Th/U and Hf (ppm) determined from LA-ICP-MS trace element depth profiling. Zircon rim ages are weighted average $^{207}Pb/^{206}Pb$ ages determined from SIMS depth profiles. Interior ages are $^{207}Pb/^{206}Pb$ ages obtained from LA-ICP-MS analyses of polished interiors. Orange circles=zircon rims; blue square=zircon interiors.

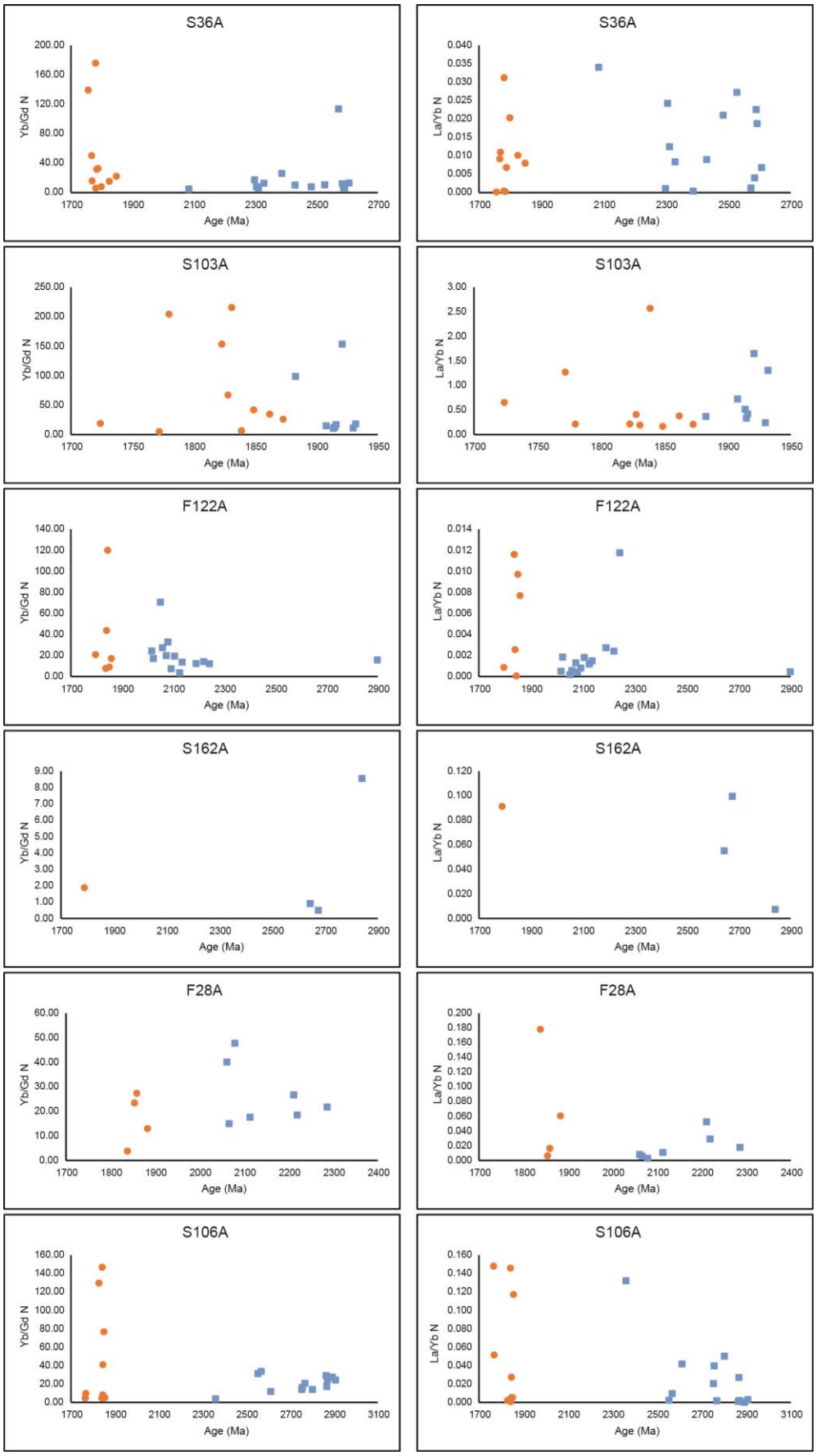


Fig. A6.2: Ages of zircon rims and interiors plotted against La_N/Yb_N and Yb_N/Gd_N determined from LA-ICP-MS trace element depth profiling, following the logic in Fig. A6.1. La, Yb and Gd values are normalized to the chondrite values of Sun and McDonough (1989).

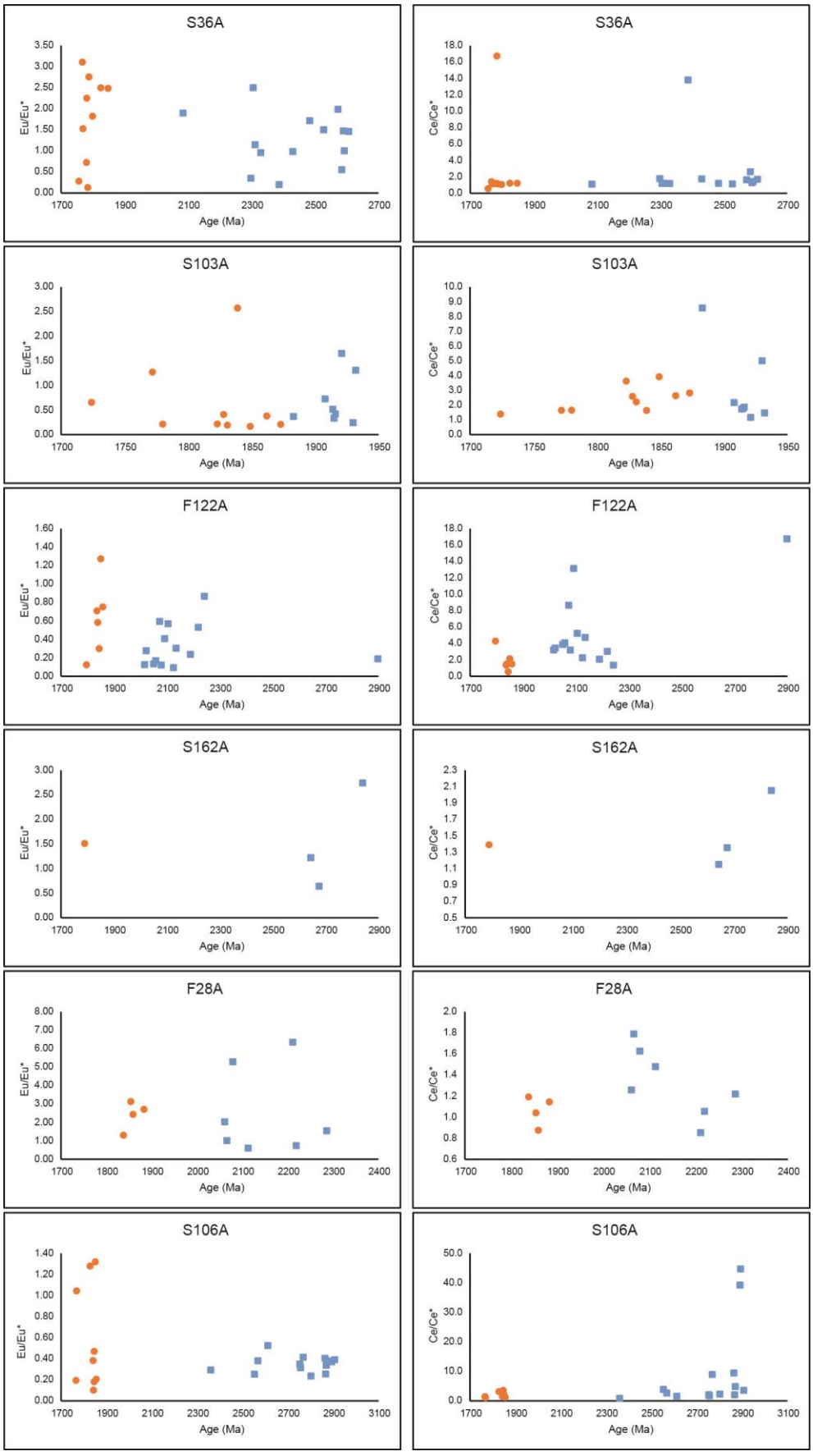


Fig. A6.3: Ages of zircon rims and interiors plotted against Eu/Eu* and Ce/Ce* determined from LA-ICP-MS trace element depth profiling, following the logic in Fig. A6.1. Trace element values used in ratio calculations are normalized to the chondrite values of Sun and McDonough (1989).

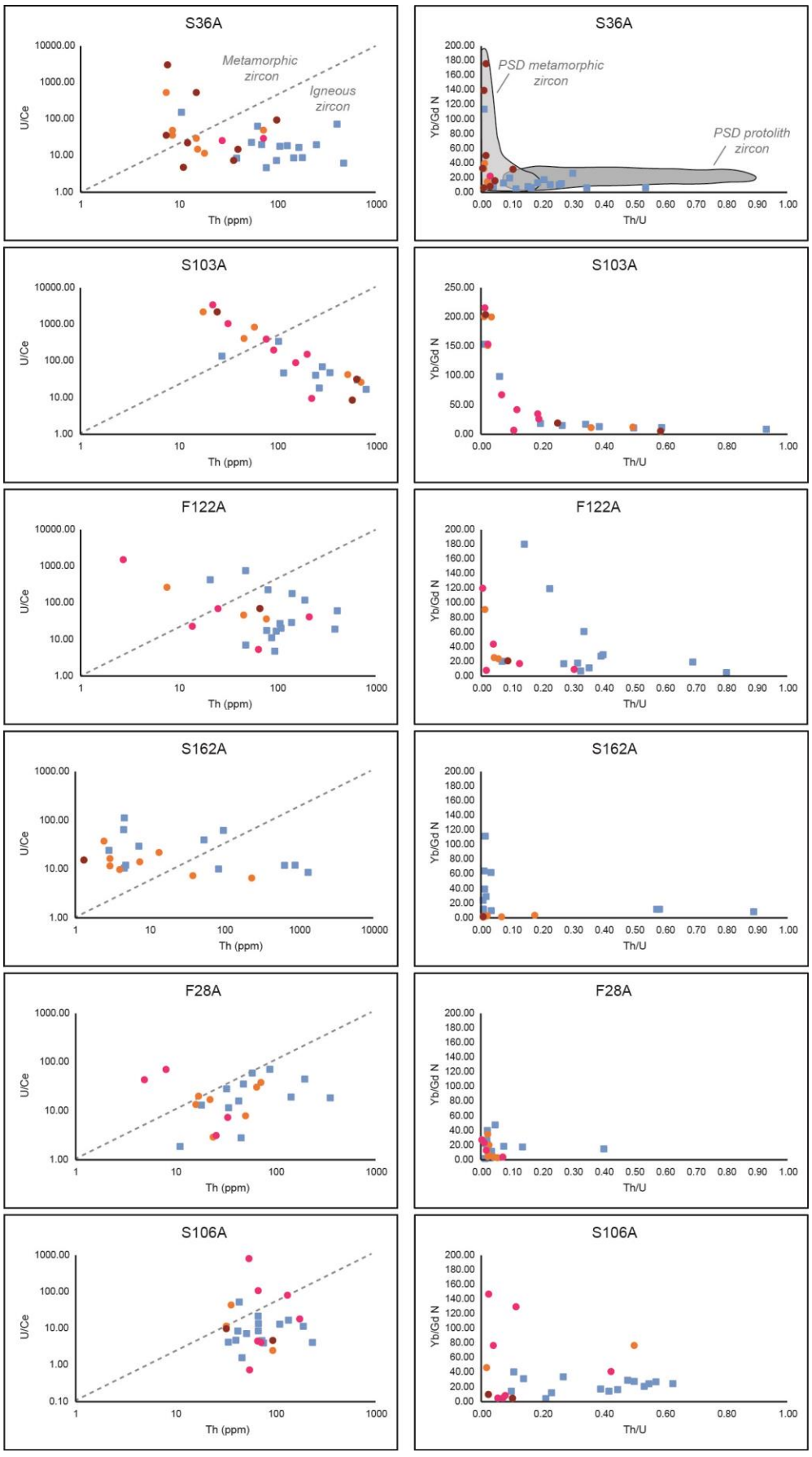


Fig. A6.4: Zircon rim and interior compositions plotted on diagrams of U/Ce vs. Th (ppm) and Yb_N/Gd_N vs. Th/U. Orange circles=undated rims; pink circles=>1800 Ma rims; brown circles=<1800 Ma rims; blue squares=interiors. Compositional fields of metamorphic and igneous zircon on the U/Ce vs. Th (ppm) plots are defined by Wooden et al. (2006). Compositional fields of zircon from the western Grenville Province (from Marsh and Stockli, 2015) are shown on a Yb_N/Gd_N vs. Th/U plot for comparison. PSD metamorphic zircon=granulite-facies/anatectic zircon from the Parry Sound domain; PSD protolith zircon=protolith zircon from granulite-facies rocks in the Parry Sound domain.

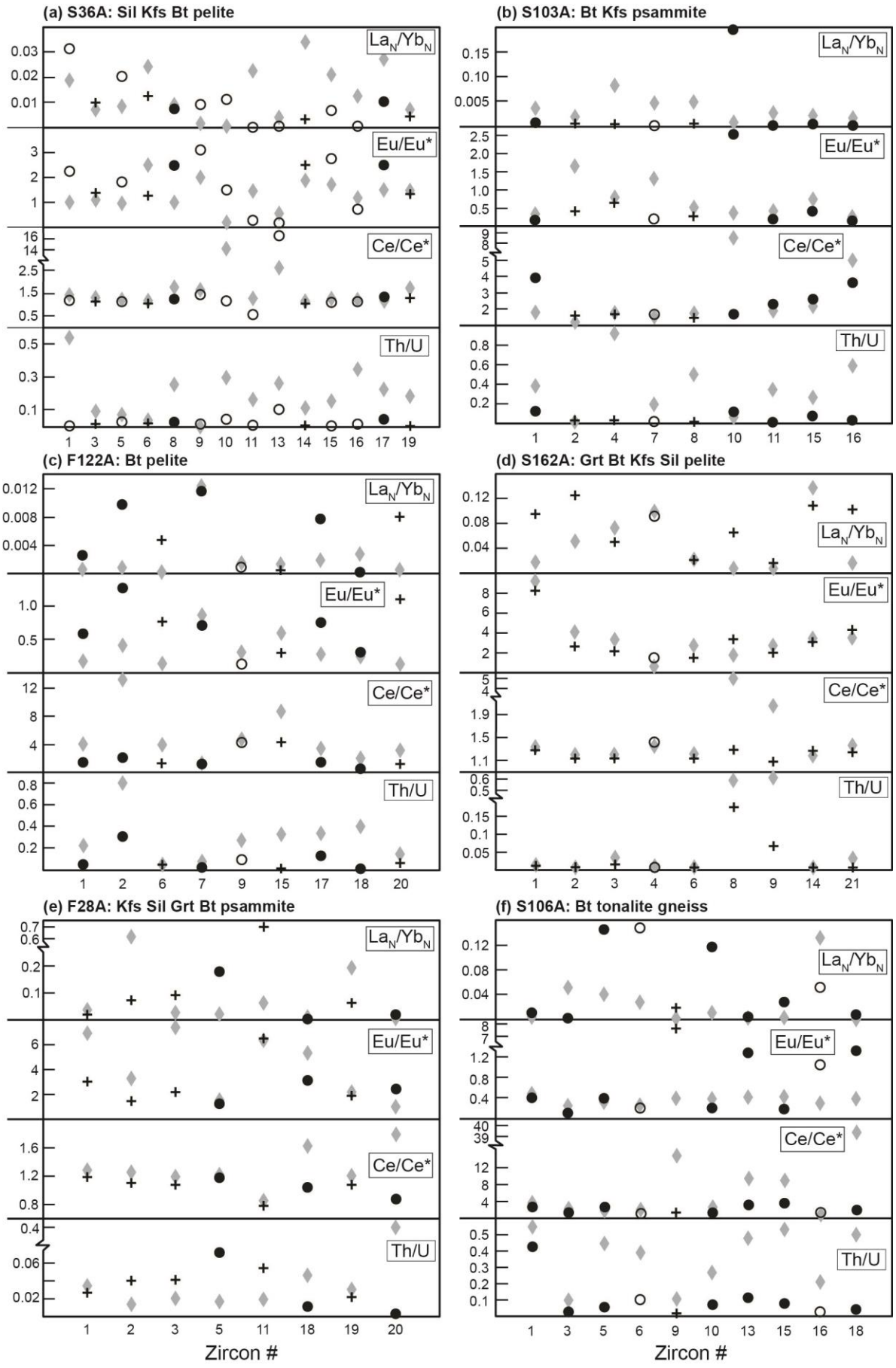

(a) S36A: Sil Kfs Bt pelite
(b) S103A: Bt Kfs psammite
(c) F122A: Bt pelite
(d) S162A: Grt Bt Kfs Sil pelite
(e) F28A: Kfs Sil Grt Bt psammite
(f) S106A: Bt tonalite gneiss
La$_N$/Yb$_N$
Eu/Eu*
Ce/Ce*
Th/U
Zircon #

Fig. A6.5 (previous page): Plots of La_N/Yb_N, Eu/Eu*, Ce/Ce* and Th/U of zircon rims (black) and interiors (grey) determined from LA-ICP-MS trace element depth profiling, allowing comparison of ratios between rims and cores of individual zircon crystals. "Zircon #" on x-axes denotes the unique identifier of each grain analyzed. Note variable scales on the y-axes. Rim symbols: open circles=<1800 Ma; black filled circles=>1800 Ma; crosses=undated or discordant.

A6.2. Sample S36A: Sillimanite-K-feldspar-biotite pelite

Most zircon interiors have REE patterns with shallow slopes (La_N/Yb_N=0.007-0.034) and small positive Eu anomalies, whereas four grains have LREE-depleted interiors with steeply sloping REE patterns (La_N/Yb_N ≤0.001-0.004) and small negative Eu anomalies. One LREE-depleted interior has a large positive Ce anomaly. Zircon rims exhibit a wide range of trace element compositions but, relative to zircon interiors in the same grains, zircon rims generally have lower Th/U ratios and REE patterns with different slopes, larger positive Eu anomalies and smaller positive Ce anomalies. In three grains with ca. 1799-1756 Ma rims, the rim REE patterns have shallow slopes (La_N/Yb_N=0.007-0.011), small positive Eu anomalies and no Ce anomalies, but each rim is slightly LREE-enriched or -depleted relative to the interior of the same zircon. Two rims of similar age have REE patterns that are parallel to those of zircon interiors but have higher REE concentrations. Additional rims have steeply sloped REE patterns (La/Yb_N≤0.001) that are LREE-depleted relative to other rims and zircon interiors, and one of these rims has a large positive Ce anomaly and a negative Eu anomaly. Rims dated at ca. 1848 Ma (z8) and ca. 1825 Ma (z17) have REE patterns with shallow slopes that are similar to those of zircon interiors in the same grains.

A6.3. Sample S103A: Biotite-K-feldspar psammite

Zircon interiors have shallow- to moderately-sloping REE patterns (La_N/Yb_N=0.001-0.008) with small negative Eu anomalies and small positive Ce anomalies, except for one grain interior that is LREE-depleted relative to others (La_N/Yb_N<0.001) with a larger positive Ce anomaly. The trace element chemistry of each rim is distinct from that of zircon interiors in the same grains. Almost all rims have REE patterns with steeper slopes that are LREE-depleted relative to zircon interiors in the same grains, and have smaller positive Eu anomalies, lower Th/U ratios and slightly smaller positive Ce anomalies. These include one ca. 1780 Ma rim and all but one of the ca. 1820-1873 Ma rims. Another rim (ca. 1839 Ma) is LREE-enriched relative to the steeply-sloping REE pattern of the interior, and has a smaller positive Ce anomaly and a larger

positive Eu anomaly. Some rims for which corresponding interior compositions were not calculated have shallow-sloping REE patterns that are similar to those of the interiors of most other grains; these include rims dated at ca. 1772 Ma and 1724 Ma and a discordant rim.

A6.4. Sample F122A: Biotite pelite

Most zircon interiors have steeply sloping REE patterns ($La_N/Yb_N \leq 0.001$-0.003) with large positive Ce anomalies and negative Eu anomalies. One zircon interior is LREE-depleted relative to other grain interiors, another zircon interior is LREE- and HREE-depleted, whereas a third is LREE-enriched (La/Yb=0.016) and lacks Eu or Ce anomalies. All zircon rims are compositionally distinct from interiors of the same grains, exhibiting lower Th/U ratios and REE patterns with different slopes, larger or smaller negative Eu anomalies and smaller positive Ce anomalies. Of the ca. 1858-1836 Ma rims, three are LREE-enriched (La_N/Yb_N=0.003-0.010) relative to the interiors of the same grains, whereas one has a similar REE pattern but lower concentrations. Another rim of similar age is LREE-depleted (La_N/Yb_N <0.001). Unlike most grain interiors, the ca. 1858-1836 Ma rims have small or nonexistent Ce and Eu anomalies. In contrast, the rim dated at ca. 1796 Ma has a steeply sloping REE pattern with large positive Ce and negative Eu anomalies, similar to the interior of the same grain but with lower REE concentrations.

A6.5. Sample S162A: Garnet-biotite-K-feldspar-sillimanite pelite

About half of the zircon interiors analyzed have steeply-sloped REE patterns (La_N/Yb_N=0.007-0.018) whereas others have REE patterns with shallow slopes (La_N/Yb_N=0.023-0.137). Some zircon interiors have small positive Ce anomalies, and most exhibit positive Eu anomalies. The REE patterns of zircon rims generally have shallow slopes (La_N/Yb_N=0.018-0.125), positive Eu anomalies and, in some cases, small positive Ce anomalies. The rims are compositionally distinct from the interiors of the same grains, with lower Th/U ratios, similar or smaller positive Ce anomalies, and mostly smaller positive Eu anomalies. The rims of four grains have shallow-sloping REE patterns that are similar those of zircon interiors in the same grains, but have lower REE concentrations. Other rims are HREE-depleted, LREE-enriched or HREE-enriched compared to the interiors of the same grains. In grains analyzed using both U-Pb and trace element depth profiling, the U-Pb ages are typically highly discordant. The only rim with a concordant U-Pb age (ca. 1789 Ma) has a shallow-sloping REE pattern that is MREE-enriched and LREE- and HREE-depleted relative to its core.

A6.6. Sample F28A: Garnet-K-feldspar-sillimanite-biotite psammite

Zircon interiors have REE patterns with shallow slopes (La/Yb_N=0.008-0.053), and two grain interiors have nearly flat REE patterns (La/Yb_N=0.607-0.193). All zircon interiors have positive Eu anomalies, except for three grains that lack Eu anomalies. Most grains exhibit small positive Ce anomalies. Compared to zircon interiors in the same grains, all rims analyzed (ca. 1838-1883 Ma) have distinct REE compositions, generally with smaller positive Eu and Ce anomalies. The rim REE patterns all have similar shallow slopes (La_N/Yb_N=0.006-0.178). Zircon rims have variable Th/U ratios (0.003-0.072) which, in some grains, are higher than the Th/U ratios of zircon interiors. Some rims have REE patterns that are parallel to those of cores in the same grains but with lower REE concentrations. Some rims display LREE-enrichment or HREE-depletion compared to interiors, or both elevated LREE and depleted HREE.

A6.7. Sample S106A: Biotite tonalite gneiss

The REE patterns of zircon interiors are variable, ranging from shallow-sloping patterns (La_N/Yb_N=0.010-0.132) with negative Eu anomalies to steeply-sloping, LREE-depleted patterns (La_N/Yb_N<0.001-0.003) with smaller negative Eu anomalies and large positive Ce anomalies. The rims have a wide range of REE pattern slopes with variable Ce and Eu anomalies, but each rim has a lower Th/U ratio and different trace element composition from the interior of the same grain. The two youngest rims, dated at ca. 1768 Ma and 1766 Ma, have similar, shallow-sloping REE patterns, but one is slightly HREE-enriched relative to its core, whereas the other is slightly LREE-enriched and has higher overall REE concentrations. The ca. 1828-1855 Ma rims have a wider range of REE pattern slopes (La_N/Yb_N=0.001-0.146) and are LREE-enriched, LREE-depleted or HREE-enriched relative to cores of the same grains. The rims mostly have smaller positive Ce anomalies than the interiors of the same grains, whereas changes in Eu anomalies are variable.

A7. References

Aleinikoff, J.N., Schenck, W.S., Plank, M.O., Srogi, L., Fanning, C.M., Kamo, S.L. & Bosbyshell, H. 2006. Deciphering igneous and metamorphic events in high-grade rocks of the Wilmington Complex, Delaware: morphology, cathodoluminescence and backscattered electron zoning, and SHRIMP U–Pb geochronology of zircon and monazite. Geological Society of America Bulletin 118, 39–64.

Andersen, T., 2002. Correction of common lead in U-Pb analyses that do not report ^{204}Pb. Chemical Geology 192, 59–79.

Breeding, C.M., Ague, J.J., Grove, M. & Rupke, A.L., 2004. Isotopic and chemical alteration of zircon by metamorphic fluids: U-Pb age depth-profiling of zircon crystals from Barrow's garnet zone, northeast Scotland. American Mineralogist 89, 1067-1077.

Chadwick, T.C., St-Onge, M.R., Weller, O.M., Carr, S.D. & Dyck, B.J., 2015. Ptarmigan Fiord basement-cover thrust imbricates, Baffin Island, Nunavut, in: Summary of Activities 2015, Canada-Nunavut Geoscience Office, 61-72.

Cherniak, D.J., Watson, E.B., 2000. Pb diffusion in zircon. Chemical Geology 172, 5-24.

Corfu, F., Hanchar, J.M., Hoskin, P.W.O., Kinny, P., 2003. Atlas of zircon textures, in: Hanchar, J.M., Hoskin, P.W.O. (Eds.), Zircon, Reviews in Mineralogy & Geochemistry 53, pp. 469-500.

Flowers, R.M., Schmitt, A.K., Grove, M., 2010. Decoupling of U-Pb dates from chemical and crystallographic domains in granulite facies zircon. Chemical Geology 270, 20-30.

Fraser, G., Ellis, D., Eggins, S., 1997. Zirconium abundance in granulite-facies minerals, with implications for zircon geochronology in high-grade rocks. Geology 25, 607-610.

Hoskin, P.W.O., Black, L.P., 2000. Metamorphic zircon formation by solid-state recrystallization of protolith igneous zircon. Journal of Metamorphic Geology 18, 423-439.

Hoskin, P.W.O, Schaltegger, U., 2003. The composition of zircon and igneous and metamorphic petrogenesis, in: Hanchar, J.M., Hoskin, P.W.O. (Eds.), Zircon, Reviews in Mineralogy & Geochemistry 53, pp. 27-62.

Jackson, S.E., 2008. LAMTRACE data reduction software for LA-ICP-MS, in: Sylvester P. (ed.), Laser ablation-ICP-mass spectrometry in the Earth sciences: Current practices and outstanding issues. Mineralogical Association of Canada, Short Course Series 40, 305–307.

Jochum, K.P., Pfänder, J., Woodhead, J.D., Willbold, M., Stoll, B., Herwig, K., Amini, M., Abouchami, W. & Hofmann, A.W., 2005. MPI-DING glasses: New geological reference materials for in situ Pb isotope analysis. Geochemistry, Geophysics, Geosystems 6, 1525–2027.

LeBreton, N. & Thompson, A.B., 1988. Fluid-absent (dehydration) melting of biotite in pelites in the early stages of crustal anatexis. Contributions to Mineralogy and Petrology 99, 226-237.

Ludwig, K., 2003. User's Manual for Isoplot/Ex rev. 3.00: a Geochronological Toolkit for Microsoft Excel. Berkeley Geochronology Center Special Publications 4.

Marsh, J.H., Stockli, D.F., 2015. Zircon U–Pb and trace element zoning characteristics in an anatectic granulite domain: Insights from LASS-ICP-MS depth profiling. Lithos 239, 170–185.

Machado, G., Bilodeau, C. & St-Onge, M.R., 2013. Geology, southern part of Hall Peninsula, south Baffin Island, Nunavut, Geological Survey of Canada Canadian Geoscience Map 135 (preliminary). Canada-Nunavut Geoscience Office, Open File Map 2013-1, scale 1:250 000.

McFarlane, C.R.M & Luo, Y., 2012. U-Pb geochronology using 193 nm Excimer LA-ICP-MS optimized for in situ accessory mineral dating in thin sections. Geoscience Canada 39, 158-172.

McFarlane, C.R.M & McKeough, M., 2013. Petrogenesis of the Kulyk Lake monazite-apatite-Fe(Ti)-oxide occurrence revealed using in-situ LA-(MC)-ICP-MS trace element mapping, U-Pb dating, and Sm-Nd isotope systematics on monazite. American Mineralogist 98, 1644-1659.

McFarlane, C.R.M., 2015. A geochronological framework for sedimentation and Mesoproterozoic tectono-magmatic activity in lower Belt-Purcell rocks exposed west of Kimberley, BC. Canadian Journal of Earth Sciences 52, 444-465.

Paces, J.B. & Miller, J.D., 1993. Precise U-Pb ages of Duluth complex and related maficintrusions, northeastern Minnesota: Geochronological insights to physical, petrogenetic, paleomagnetic, and tectonomagmatic processes associated with the 1.1 Ga Mid-continent Rift System. Journal of Geophysical Research 98, 13997–14013.

Palin, R.M., Searle, M.P., St-Onge, M.R., Waters, D.J., Roberts, N.M.W., Horstwood, M.S.A., Parrish, R.R., Weller, O.M., Chen, S. & Yang, J., 2014. Monazite geochronology and petrology of kyanite- and sillimanite-grade migmatites from the northwestern flank of the eastern Himalayan syntaxis. Gondwana Research 26, 323-347.

Paton, C., Hellstrom, J.C., Paul, B., Woodhead, J.D., Hergt, J.M., 2011. Iolite: Freeware for the visualization and processing of mass spectrometric data. Journal of Analytical Atomic Spectrometry, 26, 2508-2518.

Pearce, N.J.G., Perkins, W.T., Westgate, J.A., Gorton, M.P., Jackson, S.E., Neal, C.R. & Chenery, S.P., 1997. A compilation of new and published major and trace element data for NIST SRM 610 and NIST SRM 612 glass reference materials. Geostandards Newsletter: The Journal of Geostandards and Geoanalysis 21, 115–144.

Petrus, J.A., Kamber, B.S., 2012. VizualAge: A novel approach to laser ablation ICP-MS U-Pb geochronology and data reduction. Geostandards and Geoanalytical Research 36, 247-270.

Rayner, N.M., 2014. New U-Pb geochronological results from Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 39–52.

Rayner, N.M., 2015. New (2013-2014) U-Pb geochronological results from northern Hall Peninsula, southern Baffin Island, Nunavut, in: Summary of Activities 2014, Canada-Nunavut Geoscience Office, 31-44.

Reno, B.L., Piccoli, P.M., Brown, M. & Trouw, R., 2012. In situ chemical dating of monazite from the Southern Brazilia Belt, Brazil. Journal of Metamorphic Geology 30, 81–112.

Rubatto, D., 2002. Zircon trace element geochemistry: partitioning with garnet and the link between U-Pb ages and metamorphism. Chemical Geology 184, 123-138.

Sawyer, E.W., 1999. Criteria for the recognition of partial melting. Physics and Chemistry of the Earth (A) 24, 269-279.

Schaltegger, U., Fanning, C.M., Günther, D., Maurin, J.C., Schulmann, K., Gebauer, D., 1999. Growth, annealing and recrystallization of zircon and preservation of monazite in high-grade metamorphism: conventional and in-situ U-Pb isotope, cathodoluminescence and microchemical evidence. Contributions to Mineralogy and Petrology 134, 186-201.

Schmitt, A.K., Grove, M., Harrison, T.M., Lovera, O.M., Hulen, J., & Waters, M., 2003. The Geysers-Cobb Mountain magma system, California (Part 1): U-Pb zircon ages of volcanic rocks, conditions of zircon crystallization and magma residence times. Geochimica et Cosmochimica Acta 67, 3422–3442.

Scott, D.J., 1999. U-Pb geochronology of the eastern Hall Peninsula, southern Baffin Island, Canada: a northern link between the Archean of West Greenland and the Paleoproterozoic Torngat Orogen of northern Labrador. Precambrian Research 93, 5–26.

Skipton, D.R., St-Onge, M.R., Schneider, D.A., McFarlane, C.R.M., in press. Tectonothermal evolution of the middle crust in the Trans-Hudson Orogen, Baffin Island, Canada: evidence from petrology and monazite geochronology of sillimanite-bearing migmatites. Journal of Petrology.

Sláma, J., Košler, J., Condon, D.J., Crowley, J.L., Gerdes, A., Hanchar, J.M., et al. 2008. Plešovice zircon – A new natural reference material for U-Pb and Hf isotopic microanalysis. Chemical Geology 249, 1–35.

Spear, F.S, Kohn, M.J. & Cheney, J.T, 1999. P-T paths from anatectic pelites. Contributions to Mineralogy and Petrology 134, 17-32.

Spear, F.S. & Parrish, R.R., 1996. Petrology and cooling rates of the Valhalla complex, British Columbia, Canada. Journal of Petrology 37, 733-765.

Stacey, J.S. & Kramers, J.D., 1975. Approximation of terrestrial lead isotope evolution by a two-stage model. Earth and Planetary Science Letters 26, 207–221.

Sun, S.-S., McDonough, W.F., 1989. Chemical and isotopic systematics of oceanic basalts: implications for mantle composition and processes, in: Saunders, A.D., Norry, M.J. (Eds.) Magmatism in the Ocean Basins, Geological Society Special Publication No. 42, 313-345.

Steenkamp, H.M., St-Onge, M.R., 2014. Overview of the 2013 regional bedrock mapping program on northern Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 27–38.

White, R.W, Powell, R. & Holland, T.J.B., 2001. Calculation of partial melting equilibria in the system Na_2O-CaO-FeO-MgO-Al_2O_3-SiO_2-H_2O (NCKFMASH). Journal of Metamorphic Geology 19, 139-153.

Wiedenbeck, M., Allé, P., Corfu, F., Griffin, W.L., Meier, M., Oberli, F., et al. 1995. Three natural zircon standards for U–Th–Pb, Lu–Hf, trace-element and REE analyses. Geostandards Newsletter 19, 1–23.

Williams, M.L., Jercinovic, M.J., Goncalves, P. & Mahan, K., 2006. Format and philosophy for collecting, compiling, and reporting microprobe monazite ages. Chemical Geology 225, 1–15.

Appendix 2: *In situ* U-Pb monazite geochronology (LA-ICP-MS) results for ten metasedimentary rock samples from Hall Peninsula, Baffin Island.

Analysis[a]	Grain location[b]	Fabric alignment[c]	U (ppm)	Th (ppm)	^{204}Pb (cps)	2 s.e.	^{206}Pb/^{204}Pb (cps)	%Pb*
B75A-1-1-2	b/w Ms, Bt, Qz, Pl	S1	12540	16970	5	13	42320	100.0
B75A-1-13-1	in Bt		15810	21410	-15	15	-17000	100.0
B75A-1-9-1	b/w Qz, Sil		19500	18890	-8	13	-41250	100.0
B75A-1-6-1	in Ms	S1	15650	17270	-21	12	-13010	100.0
B75A-1-12-1	in Bt	S1	20840	24740	24	15	13942	100.0
B75A-1-17-1	in Qz		16260	17980	43	16	6528	100.0
B75A-1-10-1	b/w Bt, Qz		21010	21770	-6	17	-56600	99.9
B75A-1-14-1	in Bt	S1	21460	21760	-6	18	-61817	100.0
B75A-1-2-1	in Bt	S1	12150	19310	18	18	12450	100.0
B75A-1-20-1	b/w Bt, Ms	S1	20630	18510	-19	9	-18415	100.0
B75A-1-11-1	in Bt		24250	20930	-25	17	-16804	100.0
B75A-1-19-1	b/w Pl, Bt	S1	15580	18170	13	19	20377	100.0
B75A-1-1-1	b/w Ms, Bt, Qz, Pl	S1	16860	20680	14	13	20929	100.0
B75A-1-18-1	in Pl		12130	18030	8	14	28000	100.0
F38A-2-26-1	in Grt core	S1	5197	14414	13	23	6854	99.8
F38A-1-1-2	in Bt	S1	4687	11929	41	21	1912	99.9
F38A-1-1-1	in Bt	S1	5752	17263	3	18	30267	99.9
F38A-2-26-2	in Grt core	S1	4511	15244	32	15	2425	99.7
F38A-2-29-2	in Grt core	S1	7164	17311	10	23	12310	100.0
F38A-2-30-1	in Grt rim	S1	3801	19682	42	21	1595	99.8
F38A-1-7-1	in Grt rim		7383	11824	-4	13	-31050	99.9
F38A-2-29-1	in Grt core	S1	6376	16741	15	17	7233	99.6
F38A-1-5-2	in Grt rim		1499	20675	13	15	1950	100.0
F38A-1-2-1	b/w Bt	S1	2121	26708	-8	13	-4350	99.8
F38A-2-23-1	in Bt		3299	26217	8	23	6805	99.4
F38A-1-2-2	b/w Bt	S1	4352	15075	-4	14	-18450	99.9
F38A-1-3-3	in Grt rim	S1	7686	13011	-2	13	-63200	100.0
F38A-2-30-2	in Grt rim	S1	7199	14650	12	19	10325	99.9
F38A-1-4-2	in Pl		2951	29664	5	23	9120	99.8
F38A-1-6-1	in Grt core	early S1	5942	17966	4	26	23400	100.0
F38A-1-5-1	in Grt rim		3512	21745	-4	20	-14325	99.9
F38A-1-6-3	in Grt core	early S1	2904	18218	-4	13	-12145	99.7
F38A-1-13-1	in Grt core	S1	8150	15191	-2	21	-68300	100.0
F38A-1-6-2	in Grt core	early S1	4658	13073	13	13	5938	99.9
F38A-1-3-1	in Grt rim	S1	8696	12762	-3	11	-47900	99.9
F38A-1-12-1	in Grt core	early S1	5663	19193	22	15	4345	99.8
F38A-1-4-1	in Pl		8794	17894	-4	21	-34775	99.9
F38A-1-6-4	in Grt core	early S1	4316	20143	5	20	13860	99.7
F38A-2-24-1	in Grt core	early S1	5944	16130	31	21	3281	100.0
F38A-1-12-2	in Grt core	early S1	8490	18956	65	26	2172	99.9
F38A-2-24-2	in Grt core	early S1	4966	13185	73	19	1264	100.0
13F122A-1-7-2	b/w Qz	S1	10514	13727	2	23	90400	99.9
13F122A-1-12-1	in Qz		15325	18567	-15	21	-16833	100.0
13F122A-1-1-1	in Pl		16023	20659	8	25	32975	99.9
13F122A-1-30-1	b/w Bt, Qz, Pl		15981	21956	41	24	6039	99.9
13F122A-1-21-1	in Qz		13302	21837	7	24	30114	99.9
13F122A-1-28-1	b/w Qz		16780	16755	1	14	267200	99.9
13F122A-1-16-3	b/w Bt, Qz, Pl	S1	13682	10143	29	16	7672	100.0
13F122A-1-15-1	in Qz		15368	19496	-12	22	-20542	99.9
13F122A-1-16-1	b/w Bt, Qz, Pl	S1	17295	16635	-5	23	-54120	99.9
13F122A-1-11-1	in Pl		13548	16711	-37	28	-5854	99.9
13F122A-1-25-1	b/w Qz , Pl		14580	20477	-27	31	-8441	99.8
13F122A-1-16-2	b/w Bt, Qz, Pl	S1	15536	14550	-1	16	-254200	100.0
13F122A-1-20-2	in Qz		10553	25695	4	29	43600	100.0
13F122A-1-19-1	in Bt		14554	24289	-10	24	-23260	100.0

Analysis[a]	Isotopic ratios							Ages (Ma)	
	$^{207}Pb/^{206}Pb$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}Pb$	2 s.e.	Err. Corr.	$^{206}Pb/^{238}U$	2 s.e.
B75A-1-1-2	0.1051	0.0015	4.441	0.080	0.306	0.006	0.58055	1722	28
B75A-1-13-1	0.1060	0.0008	4.459	0.062	0.305	0.005	0.69909	1716	22
B75A-1-9-1	0.1068	0.0009	4.599	0.055	0.312	0.005	0.61716	1748	23
B75A-1-6-1	0.1073	0.0008	4.671	0.057	0.316	0.005	0.67332	1768	23
B75A-1-12-1	0.1076	0.0008	4.615	0.058	0.310	0.005	0.59788	1742	24
B75A-1-17-1	0.1080	0.0009	4.724	0.064	0.316	0.005	0.64166	1767	23
B75A-1-10-1	0.1084	0.0009	4.604	0.068	0.307	0.005	0.70234	1725	24
B75A-1-14-1	0.1102	0.0010	5.207	0.087	0.343	0.006	0.73529	1902	28
B75A-1-2-1	0.1101	0.0013	4.859	0.096	0.322	0.007	0.80372	1800	32
B75A-1-20-1	0.1106	0.0012	4.928	0.075	0.324	0.005	0.57212	1811	26
B75A-1-11-1	0.1113	0.0007	5.094	0.060	0.332	0.005	0.75950	1848	22
B75A-1-19-1	0.1116	0.0010	5.046	0.073	0.329	0.006	0.66241	1832	27
B75A-1-1-1	0.1118	0.0010	5.085	0.075	0.329	0.006	0.72658	1831	27
B75A-1-18-1	0.1125	0.0007	5.127	0.072	0.329	0.005	0.80298	1835	25
F38A-2-26-1	0.1097	0.0016	4.935	0.110	0.326	0.006	0.63612	1817	30
F38A-1-1-2	0.1102	0.0030	5.021	0.140	0.326	0.004	0.69344	1820	19
F38A-1-1-1	0.1102	0.0030	5.077	0.140	0.328	0.004	0.62342	1826	19
F38A-2-26-2	0.1109	0.0017	5.066	0.110	0.331	0.006	0.57602	1840	29
F38A-2-29-2	0.1110	0.0016	5.152	0.110	0.341	0.006	0.61181	1891	29
F38A-2-30-1	0.1115	0.0020	5.066	0.120	0.330	0.006	0.45139	1838	30
F38A-1-7-1	0.1113	0.0028	5.234	0.130	0.333	0.003	0.68144	1852	14
F38A-2-29-1	0.1114	0.0015	5.002	0.100	0.326	0.006	0.64815	1820	29
F38A-1-5-2	0.1118	0.0032	5.265	0.150	0.335	0.004	0.46536	1859	19
F38A-1-2-1	0.1117	0.0030	5.124	0.140	0.327	0.003	0.53103	1824	16
F38A-2-23-1	0.1121	0.0021	4.997	0.120	0.323	0.006	0.35675	1803	29
F38A-1-2-2	0.1122	0.0029	5.220	0.140	0.333	0.003	0.62414	1852	16
F38A-1-3-3	0.1124	0.0028	5.156	0.130	0.330	0.002	0.63363	1840	12
F38A-2-30-2	0.1124	0.0015	5.150	0.110	0.334	0.006	0.69387	1854	30
F38A-1-4-2	0.1125	0.0032	5.239	0.140	0.334	0.004	0.26936	1857	20
F38A-1-6-1	0.1124	0.0033	5.344	0.150	0.337	0.005	0.49794	1869	26
F38A-1-5-1	0.1126	0.0032	5.319	0.160	0.338	0.004	0.49097	1876	18
F38A-1-6-3	0.1125	0.0030	5.295	0.140	0.332	0.003	0.42167	1846	14
F38A-1-13-1	0.1124	0.0030	5.250	0.140	0.341	0.004	0.58328	1891	17
F38A-1-6-2	0.1126	0.0029	5.313	0.140	0.333	0.003	0.62327	1853	14
F38A-1-3-1	0.1127	0.0029	5.223	0.130	0.333	0.003	0.72743	1853	14
F38A-1-12-1	0.1130	0.0029	5.366	0.140	0.338	0.004	0.67228	1876	18
F38A-1-4-1	0.1132	0.0033	5.335	0.140	0.338	0.005	0.35678	1876	22
F38A-1-6-4	0.1131	0.0031	5.329	0.150	0.331	0.004	0.57916	1844	19
F38A-2-24-1	0.1134	0.0017	5.204	0.110	0.333	0.006	0.42853	1854	28
F38A-1-12-2	0.1160	0.0032	5.527	0.150	0.343	0.004	0.60463	1901	18
F38A-2-24-2	0.1184	0.0017	5.893	0.140	0.358	0.007	0.74148	1973	32
13F122A-1-7-2	0.1102	0.0014	4.837	0.120	0.324	0.005	0.74831	1807	22
13F122A-1-12-1	0.1103	0.0012	4.920	0.110	0.323	0.004	0.80574	1805	20
13F122A-1-1-1	0.1104	0.0012	4.931	0.110	0.320	0.004	0.67936	1789	17
13F122A-1-30-1	0.1104	0.0014	4.928	0.110	0.322	0.004	0.66692	1798	19
13F122A-1-21-1	0.1107	0.0016	5.002	0.120	0.325	0.005	0.53956	1812	23
13F122A-1-28-1	0.1106	0.0011	4.867	0.100	0.320	0.003	0.76911	1792	16
13F122A-1-16-3	0.1107	0.0012	4.872	0.100	0.322	0.003	0.61848	1800	16
13F122A-1-15-1	0.1108	0.0013	5.013	0.110	0.324	0.004	0.72510	1808	20
13F122A-1-16-1	0.1109	0.0013	4.859	0.100	0.314	0.004	0.75784	1759	18
13F122A-1-11-1	0.1109	0.0017	5.120	0.140	0.328	0.007	0.70950	1830	32
13F122A-1-25-1	0.1110	0.0016	5.048	0.130	0.328	0.006	0.77829	1826	31
13F122A-1-16-2	0.1111	0.0012	4.965	0.100	0.325	0.003	0.68924	1814	16
13F122A-1-20-2	0.1113	0.0015	5.174	0.120	0.336	0.004	0.67405	1867	21
13F122A-1-19-1	0.1113	0.0014	5.079	0.120	0.328	0.005	0.75150	1830	22

Analysis[a]	Ages (Ma)				% Disc.
	$^{207}Pb/^{235}U$	2 s.e.	$^{207}Pb/^{206}Pb$	2 s.e.	
B75A-1-1-2	1723	13	1713	26	-0.9
B75A-1-13-1	1723	12	1731	15	0.9
B75A-1-9-1	1749	10	1743	15	-0.7
B75A-1-6-1	1762	10	1753	14	-1.1
B75A-1-12-1	1752	11	1761	15	1.1
B75A-1-17-1	1771	11	1765	16	-0.8
B75A-1-10-1	1749	12	1771	15	2.5
B75A-1-14-1	1853	14	1800	17	-6.6
B75A-1-2-1	1794	17	1800	20	0.6
B75A-1-20-1	1807	13	1808	21	0.1
B75A-1-11-1	1835	10	1819	12	-1.9
B75A-1-19-1	1827	12	1825	15	-0.2
B75A-1-1-1	1833	13	1828	15	-0.7
B75A-1-18-1	1839	12	1839	12	-0.2
F38A-2-26-1	1807	18	1791	27	-2.1
F38A-1-1-2	1821	24	1800	49	-2.7
F38A-1-1-1	1832	23	1807	50	-3.0
F38A-2-26-2	1828	18	1814	27	-2.0
F38A-2-29-2	1844	18	1814	26	-3.7
F38A-2-30-1	1831	20	1818	33	-1.5
F38A-1-7-1	1858	22	1820	47	-4.6
F38A-2-29-1	1818	17	1821	24	0.2
F38A-1-5-2	1863	25	1821	53	-5.1
F38A-1-2-1	1838	23	1827	50	-1.5
F38A-2-23-1	1817	20	1833	35	1.7
F38A-1-2-2	1856	22	1833	48	-2.7
F38A-1-3-3	1847	21	1836	46	-1.1
F38A-2-30-2	1843	18	1836	25	-1.0
F38A-1-4-2	1858	23	1836	52	-2.7
F38A-1-6-1	1875	24	1837	53	-4.7
F38A-1-5-1	1872	25	1837	52	-4.2
F38A-1-6-3	1867	22	1838	49	-3.6
F38A-1-13-1	1860	23	1838	48	-2.7
F38A-1-6-2	1870	22	1844	46	-3.2
F38A-1-3-1	1855	22	1845	46	-1.3
F38A-1-12-1	1878	23	1846	47	-4.0
F38A-1-4-1	1874	23	1849	53	-3.0
F38A-1-6-4	1872	24	1850	49	-2.8
F38A-2-24-1	1852	18	1851	28	-0.3
F38A-1-12-2	1904	23	1894	49	-1.3
F38A-2-24-2	1957	20	1929	26	-3.7
13F122A-1-7-2	1792	21	1801	23	1.1
13F122A-1-12-1	1804	19	1804	19	-0.2
13F122A-1-1-1	1807	19	1805	20	-0.3
13F122A-1-30-1	1807	19	1806	23	-0.1
13F122A-1-21-1	1819	20	1808	27	-1.4
13F122A-1-28-1	1796	18	1809	19	1.5
13F122A-1-16-3	1797	18	1810	19	1.5
13F122A-1-15-1	1824	18	1812	21	-1.1
13F122A-1-16-1	1795	18	1813	21	2.1
13F122A-1-11-1	1841	23	1813	28	-3.2
13F122A-1-25-1	1826	22	1814	27	-1.6
13F122A-1-16-2	1813	18	1817	19	0.4
13F122A-1-20-2	1848	20	1819	24	-3.5
13F122A-1-19-1	1834	20	1820	22	-1.5

Analysis[a]	Grain location[b]	Fabric alignment[c]	U (ppm)	Th (ppm)	^{204}Pb (cps)	^{204}Pb 2 s.e.	^{206}Pb/^{204}Pb (cps)	%Pb*
13F122A-1-22-2	b/w Kfs, Qz, Pl	S1	19047	17826	0	21	-	99.9
13F122A-1-26-1	in Qz		21117	18456	30	18	11140	99.7
13F122A-1-2-1	b/w Qz, Kfs	S1	17295	18763	22	25	12818	99.8
13F122A-1-3-3	b/w Bt	S1	16146	26901	9	25	28733	100.0
13F122A-1-23-2	in Qz		15490	23826	13	30	18985	99.9
13F122A-1-13-1	b/w Bt	S1	12314	20328	28	26	7404	100.0
13F122A-1-10-1	b/w Qz, Kfs, Bt	S1	11112	23346	10	17	18600	99.9
13F122A-1-24-1	b/w Qz , Pl		11283	17478	29	23	6490	100.0
13F122A-1-7-4	b/w Qz	S1	16217	21614	15	25	17407	99.9
13F122A-1-10-4	b/w Qz, Kfs, Bt	S1	11931	23219	3	16	65967	99.9
13F122A-1-3-2	b/w Bt	S1	14404	25652	29	28	8200	99.9
13F122A-1-22-1	b/w Kfs, Qz, Pl	S1	20418	20948	15	21	21887	99.9
13F122A-1-26-2	in Qz		16781	19965	15	15	18067	99.9
13F122A-1-7-1	b/w Qz	S1	14471	19526	19	19	12532	99.9
13F122A-1-15-2	in Qz		10821	15472	2	25	90200	100.0
13F122A-1-21-2	in Qz		13924	22453	-11	23	-20436	99.9
13F122A-1-17-2	in Grt rim		15837	20252	-11	17	-23518	99.9
13F122A-1-10-2	b/w Qz, Kfs, Bt	S1	20829	12413	55	21	6444	100.0
13F122A-1-5-2	in Qz		12818	24820	3	30	70667	99.9
13F122A-1-7-3	b/w Qz	S1	14099	19911	1	23	231500	100.0
13F122A-1-27-1	in Qz		13271	26945	-15	18	-14353	99.9
13F122A-1-6-2	in Qz		12055	20059	-6	17	-33883	100.0
13F122A-1-14-1	in Pl		9931	16391	-7	17	-23986	100.0
13F122A-1-17-1	in Grt rim		16242	19071	-19	30	-13716	100.0
13F122A-1-29-1	in Pl		7845	16204	-2	17	-66400	100.0
13F122A-1-10-3	b/w Qz, Kfs, Bt	S1	21995	13490	-4	17	-90375	99.9
13F122A-1-5-1	in Qz		8882	22824	6	16	25033	99.9
13F122A-1-13-2	b/w Bt	S1	11692	17036	22	26	9132	100.0
13F122A-1-3-1	b/w Bt	S1	17015	20616	13	27	20562	99.7
13F122A-1-28-2	b/w Qz		14383	19920	-26	26	-8685	99.9
13F122A-1-18-1	in Qz		14476	22220	3	18	78700	99.9
13F122A-1-20-1	in Qz		8155	20685	-7	25	-19443	99.9
13F122A-1-26-3	in Qz		14553	21053	-5	20	-46980	99.9
13F122A-1-1-2	in Pl		11205	18399	-4	30	-46325	99.9
13F122A-1-4-1	in Qz		12509	34226	52	22	4054	99.8
13F122A-1-6-1	in Qz		8937	14788	1	26	150000	99.9
13F122A-1-9-1	b/w Grt & Qz		18170	25680	112	48	2582	99.6
H45A-1-1-1	b/w Kfs, Bt, Qz	S1	25210	21517	26	26	16846	99.9
H45A-1-26-1	b/w Bt, Qz, Ms		28060	27436	42	24	10762	99.9
H45A-1-28-3	b/w Ms, Pl	S1	21566	22385	23	19	15783	99.8
H45A-1-21-1	in Ms		29616	29895	32	39	14406	99.7
H45A-1-3-1	in Ms		32645	27774	140	260	3493	99.8
H45A-1-29-1	b/w Ms, Qz		26738	26274	28	20	15136	99.8
H45A-1-1-2	b/w Kfs, Bt, Qz	S1	31102	26245	23	22	22535	99.9
H45A-1-17-2	in Bt		29723	29628	36	22	13558	99.9
H45A-1-17-1	in Bt		30701	30516	20	27	24885	99.9
H45A-1-2-1	b/w Qz, Bt, Ms	S1	33297	24678	5	31	110000	99.9
H45A-1-25-1	b/w Bt, Qz, Ms		25307	26646	38	22	10829	99.9
H45A-1-6-2	b/w Bt, Ms		34378	25214	19	23	29758	99.9
H45A-1-4-1	in Ms		20198	16867	8	18	43375	100.0
H45A-1-8-1	in Bt		27930	19939	20	19	23600	100.0
H45A-1-19-1	in Bt	S1	34437	25567	12	22	45167	99.9
H45A-1-19-2	in Bt	S1	32692	29439	22	32	24182	99.9
H45A-1-24-1	b/w Ms, Qtz		22779	29633	60	38	5950	99.9
H45A-1-7-1	b/w Bt, Ms	S1	11427	10992	18	32	11333	100.0
H45A-1-27-1	in Qz		26765	28116	29	16	15621	99.8
H45A-1-2-3	b/w Qz, Bt, Ms	S1	30282	19967	38	29	13395	100.0
H45A-1-20-1	in Ms	S1	9041	22136	24	27	6583	100.0
H45A-1-14-1	in Grt rim	early S1	7606	12978	4	20	33625	100.0

Analysis[a]	Isotopic ratios							Ages (Ma)	
	$^{207}Pb/^{206}Pb$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}Pb$	2 s.e.	Err. Corr.	$^{206}Pb/^{238}U$	2 s.e.
13F122A-1-22-2	0.1114	0.0012	4.914	0.100	0.321	0.003	0.62495	1794	16
13F122A-1-26-1	0.1114	0.0011	4.812	0.100	0.314	0.003	0.74404	1759	15
13F122A-1-2-1	0.1113	0.0013	4.992	0.110	0.321	0.004	0.71170	1797	17
13F122A-1-3-3	0.1115	0.0015	4.994	0.120	0.322	0.005	0.79372	1799	25
13F122A-1-23-2	0.1113	0.0015	5.066	0.120	0.326	0.005	0.72113	1819	23
13F122A-1-13-1	0.1115	0.0013	5.018	0.110	0.326	0.005	0.74860	1817	23
13F122A-1-10-1	0.1116	0.0012	4.986	0.110	0.326	0.003	0.71574	1818	17
13F122A-1-24-1	0.1116	0.0014	4.956	0.120	0.325	0.005	0.76646	1815	23
13F122A-1-7-4	0.1118	0.0015	5.064	0.110	0.326	0.005	0.64403	1817	22
13F122A-1-10-4	0.1117	0.0012	4.990	0.110	0.324	0.003	0.66745	1811	15
13F122A-1-3-2	0.1119	0.0017	5.116	0.120	0.327	0.005	0.65737	1822	25
13F122A-1-22-1	0.1117	0.0013	5.018	0.110	0.324	0.004	0.60858	1810	18
13F122A-1-26-2	0.1120	0.0011	4.994	0.110	0.325	0.004	0.78642	1816	17
13F122A-1-7-1	0.1119	0.0013	4.999	0.110	0.324	0.004	0.65551	1810	18
13F122A-1-15-2	0.1120	0.0014	5.022	0.120	0.327	0.004	0.75973	1821	21
13F122A-1-21-2	0.1119	0.0013	5.083	0.110	0.327	0.004	0.67776	1823	18
13F122A-1-17-2	0.1121	0.0012	4.981	0.100	0.325	0.003	0.64287	1814	16
13F122A-1-10-2	0.1121	0.0013	4.955	0.110	0.326	0.003	0.67183	1816	17
13F122A-1-5-2	0.1120	0.0015	5.166	0.120	0.330	0.004	0.71538	1838	19
13F122A-1-7-3	0.1121	0.0014	5.037	0.110	0.325	0.004	0.67134	1816	19
13F122A-1-27-1	0.1122	0.0013	5.048	0.110	0.327	0.004	0.66118	1822	17
13F122A-1-6-2	0.1119	0.0013	5.114	0.110	0.330	0.004	0.74074	1838	19
13F122A-1-14-1	0.1120	0.0013	5.076	0.110	0.330	0.004	0.70681	1838	18
13F122A-1-17-1	0.1122	0.0016	5.174	0.120	0.330	0.004	0.51954	1838	21
13F122A-1-29-1	0.1122	0.0013	5.182	0.110	0.338	0.004	0.59111	1878	17
13F122A-1-10-3	0.1123	0.0012	5.007	0.110	0.324	0.003	0.57936	1810	15
13F122A-1-5-1	0.1124	0.0013	5.135	0.120	0.329	0.004	0.66781	1835	18
13F122A-1-13-2	0.1125	0.0016	5.213	0.120	0.337	0.004	0.60348	1873	21
13F122A-1-3-1	0.1126	0.0016	4.975	0.120	0.318	0.006	0.80013	1780	29
13F122A-1-28-2	0.1126	0.0015	5.108	0.120	0.326	0.005	0.67739	1820	23
13F122A-1-18-1	0.1127	0.0013	5.087	0.110	0.327	0.004	0.71422	1825	19
13F122A-1-20-1	0.1128	0.0018	5.124	0.130	0.329	0.005	0.57758	1831	23
13F122A-1-26-3	0.1128	0.0012	5.061	0.110	0.327	0.004	0.76240	1821	18
13F122A-1-1-2	0.1128	0.0015	5.228	0.130	0.333	0.007	0.83402	1851	32
13F122A-1-4-1	0.1128	0.0014	5.227	0.130	0.331	0.005	0.76859	1844	23
13F122A-1-6-1	0.1136	0.0014	5.236	0.120	0.333	0.004	0.65807	1850	17
13F122A-1-9-1	0.1164	0.0017	5.278	0.140	0.324	0.006	0.74960	1808	27
H45A-1-1-1	0.1100	0.0014	4.881	0.110	0.320	0.006	0.85868	1788	31
H45A-1-26-1	0.1101	0.0014	4.869	0.098	0.318	0.006	0.78171	1781	29
H45A-1-28-3	0.1104	0.0014	4.824	0.097	0.312	0.006	0.82733	1750	28
H45A-1-21-1	0.1104	0.0014	4.600	0.120	0.302	0.008	0.93822	1700	38
H45A-1-3-1	0.1104	0.0018	4.890	0.160	0.327	0.013	0.90473	1823	61
H45A-1-29-1	0.1106	0.0014	4.743	0.094	0.310	0.006	0.77102	1738	27
H45A-1-1-2	0.1106	0.0014	4.858	0.098	0.320	0.006	0.73867	1790	29
H45A-1-17-2	0.1109	0.0013	4.841	0.096	0.317	0.006	0.78928	1777	28
H45A-1-17-1	0.1109	0.0015	4.823	0.099	0.318	0.006	0.65466	1781	31
H45A-1-2-1	0.1110	0.0015	4.876	0.095	0.322	0.006	0.71121	1801	30
H45A-1-25-1	0.1110	0.0014	4.753	0.094	0.308	0.006	0.77880	1728	28
H45A-1-6-2	0.1111	0.0015	4.847	0.096	0.321	0.006	0.63405	1792	29
H45A-1-4-1	0.1112	0.0014	5.014	0.110	0.326	0.006	0.84882	1819	31
H45A-1-8-1	0.1114	0.0014	4.929	0.096	0.324	0.006	0.72792	1807	27
H45A-1-19-1	0.1115	0.0014	4.826	0.097	0.316	0.006	0.85007	1769	29
H45A-1-19-2	0.1115	0.0015	4.956	0.110	0.323	0.006	0.80487	1803	31
H45A-1-24-1	0.1115	0.0016	4.805	0.120	0.311	0.007	0.77648	1744	33
H45A-1-7-1	0.1115	0.0017	5.046	0.130	0.328	0.008	0.85468	1827	40
H45A-1-27-1	0.1115	0.0013	4.847	0.092	0.311	0.005	0.77287	1745	26
H45A-1-2-3	0.1117	0.0015	5.000	0.100	0.327	0.006	0.74389	1825	30
H45A-1-20-1	0.1118	0.0016	5.268	0.120	0.342	0.007	0.82480	1893	35
H45A-1-14-1	0.1120	0.0016	5.228	0.110	0.341	0.006	0.69619	1892	31

Analysis[a]	Ages (Ma)				% Disc.
	$^{207}Pb/^{235}U$	2 s.e.	$^{207}Pb/^{206}Pb$	2 s.e.	
13F122A-1-22-2	1804	18	1821	20	1.9
13F122A-1-26-1	1787	18	1822	18	4.1
13F122A-1-2-1	1819	18	1822	21	0.5
13F122A-1-3-3	1817	21	1822	25	0.4
13F122A-1-23-2	1831	19	1822	24	-1.0
13F122A-1-13-1	1822	19	1823	21	0.1
13F122A-1-10-1	1819	19	1825	20	0.9
13F122A-1-24-1	1811	20	1826	23	1.7
13F122A-1-7-4	1830	19	1827	24	-0.4
13F122A-1-10-4	1817	18	1828	20	1.2
13F122A-1-3-2	1838	20	1828	27	-1.3
13F122A-1-22-1	1823	19	1830	21	0.9
13F122A-1-26-2	1818	18	1830	18	1.4
13F122A-1-7-1	1819	19	1831	21	1.4
13F122A-1-15-2	1824	20	1831	23	0.9
13F122A-1-21-2	1835	17	1831	22	-0.3
13F122A-1-17-2	1815	18	1832	19	1.9
13F122A-1-10-2	1811	18	1833	21	2.5
13F122A-1-5-2	1846	20	1833	23	-1.7
13F122A-1-7-3	1825	19	1834	22	1.0
13F122A-1-27-1	1828	18	1834	20	0.8
13F122A-1-6-2	1838	19	1834	20	-0.5
13F122A-1-14-1	1831	19	1834	21	0.2
13F122A-1-17-1	1848	20	1834	26	-1.7
13F122A-1-29-1	1850	18	1837	21	-1.5
13F122A-1-10-3	1820	18	1838	20	2.0
13F122A-1-5-1	1842	19	1839	21	-0.3
13F122A-1-13-2	1855	20	1839	25	-1.9
13F122A-1-3-1	1814	21	1840	26	2.9
13F122A-1-28-2	1837	20	1841	24	0.4
13F122A-1-18-1	1833	19	1844	21	1.2
13F122A-1-20-1	1839	22	1844	28	0.5
13F122A-1-26-3	1829	19	1845	20	1.8
13F122A-1-1-2	1861	22	1845	24	-1.4
13F122A-1-4-1	1856	20	1849	22	-0.9
13F122A-1-6-1	1860	19	1857	22	-0.2
13F122A-1-9-1	1864	22	1908	26	4.9
H45A-1-1-1	1798	19	1799	23	0.0
H45A-1-26-1	1796	17	1801	23	0.5
H45A-1-28-3	1788	17	1804	22	1.8
H45A-1-21-1	1748	22	1805	24	6.4
H45A-1-3-1	1807	32	1805	30	0.5
H45A-1-29-1	1774	17	1808	23	3.9
H45A-1-1-2	1794	17	1809	24	1.6
H45A-1-17-2	1791	17	1813	22	2.5
H45A-1-17-1	1788	17	1814	24	2.9
H45A-1-2-1	1798	16	1815	25	2.0
H45A-1-25-1	1776	17	1815	23	4.5
H45A-1-6-2	1793	17	1816	25	2.7
H45A-1-4-1	1820	18	1817	23	-0.6
H45A-1-8-1	1806	16	1821	22	1.6
H45A-1-19-1	1792	19	1822	23	3.8
H45A-1-19-2	1811	18	1823	24	1.3
H45A-1-24-1	1785	20	1823	26	4.3
H45A-1-7-1	1826	21	1823	28	-0.5
H45A-1-27-1	1793	16	1824	21	3.6
H45A-1-2-3	1821	18	1826	24	0.8
H45A-1-20-1	1862	20	1828	26	-4.3
H45A-1-14-1	1856	17	1830	25	-3.3

Analysis[a]	Grain location[b]	Fabric alignment[c]	U (ppm)	Th (ppm)	^{204}Pb (cps)	2 s.e.	^{206}Pb/^{204}Pb (cps)	%Pb*
H45A-1-13-1	in Grt rim	early S1	7583	12842	28	21	4804	100.0
H45A-1-6-1	b/w Bt, Ms		38796	25401	39	26	15949	100.0
H45A-1-9-2	b/w Bt, Ms		19656	14146	45	28	7513	99.9
H45A-1-15-1	in Grt rim	early S1	7489	14434	12	21	11550	100.0
H45A-1-16-1	in Grt rim	early S1	8835	27080	34	21	4482	99.8
H45A-1-28-2	b/w Ms, Pl	S1	3787	14952	-3	20	-23067	99.6
H45A-1-29-2	b/w Ms, Qtz		16060	24544	58	40	4569	100.0
H45A-1-12-1	in Grt rim	early S1	6752	15425	20	24	5815	99.9
H45A-1-19-3	in Bt	S1	33200	26460	93	31	5788	99.9
H45A-1-2-2	b/w Qz, Bt, Ms	S1	31234	18907	99	23	5313	100.0
H45A-1-11-1	in Bt		18719	16140	110	27	2836	99.9
H45A-1-18-1	in Bt		12551	33569	13	35	16123	99.8
H45A-1-10-2	in Grt rim	early S1	6589	51277	50	31	2250	100.0
H45A-1-10-1	in Grt rim	early S1	8703	45978	73	29	2021	99.7
H45A-1-24-2	b/w Ms, Qtz		26188	31835	357	60	1148	100.3
H45A-1-28-1	b/w Ms, Pl	S1	25597	22516	270	39	1517	99.6
H45A-1-9-1	b/w Bt, Ms		16775	21063	564	52	510	100.7
H45A-1-26-2	b/w Bt, Qz, Ms		5194	6224	274	47	361	99.4
H45A-1-22-1	b/w Bt, Qz	S1	6235	21338	299	29	391	96.0
H45A-1-23-1	b/w Bt, Qz	S1	1433	27122	851	82	44	71.8
S1A-1-14-1	b/w Sil, Kfs	S1	12709	7762	-2	16	-110350	100.0
S1A-1-14-2	b/w Sil, Kfs	S1	8913	8293	-16	18	-9569	100.0
S1A-1-7-1	b/w Qz, Sil		3868	19306	13	16	5200	100.0
S1A-1-3-1	in Pl		1216	243	12	20	1699	99.9
S1A-2-3-1	b/w Bt, Kfs		9050	18390	3	14	41000	100.0
S1A-1-2-2	b/w Qz, Pl		1731	22324	10	16	2970	99.5
S1A-1-7-2	b/w Qz, Sil		2031	24957	12	20	2942	99.9
S1A-1-13-1	in Grt rim	S1	23254	10138	4	22	95100	99.9
S1A-2-1-2			5050	19440	4	10	18128	100.1
S1A-1-2-3	b/w Qz, Pl		8641	23058	-1	23	-145500	100.0
S1A-1-4-1	in Qz		10873	15344	20	29	9310	100.0
S1A-1-2-1	b/w Qz, Pl		2998	24007	1	18	50500	99.8
S1A-2-16-1	b/w Bt, Qz		4360	15340	3	13	53933	100.0
S1A-2-4-1	in Grt	S1	10180	17080	6	9	23328	100.0
S1A-2-3-2	b/w Bt, Kfs		14130	19630	-3	9	-59273	100.1
S1A-2-1-1			8460	20770	4	12	29725	99.9
S1A-2-7-1	in Grt	S1	10610	15640	21	13	7229	100.0
S1A-2-11-1	b/w Kfs, Pl	S1	12370	18560	-11	12	-35273	100.0
S1A-2-11-2	b/w Kfs, Pl	S1	8340	22470	6	13	42900	100.0
S1A-2-8-1	in Grt	S1	18940	15180	15	15	18133	100.0
S60A-1-16-3	b/w Pl, Kfs		4900	5610	-24	11	-6963	100.0
S60A-1-15-1	in Kfs		5660	5880	-3	20	-60233	100.0
S60A-1-11-1	in Kfs		2240	2120	0	13	-	100.0
S60A-1-16-1	b/w Pl, Kfs		7070	6900	8	20	29300	100.0
S60A-1-5-1	in Pl		4000	1996	-13	10	-10442	100.0
S60A-1-16-2	b/w Pl, Kfs		6650	13930	1	11	221400	100.0
S60A-1-10-1	in Kfs		2670	6960	-2	12	-44600	100.2
S60A-1-3-1	in Grt rim		34580	6540	-7	14	-159143	100.0
S60A-1-11-2	in Kfs		1584	1843	-15	14	-3387	100.0
S60A-1-12-1	b/w Qz, Kfs		6090	8570	-34	13	-5991	100.0
S60A-1-17-1	in Qz		4709	13370	21	14	7233	100.0
S60A-1-14-1	in Kfs		3600	1480	-4	16	-28250	100.0
S60A-1-18-1	b/w Kfs, Bt		6990	9860	1	10	159857	100.0
S60A-1-18-2	b/w Kfs, Bt		5505	42900	-49	11	-3800	100.1
S60A-1-6-1	in Bt		5200	10660	-36	11	-4908	100.0
S60A-1-10-2	in Kfs		3360	7420	-25	18	-4280	100.0
S60A-1-19-1	in Kfs		9460	38800	-15	12	-20240	100.0
S60A-1-8-1	in Pl		8860	104200	54	19	5298	100.1

Analysis[a]	Isotopic ratios							Ages (Ma)	
	$^{207}Pb/^{206}Pb$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}Pb$	2 s.e.	Err. Corr.	$^{206}Pb/^{238}U$	2 s.e.
H45A-1-13-1	0.1120	0.0016	5.249	0.100	0.343	0.006	0.61608	1902	30
H45A-1-6-1	0.1120	0.0014	4.873	0.100	0.319	0.006	0.83962	1782	29
H45A-1-9-2	0.1125	0.0016	5.021	0.110	0.327	0.007	0.79278	1824	31
H45A-1-15-1	0.1127	0.0015	5.397	0.110	0.349	0.006	0.59425	1931	29
H45A-1-16-1	0.1131	0.0016	5.136	0.110	0.330	0.006	0.66853	1835	31
H45A-1-28-2	0.1132	0.0017	5.235	0.110	0.328	0.006	0.60917	1829	30
H45A-1-29-2	0.1131	0.0018	5.154	0.110	0.331	0.007	0.41264	1840	32
H45A-1-12-1	0.1132	0.0016	5.140	0.110	0.333	0.006	0.67723	1852	30
H45A-1-19-3	0.1131	0.0015	4.919	0.098	0.316	0.006	0.77767	1772	28
H45A-1-2-2	0.1139	0.0014	5.089	0.100	0.326	0.006	0.79938	1816	29
H45A-1-11-1	0.1142	0.0016	5.152	0.120	0.330	0.007	0.33470	1838	31
H45A-1-18-1	0.1145	0.0023	5.230	0.140	0.334	0.007	0.56353	1856	36
H45A-1-10-2	0.1146	0.0019	5.268	0.120	0.339	0.007	0.54671	1883	32
H45A-1-10-1	0.1154	0.0019	5.256	0.130	0.336	0.007	0.74367	1867	35
H45A-1-24-2	0.1195	0.0023	5.170	0.130	0.314	0.008	0.64906	1757	37
H45A-1-28-1	0.1199	0.0020	5.216	0.130	0.315	0.007	0.74809	1764	32
H45A-1-9-1	0.1342	0.0024	6.240	0.170	0.342	0.008	0.73400	1896	39
H45A-1-26-2	0.1375	0.0027	7.780	0.450	0.404	0.024	0.93489	2161	98
H45A-1-22-1	0.1585	0.0062	8.260	0.510	0.363	0.010	0.86120	1993	49
H45A-1-23-1	0.4270	0.0130	30.000	1.400	0.508	0.017	0.75475	2644	71
S1A-1-14-1	0.1079	0.0014	4.981	0.097	0.334	0.006	0.65168	1859	29
S1A-1-14-2	0.1090	0.0014	4.887	0.100	0.323	0.006	0.69697	1804	28
S1A-1-7-1	0.1101	0.0016	5.104	0.110	0.337	0.006	0.54555	1872	28
S1A-1-3-1	0.1109	0.0025	4.900	0.130	0.321	0.006	0.29921	1792	31
S1A-2-3-1	0.1110	0.0037	4.947	0.160	0.325	0.007	0.59807	1812	33
S1A-1-2-2	0.1114	0.0020	5.078	0.110	0.331	0.006	0.40311	1840	30
S1A-1-7-2	0.1112	0.0020	5.236	0.120	0.343	0.006	0.31555	1901	31
S1A-1-13-1	0.1112	0.0014	4.950	0.100	0.326	0.006	0.80933	1817	30
S1A-2-1-2	0.1111	0.0038	5.007	0.170	0.329	0.007	0.60701	1832	35
S1A-1-2-3	0.1115	0.0017	5.093	0.100	0.335	0.006	0.35007	1863	29
S1A-1-4-1	0.1115	0.0018	5.231	0.120	0.344	0.007	0.61837	1906	34
S1A-1-2-1	0.1122	0.0020	5.086	0.110	0.331	0.006	0.32732	1844	29
S1A-2-16-1	0.1121	0.0011	5.256	0.140	0.335	0.008	0.50642	1863	37
S1A-2-4-1	0.1128	0.0038	5.176	0.170	0.331	0.008	0.77705	1843	37
S1A-2-3-2	0.1128	0.0037	5.103	0.170	0.329	0.007	0.77714	1833	35
S1A-2-1-1	0.1128	0.0038	5.160	0.170	0.332	0.007	0.66840	1845	35
S1A-2-7-1	0.1130	0.0037	5.170	0.170	0.331	0.007	0.55244	1840	32
S1A-2-11-1	0.1129	0.0008	5.153	0.140	0.332	0.008	0.73828	1848	36
S1A-2-11-2	0.1132	0.0015	5.114	0.140	0.331	0.008	0.54265	1844	40
S1A-2-8-1	0.1136	0.0037	4.948	0.160	0.315	0.007	0.81334	1765	32
S60A-1-16-3	0.1089	0.0008	4.855	0.120	0.321	0.007	0.56818	1792	34
S60A-1-15-1	0.1090	0.0016	4.744	0.140	0.320	0.008	0.61079	1788	38
S60A-1-11-1	0.1091	0.0013	4.838	0.150	0.320	0.008	0.71076	1791	40
S60A-1-16-1	0.1091	0.0008	4.908	0.120	0.325	0.007	0.59585	1814	35
S60A-1-5-1	0.1094	0.0008	4.859	0.130	0.321	0.007	0.68298	1796	35
S60A-1-16-2	0.1094	0.0009	4.823	0.120	0.319	0.007	0.66818	1786	35
S60A-1-10-1	0.1100	0.0021	4.853	0.150	0.323	0.008	0.30115	1802	38
S60A-1-3-1	0.1099	0.0006	4.964	0.130	0.332	0.007	0.85627	1846	35
S60A-1-11-2	0.1102	0.0019	4.891	0.150	0.323	0.008	0.38327	1804	37
S60A-1-12-1	0.1101	0.0010	4.917	0.130	0.323	0.007	0.64235	1804	36
S60A-1-17-1	0.1100	0.0012	4.954	0.130	0.329	0.007	0.38350	1831	35
S60A-1-14-1	0.1103	0.0016	4.814	0.140	0.322	0.008	0.44903	1800	37
S60A-1-18-1	0.1103	0.0010	4.830	0.120	0.321	0.007	0.51188	1796	34
S60A-1-18-2	0.1104	0.0011	5.051	0.130	0.335	0.008	0.55733	1863	36
S60A-1-6-1	0.1105	0.0009	4.888	0.130	0.323	0.007	0.65309	1803	34
S60A-1-10-2	0.1114	0.0018	4.969	0.150	0.326	0.008	0.46404	1817	37
S60A-1-19-1	0.1115	0.0010	5.028	0.150	0.327	0.009	0.87923	1821	43
S60A-1-8-1	0.1127	0.0012	5.132	0.130	0.333	0.007	0.22378	1852	34

Analysis[a]	Ages (Ma)				% Disc.
	$^{207}Pb/^{235}U$	2 s.e.	$^{207}Pb/^{206}Pb$	2 s.e.	
H45A-1-13-1	1860	17	1831	25	-3.5
H45A-1-6-1	1797	18	1831	23	3.9
H45A-1-9-2	1822	19	1839	26	1.9
H45A-1-15-1	1885	16	1841	24	-5.2
H45A-1-16-1	1841	18	1847	26	0.6
H45A-1-28-2	1857	19	1848	28	-1.2
H45A-1-29-2	1844	18	1848	28	0.3
H45A-1-12-1	1842	18	1849	25	0.7
H45A-1-19-3	1805	17	1849	23	5.0
H45A-1-2-2	1833	17	1862	23	3.2
H45A-1-11-1	1843	20	1866	26	2.5
H45A-1-18-1	1857	22	1869	36	1.3
H45A-1-10-2	1863	19	1870	31	0.7
H45A-1-10-1	1860	22	1883	30	2.4
H45A-1-24-2	1847	22	1947	34	10.9
H45A-1-28-1	1854	22	1953	30	10.8
H45A-1-9-1	2008	24	2150	31	14.6
H45A-1-26-2	2173	42	2185	35	-2.3
H45A-1-22-1	2210	53	2387	65	13.0
H45A-1-23-1	3477	45	3999	44	40.4
S1A-1-14-1	1815	16	1762	24	-6.6
S1A-1-14-2	1799	17	1781	24	-2.3
S1A-1-7-1	1835	18	1797	26	-4.8
S1A-1-3-1	1798	23	1809	43	0.8
S1A-2-3-1	1809	27	1812	61	0.2
S1A-1-2-2	1830	19	1816	32	-2.0
S1A-1-7-2	1857	19	1817	32	-5.0
S1A-1-13-1	1810	17	1820	22	1.1
S1A-2-1-2	1819	28	1820	57	-0.1
S1A-1-2-3	1834	17	1821	28	-1.7
S1A-1-4-1	1857	19	1822	29	-4.3
S1A-1-2-1	1832	19	1830	32	-0.4
S1A-2-16-1	1861	22	1831	18	-3.7
S1A-2-4-1	1847	28	1842	60	-0.8
S1A-2-3-2	1835	28	1843	60	0.7
S1A-2-1-1	1845	28	1843	61	-0.4
S1A-2-7-1	1847	27	1848	62	0.0
S1A-2-11-1	1844	22	1849	13	0.5
S1A-2-11-2	1838	23	1850	24	1.3
S1A-2-8-1	1809	27	1856	59	5.2
S60A-1-16-3	1795	21	1780	14	-1.7
S60A-1-15-1	1774	25	1781	26	0.7
S60A-1-11-1	1789	25	1782	21	-1.1
S60A-1-16-1	1803	22	1783	13	-2.5
S60A-1-5-1	1794	22	1788	14	-0.9
S60A-1-16-2	1788	22	1790	15	0.1
S60A-1-10-1	1793	26	1796	35	0.2
S60A-1-3-1	1813	22	1797	10	-2.0
S60A-1-11-2	1799	25	1798	32	-0.3
S60A-1-12-1	1804	22	1799	16	-0.7
S60A-1-17-1	1811	23	1800	21	-1.4
S60A-1-14-1	1787	24	1801	26	1.6
S60A-1-18-1	1790	22	1804	17	1.6
S60A-1-18-2	1827	22	1804	18	-2.9
S60A-1-6-1	1799	22	1806	14	0.7
S60A-1-10-2	1813	25	1820	29	0.7
S60A-1-19-1	1822	25	1824	17	0.0
S60A-1-8-1	1843	23	1841	19	-0.1

Analysis[a]	Grain location[b]	Fabric alignment[c]	U (ppm)	Th (ppm)	^{204}Pb (cps)	2 s.e.	^{206}Pb/^{204}Pb (cps)	%Pb*
S60A-1-4-1	in Kfs		6300	43150	37	16	5792	100.0
S92C-1-7-1	in Bt		4940	2564	-21	11	-3814	100.0
S92C-2-2-2	in Pl		6340	10990	16	13	5919	100.0
S92C-2-2-1	in Pl		2170	9720	16	15	2131	100.2
S92C-1-9-1	b/w Pl, Kfs		6750	15920	-10	11	-11170	100.0
S92C-2-1-1	in Pl		15650	607	9	12	28689	100.0
S92C-1-5-2	b/w Kfs	S1	6790	18890	-11	17	-10100	100.4
S92C-1-4-1	b/w Pl, Kfs	S1	10720	20120	7	20	25071	100.2
S92C-1-8-1	b/w Pl, Bt	S1	10680	31500	-8	10	-22788	100.0
S92C-1-3-2	b/w Pl	S1	10500	16760	-4	14	-44500	100.0
S92C-1-5-1	b/w Kfs	S1	13660	37400	-12	20	-18308	100.0
S92C-1-3-1	b/w Kfs	S1	10750	13960	-5	14	-37000	100.0
S92C-1-6-1	b/w Pl, Kfs		4130	12810	-24	12	-2929	99.8
S162A-2-2-2	b/w Pl, Qz		5930	11290	1	14	100500	100.1
S162A-1-8-3	in Bt		4950	15490	4	11	20900	99.9
S162A-1-8-2	in Bt		7090	12650	0	11	-	100.0
S162A-1-8-1	in Bt		7100	12060	2	11	59900	100.0
S162A-2-10-1	b/w Bt, Pl	S1	6690	10300	-6	9	-19138	100.0
S162A-2-10-2	b/w Bt, Pl	S1	3930	14100	-5	12	-13040	99.9
S162A-1-2-2	b/w Grt, Pl	S1	15570	12200	21	24	11905	100.0
S162A-2-2-1	b/w Pl, Qz		5500	11190	17	11	5388	100.1
S162A-2-12-1	in Bt	S1	7120	12310	-1	10	-173571	100.1
S162A-1-2-1	b/w Grt, Pl	S1	6739	10430	28	11	4300	100.0
S162A-2-2-4	b/w Pl, Qz		9170	10640	6	11	26050	100.0
S162A-2-11-1	in Pl	S1	7810	11060	11	9	11877	100.0
S162A-1-9-1	in Grt	S1	8600	11110	2	11	74400	100.0
S162A-2-1-1	in Grt		7690	17490	9	12	15167	100.2
S162A-1-9-2	in Grt	S1	5380	6780	6	13	16283	100.1
S162A-1-1-1	in Grt core		7320	19300	20	12	6810	99.7
S162A-2-11-2	in Pl	S1	8100	9400	5	12	28880	100.0
S162A-2-5-2	in Grt rim		10240	14580	-5	11	-35980	100.0
S162A-2-2-3	b/w Pl, Qz		11010	12060	-10	10	-20053	100.0
S162A-2-3-1	in Grt core		9700	10170	19	18	8858	100.0
S162A-2-12-2	in Bt	S1	7960	12800	0	12	-	100.0
S162A-2-7-1	in Grt core		10050	11020	-9	11	-19944	100.0
S162A-1-7-2	in Kfs	S1	8450	11170	11	11	13655	100.0
S162A-1-7-1	in Kfs	S1	8650	10610	15	13	10653	100.0
S162A-1-6-1	in Grt rim		10070	19240	19	31	10589	100.0
S162A-2-6-2	in Grt rim		8120	12530	-7	10	-26414	99.9
S162A-2-6-1	in Grt rim		9680	14370	8	11	32138	99.9
S162A-2-5-1	in Grt rim		13050	14330	14	10	25857	100.0
S165B-1-10-1	b/w Pl		10666	11260	35	14	4386	100.0
S165B-1-11-1	in Pl	S1	8318	8238	-19	15	-6416	100.0
S165B-1-11-2	in Pl	S1	6388	7427	-21	17	-4524	100.0
S165B-1-12-1	in Pl		13575	11916	13	22	14815	100.0
S165B-1-12-2	in Pl		9298	10153	-9	15	-15144	100.0
S165B-1-14-1	b/w Bt, Qz, Pl	S1	11092	10193	-3	14	-53600	100.0
S165B-1-14-2	b/w Bt, Qz, Pl	S1	11396	9726	5	16	33460	100.0
S165B-1-16-1	in Bt	S1	10022	10986	7	16	21529	100.0
S165B-1-16-2	in Bt	S1	13656	16124	-1	21	-195500	100.0
S165B-1-17-1	b/w Pl		10755	14432	3	16	52967	100.0
S165B-1-17-2	b/w Pl		12274	15539	13	16	13369	100.0
S165B-1-18-1	b/w Ap, Pl	S1	15003	22184	6	14	35650	100.0
S165B-1-19-1	in Bt		13040	16869	-20	15	-9375	100.0
S165B-1-2-1	in Grt rim	S1	8858	6984	-5	16	-26860	100.0
S165B-1-21-1	b/w Bt, Qz, Pl		12321	17981	19	14	9416	100.0
S165B-1-21-2	b/w Bt, Qz, Pl		11597	16891	14	13	11964	100.0

Analysis[a]	Isotopic ratios							Ages (Ma)	
	$^{207}Pb/^{206}Pb$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}Pb$	2 s.e.	Err. Corr.	$^{206}Pb/^{238}U$	2 s.e.
S60A-1-4-1	0.1146	0.0010	5.276	0.140	0.339	0.008	0.68675	1883	36
S92C-1-7-1	0.1036	0.0011	4.471	0.066	0.313	0.005	0.58617	1753	22
S92C-2-2-2	0.1060	0.0018	4.466	0.085	0.307	0.006	0.34343	1723	28
S92C-2-2-1	0.1072	0.0024	4.710	0.140	0.319	0.007	0.57858	1784	32
S92C-1-9-1	0.1082	0.0011	4.702	0.070	0.315	0.005	0.60812	1763	24
S92C-2-1-1	0.1084	0.0008	4.753	0.067	0.317	0.005	0.78166	1776	24
S92C-1-5-2	0.1090	0.0016	5.110	0.120	0.336	0.007	0.58088	1867	33
S92C-1-4-1	0.1111	0.0015	5.037	0.083	0.327	0.005	0.34579	1824	26
S92C-1-8-1	0.1114	0.0011	5.059	0.069	0.327	0.005	0.48287	1823	24
S92C-1-3-2	0.1119	0.0011	5.151	0.068	0.330	0.005	0.58486	1840	24
S92C-1-5-1	0.1118	0.0013	5.121	0.087	0.330	0.006	0.62461	1837	29
S92C-1-3-1	0.1121	0.0015	5.138	0.088	0.330	0.005	0.49882	1836	26
S92C-1-6-1	0.1132	0.0015	5.039	0.082	0.321	0.005	0.50732	1793	25
S162A-2-2-2	0.1056	0.0015	4.513	0.100	0.308	0.006	0.71162	1728	28
S162A-1-8-3	0.1058	0.0011	4.466	0.070	0.308	0.005	0.65224	1731	25
S162A-1-8-2	0.1061	0.0010	4.536	0.065	0.310	0.005	0.60816	1740	22
S162A-1-8-1	0.1061	0.0012	4.523	0.081	0.309	0.006	0.71684	1734	27
S162A-2-10-1	0.1060	0.0014	4.531	0.087	0.310	0.006	0.58955	1739	27
S162A-2-10-2	0.1067	0.0015	4.643	0.086	0.313	0.005	0.50844	1757	25
S162A-1-2-2	0.1071	0.0008	4.583	0.057	0.310	0.004	0.55870	1742	22
S162A-2-2-1	0.1072	0.0013	4.652	0.073	0.315	0.005	0.54355	1765	25
S162A-2-12-1	0.1086	0.0020	4.790	0.120	0.317	0.007	0.60607	1774	32
S162A-1-2-1	0.1088	0.0013	4.773	0.075	0.317	0.005	0.54420	1776	25
S162A-2-2-4	0.1106	0.0010	4.929	0.061	0.323	0.005	0.59598	1802	23
S162A-2-11-1	0.1114	0.0010	5.056	0.065	0.327	0.005	0.53240	1824	23
S162A-1-9-1	0.1115	0.0011	4.998	0.065	0.326	0.005	0.53090	1820	23
S162A-2-1-1	0.1116	0.0011	5.399	0.078	0.348	0.005	0.63233	1925	25
S162A-1-9-2	0.1118	0.0013	5.133	0.086	0.333	0.005	0.61643	1853	26
S162A-1-1-1	0.1118	0.0014	5.053	0.081	0.329	0.007	0.69068	1831	32
S162A-2-11-2	0.1120	0.0015	5.137	0.100	0.330	0.006	0.62826	1840	28
S162A-2-5-2	0.1121	0.0011	5.091	0.071	0.329	0.005	0.58041	1831	24
S162A-2-2-3	0.1123	0.0012	5.144	0.088	0.331	0.006	0.69543	1844	29
S162A-2-3-1	0.1125	0.0013	5.296	0.082	0.342	0.005	0.37894	1897	25
S162A-2-12-2	0.1128	0.0011	5.273	0.069	0.336	0.005	0.47302	1864	24
S162A-2-7-1	0.1127	0.0008	5.291	0.075	0.336	0.005	0.78227	1867	26
S162A-1-7-2	0.1130	0.0010	5.044	0.064	0.324	0.005	0.55449	1808	22
S162A-1-7-1	0.1129	0.0011	5.148	0.078	0.332	0.006	0.68216	1849	28
S162A-1-6-1	0.1398	0.0019	7.390	0.140	0.388	0.007	0.63144	2112	34
S162A-2-6-2	0.1638	0.0023	10.020	0.170	0.446	0.008	0.45601	2377	34
S162A-2-6-1	0.1829	0.0017	12.860	0.170	0.513	0.009	0.65871	2668	37
S162A-2-5-1	0.1840	0.0013	13.110	0.160	0.518	0.008	0.63238	2689	32
S165B-1-10-1	0.1077	0.0008	4.657	0.039	0.314	0.005	0.58756	1761	25
S165B-1-11-1	0.1086	0.0008	4.855	0.041	0.322	0.005	0.48391	1798	26
S165B-1-11-2	0.1085	0.0010	4.852	0.050	0.323	0.006	0.47551	1801	27
S165B-1-12-1	0.1072	0.0009	4.752	0.042	0.319	0.005	0.52448	1786	26
S165B-1-12-2	0.1081	0.0007	4.778	0.040	0.319	0.005	0.70578	1784	26
S165B-1-14-1	0.1083	0.0008	4.729	0.039	0.316	0.005	0.61473	1768	26
S165B-1-14-2	0.1074	0.0007	4.722	0.046	0.317	0.006	0.70710	1774	27
S165B-1-16-1	0.1084	0.0008	4.749	0.063	0.318	0.006	0.80372	1782	30
S165B-1-16-2	0.1077	0.0012	4.827	0.050	0.323	0.006	0.30296	1805	29
S165B-1-17-1	0.1078	0.0007	4.811	0.038	0.323	0.005	0.63127	1804	25
S165B-1-17-2	0.1065	0.0007	4.656	0.056	0.314	0.006	0.79981	1763	27
S165B-1-18-1	0.1071	0.0008	4.719	0.043	0.318	0.005	0.57924	1781	26
S165B-1-19-1	0.1057	0.0006	4.669	0.037	0.318	0.005	0.66689	1782	25
S165B-1-2-1	0.1097	0.0007	4.865	0.052	0.322	0.006	0.74155	1801	27
S165B-1-21-1	0.1063	0.0008	4.746	0.035	0.321	0.005	0.45802	1796	25
S165B-1-21-2	0.1073	0.0007	4.749	0.037	0.319	0.005	0.59697	1784	26

Analysis[a]	Ages (Ma)				% Disc.
	$^{207}Pb/^{235}U$	2 s.e.	$^{207}Pb/^{206}Pb$	2 s.e.	
S60A-1-4-1	1864	24	1872	15	0.8
S92C-1-7-1	1724	12	1686	20	-4.9
S92C-2-2-2	1723	16	1727	32	0.3
S92C-2-2-1	1764	24	1751	42	-2.2
S92C-1-9-1	1766	12	1766	19	-0.2
S92C-2-1-1	1776	12	1772	13	-0.6
S92C-1-5-2	1836	20	1781	27	-6.9
S92C-1-4-1	1825	14	1815	25	-1.3
S92C-1-8-1	1829	12	1820	18	-1.1
S92C-1-3-2	1844	11	1829	17	-1.8
S92C-1-5-1	1838	14	1831	20	-1.0
S92C-1-3-1	1844	14	1831	25	-1.3
S92C-1-6-1	1825	14	1846	25	2.3
S162A-2-2-2	1731	19	1720	27	-1.6
S162A-1-8-3	1724	13	1724	20	-0.1
S162A-1-8-2	1737	12	1730	17	-0.9
S162A-1-8-1	1734	15	1731	21	-0.5
S162A-2-10-1	1736	16	1736	27	-0.1
S162A-2-10-2	1755	15	1739	27	-2.2
S162A-1-2-2	1745	10	1748	14	0.2
S162A-2-2-1	1761	12	1750	22	-1.0
S162A-2-12-1	1781	20	1771	34	-1.5
S162A-1-2-1	1779	13	1777	21	-0.4
S162A-2-2-4	1808	11	1807	15	0.0
S162A-2-11-1	1828	11	1820	16	-1.0
S162A-1-9-1	1818	11	1822	17	0.4
S162A-2-1-1	1884	12	1824	18	-7.4
S162A-1-9-2	1840	14	1826	22	-1.9
S162A-1-1-1	1828	14	1828	22	0.0
S162A-2-11-2	1840	17	1828	25	-1.7
S162A-2-5-2	1834	12	1832	18	-0.3
S162A-2-2-3	1843	15	1836	20	-0.9
S162A-2-3-1	1868	13	1839	22	-3.5
S162A-2-12-2	1864	11	1842	18	-2.7
S162A-2-7-1	1867	12	1843	13	-2.9
S162A-1-7-2	1826	11	1845	16	2.1
S162A-1-7-1	1844	13	1845	18	0.1
S162A-1-6-1	2159	16	2223	23	6.8
S162A-2-6-2	2435	16	2493	24	5.9
S162A-2-6-1	2669	12	2678	15	0.9
S162A-2-5-1	2687	11	2688	12	0.0
S165B-1-10-1	1759	7	1758	13	-0.2
S165B-1-11-1	1794	7	1775	13	-2.3
S165B-1-11-2	1795	9	1771	16	-2.8
S165B-1-12-1	1776	7	1751	16	-3.1
S165B-1-12-2	1781	7	1768	12	-1.6
S165B-1-14-1	1773	7	1771	13	-0.2
S165B-1-14-2	1770	8	1755	13	-1.9
S165B-1-16-1	1778	11	1771	13	-0.6
S165B-1-16-2	1789	9	1758	20	-3.8
S165B-1-17-1	1786	7	1761	11	-3.1
S165B-1-17-2	1762	10	1740	13	-2.3
S165B-1-18-1	1771	8	1750	14	-2.5
S165B-1-19-1	1761	7	1725	10	-4.5
S165B-1-2-1	1796	9	1794	13	-0.3
S165B-1-21-1	1775	6	1736	13	-4.8
S165B-1-21-2	1776	7	1757	12	-2.3

Analysis[a]	Grain location[b]	Fabric alignment[c]	U (ppm)	Th (ppm)	^{204}Pb (cps)	^{204}Pb 2 s.e.	^{206}Pb/^{204}Pb (cps)	%Pb*
S165B-1-2-2	in Grt rim	S1	8578	8468	-13	19	-9738	100.0
S165B-1-22-1	b/w Pl	S1	10674	14362	27	14	5859	100.0
S165B-1-22-2	b/w Pl	S1	11178	16570	8	13	20438	100.0
S165B-1-2-3	in Grt rim	S1	10834	8095	1	14	159400	100.0
S165B-1-23-1	b/w Bt, Pl	S1	13790	17185	-16	25	-12369	100.0
S165B-1-23-2	b/w Bt, Pl	S1	14973	15601	9	14	23056	100.0
S165B-1-24-1	b/w Bt, Qz, Pl, Rt		12318	13587	76	20	2321	100.0
S165B-1-24-2	b/w Bt, Qz, Pl, Rt		9135	10488	18	25	7511	100.0
S165B-1-25-1	b/w Qz, Pl		8247	8497	5	14	24300	100.0
S165B-1-25-2	b/w Qz, Pl		8967	10244	3	13	43967	100.0
S165B-1-26-1	b/w Bt, Pl	S1	13918	11444	-8	19	-24138	100.0
S165B-1-26-2	b/w Bt, Pl	S1	9641	10687	-7	21	-19686	100.0
S165B-1-26-3	b/w Bt, Pl	S1	10563	9190	15	16	10133	100.0
S165B-1-27-1	b/w Pl, Qz	S1	8830	8828	-5	15	-24940	99.9
S165B-1-27-2	b/w Pl, Qz	S1	8372	9456	-17	13	-7059	100.0
S165B-1-28-1	b/w Bt, Pl	S1	11769	9990	5	15	33180	100.0
S165B-1-3-1	in Pl	S1	11068	5664	34	16	4788	100.0
S165B-1-3-2	in Pl	S1	14623	6870	17	23	12529	100.0
S165B-1-3-3	in Pl	S1	10096	6721	10	27	14760	100.0
S165B-1-4-1	in Pl		7857	8125	-18	20	-6644	100.0
S165B-1-4-2	in Pl		8796	9295	26	14	5012	100.0
S165B-1-5-1	b/w Qz, Pl, Zrn, Ap		8172	8965	-5	15	-24420	99.9
S165B-1-6-1	in Grt core	S1	6822	7812	-1	15	-98400	100.0
S165B-1-7-1	in Grt rim	S1	8161	8064	23	16	5135	99.9
S165B-1-8-1	b/w Grt, Zrn, Qz		10774	6640	0	13	-	100.0
S165B-1-9-1	b/w Qz, Pl		11968	10327	1	17	171000	100.0
Z1A-1-22-1	in Bt	S1	14405	28865	16	26	13094	100.0
Z1A-1-29-1	in Bt		11888	30794	-4	14	-45000	99.9
Z1A-1-22-2	in Bt	S1	11855	11214	0	19	-	100.0
Z1A-1-9-1	b/w Bt, Kfs	S1	4520	962	-9	15	-7767	100.0
Z1A-1-13-1	b/w Bt, Sil	S1	13007	17818	-6	16	-32817	100.0
Z1A-1-13-2	b/w Bt, Sil	S1	15559	35887	20	18	11635	99.9
Z1A-1-8-2	in Crd	S1	9385	11317	41	16	3610	99.9
Z1A-1-28-1	in Crd	S1	18508	40708	2	18	143250	100.0
Z1A-1-8-1	in Crd	S1	16383	58694	11	16	22909	99.7
Z1A-1-2-1	in Grt rim		20693	88589	-1	17	-323900	99.9
Z1A-1-30-1	in Grt rim	S1	16079	31603	10	14	24810	100.0
Z1A-1-19-1	in Pl	S1	17357	20837	6	16	45850	100.0
Z1A-1-23-1	in Qz		8811	26873	27	36	4937	100.0
Z1A-1-19-2	in Pl	S1	10410	77867	12	18	14833	100.0
Z1A-1-31-1	in Grt rim	S1	13968	24844	-6	15	-35533	100.0
Z1A-1-7-1	in Crd		18405	63968	-1	22	-289800	99.7
Z1A-1-24-1	in Grt rim		17038	37515	-2	15	-134500	100.0
Z1A-1-11-1	in Pl		9071	37975	19	18	6337	98.9
Z1A-1-17-1	b/w Kfs, Pl		14581	24718	-1	15	-222700	99.8
Z1A-1-18-1	b/w Kfs, Pl		19394	73706	21	21	14124	99.9
Z1A-1-25-3	b/w Grt, Pl, Kfs	S1	7570	37104	30	20	4117	99.9
Z1A-1-29-2	in Bt		15899	31600	-3	18	-78500	100.0
Z1A-1-6-2	in Kfs	S1	5168	44344	14	13	5914	99.9
Z1A-1-5-1	in Pl		24066	76245	7	16	54214	100.0
Z1A-1-25-2	b/w Grt, Pl, Kfs	S1	13215	68189	-9	21	-22389	99.9
Z1A-1-28-2	in Crd	S1	14880	35479	20	13	11575	99.9
Z1A-1-14-1	in Grt rim		17797	35293	-2	21	-136100	99.9
Z1A-1-27-1	in Crd		13520	21640	-6	14	-34917	100.0
Z1A-1-20-1	in Crd		15864	29488	33	17	7415	100.0
Z1A-1-30-2	in Grt rim	S1	14188	32450	21	15	10324	99.9
Z1A-1-25-1	b/w Grt, Pl, Kfs	S1	9754	43403	-4	13	-38475	100.0
Z1A-1-10-2	in Kfs		10892	53026	0	18	-	99.9
Z1A-1-3-1	in Grt core		12722	41198	8	19	25013	99.8

Analysis[a]	Isotopic ratios							Ages (Ma)	
	$^{207}Pb/^{206}Pb$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}Pb$	2 s.e.	Err. Corr.	$^{206}Pb/^{238}U$	2 s.e.
S165B-1-2-2	0.1096	0.0010	4.846	0.056	0.320	0.005	0.60168	1789	26
S165B-1-22-1	0.1070	0.0007	4.866	0.035	0.329	0.005	0.64457	1833	26
S165B-1-22-2	0.1078	0.0007	4.866	0.045	0.324	0.005	0.73479	1807	26
S165B-1-2-3	0.1093	0.0007	4.821	0.040	0.319	0.005	0.69229	1785	26
S165B-1-23-1	0.1066	0.0009	4.707	0.047	0.317	0.005	0.60996	1776	27
S165B-1-23-2	0.1056	0.0006	4.479	0.036	0.307	0.005	0.78443	1726	26
S165B-1-24-1	0.1098	0.0009	4.921	0.046	0.323	0.006	0.57948	1805	27
S165B-1-24-2	0.1049	0.0013	4.811	0.082	0.335	0.008	0.73783	1863	37
S165B-1-25-1	0.1092	0.0009	4.818	0.052	0.321	0.005	0.55905	1793	26
S165B-1-25-2	0.1091	0.0008	4.909	0.046	0.325	0.006	0.65614	1815	28
S165B-1-26-1	0.1058	0.0010	4.624	0.052	0.314	0.006	0.65652	1761	28
S165B-1-26-2	0.1085	0.0011	4.730	0.048	0.317	0.006	0.55403	1776	29
S165B-1-26-3	0.1060	0.0009	4.549	0.055	0.311	0.006	0.69004	1746	27
S165B-1-27-1	0.1090	0.0008	4.747	0.044	0.316	0.005	0.63075	1772	25
S165B-1-27-2	0.1093	0.0008	4.779	0.043	0.319	0.005	0.72254	1784	27
S165B-1-28-1	0.1074	0.0007	4.565	0.041	0.311	0.005	0.62441	1746	25
S165B-1-3-1	0.1096	0.0008	4.825	0.045	0.319	0.006	0.71785	1784	27
S165B-1-3-2	0.1094	0.0010	4.889	0.061	0.323	0.006	0.67010	1801	29
S165B-1-3-3	0.1052	0.0009	4.507	0.064	0.309	0.006	0.79661	1735	28
S165B-1-4-1	0.1085	0.0011	4.784	0.065	0.320	0.006	0.72212	1789	30
S165B-1-4-2	0.1084	0.0009	4.795	0.048	0.320	0.006	0.64391	1788	27
S165B-1-5-1	0.1093	0.0008	4.875	0.044	0.322	0.005	0.64171	1800	27
S165B-1-6-1	0.1073	0.0009	4.624	0.044	0.312	0.005	0.62003	1754	26
S165B-1-7-1	0.1081	0.0009	4.752	0.051	0.317	0.006	0.66157	1773	27
S165B-1-8-1	0.1089	0.0008	4.771	0.042	0.317	0.005	0.56600	1775	26
S165B-1-9-1	0.1073	0.0009	4.630	0.046	0.314	0.005	0.57154	1760	25
Z1A-1-22-1	0.1101	0.0012	4.993	0.065	0.328	0.006	0.60840	1829	27
Z1A-1-29-1	0.1104	0.0008	5.019	0.046	0.327	0.006	0.69770	1826	27
Z1A-1-22-2	0.1112	0.0010	5.025	0.056	0.326	0.006	0.70169	1819	28
Z1A-1-9-1	0.1113	0.0011	4.924	0.060	0.322	0.005	0.55137	1801	27
Z1A-1-13-1	0.1114	0.0007	4.876	0.036	0.318	0.005	0.60240	1778	25
Z1A-1-13-2	0.1115	0.0010	4.938	0.048	0.322	0.006	0.58984	1798	27
Z1A-1-8-2	0.1118	0.0008	5.047	0.048	0.328	0.006	0.72052	1830	29
Z1A-1-28-1	0.1124	0.0006	5.217	0.040	0.335	0.006	0.73287	1860	27
Z1A-1-8-1	0.1123	0.0007	5.067	0.055	0.328	0.006	0.88625	1829	30
Z1A-1-2-1	0.1122	0.0009	5.110	0.052	0.330	0.006	0.74590	1835	29
Z1A-1-30-1	0.1125	0.0005	5.216	0.043	0.333	0.006	0.79650	1852	27
Z1A-1-19-1	0.1124	0.0007	5.221	0.041	0.335	0.005	0.60023	1862	26
Z1A-1-23-1	0.1126	0.0013	5.265	0.084	0.338	0.007	0.67697	1875	32
Z1A-1-19-2	0.1124	0.0011	5.844	0.074	0.376	0.007	0.66226	2059	33
Z1A-1-31-1	0.1125	0.0007	5.169	0.047	0.332	0.006	0.74618	1850	27
Z1A-1-7-1	0.1127	0.0011	5.167	0.063	0.334	0.007	0.64977	1856	32
Z1A-1-24-1	0.1127	0.0007	5.310	0.054	0.339	0.006	0.90044	1880	28
Z1A-1-11-1	0.1128	0.0011	4.486	0.078	0.290	0.007	0.84016	1640	34
Z1A-1-17-1	0.1128	0.0007	4.995	0.041	0.322	0.005	0.67179	1800	26
Z1A-1-18-1	0.1127	0.0009	5.196	0.049	0.333	0.006	0.64545	1851	28
Z1A-1-25-3	0.1129	0.0012	5.156	0.068	0.331	0.007	0.69395	1843	32
Z1A-1-29-2	0.1128	0.0009	5.147	0.058	0.330	0.006	0.70670	1839	29
Z1A-1-6-2	0.1129	0.0009	5.180	0.053	0.332	0.005	0.54285	1850	26
Z1A-1-5-1	0.1131	0.0006	5.157	0.062	0.331	0.006	0.95368	1842	31
Z1A-1-25-2	0.1131	0.0011	5.186	0.063	0.333	0.006	0.59528	1852	28
Z1A-1-28-2	0.1130	0.0008	5.238	0.041	0.334	0.006	0.55482	1858	26
Z1A-1-14-1	0.1131	0.0010	5.168	0.050	0.331	0.006	0.62391	1844	29
Z1A-1-27-1	0.1131	0.0006	5.190	0.049	0.333	0.006	0.77970	1851	27
Z1A-1-20-1	0.1130	0.0008	5.191	0.047	0.332	0.006	0.68663	1851	28
Z1A-1-30-2	0.1132	0.0008	5.232	0.049	0.333	0.006	0.73494	1855	29
Z1A-1-25-1	0.1133	0.0007	5.167	0.045	0.331	0.005	0.69098	1842	26
Z1A-1-10-2	0.1134	0.0008	5.186	0.054	0.333	0.006	0.74964	1852	29
Z1A-1-3-1	0.1136	0.0009	5.180	0.049	0.331	0.006	0.64852	1844	28

Analysis[a]	Ages (Ma)				% Disc.
	$^{207}Pb/^{235}U$	2 s.e.	$^{207}Pb/^{206}Pb$	2 s.e.	
S165B-1-2-2	1792	10	1790	17	-0.3
S165B-1-22-1	1797	6	1750	12	-5.7
S165B-1-22-2	1795	8	1761	12	-4.3
S165B-1-2-3	1789	7	1785	12	-0.4
S165B-1-23-1	1769	9	1743	16	-3.1
S165B-1-23-2	1728	7	1723	10	-0.5
S165B-1-24-1	1806	8	1795	14	-1.3
S165B-1-24-2	1786	14	1710	23	-9.7
S165B-1-25-1	1788	9	1785	15	-0.4
S165B-1-25-2	1805	8	1783	13	-2.5
S165B-1-26-1	1754	10	1726	18	-3.4
S165B-1-26-2	1772	8	1774	18	0.2
S165B-1-26-3	1742	10	1732	15	-1.0
S165B-1-27-1	1775	8	1783	14	0.9
S165B-1-27-2	1782	8	1787	13	0.7
S165B-1-28-1	1743	7	1755	12	1.4
S165B-1-3-1	1788	8	1793	13	0.4
S165B-1-3-2	1801	11	1788	17	-1.5
S165B-1-3-3	1731	12	1720	17	-1.5
S165B-1-4-1	1781	12	1773	18	-1.1
S165B-1-4-2	1784	8	1771	14	-1.6
S165B-1-5-1	1798	8	1788	14	-1.2
S165B-1-6-1	1753	8	1753	16	-0.1
S165B-1-7-1	1775	9	1767	16	-1.1
S165B-1-8-1	1780	7	1779	13	-0.1
S165B-1-9-1	1756	8	1755	15	0.0
Z1A-1-22-1	1821	10	1800	19	-2.2
Z1A-1-29-1	1823	8	1804	13	-2.2
Z1A-1-22-2	1823	9	1819	16	-0.5
Z1A-1-9-1	1805	10	1821	18	1.7
Z1A-1-13-1	1798	6	1822	11	2.8
Z1A-1-13-2	1810	8	1825	15	1.9
Z1A-1-8-2	1826	8	1829	14	0.2
Z1A-1-28-1	1855	7	1838	10	-2.1
Z1A-1-8-1	1830	9	1838	11	0.9
Z1A-1-2-1	1837	9	1838	14	0.0
Z1A-1-30-1	1855	7	1839	9	-2.0
Z1A-1-19-1	1857	6	1840	11	-1.9
Z1A-1-23-1	1862	14	1840	22	-2.8
Z1A-1-19-2	1952	11	1840	18	-14.1
Z1A-1-31-1	1847	8	1841	11	-0.8
Z1A-1-7-1	1848	10	1843	18	-0.5
Z1A-1-24-1	1870	9	1843	11	-3.3
Z1A-1-11-1	1729	14	1844	17	12.9
Z1A-1-17-1	1818	7	1844	11	3.0
Z1A-1-18-1	1852	8	1844	15	-0.9
Z1A-1-25-3	1844	11	1845	19	0.0
Z1A-1-29-2	1843	10	1847	13	0.4
Z1A-1-6-2	1848	9	1847	15	-0.3
Z1A-1-5-1	1843	10	1849	10	0.4
Z1A-1-25-2	1849	10	1849	18	-0.2
Z1A-1-28-2	1858	7	1849	12	-1.2
Z1A-1-14-1	1847	8	1850	15	0.3
Z1A-1-27-1	1851	8	1850	10	-0.1
Z1A-1-20-1	1853	8	1851	12	0.0
Z1A-1-30-2	1858	8	1851	14	-0.8
Z1A-1-25-1	1848	8	1854	11	0.8
Z1A-1-10-2	1853	9	1855	12	0.5
Z1A-1-3-1	1849	8	1856	14	0.8

Analysis[a]	Grain location[b]	Fabric alignment[c]	U (ppm)	Th (ppm)	^{204}Pb		^{206}Pb/^{204}Pb	%Pb*
					(cps)	2 s.e.	(cps)	
Z1A-1-26-1	b/w Kfs		10808	97909	-15	31	-10787	99.9
Z1A-1-6-1	in Kfs	S1	13560	15937	-15	16	-14553	99.9
Z1A-1-14-2	in Grt rim		10039	25793	-9	14	-17656	99.9
Z1A-1-15-1	in Grt rim	S1	18486	33659	-52	17	-5467	100.0
Z1A-1-12-1	in Qz		8912	32488	-8	17	-17250	99.9
Z1A-1-1-1	in Grt rim		15426	15224	-7	16	-36557	100.0
Z1A-1-10-1	in Kfs		11787	60572	25	24	8020	100.0
Z1A-1-16-1	in Grt rim		7342	38874	16	37	7006	99.8
Z1A-1-2-2	in Grt rim		18241	80551	117	24	2444	99.1
Z1A-1-12-2	in Qz		8577	35586	40	32	3210	99.7
Z1A-1-12-3	in Qz		4977	39554	35	18	2300	99.8

Analysis[a]	Isotopic ratios							Ages (Ma)	
	$^{207}Pb/^{206}Pb$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}Pb$	2 s.e.	Err. Corr.	$^{206}Pb/^{238}U$	2 s.e.
Z1A-1-26-1	0.1137	0.0014	5.258	0.090	0.337	0.007	0.68706	1869	36
Z1A-1-6-1	0.1138	0.0007	5.219	0.046	0.333	0.006	0.74836	1854	27
Z1A-1-14-2	0.1140	0.0010	5.277	0.066	0.335	0.006	0.34384	1861	28
Z1A-1-15-1	0.1141	0.0010	5.263	0.067	0.335	0.006	0.75514	1861	30
Z1A-1-12-1	0.1142	0.0012	5.240	0.051	0.335	0.006	0.41389	1863	28
Z1A-1-1-1	0.1146	0.0008	5.303	0.052	0.336	0.006	0.79609	1867	28
Z1A-1-10-1	0.1146	0.0010	5.566	0.061	0.353	0.007	0.68156	1949	31
Z1A-1-16-1	0.1146	0.0015	5.307	0.096	0.335	0.008	0.71542	1863	38
Z1A-1-2-2	0.1166	0.0010	5.231	0.079	0.327	0.008	0.89465	1819	39
Z1A-1-12-2	0.1169	0.0021	5.367	0.095	0.336	0.009	0.74687	1865	43
Z1A-1-12-3	0.1172	0.0012	5.477	0.077	0.341	0.007	0.68041	1891	32

Analysis[a]	Ages (Ma)				% Disc.
	$^{207}Pb/^{235}U$	2 s.e.	$^{207}Pb/^{206}Pb$	2 s.e.	
Z1A-1-26-1	1867	15	1858	23	-0.5
Z1A-1-6-1	1856	8	1859	11	0.4
Z1A-1-14-2	1863	11	1861	16	-0.5
Z1A-1-15-1	1863	11	1865	16	0.2
Z1A-1-12-1	1860	9	1869	19	1.1
Z1A-1-1-1	1868	8	1872	12	0.3
Z1A-1-10-1	1912	10	1872	16	-4.6
Z1A-1-16-1	1869	15	1877	23	0.8
Z1A-1-2-2	1856	13	1903	15	5.2
Z1A-1-12-2	1883	17	1907	32	3.1
Z1A-1-12-3	1896	12	1913	19	1.8

[a]Analyses are given in the format w-x-y-z, where w=sample #, x=thin section #, y=monazite grain #, z=analysis (laser spot) #.
[b]Mineral abbreviations as in Whitney & Evans (2010, Amer. Min., 95, 185-187); "b/w"=between.
[c]S1=monazite grain is clearly aligned parallel to S1 fabric; early S1=monazite grain is aligned parallel to a non-S1-parallel inclusion trail in garnet.

Appendix 3: U-Pb zircon depth-profiling geochronology (SIMS) results for six metamorphic rocks from Hall Peninsula, Baffin Island.

Grain	Mass cycle		U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
Sample S36A, zircon 1: Type 1B																					
S36A-z1	1		930	31	0.033	97.85	85.42	3.771	0.986	0.2566	0.0668	0.99540	0.1070	0.0027	1473	343	1586	210	1741	46	17.2
S36A-z1	2		796	14	0.017	99.19	93.99	3.912	0.888	0.2668	0.0604	0.99680	0.1060	0.0019	1525	307	1616	183	1738	34	13.8
S36A-z1	**3**	*	**821**	**12**	**0.014**	**99.45**	**95.91**	**4.237**	**1.050**	**0.2867**	**0.0713**	**0.99780**	**0.1070**	**0.0018**	**1625**	**357**	**1681**	**205**	**1752**	**31**	**8.2**
S36A-z1	**4**	*	**896**	**13**	**0.014**	**99.65**	**97.38**	**4.212**	**1.060**	**0.2859**	**0.0719**	**0.99810**	**0.1070**	**0.0017**	**1621**	**360**	**1676**	**207**	**1746**	**28**	**8.1**
S36A-z1	**5**	*	**888**	**10**	**0.011**	**99.79**	**98.37**	**4.433**	**1.170**	**0.2989**	**0.0789**	**0.99840**	**0.1080**	**0.0016**	**1686**	**391**	**1718**	**219**	**1758**	**27**	**4.6**
S36A-z1	**6**	*	**920**	**11**	**0.012**	**99.77**	**98.25**	**4.370**	**1.150**	**0.2919**	**0.0768**	**0.99850**	**0.1090**	**0.0016**	**1651**	**383**	**1707**	**218**	**1776**	**27**	**8.0**
S36A-z1	**7**	*	**937**	**9**	**0.009**	**99.77**	**98.27**	**4.435**	**1.170**	**0.2974**	**0.0784**	**0.99850**	**0.1080**	**0.0016**	**1679**	**390**	**1719**	**219**	**1768**	**27**	**5.7**
S36A-z1	8		914	11	0.012	99.87	99.03	3.949	0.905	0.2637	0.0604	0.99810	0.1090	0.0015	1509	308	1624	186	1776	26	16.9
S36A-z1	**9**	*	**960**	**8**	**0.009**	**99.88**	**99.14**	**4.376**	**1.140**	**0.2892**	**0.0752**	**0.99860**	**0.1100**	**0.0015**	**1637**	**376**	**1708**	**215**	**1795**	**25**	**9.9**
S36A-z1	**10**	*	**937**	**7**	**0.008**	**99.86**	**98.93**	**4.385**	**1.130**	**0.2917**	**0.0750**	**0.99860**	**0.1090**	**0.0015**	**1650**	**374**	**1709**	**213**	**1783**	**25**	**8.4**
S36A-z1	**11**	*	**973**	**9**	**0.009**	**99.92**	**99.37**	**4.176**	**1.030**	**0.2767**	**0.0684**	**0.99850**	**0.1090**	**0.0015**	**1575**	**345**	**1669**	**203**	**1790**	**24**	**13.5**
S36A-z1	**12**	*	**1015**	**10**	**0.010**	**99.93**	**99.44**	**4.230**	**1.060**	**0.2820**	**0.0707**	**0.99860**	**0.1090**	**0.0014**	**1601**	**356**	**1680**	**206**	**1779**	**24**	**11.3**
S36A-z1	**13**	*	**1026**	**6**	**0.006**	**99.91**	**99.32**	**4.276**	**1.090**	**0.2851**	**0.0728**	**0.99860**	**0.1090**	**0.0014**	**1617**	**365**	**1689**	**210**	**1779**	**24**	**10.3**
S36A-z1	**14**	*	**1025**	**9**	**0.009**	**99.85**	**98.83**	**4.235**	**1.070**	**0.2828**	**0.0712**	**0.99860**	**0.1090**	**0.0015**	**1605**	**358**	**1681**	**207**	**1777**	**25**	**10.9**
S36A-z1	**15**	*	**1042**	**7**	**0.007**	**99.87**	**98.98**	**4.056**	**0.986**	**0.2736**	**0.0664**	**0.99850**	**0.1080**	**0.0014**	**1559**	**336**	**1646**	**198**	**1758**	**25**	**12.7**
S36A-z1	**16**	*	**1033**	**7**	**0.007**	**99.87**	**98.98**	**4.381**	**1.150**	**0.2974**	**0.0779**	**0.99870**	**0.1070**	**0.0014**	**1678**	**387**	**1709**	**217**	**1746**	**25**	**4.4**
S36A-z1	**17**	*	**1055**	**7**	**0.007**	**99.85**	**98.87**	**4.261**	**1.090**	**0.2856**	**0.0727**	**0.99860**	**0.1080**	**0.0014**	**1619**	**365**	**1686**	**210**	**1770**	**24**	**9.6**
S36A-z1	**18**	*	**1048**	**7**	**0.006**	**99.84**	**98.81**	**4.225**	**1.060**	**0.2813**	**0.0704**	**0.99860**	**0.1090**	**0.0014**	**1598**	**354**	**1679**	**206**	**1782**	**24**	**11.7**
S36A-z1	**19**	*	**1043**	**5**	**0.005**	**99.9**	**99.27**	**4.360**	**1.130**	**0.2921**	**0.0759**	**0.99870**	**0.1080**	**0.0014**	**1652**	**378**	**1705**	**215**	**1770**	**24**	**7.5**
S36A-z1	**20**	*	**1068**	**6**	**0.006**	**99.92**	**99.41**	**4.555**	**1.250**	**0.3086**	**0.0846**	**0.99890**	**0.1070**	**0.0014**	**1734**	**417**	**1741**	**228**	**1750**	**24**	**1.1**
S36A-z1	**21**	*	**1093**	**7**	**0.007**	**99.91**	**99.35**	**4.314**	**1.090**	**0.2877**	**0.0724**	**0.99870**	**0.1090**	**0.0014**	**1630**	**362**	**1696**	**207**	**1778**	**24**	**9.4**
S36A-z1	**22**	*	**1077**	**6**	**0.006**	**99.91**	**99.28**	**4.245**	**1.060**	**0.2859**	**0.0712**	**0.99860**	**0.1080**	**0.0014**	**1621**	**357**	**1683**	**205**	**1760**	**24**	**8.9**
S36A-z1	**23**	*	**1051**	**7**	**0.007**	**99.92**	**99.41**	**4.492**	**1.190**	**0.3040**	**0.0807**	**0.99880**	**0.1070**	**0.0014**	**1711**	**399**	**1729**	**220**	**1752**	**24**	**2.7**
S36A-z1	**24**	*	**1038**	**5**	**0.005**	**99.93**	**99.49**	**4.459**	**1.130**	**0.2934**	**0.0743**	**0.99870**	**0.1100**	**0.0014**	**1658**	**370**	**1723**	**210**	**1803**	**23**	**9.1**
S36A-z1	**25**	*	**1026**	**7**	**0.007**	**99.96**	**99.68**	**4.308**	**1.070**	**0.2865**	**0.0710**	**0.99870**	**0.1090**	**0.0014**	**1624**	**356**	**1695**	**204**	**1783**	**23**	**10.0**
S36A-z1	**26**	*	**1027**	**5**	**0.005**	**99.97**	**99.81**	**4.466**	**1.170**	**0.3004**	**0.0784**	**0.99880**	**0.1080**	**0.0014**	**1693**	**388**	**1725**	**217**	**1763**	**23**	**4.5**
S36A-z1	**27**	*	**1083**	**5**	**0.005**	**99.95**	**99.63**	**4.552**	**1.180**	**0.3013**	**0.0783**	**0.99880**	**0.1100**	**0.0014**	**1698**	**388**	**1740**	**216**	**1792**	**23**	**6.0**
S36A-z1	**28**	*	**1071**	**5**	**0.004**	**99.91**	**99.3**	**4.593**	**1.210**	**0.3057**	**0.0805**	**0.99880**	**0.1090**	**0.0014**	**1720**	**397**	**1748**	**220**	**1782**	**23**	**4.0**
S36A-z1	**29**	*	**1051**	**7**	**0.006**	**99.88**	**99.12**	**4.446**	**1.140**	**0.2965**	**0.0759**	**0.99870**	**0.1090**	**0.0014**	**1674**	**377**	**1721**	**212**	**1779**	**24**	**6.7**
S36A-z1	**30**	*	**1057**	**6**	**0.006**	**99.86**	**98.91**	**4.503**	**1.170**	**0.2989**	**0.0777**	**0.99870**	**0.1090**	**0.0014**	**1686**	**386**	**1731**	**216**	**1787**	**24**	**6.4**
S36A-z1	**31**	*	**1062**	**3**	**0.003**	**99.98**	**99.87**	**4.484**	**1.150**	**0.3002**	**0.0769**	**0.99880**	**0.1080**	**0.0014**	**1693**	**381**	**1728**	**213**	**1771**	**23**	**5.0**
S36A-z1	**32**	*	**1028**	**8**	**0.008**	**99.98**	**99.88**	**4.565**	**1.150**	**0.2981**	**0.0748**	**0.99880**	**0.1110**	**0.0014**	**1682**	**372**	**1743**	**209**	**1817**	**23**	**8.4**
S36A-z1	**33**	*	**1012**	**4**	**0.004**	**99.96**	**99.68**	**4.500**	**1.150**	**0.2993**	**0.0768**	**0.99880**	**0.1090**	**0.0014**	**1688**	**381**	**1731**	**213**	**1783**	**23**	**6.0**
S36A-z1	**34**	*	**1042**	**5**	**0.004**	**99.98**	**99.81**	**4.618**	**1.200**	**0.3036**	**0.0787**	**0.99880**	**0.1100**	**0.0014**	**1709**	**389**	**1753**	**216**	**1804**	**23**	**5.9**
S36A-z1	**35**	*	**1030**	**5**	**0.004**	**99.97**	**99.75**	**4.431**	**1.090**	**0.2923**	**0.0722**	**0.99870**	**0.1100**	**0.0014**	**1653**	**360**	**1718**	**205**	**1798**	**23**	**9.1**
S36A-z1	**36**	*	**1066**	**5**	**0.004**	**99.95**	**99.63**	**4.730**	**1.270**	**0.3161**	**0.0845**	**0.99890**	**0.1090**	**0.0014**	**1770**	**414**	**1773**	**224**	**1775**	**23**	**0.3**
S36A-z1	**37**	*	**1066**	**6**	**0.006**	**99.94**	**99.56**	**4.518**	**1.170**	**0.3039**	**0.0786**	**0.99880**	**0.1080**	**0.0014**	**1711**	**389**	**1734**	**215**	**1763**	**23**	**3.4**
S36A-z1	**38**	*	**1037**	**5**	**0.005**	**99.93**	**99.5**	**4.674**	**1.220**	**0.3067**	**0.0798**	**0.99880**	**0.1110**	**0.0014**	**1724**	**394**	**1763**	**218**	**1808**	**23**	**5.3**
S36A-z1	**39**	*	**1102**	**6**	**0.006**	**99.95**	**99.63**	**5.041**	**1.460**	**0.3299**	**0.0957**	**0.99910**	**0.1110**	**0.0014**	**1838**	**464**	**1826**	**246**	**1813**	**23**	**-1.6**
S36A-z1	**40**	*	**1030**	**4**	**0.004**	**99.95**	**99.63**	**4.525**	**1.130**	**0.2979**	**0.0744**	**0.99870**	**0.1100**	**0.0014**	**1681**	**369**	**1736**	**208**	**1802**	**23**	**7.6**
S36A-z1	**41**	*	**1054**	**5**	**0.005**	**99.95**	**99.63**	**4.947**	**1.390**	**0.3265**	**0.0917**	**0.99900**	**0.1100**	**0.0014**	**1822**	**446**	**1810**	**237**	**1797**	**23**	**-1.6**
S36A-z1	**42**	*	**1032**	**7**	**0.006**	**99.97**	**99.74**	**4.606**	**1.200**	**0.3076**	**0.0799**	**0.99880**	**0.1090**	**0.0014**	**1729**	**394**	**1750**	**217**	**1776**	**23**	**3.0**
S36A-z1	**43**	*	**1043**	**5**	**0.005**	**99.97**	**99.75**	**4.676**	**1.260**	**0.3158**	**0.0851**	**0.99890**	**0.1070**	**0.0014**	**1769**	**417**	**1763**	**225**	**1755**	**23**	**-1.0**
S36A-z1	**44**	*	**1054**	**4**	**0.004**	**99.91**	**99.3**	**4.603**	**1.220**	**0.3112**	**0.0825**	**0.99880**	**0.1070**	**0.0014**	**1747**	**405**	**1750**	**221**	**1754**	**24**	**0.5**
S36A-z1	**45**	*	**995**	**6**	**0.006**	**99.91**	**99.31**	**4.362**	**1.050**	**0.2892**	**0.0694**	**0.99860**	**0.1090**	**0.0014**	**1637**	**347**	**1705**	**198**	**1789**	**24**	**9.6**
S36A-z1	**46**	*	**1020**	**4**	**0.004**	**99.87**	**99.06**	**4.635**	**1.220**	**0.3082**	**0.0814**	**0.99880**	**0.1090**	**0.0014**	**1732**	**401**	**1756**	**221**	**1784**	**24**	**3.3**
S36A-z1	**47**	*	**994**	**5**	**0.006**	**99.89**	**99.19**	**4.599**	**1.170**	**0.3030**	**0.0769**	**0.99870**	**0.1100**	**0.0014**	**1706**	**380**	**1749**	**212**	**1801**	**24**	**6.0**
S36A-z1	**48**	*	**996**	**4**	**0.005**	**99.93**	**99.48**	**4.716**	**1.280**	**0.3210**	**0.0871**	**0.99890**	**0.1070**	**0.0014**	**1795**	**425**	**1770**	**227**	**1741**	**24**	**-3.5**
S36A-z1	**49**	*	**1005**	**5**	**0.005**	**99.95**	**99.62**	**4.522**	**1.140**	**0.2997**	**0.0752**	**0.99870**	**0.1090**	**0.0014**	**1690**	**373**	**1735**	**209**	**1790**	**23**	**6.4**
S36A-z1	**50**	*	**1001**	**5**	**0.005**	**99.96**	**99.68**	**4.833**	**1.300**	**0.3169**	**0.0852**	**0.99890**	**0.1110**	**0.0014**	**1774**	**417**	**1791**	**226**	**1810**	**23**	**2.3**
S36A-z1	**51**	*	**993**	**5**	**0.005**	**99.97**	**99.75**	**4.781**	**1.270**	**0.3175**	**0.0844**	**0.99890**	**0.1090**	**0.0014**	**1778**	**413**	**1782**	**223**	**1786**	**23**	**0.5**
S36A-z1	**52**	*	**992**	**5**	**0.005**	**99.95**	**99.62**	**4.810**	**1.310**	**0.3187**	**0.0867**	**0.99890**	**0.1090**	**0.0014**	**1783**	**424**	**1787**	**229**	**1790**	**23**	**0.4**
S36A-z1	**53**	*	**985**	**5**	**0.005**	**99.94**	**99.56**	**4.838**	**1.300**	**0.3217**	**0.0864**	**0.99890**	**0.1090**	**0.0014**	**1798**	**421**	**1791**	**226**	**1784**	**23**	**-0.9**
S36A-z1	**54**	*	**1032**	**5**	**0.005**	**99.92**	**99.39**	**4.811**	**1.270**	**0.3142**	**0.0826**	**0.99880**	**0.1110**	**0.0014**	**1761**	**405**	**1787**	**221**	**1817**	**23**	**3.5**
S36A-z1	**55**	*	**979**	**6**	**0.006**	**99.92**	**99.38**	**4.755**	**1.230**	**0.3157**	**0.0820**	**0.99880**	**0.1090**	**0.0014**	**1769**	**402**	**1777**	**218**	**1787**	**23**	**1.2**
S36A-z1	**56**	*	**1013**	**5**	**0.005**	**99.94**	**99.58**	**4.693**	**1.220**	**0.3124**	**0.0813**	**0.99880**	**0.1090**	**0.0014**	**1753**	**399**	**1766**	**218**	**1782**	**23**	**1.9**
S36A-z1	**57**	*	**1041**	**7**	**0.007**	**99.94**	**99.52**	**4.546**	**1.120**	**0.3016**	**0.0744**	**0.99870**	**0.1090**	**0.0014**	**1699**	**369**	**1739**	**205**	**1788**	**23**	**5.6**
S36A-z1	**58**	*	**1045**	**6**	**0.006**	**99.94**	**99.53**	**4.725**	**1.230**	**0.3119**	**0.0811**	**0.99890**	**0.1100**	**0.0014**	**1750**	**399**	**1772**	**218**	**1797**	**23**	**3.0**
S36A-z1	**59**	*	**1039**	**5**	**0.005**	**99.93**	**99.46**	**4.502**	**1.110**	**0.3034**	**0.0749**	**0.99870**	**0.1080**	**0.0013**	**1708**	**371**	**1731**	**205**	**1759**	**23**	**3.3**
Sample S36A, zircon 3: Type 2A																					
S36A-z3	1		919	86	0.094	91.27	54.56	1.720	0.377	0.1312	0.0261	0.92480	0.0951	0.0079	795	149	1016	141	1530	157	51.0
S36A-z3	2		950	56	0.059	96.87	80.05	2.930	0.716	0.1977	0.0478	0.98930	0.1070	0.0038	1163	257	1390	185	1757	65	36.9
S36A-z3	3		1052	40	0.038	98.56	89.89	3.669	1.070	0.2476	0.0721	0.99650	0.1070	0.0026	1426	372	1565	233	1757	45	21.0
S36A-z3	4		1009	32	0.032	99.03	93.03	3.872	1.100	0.2593	0.0734	0.99730	0.1080	0.0023	1486	376	1608	229	1771	38	18.0
S36A-z3	5		1054	27	0.025	99.51	96.47	4.006	1.150	0.2623	0.0752	0.99810	0.1110	0.0020	1501	384	1635	233	1812	32	19.2
S36A-z3	6		1064	40	0.038	99.61	97.13	4.071	1.180	0.2668	0.0769	0.99820	0.1110	0.0019	1525	392	1648	235	1810	31	17.7
S36A-z3	7		1093	46	0.042	99.26	94.56	3.887	1.130	0.2634	0.0765	0.99790	0.1070	0.0020	1507	390	1611	235	1749	35	15.5
S36A-z3	8		1195	71	0.060	99.16	93.89	3.674	1.050	0.2474	0.0705	0.99780	0.1080	0.0021	1425	364	1566	228	1761	35	21.2
S36A-z3	9		1172	66	0.056	99.23	94.47	3.790	1.070	0.2509	0.0706	0.99790	0.1100	0.0020	1443	364	1591	227	1792	33	21.7
S36A-z3	10		1200	76	0.063	99.38	95.59	4.348	1.410	0.2835	0.0919	0.99860	0.1110	0.0019	1609	462	1703	268	1820	31	13.1
S36A-z3	11		1259	80	0.064	99.37	95.47	3.436	0.895	0.2266	0.0589	0.99780	0.1100	0.0019	1316	310	1513	205	1799	32	29.6
S36A-z3	12		1299	80	0.062	99.08	93.46	3.338	0.837	0.2202	0.0551	0.99730	0.1100	0.0020	1283	291	1490	196	1798	34	31.5
S36A-z3	13		1327	83	0.063	98.95	92.62	3.627	1.010	0.2386	0.0661	0.99770	0.1100	0.0021	1380	344	1556	221	1803	35	26.0
S36A-z3	14		1267	89	0.070	99.22	94.48	3.398	0.864	0.2221	0.0564	0.99760	0.1110	0.0020	1293	297	1504	199	1815	32	31.7
S36A-z3	15		1303	85	0.065	99.31	95.22	3.546	0.922	0.2239	0.0581	0.99790	0.1150	0.0019	1302	306	1537	206	1878	31	33.8
S36A-z3	16		1377	99	0.072	99.2	94.37	3.501	0.920	0.2263	0.0593	0.99780	0.1120	0.0020	1315	312	1527	207	1835	32	31.3
S36A-z3	17		1544	122	0.079	99.21	94.47	3.602	1.010	0.2306	0.0644	0.99820	0.1130	0.0019	1337	338	1550	222	1853	31	30.8
S36A-z3	18		1536	153	0.100	99.21	94.54	3.474	0.913	0.2216	0.0582	0.99800	0.1140	0.0019	1290	307	1521	207	1859	30	33.7

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
	cycle	ppm	ppm	ppm	^{206}Pb*	^{207}Pb*	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
S36A-z3	19	1496	157	0.105	99.42	96	3.362	0.808	0.2098	0.0504	0.99790	0.1160	0.0018	1228	268	1496	188	1899	28	38.8
S36A-z3	20	1567	173	0.111	99.38	95.82	3.494	0.883	0.2137	0.0540	0.99820	0.1190	0.0018	1249	287	1526	199	1934	27	38.9
S36A-z3	21	1520	205	0.135	99.21	94.69	3.555	0.861	0.2189	0.0529	0.99800	0.1180	0.0018	1276	280	1540	192	1923	28	37.0
S36A-z3	22	1558	225	0.144	98.97	93.14	3.665	0.903	0.2273	0.0559	0.99790	0.1170	0.0019	1320	294	1564	197	1910	29	34.1
S36A-z3	23	1576	246	0.156	99.15	94.37	3.598	0.810	0.2183	0.0491	0.99780	0.1200	0.0018	1273	260	1549	179	1949	27	38.2
S36A-z3	24	1516	240	0.159	99.25	94.98	3.617	0.793	0.2221	0.0486	0.99770	0.1180	0.0018	1293	256	1553	174	1928	27	36.3
S36A-z3	25	1390	233	0.168	99.58	97.2	4.053	0.947	0.2435	0.0568	0.99820	0.1210	0.0017	1405	295	1645	190	1967	25	31.8
S36A-z3	26	1215	221	0.182	99.77	98.49	4.223	0.935	0.2475	0.0547	0.99810	0.1240	0.0017	1425	283	1679	182	2011	24	32.4
S36A-z3	27	1073	184	0.172	99.88	99.22	4.851	1.080	0.2739	0.0612	0.99820	0.1280	0.0017	1561	310	1794	188	2077	24	28.0
S36A-z3	28	1033	202	0.196	99.79	98.67	5.230	1.150	0.2941	0.0646	0.99800	0.1290	0.0018	1662	322	1858	187	2084	25	22.9
S36A-z3	29	953	211	0.221	99.88	99.28	5.714	1.280	0.3128	0.0701	0.99810	0.1320	0.0018	1754	344	1933	194	2131	24	20.1
S36A-z3	30	863	197	0.228	99.82	98.9	5.809	1.310	0.3197	0.0720	0.99800	0.1320	0.0019	1788	352	1948	195	2122	25	18.0
S36A-z3	31	854	202	0.236	99.73	98.4	6.441	1.520	0.3415	0.0808	0.99810	0.1370	0.0020	1894	388	2038	208	2187	25	15.5
S36A-z3	32	867	210	0.242	99.82	98.93	5.973	1.360	0.3218	0.0731	0.99790	0.1350	0.0020	1799	356	1972	198	2159	26	19.1
S36A-z3	33	880	220	0.250	99.89	99.32	6.290	1.480	0.3349	0.0788	0.99810	0.1360	0.0020	1862	380	2017	206	2180	25	16.8
S36A-z3	34	884	228	0.258	99.87	99.24	7.007	1.890	0.3736	0.1000	0.99860	0.1360	0.0020	2046	472	2112	239	2177	25	7.0
S36A-z3	35	850	227	0.267	99.91	99.45	6.472	1.530	0.3437	0.0813	0.99810	0.1370	0.0020	1904	390	2042	208	2184	25	14.8
S36A-z3	36	876	230	0.263	99.87	99.2	6.724	1.720	0.3542	0.0903	0.99840	0.1380	0.0020	1955	430	2076	226	2198	25	12.8
S36A-z3	37	832	227	0.273	99.91	99.45	6.568	1.560	0.3457	0.0819	0.99820	0.1380	0.0020	1914	392	2055	209	2200	25	15.0
S36A-z3	38	827	233	0.282	99.93	99.58	6.860	1.650	0.3555	0.0855	0.99820	0.1400	0.0020	1961	407	2094	213	2227	25	13.9
S36A-z3	39	835	214	0.256	99.94	99.65	7.724	2.140	0.3986	0.1100	0.99870	0.1410	0.0020	2162	508	2199	249	2234	25	3.8
S36A-z3	40	778	243	0.312	99.87	99.22	7.019	1.720	0.3648	0.0892	0.99820	0.1400	0.0020	2005	421	2114	217	2221	25	11.3
S36A-z3	41	813	238	0.292	99.89	99.34	7.750	2.100	0.3993	0.1080	0.99860	0.1410	0.0020	2166	497	2202	243	2237	25	3.8
S36A-z3	42	821	249	0.303	99.94	99.65	7.957	2.220	0.4138	0.1160	0.99870	0.1390	0.0020	2232	527	2226	252	2220	25	-0.7
S36A-z3	43	795	233	0.293	99.86	99.18	7.340	1.820	0.3764	0.0933	0.99830	0.1410	0.0021	2059	437	2154	222	2245	25	9.7
S36A-z3	44	813	261	0.321	99.86	99.19	7.768	2.030	0.4001	0.1050	0.99850	0.1410	0.0020	2169	482	2205	235	2237	25	3.5
S36A-z3	45	819	249	0.303	99.94	99.66	7.756	1.970	0.3942	0.1000	0.99840	0.1430	0.0020	2142	464	2203	229	2260	25	6.1
S36A-z3	46	788	245	0.310	99.93	99.6	7.843	2.020	0.4052	0.1040	0.99840	0.1400	0.0020	2193	479	2213	232	2232	25	2.1
S36A-z3	47	774	245	0.316	99.94	99.66	7.494	1.820	0.3777	0.0917	0.99830	0.1440	0.0020	2066	429	2172	218	2275	25	10.8
S36A-z3	48	770	245	0.318	99.99	99.94	8.426	2.320	0.4331	0.1190	0.99870	0.1410	0.0020	2320	535	2278	250	2241	25	-4.2
S36A-z3	49	779	260	0.334	99.94	99.66	7.794	1.960	0.3969	0.0998	0.99840	0.1420	0.0020	2155	460	2207	226	2257	25	5.3
S36A-z3	50	771	243	0.316	99.9	99.42	8.036	2.100	0.4110	0.1070	0.99850	0.1420	0.0021	2219	490	2235	236	2249	25	1.5
S36A-z3	51	761	257	0.338	99.95	99.71	7.783	1.940	0.3998	0.0997	0.99830	0.1410	0.0020	2168	459	2206	224	2242	25	3.9
S36A-z3	52	778	270	0.348	99.94	99.65	7.821	1.970	0.4027	0.1010	0.99830	0.1410	0.0021	2181	465	2211	226	2238	25	3.0
S36A-z3	53	742	238	0.321	99.88	99.29	7.918	1.980	0.4053	0.1010	0.99820	0.1420	0.0021	2194	464	2222	225	2248	26	2.9
S36A-z3	54	693	226	0.326	99.89	99.34	8.067	2.010	0.4091	0.1020	0.99820	0.1430	0.0021	2211	466	2239	225	2264	26	2.8
S36A-z3	55	689	223	0.323	99.93	99.57	8.681	2.370	0.4415	0.1200	0.99850	0.1430	0.0021	2357	539	2305	248	2259	26	-5.2
S36A-z3	56	661	215	0.326	99.97	99.81	7.744	1.830	0.3931	0.0929	0.99790	0.1430	0.0022	2137	430	2202	213	2262	26	6.5
S36A-z3	57	662	198	0.299	99.97	99.81	8.275	2.050	0.4159	0.1030	0.99810	0.1440	0.0022	2242	470	2262	225	2279	26	1.9
S36A-z3	58	662	202	0.305	99.94	99.68	8.615	2.330	0.4358	0.1180	0.99840	0.1430	0.0022	2332	529	2298	246	2268	27	-3.4
S36A-z3	59	620	209	0.338	99.9	99.41	7.954	1.880	0.4000	0.0944	0.99770	0.1440	0.0023	2169	435	2226	213	2279	27	5.7
Sample S36A, zircon 4: Type 2A																				
S36A-z4	1	816	84	0.103	89.33	49.95	3.221	0.701	0.2367	0.0476	0.93730	0.0987	0.0075	1370	248	1462	169	1599	142	15.9
S36A-z4	2	770	60	0.078	94.61	69	4.165	0.918	0.2877	0.0622	0.98230	0.1050	0.0043	1630	311	1667	180	1714	76	5.5
S36A-z4	3	781	39	0.050	97.45	83.58	4.904	1.200	0.3218	0.0782	0.99410	0.1110	0.0029	1799	382	1803	206	1808	48	0.6
S36A-z4	4	785	23	0.030	98.87	92.26	5.479	1.390	0.3527	0.0895	0.99700	0.1130	0.0022	1948	427	1897	218	1843	36	-6.6
S36A-z4	5	728	24	0.033	99.05	93.18	5.675	1.480	0.3784	0.0983	0.99720	0.1090	0.0021	2069	460	1928	225	1779	35	-19.1
S36A-z4	6	718	21	0.029	99.44	95.99	6.565	1.950	0.4232	0.1260	0.99830	0.1130	0.0020	2275	570	2055	262	1841	32	-28.0
S36A-z4	7	679	26	0.038	99.55	96.76	6.264	1.750	0.4083	0.1140	0.99810	0.1110	0.0019	2207	521	2013	244	1820	31	-25.2
S36A-z4	8	707	23	0.032	99.73	98.09	6.308	1.680	0.3916	0.1050	0.99820	0.1170	0.0019	2130	484	2020	234	1908	28	-13.7
S36A-z4	9	736	28	0.038	99.71	97.97	6.116	1.610	0.3877	0.1020	0.99820	0.1140	0.0018	2112	475	1992	230	1870	28	-15.2
S36A-z4	10	778	34	0.043	99.73	98.06	6.733	1.980	0.4295	0.1260	0.99860	0.1140	0.0017	2303	568	2077	260	1859	28	-28.5
S36A-z4	11	822	31	0.037	99.69	97.82	6.327	1.700	0.3935	0.1060	0.99850	0.1170	0.0017	2139	490	2022	236	1905	27	-14.4
S36A-z4	12	880	39	0.044	99.73	98.13	6.227	1.620	0.3793	0.0983	0.99850	0.1190	0.0017	2073	460	2008	227	1942	25	-7.9
S36A-z4	13	974	52	0.054	99.72	98.09	6.295	1.650	0.3794	0.0994	0.99860	0.1200	0.0016	2073	464	2018	230	1961	24	-6.7
S36A-z4	14	960	50	0.052	99.72	97.72	5.298	1.390	0.3892	0.1020	0.99850	0.0987	0.0014	2119	472	1869	223	1600	27	-38.2
S36A-z4	15	944	48	0.051	99.7	97.92	6.272	1.580	0.3809	0.0959	0.99860	0.1190	0.0016	2081	448	2015	221	1948	24	-7.9
S36A-z4	16	949	53	0.056	99.7	97.96	6.397	1.590	0.3841	0.0955	0.99850	0.1210	0.0016	2096	445	2032	218	1968	24	-7.6
S36A-z4	17	934	56	0.060	99.69	97.9	6.301	1.500	0.3789	0.0903	0.99840	0.1210	0.0016	2071	422	2019	209	1966	24	-6.2
S36A-z4	18	971	61	0.062	99.79	98.62	6.758	1.760	0.3992	0.1040	0.99870	0.1230	0.0016	2165	478	2080	230	1997	23	-9.9
S36A-z4	19	932	65	0.070	99.72	98.12	5.947	1.350	0.3596	0.0815	0.99820	0.1200	0.0016	1980	387	1968	197	1955	24	-1.5
S36A-z4	20	893	63	0.071	99.7	98.01	6.088	1.370	0.3626	0.0817	0.99810	0.1220	0.0017	1994	387	1989	197	1983	24	-0.6
S36A-z4	21	889	63	0.071	99.67	97.76	6.017	1.400	0.3611	0.0841	0.99820	0.1210	0.0017	1988	398	1978	203	1969	25	-1.1
S36A-z4	22	888	53	0.060	99.62	97.44	5.877	1.320	0.3559	0.0799	0.99810	0.1200	0.0017	1963	380	1958	195	1953	25	-0.6
S36A-z4	23	918	69	0.075	99.63	97.5	5.858	1.300	0.3522	0.0781	0.99800	0.1210	0.0017	1945	372	1955	192	1965	25	1.1
S36A-z4	24	909	56	0.062	99.65	97.68	6.159	1.440	0.3683	0.0861	0.99830	0.1210	0.0017	2021	406	1999	204	1975	25	-2.7
S36A-z4	25	900	60	0.066	99.81	98.73	5.645	1.180	0.3395	0.0707	0.99790	0.1210	0.0016	1884	340	1923	180	1965	24	4.7
S36A-z4	26	936	56	0.060	99.81	98.69	5.895	1.270	0.3516	0.0757	0.99810	0.1220	0.0016	1942	361	1960	187	1980	24	2.2
S36A-z4	27	893	55	0.062	99.88	99.21	5.766	1.220	0.3425	0.0722	0.99810	0.1220	0.0016	1899	347	1941	183	1987	23	5.1
S36A-z4	28	873	54	0.062	99.84	98.9	5.678	1.170	0.3368	0.0694	0.99800	0.1220	0.0016	1871	335	1928	178	1989	23	6.8
S36A-z4	29	929	57	0.061	99.84	98.91	5.667	1.190	0.3337	0.0701	0.99800	0.1230	0.0016	1856	339	1926	181	2003	23	8.4
S36A-z4	30	908	63	0.069	99.77	98.46	5.664	1.160	0.3317	0.0679	0.99790	0.1240	0.0017	1847	329	1926	177	2012	24	9.4
S36A-z4	31	931	68	0.073	99.75	98.37	5.997	1.330	0.3477	0.0768	0.99820	0.1250	0.0017	1923	367	1975	192	2030	24	6.1
S36A-z4	32	908	68	0.075	99.78	98.57	5.567	1.100	0.3218	0.0635	0.99770	0.1250	0.0017	1799	310	1911	170	2035	24	13.3
S36A-z4	33	890	62	0.069	99.82	98.83	6.190	1.380	0.3556	0.0791	0.99820	0.1260	0.0017	1961	376	2003	194	2046	23	4.8
S36A-z4	34	828	63	0.076	99.79	98.65	5.572	1.070	0.3210	0.0616	0.99750	0.1260	0.0017	1794	300	1912	165	2042	24	13.9
S36A-z4	35	848	57	0.068	99.84	98.95	5.929	1.230	0.3427	0.0711	0.99790	0.1250	0.0017	1900	341	1965	180	2035	24	7.6
S36A-z4	36	821	67	0.081	99.8	98.71	5.912	1.180	0.3399	0.0678	0.99770	0.1260	0.0017	1886	326	1963	173	2045	24	9.0
S36A-z4	37	814	72	0.088	99.69	98.01	5.847	1.160	0.3364	0.0665	0.99750	0.1260	0.0018	1869	321	1953	172	2044	25	9.9
S36A-z4	38	822	72	0.088	99.68	97.98	5.913	1.160	0.3361	0.0657	0.99750	0.1280	0.0018	1868	317	1963	170	2065	25	11.0
S36A-z4	39	809	71	0.087	99.78	98.64	5.865	1.090	0.3283	0.0608	0.99720	0.1300	0.0018	1830	295	1956	161	2092	24	14.4

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
								$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$			
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.		
S36A-z4	40		822	74	0.090	99.75	98.39	6.014	1.210	0.3444	0.0695	0.99760	0.1270	0.0018	1908	333	1978	176	2052	25		8.1
S36A-z4	41		776	72	0.093	99.67	97.88	5.882	1.110	0.3332	0.0631	0.99710	0.1280	0.0018	1854	305	1959	164	2071	25		12.0
S36A-z4	42		789	66	0.084	99.61	97.54	5.813	1.130	0.3321	0.0643	0.99720	0.1270	0.0018	1849	311	1948	168	2056	26		11.6
S36A-z4	43		741	76	0.102	99.77	98.51	5.576	0.991	0.3179	0.0564	0.99670	0.1270	0.0018	1780	276	1912	153	2060	25		15.6
S36A-z4	44		710	64	0.090	99.86	99.11	5.581	0.954	0.3114	0.0532	0.99650	0.1300	0.0018	1748	261	1913	147	2098	25		19.1
S36A-z4	45		695	72	0.103	99.78	98.61	5.976	1.140	0.3404	0.0652	0.99710	0.1270	0.0018	1889	313	1972	167	2061	26		9.6
S36A-z4	46		664	71	0.107	99.61	97.53	5.606	0.986	0.3195	0.0561	0.99630	0.1270	0.0019	1787	274	1917	152	2060	27		15.1
S36A-z4	47		641	66	0.103	99.65	97.73	5.642	0.987	0.3229	0.0564	0.99620	0.1270	0.0019	1804	275	1923	151	2053	27		13.9
S36A-z4	48		643	68	0.106	99.63	97.65	5.727	0.999	0.3283	0.0572	0.99620	0.1270	0.0019	1830	278	1935	151	2050	27		12.3
S36A-z4	49		636	68	0.108	99.72	98.24	5.794	0.974	0.3292	0.0553	0.99590	0.1280	0.0019	1835	268	1945	146	2066	27		12.9
S36A-z4	50		611	69	0.113	99.78	98.65	6.254	1.100	0.3443	0.0607	0.99630	0.1320	0.0020	1907	291	2012	154	2121	26		11.6
S36A-z4	51		595	70	0.118	99.65	97.74	5.708	0.933	0.3255	0.0531	0.99530	0.1270	0.0020	1816	258	1933	141	2059	28		13.5
S36A-z4	52		592	66	0.111	99.67	97.89	5.854	0.991	0.3308	0.0559	0.99570	0.1280	0.0020	1842	271	1954	147	2075	28		12.9
S36A-z4	53		566	59	0.105	99.74	98.33	5.677	0.919	0.3271	0.0529	0.99530	0.1260	0.0020	1824	257	1928	140	2041	28		12.2
S36A-z4	54		568	60	0.106	99.75	98.4	6.193	1.080	0.3496	0.0610	0.99600	0.1280	0.0020	1933	291	2004	153	2078	27		8.1
S36A-z4	55		561	65	0.116	99.8	98.69	5.825	0.938	0.3352	0.0539	0.99530	0.1260	0.0020	1864	260	1950	140	2043	28		10.1
S36A-z4	56		558	64	0.114	99.72	98.19	5.761	0.900	0.3271	0.0511	0.99490	0.1280	0.0020	1824	248	1941	135	2067	28		13.5
S36A-z4	57		556	71	0.127	99.74	98.37	6.024	0.959	0.3384	0.0538	0.99500	0.1290	0.0020	1879	259	1979	139	2086	28		11.4
S36A-z4	58		555	69	0.124	99.77	98.54	6.143	0.996	0.3436	0.0556	0.99530	0.1300	0.0020	1904	267	1996	142	2093	28		10.4
S36A-z4	59		535	70	0.130	99.84	98.98	5.631	0.810	0.3157	0.0454	0.99400	0.1290	0.0020	1769	222	1921	124	2089	28		17.5
Sample S36A, zircon 5: Type 1A																						
S36A-z5	1		864	65	0.075	99.32	94.97	3.111	0.712	0.2111	0.0482	0.99690	0.1070	0.0019	1235	257	1435	176	1747	33		32.2
S36A-z5	**2**	*	**846**	**36**	**0.043**	**99.88**	**99.08**	**4.220**	**0.982**	**0.2800**	**0.0651**	**0.99820**	**0.1090**	**0.0015**	**1591**	**328**	**1678**	**191**	**1788**	**25**		**12.4**
S36A-z5	**3**	*	**968**	**25**	**0.025**	**99.94**	**99.57**	**4.358**	**1.030**	**0.2850**	**0.0671**	**0.99860**	**0.1110**	**0.0014**	**1616**	**337**	**1704**	**195**	**1815**	**23**		**12.4**
S36A-z5	**4**	*	**1031**	**22**	**0.021**	**99.98**	**99.83**	**4.220**	**0.977**	**0.2799**	**0.0648**	**0.99870**	**0.1090**	**0.0013**	**1591**	**326**	**1678**	**190**	**1789**	**22**		**12.5**
S36A-z5	**5**	*	**1053**	**24**	**0.023**	**99.95**	**99.63**	**4.466**	**1.080**	**0.2964**	**0.0717**	**0.99880**	**0.1090**	**0.0013**	**1673**	**356**	**1725**	**201**	**1788**	**22**		**7.3**
S36A-z5	**6**	*	**1141**	**29**	**0.026**	**99.93**	**99.46**	**4.514**	**1.120**	**0.2996**	**0.0744**	**0.99890**	**0.1090**	**0.0013**	**1689**	**369**	**1734**	**207**	**1787**	**22**		**6.2**
S36A-z5	**7**	*	**1157**	**24**	**0.021**	**99.98**	**99.85**	**4.700**	**1.240**	**0.3127**	**0.0822**	**0.99900**	**0.1090**	**0.0013**	**1754**	**404**	**1767**	**220**	**1783**	**21**		**1.9**
S36A-z5	**8**	*	**1153**	**30**	**0.026**	**99.94**	**99.54**	**4.588**	**1.140**	**0.3001**	**0.0749**	**0.99890**	**0.1110**	**0.0013**	**1692**	**371**	**1747**	**208**	**1814**	**21**		**7.7**
S36A-z5	**9**	*	**1184**	**27**	**0.023**	**99.95**	**99.65**	**4.650**	**1.160**	**0.3028**	**0.0754**	**0.99890**	**0.1110**	**0.0013**	**1705**	**373**	**1758**	**208**	**1822**	**21**		**7.3**
S36A-z5	10		1211	21	0.017	99.98	99.86	4.528	1.090	0.2875	0.0695	0.99900	0.1140	0.0013	1629	348	1736	201	1868	20		14.5
S36A-z5	11		1162	23	0.020	99.98	99.87	5.098	1.260	0.3128	0.0775	0.99900	0.1180	0.0013	1754	381	1836	210	1929	20		10.3
S36A-z5	12		1082	24	0.022	99.96	99.73	5.296	1.310	0.3189	0.0791	0.99890	0.1200	0.0014	1784	387	1868	212	1963	20		10.4
S36A-z5	13		1007	34	0.034	99.93	99.55	5.642	1.350	0.3243	0.0778	0.99880	0.1260	0.0015	1811	379	1923	207	2045	21		13.1
S36A-z5	14		909	27	0.030	99.96	99.73	5.711	1.240	0.3164	0.0689	0.99850	0.1310	0.0016	1772	337	1933	188	2111	21		18.4
S36A-z5	15		864	31	0.035	99.96	99.74	5.877	1.210	0.3131	0.0642	0.99830	0.1360	0.0016	1756	315	1958	178	2178	21		22.1
S36A-z5	16		828	32	0.039	99.96	99.78	6.030	1.250	0.3171	0.0656	0.99830	0.1380	0.0017	1776	321	1980	180	2201	21		22.1
S36A-z5	17		781	24	0.030	99.96	99.77	5.643	1.090	0.3041	0.0589	0.99790	0.1350	0.0017	1712	291	1923	167	2158	22		23.5
S36A-z5	18		752	28	0.037	99.95	99.67	5.312	0.945	0.2860	0.0508	0.99740	0.1350	0.0017	1621	255	1871	152	2160	22		28.1
S36A-z5	19		730	28	0.038	99.98	99.86	5.745	1.100	0.3065	0.0587	0.99780	0.1360	0.0017	1723	290	1938	166	2176	22		23.7
S36A-z5	20		699	27	0.039	99.98	99.9	5.855	1.120	0.3111	0.0593	0.99770	0.1370	0.0018	1746	292	1955	165	2183	23		22.8
S36A-z5	21		649	32	0.049	99.98	99.86	5.884	1.030	0.3017	0.0530	0.99710	0.1410	0.0019	1700	262	1959	153	2245	23		27.6
S36A-z5	22		610	32	0.052	99.93	99.59	5.833	1.020	0.3041	0.0529	0.99680	0.1390	0.0019	1712	261	1951	151	2216	24		25.9
S36A-z5	23		587	37	0.063	99.95	99.68	5.663	0.959	0.2950	0.0500	0.99650	0.1390	0.0020	1667	249	1926	146	2217	25		28.1
S36A-z5	24		565	38	0.068	99.95	99.67	5.290	0.839	0.2817	0.0447	0.99580	0.1360	0.0020	1600	225	1867	135	2179	25		29.9
S36A-z5	25		539	35	0.065	99.94	99.61	5.419	0.872	0.2897	0.0466	0.99580	0.1360	0.0020	1640	233	1888	138	2173	26		27.7
S36A-z5	26		509	43	0.084	99.91	99.45	4.935	0.747	0.2735	0.0413	0.99500	0.1310	0.0020	1558	209	1808	128	2110	27		29.4
S36A-z5	27		491	38	0.078	99.91	99.43	4.719	0.680	0.2649	0.0381	0.99420	0.1290	0.0020	1515	194	1771	121	2088	27		30.8
S36A-z5	28		469	37	0.079	99.93	99.57	4.880	0.683	0.2635	0.0368	0.99380	0.1340	0.0021	1508	188	1799	118	2156	27		33.7
S36A-z5	29		482	43	0.090	99.97	99.81	5.128	0.778	0.2801	0.0424	0.99490	0.1330	0.0020	1592	214	1841	129	2135	27		28.7
S36A-z5	30		461	32	0.070	99.97	99.82	4.952	0.664	0.2642	0.0354	0.99330	0.1360	0.0021	1511	180	1811	113	2176	27		34.2
S36A-z5	31		457	38	0.082	99.97	99.82	4.990	0.665	0.2628	0.0350	0.99310	0.1380	0.0021	1504	178	1818	113	2199	27		35.4
S36A-z5	32		462	41	0.088	99.95	99.71	5.249	0.749	0.2788	0.0397	0.99410	0.1370	0.0021	1585	200	1861	122	2184	27		30.9
Sample S36A, zircon 6: Type 2A																						
S36A-z6	1		-129	-3	0.021	40.56	15.27	-3.081	1.140	-0.1022	0.0104	0.94380	0.2190	0.0607	-695	75	NaN	-559	2971	447		82.5
S36A-z6	2		-298	13	-0.045	39.14	5.85	5.248	5.700	0.4757	0.1920	0.56560	0.0800	0.0736	2508	837	1860	926	1198	1810		-132.8
S36A-z6	3		803	46	0.057	75.25	30.55	2.198	0.428	0.1330	0.0174	0.76240	0.1200	0.0152	805	99	1181	136	1954	227		62.4
S36A-z6	4		800	22	0.027	90.7	57.09	2.892	0.481	0.1856	0.0288	0.94500	0.1130	0.0062	1097	157	1380	125	1849	98		44.1
S36A-z6	5		760	21	0.028	95.09	72.59	3.948	0.845	0.2527	0.0533	0.98580	0.1130	0.0041	1453	274	1624	173	1853	65		24.1
S36A-z6	6		755	13	0.017	97.13	82.2	5.444	1.610	0.3487	0.1030	0.99560	0.1130	0.0031	1928	492	1892	254	1852	50		-4.8
S36A-z6	7		979	12	0.012	97.88	85.88	4.107	1.150	0.2729	0.0763	0.99640	0.1090	0.0026	1555	386	1656	229	1786	43		14.5
S36A-z6	8		1267	11	0.009	98.69	91.13	3.728	0.989	0.2397	0.0634	0.99770	0.1130	0.0021	1385	330	1577	212	1845	33		27.7
S36A-z6	9		1268	10	0.008	98.98	93.3	4.458	1.200	0.2719	0.0732	0.99830	0.1190	0.0019	1550	371	1723	223	1940	28		22.6
S36A-z6	10		1293	13	0.010	99.09	94.01	4.598	1.190	0.2793	0.0725	0.99840	0.1190	0.0018	1588	365	1749	217	1947	27		20.8
S36A-z6	11		1364	14	0.011	99.35	95.86	4.918	1.280	0.2851	0.0742	0.99870	0.1250	0.0017	1617	372	1805	220	2030	24		23.0
S36A-z6	12		1344	13	0.010	99.27	95.25	4.812	1.180	0.2843	0.0699	0.99850	0.1230	0.0016	1613	351	1787	207	1997	24		21.7
S36A-z6	13		1315	17	0.013	99.41	96.25	4.810	1.100	0.2754	0.0627	0.99840	0.1270	0.0016	1568	317	1787	191	2052	23		26.5
S36A-z6	14		1342	15	0.011	99.55	97.17	5.381	1.350	0.3032	0.0759	0.99880	0.1290	0.0016	1707	376	1882	215	2080	21		20.4
S36A-z6	15		1298	17	0.013	99.71	98.18	5.138	1.140	0.2873	0.0635	0.99860	0.1300	0.0015	1628	318	1842	188	2094	21		25.1
S36A-z6	16		1271	14	0.011	99.66	97.83	5.204	1.150	0.2922	0.0645	0.99860	0.1290	0.0015	1652	322	1853	188	2087	21		23.6
S36A-z6	17		1290	16	0.012	99.71	98.18	5.473	1.220	0.3030	0.0673	0.99870	0.1310	0.0015	1706	333	1896	191	2111	20		21.8
S36A-z6	18		1256	19	0.015	99.73	98.35	5.618	1.240	0.3064	0.0674	0.99870	0.1330	0.0015	1723	333	1919	190	2138	20		22.1
S36A-z6	19		1260	15	0.012	99.75	98.49	5.747	1.270	0.3127	0.0693	0.99870	0.1330	0.0015	1754	340	1938	192	2142	20		20.7
S36A-z6	20		1261	17	0.014	99.81	98.84	5.673	1.200	0.3091	0.0651	0.99860	0.1330	0.0015	1736	321	1927	182	2139	19		21.4
S36A-z6	21		1260	21	0.017	99.75	98.47	5.628	1.120	0.3024	0.0604	0.99840	0.1350	0.0015	1703	299	1920	172	2164	19		24.2
S36A-z6	22		1260	22	0.018	99.84	99.01	6.254	1.350	0.3346	0.0724	0.99870	0.1360	0.0015	1861	350	2012	190	2171	19		16.4
S36A-z6	23		1269	18	0.014	99.86	99.16	5.810	1.130	0.3076	0.0600	0.99850	0.1370	0.0015	1729	296	1948	169	2190	19		24.0
S36A-z6	24		1248	22	0.017	99.85	99.14	6.370	1.360	0.3333	0.0713	0.99870	0.1390	0.0015	1854	345	2028	188	2210	19		18.5
S36A-z6	25		1188	22	0.019	99.89	99.34	5.816	1.080	0.3047	0.0565	0.99830	0.1380	0.0015	1715	279	1949	161	2208	19		25.4
S36A-z6	26		1227	23	0.019	99.88	99.29	6.165	1.200	0.3203	0.0622	0.99850	0.1400	0.0015	1791	304	2000	170	2222	19		22.2

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
	cycle		ppm	ppm	ppm	^{206}Pb*	^{207}Pb*	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.		
S36A-z6	27		1217	23	0.019	99.86	99.16	6.465	1.350	0.3386	0.0707	0.99870	0.1380	0.0015	1880	340	2041	184	2208	19		17.1
S36A-z6	28		1193	22	0.018	99.88	99.33	6.218	1.180	0.3187	0.0607	0.99840	0.1410	0.0015	1784	297	2007	167	2246	19		23.6
S36A-z6	29		1178	24	0.020	99.92	99.55	6.323	1.220	0.3240	0.0626	0.99850	0.1420	0.0015	1809	305	2022	170	2246	19		22.3
S36A-z6	30		1169	25	0.022	99.89	99.38	6.535	1.270	0.3291	0.0638	0.99850	0.1440	0.0015	1834	310	2051	171	2276	18		22.3
S36A-z6	31		1143	18	0.016	99.91	99.46	6.161	1.120	0.3163	0.0575	0.99820	0.1410	0.0015	1772	281	1999	159	2243	19		24.0
S36A-z6	32		1143	27	0.024	99.91	99.5	6.462	1.200	0.3270	0.0608	0.99830	0.1430	0.0015	1824	295	2041	164	2268	19		22.5
S36A-z6	33		1134	23	0.020	99.86	99.21	6.438	1.190	0.3277	0.0607	0.99830	0.1430	0.0015	1827	295	2038	163	2258	19		21.9
S36A-z6	34		1139	26	0.023	99.89	99.35	6.633	1.260	0.3401	0.0647	0.99840	0.1410	0.0015	1887	311	2064	168	2245	19		18.4
Sample S36A, zircon 8: Type 1A																						
S36A-z8	1		949	644	0.679	92.42	57	2.469	0.530	0.1989	0.0409	0.96370	0.0900	0.0052	1170	220	1263	155	1426	109		19.7
S36A-z8	2		820	256	0.312	97.69	84.3	3.960	0.888	0.2728	0.0608	0.99370	0.1050	0.0027	1555	308	1626	182	1719	46		10.7
S36A-z8	3		937	175	0.187	99.02	92.85	4.146	0.967	0.2815	0.0656	0.99700	0.1070	0.0019	1599	330	1663	191	1746	33		9.5
S36A-z8	4		1090	122	0.112	99.42	95.7	4.632	1.270	0.3101	0.0849	0.99850	0.1080	0.0016	1741	418	1755	229	1772	28		2.0
S36A-z8	5		1096	66	0.060	99.68	97.6	4.863	1.400	0.3284	0.0947	0.99890	0.1070	0.0015	1831	460	1796	243	1756	25		-4.9
S36A-z8	6		1076	40	0.038	99.81	98.54	4.877	1.360	0.3233	0.0900	0.99890	0.1090	0.0014	1806	439	1798	235	1790	24		-1.0
S36A-z8	7		1114	26	0.023	99.94	99.58	5.272	1.590	0.3467	0.1050	0.99920	0.1100	0.0014	1919	501	1864	258	1804	23		-7.4
S36A-z8	8		1037	21	0.020	99.9	99.26	5.596	1.720	0.3685	0.1130	0.99910	0.1100	0.0014	2022	533	1915	265	1802	24		-14.2
S36A-z8	9		950	18	0.018	99.87	99	5.523	1.710	0.3704	0.1150	0.99910	0.1080	0.0015	2031	540	1904	267	1769	25		-17.3
S36A-z8	10		892	11	0.012	99.94	99.52	5.406	1.580	0.3561	0.1040	0.99900	0.1100	0.0015	1964	494	1886	250	1801	24		-10.5
S36A-z8	11		867	8	0.010	99.96	99.66	5.002	1.310	0.3316	0.0865	0.99870	0.1090	0.0015	1846	419	1820	221	1789	25		-3.7
S36A-z8	12		840	9	0.010	99.92	99.39	5.185	1.380	0.3387	0.0898	0.99870	0.1110	0.0015	1881	433	1850	226	1816	25		-4.1
S36A-z8	13		842	8	0.009	99.92	99.37	5.166	1.390	0.3408	0.0914	0.99870	0.1100	0.0015	1890	440	1847	228	1799	25		-5.8
S36A-z8	**14**	*	**853**	**8**	**0.009**	**99.94**	**99.59**	**5.488**	**1.530**	**0.3493**	**0.0972**	**0.99880**	**0.1140**	**0.0015**	**1931**	**465**	**1899**	**239**	**1863**	**24**		**-4.3**
S36A-z8	**15**	*	**827**	**6**	**0.008**	**99.99**	**99.93**	**5.482**	**1.540**	**0.3545**	**0.0996**	**0.99890**	**0.1120**	**0.0015**	**1956**	**474**	**1898**	**241**	**1834**	**24**		**-7.8**
S36A-z8	**16**	*	**823**	**7**	**0.008**	**99.97**	**99.8**	**5.289**	**1.400**	**0.3423**	**0.0905**	**0.99870**	**0.1120**	**0.0015**	**1898**	**435**	**1867**	**226**	**1833**	**24**		**-4.1**
S36A-z8	**17**	*	**837**	**5**	**0.006**	**99.98**	**99.86**	**5.297**	**1.390**	**0.3429**	**0.0900**	**0.99870**	**0.1120**	**0.0015**	**1900**	**432**	**1868**	**224**	**1833**	**24**		**-4.2**
S36A-z8	**18**	*	**851**	**5**	**0.006**	**100**	**100**	**5.307**	**1.400**	**0.3457**	**0.0909**	**0.99870**	**0.1110**	**0.0015**	**1914**	**435**	**1870**	**225**	**1822**	**24**		**-5.8**
S36A-z8	**19**	*	**848**	**4**	**0.005**	**100**	**100**	**5.257**	**1.340**	**0.3412**	**0.0872**	**0.99870**	**0.1120**	**0.0015**	**1893**	**419**	**1862**	**218**	**1828**	**24**		**-4.1**
S36A-z8	**20**	*	**892**	**6**	**0.007**	**99.99**	**99.94**	**5.484**	**1.520**	**0.3604**	**0.1000**	**0.99890**	**0.1100**	**0.0015**	**1984**	**474**	**1898**	**239**	**1805**	**24**		**-11.6**
S36A-z8	**21**	*	**873**	**5**	**0.005**	**99.98**	**99.87**	**5.220**	**1.350**	**0.3372**	**0.0871**	**0.99870**	**0.1120**	**0.0015**	**1873**	**420**	**1856**	**220**	**1837**	**24**		**-2.2**
S36A-z8	**22**	*	**857**	**5**	**0.006**	**100**	**100**	**5.132**	**1.220**	**0.3239**	**0.0772**	**0.99850**	**0.1150**	**0.0015**	**1809**	**376**	**1841**	**203**	**1878**	**24**		**4.2**
S36A-z8	**23**	*	**874**	**5**	**0.006**	**99.99**	**99.94**	**5.272**	**1.350**	**0.3386**	**0.0864**	**0.99870**	**0.1130**	**0.0015**	**1880**	**416**	**1864**	**218**	**1847**	**24**		**-2.1**
S36A-z8	**24**	*	**846**	**4**	**0.005**	**99.95**	**99.63**	**5.183**	**1.300**	**0.3334**	**0.0838**	**0.99860**	**0.1130**	**0.0015**	**1855**	**405**	**1850**	**214**	**1844**	**24**		**-0.7**
S36A-z8	**25**	*	**875**	**4**	**0.005**	**99.93**	**99.5**	**5.115**	**1.270**	**0.3288**	**0.0818**	**0.99860**	**0.1130**	**0.0015**	**1832**	**397**	**1839**	**211**	**1846**	**24**		**0.9**
S36A-z8	**26**	*	**893**	**5**	**0.006**	**100**	**100**	**4.700**	**1.060**	**0.3057**	**0.0687**	**0.99840**	**0.1110**	**0.0014**	**1720**	**339**	**1767**	**188**	**1824**	**23**		**6.5**
S36A-z8	**27**	*	**934**	**6**	**0.006**	**100**	**100**	**5.244**	**1.330**	**0.3357**	**0.0849**	**0.99870**	**0.1130**	**0.0014**	**1866**	**410**	**1860**	**216**	**1853**	**23**		**-0.8**
S36A-z8	**28**	*	**899**	**5**	**0.005**	**100**	**100**	**4.939**	**1.150**	**0.3124**	**0.0726**	**0.99850**	**0.1150**	**0.0015**	**1752**	**357**	**1809**	**196**	**1875**	**23**		**7.5**
S36A-z8	**29**	*	**899**	**4**	**0.005**	**100**	**100**	**4.878**	**1.130**	**0.3138**	**0.0724**	**0.99850**	**0.1130**	**0.0014**	**1760**	**355**	**1798**	**194**	**1844**	**23**		**5.2**
S36A-z8	**30**	*	**929**	**6**	**0.007**	**99.99**	**99.94**	**5.152**	**1.250**	**0.3273**	**0.0792**	**0.99870**	**0.1140**	**0.0014**	**1825**	**385**	**1845**	**206**	**1867**	**23**		**2.6**
S36A-z8	**31**	*	**946**	**4**	**0.004**	**99.97**	**99.78**	**4.920**	**1.110**	**0.3095**	**0.0700**	**0.99850**	**0.1150**	**0.0014**	**1738**	**345**	**1806**	**191**	**1885**	**23**		**8.9**
S36A-z8	**32**	*	**922**	**6**	**0.007**	**99.97**	**99.77**	**5.102**	**1.230**	**0.3349**	**0.0810**	**0.99860**	**0.1100**	**0.0014**	**1862**	**391**	**1836**	**205**	**1807**	**23**		**-3.5**
S36A-z8	**33**	*	**910**	**6**	**0.007**	**100**	**100**	**5.166**	**1.230**	**0.3317**	**0.0787**	**0.99860**	**0.1130**	**0.0014**	**1846**	**381**	**1847**	**202**	**1848**	**23**		**0.1**
S36A-z8	**34**	*	**938**	**6**	**0.006**	**99.99**	**99.9**	**5.042**	**1.140**	**0.3143**	**0.0710**	**0.99850**	**0.1160**	**0.0014**	**1762**	**348**	**1826**	**191**	**1901**	**22**		**8.4**
S36A-z8	**35**	*	**956**	**7**	**0.008**	**99.97**	**99.78**	**5.161**	**1.240**	**0.3351**	**0.0803**	**0.99870**	**0.1120**	**0.0014**	**1863**	**388**	**1846**	**204**	**1827**	**23**		**-2.3**
S36A-z8	**36**	*	**948**	**10**	**0.010**	**100**	**100**	**5.156**	**1.210**	**0.3324**	**0.0781**	**0.99860**	**0.1120**	**0.0014**	**1850**	**378**	**1845**	**200**	**1840**	**22**		**-0.6**
S36A-z8	**37**	*	**932**	**8**	**0.009**	**100**	**100**	**5.147**	**1.160**	**0.3245**	**0.0731**	**0.99850**	**0.1150**	**0.0014**	**1812**	**356**	**1844**	**192**	**1880**	**22**		**4.1**
S36A-z8	**38**	*	**951**	**10**	**0.011**	**100**	**100**	**4.885**	**1.070**	**0.3105**	**0.0677**	**0.99850**	**0.1140**	**0.0014**	**1743**	**333**	**1800**	**184**	**1866**	**22**		**7.5**
S36A-z8	39		1007	12	0.012	100	100	5.239	1.240	0.3320	0.0788	0.99870	0.1140	0.0014	1848	381	1859	202	1872	22		1.5
S36A-z8	40		1020	21	0.021	100	100	4.990	1.080	0.3184	0.0689	0.99850	0.1140	0.0014	1782	337	1818	183	1859	22		4.8
S36A-z8	41		982	21	0.021	100	100	5.229	1.140	0.3272	0.0712	0.99850	0.1160	0.0014	1825	346	1857	185	1894	22		4.2
S36A-z8	42		929	22	0.023	100	100	5.321	1.160	0.3335	0.0730	0.99840	0.1160	0.0014	1855	353	1872	187	1891	22		2.2
S36A-z8	43		919	28	0.030	100	100	5.057	1.020	0.3151	0.0638	0.99820	0.1160	0.0014	1766	313	1829	172	1901	22		8.1
S36A-z8	44		890	29	0.032	100	100	4.998	0.968	0.3114	0.0603	0.99800	0.1160	0.0014	1748	296	1819	164	1902	22		9.3
S36A-z8	45		864	29	0.034	100	100	4.924	0.926	0.3069	0.0577	0.99780	0.1160	0.0015	1725	284	1806	159	1901	22		10.5
S36A-z8	46		858	30	0.035	100	100	5.009	0.955	0.3135	0.0598	0.99780	0.1160	0.0015	1758	293	1821	161	1894	23		8.2
S36A-z8	47		849	39	0.045	100	100	4.798	0.838	0.2957	0.0516	0.99740	0.1180	0.0015	1670	257	1785	147	1921	23		14.8
S36A-z8	48		825	42	0.050	100	100	5.267	0.958	0.3135	0.0570	0.99760	0.1220	0.0015	1758	280	1863	155	1983	22		12.9
S36A-z8	49		748	46	0.062	100	100	4.935	0.802	0.2987	0.0485	0.99690	0.1200	0.0015	1685	241	1808	137	1954	23		15.7
S36A-z8	50		769	57	0.074	99.99	99.95	5.218	0.878	0.3058	0.0514	0.99710	0.1240	0.0016	1720	254	1856	143	2011	23		16.5
S36A-z8	51		775	65	0.084	99.98	99.86	5.441	0.931	0.3229	0.0552	0.99710	0.1220	0.0016	1804	269	1891	147	1989	23		10.7
S36A-z8	52		747	75	0.101	99.99	99.91	5.105	0.784	0.3015	0.0462	0.99640	0.1230	0.0016	1699	229	1837	130	1998	23		17.1
S36A-z8	53		759	81	0.106	100	100	5.598	0.935	0.3188	0.0532	0.99700	0.1270	0.0016	1784	260	1916	144	2062	23		15.4
S36A-z8	54		750	107	0.143	100	100	5.866	1.030	0.3323	0.0582	0.99730	0.1280	0.0016	1849	281	1956	152	2071	23		12.3
S36A-z8	55		736	110	0.150	100	100	5.728	0.915	0.3113	0.0497	0.99670	0.1330	0.0017	1747	244	1936	138	2144	23		21.1
S36A-z8	56		765	124	0.161	100	100	5.995	1.030	0.3347	0.0577	0.99720	0.1300	0.0017	1861	279	1975	150	2097	23		13.0
S36A-z8	57		736	118	0.161	100	100	6.085	1.000	0.3266	0.0537	0.99700	0.1350	0.0017	1822	261	1988	143	2165	22		18.1
S36A-z8	58		719	131	0.183	100	100	6.308	1.050	0.3363	0.0557	0.99700	0.1360	0.0018	1869	269	2020	145	2177	22		16.3
S36A-z8	59		765	151	0.197	99.99	99.96	6.817	1.250	0.3615	0.0664	0.99760	0.1370	0.0017	1989	314	2088	163	2187	22		10.5
Sample S36A, zircon 9: Type 1B																						
S36A-z9	1		1123	52	0.047	97.02	78.94	3.025	0.754	0.2304	0.0569	0.99140	0.0952	0.0031	1337	298	1414	190	1532	61		14.1
S36A-z9	2		1132	26	0.023	98.97	92.31	4.170	1.160	0.2937	0.0815	0.99760	0.1030	0.0020	1660	406	1668	228	1678	36		1.2
S36A-z9	3		1112	23	0.021	99.41	95.52	3.962	0.964	0.2746	0.0667	0.99760	0.1050	0.0018	1564	337	1626	197	1708	31		9.5
S36A-z9	4		1117	14	0.013	99.68	97.51	4.401	1.220	0.3081	0.0853	0.99850	0.1040	0.0016	1731	421	1713	229	1690	28		-2.8
S36A-z9	5		1124	12	0.011	99.76	98.13	3.877	0.943	0.2633	0.0639	0.99820	0.1070	0.0016	1506	326	1609	196	1746	27		15.4
S36A-z9	6		1081	13	0.012	99.69	97.59	3.987	0.980	0.2734	0.0671	0.99810	0.1060	0.0016	1558	340	1632	199	1728	28		11.1
S36A-z9	7		1088	16	0.015	99.65	97.2	4.167	1.110	0.2953	0.0789	0.99830	0.1020	0.0016	1668	392	1668	219	1667	29		-0.1
S36A-z9	8		1020	15	0.015	99.67	97.41	4.059	1.020	0.2814	0.0708	0.99820	0.1050	0.0016	1599	356	1646	205	1707	28		7.2
S36A-z9	**9**	*	**962**	**15**	**0.016**	**99.79**	**98.38**	**4.109**	**0.999**	**0.2810**	**0.0683**	**0.99820**	**0.1060**	**0.0016**	**1597**	**344**	**1656**	**199**	**1732**	**27**		**8.8**
S36A-z9	**10**	*	**933**	**13**	**0.014**	**99.8**	**98.48**	**4.473**	**1.140**	**0.3044**	**0.0778**	**0.99840**	**0.1070**	**0.0016**	**1713**	**385**	**1726**	**212**	**1742**	**27**		**1.9**
S36A-z9	**11**	*	**906**	**13**	**0.014**	**99.81**	**98.55**	**4.979**	**1.350**	**0.3368**	**0.0912**	**0.99860**	**0.1070**	**0.0015**	**1871**	**440**	**1816**	**229**	**1752**	**26**		**-7.9**

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
S36A-z9	**12**	*	**922**	**15**	**0.016**	**99.77**	**98.29**	**4.897**	**1.290**	**0.3305**	**0.0867**	**0.99850**	**0.1070**	**0.0016**	**1841**	**420**	**1802**	**221**	**1757**	**27**	**-5.5**
S36A-z9	**13**	*	**906**	**13**	**0.014**	**99.8**	**98.51**	**5.219**	**1.440**	**0.3513**	**0.0969**	**0.99860**	**0.1080**	**0.0015**	**1941**	**462**	**1856**	**235**	**1761**	**26**	**-11.9**
S36A-z9	**14**	*	**879**	**14**	**0.016**	**99.87**	**99.02**	**5.011**	**1.290**	**0.3379**	**0.0866**	**0.99850**	**0.1080**	**0.0015**	**1876**	**418**	**1821**	**217**	**1759**	**26**	**-7.7**
S36A-z9	**15**	*	**895**	**12**	**0.014**	**99.86**	**98.89**	**4.745**	**1.160**	**0.3247**	**0.0794**	**0.99830**	**0.1060**	**0.0015**	**1813**	**386**	**1775**	**205**	**1732**	**26**	**-5.3**
S36A-z9	16		898	13	0.014	99.79	98.38	5.426	1.520	0.3675	0.1030	0.99870	0.1070	0.0015	2018	484	1889	240	1751	26	-17.7
S36A-z9	**17**	*	**863**	**14**	**0.017**	**99.82**	**98.65**	**4.764**	**1.150**	**0.3228**	**0.0778**	**0.99830**	**0.1070**	**0.0015**	**1803**	**379**	**1779**	**202**	**1750**	**26**	**-3.5**
S36A-z9	**18**	*	**851**	**12**	**0.015**	**99.91**	**99.32**	**5.114**	**1.360**	**0.3494**	**0.0926**	**0.99870**	**0.1060**	**0.0014**	**1932**	**442**	**1838**	**225**	**1735**	**25**	**-13.1**
S36A-z9	**19**	*	**824**	**15**	**0.018**	**99.94**	**99.55**	**4.910**	**1.190**	**0.3284**	**0.0797**	**0.99850**	**0.1080**	**0.0015**	**1831**	**387**	**1804**	**205**	**1773**	**24**	**-3.8**
S36A-z9	**20**	*	**868**	**14**	**0.016**	**99.93**	**99.43**	**5.134**	**1.330**	**0.3460**	**0.0897**	**0.99870**	**0.1080**	**0.0014**	**1915**	**430**	**1842**	**221**	**1760**	**24**	**-10.2**
S36A-z9	**21**	*	**879**	**14**	**0.016**	**99.94**	**99.56**	**4.854**	**1.160**	**0.3258**	**0.0782**	**0.99850**	**0.1080**	**0.0014**	**1818**	**380**	**1794**	**202**	**1767**	**24**	**-3.3**
S36A-z9	**22**	*	**843**	**13**	**0.015**	**99.98**	**99.81**	**4.662**	**1.070**	**0.3145**	**0.0723**	**0.99840**	**0.1080**	**0.0014**	**1763**	**354**	**1760**	**192**	**1758**	**24**	**-0.3**
S36A-z9	**23**	*	**844**	**10**	**0.012**	**99.98**	**99.82**	**4.955**	**1.210**	**0.3338**	**0.0816**	**0.99860**	**0.1080**	**0.0014**	**1857**	**394**	**1812**	**207**	**1760**	**24**	**-6.3**
S36A-z9	**24**	*	**855**	**13**	**0.016**	**99.97**	**99.76**	**4.896**	**1.170**	**0.3299**	**0.0789**	**0.99860**	**0.1080**	**0.0014**	**1838**	**382**	**1802**	**202**	**1760**	**23**	**-5.1**
S36A-z9	**25**	*	**857**	**10**	**0.012**	**99.95**	**99.64**	**4.711**	**1.070**	**0.3138**	**0.0714**	**0.99840**	**0.1090**	**0.0014**	**1759**	**350**	**1769**	**191**	**1781**	**23**	**1.4**
S36A-z9	**26**	*	**864**	**15**	**0.017**	**99.94**	**99.53**	**4.762**	**1.090**	**0.3211**	**0.0737**	**0.99840**	**0.1080**	**0.0014**	**1795**	**359**	**1778**	**193**	**1759**	**24**	**-2.3**
S36A-z9	**27**	*	**877**	**14**	**0.015**	**99.93**	**99.48**	**4.766**	**1.060**	**0.3151**	**0.0699**	**0.99830**	**0.1100**	**0.0014**	**1766**	**342**	**1779**	**186**	**1794**	**23**	**1.8**
S36A-z9	**28**	*	**877**	**14**	**0.016**	**99.97**	**99.78**	**4.605**	**0.980**	**0.3023**	**0.0643**	**0.99830**	**0.1100**	**0.0014**	**1703**	**318**	**1750**	**177**	**1807**	**23**	**6.5**
S36A-z9	**29**	*	**882**	**11**	**0.013**	**99.95**	**99.6**	**4.396**	**0.906**	**0.2981**	**0.0614**	**0.99810**	**0.1070**	**0.0014**	**1682**	**305**	**1712**	**171**	**1748**	**23**	**4.3**
S36A-z9	**30**	*	**885**	**12**	**0.013**	**99.94**	**99.55**	**4.597**	**0.964**	**0.3055**	**0.0640**	**0.99820**	**0.1090**	**0.0014**	**1719**	**316**	**1749**	**175**	**1785**	**23**	**4.2**
S36A-z9	**31**	*	**858**	**13**	**0.015**	**99.96**	**99.66**	**4.425**	**0.900**	**0.2986**	**0.0607**	**0.99810**	**0.1070**	**0.0014**	**1684**	**301**	**1717**	**168**	**1757**	**23**	**4.7**
S36A-z9	**32**	*	**836**	**10**	**0.012**	**99.96**	**99.66**	**4.208**	**0.800**	**0.2855**	**0.0542**	**0.99780**	**0.1070**	**0.0014**	**1619**	**272**	**1676**	**156**	**1747**	**23**	**8.3**
S36A-z9	**33**	*	**847**	**12**	**0.014**	**99.96**	**99.72**	**4.583**	**0.928**	**0.3009**	**0.0609**	**0.99800**	**0.1100**	**0.0014**	**1696**	**302**	**1746**	**169**	**1807**	**23**	**7.0**
S36A-z9	**34**	*	**839**	**8**	**0.009**	**99.98**	**99.83**	**4.780**	**1.030**	**0.3183**	**0.0686**	**0.99830**	**0.1090**	**0.0014**	**1781**	**335**	**1781**	**181**	**1782**	**23**	**0.1**
S36A-z9	**35**	*	**782**	**10**	**0.013**	**99.98**	**99.83**	**4.138**	**0.731**	**0.2773**	**0.0489**	**0.99730**	**0.1080**	**0.0014**	**1578**	**247**	**1662**	**144**	**1770**	**24**	**12.2**
S36A-z9	**36**	*	**780**	**9**	**0.011**	**99.98**	**99.88**	**4.521**	**0.890**	**0.3016**	**0.0594**	**0.99790**	**0.1090**	**0.0014**	**1699**	**294**	**1735**	**164**	**1778**	**24**	**5.0**
S36A-z9	37		759	10	0.013	99.99	99.89	4.028	0.680	0.2689	0.0454	0.99700	0.1090	0.0014	1535	231	1640	137	1776	24	15.2
S36A-z9	**38**	*	**788**	**8**	**0.010**	**99.96**	**99.71**	**4.361**	**0.824**	**0.2929**	**0.0553**	**0.99760**	**0.1080**	**0.0014**	**1656**	**276**	**1705**	**156**	**1766**	**24**	**7.1**
S36A-z9	**39**	*	**757**	**9**	**0.012**	**99.98**	**99.83**	**4.282**	**0.763**	**0.2850**	**0.0508**	**0.99730**	**0.1090**	**0.0014**	**1616**	**255**	**1690**	**147**	**1782**	**24**	**10.5**
S36A-z9	**40**	*	**742**	**8**	**0.011**	**99.97**	**99.77**	**4.281**	**0.755**	**0.2849**	**0.0502**	**0.99710**	**0.1090**	**0.0015**	**1616**	**252**	**1690**	**145**	**1783**	**24**	**10.6**
S36A-z9	**41**	*	**740**	**7**	**0.009**	**99.95**	**99.64**	**4.151**	**0.725**	**0.2834**	**0.0494**	**0.99700**	**0.1060**	**0.0014**	**1608**	**248**	**1664**	**143**	**1736**	**25**	**8.3**
S36A-z9	42		697	5	0.008	99.96	99.7	3.957	0.624	0.2632	0.0415	0.99630	0.1090	0.0015	1506	212	1625	128	1783	25	17.4
S36A-z9	**43**	*	**727**	**9**	**0.012**	**99.97**	**99.76**	**4.337**	**0.775**	**0.2914**	**0.0520**	**0.99720**	**0.1080**	**0.0014**	**1649**	**260**	**1700**	**147**	**1765**	**25**	**7.5**
S36A-z9	**44**	*	**728**	**7**	**0.010**	**99.96**	**99.7**	**4.134**	**0.676**	**0.2748**	**0.0449**	**0.99660**	**0.1090**	**0.0015**	**1565**	**227**	**1661**	**134**	**1785**	**25**	**13.9**
S36A-z9	**45**	*	**757**	**8**	**0.010**	**99.98**	**99.82**	**4.118**	**0.694**	**0.2756**	**0.0464**	**0.99680**	**0.1080**	**0.0015**	**1569**	**234**	**1658**	**138**	**1773**	**24**	**13.0**
S36A-z9	**46**	*	**738**	**5**	**0.007**	**99.98**	**99.88**	**4.178**	**0.706**	**0.2794**	**0.0472**	**0.99680**	**0.1080**	**0.0015**	**1589**	**238**	**1670**	**138**	**1773**	**25**	**11.7**
S36A-z9	**47**	*	**755**	**6**	**0.008**	**100**	**100**	**4.381**	**0.782**	**0.2881**	**0.0514**	**0.99730**	**0.1100**	**0.0015**	**1632**	**257**	**1709**	**147**	**1804**	**24**	**10.8**
S36A-z9	**48**	*	**712**	**7**	**0.009**	**100**	**100**	**3.996**	**0.637**	**0.2697**	**0.0430**	**0.99640**	**0.1070**	**0.0014**	**1539**	**218**	**1633**	**130**	**1757**	**25**	**13.9**
S36A-z9	**49**	*	**682**	**7**	**0.010**	**99.98**	**99.83**	**3.968**	**0.612**	**0.2660**	**0.0410**	**0.99610**	**0.1080**	**0.0015**	**1521**	**209**	**1628**	**125**	**1769**	**25**	**15.8**
S36A-z9	**50**	*	**705**	**5**	**0.008**	**99.95**	**99.64**	**4.141**	**0.689**	**0.2790**	**0.0464**	**0.99670**	**0.1080**	**0.0015**	**1586**	**234**	**1662**	**136**	**1760**	**25**	**11.1**
S36A-z9	51		691	7	0.010	99.99	99.94	3.945	0.611	0.2658	0.0412	0.99620	0.1080	0.0014	1520	210	1623	126	1760	25	15.3
S36A-z9	52		706	6	0.008	99.98	99.88	3.925	0.604	0.2639	0.0406	0.99620	0.1080	0.0014	1510	207	1619	125	1764	24	16.2
S36A-z9	**53**	*	**725**	**6**	**0.008**	**99.99**	**99.94**	**4.219**	**0.709**	**0.2827**	**0.0475**	**0.99690**	**0.1080**	**0.0014**	**1605**	**239**	**1678**	**138**	**1770**	**24**	**10.5**
S36A-z9	**54**	*	**712**	**6**	**0.008**	**99.98**	**99.89**	**4.141**	**0.669**	**0.2770**	**0.0447**	**0.99660**	**0.1080**	**0.0014**	**1576**	**226**	**1663**	**132**	**1773**	**24**	**12.5**
S36A-z9	55		738	6	0.009	100	100	4.037	0.627	0.2682	0.0416	0.99640	0.1090	0.0014	1532	212	1642	126	1785	24	15.9
S36A-z9	**56**	*	**784**	**8**	**0.010**	**100**	**100**	**4.047**	**0.652**	**0.2708**	**0.0436**	**0.99680**	**0.1080**	**0.0014**	**1545**	**221**	**1644**	**131**	**1772**	**24**	**14.4**
S36A-z9	57		761	6	0.008	99.99	99.9	3.916	0.583	0.2603	0.0387	0.99620	0.1090	0.0014	1491	198	1617	120	1785	24	18.4
S36A-z9	**58**	*	**773**	**5**	**0.006**	**99.97**	**99.78**	**3.991**	**0.620**	**0.2680**	**0.0416**	**0.99650**	**0.1080**	**0.0014**	**1531**	**212**	**1632**	**126**	**1766**	**24**	**15.0**
S36A-z9	59		755	5	0.007	99.99	99.95	3.806	0.549	0.2579	0.0372	0.99600	0.1070	0.0014	1479	191	1594	116	1749	24	17.2
Sample S36A, zircon 10: Type 1B																					
S36A-z10	1		1105	32	0.029	94.89	70.64	3.267	0.589	0.2209	0.0390	0.98270	0.1070	0.0036	1287	206	1473	140	1753	61	29.3
S36A-z10	**2**	*	**975**	**18**	**0.018**	**98.11**	**87.39**	**4.514**	**0.900**	**0.2968**	**0.0589**	**0.99470**	**0.1100**	**0.0023**	**1675**	**293**	**1734**	**166**	**1805**	**37**	**8.2**
S36A-z10	**3**	*	**940**	**11**	**0.012**	**98.86**	**91.76**	**4.835**	**1.010**	**0.3301**	**0.0685**	**0.99620**	**0.1060**	**0.0019**	**1839**	**332**	**1791**	**175**	**1736**	**33**	**-6.8**
S36A-z10	**4**	*	**902**	**11**	**0.013**	**99.04**	**92.98**	**5.052**	**1.060**	**0.3449**	**0.0724**	**0.99660**	**0.1060**	**0.0018**	**1910**	**347**	**1828**	**178**	**1736**	**32**	**-11.6**
S36A-z10	5		834	8	0.010	99.37	95.29	5.321	1.140	0.3640	0.0778	0.99710	0.1060	0.0017	2001	368	1872	183	1732	30	-18.1
S36A-z10	**6**	*	**838**	**9**	**0.011**	**99.7**	**97.74**	**5.251**	**1.080**	**0.3546**	**0.0726**	**0.99730**	**0.1070**	**0.0016**	**1957**	**345**	**1861**	**175**	**1756**	**28**	**-13.2**
S36A-z10	7		820	12	0.015	99.79	98.39	5.530	1.190	0.3749	0.0804	0.99760	0.1070	0.0016	2052	377	1905	185	1748	27	-20.4
S36A-z10	8		796	11	0.014	99.86	98.89	5.516	1.180	0.3749	0.0805	0.99760	0.1070	0.0016	2053	377	1903	185	1744	27	-20.7
S36A-z10	9		796	11	0.013	99.82	98.62	5.563	1.190	0.3752	0.0803	0.99750	0.1080	0.0016	2054	376	1910	184	1758	28	-19.7
S36A-z10	10		807	12	0.015	99.83	98.66	6.143	1.510	0.4178	0.1030	0.99820	0.1070	0.0016	2250	468	1996	215	1743	27	-34.6
S36A-z10	11		765	11	0.014	99.81	98.52	5.240	1.050	0.3594	0.0716	0.99700	0.1060	0.0016	1979	340	1859	170	1727	28	-17.0
S36A-z10	12		770	10	0.013	99.8	98.5	5.520	1.180	0.3768	0.0802	0.99740	0.1060	0.0016	2061	375	1904	183	1736	28	-21.9
S36A-z10	13		768	10	0.014	99.95	99.61	5.880	1.300	0.3877	0.0857	0.99780	0.1100	0.0016	2112	398	1958	192	1799	27	-20.5
S36A-z10	14		783	11	0.014	99.96	99.67	5.713	1.220	0.3817	0.0816	0.99770	0.1090	0.0016	2084	381	1933	185	1775	27	-20.4
S36A-z10	**15**	*	**788**	**11**	**0.014**	**99.95**	**99.61**	**5.389**	**1.110**	**0.3612**	**0.0744**	**0.99750**	**0.1080**	**0.0016**	**1988**	**352**	**1883**	**176**	**1769**	**27**	**-14.4**
S36A-z10	16		758	12	0.016	99.92	99.4	5.523	1.130	0.3670	0.0747	0.99730	0.1090	0.0016	2015	352	1904	175	1785	27	-15.0
S36A-z10	17		749	12	0.016	99.89	99.15	5.697	1.210	0.3806	0.0807	0.99750	0.1090	0.0016	2079	377	1931	183	1775	28	-20.1
S36A-z10	**18**	*	**707**	**11**	**0.015**	**99.77**	**98.23**	**5.344**	**1.060**	**0.3596**	**0.0715**	**0.99690**	**0.1080**	**0.0017**	**1980**	**339**	**1876**	**170**	**1762**	**29**	**-14.4**
S36A-z10	19		708	12	0.017	99.9	99.24	5.464	1.100	0.3662	0.0740	0.99720	0.1080	0.0017	2012	349	1895	174	1769	28	-16.0
S36A-z10	**20**	*	**678**	**9**	**0.014**	**99.93**	**99.49**	**5.231**	**0.999**	**0.3551**	**0.0678**	**0.99670**	**0.1070**	**0.0016**	**1959**	**322**	**1858**	**163**	**1746**	**28**	**-14.2**
S36A-z10	21		677	12	0.017	99.94	99.57	5.699	1.200	0.3833	0.0805	0.99730	0.1080	0.0017	2092	375	1931	182	1763	28	-21.9
S36A-z10	**22**	*	**645**	**10**	**0.016**	**99.89**	**99.17**	**5.079**	**0.927**	**0.3460**	**0.0631**	**0.99610**	**0.1060**	**0.0017**	**1915**	**302**	**1833**	**155**	**1740**	**30**	**-11.6**
S36A-z10	**23**	*	**645**	**12**	**0.019**	**99.91**	**99.33**	**5.341**	**1.020**	**0.3546**	**0.0676**	**0.99650**	**0.1090**	**0.0017**	**1956**	**322**	**1875**	**163**	**1787**	**29**	**-11.0**
S36A-z10	**24**	*	**650**	**12**	**0.018**	**99.91**	**99.32**	**5.182**	**0.967**	**0.3492**	**0.0651**	**0.99630**	**0.1080**	**0.0017**	**1931**	**311**	**1850**	**159**	**1760**	**29**	**-11.2**
S36A-z10	**25**	*	**673**	**10**	**0.015**	**99.9**	**99.25**	**5.544**	**1.120**	**0.3720**	**0.0750**	**0.99690**	**0.1080**	**0.0017**	**2039**	**352**	**1907**	**174**	**1767**	**29**	**-18.0**
S36A-z10	**26**	*	**625**	**12**	**0.020**	**99.88**	**99.11**	**5.035**	**0.879**	**0.3339**	**0.0582**	**0.99570**	**0.1090**	**0.0018**	**1857**	**281**	**1825**	**148**	**1789**	**30**	**-4.4**
S36A-z10	**27**	*	**630**	**10**	**0.016**	**99.88**	**99.1**	**5.086**	**0.921**	**0.3428**	**0.0620**	**0.99600**	**0.1080**	**0.0017**	**1900**	**298**	**1834**	**154**	**1759**	**30**	**-9.3**
S36A-z10	**28**	*	**620**	**9**	**0.015**	**99.89**	**99.18**	**5.054**	**0.888**	**0.3368**	**0.0591**	**0.99580**	**0.1090**	**0.0018**	**1871**	**285**	**1828**	**149**	**1780**	**30**	**-5.9**
S36A-z10	**29**	*	**597**	**11**	**0.019**	**99.91**	**99.32**	**4.855**	**0.816**	**0.3297**	**0.0554**	**0.99530**	**0.1070**	**0.0017**	**1837**	**268**	**1795**	**142**	**1745**	**30**	**-6.1**
S36A-z10	**30**	*	**628**	**8**	**0.013**	**99.88**	**99.12**	**5.058**	**0.892**	**0.3372**	**0.0594**	**0.99580**	**0.1090**	**0.0018**	**1873**	**286**	**1829**	**150**	**1779**	**30**	**-6.1**
S36A-z10	**31**	*	**637**	**13**	**0.020**	**99.87**	**99.01**	**4.987**	**0.865**	**0.3377**	**0.0585**	**0.99550**	**0.1070**	**0.0018**	**1875**	**282**	**1817**	**147**	**1751**	**30**	**-8.2**
S36A-z10	**32**	*	**623**	**12**	**0.019**	**99.93**	**99.48**	**4.960**	**0.857**	**0.3335**	**0.0576**	**0.99570**	**0.1080**	**0.0017**	**1855**	**278**	**1813**	**146**	**1764**	**29**	**-5.9**

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
S36A-z10	**33**	*	**614**	**11**	**0.018**	**99.87**	**99.02**	**4.855**	**0.824**	**0.3318**	**0.0562**	**0.99530**	**0.1060**	**0.0017**	**1847**	**272**	**1795**	**143**	**1734**	**30**	**-7.5**
S36A-z10	**34**	*	**607**	**13**	**0.021**	**99.91**	**99.34**	**4.809**	**0.777**	**0.3198**	**0.0516**	**0.99500**	**0.1090**	**0.0018**	**1789**	**252**	**1787**	**136**	**1784**	**29**	**-0.3**
S36A-z10	**35**	*	**617**	**9**	**0.015**	**99.91**	**99.35**	**4.830**	**0.778**	**0.3189**	**0.0513**	**0.99500**	**0.1100**	**0.0018**	**1784**	**251**	**1790**	**135**	**1797**	**29**	**0.8**
S36A-z10	**36**	*	**605**	**10**	**0.017**	**99.9**	**99.25**	**4.616**	**0.715**	**0.3144**	**0.0486**	**0.99440**	**0.1060**	**0.0017**	**1762**	**238**	**1752**	**129**	**1740**	**30**	**-1.5**
S36A-z10	**37**	*	**614**	**9**	**0.015**	**99.87**	**98.98**	**4.670**	**0.741**	**0.3140**	**0.0497**	**0.99470**	**0.1080**	**0.0018**	**1760**	**244**	**1762**	**133**	**1764**	**30**	**0.3**
S36A-z10	**38**	*	**617**	**13**	**0.020**	**99.84**	**98.81**	**4.464**	**0.660**	**0.3023**	**0.0446**	**0.99370**	**0.1070**	**0.0018**	**1703**	**221**	**1724**	**123**	**1751**	**30**	**3.2**
S36A-z10	**39**	*	**656**	**11**	**0.016**	**99.88**	**99.13**	**4.929**	**0.825**	**0.3267**	**0.0546**	**0.99530**	**0.1090**	**0.0018**	**1822**	**265**	**1807**	**141**	**1790**	**29**	**-2.1**
S36A-z10	**40**	*	**620**	**9**	**0.014**	**99.89**	**99.21**	**4.705**	**0.728**	**0.3097**	**0.0478**	**0.99450**	**0.1100**	**0.0018**	**1739**	**236**	**1768**	**130**	**1802**	**29**	**4.0**
S36A-z10	**41**	*	**635**	**12**	**0.019**	**99.91**	**99.35**	**4.670**	**0.724**	**0.3120**	**0.0483**	**0.99460**	**0.1090**	**0.0017**	**1750**	**237**	**1762**	**130**	**1776**	**29**	**1.7**
S36A-z10	**42**	*	**642**	**12**	**0.018**	**99.9**	**99.22**	**4.726**	**0.743**	**0.3135**	**0.0492**	**0.99480**	**0.1090**	**0.0018**	**1758**	**241**	**1772**	**132**	**1789**	**29**	**2.0**
S36A-z10	**43**	*	**610**	**13**	**0.022**	**99.88**	**99.07**	**4.419**	**0.638**	**0.2939**	**0.0423**	**0.99370**	**0.1090**	**0.0018**	**1661**	**211**	**1716**	**119**	**1784**	**30**	**7.8**
S36A-z10	**44**	*	**616**	**7**	**0.011**	**99.93**	**99.5**	**4.526**	**0.673**	**0.3024**	**0.0449**	**0.99420**	**0.1090**	**0.0017**	**1703**	**222**	**1736**	**124**	**1775**	**29**	**4.6**
S36A-z10	**45**	*	**618**	**10**	**0.017**	**99.95**	**99.65**	**4.392**	**0.634**	**0.2909**	**0.0420**	**0.99400**	**0.1090**	**0.0017**	**1646**	**210**	**1711**	**119**	**1791**	**29**	**9.2**
S36A-z10	**46**	*	**623**	**10**	**0.015**	**99.92**	**99.43**	**4.516**	**0.672**	**0.3011**	**0.0447**	**0.99420**	**0.1090**	**0.0017**	**1697**	**222**	**1734**	**124**	**1779**	**29**	**5.3**
S36A-z10	**47**	*	**629**	**12**	**0.019**	**99.93**	**99.43**	**4.505**	**0.670**	**0.3023**	**0.0449**	**0.99420**	**0.1080**	**0.0017**	**1703**	**222**	**1732**	**123**	**1767**	**29**	**4.1**
S36A-z10	**48**	*	**645**	**10**	**0.015**	**99.9**	**99.22**	**4.519**	**0.674**	**0.2996**	**0.0446**	**0.99420**	**0.1090**	**0.0018**	**1689**	**221**	**1735**	**124**	**1790**	**29**	**6.4**
S36A-z10	**49**	*	**655**	**10**	**0.015**	**99.92**	**99.43**	**4.610**	**0.698**	**0.3064**	**0.0463**	**0.99440**	**0.1090**	**0.0017**	**1723**	**229**	**1751**	**126**	**1785**	**29**	**4.0**
S36A-z10	**50**	*	**643**	**13**	**0.020**	**99.93**	**99.51**	**4.399**	**0.624**	**0.2921**	**0.0414**	**0.99360**	**0.1090**	**0.0017**	**1652**	**206**	**1712**	**117**	**1787**	**29**	**8.6**
S36A-z10	**51**	*	**651**	**10**	**0.015**	**99.91**	**99.28**	**4.433**	**0.646**	**0.3005**	**0.0437**	**0.99380**	**0.1070**	**0.0017**	**1694**	**217**	**1719**	**121**	**1749**	**30**	**3.6**
S36A-z10	**52**	*	**626**	**11**	**0.017**	**99.91**	**99.27**	**4.201**	**0.575**	**0.2861**	**0.0391**	**0.99290**	**0.1060**	**0.0017**	**1622**	**196**	**1674**	**112**	**1740**	**30**	**7.7**
S36A-z10	**53**	*	**634**	**11**	**0.018**	**99.92**	**99.38**	**4.345**	**0.598**	**0.2860**	**0.0393**	**0.99310**	**0.1100**	**0.0018**	**1622**	**197**	**1702**	**114**	**1802**	**29**	**11.3**
S36A-z10	**54**	*	**641**	**10**	**0.016**	**99.87**	**99**	**4.288**	**0.602**	**0.2871**	**0.0402**	**0.99330**	**0.1080**	**0.0018**	**1627**	**202**	**1691**	**116**	**1771**	**30**	**9.2**
S36A-z10	**55**	*	**639**	**11**	**0.018**	**99.92**	**99.36**	**4.234**	**0.589**	**0.2848**	**0.0395**	**0.99340**	**0.1080**	**0.0017**	**1616**	**198**	**1681**	**114**	**1763**	**29**	**9.5**
S36A-z10	**56**	*	**652**	**13**	**0.020**	**99.92**	**99.37**	**4.363**	**0.628**	**0.2949**	**0.0423**	**0.99380**	**0.1070**	**0.0017**	**1666**	**211**	**1705**	**119**	**1754**	**29**	**5.7**
S36A-z10	**57**	*	**647**	**11**	**0.017**	**99.85**	**98.86**	**4.081**	**0.543**	**0.2757**	**0.0366**	**0.99240**	**0.1070**	**0.0018**	**1570**	**185**	**1650**	**108**	**1755**	**30**	**11.9**
S36A-z10	58		647	12	0.018	99.92	99.39	4.127	0.526	0.2707	0.0344	0.99200	0.1110	0.0018	1544	175	1660	104	1809	29	16.4
S36A-z10	**59**	*	**665**	**11**	**0.017**	**99.89**	**99.14**	**4.304**	**0.610**	**0.2908**	**0.0412**	**0.99350**	**0.1070**	**0.0017**	**1645**	**206**	**1694**	**117**	**1755**	**30**	**7.1**
Sample S36A, zircon 11: Type 1A																					
S36A-z11	1		1318	107	0.081	98.98	92.52	2.406	0.554	0.1653	0.0379	0.99570	0.1060	0.0023	986	210	1244	165	1724	39	46.1
S36A-z11	2		1094	37	0.033	99.74	98.09	3.370	0.787	0.2250	0.0525	0.99780	0.1090	0.0017	1308	276	1497	183	1776	29	29.0
S36A-z11	**3**	*	**1044**	**20**	**0.019**	**99.87**	**99.05**	**4.411**	**1.250**	**0.2954**	**0.0834**	**0.99860**	**0.1080**	**0.0016**	**1668**	**415**	**1714**	**234**	**1771**	**27**	**6.6**
S36A-z11	**4**	*	**989**	**10**	**0.010**	**99.97**	**99.74**	**4.087**	**0.997**	**0.2751**	**0.0671**	**0.99820**	**0.1080**	**0.0016**	**1567**	**339**	**1652**	**199**	**1761**	**26**	**12.4**
S36A-z11	**5**	*	**954**	**9**	**0.010**	**99.98**	**99.83**	**4.475**	**1.190**	**0.3063**	**0.0816**	**0.99850**	**0.1060**	**0.0015**	**1723**	**403**	**1726**	**221**	**1731**	**27**	**0.6**
S36A-z11	**6**	*	**946**	**8**	**0.008**	**99.94**	**99.51**	**4.330**	**1.100**	**0.2933**	**0.0743**	**0.99830**	**0.1070**	**0.0016**	**1658**	**370**	**1699**	**209**	**1750**	**27**	**6.0**
S36A-z11	**7**	*	**941**	**7**	**0.008**	**99.85**	**98.8**	**4.180**	**1.000**	**0.2877**	**0.0691**	**0.99800**	**0.1050**	**0.0016**	**1630**	**346**	**1670**	**197**	**1721**	**28**	**6.0**
S36A-z11	**8**	*	**914**	**8**	**0.009**	**99.96**	**99.66**	**4.319**	**1.050**	**0.2975**	**0.0725**	**0.99820**	**0.1050**	**0.0015**	**1679**	**360**	**1697**	**201**	**1719**	**27**	**2.6**
S36A-z11	**9**	*	**903**	**6**	**0.007**	**100**	**100**	**4.406**	**1.090**	**0.2969**	**0.0731**	**0.99830**	**0.1080**	**0.0015**	**1676**	**363**	**1714**	**204**	**1760**	**26**	**5.4**
S36A-z11	**10**	*	**927**	**6**	**0.006**	**100**	**100**	**4.381**	**1.100**	**0.2972**	**0.0744**	**0.99840**	**0.1070**	**0.0015**	**1678**	**370**	**1709**	**207**	**1747**	**26**	**4.5**
S36A-z11	**11**	*	**906**	**8**	**0.009**	**99.99**	**99.92**	**4.315**	**1.040**	**0.2945**	**0.0710**	**0.99820**	**0.1060**	**0.0015**	**1664**	**354**	**1696**	**199**	**1736**	**26**	**4.7**
S36A-z11	**12**	*	**890**	**8**	**0.009**	**99.97**	**99.75**	**4.281**	**1.000**	**0.2892**	**0.0675**	**0.99810**	**0.1070**	**0.0016**	**1637**	**338**	**1690**	**192**	**1755**	**27**	**7.6**
S36A-z11	**13**	*	**883**	**5**	**0.006**	**99.98**	**99.83**	**4.349**	**1.040**	**0.2996**	**0.0717**	**0.99820**	**0.1050**	**0.0015**	**1689**	**356**	**1703**	**198**	**1719**	**27**	**2.0**
S36A-z11	**14**	*	**890**	**5**	**0.005**	**100**	**100**	**4.732**	**1.230**	**0.3218**	**0.0838**	**0.99850**	**0.1070**	**0.0015**	**1798**	**409**	**1773**	**218**	**1743**	**26**	**-3.6**
S36A-z11	**15**	*	**874**	**7**	**0.008**	**100**	**100**	**4.439**	**1.060**	**0.2969**	**0.0708**	**0.99820**	**0.1080**	**0.0015**	**1676**	**352**	**1720**	**198**	**1773**	**26**	**6.2**
S36A-z11	**16**	*	**898**	**9**	**0.010**	**100**	**100**	**4.498**	**1.090**	**0.3042**	**0.0734**	**0.99830**	**0.1070**	**0.0015**	**1712**	**363**	**1731**	**201**	**1753**	**26**	**2.7**
S36A-z11	**17**	*	**864**	**10**	**0.012**	**99.99**	**99.93**	**4.232**	**0.914**	**0.2815**	**0.0608**	**0.99780**	**0.1090**	**0.0016**	**1599**	**306**	**1680**	**177**	**1783**	**26**	**11.6**
S36A-z11	**18**	*	**856**	**7**	**0.008**	**99.98**	**99.84**	**4.445**	**1.050**	**0.3032**	**0.0713**	**0.99820**	**0.1060**	**0.0015**	**1707**	**353**	**1721**	**195**	**1737**	**26**	**1.9**
S36A-z11	**19**	*	**870**	**8**	**0.010**	**100**	**100**	**4.260**	**0.920**	**0.2819**	**0.0609**	**0.99790**	**0.1100**	**0.0015**	**1601**	**306**	**1686**	**178**	**1793**	**26**	**12.1**
S36A-z11	**20**	*	**863**	**7**	**0.008**	**100**	**100**	**4.256**	**0.943**	**0.2899**	**0.0642**	**0.99800**	**0.1060**	**0.0015**	**1641**	**321**	**1685**	**182**	**1740**	**26**	**6.4**
S36A-z11	**21**	*	**859**	**9**	**0.011**	**100**	**100**	**4.307**	**0.935**	**0.2901**	**0.0629**	**0.99790**	**0.1080**	**0.0015**	**1642**	**314**	**1695**	**179**	**1760**	**26**	**7.6**
S36A-z11	**22**	*	**887**	**11**	**0.012**	**100**	**100**	**4.414**	**0.982**	**0.2953**	**0.0656**	**0.99800**	**0.1080**	**0.0015**	**1668**	**327**	**1715**	**184**	**1773**	**26**	**6.7**
S36A-z11	**23**	*	**853**	**8**	**0.010**	**100**	**100**	**4.318**	**0.922**	**0.2886**	**0.0616**	**0.99780**	**0.1090**	**0.0015**	**1634**	**308**	**1697**	**176**	**1775**	**26**	**9.0**
S36A-z11	**24**	*	**813**	**12**	**0.015**	**100**	**100**	**4.070**	**0.817**	**0.2730**	**0.0548**	**0.99750**	**0.1080**	**0.0015**	**1556**	**277**	**1648**	**164**	**1768**	**26**	**13.5**
S36A-z11	**25**	*	**801**	**10**	**0.013**	**100**	**100**	**4.312**	**0.904**	**0.2865**	**0.0600**	**0.99770**	**0.1090**	**0.0016**	**1624**	**301**	**1696**	**173**	**1785**	**26**	**10.2**
S36A-z11	**26**	*	**798**	**9**	**0.011**	**100**	**100**	**4.005**	**0.775**	**0.2685**	**0.0519**	**0.99720**	**0.1080**	**0.0016**	**1533**	**264**	**1635**	**157**	**1769**	**26**	**15.0**
S36A-z11	27		815	12	0.015	99.99	99.93	4.005	0.781	0.2677	0.0522	0.99730	0.1080	0.0016	1529	265	1635	158	1774	26	15.5
S36A-z11	**28**	*	**813**	**9**	**0.011**	**99.98**	**99.84**	**4.081**	**0.827**	**0.2771**	**0.0561**	**0.99740**	**0.1070**	**0.0015**	**1577**	**283**	**1651**	**165**	**1746**	**27**	**10.9**
S36A-z11	29		778	12	0.015	100	100	4.073	0.789	0.2704	0.0524	0.99720	0.1090	0.0016	1543	266	1649	158	1787	26	15.4
S36A-z11	30		774	13	0.016	100	100	3.877	0.722	0.2604	0.0484	0.99700	0.1080	0.0016	1492	248	1609	150	1766	27	17.4
S36A-z11	**31**	*	**757**	**11**	**0.015**	**100**	**100**	**4.052**	**0.788**	**0.2751**	**0.0534**	**0.99720**	**0.1070**	**0.0016**	**1567**	**270**	**1645**	**158**	**1746**	**27**	**11.6**
S36A-z11	32		749	11	0.015	100	100	3.908	0.710	0.2596	0.0471	0.99670	0.1090	0.0016	1488	241	1615	147	1786	27	18.7
S36A-z11	**33**	*	**756**	**11**	**0.015**	**99.99**	**99.92**	**4.145**	**0.821**	**0.2769**	**0.0548**	**0.99720**	**0.1090**	**0.0016**	**1576**	**277**	**1663**	**162**	**1776**	**27**	**12.7**
S36A-z11	**34**	*	**727**	**10**	**0.014**	**99.98**	**99.84**	**3.987**	**0.755**	**0.2681**	**0.0507**	**0.99690**	**0.1080**	**0.0016**	**1531**	**258**	**1632**	**154**	**1764**	**27**	**14.8**
S36A-z11	35		705	10	0.014	99.99	99.92	3.883	0.690	0.2588	0.0460	0.99640	0.1090	0.0016	1484	235	1610	144	1780	28	18.6
S36A-z11	36		722	11	0.015	99.98	99.83	4.000	0.758	0.2657	0.0503	0.99690	0.1090	0.0016	1519	256	1634	154	1786	27	16.8
S36A-z11	37		713	12	0.016	100	100	4.103	0.778	0.2689	0.0510	0.99690	0.1110	0.0017	1535	259	1655	155	1810	27	17.0
S36A-z11	38		692	11	0.015	100	100	3.887	0.699	0.2592	0.0465	0.99640	0.1090	0.0017	1486	238	1611	145	1778	28	18.4
S36A-z11	39		678	10	0.015	100	100	3.868	0.681	0.2568	0.0452	0.99620	0.1090	0.0017	1474	232	1607	142	1787	28	19.6
S36A-z11	40		686	12	0.018	100	100	3.965	0.732	0.2639	0.0487	0.99660	0.1090	0.0017	1510	248	1627	150	1782	28	17.1
S36A-z11	41		693	8	0.011	100	100	4.246	0.839	0.2823	0.0557	0.99700	0.1090	0.0017	1603	280	1683	162	1784	28	11.4
S36A-z11	42		687	11	0.017	100	100	4.122	0.764	0.2719	0.0503	0.99660	0.1100	0.0017	1550	255	1659	151	1799	28	15.6
S36A-z11	43		685	11	0.016	100	100	4.005	0.716	0.2659	0.0475	0.99630	0.1090	0.0017	1520	242	1635	145	1787	28	16.8
S36A-z11	44		661	8	0.012	100	100	3.958	0.664	0.2575	0.0431	0.99590	0.1110	0.0017	1477	221	1626	136	1824	28	21.3
S36A-z11	45		656	12	0.018	100	100	4.190	0.715	0.2674	0.0456	0.99610	0.1140	0.0017	1527	232	1672	140	1859	27	20.0
S36A-z11	46		656	11	0.017	100	100	4.110	0.640	0.2558	0.0398	0.99540	0.1170	0.0017	1468	204	1656	127	1904	27	25.6
S36A-z11	47		691	13	0.019	100	100	4.370	0.716	0.2663	0.0436	0.99600	0.1190	0.0017	1522	222	1707	135	1942	26	24.3
S36A-z11	48		689	12	0.018	100	100	4.595	0.753	0.2718	0.0445	0.99610	0.1230	0.0018	1550	225	1748	137	1994	26	25.0
S36A-z11	49		689	14	0.020	100	100	4.782	0.771	0.2778	0.0448	0.99600	0.1250	0.0018	1580	226	1782	135	2027	26	24.8
S36A-z11	50		696	15	0.022	99.99	99.94	5.027	0.844	0.2871	0.0482	0.99640	0.1270	0.0018	1627	241	1824	142	2057	25	23.6
S36A-z11	51		667	13	0.020	99.98	99.88	4.937	0.774	0.2767	0.0433	0.99590	0.1290	0.0018	1575	219	1809	132	2090	25	27.7
S36A-z11	52		692	19	0.027	100	100	5.134	0.817	0.2840	0.0451	0.99600	0.1310	0.0019	1611	227	1842	135	2113	25	26.8
S36A-z11	53		688	15	0.022	100	100	4.913	0.738	0.2757	0.0414	0.99550	0.1290	0.0018	1570	209	1805	127	2088	25	27.9

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
	cycle		ppm	ppm	ppm	^{206}Pb*	^{207}Pb*	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.		
S36A-z11	54		670	21	0.031	100	100	5.272	0.832	0.2891	0.0456	0.99600	0.1320	0.0019	1637	228	1864	135	2128	25		26.1
S36A-z11	55		677	15	0.022	100	100	5.094	0.751	0.2740	0.0403	0.99540	0.1350	0.0019	1561	204	1835	125	2162	25		31.2
S36A-z11	56		701	26	0.037	100	100	5.406	0.820	0.2832	0.0429	0.99570	0.1380	0.0019	1607	216	1886	130	2208	24		30.7
S36A-z11	57		687	19	0.028	100	100	5.390	0.807	0.2840	0.0425	0.99560	0.1380	0.0019	1612	213	1883	128	2198	24		30.1
S36A-z11	58		660	22	0.033	99.99	99.95	5.624	0.868	0.2939	0.0453	0.99580	0.1390	0.0020	1661	226	1920	133	2212	24		28.2
S36A-z11	59		674	22	0.032	99.98	99.9	5.530	0.846	0.2873	0.0439	0.99580	0.1400	0.0020	1628	220	1905	131	2222	24		30.2
Sample S36A, zircon 13: Type 1B																						
S36A-z13	1		874	57	0.065	90.51	57.99	3.763	0.805	0.2277	0.0475	0.97850	0.1200	0.0053	1322	249	1585	172	1955	79		35.8
S36A-z13	2		735	26	0.036	93.8	65.96	4.671	1.090	0.3196	0.0738	0.98710	0.1060	0.0040	1788	361	1762	196	1732	69		-3.7
S36A-z13	3		731	15	0.020	96.62	78.58	4.589	1.030	0.3136	0.0701	0.99200	0.1060	0.0030	1758	344	1747	188	1734	52		-1.6
S36A-z13	4		774	13	0.017	98.19	87.54	6.277	1.970	0.4255	0.1330	0.99740	0.1070	0.0024	2285	602	2015	275	1749	41		-36.5
S36A-z13	5		773	18	0.024	98.98	92.5	5.461	1.520	0.3756	0.1040	0.99760	0.1050	0.0020	2056	489	1894	239	1722	35		-22.7
S36A-z13	6		779	8	0.010	99.35	95.14	5.603	1.610	0.3824	0.1100	0.99820	0.1060	0.0018	2087	513	1917	248	1736	31		-23.8
S36A-z13	7		800	7	0.009	99.61	97.12	5.433	1.480	0.3647	0.0995	0.99840	0.1080	0.0017	2005	470	1890	234	1767	29		-15.6
S36A-z13	8		814	8	0.009	99.65	97.31	5.812	1.720	0.4019	0.1190	0.99870	0.1050	0.0016	2178	548	1948	257	1712	28		-32.1
S36A-z13	9		860	7	0.008	99.89	99.16	5.677	1.620	0.3828	0.1090	0.99880	0.1080	0.0015	2089	509	1928	246	1758	26		-22.1
S36A-z13	**10**	*	**856**	**5**	**0.005**	**99.95**	**99.6**	**5.362**	**1.380**	**0.3610**	**0.0928**	**0.99860**	**0.1080**	**0.0015**	**1987**	**439**	**1879**	**220**	**1762**	**25**		**-14.8**
S36A-z13	11		901	6	0.007	99.95	99.6	5.951	1.760	0.3981	0.1180	0.99900	0.1080	0.0015	2161	542	1969	257	1773	25		-25.7
S36A-z13	12		901	7	0.007	99.95	99.62	5.769	1.610	0.3864	0.1080	0.99890	0.1080	0.0014	2106	500	1942	241	1771	24		-22.2
S36A-z13	13		910	5	0.005	99.95	99.62	5.775	1.600	0.3852	0.1070	0.99890	0.1090	0.0014	2101	497	1943	240	1778	24		-21.3
S36A-z13	14		922	6	0.007	99.96	99.69	5.660	1.520	0.3760	0.1010	0.99880	0.1090	0.0014	2057	474	1925	232	1786	24		-17.8
S36A-z13	**15**	*	**924**	**4**	**0.004**	**99.98**	**99.82**	**5.400**	**1.330**	**0.3601**	**0.0884**	**0.99860**	**0.1090**	**0.0014**	**1982**	**419**	**1885**	**210**	**1779**	**24**		**-13.3**
S36A-z13	16		969	6	0.006	99.98	99.88	5.632	1.490	0.3776	0.1000	0.99880	0.1080	0.0014	2065	468	1921	229	1769	23		-19.6
S36A-z13	**17**	*	**944**	**6**	**0.006**	**99.99**	**99.89**	**5.074**	**1.150**	**0.3381**	**0.0766**	**0.99840**	**0.1090**	**0.0014**	**1878**	**369**	**1832**	**192**	**1780**	**24**		**-6.3**
S36A-z13	18		1010	4	0.004	99.97	99.77	5.833	1.580	0.3891	0.1050	0.99890	0.1090	0.0014	2119	488	1951	234	1778	23		-22.5
S36A-z13	**19**	*	**923**	**4**	**0.004**	**99.99**	**99.94**	**5.107**	**1.150**	**0.3433**	**0.0773**	**0.99840**	**0.1080**	**0.0014**	**1902**	**371**	**1837**	**191**	**1764**	**23**		**-9.1**
S36A-z13	**20**	*	**934**	**7**	**0.007**	**99.99**	**99.89**	**5.168**	**1.150**	**0.3439**	**0.0766**	**0.99840**	**0.1090**	**0.0014**	**1905**	**367**	**1847**	**190**	**1783**	**23**		**-7.9**
S36A-z13	**21**	*	**960**	**4**	**0.005**	**99.99**	**99.95**	**5.158**	**1.170**	**0.3495**	**0.0796**	**0.99850**	**0.1070**	**0.0014**	**1932**	**380**	**1846**	**194**	**1750**	**23**		**-12.0**
S36A-z13	**22**	*	**968**	**6**	**0.006**	**99.99**	**99.89**	**5.284**	**1.170**	**0.3480**	**0.0770**	**0.99840**	**0.1100**	**0.0014**	**1925**	**368**	**1866**	**189**	**1802**	**23**		**-7.9**
S36A-z13	**23**	*	**968**	**4**	**0.005**	**100**	**100**	**5.053**	**1.060**	**0.3331**	**0.0701**	**0.99820**	**0.1100**	**0.0014**	**1853**	**339**	**1828**	**179**	**1800**	**23**		**-3.4**
S36A-z13	**24**	*	**981**	**6**	**0.006**	**99.99**	**99.9**	**5.156**	**1.110**	**0.3400**	**0.0733**	**0.99830**	**0.1100**	**0.0014**	**1887**	**352**	**1845**	**183**	**1799**	**23**		**-5.6**
S36A-z13	**25**	*	**949**	**4**	**0.004**	**99.96**	**99.73**	**4.991**	**1.010**	**0.3309**	**0.0671**	**0.99800**	**0.1090**	**0.0014**	**1843**	**325**	**1818**	**172**	**1789**	**23**		**-3.5**
S36A-z13	**26**	*	**970**	**5**	**0.005**	**99.99**	**99.89**	**5.052**	**1.060**	**0.3349**	**0.0703**	**0.99820**	**0.1090**	**0.0014**	**1862**	**340**	**1828**	**178**	**1790**	**23**		**-4.6**
S36A-z13	**27**	*	**947**	**5**	**0.005**	**99.99**	**99.95**	**4.827**	**0.915**	**0.3181**	**0.0603**	**0.99780**	**0.1100**	**0.0014**	**1781**	**295**	**1790**	**159**	**1800**	**23**		**1.2**
S36A-z13	**28**	*	**940**	**5**	**0.005**	**99.99**	**99.89**	**4.767**	**0.912**	**0.3196**	**0.0611**	**0.99780**	**0.1080**	**0.0014**	**1788**	**298**	**1779**	**161**	**1769**	**23**		**-1.2**
S36A-z13	**29**	*	**949**	**5**	**0.005**	**99.99**	**99.9**	**4.858**	**0.934**	**0.3242**	**0.0623**	**0.99790**	**0.1090**	**0.0014**	**1810**	**303**	**1795**	**162**	**1778**	**23**		**-2.0**
S36A-z13	**30**	*	**959**	**3**	**0.004**	**99.97**	**99.79**	**4.714**	**0.871**	**0.3140**	**0.0580**	**0.99770**	**0.1090**	**0.0014**	**1761**	**285**	**1770**	**155**	**1781**	**23**		**1.3**
S36A-z13	**31**	*	**993**	**4**	**0.004**	**100**	**100**	**4.956**	**0.967**	**0.3302**	**0.0644**	**0.99800**	**0.1090**	**0.0014**	**1839**	**312**	**1812**	**165**	**1781**	**23**		**-3.7**
S36A-z13	**32**	*	**945**	**6**	**0.006**	**100**	**100**	**4.762**	**0.869**	**0.3182**	**0.0580**	**0.99770**	**0.1090**	**0.0014**	**1781**	**284**	**1778**	**153**	**1775**	**23**		**-0.4**
S36A-z13	**33**	*	**941**	**4**	**0.004**	**100**	**100**	**4.695**	**0.836**	**0.3153**	**0.0561**	**0.99750**	**0.1080**	**0.0014**	**1767**	**275**	**1766**	**149**	**1766**	**23**		**0.0**
S36A-z13	**34**	*	**964**	**3**	**0.003**	**100**	**100**	**4.776**	**0.860**	**0.3160**	**0.0569**	**0.99760**	**0.1100**	**0.0014**	**1770**	**279**	**1781**	**151**	**1793**	**23**		**1.5**
S36A-z13	**35**	*	**941**	**5**	**0.005**	**100**	**100**	**4.603**	**0.780**	**0.3054**	**0.0517**	**0.99730**	**0.1090**	**0.0014**	**1718**	**255**	**1750**	**141**	**1788**	**23**		**4.5**
S36A-z13	**36**	*	**927**	**5**	**0.006**	**99.99**	**99.95**	**4.641**	**0.794**	**0.3112**	**0.0532**	**0.99730**	**0.1080**	**0.0014**	**1747**	**262**	**1757**	**143**	**1768**	**23**		**1.3**
S36A-z13	**37**	*	**920**	**4**	**0.004**	**99.99**	**99.9**	**4.697**	**0.823**	**0.3149**	**0.0551**	**0.99740**	**0.1080**	**0.0014**	**1765**	**270**	**1767**	**147**	**1769**	**23**		**0.3**
S36A-z13	**38**	*	**907**	**5**	**0.006**	**100**	**100**	**4.588**	**0.750**	**0.3026**	**0.0494**	**0.99700**	**0.1100**	**0.0014**	**1704**	**245**	**1747**	**136**	**1799**	**23**		**6.0**
S36A-z13	**39**	*	**913**	**6**	**0.007**	**100**	**100**	**4.627**	**0.761**	**0.3069**	**0.0505**	**0.99710**	**0.1090**	**0.0014**	**1725**	**249**	**1754**	**137**	**1789**	**23**		**4.1**
S36A-z13	**40**	*	**900**	**6**	**0.006**	**100**	**100**	**4.651**	**0.783**	**0.3129**	**0.0526**	**0.99720**	**0.1080**	**0.0014**	**1755**	**258**	**1758**	**141**	**1763**	**23**		**0.5**
S36A-z13	**41**	*	**908**	**5**	**0.005**	**100**	**100**	**4.662**	**0.779**	**0.3102**	**0.0518**	**0.99720**	**0.1090**	**0.0014**	**1742**	**255**	**1761**	**140**	**1783**	**23**		**2.7**
S36A-z13	**42**	*	**895**	**5**	**0.006**	**100**	**100**	**4.540**	**0.716**	**0.3010**	**0.0474**	**0.99680**	**0.1090**	**0.0014**	**1696**	**235**	**1738**	**131**	**1789**	**23**		**5.9**
S36A-z13	**43**	*	**864**	**3**	**0.003**	**100**	**100**	**4.528**	**0.697**	**0.2978**	**0.0458**	**0.99660**	**0.1100**	**0.0014**	**1680**	**227**	**1736**	**128**	**1804**	**23**		**7.8**
S36A-z13	**44**	*	**892**	**6**	**0.006**	**100**	**100**	**4.487**	**0.678**	**0.2944**	**0.0444**	**0.99650**	**0.1110**	**0.0014**	**1663**	**221**	**1729**	**125**	**1808**	**23**		**9.0**
S36A-z13	**45**	*	**900**	**4**	**0.004**	**100**	**100**	**4.471**	**0.688**	**0.2973**	**0.0457**	**0.99660**	**0.1090**	**0.0014**	**1678**	**227**	**1726**	**128**	**1784**	**23**		**6.8**
S36A-z13	**46**	*	**874**	**3**	**0.004**	**100**	**100**	**4.549**	**0.710**	**0.3040**	**0.0474**	**0.99670**	**0.1090**	**0.0014**	**1711**	**234**	**1740**	**130**	**1775**	**23**		**4.1**
S36A-z13	**47**	*	**914**	**5**	**0.005**	**100**	**100**	**4.511**	**0.698**	**0.2996**	**0.0463**	**0.99670**	**0.1090**	**0.0014**	**1689**	**230**	**1733**	**129**	**1786**	**23**		**6.1**
S36A-z13	**48**	*	**919**	**4**	**0.005**	**100**	**100**	**4.595**	**0.727**	**0.3049**	**0.0482**	**0.99690**	**0.1090**	**0.0014**	**1715**	**238**	**1748**	**132**	**1788**	**23**		**4.6**
S36A-z13	**49**	*	**912**	**4**	**0.004**	**99.99**	**99.96**	**4.595**	**0.720**	**0.3036**	**0.0475**	**0.99680**	**0.1100**	**0.0014**	**1709**	**235**	**1748**	**131**	**1795**	**23**		**5.4**
S36A-z13	**50**	*	**909**	**4**	**0.005**	**99.99**	**99.91**	**4.366**	**0.647**	**0.2913**	**0.0431**	**0.99640**	**0.1090**	**0.0014**	**1648**	**215**	**1706**	**122**	**1778**	**23**		**8.3**
S36A-z13	**51**	*	**926**	**4**	**0.004**	**100**	**100**	**4.549**	**0.729**	**0.3063**	**0.0491**	**0.99700**	**0.1080**	**0.0013**	**1723**	**242**	**1740**	**133**	**1761**	**23**		**2.5**
S36A-z13	**52**	*	**921**	**3**	**0.003**	**100**	**100**	**4.450**	**0.668**	**0.2908**	**0.0436**	**0.99660**	**0.1110**	**0.0014**	**1646**	**218**	**1722**	**124**	**1815**	**22**		**10.5**
S36A-z13	**53**	*	**949**	**4**	**0.005**	**100**	**100**	**4.488**	**0.691**	**0.3006**	**0.0462**	**0.99680**	**0.1080**	**0.0013**	**1694**	**229**	**1729**	**128**	**1771**	**23**		**4.9**
S36A-z13	**54**	*	**936**	**3**	**0.003**	**99.99**	**99.96**	**4.544**	**0.694**	**0.2969**	**0.0453**	**0.99670**	**0.1110**	**0.0014**	**1676**	**225**	**1739**	**127**	**1816**	**22**		**8.8**
S36A-z13	**55**	*	**912**	**6**	**0.006**	**99.98**	**99.82**	**4.390**	**0.653**	**0.2913**	**0.0433**	**0.99650**	**0.1090**	**0.0014**	**1648**	**216**	**1710**	**123**	**1788**	**23**		**8.9**
S36A-z13	**56**	*	**902**	**4**	**0.004**	**99.98**	**99.81**	**4.287**	**0.618**	**0.2836**	**0.0408**	**0.99620**	**0.1100**	**0.0014**	**1609**	**205**	**1691**	**119**	**1793**	**23**		**11.5**
S36A-z13	**57**	*	**944**	**5**	**0.006**	**100**	**100**	**4.450**	**0.678**	**0.2950**	**0.0449**	**0.99670**	**0.1090**	**0.0014**	**1666**	**223**	**1722**	**126**	**1790**	**23**		**7.9**
S36A-z13	**58**	*	**959**	**5**	**0.005**	**100**	**100**	**4.369**	**0.650**	**0.2908**	**0.0432**	**0.99650**	**0.1090**	**0.0014**	**1646**	**216**	**1707**	**123**	**1782**	**23**		**8.7**
S36A-z13	**59**	*	**949**	**4**	**0.004**	**99.99**	**99.91**	**4.241**	**0.610**	**0.2824**	**0.0406**	**0.99630**	**0.1090**	**0.0014**	**1604**	**204**	**1682**	**118**	**1781**	**23**		**11.2**
Sample S36A, zircon 14: Type 2A																						
S36A-z14	1		850	81	0.095	96.6	77.99	2.498	0.510	0.1753	0.0350	0.97930	0.1030	0.0043	1041	192	1271	148	1685	76		41.3
S36A-z14	2		880	40	0.045	98.28	87.8	3.246	0.796	0.2258	0.0550	0.99270	0.1040	0.0031	1312	289	1468	190	1702	54		25.3
S36A-z14	3		878	25	0.028	99.06	93.04	3.549	0.909	0.2440	0.0623	0.99550	0.1050	0.0026	1408	323	1538	203	1723	45		20.4
S36A-z14	4		869	19	0.021	99.48	96.18	3.907	1.040	0.2603	0.0693	0.99680	0.1090	0.0023	1491	355	1615	216	1781	39		18.2
S36A-z14	5		792	14	0.017	99.57	96.83	3.681	0.854	0.2456	0.0568	0.99600	0.1090	0.0023	1416	294	1567	185	1778	38		22.7
S36A-z14	6		837	11	0.013	99.57	96.8	3.736	0.896	0.2475	0.0592	0.99620	0.1090	0.0023	1426	306	1579	192	1791	38		22.7
S36A-z14	7		912	16	0.018	99.69	97.66	3.798	0.958	0.2528	0.0636	0.99690	0.1090	0.0022	1453	327	1592	203	1782	36		20.6
S36A-z14	8		952	18	0.019	99.59	96.99	3.874	1.050	0.2567	0.0697	0.99720	0.1090	0.0022	1473	357	1608	219	1790	37		19.8
S36A-z14	9		940	23	0.024	99.65	97.42	3.479	0.832	0.2318	0.0554	0.99660	0.1090	0.0021	1344	290	1523	189	1780	36		27.1
S36A-z14	10		909	23	0.025	99.84	98.83	3.801	0.954	0.2471	0.0620	0.99740	0.1120	0.0020	1424	320	1593	202	1825	33		24.5
S36A-z14	11		867	22	0.025	99.84	98.81	3.711	0.932	0.2488	0.0624	0.99740	0.1080	0.0020	1432	322	1574	201	1768	33		21.1
S36A-z14	12		878	28	0.032	99.84	98.88	3.825	0.908	0.2421	0.0574	0.99710	0.1150	0.0021	1397	298	1598	191	1873	33		28.2
S36A-z14	13		943	34	0.036	99.85	98.88	4.044	1.040	0.2604	0.0670	0.99760	0.1130	0.0020	1492	343	1643	210	1843	33		21.3

Grain	Mass cycle		U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
S36A-z14	14		919	34	0.038	99.86	98.99	4.255	1.170	0.2780	0.0766	0.99790	0.1110	0.0020	1581	387	1685	227	1816	32	14.6
S36A-z14	15		899	35	0.039	99.88	99.13	4.010	1.030	0.2640	0.0679	0.99760	0.1100	0.0020	1510	346	1636	209	1802	32	18.1
S36A-z14	16		894	36	0.041	99.88	99.14	4.246	1.120	0.2757	0.0727	0.99780	0.1120	0.0020	1570	367	1683	217	1827	32	15.8
S36A-z14	17		862	38	0.044	99.93	99.52	4.010	0.973	0.2562	0.0621	0.99740	0.1130	0.0020	1471	319	1636	197	1856	31	23.2
S36A-z14	18		904	42	0.047	99.93	99.52	4.296	1.140	0.2729	0.0727	0.99790	0.1140	0.0020	1556	368	1693	219	1867	31	18.8
S36A-z14	19		897	37	0.041	100	100	4.187	1.040	0.2645	0.0655	0.99770	0.1150	0.0019	1513	334	1672	203	1877	30	21.7
S36A-z14	20		899	51	0.057	99.98	99.89	4.184	1.050	0.2718	0.0679	0.99770	0.1120	0.0019	1550	344	1671	205	1826	31	17.0
S36A-z14	21		945	46	0.049	99.97	99.77	4.740	1.310	0.2925	0.0809	0.99820	0.1180	0.0020	1654	403	1774	232	1919	30	15.6
S36A-z14	22		917	56	0.061	99.97	99.78	4.489	1.150	0.2813	0.0723	0.99790	0.1160	0.0019	1598	364	1729	214	1891	30	17.5
S36A-z14	23		895	57	0.064	99.89	99.2	4.175	1.020	0.2682	0.0653	0.99750	0.1130	0.0020	1532	332	1669	200	1847	31	19.2
S36A-z14	24		910	69	0.076	99.89	99.21	4.507	1.160	0.2816	0.0723	0.99780	0.1160	0.0020	1600	364	1732	214	1897	31	17.7
S36A-z14	25		903	59	0.066	99.95	99.67	4.986	1.430	0.3109	0.0893	0.99830	0.1160	0.0019	1745	439	1817	243	1901	30	9.4
S36A-z14	26		834	65	0.078	99.97	99.78	4.714	1.230	0.2915	0.0759	0.99790	0.1170	0.0020	1649	379	1770	218	1915	30	15.7
S36A-z14	27		865	65	0.075	100	100	4.766	1.280	0.2935	0.0785	0.99810	0.1180	0.0020	1659	391	1779	225	1923	30	15.6
S36A-z14	28		899	68	0.076	100	100	4.895	1.340	0.2985	0.0814	0.99810	0.1190	0.0020	1684	404	1801	230	1940	30	15.0
S36A-z14	29		880	76	0.086	99.98	99.89	4.778	1.280	0.2964	0.0794	0.99800	0.1170	0.0020	1673	395	1781	225	1910	30	14.1
S36A-z14	30		802	72	0.090	99.97	99.77	5.008	1.380	0.3084	0.0852	0.99810	0.1180	0.0020	1733	420	1821	234	1923	30	11.3
S36A-z14	31		812	78	0.097	100	100	5.180	1.410	0.3080	0.0836	0.99810	0.1220	0.0021	1731	412	1849	231	1986	30	14.7
S36A-z14	32		824	83	0.101	99.98	99.89	4.539	1.140	0.2834	0.0714	0.99770	0.1160	0.0020	1608	359	1738	210	1898	31	17.2
S36A-z14	33		830	88	0.105	99.92	99.44	5.202	1.470	0.3167	0.0894	0.99810	0.1190	0.0021	1774	437	1853	240	1943	31	10.0
S36A-z14	34		789	85	0.108	99.9	99.31	4.914	1.270	0.2948	0.0762	0.99770	0.1210	0.0021	1665	379	1805	218	1969	31	17.5
S36A-z14	35		766	103	0.134	100	100	5.303	1.490	0.3180	0.0895	0.99820	0.1210	0.0021	1780	438	1869	241	1970	31	11.0
S36A-z14	36		751	95	0.126	99.97	99.78	5.118	1.370	0.3056	0.0820	0.99790	0.1210	0.0021	1719	405	1839	228	1978	31	14.9
S36A-z14	37		739	101	0.137	99.88	99.18	4.900	1.260	0.2998	0.0773	0.99750	0.1190	0.0021	1690	383	1802	218	1934	32	14.3
S36A-z14	38		736	104	0.142	99.9	99.29	4.879	1.210	0.2929	0.0728	0.99740	0.1210	0.0022	1656	363	1799	210	1968	32	17.9
S36A-z14	39		758	117	0.154	99.98	99.89	5.326	1.430	0.3118	0.0836	0.99790	0.1240	0.0022	1750	411	1873	229	2013	31	14.9
S36A-z14	40		740	102	0.138	99.97	99.76	5.448	1.510	0.3248	0.0899	0.99800	0.1220	0.0022	1813	437	1892	237	1980	32	9.6
S36A-z14	41		706	111	0.157	99.97	99.78	5.040	1.230	0.2948	0.0717	0.99730	0.1240	0.0022	1666	357	1826	206	2014	32	19.6
S36A-z14	42		734	120	0.163	99.93	99.53	5.502	1.540	0.3279	0.0917	0.99800	0.1220	0.0022	1828	445	1901	241	1981	32	8.8
S36A-z14	43		688	123	0.178	99.97	99.78	5.077	1.210	0.2965	0.0708	0.99720	0.1240	0.0022	1674	352	1832	203	2017	32	19.3
S36A-z14	44		691	110	0.159	99.9	99.31	5.624	1.560	0.3281	0.0910	0.99790	0.1240	0.0022	1829	442	1920	239	2019	32	10.8
S36A-z14	45		674	119	0.177	99.93	99.53	5.270	1.320	0.3104	0.0779	0.99740	0.1230	0.0022	1743	383	1864	214	2002	32	14.8
S36A-z14	46		700	127	0.182	100	100	5.365	1.400	0.3145	0.0820	0.99770	0.1240	0.0022	1763	402	1879	223	2011	31	14.1
S36A-z14	47		704	121	0.172	99.95	99.66	5.544	1.500	0.3282	0.0887	0.99780	0.1230	0.0022	1830	431	1907	233	1993	32	9.4
S36A-z14	48		711	134	0.188	99.89	99.3	5.461	1.430	0.3208	0.0840	0.99760	0.1230	0.0023	1794	410	1895	225	2007	32	12.2
S36A-z14	49		690	125	0.181	99.98	99.89	5.017	1.200	0.3002	0.0718	0.99710	0.1210	0.0022	1693	356	1822	203	1974	32	16.2
S36A-z14	50		669	132	0.197	99.95	99.65	5.703	1.550	0.3355	0.0912	0.99780	0.1230	0.0022	1865	440	1932	235	2005	32	8.1
S36A-z14	51		662	132	0.200	99.96	99.78	5.522	1.350	0.2978	0.0728	0.99740	0.1340	0.0024	1681	362	1904	210	2157	31	25.0
S36A-z14	52		677	138	0.204	100	100	5.660	1.530	0.3309	0.0894	0.99780	0.1240	0.0022	1843	433	1925	233	2015	32	9.8
S36A-z14	53		655	130	0.199	99.98	99.89	5.692	1.530	0.3318	0.0890	0.99780	0.1240	0.0022	1847	431	1930	232	2020	32	9.8
S36A-z14	54		647	134	0.207	99.95	99.65	5.529	1.420	0.3212	0.0825	0.99750	0.1250	0.0023	1796	403	1905	221	2026	32	13.0
S36A-z14	55		639	125	0.196	99.96	99.77	5.263	1.270	0.3055	0.0739	0.99720	0.1250	0.0023	1719	365	1863	206	2028	32	17.4
S36A-z14	56		633	149	0.236	99.97	99.78	5.110	1.200	0.2962	0.0693	0.99700	0.1250	0.0023	1673	345	1838	199	2030	32	19.9
S36A-z14	57		647	135	0.209	99.93	99.53	5.906	1.630	0.3421	0.0946	0.99780	0.1250	0.0023	1897	454	1962	240	2032	32	7.7
S36A-z14	58		648	133	0.205	100	100	5.679	1.480	0.3248	0.0849	0.99770	0.1270	0.0023	1813	413	1928	226	2054	32	13.4
S36A-z14	59		654	141	0.215	100	100	5.922	1.630	0.3422	0.0944	0.99790	0.1260	0.0023	1897	453	1964	240	2036	32	7.9
Sample S36A, zircon 15: Type 1B																					
S36A-z15	1		883	20	0.022	96.89	79.02	3.613	0.675	0.2617	0.0483	0.98810	0.1000	0.0029	1498	247	1552	149	1627	54	8.9
S36A-z15	2		856	8	0.009	98.53	89.28	4.386	0.932	0.3085	0.0653	0.99520	0.1030	0.0022	1733	322	1710	176	1681	39	-3.5
S36A-z15	3		836	8	0.009	99.04	92.98	4.683	0.985	0.3212	0.0674	0.99630	0.1060	0.0019	1796	329	1764	176	1727	33	-4.6
S36A-z15	**4**	*	**870**	**7**	**0.009**	**99.34**	**95.14**	**4.827**	**1.030**	**0.3236**	**0.0688**	**0.99700**	**0.1080**	**0.0018**	**1807**	**335**	**1790**	**179**	**1769**	**30**	**-2.5**
S36A-z15	**5**	*	**889**	**10**	**0.011**	**99.42**	**95.67**	**4.666**	**0.967**	**0.3161**	**0.0654**	**0.99700**	**0.1070**	**0.0017**	**1770**	**320**	**1761**	**173**	**1750**	**29**	**-1.3**
S36A-z15	**6**	*	**868**	**8**	**0.010**	**99.51**	**96.41**	**4.841**	**1.010**	**0.3208**	**0.0670**	**0.99720**	**0.1090**	**0.0017**	**1794**	**327**	**1792**	**176**	**1790**	**28**	**-0.2**
S36A-z15	**7**	*	**771**	**10**	**0.013**	**99.37**	**95.33**	**4.818**	**0.952**	**0.3261**	**0.0643**	**0.99640**	**0.1070**	**0.0018**	**1819**	**313**	**1788**	**166**	**1752**	**31**	**-4.4**
S36A-z15	8		717	8	0.011	99.33	94.93	5.383	1.200	0.3719	0.0830	0.99690	0.1050	0.0019	2038	390	1882	191	1714	33	-22.1
S36A-z15	**9**	*	**723**	**11**	**0.016**	**99.7**	**97.82**	**5.612**	**1.260**	**0.3693**	**0.0830**	**0.99750**	**0.1100**	**0.0017**	**2026**	**391**	**1918**	**194**	**1803**	**29**	**-14.4**
S36A-z15	10		799	7	0.009	99.88	99.11	5.673	1.360	0.3759	0.0902	0.99820	0.1090	0.0016	2057	422	1927	207	1790	26	-17.5
S36A-z15	**11**	*	**848**	**8**	**0.009**	**99.84**	**98.8**	**4.846**	**0.973**	**0.3210**	**0.0644**	**0.99770**	**0.1100**	**0.0015**	**1795**	**314**	**1793**	**169**	**1791**	**25**	**-0.2**
S36A-z15	**12**	*	**967**	**4**	**0.005**	**99.86**	**98.97**	**5.186**	**1.160**	**0.3462**	**0.0772**	**0.99840**	**0.1090**	**0.0014**	**1916**	**370**	**1850**	**190**	**1777**	**23**	**-9.1**
S36A-z15	**13**	*	**1025**	**6**	**0.006**	**99.82**	**98.67**	**5.104**	**1.120**	**0.3383**	**0.0741**	**0.99840**	**0.1090**	**0.0014**	**1878**	**357**	**1837**	**186**	**1790**	**23**	**-5.7**
S36A-z15	**14**	*	**1057**	**4**	**0.004**	**99.9**	**99.22**	**5.082**	**1.090**	**0.3385**	**0.0726**	**0.99850**	**0.1090**	**0.0013**	**1880**	**350**	**1833**	**182**	**1781**	**22**	**-6.4**
S36A-z15	**15**	*	**1146**	**7**	**0.006**	**99.98**	**99.87**	**5.363**	**1.210**	**0.3542**	**0.0798**	**0.99870**	**0.1100**	**0.0012**	**1955**	**380**	**1879**	**193**	**1796**	**21**	**-10.3**
S36A-z15	**16**	*	**1221**	**4**	**0.003**	**99.98**	**99.83**	**5.411**	**1.230**	**0.3539**	**0.0806**	**0.99880**	**0.1110**	**0.0012**	**1953**	**384**	**1887**	**195**	**1814**	**20**	**-8.9**
S36A-z15	**17**	*	**1212**	**5**	**0.004**	**99.97**	**99.75**	**5.403**	**1.230**	**0.3575**	**0.0813**	**0.99880**	**0.1100**	**0.0012**	**1970**	**386**	**1885**	**195**	**1793**	**20**	**-11.5**
S36A-z15	**18**	*	**1168**	**5**	**0.005**	**99.97**	**99.76**	**5.072**	**1.070**	**0.3367**	**0.0710**	**0.99860**	**0.1090**	**0.0012**	**1871**	**342**	**1831**	**179**	**1787**	**20**	**-5.4**
S36A-z15	**19**	*	**1170**	**5**	**0.004**	**99.97**	**99.8**	**5.120**	**1.100**	**0.3398**	**0.0729**	**0.99870**	**0.1090**	**0.0012**	**1886**	**351**	**1840**	**182**	**1788**	**20**	**-6.3**
S36A-z15	**20**	*	**1185**	**6**	**0.005**	**99.99**	**99.92**	**5.336**	**1.200**	**0.3530**	**0.0797**	**0.99880**	**0.1100**	**0.0012**	**1949**	**380**	**1875**	**193**	**1794**	**20**	**-10.0**
S36A-z15	21		1205	6	0.005	99.99	99.96	5.652	1.360	0.3726	0.0893	0.99900	0.1100	0.0012	2041	419	1924	207	1800	20	-15.7
S36A-z15	**22**	*	**1198**	**7**	**0.006**	**99.98**	**99.84**	**5.252**	**1.150**	**0.3444**	**0.0751**	**0.99870**	**0.1110**	**0.0012**	**1908**	**360**	**1861**	**186**	**1809**	**20**	**-6.3**
S36A-z15	23		1236	5	0.004	99.97	99.75	5.406	1.260	0.3647	0.0849	0.99890	0.1080	0.0012	2004	401	1886	200	1758	20	-16.3
S36A-z15	**24**	*	**1185**	**3**	**0.003**	**99.98**	**99.84**	**5.127**	**1.100**	**0.3396**	**0.0728**	**0.99870**	**0.1090**	**0.0012**	**1885**	**350**	**1841**	**182**	**1791**	**20**	**-6.0**
S36A-z15	**25**	*	**1169**	**5**	**0.004**	**99.98**	**99.84**	**5.486**	**1.270**	**0.3635**	**0.0844**	**0.99890**	**0.1090**	**0.0012**	**1999**	**399**	**1898**	**199**	**1790**	**20**	**-13.6**
S36A-z15	**26**	*	**1172**	**6**	**0.005**	**99.96**	**99.68**	**5.309**	**1.160**	**0.3468**	**0.0759**	**0.99870**	**0.1110**	**0.0012**	**1919**	**363**	**1870**	**187**	**1816**	**20**	**-6.6**
S36A-z15	**27**	*	**1162**	**4**	**0.004**	**99.99**	**99.96**	**5.441**	**1.230**	**0.3549**	**0.0803**	**0.99880**	**0.1110**	**0.0012**	**1958**	**382**	**1891**	**194**	**1819**	**20**	**-8.9**
S36A-z15	**28**	*	**1119**	**5**	**0.005**	**99.99**	**99.92**	**5.485**	**1.270**	**0.3621**	**0.0837**	**0.99890**	**0.1100**	**0.0012**	**1992**	**396**	**1898**	**199**	**1797**	**20**	**-12.6**
S36A-z15	**29**	*	**1117**	**5**	**0.004**	**100**	**100**	**5.241**	**1.150**	**0.3459**	**0.0762**	**0.99880**	**0.1100**	**0.0012**	**1915**	**365**	**1859**	**188**	**1798**	**20**	**-7.5**
S36A-z15	**30**	*	**1106**	**6**	**0.005**	**99.99**	**99.92**	**5.225**	**1.150**	**0.3501**	**0.0769**	**0.99870**	**0.1080**	**0.0012**	**1935**	**367**	**1857**	**187**	**1770**	**20**	**-10.8**
S36A-z15	**31**	*	**1169**	**6**	**0.005**	**99.97**	**99.79**	**5.318**	**1.190**	**0.3518**	**0.0790**	**0.99880**	**0.1100**	**0.0012**	**1943**	**377**	**1872**	**192**	**1793**	**20**	**-9.7**
S36A-z15	**32**	*	**1137**	**5**	**0.005**	**99.99**	**99.91**	**5.346**	**1.200**	**0.3588**	**0.0804**	**0.99880**	**0.1080**	**0.0012**	**1976**	**382**	**1876**	**192**	**1767**	**20**	**-13.8**
S36A-z15	**33**	*	**1128**	**6**	**0.005**	**99.99**	**99.96**	**5.363**	**1.190**	**0.3555**	**0.0789**	**0.99870**	**0.1090**	**0.0012**	**1961**	**375**	**1879**	**190**	**1790**	**20**	**-11.1**
S36A-z15	**34**	*	**1128**	**6**	**0.005**	**99.98**	**99.83**	**5.142**	**1.100**	**0.3429**	**0.0734**	**0.99860**	**0.1090**	**0.0012**	**1901**	**352**	**1843**	**182**	**1779**	**20**	**-7.9**

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
								$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$			
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.		
S36A-z15	**35**	*	**1103**	**7**	**0.006**	**99.97**	**99.75**	**5.264**	**1.150**	**0.3487**	**0.0764**	**0.99870**	**0.1090**	**0.0012**	**1928**	**365**	**1863**	**187**	**1791**	**20**		**-8.9**
S36A-z15	**36**	*	**1083**	**4**	**0.004**	**99.97**	**99.79**	**5.015**	**1.040**	**0.3336**	**0.0692**	**0.99850**	**0.1090**	**0.0012**	**1856**	**334**	**1822**	**176**	**1783**	**21**		**-4.7**
S36A-z15	**37**	*	**1099**	**6**	**0.005**	**99.99**	**99.91**	**5.127**	**1.090**	**0.3395**	**0.0724**	**0.99860**	**0.1100**	**0.0012**	**1884**	**348**	**1841**	**181**	**1792**	**20**		**-5.9**
S36A-z15	**38**	*	**1105**	**5**	**0.005**	**100**	**100**	**5.184**	**1.120**	**0.3462**	**0.0744**	**0.99870**	**0.1090**	**0.0012**	**1916**	**356**	**1850**	**183**	**1776**	**20**		**-9.2**
S36A-z15	**39**	*	**1091**	**5**	**0.005**	**100**	**100**	**4.956**	**1.010**	**0.3304**	**0.0671**	**0.99850**	**0.1090**	**0.0012**	**1840**	**325**	**1812**	**172**	**1779**	**20**		**-4.0**
S36A-z15	**40**	*	**1129**	**5**	**0.004**	**99.98**	**99.88**	**5.216**	**1.130**	**0.3420**	**0.0740**	**0.99870**	**0.1110**	**0.0012**	**1896**	**355**	**1855**	**184**	**1810**	**20**		**-5.5**
S36A-z15	**41**	*	**1083**	**5**	**0.004**	**99.97**	**99.74**	**4.863**	**0.963**	**0.3256**	**0.0644**	**0.99830**	**0.1080**	**0.0012**	**1817**	**313**	**1796**	**167**	**1771**	**21**		**-3.0**
S36A-z15	**42**	*	**1084**	**5**	**0.005**	**99.99**	**99.92**	**4.886**	**0.978**	**0.3265**	**0.0653**	**0.99840**	**0.1090**	**0.0012**	**1821**	**317**	**1800**	**169**	**1775**	**21**		**-3.0**
S36A-z15	**43**	*	**1075**	**4**	**0.004**	**99.96**	**99.71**	**4.879**	**0.961**	**0.3203**	**0.0631**	**0.99840**	**0.1110**	**0.0012**	**1791**	**308**	**1799**	**166**	**1808**	**21**		**1.1**
S36A-z15	**44**	*	**1067**	**4**	**0.004**	**99.97**	**99.74**	**4.885**	**0.981**	**0.3272**	**0.0656**	**0.99840**	**0.1080**	**0.0012**	**1825**	**319**	**1800**	**169**	**1771**	**21**		**-3.5**
S36A-z15	**45**	*	**1106**	**4**	**0.004**	**99.99**	**99.96**	**4.823**	**0.944**	**0.3206**	**0.0627**	**0.99840**	**0.1090**	**0.0012**	**1793**	**306**	**1789**	**165**	**1784**	**20**		**-0.6**
S36A-z15	**46**	*	**1074**	**9**	**0.008**	**99.99**	**99.92**	**4.984**	**1.020**	**0.3305**	**0.0675**	**0.99850**	**0.1090**	**0.0012**	**1841**	**327**	**1817**	**173**	**1789**	**20**		**-3.3**
S36A-z15	**47**	*	**1063**	**3**	**0.003**	**100**	**100**	**4.840**	**0.945**	**0.3210**	**0.0627**	**0.99840**	**0.1090**	**0.0012**	**1795**	**306**	**1792**	**164**	**1788**	**20**		**-0.5**
S36A-z15	**48**	*	**1078**	**5**	**0.004**	**99.99**	**99.96**	**4.890**	**0.968**	**0.3269**	**0.0647**	**0.99840**	**0.1080**	**0.0012**	**1823**	**314**	**1801**	**167**	**1774**	**20**		**-3.2**
S36A-z15	**49**	*	**1103**	**4**	**0.004**	**99.98**	**99.88**	**4.914**	**0.972**	**0.3252**	**0.0643**	**0.99840**	**0.1100**	**0.0012**	**1815**	**313**	**1805**	**167**	**1792**	**20**		**-1.5**
S36A-z15	**50**	*	**1065**	**7**	**0.006**	**99.98**	**99.88**	**4.695**	**0.887**	**0.3174**	**0.0599**	**0.99820**	**0.1070**	**0.0012**	**1777**	**293**	**1766**	**158**	**1754**	**21**		**-1.5**
S36A-z15	**51**	*	**1055**	**4**	**0.004**	**99.98**	**99.84**	**4.764**	**0.905**	**0.3176**	**0.0603**	**0.99830**	**0.1090**	**0.0012**	**1778**	**295**	**1779**	**159**	**1779**	**20**		**0.1**
S36A-z15	**52**	*	**1081**	**5**	**0.004**	**99.97**	**99.8**	**4.736**	**0.884**	**0.3133**	**0.0584**	**0.99820**	**0.1100**	**0.0012**	**1757**	**287**	**1774**	**156**	**1794**	**20**		**2.4**
S36A-z15	**53**	*	**1081**	**3**	**0.003**	**99.99**	**99.92**	**4.849**	**0.925**	**0.3223**	**0.0614**	**0.99830**	**0.1090**	**0.0012**	**1801**	**299**	**1794**	**161**	**1785**	**20**		**-1.0**
S36A-z15	**54**	*	**1048**	**5**	**0.004**	**100**	**100**	**4.882**	**0.916**	**0.3194**	**0.0599**	**0.99820**	**0.1110**	**0.0012**	**1787**	**293**	**1799**	**158**	**1814**	**20**		**1.7**
S36A-z15	**55**	*	**1084**	**6**	**0.005**	**100**	**100**	**4.639**	**0.849**	**0.3113**	**0.0570**	**0.99810**	**0.1080**	**0.0012**	**1747**	**280**	**1756**	**153**	**1767**	**20**		**1.3**
S36A-z15	**56**	*	**1082**	**5**	**0.005**	**100**	**100**	**4.551**	**0.809**	**0.3054**	**0.0543**	**0.99800**	**0.1080**	**0.0012**	**1718**	**268**	**1740**	**148**	**1767**	**21**		**3.1**
S36A-z15	**57**	*	**1059**	**6**	**0.006**	**100**	**100**	**4.618**	**0.812**	**0.3060**	**0.0538**	**0.99790**	**0.1090**	**0.0012**	**1721**	**265**	**1753**	**147**	**1790**	**21**		**4.4**
S36A-z15	**58**	*	**1050**	**4**	**0.004**	**100**	**100**	**4.793**	**0.875**	**0.3156**	**0.0575**	**0.99810**	**0.1100**	**0.0012**	**1768**	**282**	**1784**	**153**	**1802**	**20**		**2.2**
S36A-z15	**59**	*	**1040**	**5**	**0.005**	**99.99**	**99.96**	**4.538**	**0.783**	**0.3029**	**0.0522**	**0.99780**	**0.1090**	**0.0012**	**1706**	**258**	**1738**	**143**	**1777**	**21**		**4.6**
Sample S36A, zircon 16: Type 1B																						
S36A-z16	1		858	26	0.030	97.85	84.94	3.217	0.886	0.2276	0.0624	0.99410	0.1020	0.0031	1322	327	1461	213	1670	55		23.0
S36A-z16	2		764	14	0.019	99.44	95.85	3.815	0.961	0.2589	0.0651	0.99710	0.1070	0.0020	1484	333	1596	203	1746	35		16.7
S36A-z16	**3**	*	**788**	**12**	**0.015**	**99.69**	**97.6**	**5.017**	**1.680**	**0.3435**	**0.1150**	**0.99860**	**0.1060**	**0.0019**	**1903**	**553**	**1822**	**284**	**1730**	**32**		**-11.6**
S36A-z16	**4**	*	**800**	**13**	**0.016**	**99.89**	**99.14**	**5.060**	**1.630**	**0.3349**	**0.1080**	**0.99870**	**0.1100**	**0.0018**	**1862**	**522**	**1829**	**274**	**1793**	**30**		**-4.4**
S36A-z16	**5**	*	**754**	**9**	**0.011**	**99.84**	**98.79**	**4.927**	**1.520**	**0.3275**	**0.1010**	**0.99850**	**0.1090**	**0.0019**	**1826**	**492**	**1807**	**261**	**1785**	**31**		**-2.6**
S36A-z16	**6**	*	**731**	**9**	**0.012**	**99.88**	**99.08**	**5.228**	**1.750**	**0.3552**	**0.1190**	**0.99870**	**0.1070**	**0.0018**	**1959**	**565**	**1857**	**285**	**1745**	**31**		**-14.2**
S36A-z16	7		731	7	0.010	99.89	99.2	5.719	2.080	0.3779	0.1380	0.99890	0.1100	0.0019	2067	643	1934	315	1795	31		-17.7
S36A-z16	**8**	*	**688**	**7**	**0.010**	**99.89**	**99.17**	**5.333**	**1.760**	**0.3508**	**0.1160**	**0.99860**	**0.1100**	**0.0019**	**1938**	**552**	**1874**	**282**	**1804**	**31**		**-8.6**
S36A-z16	9		680	8	0.012	99.95	99.63	5.301	1.770	0.3609	0.1210	0.99870	0.1070	0.0018	1986	571	1869	285	1741	31		-16.4
S36A-z16	**10**	*	**622**	**7**	**0.012**	**99.93**	**99.49**	**5.035**	**1.550**	**0.3455**	**0.1060**	**0.99840**	**0.1060**	**0.0019**	**1913**	**509**	**1825**	**261**	**1726**	**32**		**-12.6**
S36A-z16	**11**	*	**611**	**5**	**0.008**	**99.98**	**99.88**	**5.306**	**1.670**	**0.3538**	**0.1110**	**0.99850**	**0.1090**	**0.0019**	**1953**	**530**	**1870**	**269**	**1779**	**32**		**-11.3**
S36A-z16	**12**	*	**614**	**7**	**0.011**	**99.94**	**99.51**	**5.078**	**1.540**	**0.3476**	**0.1060**	**0.99830**	**0.1060**	**0.0019**	**1923**	**505**	**1832**	**258**	**1731**	**32**		**-12.8**
S36A-z16	**13**	*	**633**	**7**	**0.011**	**99.94**	**99.52**	**4.875**	**1.360**	**0.3249**	**0.0903**	**0.99800**	**0.1090**	**0.0019**	**1814**	**439**	**1798**	**234**	**1780**	**32**		**-2.2**
S36A-z16	**14**	*	**645**	**7**	**0.010**	**99.99**	**99.89**	**4.830**	**1.310**	**0.3189**	**0.0866**	**0.99810**	**0.1100**	**0.0019**	**1784**	**423**	**1790**	**229**	**1797**	**31**		**0.8**
S36A-z16	**15**	*	**659**	**7**	**0.010**	**99.96**	**99.67**	**4.446**	**1.100**	**0.2985**	**0.0741**	**0.99770**	**0.1080**	**0.0018**	**1684**	**368**	**1721**	**206**	**1766**	**31**		**5.3**
S36A-z16	**16**	*	**697**	**5**	**0.007**	**99.97**	**99.79**	**4.566**	**1.170**	**0.3042**	**0.0778**	**0.99800**	**0.1090**	**0.0018**	**1712**	**384**	**1743**	**213**	**1781**	**30**		**4.4**
S36A-z16	**17**	*	**711**	**7**	**0.010**	**99.99**	**99.9**	**4.247**	**0.970**	**0.2822**	**0.0644**	**0.99760**	**0.1090**	**0.0017**	**1603**	**324**	**1683**	**188**	**1785**	**29**		**11.5**
S36A-z16	**18**	*	**742**	**8**	**0.011**	**99.96**	**99.72**	**4.314**	**0.997**	**0.2869**	**0.0662**	**0.99770**	**0.1090**	**0.0017**	**1626**	**332**	**1696**	**190**	**1784**	**29**		**10.0**
S36A-z16	**19**	*	**784**	**6**	**0.008**	**99.95**	**99.64**	**4.397**	**1.040**	**0.2940**	**0.0696**	**0.99790**	**0.1080**	**0.0017**	**1662**	**347**	**1712**	**196**	**1774**	**28**		**7.2**
S36A-z16	**20**	*	**792**	**7**	**0.009**	**99.94**	**99.56**	**4.378**	**0.992**	**0.2908**	**0.0659**	**0.99770**	**0.1090**	**0.0017**	**1646**	**329**	**1708**	**187**	**1786**	**28**		**8.9**
S36A-z16	**21**	*	**809**	**4**	**0.006**	**99.98**	**99.83**	**4.163**	**0.895**	**0.2788**	**0.0599**	**0.99760**	**0.1080**	**0.0016**	**1585**	**302**	**1667**	**176**	**1771**	**27**		**11.8**
S36A-z16	**22**	*	**814**	**5**	**0.006**	**99.99**	**99.92**	**4.117**	**0.857**	**0.2740**	**0.0570**	**0.99760**	**0.1090**	**0.0016**	**1561**	**288**	**1658**	**170**	**1783**	**27**		**14.0**
S36A-z16	**23**	*	**845**	**8**	**0.009**	**99.97**	**99.76**	**4.119**	**0.857**	**0.2762**	**0.0575**	**0.99760**	**0.1080**	**0.0016**	**1572**	**290**	**1658**	**170**	**1768**	**27**		**12.4**
S36A-z16	**24**	*	**877**	**7**	**0.008**	**99.95**	**99.63**	**4.303**	**0.937**	**0.2865**	**0.0623**	**0.99780**	**0.1090**	**0.0016**	**1624**	**312**	**1694**	**179**	**1782**	**26**		**10.0**
S36A-z16	25		827	6	0.007	99.93	99.48	3.933	0.752	0.2613	0.0499	0.99720	0.1090	0.0016	1497	255	1620	155	1785	26		18.1
S36A-z16	26		838	5	0.006	99.98	99.85	4.011	0.796	0.2675	0.0530	0.99750	0.1090	0.0015	1528	270	1636	161	1778	26		15.7
S36A-z16	**27**	*	**881**	**7**	**0.008**	**100**	**100**	**4.125**	**0.843**	**0.2760**	**0.0563**	**0.99770**	**0.1080**	**0.0015**	**1571**	**285**	**1659**	**167**	**1773**	**25**		**12.8**
S36A-z16	**28**	*	**904**	**5**	**0.006**	**100**	**100**	**4.394**	**0.941**	**0.2867**	**0.0614**	**0.99800**	**0.1110**	**0.0015**	**1625**	**307**	**1711**	**177**	**1818**	**25**		**12.0**
S36A-z16	29		877	4	0.004	100	100	3.922	0.729	0.2585	0.0480	0.99730	0.1100	0.0015	1482	246	1618	150	1800	25		19.7
S36A-z16	30		922	4	0.005	100	100	4.027	0.780	0.2681	0.0519	0.99750	0.1090	0.0015	1531	264	1640	158	1782	25		15.8
S36A-z16	31		940	7	0.007	100	100	4.213	0.809	0.2666	0.0512	0.99750	0.1150	0.0015	1523	260	1677	158	1874	24		21.0
S36A-z16	**32**	*	**923**	**3**	**0.003**	**100**	**100**	**4.365**	**0.920**	**0.2884**	**0.0607**	**0.99800**	**0.1100**	**0.0015**	**1634**	**304**	**1706**	**174**	**1795**	**24**		**10.1**
S36A-z16	33		907	6	0.006	100	100	4.044	0.760	0.2658	0.0499	0.99740	0.1100	0.0015	1520	254	1643	153	1805	25		17.7
S36A-z16	34		926	5	0.005	100	100	4.056	0.760	0.2695	0.0505	0.99740	0.1090	0.0015	1538	256	1646	153	1785	25		15.5
S36A-z16	**35**	*	**927**	**5**	**0.005**	**100**	**100**	**4.070**	**0.788**	**0.2739**	**0.0530**	**0.99760**	**0.1080**	**0.0014**	**1560**	**268**	**1648**	**158**	**1762**	**25**		**12.9**
S36A-z16	**36**	*	**949**	**5**	**0.005**	**100**	**100**	**4.136**	**0.825**	**0.2788**	**0.0556**	**0.99780**	**0.1080**	**0.0014**	**1585**	**280**	**1661**	**163**	**1759**	**24**		**11.1**
S36A-z16	**37**	*	**910**	**4**	**0.005**	**100**	**100**	**4.162**	**0.801**	**0.2767**	**0.0532**	**0.99760**	**0.1090**	**0.0014**	**1575**	**269**	**1667**	**158**	**1785**	**24**		**13.3**
S36A-z16	**38**	*	**908**	**3**	**0.003**	**99.99**	**99.94**	**4.162**	**0.812**	**0.2773**	**0.0541**	**0.99770**	**0.1090**	**0.0014**	**1578**	**273**	**1667**	**160**	**1780**	**24**		**12.8**
S36A-z16	39		907	6	0.007	99.98	99.87	4.146	0.793	0.2735	0.0523	0.99760	0.1100	0.0015	1559	265	1663	157	1799	24		15.1
S36A-z16	**40**	*	**916**	**4**	**0.005**	**100**	**100**	**4.080**	**0.780**	**0.2755**	**0.0526**	**0.99760**	**0.1070**	**0.0014**	**1569**	**266**	**1650**	**156**	**1756**	**24**		**12.0**
S36A-z16	**41**	*	**926**	**5**	**0.006**	**99.99**	**99.94**	**4.188**	**0.807**	**0.2809**	**0.0541**	**0.99760**	**0.1080**	**0.0014**	**1596**	**272**	**1672**	**158**	**1768**	**24**		**11.0**
S36A-z16	**42**	*	**944**	**3**	**0.004**	**99.98**	**99.87**	**4.292**	**0.850**	**0.2836**	**0.0561**	**0.99780**	**0.1100**	**0.0014**	**1609**	**282**	**1692**	**163**	**1796**	**24**		**11.8**
S36A-z16	43		897	5	0.005	100	100	4.027	0.710	0.2662	0.0469	0.99720	0.1100	0.0015	1522	239	1640	143	1795	24		17.1
S36A-z16	**44**	*	**935**	**4**	**0.005**	**99.99**	**99.94**	**4.553**	**0.938**	**0.3007**	**0.0619**	**0.99800**	**0.1100**	**0.0014**	**1695**	**307**	**1741**	**171**	**1796**	**24**		**6.4**
S36A-z16	45		902	3	0.004	99.98	99.87	4.038	0.716	0.2681	0.0475	0.99720	0.1090	0.0015	1531	242	1642	144	1787	24		16.1
S36A-z16	**46**	*	**904**	**4**	**0.005**	**99.99**	**99.94**	**4.291**	**0.827**	**0.2868**	**0.0553**	**0.99770**	**0.1090**	**0.0014**	**1626**	**277**	**1692**	**159**	**1775**	**24**		**9.5**
S36A-z16	47		883	4	0.004	99.98	99.87	4.049	0.715	0.2697	0.0476	0.99710	0.1090	0.0015	1539	242	1644	144	1781	24		15.3
S36A-z16	**48**	*	**891**	**4**	**0.005**	**100**	**100**	**4.257**	**0.783**	**0.2804**	**0.0516**	**0.99740**	**0.1100**	**0.0015**	**1594**	**260**	**1685**	**151**	**1801**	**24**		**13.0**
S36A-z16	**49**	*	**892**	**3**	**0.003**	**99.98**	**99.88**	**4.276**	**0.796**	**0.2847**	**0.0530**	**0.99750**	**0.1090**	**0.0014**	**1615**	**266**	**1689**	**153**	**1781**	**24**		**10.5**
S36A-z16	**50**	*	**914**	**5**	**0.005**	**99.97**	**99.75**	**4.083**	**0.729**	**0.2782**	**0.0496**	**0.99720**	**0.1060**	**0.0014**	**1582**	**250**	**1651**	**146**	**1739**	**25**		**10.1**
S36A-z16	**51**	*	**903**	**7**	**0.008**	**100**	**100**	**4.362**	**0.807**	**0.2861**	**0.0529**	**0.99740**	**0.1110**	**0.0015**	**1622**	**265**	**1705**	**153**	**1809**	**24**		**11.7**
S36A-z16	52		870	5	0.005	100	100	4.164	0.725	0.2740	0.0477	0.99710	0.1100	0.0015	1561	241	1667	143	1804	24		15.2
S36A-z16	**53**	*	**914**	**3**	**0.003**	**100**	**100**	**4.189**	**0.740**	**0.2758**	**0.0487**	**0.99730**	**0.1100**	**0.0014**	**1570**	**246**	**1672**	**145**	**1802**	**24**		**14.5**
S36A-z16	**54**	*	**921**	**6**	**0.006**	**99.99**	**99.94**	**4.224**	**0.758**	**0.2783**	**0.0499**	**0.99740**	**0.1100**	**0.0014**	**1583**	**252**	**1679**	**147**	**1800**	**24**		**13.6**
S36A-z16	**55**	*	**936**	**4**	**0.004**	**99.98**	**99.88**	**4.232**	**0.757**	**0.2807**	**0.0502**	**0.99730**	**0.1090**	**0.0014**	**1595**	**253**	**1680**	**147**	**1789**	**24**		**12.3**

Grain	Mass cycle		U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
S36A-z16	56		916	4	0.004	100	100	4.108	0.689	0.2690	0.0451	0.99700	0.1110	0.0014	1535	229	1656	137	1812	24	17.1
S36A-z16	**57**	*	**964**	**2**	**0.003**	**100**	**100**	**4.304**	**0.768**	**0.2799**	**0.0499**	**0.99740**	**0.1120**	**0.0014**	**1591**	**251**	**1694**	**147**	**1824**	**23**	**14.4**
S36A-z16	**58**	*	**940**	**4**	**0.004**	**99.99**	**99.95**	**4.108**	**0.702**	**0.2772**	**0.0473**	**0.99710**	**0.1070**	**0.0014**	**1577**	**239**	**1656**	**140**	**1757**	**24**	**11.5**
S36A-z16	59		926	4	0.004	99.99	99.89	4.202	0.713	0.2753	0.0467	0.99720	0.1110	0.0014	1568	236	1674	139	1811	23	15.1
S36A-z16	**60**	*	**956**	**5**	**0.005**	**100**	**100**	**4.366**	**0.765**	**0.2820**	**0.0494**	**0.99740**	**0.1120**	**0.0014**	**1601**	**248**	**1706**	**145**	**1837**	**23**	**14.5**
Sample S36A, zircon 17: Type 1A																					
S36A-z17	1		783	52	0.066	97.62	83.14	3.698	0.847	0.2698	0.0612	0.99140	0.0994	0.0030	1540	311	1571	183	1613	56	5.1
S36A-z17	2		778	37	0.048	99.33	94.93	4.412	1.030	0.3061	0.0716	0.99650	0.1050	0.0020	1721	354	1715	194	1706	36	-1.0
S36A-z17	3		811	23	0.028	99.69	97.64	4.635	1.080	0.3146	0.0734	0.99730	0.1070	0.0018	1763	360	1756	195	1746	31	-1.2
S36A-z17	**4**	*	**859**	**19**	**0.022**	**99.82**	**98.64**	**4.805**	**1.140**	**0.3181**	**0.0757**	**0.99780**	**0.1100**	**0.0017**	**1780**	**370**	**1786**	**200**	**1792**	**29**	**0.7**
S36A-z17	**5**	*	**910**	**11**	**0.012**	**99.89**	**99.18**	**4.585**	**1.030**	**0.3003**	**0.0672**	**0.99770**	**0.1110**	**0.0017**	**1693**	**333**	**1747**	**187**	**1812**	**28**	**7.5**
S36A-z17	**6**	*	**969**	**13**	**0.013**	**99.89**	**99.17**	**4.709**	**1.080**	**0.3071**	**0.0702**	**0.99790**	**0.1110**	**0.0017**	**1726**	**346**	**1769**	**192**	**1819**	**27**	**5.8**
S36A-z17	**7**	*	**993**	**10**	**0.010**	**99.86**	**98.97**	**4.692**	**1.070**	**0.3029**	**0.0688**	**0.99790**	**0.1120**	**0.0016**	**1706**	**340**	**1766**	**190**	**1837**	**26**	**8.1**
S36A-z17	**8**	*	**1040**	**10**	**0.010**	**99.99**	**99.93**	**5.053**	**1.210**	**0.3233**	**0.0775**	**0.99840**	**0.1130**	**0.0015**	**1806**	**377**	**1828**	**203**	**1854**	**25**	**3.0**
S36A-z17	9		1123	13	0.011	99.96	99.74	4.874	1.120	0.3104	0.0715	0.99830	0.1140	0.0015	1743	352	1798	194	1862	24	7.3
S36A-z17	10		1170	14	0.012	99.95	99.63	5.026	1.180	0.3153	0.0740	0.99840	0.1160	0.0015	1767	363	1824	199	1889	24	7.4
S36A-z17	11		1169	13	0.011	99.96	99.71	5.444	1.330	0.3332	0.0816	0.99860	0.1190	0.0015	1854	395	1892	210	1934	23	4.8
S36A-z17	12		1236	15	0.012	99.98	99.89	5.523	1.390	0.3392	0.0851	0.99880	0.1180	0.0015	1883	410	1904	216	1928	22	2.7
S36A-z17	13		1283	19	0.015	99.99	99.95	5.538	1.340	0.3308	0.0799	0.99870	0.1210	0.0015	1842	387	1907	208	1977	22	7.8
S36A-z17	14		1308	24	0.018	99.98	99.86	5.321	1.130	0.3021	0.0643	0.99850	0.1280	0.0015	1702	318	1872	182	2067	21	20.1
S36A-z17	15		1378	24	0.018	99.98	99.88	5.896	1.330	0.3233	0.0729	0.99870	0.1320	0.0015	1806	355	1961	196	2128	20	17.3
S36A-z17	16		1460	37	0.025	99.99	99.92	5.978	1.320	0.3196	0.0705	0.99870	0.1360	0.0015	1788	345	1973	192	2173	19	20.3
S36A-z17	17		1556	41	0.027	99.99	99.97	6.217	1.370	0.3243	0.0714	0.99880	0.1390	0.0015	1811	347	2007	193	2215	19	20.9
S36A-z17	18		1564	43	0.027	99.98	99.9	6.308	1.350	0.3206	0.0684	0.99880	0.1430	0.0015	1793	334	2020	187	2260	18	23.6
S36A-z17	19		1587	43	0.027	99.98	99.91	6.754	1.490	0.3394	0.0749	0.99890	0.1440	0.0015	1884	361	2080	195	2280	18	20.0
S36A-z17	20		1601	46	0.029	99.99	99.94	6.826	1.490	0.3415	0.0745	0.99890	0.1450	0.0015	1894	358	2089	193	2287	18	19.8
S36A-z17	21		1553	45	0.029	100	100	6.818	1.410	0.3333	0.0689	0.99880	0.1480	0.0015	1854	333	2088	183	2327	17	23.3
S36A-z17	22		1692	60	0.035	100	100	7.205	1.570	0.3491	0.0759	0.99900	0.1500	0.0015	1930	363	2137	194	2343	17	20.4
S36A-z17	23		1743	54	0.031	100	100	7.252	1.540	0.3509	0.0747	0.99890	0.1500	0.0015	1939	357	2143	190	2345	17	20.0
S36A-z17	24		1688	58	0.034	99.99	99.95	7.233	1.490	0.3436	0.0707	0.99890	0.1530	0.0015	1904	339	2141	184	2376	17	22.9
S36A-z17	25		1670	52	0.031	99.98	99.88	7.592	1.650	0.3629	0.0790	0.99900	0.1520	0.0015	1996	374	2184	195	2365	17	18.1
S36A-z17	26		1685	51	0.030	99.99	99.95	7.671	1.620	0.3577	0.0755	0.99890	0.1560	0.0015	1971	358	2193	190	2408	17	21.0
S36A-z17	27		1719	69	0.040	100	100	7.931	1.720	0.3723	0.0806	0.99900	0.1540	0.0015	2040	379	2223	195	2396	16	17.3
S36A-z17	28		1734	67	0.039	100	99.98	7.837	1.660	0.3636	0.0770	0.99900	0.1560	0.0015	1999	364	2213	191	2416	16	20.0
S36A-z17	29		1700	61	0.036	99.99	99.95	7.960	1.700	0.3729	0.0794	0.99900	0.1550	0.0015	2043	373	2227	192	2400	16	17.3
Sample S36A, zircon 19: Type 2B																					
S36A-z19	1		2	156	95.269	93.15	63.72	0.898	0.346	0.0609	0.0231	0.49680	0.1070	0.0410	381	140	651	185	1749	702	80.5
S36A-z19	2		3	126	39.268	95.39	72.59	0.909	0.230	0.0622	0.0155	0.49650	0.1060	0.0267	389	94	657	122	1732	462	79.8
S36A-z19	3		3	104	40.930	96.73	78.61	1.029	0.275	0.0726	0.0192	0.49820	0.1030	0.0274	452	115	718	137	1675	492	75.5
S36A-z19	4		3	69	21.933	97.65	84.33	1.144	0.273	0.0774	0.0183	0.49900	0.1070	0.0255	481	110	774	129	1751	435	75.2
S36A-z19	5		4	69	17.886	98.4	88.83	1.198	0.253	0.0814	0.0171	0.49950	0.1070	0.0225	504	102	800	117	1746	386	73.9
S36A-z19	6		2	58	27.123	98.8	91.62	1.282	0.354	0.0844	0.0233	0.50000	0.1100	0.0304	522	138	838	158	1802	502	73.8
S36A-z19	7		1	53	45.248	98.95	92.4	1.268	0.473	0.0860	0.0320	0.50000	0.1070	0.0399	532	190	832	212	1748	683	72.4
S36A-z19	8		5	47	9.600	99.14	93.79	1.348	0.242	0.0901	0.0161	0.50030	0.1090	0.0194	556	95	867	105	1775	327	71.6
S36A-z19	9		2	46	29.625	99.38	95.34	1.348	0.411	0.0919	0.0279	0.50020	0.1060	0.0324	567	165	867	178	1739	558	70.3
S36A-z19	10		2	40	21.390	99.32	95	1.358	0.380	0.0913	0.0255	0.50020	0.1080	0.0301	563	151	871	164	1763	511	71.0
S36A-z19	11		3	46	13.442	99.37	95.32	1.360	0.290	0.0929	0.0197	0.50040	0.1060	0.0226	573	116	872	125	1735	390	69.9
S36A-z19	12		2	44	18.047	99.48	96.16	1.400	0.349	0.0932	0.0232	0.50030	0.1090	0.0271	575	137	889	148	1781	454	70.7
S36A-z19	13		2	47	19.558	99.62	97.16	1.405	0.353	0.0935	0.0235	0.50040	0.1090	0.0274	576	138	891	149	1783	458	70.7
S36A-z19	14		2	45	20.991	99.6	97.02	1.395	0.372	0.0943	0.0251	0.50030	0.1070	0.0286	581	148	887	158	1753	488	69.8
S36A-z19	15		2	48	23.400	99.64	97.32	1.381	0.368	0.0930	0.0248	0.50030	0.1080	0.0287	573	146	881	157	1762	487	70.4
S36A-z19	16		3	43	14.879	99.84	98.86	1.439	0.321	0.0931	0.0207	0.50060	0.1120	0.0250	574	122	905	134	1834	404	71.7
S36A-z19	17		2	34	15.911	99.85	98.89	1.454	0.381	0.0953	0.0249	0.50040	0.1110	0.0290	587	147	912	158	1812	475	70.7
S36A-z19	18		3	41	12.780	99.77	98.29	1.410	0.299	0.0937	0.0198	0.50060	0.1090	0.0231	577	117	893	126	1786	385	70.7
S36A-z19	19		1	32	31.754	99.79	98.39	1.424	0.534	0.0960	0.0360	0.50020	0.1080	0.0403	591	212	899	224	1759	685	69.4
S36A-z19	20		4	32	8.282	99.77	98.28	1.472	0.280	0.0965	0.0183	0.50080	0.1110	0.0210	594	108	919	115	1810	345	70.2
S36A-z19	21		3	38	14.838	99.82	98.69	1.469	0.344	0.0972	0.0227	0.50050	0.1100	0.0256	598	133	918	141	1793	425	69.7
S36A-z19	22		1	32	24.989	99.87	99.05	1.449	0.478	0.0965	0.0318	0.50030	0.1090	0.0359	594	187	910	198	1780	601	69.6
S36A-z19	23		2	33	19.726	99.78	98.34	1.466	0.427	0.0973	0.0283	0.50030	0.1090	0.0318	599	167	916	176	1786	531	69.5
S36A-z19	24		2	28	16.453	99.84	98.82	1.473	0.427	0.0991	0.0287	0.50030	0.1080	0.0313	609	169	919	175	1762	530	68.5
S36A-z19	25		2	18	8.968	99.84	98.79	1.526	0.395	0.1000	0.0259	0.50040	0.1110	0.0286	614	152	941	159	1811	470	69.2
S36A-z19	26		2	16	10.072	99.85	98.86	1.523	0.461	0.1008	0.0305	0.50030	0.1100	0.0332	619	179	940	186	1792	552	68.5
S36A-z19	27		2	16	9.558	99.89	99.17	1.563	0.467	0.1047	0.0312	0.50030	0.1080	0.0323	642	182	956	185	1771	545	66.9
S36A-z19	28		3	12	4.357	99.87	99.05	1.601	0.379	0.1045	0.0247	0.50050	0.1110	0.0263	641	144	971	148	1818	430	67.9
S36A-z19	29		2	13	5.399	99.91	99.34	1.571	0.390	0.1042	0.0258	0.50050	0.1090	0.0271	639	151	959	154	1789	452	67.4
S36A-z19	30		2	14	5.445	99.9	99.28	1.617	0.388	0.1065	0.0256	0.50050	0.1100	0.0264	653	149	977	151	1801	437	67.0
S36A-z19	31		2	15	6.182	99.91	99.35	1.615	0.395	0.1061	0.0259	0.50050	0.1100	0.0270	650	151	976	153	1807	444	67.2
S36A-z19	32		2	11	5.930	99.95	99.65	1.613	0.438	0.1070	0.0290	0.50040	0.1090	0.0297	655	169	975	170	1789	494	66.6
S36A-z19	33		2	10	4.278	99.94	99.57	1.659	0.397	0.1087	0.0260	0.50060	0.1110	0.0264	665	151	993	151	1810	434	66.5
S36A-z19	34		1	9	12.921	99.99	99.93	1.639	0.735	0.1080	0.0484	0.50020	0.1100	0.0494	661	282	985	283	1801	816	66.5
S36A-z19	35		3	7	2.465	99.97	99.79	1.630	0.361	0.1088	0.0241	0.50070	0.1090	0.0241	666	140	982	140	1777	404	65.7
S36A-z19	36		1	9	7.294	99.95	99.66	1.672	0.551	0.1085	0.0358	0.50030	0.1120	0.0368	664	208	998	209	1828	597	66.9
S36A-z19	37		2	9	5.652	99.93	99.44	1.648	0.497	0.1099	0.0331	0.50030	0.1090	0.0328	672	192	989	191	1778	550	65.4
S36A-z19	38		2	6	3.103	99.94	99.59	1.666	0.447	0.1095	0.0294	0.50040	0.1100	0.0296	670	171	996	170	1805	488	66.1
S36A-z19	39		2	8	3.527	99.95	99.66	1.678	0.417	0.1105	0.0275	0.50050	0.1100	0.0274	676	160	1000	158	1801	452	65.7
S36A-z19	40		2	7	3.009	99.97	99.8	1.699	0.422	0.1122	0.0278	0.50050	0.1100	0.0272	686	161	1008	159	1796	451	65.1
S36A-z19	41		2	6	2.947	99.98	99.86	1.665	0.441	0.1106	0.0293	0.50050	0.1090	0.0289	676	170	995	168	1786	482	65.4
S36A-z19	42		2	9	5.324	100	100	1.705	0.499	0.1132	0.0331	0.50040	0.1090	0.0320	691	192	1010	187	1786	533	64.5
S36A-z19	43		1	6	4.612	99.98	99.87	1.704	0.555	0.1112	0.0362	0.50030	0.1110	0.0362	680	210	1010	208	1819	591	65.9
S36A-z19	44		2	8	3.479	99.95	99.6	1.700	0.431	0.1127	0.0286	0.50050	0.1090	0.0277	689	166	1009	162	1789	462	64.8

Grain	Mass cycle	U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
S36A-z19	45	2	8	4.032	99.96	99.73	1.732	0.468	0.1133	0.0307	0.50040	0.1110	0.0300	692	177	1020	174	1813	491	65.1
S36A-z19	46	2	7	3.730	99.99	99.94	1.770	0.499	0.1152	0.0325	0.50040	0.1110	0.0314	703	188	1035	183	1823	511	64.8
S36A-z19	47	2	5	2.292	99.98	99.87	1.738	0.441	0.1136	0.0288	0.50050	0.1110	0.0282	694	167	1023	164	1816	461	65.1
S36A-z19	48	1	6	4.231	100	100	1.750	0.565	0.1148	0.0371	0.50030	0.1110	0.0357	701	214	1027	209	1809	587	64.6
S36A-z19	49	2	10	5.973	100	100	1.755	0.530	0.1168	0.0352	0.50040	0.1090	0.0329	712	203	1029	195	1783	550	63.4
S36A-z19	50	1	8	5.446	99.99	99.94	1.751	0.548	0.1137	0.0356	0.50030	0.1120	0.0350	694	206	1028	202	1827	567	65.3
S36A-z19	51	2	7	3.910	99.97	99.8	1.754	0.491	0.1161	0.0325	0.50040	0.1100	0.0306	708	188	1029	181	1792	509	63.8
S36A-z19	52	2	5	2.640	99.97	99.8	1.717	0.449	0.1137	0.0297	0.50050	0.1100	0.0286	694	172	1015	168	1792	476	64.5
S36A-z19	53	1	8	7.799	99.97	99.8	1.745	0.643	0.1155	0.0426	0.50020	0.1100	0.0404	705	246	1025	238	1791	671	63.9
S36A-z19	54	3	7	2.208	99.97	99.81	1.789	0.400	0.1172	0.0262	0.50070	0.1110	0.0247	714	151	1041	146	1812	406	63.9
S36A-z19	55	2	9	4.074	99.98	99.87	1.778	0.458	0.1165	0.0300	0.50050	0.1110	0.0285	710	173	1038	168	1811	468	64.1
S36A-z19	56	2	5	2.352	99.97	99.81	1.814	0.500	0.1180	0.0325	0.50050	0.1110	0.0307	719	187	1051	180	1824	500	63.9
S36A-z19	57	2	9	5.645	99.94	99.55	1.811	0.530	0.1168	0.0341	0.50040	0.1120	0.0329	712	197	1049	191	1839	529	64.6
S36A-z19	58	2	8	3.944	99.97	99.81	1.807	0.460	0.1166	0.0297	0.50050	0.1120	0.0286	711	171	1048	166	1839	461	64.7
S36A-z19	59	2	9	5.732	99.97	99.8	1.810	0.536	0.1187	0.0352	0.50040	0.1110	0.0328	723	203	1049	194	1809	538	63.4
Sample S103A, zircon 1: Type 1B																				
S103A-z1	1	3186	4024	1.263	90.1	55.42	1.780	0.301	0.1141	0.0186	0.96980	0.1130	0.0047	697	107	1038	110	1850	75	65.7
S103A-z1	2	2435	1963	0.806	94.96	71.38	2.667	0.494	0.1766	0.0323	0.98980	0.1100	0.0029	1048	177	1319	137	1792	48	44.9
S103A-z1	3	2139	1088	0.509	96.81	79.54	3.542	0.766	0.2424	0.0522	0.99520	0.1060	0.0023	1399	271	1537	171	1731	39	21.3
S103A-z1	4	1922	692	0.360	97.92	85.92	4.236	0.987	0.2864	0.0666	0.99710	0.1070	0.0019	1623	334	1681	191	1754	32	8.4
S103A-z1	5	1785	437	0.245	98.27	87.84	4.406	1.020	0.3030	0.0699	0.99740	0.1050	0.0017	1706	346	1713	191	1722	30	1.0
S103A-z1	6	1784	437	0.245	98.5	89.8	4.231	0.903	0.2760	0.0588	0.99760	0.1110	0.0016	1571	297	1680	175	1819	27	15.3
S103A-z1	7	1907	430	0.226	98.74	91.23	4.540	1.040	0.2990	0.0687	0.99820	0.1100	0.0015	1686	341	1738	191	1801	25	7.2
S103A-z1	8	1932	343	0.178	98.96	92.74	4.418	0.951	0.2867	0.0616	0.99820	0.1120	0.0014	1625	309	1716	178	1829	23	12.6
S103A-z1	9	1897	292	0.154	99.12	93.71	4.628	1.070	0.3054	0.0703	0.99860	0.1100	0.0014	1718	347	1754	192	1798	23	5.1
S103A-z1	10	1819	246	0.135	99.18	94.13	4.644	1.060	0.3077	0.0701	0.99860	0.1090	0.0013	1729	345	1757	190	1791	22	3.9
S103A-z1	11	1790	219	0.123	99.42	95.77	4.593	1.010	0.3022	0.0662	0.99860	0.1100	0.0013	1702	327	1748	183	1803	21	6.3
S103A-z1	12	1861	192	0.103	99.37	95.39	4.927	1.200	0.3279	0.0796	0.99890	0.1090	0.0013	1828	386	1807	205	1782	21	-3.0
S103A-z1	13	1795	180	0.100	99.44	95.93	4.850	1.150	0.3224	0.0766	0.99890	0.1090	0.0012	1801	374	1794	200	1785	21	-1.0
S103A-z1	14	1700	142	0.083	99.47	96.13	5.008	1.220	0.3332	0.0809	0.99890	0.1090	0.0012	1854	391	1821	206	1783	21	-4.6
S103A-z1	15	1767	141	0.080	99.64	97.36	4.987	1.190	0.3258	0.0779	0.99900	0.1110	0.0012	1818	379	1817	202	1816	20	-0.1
S103A-z1	16	1798	135	0.075	99.56	96.9	4.869	1.120	0.3111	0.0713	0.99890	0.1140	0.0012	1746	351	1797	193	1856	20	6.7
S103A-z1	17	1750	150	0.086	99.55	96.74	4.929	1.170	0.3212	0.0764	0.99890	0.1110	0.0012	1795	373	1807	201	1821	20	1.6
S103A-z1	18	1676	146	0.087	99.55	96.74	4.810	1.100	0.3141	0.0718	0.99880	0.1110	0.0012	1761	352	1787	192	1817	20	3.5
S103A-z1	19	1659	131	0.079	99.6	97.16	5.178	1.250	0.3316	0.0801	0.99900	0.1130	0.0012	1846	388	1849	206	1852	20	0.4
S103A-z1	20	1592	110	0.069	99.58	96.9	4.961	1.140	0.3263	0.0751	0.99880	0.1100	0.0013	1821	365	1813	195	1804	21	-1.0
S103A-z1	**21 ***	**1487**	**104**	**0.070**	**99.6**	**97.1**	**5.380**	**1.330**	**0.3510**	**0.0864**	**0.99890**	**0.1110**	**0.0013**	**1939**	**412**	**1882**	**211**	**1819**	**21**	**-7.6**
S103A-z1	**22 ***	**1453**	**107**	**0.074**	**99.61**	**97.17**	**5.264**	**1.270**	**0.3425**	**0.0826**	**0.99890**	**0.1110**	**0.0013**	**1899**	**396**	**1863**	**206**	**1824**	**21**	**-4.7**
S103A-z1	**23 ***	**1340**	**110**	**0.082**	**99.7**	**97.85**	**5.122**	**1.130**	**0.3300**	**0.0729**	**0.99870**	**0.1130**	**0.0013**	**1838**	**353**	**1840**	**188**	**1841**	**21**	**0.1**
S103A-z1	**24 ***	**1269**	**100**	**0.079**	**99.65**	**97.46**	**5.359**	**1.270**	**0.3506**	**0.0828**	**0.99880**	**0.1110**	**0.0013**	**1938**	**395**	**1878**	**202**	**1813**	**21**	**-8.0**
S103A-z1	**25 ***	**1208**	**102**	**0.085**	**99.63**	**97.27**	**5.251**	**1.210**	**0.3433**	**0.0791**	**0.99860**	**0.1110**	**0.0013**	**1903**	**379**	**1861**	**197**	**1815**	**22**	**-5.6**
S103A-z1	**26 ***	**1183**	**117**	**0.099**	**99.63**	**97.33**	**5.060**	**1.080**	**0.3249**	**0.0692**	**0.99840**	**0.1130**	**0.0014**	**1814**	**337**	**1829**	**181**	**1847**	**22**	**2.0**
S103A-z1	**27 ***	**1170**	**125**	**0.107**	**99.56**	**96.87**	**5.199**	**1.150**	**0.3345**	**0.0742**	**0.99840**	**0.1130**	**0.0014**	**1860**	**359**	**1852**	**189**	**1844**	**23**	**-1.0**
S103A-z1	**28 ***	**1102**	**131**	**0.119**	**99.64**	**97.41**	**5.142**	**1.120**	**0.3330**	**0.0726**	**0.99840**	**0.1120**	**0.0014**	**1853**	**351**	**1843**	**185**	**1832**	**23**	**-1.3**
S103A-z1	**29 ***	**1104**	**152**	**0.138**	**99.62**	**97.27**	**5.173**	**1.150**	**0.3352**	**0.0748**	**0.99840**	**0.1120**	**0.0014**	**1863**	**361**	**1848**	**190**	**1831**	**23**	**-2.0**
S103A-z1	**30 ***	**1127**	**155**	**0.138**	**99.65**	**97.53**	**5.038**	**1.070**	**0.3198**	**0.0681**	**0.99830**	**0.1140**	**0.0014**	**1789**	**333**	**1826**	**181**	**1868**	**23**	**4.8**
S103A-z1	**31 ***	**1092**	**158**	**0.145**	**99.63**	**97.32**	**4.987**	**1.070**	**0.3203**	**0.0688**	**0.99820**	**0.1130**	**0.0014**	**1791**	**336**	**1817**	**182**	**1847**	**23**	**3.5**
S103A-z1	**32 ***	**1056**	**151**	**0.143**	**99.61**	**97.27**	**5.300**	**1.190**	**0.3335**	**0.0751**	**0.99840**	**0.1150**	**0.0015**	**1855**	**363**	**1869**	**192**	**1884**	**23**	**1.8**
S103A-z1	**33 ***	**1037**	**152**	**0.146**	**99.55**	**96.8**	**4.924**	**1.050**	**0.3167**	**0.0677**	**0.99810**	**0.1130**	**0.0015**	**1774**	**332**	**1806**	**181**	**1844**	**24**	**4.3**
S103A-z1	**34 ***	**1017**	**139**	**0.137**	**99.57**	**96.95**	**5.369**	**1.250**	**0.3436**	**0.0800**	**0.99840**	**0.1130**	**0.0015**	**1904**	**384**	**1880**	**199**	**1853**	**24**	**-3.2**
S103A-z1	**35 ***	**970**	**124**	**0.128**	**99.65**	**97.52**	**4.979**	**1.050**	**0.3136**	**0.0659**	**0.99810**	**0.1150**	**0.0015**	**1758**	**323**	**1816**	**178**	**1882**	**23**	**7.5**
S103A-z1	**36 ***	**998**	**121**	**0.121**	**99.7**	**97.84**	**5.048**	**1.080**	**0.3227**	**0.0691**	**0.99820**	**0.1130**	**0.0015**	**1803**	**337**	**1827**	**182**	**1856**	**23**	**3.3**
S103A-z1	**37 ***	**1031**	**118**	**0.115**	**99.72**	**97.97**	**5.160**	**1.140**	**0.3289**	**0.0724**	**0.99830**	**0.1140**	**0.0015**	**1833**	**351**	**1846**	**187**	**1861**	**23**	**1.7**
S103A-z1	**38 ***	**993**	**115**	**0.116**	**99.73**	**98.03**	**4.746**	**0.978**	**0.3081**	**0.0634**	**0.99800**	**0.1120**	**0.0014**	**1732**	**313**	**1775**	**173**	**1827**	**23**	**5.9**
S103A-z1	**39 ***	**984**	**111**	**0.113**	**99.71**	**97.89**	**4.684**	**0.949**	**0.3005**	**0.0608**	**0.99800**	**0.1130**	**0.0015**	**1694**	**301**	**1764**	**169**	**1849**	**23**	**9.5**
S103A-z1	**40 ***	**967**	**106**	**0.109**	**99.77**	**98.36**	**4.940**	**1.040**	**0.3116**	**0.0657**	**0.99820**	**0.1150**	**0.0015**	**1748**	**323**	**1809**	**178**	**1880**	**23**	**8.0**
S103A-z1	**41 ***	**990**	**109**	**0.110**	**99.78**	**98.41**	**5.158**	**1.170**	**0.3326**	**0.0754**	**0.99840**	**0.1120**	**0.0014**	**1851**	**365**	**1846**	**193**	**1840**	**23**	**-0.7**
S103A-z1	**42 ***	**990**	**106**	**0.107**	**99.84**	**98.86**	**5.013**	**1.090**	**0.3187**	**0.0690**	**0.99830**	**0.1140**	**0.0014**	**1783**	**337**	**1822**	**183**	**1866**	**23**	**5.1**
S103A-z1	**43 ***	**959**	**97**	**0.102**	**99.84**	**98.86**	**5.089**	**1.120**	**0.3239**	**0.0709**	**0.99840**	**0.1140**	**0.0014**	**1809**	**345**	**1834**	**186**	**1863**	**23**	**3.3**
S103A-z1	**44 ***	**973**	**98**	**0.101**	**99.81**	**98.67**	**5.027**	**1.060**	**0.3132**	**0.0661**	**0.99820**	**0.1160**	**0.0015**	**1757**	**325**	**1824**	**179**	**1902**	**23**	**8.7**
S103A-z1	**45 ***	**968**	**105**	**0.109**	**99.82**	**98.68**	**4.966**	**1.060**	**0.3187**	**0.0680**	**0.99820**	**0.1130**	**0.0014**	**1784**	**332**	**1814**	**180**	**1848**	**23**	**4.0**
S103A-z1	**46 ***	**950**	**94**	**0.099**	**99.77**	**98.37**	**4.964**	**1.060**	**0.3192**	**0.0682**	**0.99810**	**0.1130**	**0.0015**	**1786**	**333**	**1813**	**181**	**1845**	**24**	**3.7**
S103A-z1	**47 ***	**958**	**106**	**0.111**	**99.68**	**97.74**	**5.062**	**1.120**	**0.3237**	**0.0715**	**0.99820**	**0.1130**	**0.0015**	**1808**	**348**	**1830**	**187**	**1855**	**24**	**2.9**
S103A-z1	**48 ***	**928**	**97**	**0.104**	**99.78**	**98.44**	**4.654**	**0.938**	**0.2988**	**0.0602**	**0.99790**	**0.1130**	**0.0015**	**1685**	**299**	**1759**	**168**	**1847**	**24**	**9.9**
S103A-z1	**49 ***	**918**	**100**	**0.109**	**99.82**	**98.72**	**5.117**	**1.150**	**0.3268**	**0.0732**	**0.99840**	**0.1140**	**0.0015**	**1823**	**356**	**1839**	**191**	**1857**	**23**	**2.1**
S103A-z1	**50 ***	**920**	**101**	**0.110**	**99.74**	**98.1**	**4.758**	**0.989**	**0.3069**	**0.0638**	**0.99800**	**0.1120**	**0.0015**	**1726**	**314**	**1777**	**174**	**1839**	**24**	**7.0**
S103A-z1	**51 ***	**918**	**99**	**0.108**	**99.79**	**98.48**	**4.611**	**0.914**	**0.2949**	**0.0584**	**0.99780**	**0.1130**	**0.0015**	**1666**	**291**	**1751**	**165**	**1855**	**24**	**11.6**
S103A-z1	**52 ***	**920**	**105**	**0.114**	**99.81**	**98.65**	**4.948**	**1.060**	**0.3133**	**0.0673**	**0.99820**	**0.1150**	**0.0015**	**1757**	**330**	**1810**	**182**	**1873**	**23**	**7.1**
S103A-z1	**53 ***	**914**	**104**	**0.113**	**99.75**	**98.23**	**4.916**	**1.050**	**0.3151**	**0.0674**	**0.99810**	**0.1130**	**0.0015**	**1766**	**331**	**1805**	**181**	**1850**	**24**	**5.2**
S103A-z1	**54 ***	**900**	**95**	**0.106**	**99.61**	**97.2**	**4.533**	**0.898**	**0.2905**	**0.0575**	**0.99760**	**0.1130**	**0.0016**	**1644**	**287**	**1737**	**165**	**1851**	**25**	**12.7**
S103A-z1	**55 ***	**895**	**103**	**0.115**	**99.66**	**97.51**	**4.932**	**1.080**	**0.3197**	**0.0702**	**0.99810**	**0.1120**	**0.0015**	**1788**	**343**	**1808**	**186**	**1831**	**25**	**2.7**
S103A-z1	**56 ***	**871**	**110**	**0.126**	**99.73**	**98.06**	**4.642**	**0.933**	**0.2980**	**0.0598**	**0.99770**	**0.1130**	**0.0015**	**1681**	**297**	**1757**	**168**	**1848**	**24**	**10.2**
S103A-z1	**57 ***	**864**	**91**	**0.105**	**99.75**	**98.19**	**4.665**	**0.955**	**0.3011**	**0.0616**	**0.99780**	**0.1120**	**0.0015**	**1697**	**305**	**1761**	**171**	**1838**	**24**	**8.7**
S103A-z1	**58 ***	**827**	**100**	**0.120**	**99.78**	**98.4**	**4.483**	**0.866**	**0.2874**	**0.0555**	**0.99760**	**0.1130**	**0.0015**	**1629**	**278**	**1728**	**160**	**1850**	**24**	**13.5**
S103A-z1	**59 ***	**861**	**101**	**0.117**	**99.74**	**98.13**	**5.161**	**1.180**	**0.3265**	**0.0747**	**0.99830**	**0.1150**	**0.0015**	**1821**	**363**	**1846**	**195**	**1874**	**24**	**3.2**
Sample S103A, zircon 2: Type 2B																				
S103A-z2	1	2302	2058	0.894	95.06	70.27	1.516	0.186	0.1082	0.0127	0.96160	0.1020	0.0034	662	74	937	75	1654	63	63.0
S103A-z2	2	1976	1237	0.626	97.81	85.02	2.110	0.252	0.1455	0.0171	0.98280	0.1050	0.0023	876	96	1152	82	1718	41	52.4
S103A-z2	3	1907	908	0.476	98.75	91.05	2.447	0.290	0.1668	0.0196	0.98810	0.1060	0.0019	994	108	1257	85	1739	33	46.1
S103A-z2	4	1851	743	0.401	99.05	93.14	2.735	0.342	0.1841	0.0229	0.99110	0.1080	0.0018	1089	124	1338	93	1762	30	41.4

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
	cycle	ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
S103A-z2	5	1833	595	0.325	99.18	93.92	2.872	0.380	0.1971	0.0260	0.99260	0.1060	0.0017	1160	140	1375	100	1726	30	35.8
S103A-z2	6	1788	521	0.291	99.55	96.66	2.892	0.355	0.1939	0.0237	0.99290	0.1080	0.0016	1143	128	1380	93	1769	27	38.6
S103A-z2	7	1822	458	0.251	99.63	97.23	3.062	0.401	0.2037	0.0266	0.99410	0.1090	0.0015	1195	143	1423	100	1783	26	36.1
S103A-z2	8	1851	398	0.215	99.6	97.08	3.135	0.428	0.2074	0.0282	0.99470	0.1100	0.0015	1215	151	1441	105	1794	26	35.4
S103A-z2	9	1895	370	0.195	99.72	97.88	3.073	0.407	0.2068	0.0273	0.99470	0.1080	0.0015	1212	146	1426	101	1762	25	34.2
S103A-z2	10	2004	346	0.172	99.8	98.5	3.136	0.440	0.2094	0.0293	0.99570	0.1090	0.0014	1226	156	1442	108	1776	24	34.0
S103A-z2	11	1887	302	0.160	99.84	98.78	3.081	0.420	0.2036	0.0277	0.99560	0.1100	0.0014	1194	148	1428	104	1795	23	36.6
S103A-z2	12	1885	290	0.154	99.79	98.38	3.144	0.448	0.2111	0.0300	0.99590	0.1080	0.0014	1235	160	1443	110	1766	24	33.0
S103A-z2	13	2092	301	0.144	99.84	98.77	3.046	0.428	0.2059	0.0289	0.99600	0.1070	0.0013	1207	154	1419	107	1754	23	34.2
S103A-z2	14	2152	317	0.147	99.77	98.31	3.120	0.453	0.2069	0.0300	0.99620	0.1090	0.0014	1212	160	1438	112	1789	23	35.3
S103A-z2	15	2124	309	0.146	99.76	98.16	2.943	0.411	0.1989	0.0277	0.99580	0.1070	0.0014	1169	149	1393	106	1755	23	36.5
S103A-z2	16	2129	320	0.150	99.86	98.94	2.962	0.418	0.1986	0.0280	0.99620	0.1080	0.0013	1168	151	1398	107	1769	22	37.1
S103A-z2	17	2205	358	0.163	99.88	99.12	3.031	0.439	0.1996	0.0289	0.99660	0.1100	0.0013	1173	155	1415	111	1802	22	38.1
S103A-z2	18	2222	355	0.160	99.87	99	2.946	0.424	0.1977	0.0284	0.99650	0.1080	0.0013	1163	153	1394	109	1767	22	37.3
S103A-z2	19	2206	357	0.162	99.88	99.11	2.882	0.416	0.1945	0.0280	0.99660	0.1070	0.0013	1146	151	1377	109	1757	22	37.9
S103A-z2	20	2274	313	0.137	99.81	98.55	2.971	0.447	0.2017	0.0303	0.99670	0.1070	0.0013	1184	163	1400	114	1746	22	35.2
S103A-z2	21	2297	367	0.160	99.84	98.78	2.913	0.417	0.1950	0.0278	0.99650	0.1080	0.0013	1148	150	1385	108	1772	22	38.4
S103A-z2	22	2322	345	0.149	99.85	98.88	2.948	0.442	0.1980	0.0296	0.99690	0.1080	0.0013	1165	159	1394	114	1766	22	37.2
S103A-z2	23	2324	339	0.146	99.85	98.85	2.887	0.415	0.1913	0.0274	0.99660	0.1090	0.0013	1128	149	1379	108	1791	22	40.3
S103A-z2	24	2314	350	0.151	99.86	98.95	2.971	0.442	0.1994	0.0296	0.99690	0.1080	0.0013	1172	159	1400	113	1767	22	36.8
S103A-z2	25	2358	321	0.136	99.84	98.77	2.970	0.445	0.1983	0.0296	0.99690	0.1090	0.0013	1166	159	1400	114	1777	21	37.5
S103A-z2	26	2293	285	0.124	99.9	99.26	2.977	0.436	0.1964	0.0287	0.99690	0.1100	0.0013	1156	155	1402	111	1799	21	39.0
S103A-z2	27	2240	253	0.113	99.93	99.44	2.979	0.442	0.1977	0.0293	0.99710	0.1090	0.0012	1163	158	1402	113	1787	21	38.1
S103A-z2	28	2288	250	0.109	99.9	99.21	2.986	0.454	0.2013	0.0306	0.99720	0.1080	0.0012	1182	164	1404	116	1759	21	35.8
S103A-z2	29	2317	259	0.112	99.87	99.02	2.862	0.406	0.1942	0.0275	0.99670	0.1070	0.0012	1144	148	1372	107	1747	21	37.6
S103A-z2	30	2462	207	0.084	99.92	99.37	3.064	0.475	0.2038	0.0316	0.99740	0.1090	0.0012	1196	169	1424	119	1784	20	36.1
S103A-z2	31	2403	219	0.091	99.89	99.18	2.837	0.398	0.1884	0.0264	0.99670	0.1090	0.0012	1113	143	1365	105	1786	21	41.0
S103A-z2	32	2375	232	0.098	99.93	99.47	2.863	0.407	0.1913	0.0272	0.99690	0.1090	0.0012	1128	147	1372	107	1775	20	39.6
S103A-z2	33	2325	230	0.099	99.87	99.02	2.935	0.422	0.1951	0.0280	0.99690	0.1090	0.0012	1149	151	1391	109	1784	21	38.8
S103A-z2	34	2412	233	0.097	99.88	99.12	2.924	0.427	0.1937	0.0282	0.99700	0.1090	0.0012	1141	152	1388	110	1791	21	39.5
S103A-z2	35	2519	254	0.101	99.85	98.85	3.051	0.465	0.2041	0.0311	0.99720	0.1080	0.0012	1197	166	1421	117	1773	21	35.5
S103A-z2	36	2385	253	0.106	99.83	98.73	2.854	0.394	0.1898	0.0261	0.99650	0.1090	0.0013	1120	142	1370	104	1784	21	40.5
S103A-z2	37	2358	206	0.087	99.87	98.99	2.946	0.427	0.1973	0.0286	0.99700	0.1080	0.0012	1161	154	1394	110	1771	21	37.6
S103A-z2	38	2432	229	0.094	99.91	99.31	3.047	0.461	0.2027	0.0306	0.99730	0.1090	0.0012	1190	164	1419	116	1784	20	36.5
S103A-z2	39	2432	222	0.091	99.91	99.3	2.905	0.411	0.1929	0.0273	0.99690	0.1090	0.0012	1137	147	1383	107	1786	20	39.6
S103A-z2	40	2417	223	0.092	99.92	99.41	3.087	0.471	0.2019	0.0308	0.99740	0.1110	0.0012	1186	165	1429	117	1814	20	37.9
S103A-z2	41	2425	204	0.084	99.9	99.24	3.004	0.436	0.1986	0.0288	0.99710	0.1100	0.0012	1168	155	1409	111	1794	20	38.1
S103A-z2	42	2464	200	0.081	99.9	99.27	2.950	0.427	0.1995	0.0289	0.99710	0.1070	0.0012	1173	155	1395	110	1753	20	36.2
S103A-z2	43	2495	201	0.080	99.92	99.37	2.912	0.402	0.1934	0.0267	0.99680	0.1090	0.0012	1140	144	1385	104	1787	20	39.5
S103A-z2	44	2564	189	0.074	99.92	99.38	3.052	0.455	0.2023	0.0302	0.99740	0.1090	0.0012	1188	162	1421	114	1790	20	36.8
S103A-z2	45	2475	187	0.076	99.91	99.35	3.119	0.475	0.2059	0.0313	0.99750	0.1100	0.0012	1207	168	1437	117	1797	20	35.9
S103A-z2	46	2467	199	0.081	99.91	99.34	3.070	0.465	0.2056	0.0311	0.99750	0.1080	0.0012	1205	166	1425	116	1771	20	35.0
S103A-z2	47	2508	194	0.077	99.93	99.47	2.835	0.390	0.1902	0.0261	0.99700	0.1080	0.0012	1123	142	1365	103	1767	20	39.7
S103A-z2	48	2591	206	0.080	99.92	99.37	3.086	0.464	0.2025	0.0304	0.99760	0.1110	0.0012	1189	163	1429	115	1809	19	37.5
S103A-z2	49	2536	200	0.079	99.88	99.11	2.951	0.422	0.1940	0.0277	0.99720	0.1100	0.0012	1143	150	1395	108	1804	19	39.9
S103A-z2	50	2662	218	0.082	99.86	98.96	2.876	0.421	0.1944	0.0284	0.99740	0.1070	0.0011	1145	153	1376	110	1754	19	37.8
S103A-z2	51	2711	220	0.081	99.94	99.57	2.907	0.423	0.1940	0.0282	0.99750	0.1090	0.0011	1143	152	1384	110	1777	19	38.9
S103A-z2	52	2751	212	0.077	99.93	99.46	2.935	0.443	0.1982	0.0299	0.99770	0.1070	0.0011	1166	161	1391	114	1756	19	36.7
S103A-z2	53	2657	202	0.076	99.86	98.94	2.806	0.399	0.1884	0.0267	0.99730	0.1080	0.0011	1112	145	1357	106	1767	19	40.3
S103A-z2	54	2671	200	0.075	99.85	98.83	2.810	0.409	0.1917	0.0279	0.99740	0.1060	0.0011	1130	151	1358	109	1738	19	38.1
S103A-z2	55	2729	235	0.086	99.92	99.38	2.922	0.436	0.1962	0.0293	0.99760	0.1080	0.0011	1155	158	1388	113	1766	19	37.7
S103A-z2	56	2701	220	0.082	99.93	99.43	2.808	0.398	0.1892	0.0268	0.99740	0.1080	0.0011	1117	145	1358	106	1760	19	39.7
S103A-z2	57	2718	231	0.085	99.91	99.32	2.915	0.422	0.1979	0.0286	0.99750	0.1070	0.0011	1164	154	1386	109	1746	19	36.4
S103A-z2	58	2694	211	0.078	99.94	99.57	3.016	0.429	0.1959	0.0279	0.99750	0.1120	0.0011	1153	150	1412	109	1827	18	40.2
S103A-z2	59	2734	219	0.080	99.91	99.3	2.961	0.440	0.1962	0.0292	0.99760	0.1090	0.0011	1155	157	1398	113	1790	19	38.7
Sample S103A, zircon 5: Type 2B																				
S103A-z5	1	2661	5827	2.190	93.72	64.23	2.132	0.386	0.1551	0.0278	0.99210	0.0997	0.0023	929	155	1159	125	1619	42	45.7
S103A-z5	2	2169	3089	1.424	97.65	84.14	3.379	0.675	0.2322	0.0463	0.99780	0.1060	0.0014	1346	242	1499	156	1724	24	24.3
S103A-z5	3	2057	2362	1.149	98.55	89.81	3.675	0.720	0.2478	0.0485	0.99840	0.1080	0.0012	1427	251	1566	156	1759	21	21.0
S103A-z5	4	2005	2164	1.080	98.97	92.7	3.854	0.766	0.2562	0.0509	0.99870	0.1090	0.0011	1470	261	1604	160	1784	19	19.6
S103A-z5	5	1991	2155	1.082	99.06	93.34	4.061	0.841	0.2672	0.0553	0.99880	0.1100	0.0011	1527	281	1647	169	1803	18	17.2
S103A-z5	6	1934	1903	0.984	99.13	93.76	3.993	0.817	0.2656	0.0543	0.99880	0.1090	0.0011	1519	276	1633	166	1783	18	16.6
S103A-z5	7	1940	1791	0.924	99.21	94.36	4.030	0.827	0.2644	0.0542	0.99890	0.1110	0.0011	1512	276	1640	167	1808	18	18.3
S103A-z5	8	1937	1696	0.876	99.21	94.33	4.170	0.911	0.2763	0.0603	0.99900	0.1090	0.0011	1573	305	1668	179	1790	18	13.7
S103A-z5	9	1902	1620	0.852	99.21	94.31	4.084	0.869	0.2713	0.0577	0.99890	0.1090	0.0011	1547	293	1651	174	1786	18	15.0
S103A-z5	10	1956	1523	0.778	99.11	93.58	3.963	0.835	0.2650	0.0558	0.99890	0.1080	0.0011	1515	284	1627	171	1774	18	16.4
S103A-z5	11	2001	1531	0.765	99.19	94.13	4.006	0.862	0.2678	0.0576	0.99890	0.1080	0.0011	1530	293	1635	175	1774	18	15.5
S103A-z5	12	1995	1530	0.767	99.29	94.88	3.870	0.802	0.2566	0.0531	0.99890	0.1090	0.0011	1472	273	1607	167	1789	18	19.8
S103A-z5	13	1936	1441	0.744	99.22	94.41	3.937	0.833	0.2595	0.0549	0.99890	0.1100	0.0011	1487	281	1621	171	1800	18	19.4
S103A-z5	14	1953	1399	0.717	99.21	94.3	3.716	0.758	0.2477	0.0505	0.99880	0.1090	0.0011	1427	261	1575	163	1779	18	22.0
S103A-z5	15	1952	1395	0.715	99.19	94.17	3.831	0.813	0.2534	0.0538	0.99890	0.1100	0.0011	1456	276	1599	171	1794	18	21.0
S103A-z5	16	1945	1253	0.645	99.29	94.9	3.794	0.808	0.2508	0.0534	0.99900	0.1100	0.0011	1442	275	1591	171	1795	18	21.9
S103A-z5	17	2034	1336	0.657	99.24	94.55	3.777	0.804	0.2503	0.0533	0.99890	0.1090	0.0011	1440	275	1588	171	1790	18	21.8
S103A-z5	18	2011	1319	0.656	99.19	94.26	3.674	0.741	0.2400	0.0484	0.99880	0.1110	0.0011	1387	251	1566	161	1816	18	26.2
S103A-z5	19	1996	1271	0.637	99.15	93.9	3.704	0.762	0.2456	0.0505	0.99880	0.1090	0.0011	1416	261	1572	165	1789	18	23.2
S103A-z5	20	1941	1234	0.636	99.28	94.82	3.751	0.759	0.2467	0.0499	0.99880	0.1100	0.0011	1422	258	1582	162	1804	18	23.6
S103A-z5	21	1986	1188	0.598	99.37	95.5	3.635	0.712	0.2368	0.0463	0.99880	0.1110	0.0011	1370	242	1557	156	1821	17	27.4
S103A-z5	22	1945	1125	0.579	99.32	95.12	3.684	0.721	0.2410	0.0471	0.99880	0.1110	0.0011	1392	245	1568	156	1813	18	25.8
S103A-z5	23	1903	1063	0.559	99.19	94.21	3.700	0.732	0.2431	0.0481	0.99870	0.1100	0.0011	1403	249	1571	158	1806	18	24.8
S103A-z5	24	1935	952	0.492	99.16	94.01	3.767	0.756	0.2490	0.0499	0.99880	0.1100	0.0011	1433	258	1586	161	1795	18	22.5
S103A-z5	25	1861	890	0.478	99.24	94.57	4.038	0.832	0.2656	0.0547	0.99890	0.1100	0.0011	1518	279	1642	168	1804	18	17.8

Grain	Mass cycle	U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
S103A-z5	26	1858	757	0.408	99.42	95.83	3.932	0.782	0.2573	0.0512	0.99890	0.1110	0.0010	1476	262	1620	161	1814	17	20.9
S103A-z5	27	1829	640	0.350	99.47	96.18	3.925	0.750	0.2560	0.0489	0.99880	0.1110	0.0010	1469	251	1619	155	1819	17	21.5
S103A-z5	28	1816	548	0.302	99.48	96.27	3.990	0.771	0.2602	0.0502	0.99890	0.1110	0.0010	1491	257	1632	157	1820	17	20.3
S103A-z5	29	1790	475	0.265	99.57	96.89	4.109	0.802	0.2700	0.0527	0.99890	0.1100	0.0010	1541	267	1656	159	1806	16	16.5
S103A-z5	30	1748	439	0.251	99.62	97.21	3.970	0.730	0.2605	0.0479	0.99880	0.1110	0.0010	1493	245	1628	149	1808	16	19.5
S103A-z5	31	1756	423	0.241	99.6	97.11	3.979	0.742	0.2613	0.0487	0.99890	0.1100	0.0010	1497	249	1630	151	1806	16	19.2
S103A-z5	32	1758	420	0.239	99.64	97.38	4.610	0.957	0.3008	0.0624	0.99910	0.1110	0.0010	1695	309	1751	173	1819	16	7.8
S103A-z5	33	1715	353	0.206	99.64	97.34	4.077	0.736	0.2667	0.0481	0.99880	0.1110	0.0010	1524	245	1650	147	1814	16	17.9
S103A-z5	34	1723	338	0.196	99.69	97.74	4.293	0.803	0.2793	0.0522	0.99890	0.1110	0.0010	1588	263	1692	154	1824	16	14.6
S103A-z5	35	1710	280	0.164	99.74	98.12	4.253	0.775	0.2762	0.0503	0.99890	0.1120	0.0010	1572	254	1684	150	1827	16	15.7
S103A-z5	36	1718	256	0.149	99.79	98.45	4.200	0.752	0.2738	0.0490	0.99890	0.1110	0.0009	1560	248	1674	147	1820	15	16.1
S103A-z5	37	1672	237	0.142	99.8	98.51	4.429	0.834	0.2878	0.0542	0.99900	0.1120	0.0009	1631	271	1718	156	1826	15	12.1
S103A-z5	38	1648	220	0.133	99.81	98.63	4.420	0.818	0.2848	0.0527	0.99900	0.1130	0.0009	1616	264	1716	153	1841	15	13.8
S103A-z5	39	1723	223	0.129	99.84	98.83	4.398	0.816	0.2873	0.0533	0.99900	0.1110	0.0009	1628	267	1712	154	1816	15	11.7
S103A-z5	40	1705	234	0.137	99.84	98.8	4.175	0.718	0.2722	0.0468	0.99880	0.1110	0.0009	1552	237	1669	141	1820	15	16.6
S103A-z5	41	1681	211	0.126	99.83	98.76	4.416	0.815	0.2878	0.0531	0.99900	0.1110	0.0009	1631	266	1715	153	1820	15	11.8
S103A-z5	42	1665	236	0.142	99.85	98.88	4.319	0.775	0.2830	0.0508	0.99890	0.1110	0.0009	1606	255	1697	148	1811	15	12.8
S103A-z5	43	1626	224	0.138	99.86	98.99	4.316	0.752	0.2789	0.0486	0.99890	0.1120	0.0009	1586	245	1696	144	1836	15	15.4
S103A-z5	44	1647	223	0.135	99.87	99.06	4.451	0.809	0.2862	0.0520	0.99900	0.1130	0.0009	1622	261	1722	151	1845	15	13.6
S103A-z5	45	1642	229	0.139	99.89	99.16	4.336	0.763	0.2798	0.0492	0.99890	0.1120	0.0009	1590	248	1700	145	1838	15	15.2
S103A-z5	46	1644	221	0.134	99.88	99.1	4.301	0.741	0.2788	0.0480	0.99890	0.1120	0.0009	1585	242	1694	142	1831	15	15.2
S103A-z5	47	1640	230	0.140	99.85	98.92	4.205	0.702	0.2726	0.0455	0.99880	0.1120	0.0009	1554	230	1675	137	1830	15	17.0
S103A-z5	48	1630	236	0.145	99.83	98.77	4.329	0.747	0.2820	0.0486	0.99880	0.1110	0.0009	1601	244	1699	142	1822	15	13.7
S103A-z5	49	1619	235	0.145	99.88	99.11	4.377	0.760	0.2848	0.0494	0.99890	0.1110	0.0009	1616	248	1708	144	1823	15	12.8
S103A-z5	50	1582	215	0.136	99.89	99.16	4.401	0.755	0.2859	0.0490	0.99890	0.1120	0.0009	1621	246	1713	142	1826	15	12.7
S103A-z5	51	1619	235	0.145	99.89	99.19	4.234	0.698	0.2775	0.0457	0.99880	0.1110	0.0009	1579	231	1681	135	1810	15	14.4
S103A-z5	52	1659	223	0.134	99.92	99.41	4.349	0.729	0.2818	0.0472	0.99880	0.1120	0.0009	1601	237	1703	138	1831	15	14.2
S103A-z5	53	1605	236	0.147	99.9	99.29	4.235	0.686	0.2748	0.0445	0.99870	0.1120	0.0009	1565	225	1681	133	1829	15	16.3
S103A-z5	54	1612	233	0.145	99.88	99.11	4.416	0.747	0.2851	0.0482	0.99880	0.1120	0.0009	1617	242	1715	140	1838	15	13.6
S103A-z5	55	1610	309	0.192	99.87	99.04	4.264	0.692	0.2772	0.0450	0.99870	0.1120	0.0009	1577	227	1686	133	1825	15	15.3
S103A-z5	56	1607	314	0.196	99.9	99.25	4.248	0.676	0.2740	0.0436	0.99870	0.1120	0.0009	1561	221	1683	131	1840	15	17.1
S103A-z5	57	1608	307	0.191	99.85	98.92	4.415	0.741	0.2861	0.0480	0.99880	0.1120	0.0009	1622	241	1715	139	1831	15	12.9
S103A-z5	58	1597	313	0.196	99.82	98.64	4.286	0.703	0.2789	0.0457	0.99870	0.1110	0.0009	1586	230	1691	135	1824	15	14.8
S103A-z5	59	1543	285	0.185	99.83	98.77	4.226	0.670	0.2735	0.0434	0.99860	0.1120	0.0009	1559	219	1679	130	1833	15	16.8
Sample S103A, zircon 7: Type 1B																				
S103A-z7	1	1148	7884	6.867	72.36	19.53	1.739	0.267	0.1643	0.0193	0.80740	0.0768	0.0070	981	107	1023	99	1115	181	13.0
S103A-z7	2	1353	5513	4.073	87.31	44.75	3.533	0.493	0.2628	0.0352	0.96680	0.0975	0.0035	1504	180	1535	110	1577	67	5.2
S103A-z7	3	1399	3408	2.437	91.03	55.87	4.798	0.703	0.3367	0.0486	0.98570	0.1030	0.0026	1871	234	1785	123	1685	46	-12.7
S103A-z7	4	1436	2591	1.804	93.23	64.47	6.079	1.010	0.4043	0.0666	0.99310	0.1090	0.0021	2189	306	1987	145	1784	35	-26.8
S103A-z7	5	1484	2287	1.541	94.59	69.62	5.604	0.860	0.3746	0.0571	0.99360	0.1090	0.0019	2051	268	1917	132	1775	32	-18.1
S103A-z7	6	1561	1870	1.198	95.45	72.84	5.700	0.945	0.3907	0.0645	0.99520	0.1060	0.0017	2126	299	1931	143	1728	30	-27.1
S103A-z7	7	1532	1533	1.001	96.41	77.48	5.605	0.923	0.3831	0.0628	0.99610	0.1060	0.0015	2091	293	1917	142	1734	27	-24.1
S103A-z7	8	1533	1241	0.810	97.02	80.87	5.692	0.962	0.3844	0.0648	0.99680	0.1070	0.0014	2097	302	1930	146	1756	25	-22.7
S103A-z7	9	1539	1133	0.736	97.4	82.67	5.559	0.941	0.3829	0.0646	0.99710	0.1050	0.0014	2090	301	1910	146	1719	24	-25.3
S103A-z7	10	1672	1093	0.654	97.99	86.37	5.566	0.948	0.3759	0.0639	0.99760	0.1070	0.0013	2057	299	1911	147	1755	21	-20.2
S103A-z7	11	1640	977	0.596	98.4	88.98	5.592	0.945	0.3721	0.0628	0.99790	0.1090	0.0012	2039	295	1915	146	1783	20	-16.8
S103A-z7	12	1628	852	0.523	98.73	91.16	5.661	0.964	0.3739	0.0636	0.99820	0.1100	0.0011	2048	298	1925	147	1796	19	-16.4
S103A-z7	13	1669	700	0.420	98.7	90.83	5.441	0.942	0.3659	0.0633	0.99830	0.1080	0.0011	2010	299	1891	149	1763	19	-16.4
S103A-z7	14	1665	598	0.359	98.84	91.62	5.437	0.969	0.3697	0.0658	0.99840	0.1070	0.0011	2028	310	1891	153	1743	18	-19.1
S103A-z7	15	1710	551	0.322	99.02	92.94	5.457	0.973	0.3662	0.0653	0.99860	0.1080	0.0010	2012	308	1894	153	1767	17	-16.1
S103A-z7	**16 ***	**1729**	**517**	**0.299**	**99.26**	**94.64**	**5.394**	**0.954**	**0.3573**	**0.0632**	**0.99870**	**0.1090**	**0.0010**	**1969**	**300**	**1884**	**151**	**1791**	**16**	**-11.6**
S103A-z7	**17 ***	**1741**	**463**	**0.266**	**99.34**	**95.18**	**5.263**	**0.949**	**0.3518**	**0.0634**	**0.99880**	**0.1080**	**0.0010**	**1943**	**302**	**1863**	**154**	**1774**	**16**	**-11.1**
S103A-z7	**18 ***	**1737**	**417**	**0.240**	**99.4**	**95.63**	**5.390**	**0.994**	**0.3599**	**0.0663**	**0.99890**	**0.1090**	**0.0009**	**1982**	**314**	**1883**	**158**	**1776**	**16**	**-13.5**
S103A-z7	**19 ***	**1754**	**386**	**0.220**	**99.44**	**95.89**	**5.324**	**0.980**	**0.3567**	**0.0656**	**0.99890**	**0.1080**	**0.0009**	**1967**	**312**	**1873**	**157**	**1770**	**16**	**-12.9**
S103A-z7	**20 ***	**1703**	**359**	**0.211**	**99.52**	**96.47**	**5.015**	**0.869**	**0.3359**	**0.0582**	**0.99880**	**0.1080**	**0.0009**	**1867**	**281**	**1822**	**147**	**1770**	**16**	**-6.4**
S103A-z7	**21 ***	**1774**	**341**	**0.192**	**99.59**	**96.98**	**5.241**	**0.982**	**0.3478**	**0.0651**	**0.99900**	**0.1090**	**0.0009**	**1924**	**312**	**1859**	**160**	**1787**	**15**	**-8.9**
S103A-z7	**22 ***	**1751**	**295**	**0.169**	**99.62**	**97.14**	**5.065**	**0.933**	**0.3376**	**0.0621**	**0.99900**	**0.1090**	**0.0009**	**1875**	**300**	**1830**	**156**	**1780**	**15**	**-6.1**
S103A-z7	**23 ***	**1719**	**273**	**0.159**	**99.67**	**97.55**	**5.012**	**0.922**	**0.3342**	**0.0615**	**0.99900**	**0.1090**	**0.0009**	**1859**	**297**	**1821**	**156**	**1779**	**15**	**-5.2**
S103A-z7	**24 ***	**1764**	**265**	**0.150**	**99.69**	**97.66**	**4.933**	**0.933**	**0.3308**	**0.0625**	**0.99910**	**0.1080**	**0.0009**	**1842**	**303**	**1808**	**160**	**1769**	**15**	**-4.7**
S103A-z7	**25 ***	**1724**	**242**	**0.140**	**99.66**	**97.48**	**4.804**	**0.897**	**0.3221**	**0.0601**	**0.99900**	**0.1080**	**0.0009**	**1800**	**293**	**1786**	**157**	**1769**	**15**	**-2.0**
S103A-z7	**26 ***	**1721**	**208**	**0.121**	**99.63**	**97.26**	**4.859**	**0.932**	**0.3246**	**0.0623**	**0.99910**	**0.1090**	**0.0009**	**1812**	**303**	**1795**	**162**	**1776**	**15**	**-2.3**
S103A-z7	**27 ***	**1756**	**196**	**0.112**	**99.62**	**97.15**	**4.809**	**0.942**	**0.3220**	**0.0631**	**0.99910**	**0.1080**	**0.0009**	**1800**	**308**	**1786**	**165**	**1771**	**15**	**-1.9**
S103A-z7	**28 ***	**1780**	**199**	**0.112**	**99.73**	**97.97**	**4.687**	**0.895**	**0.3145**	**0.0600**	**0.99910**	**0.1080**	**0.0009**	**1763**	**294**	**1765**	**160**	**1768**	**15**	**0.4**
S103A-z7	**29 ***	**1792**	**183**	**0.102**	**99.71**	**97.85**	**4.722**	**0.923**	**0.3168**	**0.0619**	**0.99910**	**0.1080**	**0.0009**	**1774**	**303**	**1771**	**164**	**1768**	**15**	**-0.4**
S103A-z7	**30 ***	**1757**	**176**	**0.100**	**99.69**	**97.66**	**5.043**	**1.050**	**0.3379**	**0.0704**	**0.99920**	**0.1080**	**0.0009**	**1877**	**339**	**1827**	**177**	**1770**	**15**	**-6.9**
S103A-z7	**31 ***	**1787**	**167**	**0.093**	**99.69**	**97.69**	**4.787**	**0.948**	**0.3187**	**0.0631**	**0.99910**	**0.1090**	**0.0009**	**1783**	**308**	**1783**	**166**	**1782**	**15**	**-0.1**
S103A-z7	**32 ***	**1793**	**176**	**0.098**	**99.76**	**98.21**	**4.744**	**0.952**	**0.3164**	**0.0635**	**0.99920**	**0.1090**	**0.0009**	**1772**	**311**	**1775**	**168**	**1778**	**15**	**0.4**
S103A-z7	**33 ***	**1739**	**161**	**0.093**	**99.77**	**98.28**	**4.776**	**0.966**	**0.3176**	**0.0642**	**0.99920**	**0.1090**	**0.0009**	**1778**	**314**	**1781**	**170**	**1784**	**15**	**0.4**
S103A-z7	**34 ***	**1765**	**169**	**0.096**	**99.8**	**98.48**	**4.673**	**0.928**	**0.3117**	**0.0619**	**0.99920**	**0.1090**	**0.0009**	**1749**	**304**	**1762**	**166**	**1779**	**15**	**2.0**
S103A-z7	**35 ***	**1739**	**157**	**0.090**	**99.81**	**98.59**	**4.634**	**0.910**	**0.3066**	**0.0602**	**0.99920**	**0.1100**	**0.0009**	**1724**	**297**	**1755**	**164**	**1793**	**14**	**4.4**
S103A-z7	**36 ***	**1785**	**146**	**0.082**	**99.8**	**98.5**	**4.666**	**0.948**	**0.3102**	**0.0630**	**0.99920**	**0.1090**	**0.0009**	**1742**	**310**	**1761**	**170**	**1784**	**15**	**2.7**
S103A-z7	**37 ***	**1774**	**138**	**0.078**	**99.83**	**98.76**	**4.697**	**0.959**	**0.3095**	**0.0631**	**0.99930**	**0.1100**	**0.0009**	**1738**	**311**	**1767**	**171**	**1801**	**14**	**4.0**
S103A-z7	**38 ***	**1820**	**129**	**0.071**	**99.85**	**98.9**	**4.771**	**1.000**	**0.3175**	**0.0667**	**0.99930**	**0.1090**	**0.0009**	**1777**	**327**	**1780**	**176**	**1783**	**14**	**0.4**
S103A-z7	**39 ***	**1814**	**114**	**0.063**	**99.83**	**98.73**	**4.646**	**0.937**	**0.3084**	**0.0622**	**0.99920**	**0.1090**	**0.0009**	**1733**	**306**	**1758**	**169**	**1787**	**14**	**3.4**
S103A-z7	**40 ***	**1871**	**115**	**0.061**	**99.82**	**98.66**	**4.814**	**1.040**	**0.3211**	**0.0691**	**0.99930**	**0.1090**	**0.0009**	**1795**	**337**	**1787**	**181**	**1778**	**14**	**-1.1**
S103A-z7	**41 ***	**1838**	**109**	**0.059**	**99.86**	**98.92**	**4.708**	**0.981**	**0.3145**	**0.0655**	**0.99930**	**0.1090**	**0.0008**	**1763**	**321**	**1769**	**174**	**1776**	**14**	**0.9**
S103A-z7	**42 ***	**1819**	**100**	**0.055**	**99.85**	**98.92**	**4.730**	**0.959**	**0.3121**	**0.0633**	**0.99930**	**0.1100**	**0.0009**	**1751**	**311**	**1773**	**170**	**1798**	**14**	**3.0**
S103A-z7	**43 ***	**1813**	**95**	**0.052**	**99.87**	**99.02**	**4.938**	**1.060**	**0.3264**	**0.0699**	**0.99930**	**0.1100**	**0.0009**	**1821**	**340**	**1809**	**181**	**1794**	**14**	**-1.8**
S103A-z7	44	1755	85	0.048	99.9	99.22	4.856	1.030	0.3199	0.0676	0.99930	0.1100	0.0008	1789	330	1795	178	1801	14	0.8
S103A-z7	45	1755	79	0.045	99.89	99.18	4.800	1.000	0.3172	0.0663	0.99930	0.1100	0.0008	1776	324	1785	176	1795	14	1.2
S103A-z7	46	1807	77	0.043	99.87	99.05	4.781	1.010	0.3156	0.0664	0.99930	0.1100	0.0009	1768	325	1782	177	1797	14	1.8

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
	cycle	ppm	ppm	ppm	^{206}Pb*	^{207}Pb*	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
S103A-z7	47	1824	77	0.042	99.91	99.33	4.777	1.010	0.3161	0.0666	0.99930	0.1100	0.0008	1771	326	1781	177	1793	14	1.4
S103A-z7	48	1808	70	0.039	99.91	99.31	4.729	0.985	0.3129	0.0652	0.99930	0.1100	0.0008	1755	320	1772	175	1793	14	2.4
S103A-z7	49	1797	70	0.039	99.88	99.13	4.917	1.070	0.3241	0.0705	0.99940	0.1100	0.0009	1810	343	1805	184	1800	14	-0.6
S103A-z7	50	1776	73	0.041	99.89	99.19	4.757	0.989	0.3127	0.0650	0.99930	0.1100	0.0009	1754	319	1777	174	1805	14	3.2
S103A-z7	51	1831	64	0.035	99.89	99.15	4.744	1.000	0.3156	0.0665	0.99930	0.1090	0.0008	1768	326	1775	177	1783	14	0.9
S103A-z7	52	1810	64	0.036	99.88	99.07	4.796	1.010	0.3158	0.0663	0.99930	0.1100	0.0009	1769	325	1784	176	1802	14	2.1
S103A-z7	53	1796	63	0.035	99.91	99.31	4.876	1.040	0.3187	0.0681	0.99940	0.1110	0.0009	1783	333	1798	180	1815	14	2.0
S103A-z7	54	1794	62	0.035	99.92	99.37	5.034	1.110	0.3302	0.0731	0.99940	0.1110	0.0008	1839	354	1825	187	1809	14	-1.9
S103A-z7	55	1778	54	0.030	99.91	99.32	4.931	1.060	0.3245	0.0699	0.99940	0.1100	0.0009	1812	340	1808	182	1803	14	-0.5
S103A-z7	56	1798	66	0.037	99.95	99.65	4.892	1.050	0.3207	0.0685	0.99940	0.1110	0.0008	1793	334	1801	180	1810	14	1.1
S103A-z7	57	1754	62	0.036	99.95	99.63	4.941	1.050	0.3264	0.0693	0.99940	0.1100	0.0008	1821	337	1809	179	1796	14	-1.6
S103A-z7	58	1761	59	0.033	99.93	99.48	4.853	1.000	0.3169	0.0655	0.99930	0.1110	0.0009	1775	321	1794	174	1817	14	2.7
S103A-z7	59	1766	63	0.036	99.89	99.17	5.148	1.140	0.3383	0.0749	0.99940	0.1100	0.0009	1879	361	1844	188	1805	14	-4.7
Sample S103A, zircon 8: Type 2B																				
S103A-z8	1	1451	1229	0.847	97.03	79.8	2.795	0.387	0.2023	0.0276	0.98670	0.1000	0.0023	1188	148	1354	103	1628	42	29.6
S103A-z8	2	1316	476	0.361	99.12	93.55	4.369	0.601	0.2972	0.0408	0.99430	0.1070	0.0016	1678	203	1707	114	1742	27	4.2
S103A-z8	3	1312	270	0.206	99.62	97.2	5.708	0.891	0.3788	0.0591	0.99650	0.1090	0.0014	2071	276	1933	135	1788	24	-18.5
S103A-z8	4	1301	178	0.137	99.74	98.11	5.690	0.821	0.3738	0.0538	0.99610	0.1100	0.0014	2047	253	1930	125	1806	23	-15.6
S103A-z8	5	1274	159	0.125	99.76	98.25	5.727	0.825	0.3790	0.0545	0.99620	0.1100	0.0014	2071	255	1936	125	1793	23	-18.2
S103A-z8	6	1280	124	0.097	99.81	98.55	6.054	0.914	0.3994	0.0603	0.99660	0.1100	0.0014	2166	278	1984	132	1798	23	-24.2
S103A-z8	7	1250	92	0.073	99.85	98.89	5.888	0.840	0.3901	0.0556	0.99630	0.1090	0.0014	2123	258	1959	124	1791	23	-21.8
S103A-z8	8	1265	69	0.054	99.89	99.18	6.347	0.994	0.4180	0.0654	0.99700	0.1100	0.0013	2251	297	2025	137	1801	22	-29.7
S103A-z8	9	1206	70	0.058	99.86	98.92	5.999	0.872	0.3964	0.0576	0.99650	0.1100	0.0013	2153	266	1976	127	1795	22	-23.5
S103A-z8	10	1192	64	0.054	99.87	99.03	6.210	0.918	0.4042	0.0597	0.99660	0.1110	0.0014	2188	274	2006	129	1823	22	-23.7
S103A-z8	11	1254	51	0.041	99.91	99.33	6.412	1.030	0.4261	0.0683	0.99720	0.1090	0.0013	2288	309	2034	141	1785	22	-33.6
S103A-z8	12	1269	48	0.038	99.95	99.61	6.201	0.943	0.4052	0.0616	0.99690	0.1110	0.0013	2193	283	2005	133	1816	22	-24.5
S103A-z8	13	1226	42	0.034	99.95	99.6	6.461	1.040	0.4237	0.0682	0.99720	0.1110	0.0013	2277	309	2041	142	1809	22	-30.8
S103A-z8	14	1150	34	0.030	99.94	99.53	6.526	1.080	0.4243	0.0700	0.99740	0.1120	0.0013	2280	317	2049	145	1825	22	-29.6
S103A-z8	15	1139	38	0.034	99.94	99.52	6.063	0.941	0.3963	0.0615	0.99700	0.1110	0.0013	2152	284	1985	135	1815	22	-21.9
S103A-z8	16	1186	39	0.033	99.96	99.73	6.191	0.991	0.4024	0.0643	0.99720	0.1120	0.0013	2180	296	2003	140	1826	22	-22.8
S103A-z8	17	1227	37	0.030	99.93	99.48	6.572	1.150	0.4322	0.0758	0.99770	0.1100	0.0013	2316	341	2056	155	1804	22	-33.8
S103A-z8	18	1206	34	0.028	99.9	99.23	6.079	0.996	0.4013	0.0657	0.99730	0.1100	0.0013	2175	302	1987	143	1797	22	-24.8
S103A-z8	19	1190	37	0.031	99.9	99.29	6.165	1.030	0.4024	0.0674	0.99740	0.1110	0.0013	2180	310	2000	146	1818	22	-23.5
S103A-z8	20	1226	34	0.027	99.95	99.64	5.973	0.982	0.3901	0.0641	0.99740	0.1110	0.0013	2124	297	1972	143	1816	22	-19.9
S103A-z8	21	1186	31	0.026	99.95	99.65	6.237	1.080	0.4062	0.0703	0.99770	0.1110	0.0013	2197	322	2010	152	1822	22	-24.3
S103A-z8	22	1165	30	0.026	99.93	99.46	5.858	0.973	0.3882	0.0644	0.99740	0.1090	0.0013	2114	299	1955	144	1790	22	-21.3
S103A-z8	23	1248	33	0.026	99.95	99.64	6.296	1.140	0.4101	0.0741	0.99790	0.1110	0.0013	2215	339	2018	158	1822	21	-25.5
S103A-z8	24	1246	34	0.027	99.94	99.57	5.924	1.010	0.3897	0.0663	0.99760	0.1100	0.0013	2122	308	1965	148	1803	22	-20.8
S103A-z8	25	1232	31	0.025	99.95	99.6	5.966	1.030	0.3927	0.0679	0.99770	0.1100	0.0013	2135	314	1971	150	1803	21	-21.6
S103A-z8	26	1207	26	0.022	99.96	99.68	5.811	0.954	0.3759	0.0617	0.99740	0.1120	0.0013	2057	289	1948	142	1834	21	-14.2
S103A-z8	27	1208	28	0.023	99.96	99.72	5.960	1.010	0.3847	0.0651	0.99760	0.1120	0.0013	2098	303	1970	147	1838	21	-16.6
S103A-z8	28	1229	26	0.021	99.95	99.61	6.023	1.060	0.3949	0.0695	0.99780	0.1110	0.0013	2146	321	1979	153	1809	21	-21.9
S103A-z8	29	1258	31	0.025	99.92	99.43	5.659	0.919	0.3712	0.0602	0.99740	0.1110	0.0013	2035	283	1925	140	1809	21	-14.6
S103A-z8	30	1271	25	0.020	99.98	99.86	6.078	1.080	0.3979	0.0704	0.99790	0.1110	0.0013	2159	324	1987	154	1812	21	-22.6
S103A-z8	31	1204	24	0.020	100	99.97	5.985	1.040	0.3905	0.0678	0.99780	0.1110	0.0013	2125	314	1974	151	1819	21	-19.7
S103A-z8	32	1199	27	0.023	99.99	99.9	5.975	1.020	0.3860	0.0658	0.99770	0.1120	0.0013	2104	306	1972	148	1836	21	-17.2
S103A-z8	33	1274	28	0.022	99.98	99.83	6.103	1.100	0.3985	0.0719	0.99800	0.1110	0.0013	2162	331	1991	158	1817	21	-22.4
S103A-z8	34	1318	27	0.020	99.97	99.75	5.944	1.060	0.3868	0.0688	0.99790	0.1110	0.0013	2108	320	1968	155	1823	21	-18.4
S103A-z8	35	1292	30	0.023	99.99	99.93	6.152	1.100	0.4002	0.0714	0.99790	0.1120	0.0013	2170	329	1998	156	1824	21	-22.4
S103A-z8	36	1299	27	0.021	99.98	99.83	5.988	1.060	0.3906	0.0691	0.99790	0.1110	0.0013	2126	320	1974	154	1819	21	-19.8
S103A-z8	37	1316	28	0.021	99.95	99.64	5.832	1.030	0.3821	0.0673	0.99790	0.1110	0.0013	2086	314	1951	153	1811	21	-17.8
S103A-z8	38	1313	25	0.019	99.99	99.93	5.905	1.050	0.3839	0.0679	0.99790	0.1120	0.0013	2095	316	1962	154	1825	21	-17.3
S103A-z8	39	1304	32	0.024	99.97	99.79	5.784	1.010	0.3750	0.0652	0.99790	0.1120	0.0013	2053	305	1944	150	1830	21	-14.2
S103A-z8	40	1268	28	0.022	99.95	99.66	6.289	1.160	0.4088	0.0757	0.99810	0.1120	0.0013	2209	346	2017	162	1825	21	-24.9
S103A-z8	41	1298	24	0.019	99.94	99.54	5.983	1.080	0.3918	0.0709	0.99800	0.1110	0.0013	2131	328	1973	157	1812	21	-20.7
S103A-z8	42	1277	31	0.024	99.97	99.8	5.898	0.990	0.3807	0.0639	0.99770	0.1120	0.0013	2080	298	1961	146	1838	21	-15.4
S103A-z8	43	1336	26	0.019	99.95	99.65	6.025	1.050	0.3908	0.0682	0.99780	0.1120	0.0013	2127	316	1979	152	1829	21	-19.1
S103A-z8	44	1343	32	0.023	99.96	99.69	6.053	1.060	0.3906	0.0686	0.99790	0.1120	0.0013	2126	318	1984	153	1839	21	-18.3
S103A-z8	45	1305	27	0.020	99.94	99.54	5.748	0.966	0.3764	0.0632	0.99760	0.1110	0.0013	2059	296	1939	145	1812	21	-16.0
S103A-z8	46	1276	30	0.024	99.96	99.72	5.819	0.959	0.3734	0.0615	0.99750	0.1130	0.0013	2045	289	1949	143	1848	21	-12.5
S103A-z8	47	1342	29	0.022	99.97	99.79	5.857	1.020	0.3830	0.0668	0.99780	0.1110	0.0013	2091	311	1955	151	1814	21	-17.9
S103A-z8	48	1345	32	0.024	99.98	99.82	5.820	1.010	0.3770	0.0654	0.99780	0.1120	0.0013	2062	306	1949	150	1832	21	-14.7
S103A-z8	49	1332	27	0.020	99.98	99.82	5.869	1.040	0.3829	0.0679	0.99790	0.1110	0.0013	2090	316	1957	154	1819	21	-17.4
S103A-z8	50	1313	29	0.022	99.96	99.68	5.690	0.970	0.3679	0.0627	0.99770	0.1120	0.0013	2019	295	1930	147	1835	21	-11.7
S103A-z8	51	1218	24	0.020	99.96	99.68	5.431	0.886	0.3559	0.0580	0.99750	0.1110	0.0013	1963	276	1890	140	1811	21	-9.7
S103A-z8	52	1286	26	0.020	99.97	99.79	6.011	1.080	0.3872	0.0697	0.99800	0.1130	0.0013	2110	324	1977	157	1842	21	-17.0
S103A-z8	53	1294	23	0.018	100	99.97	5.719	0.980	0.3698	0.0634	0.99780	0.1120	0.0013	2028	298	1934	148	1835	21	-12.3
S103A-z8	54	1247	24	0.019	99.98	99.86	5.778	1.000	0.3750	0.0649	0.99780	0.1120	0.0013	2053	304	1943	150	1828	21	-14.4
S103A-z8	55	1287	26	0.020	99.97	99.79	5.817	0.997	0.3759	0.0644	0.99780	0.1120	0.0013	2057	302	1949	149	1836	21	-14.1
S103A-z8	56	1302	27	0.021	99.97	99.75	5.441	0.888	0.3585	0.0585	0.99750	0.1100	0.0013	1975	277	1891	140	1801	21	-11.2
S103A-z8	57	1318	28	0.022	99.95	99.65	5.712	0.971	0.3740	0.0635	0.99770	0.1110	0.0013	2048	298	1933	147	1812	21	-15.2
S103A-z8	58	1336	33	0.025	99.95	99.64	5.620	0.952	0.3700	0.0626	0.99770	0.1100	0.0013	2029	295	1919	146	1802	21	-14.7
S103A-z8	59	1342	26	0.019	99.97	99.79	5.825	1.010	0.3770	0.0655	0.99780	0.1120	0.0013	2062	307	1950	151	1833	21	-14.6
Sample S103A, zircon 9: Type 1B																				
S103A-z9	1	964	719	0.746	96.37	76.26	3.297	0.565	0.2385	0.0404	0.98980	0.1000	0.0024	1379	210	1480	133	1629	45	17.0
S103A-z9	2	814	313	0.385	98.4	88.35	4.197	0.735	0.2985	0.0521	0.99530	0.1020	0.0017	1684	258	1673	144	1660	31	-1.7
S103A-z9	3	797	220	0.276	98.99	92.49	4.574	0.825	0.3189	0.0574	0.99670	0.1040	0.0015	1784	281	1745	150	1697	27	-5.9
S103A-z9	4	824	190	0.231	99.27	94.6	4.637	0.830	0.3168	0.0566	0.99730	0.1060	0.0014	1774	277	1756	149	1734	24	-2.7
S103A-z9	5	863	146	0.170	99.57	96.71	4.739	0.866	0.3242	0.0592	0.99780	0.1060	0.0013	1810	288	1774	153	1732	22	-5.2
S103A-z9	6	909	128	0.141	99.63	97.23	4.740	0.868	0.3223	0.0590	0.99800	0.1070	0.0012	1801	288	1774	154	1744	21	-3.7

Grain	Mass cycle		U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
S103A-z9	7		930	112	0.120	99.7	97.7	4.862	0.900	0.3298	0.0610	0.99810	0.1070	0.0012	1837	296	1796	156	1748	21	-5.9
S103A-z9	8		963	92	0.095	99.75	98.12	4.801	0.881	0.3264	0.0598	0.99820	0.1070	0.0012	1821	291	1785	154	1743	20	-5.2
S103A-z9	9		998	85	0.085	99.79	98.38	5.136	1.020	0.3468	0.0685	0.99860	0.1070	0.0011	1919	328	1842	168	1756	20	-10.8
S103A-z9	10		971	62	0.064	99.83	98.69	4.916	0.921	0.3360	0.0629	0.99840	0.1060	0.0011	1867	303	1805	158	1734	19	-8.8
S103A-z9	11		991	57	0.057	99.86	98.9	4.988	0.932	0.3356	0.0627	0.99850	0.1080	0.0011	1866	302	1817	158	1762	19	-6.8
S103A-z9	12		1013	43	0.043	99.89	99.15	4.893	0.903	0.3347	0.0617	0.99850	0.1060	0.0011	1861	298	1801	156	1732	18	-8.6
S103A-z9	**13**	*	**1040**	**45**	**0.043**	**99.92**	**99.36**	**4.957**	**0.907**	**0.3329**	**0.0608**	**0.99860**	**0.1080**	**0.0011**	**1852**	**294**	**1812**	**155**	**1766**	**18**	**-5.6**
S103A-z9	**14**	*	**1092**	**35**	**0.032**	**99.94**	**99.51**	**5.069**	**0.967**	**0.3423**	**0.0653**	**0.99870**	**0.1070**	**0.0010**	**1898**	**313**	**1831**	**162**	**1756**	**18**	**-9.3**
S103A-z9	**15**	*	**1115**	**35**	**0.031**	**99.95**	**99.6**	**4.982**	**0.935**	**0.3384**	**0.0635**	**0.99870**	**0.1070**	**0.0010**	**1879**	**306**	**1816**	**159**	**1745**	**17**	**-8.9**
S103A-z9	**16**	*	**1108**	**33**	**0.029**	**99.95**	**99.64**	**4.983**	**0.918**	**0.3357**	**0.0618**	**0.99870**	**0.1080**	**0.0010**	**1866**	**298**	**1816**	**156**	**1760**	**17**	**-6.9**
S103A-z9	17		1124	32	0.029	99.94	99.54	5.640	1.180	0.3788	0.0791	0.99900	0.1080	0.0010	2070	370	1922	180	1766	17	-20.2
S103A-z9	**18**	*	**1141**	**31**	**0.027**	**99.94**	**99.55**	**5.263**	**1.030**	**0.3517**	**0.0689**	**0.99890**	**0.1090**	**0.0010**	**1943**	**329**	**1863**	**167**	**1775**	**17**	**-10.9**
S103A-z9	**19**	*	**1135**	**29**	**0.025**	**99.97**	**99.79**	**5.023**	**0.927**	**0.3376**	**0.0623**	**0.99880**	**0.1080**	**0.0010**	**1875**	**300**	**1823**	**156**	**1764**	**17**	**-7.3**
S103A-z9	**20**	*	**1191**	**29**	**0.024**	**99.97**	**99.77**	**5.200**	**1.010**	**0.3480**	**0.0675**	**0.99890**	**0.1080**	**0.0010**	**1925**	**323**	**1853**	**165**	**1772**	**17**	**-10.0**
S103A-z9	**21**	*	**1186**	**27**	**0.023**	**99.96**	**99.71**	**5.044**	**0.946**	**0.3411**	**0.0639**	**0.99880**	**0.1070**	**0.0010**	**1892**	**307**	**1827**	**159**	**1753**	**17**	**-9.2**
S103A-z9	**22**	*	**1164**	**26**	**0.022**	**99.98**	**99.85**	**5.051**	**0.927**	**0.3364**	**0.0617**	**0.99880**	**0.1090**	**0.0010**	**1869**	**298**	**1828**	**156**	**1781**	**17**	**-5.7**
S103A-z9	**23**	*	**1190**	**25**	**0.021**	**99.96**	**99.7**	**5.043**	**0.932**	**0.3364**	**0.0621**	**0.99880**	**0.1090**	**0.0010**	**1869**	**300**	**1827**	**157**	**1779**	**17**	**-5.8**
S103A-z9	**24**	*	**1192**	**24**	**0.020**	**99.97**	**99.77**	**5.129**	**0.950**	**0.3401**	**0.0629**	**0.99880**	**0.1090**	**0.0010**	**1887**	**303**	**1841**	**157**	**1789**	**16**	**-6.3**
S103A-z9	**25**	*	**1198**	**22**	**0.018**	**99.99**	**99.93**	**5.135**	**0.970**	**0.3419**	**0.0646**	**0.99890**	**0.1090**	**0.0010**	**1896**	**310**	**1842**	**161**	**1781**	**16**	**-7.5**
S103A-z9	**26**	*	**1227**	**25**	**0.020**	**99.98**	**99.88**	**5.103**	**0.971**	**0.3456**	**0.0658**	**0.99890**	**0.1070**	**0.0010**	**1914**	**315**	**1837**	**162**	**1750**	**16**	**-10.8**
S103A-z9	**27**	*	**1239**	**23**	**0.019**	**99.98**	**99.83**	**5.084**	**0.946**	**0.3416**	**0.0635**	**0.99890**	**0.1080**	**0.0010**	**1894**	**305**	**1833**	**158**	**1765**	**16**	**-8.5**
S103A-z9	**28**	*	**1238**	**24**	**0.020**	**99.99**	**99.95**	**5.158**	**0.978**	**0.3433**	**0.0651**	**0.99890**	**0.1090**	**0.0010**	**1902**	**312**	**1846**	**161**	**1782**	**16**	**-7.8**
S103A-z9	**29**	*	**1265**	**24**	**0.019**	**99.99**	**99.95**	**5.064**	**0.942**	**0.3409**	**0.0634**	**0.99890**	**0.1080**	**0.0009**	**1891**	**305**	**1830**	**158**	**1762**	**16**	**-8.4**
S103A-z9	**30**	*	**1278**	**26**	**0.020**	**99.98**	**99.83**	**5.076**	**0.940**	**0.3364**	**0.0623**	**0.99890**	**0.1090**	**0.0010**	**1869**	**300**	**1832**	**157**	**1790**	**16**	**-5.1**
S103A-z9	**31**	*	**1254**	**23**	**0.018**	**99.98**	**99.83**	**5.172**	**0.986**	**0.3451**	**0.0658**	**0.99890**	**0.1090**	**0.0010**	**1911**	**315**	**1848**	**162**	**1777**	**16**	**-8.8**
S103A-z9	**32**	*	**1230**	**27**	**0.022**	**99.99**	**99.91**	**5.148**	**0.964**	**0.3419**	**0.0640**	**0.99890**	**0.1090**	**0.0010**	**1896**	**307**	**1844**	**159**	**1786**	**16**	**-7.1**
S103A-z9	**33**	*	**1256**	**30**	**0.024**	**99.99**	**99.9**	**5.156**	**0.969**	**0.3423**	**0.0643**	**0.99890**	**0.1090**	**0.0010**	**1898**	**309**	**1845**	**160**	**1787**	**16**	**-7.1**
S103A-z9	**34**	*	**1247**	**31**	**0.025**	**99.99**	**99.93**	**5.084**	**0.939**	**0.3387**	**0.0626**	**0.99890**	**0.1090**	**0.0010**	**1881**	**301**	**1833**	**157**	**1780**	**16**	**-6.5**
S103A-z9	**35**	*	**1253**	**31**	**0.025**	**99.97**	**99.78**	**5.064**	**0.951**	**0.3407**	**0.0640**	**0.99890**	**0.1080**	**0.0009**	**1890**	**308**	**1830**	**159**	**1763**	**16**	**-8.3**
S103A-z9	**36**	*	**1246**	**32**	**0.026**	**99.98**	**99.83**	**5.021**	**0.911**	**0.3355**	**0.0609**	**0.99880**	**0.1090**	**0.0010**	**1865**	**294**	**1823**	**154**	**1775**	**16**	**-5.8**
Sample S103A, zircon 10: Type 1B																					
S103A-z10	1		4810	6556	1.363	86.02	42.65	0.754	0.114	0.0547	0.0075	0.92480	0.1000	0.0058	343	46	571	66	1625	107	80.9
S103A-z10	2		2607	4092	1.570	92.73	61.33	1.501	0.225	0.1058	0.0154	0.97390	0.1030	0.0035	648	90	931	91	1678	63	64.4
S103A-z10	3		2074	3060	1.476	95.6	73.47	2.029	0.304	0.1393	0.0205	0.98600	0.1060	0.0026	840	116	1125	102	1726	46	54.6
S103A-z10	4		1790	2386	1.333	96.79	79.6	2.594	0.421	0.1757	0.0283	0.99150	0.1070	0.0023	1044	155	1299	119	1750	39	43.7
S103A-z10	5		1658	1988	1.199	97.4	82.79	2.914	0.481	0.1991	0.0326	0.99310	0.1060	0.0021	1170	175	1386	125	1735	36	35.6
S103A-z10	6		1624	1704	1.049	98.15	87.42	3.327	0.574	0.2225	0.0382	0.99520	0.1080	0.0018	1295	202	1487	135	1774	31	29.8
S103A-z10	7		1534	1349	0.879	98.5	89.68	3.765	0.691	0.2488	0.0455	0.99640	0.1100	0.0017	1432	235	1585	147	1795	29	22.5
S103A-z10	8		1470	1134	0.771	98.78	91.48	4.178	0.803	0.2747	0.0527	0.99710	0.1100	0.0016	1565	266	1670	157	1804	27	14.9
S103A-z10	9		1478	984	0.666	98.88	92.02	4.163	0.777	0.2786	0.0519	0.99700	0.1080	0.0016	1584	262	1667	153	1772	26	11.9
S103A-z10	10		1440	778	0.540	99.05	93.15	4.422	0.845	0.2965	0.0566	0.99740	0.1080	0.0015	1674	281	1717	158	1769	25	6.1
S103A-z10	11		1460	653	0.447	99.21	94.25	4.480	0.861	0.3015	0.0579	0.99770	0.1080	0.0014	1699	287	1727	160	1762	24	4.1
S103A-z10	12		1500	540	0.360	99.44	95.98	4.946	0.995	0.3209	0.0645	0.99820	0.1120	0.0013	1794	315	1810	170	1829	22	2.2
S103A-z10	13		1463	481	0.329	99.56	96.84	4.844	0.930	0.3162	0.0607	0.99820	0.1110	0.0013	1771	297	1793	162	1817	21	2.9
S103A-z10	14		1419	412	0.291	99.67	97.56	4.914	0.938	0.3207	0.0612	0.99820	0.1110	0.0013	1793	299	1805	161	1818	21	1.6
S103A-z10	15		1500	384	0.256	99.61	97.15	5.009	0.982	0.3280	0.0643	0.99830	0.1110	0.0012	1829	312	1821	166	1812	21	-1.1
S103A-z10	16		1549	330	0.213	99.67	97.59	5.273	1.080	0.3451	0.0707	0.99860	0.1110	0.0012	1911	339	1864	175	1813	20	-6.3
S103A-z10	17		1531	317	0.207	99.74	98.07	5.021	0.962	0.3311	0.0634	0.99840	0.1100	0.0012	1844	307	1823	162	1799	20	-2.9
S103A-z10	**18**	*	**1600**	**298**	**0.187**	**99.76**	**98.27**	**5.269**	**1.060**	**0.3428**	**0.0690**	**0.99860**	**0.1110**	**0.0012**	**1900**	**331**	**1864**	**172**	**1824**	**19**	**-4.8**
S103A-z10	**19**	*	**1565**	**272**	**0.174**	**99.82**	**98.67**	**5.438**	**1.110**	**0.3535**	**0.0723**	**0.99870**	**0.1120**	**0.0012**	**1951**	**344**	**1891**	**176**	**1825**	**19**	**-8.0**
S103A-z10	**20**	*	**1546**	**237**	**0.153**	**99.83**	**98.78**	**5.444**	**1.110**	**0.3562**	**0.0729**	**0.99870**	**0.1110**	**0.0011**	**1964**	**346**	**1892**	**176**	**1813**	**19**	**-9.7**
S103A-z10	**21**	*	**1526**	**228**	**0.150**	**99.82**	**98.66**	**5.119**	**0.977**	**0.3384**	**0.0646**	**0.99850**	**0.1100**	**0.0011**	**1879**	**311**	**1839**	**162**	**1794**	**19**	**-5.5**
S103A-z10	**22**	*	**1608**	**206**	**0.128**	**99.84**	**98.81**	**5.488**	**1.130**	**0.3560**	**0.0733**	**0.99880**	**0.1120**	**0.0011**	**1963**	**348**	**1899**	**177**	**1829**	**18**	**-8.5**
S103A-z10	**23**	*	**1633**	**207**	**0.127**	**99.9**	**99.24**	**5.487**	**1.120**	**0.3560**	**0.0725**	**0.99880**	**0.1120**	**0.0011**	**1963**	**345**	**1899**	**175**	**1829**	**18**	**-8.5**
S103A-z10	**24**	*	**1593**	**174**	**0.109**	**99.89**	**99.18**	**5.523**	**1.110**	**0.3606**	**0.0727**	**0.99880**	**0.1110**	**0.0011**	**1985**	**344**	**1904**	**173**	**1817**	**18**	**-10.8**
S103A-z10	**25**	*	**1554**	**159**	**0.102**	**99.9**	**99.28**	**5.255**	**0.995**	**0.3395**	**0.0642**	**0.99860**	**0.1120**	**0.0011**	**1884**	**309**	**1862**	**161**	**1836**	**18**	**-3.1**
S103A-z10	**26**	*	**1550**	**151**	**0.097**	**99.89**	**99.22**	**5.708**	**1.170**	**0.3632**	**0.0746**	**0.99890**	**0.1140**	**0.0011**	**1997**	**353**	**1933**	**177**	**1864**	**18**	**-8.3**
S103A-z10	**27**	*	**1560**	**159**	**0.102**	**99.87**	**99.08**	**5.569**	**1.110**	**0.3585**	**0.0717**	**0.99880**	**0.1130**	**0.0011**	**1975**	**340**	**1911**	**172**	**1843**	**18**	**-8.3**
S103A-z10	**28**	*	**1540**	**146**	**0.095**	**99.89**	**99.16**	**5.607**	**1.120**	**0.3619**	**0.0723**	**0.99880**	**0.1120**	**0.0011**	**1991**	**342**	**1917**	**172**	**1838**	**18**	**-9.7**
S103A-z10	**29**	*	**1536**	**139**	**0.090**	**99.93**	**99.51**	**5.488**	**1.070**	**0.3533**	**0.0688**	**0.99880**	**0.1130**	**0.0011**	**1951**	**328**	**1899**	**167**	**1843**	**17**	**-6.7**
S103A-z10	**30**	*	**1544**	**135**	**0.087**	**99.89**	**99.21**	**5.570**	**1.100**	**0.3579**	**0.0707**	**0.99880**	**0.1130**	**0.0011**	**1972**	**336**	**1911**	**170**	**1846**	**18**	**-8.0**
S103A-z10	**31**	*	**1537**	**122**	**0.079**	**99.91**	**99.35**	**5.394**	**1.020**	**0.3474**	**0.0655**	**0.99870**	**0.1130**	**0.0011**	**1922**	**313**	**1884**	**162**	**1842**	**18**	**-5.0**
S103A-z10	32		1614	130	0.080	99.93	99.46	5.741	1.210	0.3785	0.0795	0.99900	0.1100	0.0010	2069	372	1938	182	1799	17	-17.6
S103A-z10	**33**	*	**1545**	**110**	**0.071**	**99.92**	**99.44**	**5.387**	**1.010**	**0.3452**	**0.0646**	**0.99870**	**0.1130**	**0.0011**	**1911**	**310**	**1883**	**160**	**1851**	**17**	**-3.8**
S103A-z10	**34**	*	**1556**	**112**	**0.072**	**99.94**	**99.55**	**5.680**	**1.130**	**0.3692**	**0.0732**	**0.99890**	**0.1120**	**0.0011**	**2026**	**345**	**1928**	**171**	**1825**	**17**	**-12.8**
S103A-z10	**35**	*	**1585**	**116**	**0.073**	**99.91**	**99.38**	**5.602**	**1.080**	**0.3596**	**0.0695**	**0.99880**	**0.1130**	**0.0011**	**1980**	**329**	**1916**	**166**	**1848**	**17**	**-8.3**
S103A-z10	**36**	*	**1576**	**110**	**0.069**	**99.92**	**99.44**	**5.598**	**1.100**	**0.3642**	**0.0713**	**0.99880**	**0.1110**	**0.0011**	**2002**	**337**	**1916**	**169**	**1824**	**17**	**-11.3**
S103A-z10	**37**	*	**1518**	**97**	**0.064**	**99.98**	**99.87**	**5.572**	**1.060**	**0.3591**	**0.0685**	**0.99880**	**0.1130**	**0.0011**	**1978**	**325**	**1912**	**164**	**1841**	**17**	**-8.6**
S103A-z10	**38**	*	**1542**	**89**	**0.058**	**99.97**	**99.77**	**5.803**	**1.180**	**0.3728**	**0.0757**	**0.99900**	**0.1130**	**0.0010**	**2043**	**356**	**1947**	**176**	**1846**	**17**	**-12.5**
S103A-z10	**39**	*	**1511**	**98**	**0.065**	**99.96**	**99.72**	**5.524**	**1.010**	**0.3498**	**0.0637**	**0.99870**	**0.1150**	**0.0011**	**1933**	**304**	**1904**	**157**	**1873**	**17**	**-3.7**
S103A-z10	**40**	*	**1602**	**100**	**0.062**	**99.96**	**99.69**	**5.804**	**1.160**	**0.3744**	**0.0746**	**0.99890**	**0.1120**	**0.0010**	**2050**	**350**	**1947**	**173**	**1839**	**17**	**-13.4**
S103A-z10	**41**	*	**1587**	**99**	**0.062**	**99.98**	**99.85**	**5.611**	**1.060**	**0.3592**	**0.0678**	**0.99880**	**0.1130**	**0.0011**	**1978**	**321**	**1918**	**163**	**1853**	**17**	**-7.9**
S103A-z10	**42**	*	**1533**	**85**	**0.056**	**99.96**	**99.72**	**5.443**	**0.985**	**0.3515**	**0.0636**	**0.99870**	**0.1120**	**0.0011**	**1942**	**303**	**1892**	**155**	**1837**	**17**	**-6.6**
S103A-z10	**43**	*	**1582**	**94**	**0.059**	**99.92**	**99.45**	**5.630**	**1.070**	**0.3623**	**0.0689**	**0.99880**	**0.1130**	**0.0011**	**1993**	**326**	**1921**	**164**	**1843**	**17**	**-9.5**
S103A-z10	**44**	*	**1563**	**89**	**0.057**	**99.93**	**99.47**	**5.581**	**1.040**	**0.3604**	**0.0673**	**0.99870**	**0.1120**	**0.0011**	**1984**	**319**	**1913**	**161**	**1837**	**17**	**-9.3**
S103A-z10	**45**	*	**1529**	**78**	**0.051**	**99.96**	**99.7**	**5.685**	**1.070**	**0.3660**	**0.0688**	**0.99880**	**0.1130**	**0.0011**	**2010**	**325**	**1929**	**162**	**1843**	**17**	**-10.6**
S103A-z10	**46**	*	**1530**	**87**	**0.057**	**99.97**	**99.8**	**5.575**	**1.040**	**0.3584**	**0.0671**	**0.99880**	**0.1130**	**0.0010**	**1975**	**318**	**1912**	**161**	**1845**	**17**	**-8.2**
S103A-z10	**47**	*	**1538**	**77**	**0.050**	**99.97**	**99.75**	**5.754**	**1.110**	**0.3723**	**0.0720**	**0.99880**	**0.1120**	**0.0010**	**2040**	**338**	**1939**	**167**	**1834**	**17**	**-13.1**
S103A-z10	**48**	*	**1581**	**79**	**0.050**	**99.98**	**99.85**	**5.562**	**1.010**	**0.3577**	**0.0651**	**0.99870**	**0.1130**	**0.0011**	**1971**	**309**	**1910**	**157**	**1845**	**17**	**-7.9**
S103A-z10	**49**	*	**1542**	**85**	**0.055**	**99.98**	**99.82**	**5.508**	**0.992**	**0.3564**	**0.0642**	**0.99860**	**0.1120**	**0.0011**	**1965**	**305**	**1902**	**155**	**1833**	**17**	**-8.4**
S103A-z10	**50**	*	**1528**	**85**	**0.056**	**99.96**	**99.73**	**5.734**	**1.090**	**0.3683**	**0.0699**	**0.99880**	**0.1130**	**0.0011**	**2022**	**329**	**1937**	**164**	**1847**	**17**	**-11.0**

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
	cycle		ppm	ppm	ppm	^{206}Pb*	^{207}Pb*	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.		
S103A-z10	**51**	*	**1485**	**79**	**0.053**	**99.94**	**99.58**	**5.718**	**1.070**	**0.3698**	**0.0689**	**0.99870**	**0.1120**	**0.0011**	**2029**	**324**	**1934**	**161**	**1834**	**17**		**-12.4**
S103A-z10	**52**	*	**1519**	**84**	**0.055**	**99.94**	**99.59**	**5.575**	**1.030**	**0.3615**	**0.0666**	**0.99870**	**0.1120**	**0.0011**	**1990**	**315**	**1912**	**159**	**1830**	**17**		**-10.1**
S103A-z10	**53**	*	**1524**	**76**	**0.050**	**99.96**	**99.73**	**5.713**	**1.050**	**0.3643**	**0.0669**	**0.99870**	**0.1140**	**0.0011**	**2002**	**316**	**1933**	**159**	**1860**	**17**		**-8.9**
S103A-z10	**54**	*	**1469**	**83**	**0.057**	**99.94**	**99.57**	**5.522**	**0.980**	**0.3560**	**0.0631**	**0.99860**	**0.1130**	**0.0011**	**1963**	**300**	**1904**	**153**	**1840**	**17**		**-7.8**
S103A-z10	**55**	*	**1515**	**77**	**0.051**	**99.96**	**99.7**	**5.866**	**1.120**	**0.3777**	**0.0723**	**0.99880**	**0.1130**	**0.0011**	**2066**	**338**	**1956**	**166**	**1842**	**17**		**-14.2**
S103A-z10	**56**	*	**1464**	**68**	**0.046**	**99.95**	**99.63**	**5.669**	**1.020**	**0.3624**	**0.0654**	**0.99860**	**0.1130**	**0.0011**	**1994**	**309**	**1927**	**156**	**1855**	**17**		**-8.7**
S103A-z10	**57**	*	**1464**	**74**	**0.051**	**99.97**	**99.77**	**5.468**	**0.957**	**0.3543**	**0.0620**	**0.99860**	**0.1120**	**0.0011**	**1955**	**295**	**1896**	**150**	**1831**	**17**		**-7.9**
S103A-z10	**58**	*	**1500**	**72**	**0.048**	**99.97**	**99.8**	**5.581**	**1.010**	**0.3631**	**0.0655**	**0.99860**	**0.1110**	**0.0010**	**1997**	**310**	**1913**	**155**	**1824**	**17**		**-11.0**
S103A-z10	**59**	*	**1502**	**70**	**0.047**	**99.98**	**99.83**	**5.650**	**1.020**	**0.3633**	**0.0655**	**0.99870**	**0.1130**	**0.0011**	**1998**	**310**	**1924**	**156**	**1845**	**17**		**-9.6**
Sample S103A, zircon 11: Type 1B																						
S103A-z11	1		1831	2164	1.182	95.77	73.99	3.146	0.660	0.2193	0.0458	0.99520	0.1040	0.0021	1278	242	1444	162	1697	38		27.2
S103A-z11	2		1534	767	0.500	98.58	89.83	4.354	0.914	0.2987	0.0626	0.99820	0.1060	0.0013	1685	311	1704	173	1727	23		2.8
S103A-z11	3		1452	324	0.223	99.47	96.09	5.140	1.150	0.3433	0.0769	0.99890	0.1090	0.0011	1903	369	1843	191	1776	19		-8.2
S103A-z11	4		1419	197	0.139	99.69	97.72	5.309	1.190	0.3523	0.0787	0.99900	0.1090	0.0011	1946	375	1870	191	1788	18		-10.2
S103A-z11	5		1411	140	0.099	99.85	98.91	5.582	1.300	0.3674	0.0857	0.99920	0.1100	0.0010	2017	404	1913	201	1803	17		-13.8
S103A-z11	6		1424	94	0.066	99.84	98.79	5.524	1.300	0.3693	0.0866	0.99920	0.1080	0.0010	2026	408	1904	202	1774	17		-16.6
S103A-z11	7		1433	75	0.053	99.83	98.72	5.925	1.480	0.3919	0.0981	0.99930	0.1100	0.0010	2132	455	1965	218	1794	17		-22.1
S103A-z11	8		1411	62	0.044	99.86	98.93	5.823	1.430	0.3873	0.0952	0.99930	0.1090	0.0010	2110	442	1950	213	1783	17		-21.6
S103A-z11	9		1388	54	0.039	99.85	98.9	5.590	1.300	0.3705	0.0859	0.99920	0.1090	0.0010	2032	404	1915	200	1790	17		-15.8
S103A-z11	10		1395	45	0.032	99.89	99.22	6.280	1.650	0.4128	0.1080	0.99940	0.1100	0.0010	2228	494	2016	230	1805	17		-27.7
S103A-z11	11		1367	42	0.030	99.89	99.2	6.060	1.530	0.3993	0.1010	0.99930	0.1100	0.0010	2166	463	1985	219	1801	17		-23.9
S103A-z11	12		1381	36	0.026	99.91	99.29	6.012	1.500	0.3978	0.0992	0.99930	0.1100	0.0010	2159	457	1978	217	1793	17		-24.0
S103A-z11	13		1394	27	0.019	99.98	99.81	6.137	1.550	0.4025	0.1020	0.99940	0.1110	0.0010	2181	467	1995	220	1809	16		-24.2
S103A-z11	14		1398	25	0.018	99.98	99.84	6.153	1.560	0.4074	0.1030	0.99940	0.1100	0.0010	2203	472	1998	221	1792	16		-27.1
S103A-z11	15		1387	25	0.018	99.99	99.9	6.083	1.470	0.3944	0.0954	0.99930	0.1120	0.0010	2143	441	1988	211	1830	16		-20.1
S103A-z11	16		1379	23	0.017	99.96	99.73	5.995	1.470	0.3959	0.0971	0.99930	0.1100	0.0010	2150	448	1975	213	1797	16		-23.1
S103A-z11	17		1415	25	0.018	99.98	99.87	6.483	1.730	0.4253	0.1130	0.99950	0.1110	0.0010	2284	512	2044	234	1809	16		-31.3
S103A-z11	18		1378	18	0.013	99.99	99.95	6.084	1.490	0.3958	0.0972	0.99940	0.1110	0.0010	2149	449	1988	214	1824	16		-21.0
S103A-z11	19		1355	17	0.013	99.99	99.92	6.184	1.550	0.4066	0.1020	0.99940	0.1100	0.0010	2199	468	2002	220	1805	16		-25.8
S103A-z11	20		1374	18	0.013	99.98	99.82	6.299	1.620	0.4148	0.1060	0.99940	0.1100	0.0010	2237	485	2018	225	1802	16		-28.6
S103A-z11	21		1378	16	0.011	99.99	99.9	6.342	1.610	0.4172	0.1060	0.99940	0.1100	0.0010	2248	482	2024	223	1804	16		-29.2
S103A-z11	22		1413	16	0.011	99.98	99.87	6.416	1.660	0.4173	0.1080	0.99940	0.1120	0.0010	2248	491	2034	227	1824	16		-27.6
S103A-z11	23		1420	16	0.011	99.98	99.88	6.019	1.430	0.3920	0.0934	0.99930	0.1110	0.0010	2132	433	1979	208	1822	16		-20.0
S103A-z11	24		1443	15	0.011	99.98	99.85	6.099	1.460	0.3984	0.0956	0.99930	0.1110	0.0010	2162	441	1990	209	1816	16		-22.5
S103A-z11	25		1435	16	0.011	100	100	6.148	1.490	0.4016	0.0972	0.99940	0.1110	0.0010	2176	447	1997	211	1816	16		-23.4
S103A-z11	26		1408	15	0.011	100	100	6.016	1.410	0.3916	0.0918	0.99930	0.1110	0.0010	2130	425	1978	204	1823	16		-19.8
S103A-z11	27		1462	14	0.010	99.99	99.95	6.124	1.480	0.4013	0.0967	0.99940	0.1110	0.0009	2175	445	1994	210	1811	16		-23.7
S103A-z11	28		1466	14	0.009	99.98	99.88	6.107	1.470	0.4018	0.0969	0.99940	0.1100	0.0009	2177	446	1991	211	1803	16		-24.5
S103A-z11	29		1474	11	0.007	99.99	99.91	6.137	1.470	0.3991	0.0959	0.99940	0.1120	0.0010	2165	442	1996	210	1824	16		-22.1
S103A-z11	30		1469	14	0.010	99.98	99.88	6.062	1.420	0.3937	0.0920	0.99930	0.1120	0.0010	2140	425	1985	204	1827	16		-20.1
S103A-z11	31		1390	13	0.009	99.99	99.93	5.816	1.290	0.3787	0.0842	0.99930	0.1110	0.0010	2070	394	1949	193	1822	16		-16.0
S103A-z11	**32**	*	**1377**	**12**	**0.008**	**99.99**	**99.93**	**5.665**	**1.220**	**0.3686**	**0.0793**	**0.99920**	**0.1110**	**0.0010**	**2023**	**373**	**1926**	**186**	**1824**	**16**		**-12.7**
S103A-z11	33		1423	11	0.007	99.99	99.95	5.742	1.260	0.3760	0.0828	0.99920	0.1110	0.0010	2057	388	1938	190	1812	16		-15.8
S103A-z11	34		1444	12	0.008	100	100	5.839	1.310	0.3792	0.0847	0.99930	0.1120	0.0010	2072	396	1952	194	1827	16		-15.7
S103A-z11	**35**	*	**1421**	**12**	**0.009**	**100**	**99.98**	**5.591**	**1.170**	**0.3614**	**0.0754**	**0.99920**	**0.1120**	**0.0010**	**1989**	**357**	**1915**	**180**	**1835**	**16**		**-9.8**
S103A-z11	36		1408	11	0.008	99.99	99.95	5.809	1.280	0.3792	0.0835	0.99920	0.1110	0.0010	2073	390	1948	191	1818	16		-16.4
S103A-z11	**37**	*	**1413**	**14**	**0.010**	**99.99**	**99.93**	**5.587**	**1.170**	**0.3633**	**0.0763**	**0.99920**	**0.1120**	**0.0010**	**1998**	**361**	**1914**	**181**	**1825**	**16**		**-11.0**
S103A-z11	**38**	*	**1446**	**11**	**0.007**	**99.98**	**99.86**	**5.586**	**1.180**	**0.3664**	**0.0776**	**0.99920**	**0.1110**	**0.0010**	**2013**	**366**	**1914**	**182**	**1809**	**16**		**-13.1**
S103A-z11	**39**	*	**1478**	**12**	**0.008**	**100**	**99.98**	**5.843**	**1.270**	**0.3754**	**0.0816**	**0.99920**	**0.1130**	**0.0010**	**2055**	**383**	**1953**	**189**	**1846**	**15**		**-13.2**
S103A-z11	**40**	*	**1415**	**13**	**0.009**	**99.99**	**99.93**	**5.542**	**1.140**	**0.3595**	**0.0738**	**0.99910**	**0.1120**	**0.0010**	**1980**	**350**	**1907**	**177**	**1829**	**16**		**-9.6**
S103A-z11	**41**	*	**1411**	**13**	**0.009**	**99.99**	**99.95**	**5.625**	**1.180**	**0.3646**	**0.0766**	**0.99920**	**0.1120**	**0.0010**	**2004**	**362**	**1920**	**181**	**1830**	**16**		**-11.1**
S103A-z11	**42**	*	**1427**	**11**	**0.008**	**100**	**99.98**	**5.529**	**1.130**	**0.3579**	**0.0732**	**0.99910**	**0.1120**	**0.0010**	**1972**	**348**	**1905**	**176**	**1833**	**15**		**-8.8**
S103A-z11	**43**	*	**1441**	**12**	**0.008**	**99.99**	**99.93**	**5.458**	**1.100**	**0.3532**	**0.0711**	**0.99910**	**0.1120**	**0.0010**	**1950**	**339**	**1894**	**173**	**1834**	**15**		**-7.3**
S103A-z11	**44**	*	**1412**	**10**	**0.007**	**99.99**	**99.93**	**5.376**	**1.060**	**0.3490**	**0.0688**	**0.99910**	**0.1120**	**0.0010**	**1930**	**329**	**1881**	**169**	**1828**	**15**		**-6.4**
S103A-z11	**45**	*	**1432**	**10**	**0.007**	**99.99**	**99.95**	**5.444**	**1.090**	**0.3513**	**0.0701**	**0.99910**	**0.1120**	**0.0010**	**1941**	**334**	**1892**	**171**	**1838**	**15**		**-6.5**
S103A-z11	**46**	*	**1412**	**13**	**0.009**	**100**	**100**	**5.267**	**0.996**	**0.3404**	**0.0643**	**0.99900**	**0.1120**	**0.0010**	**1889**	**309**	**1863**	**161**	**1836**	**15**		**-3.3**
S103A-z11	**47**	*	**1444**	**11**	**0.008**	**100**	**100**	**5.293**	**1.030**	**0.3429**	**0.0664**	**0.99910**	**0.1120**	**0.0009**	**1901**	**319**	**1868**	**165**	**1831**	**15**		**-4.4**
S103A-z11	**48**	*	**1479**	**14**	**0.009**	**100**	**100**	**5.469**	**1.110**	**0.3591**	**0.0729**	**0.99910**	**0.1100**	**0.0009**	**1978**	**346**	**1896**	**174**	**1807**	**15**		**-11.0**
S103A-z11	**49**	*	**1423**	**13**	**0.009**	**100**	**99.98**	**5.108**	**0.946**	**0.3330**	**0.0617**	**0.99900**	**0.1110**	**0.0009**	**1853**	**298**	**1837**	**157**	**1820**	**15**		**-2.1**
S103A-z11	**50**	*	**1418**	**10**	**0.007**	**99.99**	**99.93**	**5.363**	**1.030**	**0.3449**	**0.0664**	**0.99900**	**0.1130**	**0.0010**	**1910**	**318**	**1879**	**165**	**1845**	**15**		**-4.1**
S103A-z11	**51**	*	**1420**	**10**	**0.007**	**99.99**	**99.93**	**5.046**	**0.917**	**0.3278**	**0.0596**	**0.99890**	**0.1120**	**0.0009**	**1828**	**289**	**1827**	**154**	**1826**	**15**		**-0.1**
S103A-z11	**52**	*	**1439**	**12**	**0.008**	**99.99**	**99.93**	**5.124**	**0.947**	**0.3319**	**0.0613**	**0.99900**	**0.1120**	**0.0009**	**1848**	**297**	**1840**	**157**	**1832**	**15**		**-1.0**
S103A-z11	**53**	*	**1422**	**13**	**0.009**	**99.99**	**99.96**	**5.314**	**1.020**	**0.3434**	**0.0659**	**0.99900**	**0.1120**	**0.0009**	**1903**	**316**	**1871**	**164**	**1836**	**15**		**-4.2**
S103A-z11	**54**	*	**1417**	**13**	**0.009**	**100**	**100**	**5.134**	**0.932**	**0.3278**	**0.0595**	**0.99890**	**0.1140**	**0.0010**	**1828**	**289**	**1842**	**154**	**1857**	**15**		**1.8**
S103A-z11	**55**	*	**1432**	**10**	**0.007**	**100**	**100**	**4.977**	**0.869**	**0.3197**	**0.0558**	**0.99880**	**0.1130**	**0.0010**	**1788**	**273**	**1815**	**148**	**1847**	**15**		**3.7**
S103A-z11	**56**	*	**1429**	**12**	**0.008**	**100**	**100**	**4.910**	**0.847**	**0.3166**	**0.0546**	**0.99880**	**0.1120**	**0.0009**	**1773**	**267**	**1804**	**146**	**1840**	**15**		**4.2**
S103A-z11	**57**	*	**1420**	**12**	**0.008**	**100**	**100**	**5.008**	**0.898**	**0.3275**	**0.0587**	**0.99890**	**0.1110**	**0.0009**	**1826**	**285**	**1821**	**152**	**1814**	**15**		**-0.8**
S103A-z11	**58**	*	**1436**	**10**	**0.007**	**100**	**100**	**4.974**	**0.883**	**0.3229**	**0.0573**	**0.99890**	**0.1120**	**0.0009**	**1804**	**279**	**1815**	**150**	**1827**	**15**		**1.4**
S103A-z11	**59**	*	**1435**	**10**	**0.007**	**100**	**100**	**5.075**	**0.916**	**0.3289**	**0.0594**	**0.99890**	**0.1120**	**0.0009**	**1833**	**288**	**1832**	**153**	**1831**	**15**		**-0.1**
Sample S103A, zircon 12: Type 1B																						
S103A-z12	1		251	79	0.313	65.9	-15.07	-0.209	0.257	0.0271	0.0038	0.48320	-0.0561	-0.0729	172	24	-239	329	-1	0		-21088.0
S103A-z12	2		276	105	0.382	83.98	37.02	0.595	0.161	0.0465	0.0048	0.58420	0.0929	0.0210	293	29	474	102	1486	429		82.1
S103A-z12	3		326	110	0.339	86.12	45.13	1.167	0.198	0.0771	0.0080	0.71190	0.1100	0.0132	479	48	786	93	1796	219		76.0
S103A-z12	4		394	125	0.318	87.32	50.25	1.821	0.247	0.1087	0.0113	0.81720	0.1220	0.0096	665	66	1053	89	1979	140		69.8
S103A-z12	5		457	143	0.312	89.94	57.85	2.436	0.296	0.1389	0.0146	0.89040	0.1270	0.0070	839	83	1253	88	2059	98		63.1
S103A-z12	6		501	144	0.287	91.03	59.85	2.507	0.275	0.1494	0.0143	0.89310	0.1220	0.0060	898	80	1274	80	1981	88		58.5
S103A-z12	7		596	151	0.253	91.89	60.72	2.706	0.315	0.1737	0.0183	0.91590	0.1130	0.0053	1032	100	1330	86	1848	85		47.7
S103A-z12	8		593	133	0.225	93.42	66.35	3.077	0.358	0.1939	0.0211	0.94100	0.1150	0.0045	1142	114	1427	89	1882	71		42.8
S103A-z12	9		626	131	0.210	94.31	69.78	3.244	0.386	0.2041	0.0231	0.95460	0.1150	0.0041	1197	124	1468	92	1884	64		39.9
S103A-z12	10		653	141	0.216	95.44	74.58	3.528	0.429	0.2204	0.0259	0.96680	0.1160	0.0036	1284	137	1533	96	1897	56		35.6

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
								$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$			
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.		
S103A-z12	11		676	145	0.214	96.45	79.79	3.805	0.470	0.2294	0.0277	0.97620	0.1200	0.0032	1332	145	1594	99	1960	48		35.4
S103A-z12	12		672	132	0.196	96.95	81.71	3.881	0.494	0.2418	0.0303	0.97980	0.1160	0.0030	1396	157	1610	103	1902	46		29.6
S103A-z12	13		662	150	0.227	97.34	83.58	3.815	0.460	0.2401	0.0285	0.97970	0.1150	0.0028	1387	148	1596	97	1883	44		29.2
S103A-z12	14		692	142	0.205	97.88	86.08	3.831	0.475	0.2504	0.0306	0.98300	0.1110	0.0025	1440	158	1599	100	1816	41		23.1
S103A-z12	15		693	151	0.218	98.14	87.79	4.309	0.580	0.2774	0.0370	0.98720	0.1130	0.0024	1578	187	1695	111	1843	39		16.2
S103A-z12	16		700	143	0.204	98.44	89.49	4.275	0.573	0.2778	0.0370	0.98840	0.1120	0.0023	1580	186	1689	110	1825	37		15.1
S103A-z12	**17**	*	**675**	**149**	**0.221**	**98.77**	**91.59**	**4.441**	**0.599**	**0.2866**	**0.0384**	**0.98970**	**0.1120**	**0.0022**	**1625**	**192**	**1720**	**112**	**1838**	**35**		**13.1**
S103A-z12	18		673	148	0.220	99.22	94.67	4.488	0.575	0.2820	0.0360	0.99030	0.1150	0.0021	1602	181	1729	106	1886	32		17.0
S103A-z12	**19**	*	**694**	**155**	**0.223**	**99.38**	**95.7**	**4.787**	**0.646**	**0.2998**	**0.0403**	**0.99180**	**0.1160**	**0.0020**	**1690**	**200**	**1783**	**113**	**1893**	**31**		**12.2**
S103A-z12	**20**	*	**682**	**152**	**0.223**	**99.43**	**96.02**	**4.802**	**0.662**	**0.3040**	**0.0418**	**0.99230**	**0.1150**	**0.0020**	**1711**	**207**	**1785**	**116**	**1873**	**31**		**9.8**
S103A-z12	**21**	*	**645**	**137**	**0.213**	**99.55**	**96.78**	**4.943**	**0.688**	**0.3148**	**0.0437**	**0.99280**	**0.1140**	**0.0019**	**1764**	**214**	**1810**	**118**	**1862**	**30**		**6.0**
S103A-z12	**22**	*	**668**	**157**	**0.234**	**99.64**	**97.43**	**4.740**	**0.631**	**0.3021**	**0.0401**	**0.99230**	**0.1140**	**0.0019**	**1702**	**199**	**1774**	**112**	**1861**	**30**		**9.7**
S103A-z12	**23**	*	**690**	**166**	**0.240**	**99.59**	**97.05**	**4.924**	**0.690**	**0.3176**	**0.0444**	**0.99290**	**0.1120**	**0.0019**	**1778**	**217**	**1806**	**118**	**1839**	**30**		**3.8**
S103A-z12	**24**	*	**652**	**156**	**0.239**	**99.7**	**97.87**	**4.736**	**0.610**	**0.2985**	**0.0383**	**0.99190**	**0.1150**	**0.0019**	**1684**	**190**	**1774**	**108**	**1881**	**30**		**11.9**
S103A-z12	**25**	*	**633**	**157**	**0.249**	**99.66**	**97.56**	**5.072**	**0.705**	**0.3217**	**0.0446**	**0.99290**	**0.1140**	**0.0019**	**1798**	**217**	**1831**	**118**	**1870**	**30**		**4.4**
S103A-z12	**26**	*	**627**	**151**	**0.240**	**99.75**	**98.19**	**5.155**	**0.736**	**0.3259**	**0.0465**	**0.99360**	**0.1150**	**0.0019**	**1819**	**226**	**1845**	**121**	**1875**	**29**		**3.4**
S103A-z12	**27**	*	**625**	**154**	**0.246**	**99.87**	**99.11**	**5.042**	**0.681**	**0.3145**	**0.0424**	**0.99310**	**0.1160**	**0.0018**	**1763**	**208**	**1826**	**114**	**1900**	**29**		**8.3**
S103A-z12	**28**	*	**624**	**152**	**0.244**	**99.86**	**99.04**	**5.154**	**0.721**	**0.3208**	**0.0448**	**0.99360**	**0.1170**	**0.0018**	**1793**	**219**	**1845**	**119**	**1904**	**28**		**6.7**
S103A-z12	**29**	*	**600**	**161**	**0.268**	**99.87**	**99.06**	**5.039**	**0.683**	**0.3187**	**0.0431**	**0.99310**	**0.1150**	**0.0018**	**1784**	**211**	**1826**	**115**	**1875**	**29**		**5.6**
S103A-z12	**30**	*	**608**	**160**	**0.263**	**99.74**	**98.12**	**4.875**	**0.648**	**0.3132**	**0.0415**	**0.99240**	**0.1130**	**0.0018**	**1757**	**204**	**1798**	**112**	**1846**	**30**		**5.5**
S103A-z12	**31**	*	**591**	**162**	**0.274**	**99.82**	**98.72**	**4.756**	**0.606**	**0.3056**	**0.0389**	**0.99190**	**0.1130**	**0.0018**	**1719**	**192**	**1777**	**107**	**1846**	**29**		**7.8**
S103A-z12	**32**	*	**587**	**166**	**0.282**	**99.81**	**98.62**	**4.904**	**0.634**	**0.3082**	**0.0398**	**0.99210**	**0.1150**	**0.0019**	**1732**	**196**	**1803**	**109**	**1886**	**29**		**9.3**
S103A-z12	**33**	*	**595**	**161**	**0.270**	**99.78**	**98.43**	**4.961**	**0.670**	**0.3114**	**0.0420**	**0.99280**	**0.1160**	**0.0019**	**1747**	**206**	**1813**	**114**	**1889**	**29**		**8.6**
S103A-z12	**34**	*	**594**	**156**	**0.263**	**99.84**	**98.88**	**4.787**	**0.626**	**0.3044**	**0.0397**	**0.99240**	**0.1140**	**0.0018**	**1713**	**196**	**1783**	**110**	**1865**	**29**		**9.3**
S103A-z12	**35**	*	**585**	**166**	**0.283**	**99.92**	**99.46**	**4.917**	**0.649**	**0.3079**	**0.0405**	**0.99280**	**0.1160**	**0.0018**	**1730**	**200**	**1805**	**111**	**1893**	**29**		**9.8**
S103A-z12	**36**	*	**572**	**158**	**0.277**	**99.89**	**99.2**	**4.791**	**0.621**	**0.3047**	**0.0394**	**0.99240**	**0.1140**	**0.0018**	**1714**	**195**	**1783**	**109**	**1865**	**29**		**9.2**
S103A-z12	**37**	*	**574**	**162**	**0.282**	**99.91**	**99.33**	**4.820**	**0.635**	**0.3064**	**0.0403**	**0.99270**	**0.1140**	**0.0018**	**1723**	**199**	**1788**	**111**	**1865**	**29**		**8.6**
S103A-z12	**38**	*	**565**	**150**	**0.265**	**99.9**	**99.26**	**4.753**	**0.605**	**0.2970**	**0.0378**	**0.99210**	**0.1160**	**0.0019**	**1677**	**188**	**1777**	**107**	**1896**	**29**		**13.1**
S103A-z12	**39**	*	**571**	**177**	**0.310**	**99.93**	**99.51**	**4.815**	**0.636**	**0.3034**	**0.0400**	**0.99280**	**0.1150**	**0.0018**	**1708**	**198**	**1788**	**111**	**1882**	**29**		**10.5**
S103A-z12	**40**	*	**562**	**165**	**0.293**	**99.87**	**99.07**	**4.760**	**0.623**	**0.3026**	**0.0395**	**0.99240**	**0.1140**	**0.0018**	**1704**	**196**	**1778**	**110**	**1865**	**29**		**9.8**
S103A-z12	41		541	161	0.297	99.79	98.52	4.436	0.534	0.2825	0.0339	0.99070	0.1140	0.0019	1604	171	1719	100	1862	30		15.6
S103A-z12	42		555	167	0.301	99.77	98.32	4.446	0.541	0.2828	0.0343	0.99080	0.1140	0.0019	1605	172	1721	101	1864	30		15.6
S103A-z12	**43**	*	**557**	**151**	**0.271**	**99.85**	**98.92**	**4.559**	**0.578**	**0.2927**	**0.0370**	**0.99180**	**0.1130**	**0.0018**	**1655**	**185**	**1742**	**106**	**1848**	**29**		**11.9**
S103A-z12	**44**	*	**547**	**165**	**0.302**	**99.91**	**99.31**	**4.558**	**0.571**	**0.2906**	**0.0363**	**0.99180**	**0.1140**	**0.0018**	**1645**	**182**	**1742**	**104**	**1860**	**29**		**13.1**
S103A-z12	45		541	173	0.320	99.88	99.12	4.487	0.553	0.2836	0.0348	0.99140	0.1150	0.0019	1609	175	1729	102	1876	29		16.0
S103A-z12	**46**	*	**573**	**162**	**0.282**	**99.91**	**99.36**	**4.829**	**0.660**	**0.3028**	**0.0413**	**0.99320**	**0.1160**	**0.0018**	**1705**	**204**	**1790**	**115**	**1891**	**29**		**11.2**
S103A-z12	47		526	172	0.327	99.92	99.44	4.348	0.509	0.2732	0.0319	0.99050	0.1150	0.0019	1557	162	1702	97	1886	29		19.6
S103A-z12	48		516	160	0.309	99.87	99.12	4.524	0.555	0.2805	0.0343	0.99120	0.1170	0.0019	1594	173	1735	102	1911	29		18.7
S103A-z12	49		525	178	0.339	99.87	99.1	4.310	0.508	0.2720	0.0320	0.99020	0.1150	0.0019	1551	162	1695	97	1879	30		19.6
S103A-z12	50		549	171	0.312	99.87	99.09	4.505	0.577	0.2823	0.0361	0.99200	0.1160	0.0019	1603	181	1732	106	1892	29		17.3
S103A-z12	51		519	163	0.314	99.92	99.42	4.266	0.499	0.2684	0.0313	0.99030	0.1150	0.0019	1533	159	1687	96	1884	29		20.9
S103A-z12	52		519	168	0.323	99.89	99.22	4.477	0.540	0.2796	0.0337	0.99080	0.1160	0.0019	1589	170	1727	100	1897	30		18.3
S103A-z12	53		511	168	0.328	99.95	99.67	4.304	0.505	0.2719	0.0318	0.99040	0.1150	0.0019	1550	161	1694	97	1877	29		19.6
S103A-z12	54		512	162	0.315	99.96	99.74	4.247	0.499	0.2697	0.0316	0.99050	0.1140	0.0019	1539	160	1683	97	1867	29		19.7
S103A-z12	55		495	155	0.313	99.92	99.43	4.343	0.509	0.2712	0.0317	0.99030	0.1160	0.0019	1547	161	1702	97	1898	29		20.8
S103A-z12	56		498	164	0.330	99.88	99.15	4.405	0.545	0.2797	0.0345	0.99130	0.1140	0.0019	1590	174	1713	102	1868	30		16.8
S103A-z12	57		474	166	0.349	99.93	99.47	4.115	0.454	0.2609	0.0287	0.98880	0.1140	0.0019	1495	147	1657	90	1870	30		22.5
S103A-z12	58		492	156	0.317	99.94	99.54	4.255	0.497	0.2682	0.0312	0.99030	0.1150	0.0019	1532	159	1685	96	1881	29		20.8
S103A-z12	59		480	155	0.322	99.94	99.54	4.364	0.515	0.2741	0.0323	0.99040	0.1150	0.0019	1562	163	1705	98	1887	29		19.4
Sample S103A, zircon 13: Type 1B																						
S103A-z13	1		1561	2748	1.760	79.49	27.62	1.650	0.244	0.1468	0.0168	0.81690	0.0815	0.0070	883	95	990	93	1235	168		30.5
S103A-z13	2		1298	2086	1.607	87.81	45.3	2.871	0.396	0.2187	0.0282	0.94400	0.0952	0.0043	1275	149	1374	104	1533	86		18.6
S103A-z13	3		1284	1808	1.408	91.57	57.64	3.615	0.504	0.2526	0.0342	0.97400	0.1040	0.0033	1452	176	1553	111	1693	58		15.9
S103A-z13	**4**	*	**1308**	**1517**	**1.159**	**93.28**	**63.1**	**3.876**	**0.556**	**0.2756**	**0.0388**	**0.98180**	**0.1020**	**0.0028**	**1569**	**196**	**1609**	**116**	**1661**	**51**		**6.2**
S103A-z13	**5**	*	**1359**	**1234**	**0.908**	**95.13**	**71.38**	**4.519**	**0.696**	**0.3096**	**0.0472**	**0.98980**	**0.1060**	**0.0023**	**1739**	**232**	**1734**	**128**	**1729**	**40**		**-0.7**
S103A-z13	**6**	*	**1417**	**1103**	**0.778**	**95.96**	**75.37**	**4.439**	**0.659**	**0.3015**	**0.0444**	**0.99120**	**0.1070**	**0.0021**	**1699**	**220**	**1720**	**123**	**1745**	**36**		**3.0**
S103A-z13	**7**	*	**1419**	**912**	**0.643**	**96.3**	**76.61**	**4.788**	**0.777**	**0.3333**	**0.0538**	**0.99320**	**0.1040**	**0.0020**	**1854**	**260**	**1783**	**136**	**1700**	**35**		**-10.5**
S103A-z13	**8**	*	**1510**	**877**	**0.581**	**96.73**	**79.12**	**4.686**	**0.739**	**0.3209**	**0.0503**	**0.99370**	**0.1060**	**0.0019**	**1794**	**245**	**1765**	**132**	**1730**	**32**		**-4.3**
S103A-z13	**9**	*	**1630**	**858**	**0.526**	**97.29**	**82.48**	**4.782**	**0.761**	**0.3199**	**0.0507**	**0.99500**	**0.1080**	**0.0017**	**1789**	**248**	**1782**	**134**	**1773**	**29**		**-1.0**
S103A-z13	**10**	*	**1646**	**748**	**0.454**	**97.48**	**83.25**	**4.950**	**0.821**	**0.3377**	**0.0558**	**0.99560**	**0.1060**	**0.0017**	**1876**	**269**	**1811**	**140**	**1737**	**29**		**-9.2**
S103A-z13	**11**	*	**1656**	**724**	**0.437**	**97.6**	**83.88**	**4.809**	**0.769**	**0.3287**	**0.0524**	**0.99550**	**0.1060**	**0.0016**	**1832**	**254**	**1786**	**134**	**1733**	**28**		**-6.6**
S103A-z13	**12**	*	**1674**	**681**	**0.407**	**97.81**	**85.04**	**4.842**	**0.785**	**0.3334**	**0.0539**	**0.99590**	**0.1050**	**0.0015**	**1855**	**261**	**1792**	**136**	**1720**	**27**		**-9.0**
S103A-z13	**13**	*	**1663**	**707**	**0.425**	**98.03**	**86.53**	**4.838**	**0.763**	**0.3275**	**0.0515**	**0.99610**	**0.1070**	**0.0015**	**1826**	**250**	**1791**	**133**	**1751**	**26**		**-5.0**
S103A-z13	**14**	*	**1647**	**622**	**0.378**	**98.35**	**88.39**	**4.908**	**0.784**	**0.3359**	**0.0535**	**0.99660**	**0.1060**	**0.0014**	**1867**	**258**	**1804**	**135**	**1731**	**24**		**-9.1**
S103A-z13	**15**	*	**1681**	**628**	**0.373**	**98.33**	**88.28**	**4.905**	**0.806**	**0.3357**	**0.0550**	**0.99690**	**0.1060**	**0.0014**	**1866**	**266**	**1803**	**139**	**1731**	**24**		**-9.0**
S103A-z13	**16**	*	**1681**	**645**	**0.384**	**98.43**	**88.96**	**4.768**	**0.752**	**0.3255**	**0.0512**	**0.99680**	**0.1060**	**0.0013**	**1816**	**249**	**1779**	**132**	**1736**	**23**		**-5.3**
S103A-z13	**17**	*	**1694**	**630**	**0.372**	**98.52**	**89.36**	**4.634**	**0.726**	**0.3216**	**0.0503**	**0.99680**	**0.1050**	**0.0013**	**1798**	**245**	**1755**	**131**	**1706**	**23**		**-6.1**
S103A-z13	**18**	*	**1708**	**637**	**0.373**	**98.58**	**89.78**	**4.802**	**0.787**	**0.3331**	**0.0545**	**0.99720**	**0.1050**	**0.0013**	**1853**	**263**	**1785**	**138**	**1707**	**23**		**-9.8**
S103A-z13	**19**	*	**1646**	**599**	**0.364**	**98.86**	**91.73**	**4.595**	**0.702**	**0.3146**	**0.0479**	**0.99710**	**0.1060**	**0.0012**	**1763**	**235**	**1748**	**127**	**1731**	**21**		**-2.1**
S103A-z13	**20**	*	**1711**	**558**	**0.326**	**98.85**	**91.68**	**4.787**	**0.774**	**0.3281**	**0.0530**	**0.99750**	**0.1060**	**0.0012**	**1829**	**257**	**1783**	**136**	**1729**	**21**		**-6.6**
S103A-z13	**21**	*	**1739**	**477**	**0.274**	**98.88**	**91.73**	**4.765**	**0.784**	**0.3317**	**0.0545**	**0.99760**	**0.1040**	**0.0012**	**1846**	**264**	**1779**	**138**	**1700**	**21**		**-9.9**
S103A-z13	**22**	*	**1720**	**410**	**0.238**	**99.13**	**93.6**	**4.807**	**0.784**	**0.3297**	**0.0537**	**0.99780**	**0.1060**	**0.0011**	**1837**	**260**	**1786**	**137**	**1727**	**20**		**-7.3**
S103A-z13	**23**	*	**1678**	**387**	**0.230**	**99.18**	**93.84**	**4.874**	**0.808**	**0.3379**	**0.0559**	**0.99790**	**0.1050**	**0.0011**	**1876**	**270**	**1798**	**140**	**1708**	**20**		**-11.4**
S103A-z13	**24**	*	**1731**	**343**	**0.198**	**99.26**	**94.47**	**4.905**	**0.832**	**0.3387**	**0.0574**	**0.99810**	**0.1050**	**0.0011**	**1881**	**276**	**1803**	**143**	**1715**	**19**		**-11.1**
S103A-z13	**25**	*	**1733**	**337**	**0.194**	**99.35**	**95.05**	**4.794**	**0.785**	**0.3325**	**0.0544**	**0.99810**	**0.1050**	**0.0011**	**1850**	**263**	**1784**	**138**	**1707**	**19**		**-9.7**
S103A-z13	**26**	*	**1689**	**301**	**0.178**	**99.54**	**96.49**	**4.962**	**0.825**	**0.3397**	**0.0564**	**0.99830**	**0.1060**	**0.0010**	**1885**	**271**	**1813**	**140**	**1731**	**18**		**-10.3**
S103A-z13	**27**	*	**1722**	**260**	**0.151**	**99.52**	**96.32**	**4.967**	**0.846**	**0.3434**	**0.0584**	**0.99840**	**0.1050**	**0.0010**	**1903**	**280**	**1814**	**144**	**1713**	**18**		**-12.8**
S103A-z13	**28**	*	**1765**	**251**	**0.142**	**99.57**	**96.77**	**4.993**	**0.825**	**0.3401**	**0.0561**	**0.99840**	**0.1060**	**0.0010**	**1887**	**270**	**1818**	**140**	**1740**	**17**		**-9.8**
S103A-z13	29		1744	196	0.112	99.58	96.77	5.199	0.898	0.3594	0.0620	0.99850	0.1050	0.0010	1979	294	1853	147	1713	17		-18.1
S103A-z13	**30**	*	**1711**	**162**	**0.095**	**99.59**	**96.85**	**5.010**	**0.819**	**0.3445**	**0.0563**	**0.99840**	**0.1050**	**0.0010**	**1908**	**270**	**1821**	**138**	**1723**	**17**		**-12.4**
S103A-z13	**31**	*	**1723**	**154**	**0.089**	**99.65**	**97.29**	**5.090**	**0.829**	**0.3491**	**0.0568**	**0.99840**	**0.1060**	**0.0010**	**1930**	**272**	**1834**	**138**	**1727**	**17**		**-13.7**

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
								$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$			
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.		
S103A-z13	**32**	*	**1723**	**127**	**0.074**	**99.65**	**97.34**	**4.985**	**0.804**	**0.3444**	**0.0555**	**0.99840**	**0.1050**	**0.0010**	**1908**	**266**	**1817**	**136**	**1714**	**17**		**-13.1**
S103A-z13	**33**	*	**1756**	**104**	**0.059**	**99.68**	**97.57**	**5.087**	**0.839**	**0.3502**	**0.0577**	**0.99850**	**0.1050**	**0.0009**	**1936**	**276**	**1834**	**140**	**1720**	**17**		**-14.5**
S103A-z13	34		1773	99	0.056	99.68	97.52	5.162	0.871	0.3541	0.0597	0.99860	0.1060	0.0009	1954	284	1846	144	1727	17		-15.3
S103A-z13	**35**	*	**1747**	**78**	**0.044**	**99.79**	**98.37**	**5.160**	**0.863**	**0.3534**	**0.0591**	**0.99860**	**0.1060**	**0.0009**	**1951**	**281**	**1846**	**142**	**1730**	**16**		**-14.8**
S103A-z13	36		1823	96	0.053	99.72	97.83	5.322	0.950	0.3708	0.0662	0.99880	0.1040	0.0009	2033	311	1872	153	1699	16		-22.9
S103A-z13	**37**	*	**1863**	**84**	**0.045**	**99.74**	**97.97**	**5.075**	**0.844**	**0.3488**	**0.0580**	**0.99860**	**0.1060**	**0.0009**	**1929**	**277**	**1832**	**141**	**1723**	**16**		**-13.9**
S103A-z13	38		1823	76	0.042	99.77	98.25	5.159	0.860	0.3563	0.0594	0.99860	0.1050	0.0009	1965	282	1846	142	1714	16		-17.0
S103A-z13	39		1794	79	0.044	99.83	98.72	5.297	0.894	0.3596	0.0607	0.99870	0.1070	0.0009	1980	288	1868	144	1746	16		-15.6
S103A-z13	40		1826	71	0.039	99.84	98.75	5.378	0.928	0.3635	0.0627	0.99880	0.1070	0.0009	1999	296	1881	148	1754	15		-16.3
S103A-z13	41		1872	101	0.054	99.87	98.98	5.318	0.921	0.3627	0.0628	0.99890	0.1060	0.0009	1995	297	1872	148	1738	15		-17.2
S103A-z13	42		1857	87	0.047	99.9	99.21	5.386	0.903	0.3595	0.0602	0.99880	0.1090	0.0009	1980	286	1883	144	1777	15		-13.3
S103A-z13	43		1855	67	0.036	99.91	99.32	5.487	0.939	0.3680	0.0630	0.99890	0.1080	0.0009	2020	297	1898	147	1768	15		-16.6
S103A-z13	44		1851	60	0.032	99.86	98.91	5.333	0.907	0.3627	0.0616	0.99880	0.1070	0.0009	1995	292	1874	145	1743	15		-16.8
S103A-z13	45		1826	63	0.034	99.83	98.71	5.351	0.897	0.3644	0.0611	0.99880	0.1070	0.0009	2003	289	1877	143	1741	15		-17.5
S103A-z13	46		1897	66	0.035	99.86	98.93	5.450	0.914	0.3635	0.0609	0.99880	0.1090	0.0009	1999	288	1893	144	1778	15		-14.5
S103A-z13	47		1880	61	0.032	99.88	99.12	5.460	0.900	0.3660	0.0603	0.99880	0.1080	0.0009	2010	285	1894	141	1769	15		-15.9
S103A-z13	48		1931	63	0.033	99.88	99.12	5.588	0.956	0.3757	0.0643	0.99890	0.1080	0.0009	2056	301	1914	147	1764	15		-19.4
S103A-z13	49		1900	67	0.036	99.92	99.38	5.576	0.929	0.3717	0.0619	0.99890	0.1090	0.0009	2037	291	1912	143	1779	14		-17.0
S103A-z13	50		1920	64	0.033	99.91	99.36	5.811	1.020	0.3880	0.0679	0.99900	0.1090	0.0008	2113	315	1948	152	1777	14		-22.2
S103A-z13	51		1952	62	0.032	99.92	99.43	5.771	0.996	0.3858	0.0665	0.99900	0.1090	0.0008	2103	310	1942	149	1775	14		-21.7
S103A-z13	52		1951	75	0.038	99.91	99.33	5.736	0.945	0.3785	0.0624	0.99890	0.1100	0.0009	2069	292	1937	143	1798	14		-17.7
S103A-z13	53		1948	65	0.033	99.89	99.2	5.923	1.010	0.3938	0.0668	0.99900	0.1090	0.0008	2140	309	1965	147	1784	14		-23.5
S103A-z13	54		1950	66	0.034	99.92	99.4	5.799	0.934	0.3823	0.0616	0.99880	0.1100	0.0009	2087	287	1946	140	1800	14		-18.7
S103A-z13	55		2036	66	0.032	99.91	99.37	6.206	1.080	0.4062	0.0708	0.99900	0.1110	0.0008	2198	325	2005	152	1813	14		-25.1
S103A-z13	56		1981	60	0.030	99.93	99.44	5.993	1.010	0.3987	0.0671	0.99900	0.1090	0.0008	2163	309	1975	146	1783	14		-25.1
S103A-z13	57		2041	55	0.027	99.92	99.37	5.937	0.987	0.3960	0.0658	0.99890	0.1090	0.0008	2151	304	1967	144	1778	14		-24.7
S103A-z13	58		2061	49	0.024	99.94	99.55	6.271	1.070	0.4126	0.0707	0.99900	0.1100	0.0008	2227	322	2014	150	1803	14		-27.9
S103A-z13	59		2017	40	0.020	99.94	99.56	6.084	1.010	0.4026	0.0669	0.99900	0.1100	0.0008	2181	308	1988	145	1793	14		-25.5
Sample S103A, zircon 14: Type 1B																						
S103A-z14	1		1186	735	0.619	81.88	32.47	2.838	0.516	0.2336	0.0399	0.94890	0.0881	0.0051	1354	208	1366	137	1384	110		2.4
S103A-z14	2		903	273	0.302	93.31	61.62	4.048	0.836	0.3078	0.0628	0.98900	0.0954	0.0029	1730	309	1644	168	1536	58		-14.4
S103A-z14	3		826	145	0.176	97.19	81.32	4.695	1.010	0.3262	0.0702	0.99560	0.1040	0.0021	1820	341	1766	181	1703	37		-7.9
S103A-z14	4		703	97	0.139	98.4	88.91	5.160	1.100	0.3468	0.0737	0.99660	0.1080	0.0019	1919	353	1846	181	1764	32		-10.2
S103A-z14	5		612	81	0.132	99.18	94.15	5.581	1.210	0.3682	0.0800	0.99740	0.1100	0.0017	2021	377	1913	187	1798	29		-14.5
S103A-z14	6		599	71	0.119	99.45	96.02	5.840	1.310	0.3800	0.0852	0.99770	0.1110	0.0017	2076	398	1952	195	1823	27		-16.3
S103A-z14	7		592	60	0.102	99.61	97.15	5.973	1.370	0.3884	0.0892	0.99800	0.1120	0.0016	2115	414	1972	200	1825	27		-18.7
S103A-z14	**8**	*	**582**	**63**	**0.108**	**99.6**	**97.15**	**5.657**	**1.200**	**0.3607**	**0.0761**	**0.99760**	**0.1140**	**0.0017**	**1986**	**361**	**1925**	**182**	**1860**	**26**		**-7.8**
S103A-z14	**9**	*	**586**	**59**	**0.101**	**99.73**	**98.02**	**5.635**	**1.180**	**0.3646**	**0.0765**	**0.99770**	**0.1120**	**0.0016**	**2004**	**361**	**1921**	**181**	**1834**	**26**		**-10.8**
S103A-z14	**10**	*	**571**	**61**	**0.106**	**99.84**	**98.82**	**5.845**	**1.230**	**0.3713**	**0.0779**	**0.99780**	**0.1140**	**0.0016**	**2036**	**366**	**1953**	**182**	**1867**	**25**		**-10.5**
S103A-z14	11		573	53	0.092	99.75	98.23	6.102	1.350	0.3916	0.0866	0.99800	0.1130	0.0016	2130	401	1991	193	1849	25		-17.8
S103A-z14	12		596	50	0.084	99.58	96.97	5.765	1.240	0.3779	0.0809	0.99780	0.1110	0.0016	2067	379	1941	185	1810	26		-16.6
S103A-z14	13		610	57	0.093	99.74	98.08	5.936	1.280	0.3843	0.0828	0.99800	0.1120	0.0015	2096	385	1967	187	1832	25		-17.0
S103A-z14	14		622	58	0.093	99.77	98.34	5.904	1.250	0.3836	0.0812	0.99800	0.1120	0.0015	2093	378	1962	184	1826	24		-17.2
S103A-z14	**15**	*	**653**	**60**	**0.091**	**99.76**	**98.26**	**5.737**	**1.190**	**0.3721**	**0.0770**	**0.99800**	**0.1120**	**0.0015**	**2039**	**362**	**1937**	**179**	**1829**	**24**		**-13.4**
S103A-z14	**16**	*	**696**	**62**	**0.089**	**99.86**	**98.96**	**5.871**	**1.250**	**0.3773**	**0.0805**	**0.99830**	**0.1130**	**0.0014**	**2064**	**377**	**1957**	**185**	**1846**	**23**		**-13.8**
S103A-z14	**17**	*	**723**	**65**	**0.090**	**99.88**	**99.09**	**5.832**	**1.220**	**0.3745**	**0.0784**	**0.99830**	**0.1130**	**0.0014**	**2051**	**367**	**1951**	**181**	**1847**	**22**		**-12.9**
S103A-z14	**18**	*	**725**	**72**	**0.100**	**99.84**	**98.84**	**5.652**	**1.160**	**0.3657**	**0.0748**	**0.99820**	**0.1120**	**0.0014**	**2009**	**353**	**1924**	**177**	**1834**	**22**		**-11.1**
S103A-z14	**19**	*	**730**	**71**	**0.097**	**99.89**	**99.21**	**5.765**	**1.190**	**0.3711**	**0.0769**	**0.99830**	**0.1130**	**0.0014**	**2034**	**361**	**1941**	**179**	**1843**	**22**		**-12.1**
S103A-z14	**20**	*	**754**	**72**	**0.095**	**99.85**	**98.94**	**5.978**	**1.260**	**0.3805**	**0.0804**	**0.99840**	**0.1140**	**0.0014**	**2079**	**376**	**1973**	**184**	**1863**	**22**		**-13.6**
S103A-z14	**21**	*	**744**	**89**	**0.119**	**99.85**	**98.92**	**5.661**	**1.120**	**0.3588**	**0.0710**	**0.99820**	**0.1140**	**0.0014**	**1976**	**337**	**1925**	**171**	**1871**	**22**		**-6.5**
S103A-z14	**22**	*	**744**	**97**	**0.130**	**99.82**	**98.69**	**5.813**	**1.190**	**0.3662**	**0.0750**	**0.99830**	**0.1150**	**0.0014**	**2011**	**354**	**1948**	**178**	**1882**	**22**		**-8.0**
S103A-z14	**23**	*	**742**	**97**	**0.131**	**99.8**	**98.55**	**5.668**	**1.150**	**0.3602**	**0.0728**	**0.99820**	**0.1140**	**0.0014**	**1983**	**345**	**1927**	**175**	**1866**	**22**		**-7.3**
S103A-z14	**24**	*	**719**	**98**	**0.136**	**99.76**	**98.25**	**5.505**	**1.060**	**0.3497**	**0.0676**	**0.99800**	**0.1140**	**0.0014**	**1933**	**323**	**1901**	**166**	**1867**	**22**		**-4.1**
S103A-z14	**25**	*	**708**	**96**	**0.136**	**99.74**	**98.14**	**5.579**	**1.120**	**0.3593**	**0.0721**	**0.99810**	**0.1130**	**0.0014**	**1979**	**342**	**1913**	**173**	**1842**	**22**		**-8.6**
S103A-z14	**26**	*	**686**	**96**	**0.140**	**99.78**	**98.44**	**5.388**	**1.010**	**0.3437**	**0.0643**	**0.99780**	**0.1140**	**0.0014**	**1905**	**309**	**1883**	**160**	**1859**	**22**		**-2.8**
S103A-z14	**27**	*	**682**	**100**	**0.146**	**99.85**	**98.95**	**5.493**	**1.020**	**0.3442**	**0.0636**	**0.99790**	**0.1160**	**0.0014**	**1907**	**305**	**1899**	**159**	**1891**	**22**		**-1.0**
S103A-z14	**28**	*	**705**	**112**	**0.158**	**99.8**	**98.58**	**5.218**	**0.943**	**0.3307**	**0.0597**	**0.99770**	**0.1140**	**0.0014**	**1842**	**289**	**1856**	**154**	**1871**	**22**		**1.8**
S103A-z14	**29**	*	**697**	**133**	**0.191**	**99.74**	**98.13**	**5.097**	**0.900**	**0.3223**	**0.0568**	**0.99750**	**0.1150**	**0.0014**	**1801**	**277**	**1836**	**150**	**1875**	**22**		**4.5**
S103A-z14	**30**	*	**723**	**155**	**0.214**	**99.69**	**97.81**	**5.210**	**0.961**	**0.3303**	**0.0609**	**0.99770**	**0.1140**	**0.0014**	**1840**	**295**	**1854**	**157**	**1870**	**23**		**1.8**
S103A-z14	**31**	*	**711**	**166**	**0.233**	**99.65**	**97.5**	**4.891**	**0.841**	**0.3125**	**0.0537**	**0.99730**	**0.1140**	**0.0014**	**1753**	**264**	**1801**	**145**	**1857**	**23**		**6.4**
S103A-z14	**32**	*	**748**	**172**	**0.231**	**99.71**	**97.96**	**5.023**	**0.915**	**0.3171**	**0.0577**	**0.99770**	**0.1150**	**0.0014**	**1776**	**283**	**1823**	**154**	**1878**	**22**		**6.2**
S103A-z14	**33**	*	**718**	**182**	**0.254**	**99.69**	**97.8**	**4.927**	**0.861**	**0.3103**	**0.0542**	**0.99740**	**0.1150**	**0.0014**	**1742**	**266**	**1807**	**147**	**1882**	**23**		**8.5**
S103A-z14	**34**	*	**713**	**167**	**0.234**	**99.58**	**97.09**	**4.872**	**0.852**	**0.3064**	**0.0535**	**0.99730**	**0.1150**	**0.0015**	**1723**	**264**	**1797**	**147**	**1885**	**23**		**9.8**
S103A-z14	**35**	*	**681**	**171**	**0.251**	**99.51**	**96.55**	**4.780**	**0.816**	**0.3032**	**0.0517**	**0.99700**	**0.1140**	**0.0015**	**1707**	**256**	**1781**	**143**	**1869**	**24**		**9.8**
S103A-z14	36		670	213	0.317	99.48	96.34	4.460	0.711	0.2818	0.0449	0.99650	0.1150	0.0015	1600	226	1724	132	1876	24		16.5
S103A-z14	37		696	259	0.372	99.46	96.27	4.629	0.782	0.2887	0.0487	0.99700	0.1160	0.0015	1635	244	1755	141	1900	24		15.8
S103A-z14	38		673	226	0.335	99.4	95.89	4.704	0.783	0.2923	0.0486	0.99670	0.1170	0.0016	1653	242	1768	139	1906	24		15.0
S103A-z14	**39**	*	**646**	**219**	**0.340**	**99.34**	**95.42**	**4.562**	**0.722**	**0.2901**	**0.0458**	**0.99610**	**0.1140**	**0.0016**	**1642**	**229**	**1742**	**132**	**1865**	**25**		**13.5**
S103A-z14	**40**	*	**636**	**205**	**0.322**	**99.39**	**95.72**	**4.519**	**0.714**	**0.2905**	**0.0458**	**0.99610**	**0.1130**	**0.0016**	**1644**	**229**	**1734**	**131**	**1845**	**25**		**12.3**
S103A-z14	**41**	*	**625**	**224**	**0.358**	**99.43**	**95.99**	**4.506**	**0.703**	**0.2861**	**0.0445**	**0.99610**	**0.1140**	**0.0016**	**1622**	**223**	**1732**	**130**	**1868**	**25**		**14.9**
S103A-z14	**42**	*	**604**	**203**	**0.336**	**99.45**	**96.13**	**4.554**	**0.702**	**0.2899**	**0.0446**	**0.99590**	**0.1140**	**0.0016**	**1641**	**223**	**1741**	**128**	**1863**	**25**		**13.5**
S103A-z14	**43**	*	**610**	**216**	**0.353**	**99.45**	**96.11**	**4.363**	**0.651**	**0.2818**	**0.0420**	**0.99550**	**0.1120**	**0.0016**	**1600**	**211**	**1705**	**123**	**1837**	**26**		**14.5**
S103A-z14	44		590	194	0.329	99.57	97.02	4.545	0.677	0.2838	0.0422	0.99580	0.1160	0.0016	1610	212	1739	124	1898	25		17.1
S103A-z14	45		565	182	0.322	99.54	96.8	4.375	0.623	0.2751	0.0391	0.99520	0.1150	0.0016	1567	198	1708	118	1885	25		19.0
S103A-z14	**46**	*	**571**	**180**	**0.315**	**99.54**	**96.81**	**4.500**	**0.666**	**0.2841**	**0.0420**	**0.99550**	**0.1150**	**0.0016**	**1612**	**211**	**1731**	**123**	**1878**	**25**		**16.0**
S103A-z14	47		571	187	0.328	99.6	97.22	4.401	0.635	0.2767	0.0398	0.99540	0.1150	0.0016	1575	201	1713	119	1885	25		18.5
S103A-z14	48		540	178	0.330	99.58	97.05	4.360	0.598	0.2743	0.0376	0.99480	0.1150	0.0016	1563	190	1705	113	1884	25		19.2
S103A-z14	49		570	194	0.340	99.54	96.76	4.374	0.629	0.2788	0.0400	0.99520	0.1140	0.0016	1585	202	1707	119	1860	26		16.6
Sample S103A, zircon 15: Type 1B																						
S103A-z15	1		1968	1803	0.916	94.31	61.94	2.330	0.492	0.2077	0.0431	0.98530	0.0814	0.0029	1216	230	1221	150	1230	71		1.2

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.		
S103A-z15	2		1569	885	0.564	98.25	87.67	3.972	0.829	0.2751	0.0573	0.99730	0.1050	0.0016	1566	290	1629	169	1710	28		9.5
S103A-z15	3		1672	564	0.337	98.79	91.35	4.566	1.000	0.3097	0.0679	0.99830	0.1070	0.0014	1739	334	1743	183	1748	23		0.6
S103A-z15	4		1751	361	0.206	99.24	94.42	4.531	0.964	0.3057	0.0650	0.99860	0.1070	0.0012	1720	321	1737	177	1757	21		2.4
S103A-z15	5		1796	258	0.144	99.59	96.94	4.660	1.010	0.3107	0.0674	0.99890	0.1090	0.0011	1744	332	1760	181	1779	19		2.2
S103A-z15	**6**	*	**1773**	**183**	**0.103**	**99.77**	**98.32**	**4.781**	**1.030**	**0.3116**	**0.0669**	**0.99900**	**0.1110**	**0.0011**	**1749**	**329**	**1781**	**180**	**1820**	**17**		**4.5**
S103A-z15	**7**	*	**1808**	**146**	**0.081**	**99.85**	**98.92**	**5.149**	**1.190**	**0.3352**	**0.0775**	**0.99920**	**0.1110**	**0.0010**	**1864**	**374**	**1844**	**197**	**1822**	**17**		**-2.7**
S103A-z15	**8**	*	**1749**	**108**	**0.062**	**99.9**	**99.27**	**5.069**	**1.160**	**0.3305**	**0.0755**	**0.99920**	**0.1110**	**0.0010**	**1841**	**366**	**1831**	**194**	**1820**	**17**		**-1.3**
S103A-z15	**9**	*	**1715**	**96**	**0.056**	**99.88**	**99.11**	**4.969**	**1.070**	**0.3271**	**0.0703**	**0.99910**	**0.1100**	**0.0010**	**1824**	**342**	**1814**	**182**	**1803**	**17**		**-1.3**
S103A-z15	**10**	*	**1723**	**85**	**0.049**	**99.88**	**99.14**	**4.986**	**1.070**	**0.3225**	**0.0693**	**0.99910**	**0.1120**	**0.0010**	**1802**	**338**	**1817**	**182**	**1834**	**17**		**2.0**
S103A-z15	**11**	*	**1703**	**75**	**0.044**	**99.93**	**99.47**	**5.063**	**1.100**	**0.3316**	**0.0720**	**0.99910**	**0.1110**	**0.0010**	**1846**	**349**	**1830**	**184**	**1812**	**17**		**-2.1**
S103A-z15	**12**	*	**1704**	**75**	**0.044**	**99.92**	**99.4**	**5.175**	**1.140**	**0.3375**	**0.0744**	**0.99910**	**0.1110**	**0.0010**	**1875**	**359**	**1848**	**188**	**1819**	**17**		**-3.5**
S103A-z15	**13**	*	**1690**	**65**	**0.039**	**99.87**	**99.04**	**5.112**	**1.080**	**0.3317**	**0.0702**	**0.99900**	**0.1120**	**0.0010**	**1846**	**340**	**1838**	**180**	**1829**	**17**		**-1.1**
S103A-z15	**14**	*	**1662**	**57**	**0.034**	**99.89**	**99.2**	**5.118**	**1.090**	**0.3343**	**0.0712**	**0.99910**	**0.1110**	**0.0010**	**1859**	**344**	**1839**	**181**	**1817**	**17**		**-2.6**
S103A-z15	**15**	*	**1613**	**52**	**0.032**	**99.93**	**99.48**	**4.968**	**1.000**	**0.3239**	**0.0653**	**0.99890**	**0.1110**	**0.0010**	**1809**	**318**	**1814**	**170**	**1820**	**17**		**0.7**
S103A-z15	**16**	*	**1612**	**43**	**0.027**	**99.95**	**99.64**	**5.049**	**1.020**	**0.3267**	**0.0661**	**0.99900**	**0.1120**	**0.0010**	**1822**	**321**	**1828**	**172**	**1834**	**17**		**0.8**
S103A-z15	**17**	*	**1631**	**46**	**0.028**	**99.96**	**99.73**	**5.122**	**1.040**	**0.3299**	**0.0669**	**0.99900**	**0.1130**	**0.0010**	**1838**	**324**	**1840**	**172**	**1842**	**17**		**0.3**
S103A-z15	**18**	*	**1666**	**45**	**0.027**	**99.96**	**99.67**	**5.112**	**1.040**	**0.3320**	**0.0678**	**0.99900**	**0.1120**	**0.0010**	**1848**	**328**	**1838**	**174**	**1827**	**17**		**-1.3**
S103A-z15	**19**	*	**1623**	**44**	**0.027**	**99.96**	**99.67**	**5.010**	**0.994**	**0.3240**	**0.0642**	**0.99890**	**0.1120**	**0.0010**	**1809**	**313**	**1821**	**168**	**1835**	**17**		**1.6**
S103A-z15	**20**	*	**1570**	**35**	**0.022**	**99.97**	**99.75**	**4.902**	**0.936**	**0.3175**	**0.0606**	**0.99880**	**0.1120**	**0.0010**	**1778**	**296**	**1803**	**161**	**1832**	**17**		**3.4**
S103A-z15	**21**	*	**1628**	**38**	**0.023**	**99.99**	**99.89**	**5.285**	**1.110**	**0.3417**	**0.0719**	**0.99900**	**0.1120**	**0.0010**	**1895**	**346**	**1866**	**180**	**1835**	**17**		**-3.8**
S103A-z15	**22**	*	**1548**	**36**	**0.023**	**99.98**	**99.83**	**4.855**	**0.922**	**0.3184**	**0.0604**	**0.99880**	**0.1110**	**0.0010**	**1782**	**295**	**1794**	**160**	**1809**	**17**		**1.7**
S103A-z15	**23**	*	**1576**	**33**	**0.021**	**99.98**	**99.86**	**4.753**	**0.866**	**0.3080**	**0.0561**	**0.99870**	**0.1120**	**0.0010**	**1731**	**277**	**1777**	**153**	**1831**	**17**		**6.2**
S103A-z15	**24**	*	**1525**	**35**	**0.023**	**99.98**	**99.84**	**4.764**	**0.859**	**0.3083**	**0.0556**	**0.99860**	**0.1120**	**0.0011**	**1732**	**274**	**1779**	**151**	**1833**	**17**		**6.2**
S103A-z15	**25**	*	**1541**	**37**	**0.024**	**99.96**	**99.69**	**4.909**	**0.925**	**0.3176**	**0.0598**	**0.99870**	**0.1120**	**0.0011**	**1778**	**293**	**1804**	**159**	**1834**	**17**		**3.5**
S103A-z15	**26**	*	**1547**	**34**	**0.022**	**99.97**	**99.8**	**4.603**	**0.811**	**0.2999**	**0.0528**	**0.99860**	**0.1110**	**0.0011**	**1691**	**262**	**1750**	**147**	**1821**	**17**		**8.1**
S103A-z15	**27**	*	**1526**	**39**	**0.026**	**99.98**	**99.89**	**4.830**	**0.897**	**0.3132**	**0.0581**	**0.99870**	**0.1120**	**0.0010**	**1756**	**285**	**1790**	**156**	**1830**	**17**		**4.6**
S103A-z15	**28**	*	**1496**	**35**	**0.023**	**99.98**	**99.83**	**4.660**	**0.822**	**0.3030**	**0.0534**	**0.99860**	**0.1120**	**0.0011**	**1706**	**264**	**1760**	**147**	**1825**	**17**		**7.4**
S103A-z15	**29**	*	**1529**	**40**	**0.026**	**99.98**	**99.86**	**4.615**	**0.812**	**0.3007**	**0.0529**	**0.99860**	**0.1110**	**0.0011**	**1695**	**262**	**1752**	**147**	**1821**	**17**		**7.9**
S103A-z15	**30**	*	**1526**	**36**	**0.024**	**99.99**	**99.92**	**4.879**	**0.889**	**0.3118**	**0.0568**	**0.99870**	**0.1130**	**0.0011**	**1750**	**279**	**1799**	**154**	**1856**	**17**		**6.5**
S103A-z15	**31**	*	**1485**	**34**	**0.023**	**99.99**	**99.91**	**4.684**	**0.820**	**0.3031**	**0.0530**	**0.99850**	**0.1120**	**0.0011**	**1707**	**262**	**1764**	**146**	**1834**	**17**		**7.9**
S103A-z15	**32**	*	**1448**	**39**	**0.027**	**99.99**	**99.91**	**4.678**	**0.819**	**0.3053**	**0.0535**	**0.99850**	**0.1110**	**0.0011**	**1717**	**264**	**1763**	**147**	**1818**	**17**		**6.3**
S103A-z15	**33**	*	**1410**	**34**	**0.024**	**99.99**	**99.91**	**4.630**	**0.800**	**0.3004**	**0.0518**	**0.99850**	**0.1120**	**0.0011**	**1693**	**257**	**1755**	**144**	**1829**	**17**		**8.5**
S103A-z15	**34**	*	**1418**	**39**	**0.028**	**99.98**	**99.86**	**4.573**	**0.775**	**0.2977**	**0.0504**	**0.99840**	**0.1110**	**0.0011**	**1680**	**251**	**1744**	**141**	**1822**	**17**		**8.8**
S103A-z15	**35**	*	**1427**	**34**	**0.024**	**99.98**	**99.82**	**4.541**	**0.768**	**0.2945**	**0.0498**	**0.99840**	**0.1120**	**0.0011**	**1664**	**248**	**1739**	**141**	**1830**	**17**		**10.3**
S103A-z15	**36**	*	**1373**	**36**	**0.026**	**99.98**	**99.89**	**4.345**	**0.683**	**0.2817**	**0.0442**	**0.99810**	**0.1120**	**0.0011**	**1600**	**222**	**1702**	**130**	**1830**	**18**		**14.2**
S103A-z15	**37**	*	**1443**	**40**	**0.028**	**99.97**	**99.77**	**4.529**	**0.757**	**0.2912**	**0.0487**	**0.99830**	**0.1130**	**0.0011**	**1648**	**243**	**1736**	**139**	**1845**	**18**		**12.1**
S103A-z15	**38**	*	**1368**	**34**	**0.025**	**100**	**99.97**	**4.472**	**0.718**	**0.2891**	**0.0464**	**0.99820**	**0.1120**	**0.0011**	**1637**	**232**	**1726**	**133**	**1835**	**18**		**12.2**
S103A-z15	**39**	*	**1367**	**37**	**0.027**	**99.99**	**99.91**	**4.540**	**0.766**	**0.2939**	**0.0495**	**0.99840**	**0.1120**	**0.0011**	**1661**	**247**	**1738**	**140**	**1833**	**18**		**10.7**
S103A-z15	**40**	*	**1319**	**40**	**0.031**	**99.99**	**99.91**	**4.393**	**0.691**	**0.2824**	**0.0444**	**0.99810**	**0.1130**	**0.0011**	**1603**	**223**	**1711**	**130**	**1845**	**18**		**14.8**
S103A-z15	**41**	*	**1378**	**42**	**0.030**	**99.98**	**99.89**	**4.528**	**0.747**	**0.2899**	**0.0478**	**0.99830**	**0.1130**	**0.0011**	**1641**	**239**	**1736**	**137**	**1853**	**18**		**13.0**
S103A-z15	42		1359	39	0.029	99.98	99.85	4.365	0.689	0.2800	0.0442	0.99810	0.1130	0.0011	1591	222	1706	130	1849	18		15.7
S103A-z15	**43**	*	**1302**	**36**	**0.028**	**99.99**	**99.94**	**4.326**	**0.682**	**0.2819**	**0.0444**	**0.99810**	**0.1110**	**0.0011**	**1601**	**223**	**1698**	**130**	**1821**	**18**		**13.7**
S103A-z15	44		1309	34	0.026	100	99.97	4.409	0.694	0.2827	0.0444	0.99810	0.1130	0.0011	1605	223	1714	130	1850	18		15.0
S103A-z15	45		1300	37	0.028	99.99	99.91	4.366	0.682	0.2819	0.0440	0.99800	0.1120	0.0011	1601	221	1706	129	1837	18		14.5
S103A-z15	46		1293	38	0.029	99.98	99.88	4.383	0.679	0.2790	0.0432	0.99800	0.1140	0.0011	1586	218	1709	128	1863	18		16.7
S103A-z15	47		1322	47	0.036	99.98	99.85	4.227	0.621	0.2694	0.0395	0.99770	0.1140	0.0011	1538	201	1679	121	1861	18		19.5
S103A-z15	48		1362	50	0.037	99.98	99.88	4.384	0.696	0.2809	0.0445	0.99810	0.1130	0.0011	1596	224	1709	131	1851	18		15.5
S103A-z15	49		1309	46	0.035	99.98	99.85	4.157	0.606	0.2655	0.0387	0.99770	0.1140	0.0011	1518	197	1666	119	1857	18		20.5
S103A-z15	50		1284	51	0.040	99.99	99.94	4.302	0.654	0.2756	0.0419	0.99790	0.1130	0.0011	1569	212	1694	125	1852	18		17.2
S103A-z15	51		1264	48	0.038	100	99.97	4.252	0.649	0.2731	0.0417	0.99800	0.1130	0.0011	1557	211	1684	126	1847	18		17.7
S103A-z15	52		1291	44	0.034	99.98	99.85	4.303	0.664	0.2781	0.0429	0.99800	0.1120	0.0011	1582	216	1694	127	1836	18		15.6
S103A-z15	53		1289	47	0.036	99.97	99.79	4.216	0.634	0.2717	0.0408	0.99780	0.1130	0.0011	1549	207	1677	123	1841	18		17.8
S103A-z15	54		1248	54	0.043	99.99	99.91	4.276	0.637	0.2726	0.0406	0.99780	0.1140	0.0011	1554	206	1689	123	1861	18		18.6
S103A-z15	55		1263	48	0.038	99.98	99.88	4.195	0.619	0.2703	0.0398	0.99770	0.1130	0.0011	1542	202	1673	121	1841	18		18.2
S103A-z15	56		1259	54	0.043	99.98	99.85	4.185	0.602	0.2675	0.0384	0.99760	0.1130	0.0011	1528	195	1671	118	1856	18		19.8
S103A-z15	57		1263	54	0.043	99.99	99.94	4.088	0.576	0.2643	0.0372	0.99750	0.1120	0.0011	1512	190	1652	115	1835	18		19.7
S103A-z15	58		1249	50	0.040	100	99.97	4.381	0.668	0.2757	0.0420	0.99790	0.1150	0.0011	1570	212	1709	126	1884	18		18.8
S103A-z15	59		1243	56	0.045	99.98	99.88	4.231	0.620	0.2683	0.0393	0.99770	0.1140	0.0011	1532	200	1680	120	1870	18		20.3
Sample S103A, zircon 16: Type 1B																						
S103A-z16	1		3435	4234	1.233	76.34	32.37	2.320	0.318	0.1369	0.0175	0.94880	0.1230	0.0053	827	99	1218	97	1998	77		62.3
S103A-z16	2		2116	1462	0.691	88.14	48.18	3.494	0.629	0.2446	0.0434	0.98700	0.1040	0.0030	1411	225	1526	142	1690	53		18.4
S103A-z16	3		1713	733	0.428	93.35	64.27	4.638	1.000	0.3167	0.0680	0.99540	0.1060	0.0022	1774	333	1756	180	1735	38		-2.6
S103A-z16	4		1523	440	0.289	95.94	75.56	5.252	1.230	0.3520	0.0820	0.99750	0.1080	0.0018	1944	391	1861	199	1769	30		-11.5
S103A-z16	5		1450	272	0.188	97.35	82.64	5.621	1.430	0.3799	0.0963	0.99840	0.1070	0.0016	2076	450	1919	219	1754	27		-21.5
S103A-z16	6		1359	169	0.124	98.16	87.47	5.576	1.360	0.3735	0.0912	0.99860	0.1080	0.0014	2046	428	1912	210	1771	24		-18.1
S103A-z16	7		1300	136	0.105	98.5	89.41	5.535	1.350	0.3764	0.0916	0.99870	0.1070	0.0013	2060	429	1906	209	1743	23		-21.2
S103A-z16	8		1282	105	0.082	99.02	92.93	5.743	1.430	0.3850	0.0959	0.99900	0.1080	0.0012	2100	446	1938	216	1769	21		-21.9
S103A-z16	9		1280	79	0.062	99.35	95.25	6.025	1.530	0.3992	0.1020	0.99910	0.1090	0.0012	2165	468	1979	222	1791	19		-24.6
S103A-z16	10		1261	69	0.054	99.48	96.26	5.785	1.350	0.3788	0.0882	0.99900	0.1110	0.0011	2071	413	1944	202	1812	19		-16.7
S103A-z16	11		1248	53	0.043	99.56	96.75	5.666	1.280	0.3752	0.0849	0.99900	0.1100	0.0011	2054	398	1926	195	1792	18		-17.0
S103A-z16	12		1221	45	0.037	99.63	97.28	5.779	1.300	0.3827	0.0863	0.99900	0.1100	0.0011	2089	402	1943	195	1792	18		-19.4
S103A-z16	13		1233	39	0.032	99.73	97.98	5.819	1.320	0.3855	0.0871	0.99910	0.1090	0.0011	2102	405	1949	196	1791	18		-20.4
S103A-z16	14		1218	35	0.029	99.79	98.46	5.673	1.230	0.3770	0.0815	0.99900	0.1090	0.0010	2062	382	1927	187	1785	17		-18.2
S103A-z16	15		1215	30	0.025	99.81	98.56	5.826	1.280	0.3837	0.0844	0.99910	0.1100	0.0010	2093	393	1950	191	1802	17		-18.9
S103A-z16	16		1214	25	0.021	99.83	98.76	5.722	1.220	0.3795	0.0809	0.99900	0.1090	0.0010	2074	378	1935	184	1789	17		-18.6
S103A-z16	17		1222	27	0.022	99.85	98.89	5.721	1.200	0.3808	0.0800	0.99900	0.1090	0.0010	2080	373	1934	182	1782	17		-19.6
S103A-z16	18		1195	24	0.020	99.88	99.13	5.695	1.160	0.3721	0.0759	0.99900	0.1110	0.0010	2039	357	1931	176	1816	17		-14.3
S103A-z16	19		1171	22	0.019	99.91	99.34	5.586	1.120	0.3681	0.0738	0.99900	0.1100	0.0010	2020	348	1914	173	1800	17		-14.3
S103A-z16	20		1162	23	0.020	99.87	99.07	5.101	0.897	0.3355	0.0590	0.99860	0.1100	0.0010	1865	285	1836	149	1804	17		-3.9
S103A-z16	21		1222	18	0.015	99.89	99.15	5.456	1.050	0.3595	0.0691	0.99890	0.1100	0.0010	1980	327	1894	165	1801	17		-11.5
S103A-z16	22		1187	20	0.017	99.9	99.28	5.423	1.020	0.3573	0.0671	0.99880	0.1100	0.0010	1969	319	1889	161	1801	17		-10.8

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
	cycle	ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
S103A-z16	**23 ***	**1159**	**23**	**0.020**	**99.93**	**99.5**	**5.261**	**0.948**	**0.3437**	**0.0619**	**0.99870**	**0.1110**	**0.0010**	**1904**	**297**	**1863**	**154**	**1816**	**17**	**-5.6**
S103A-z16	**24 ***	**1163**	**17**	**0.015**	**99.95**	**99.62**	**5.344**	**0.972**	**0.3478**	**0.0632**	**0.99880**	**0.1110**	**0.0010**	**1924**	**302**	**1876**	**156**	**1823**	**16**	**-6.4**
S103A-z16	**25 ***	**1161**	**19**	**0.016**	**99.95**	**99.64**	**5.104**	**0.867**	**0.3334**	**0.0566**	**0.99860**	**0.1110**	**0.0010**	**1855**	**274**	**1837**	**144**	**1816**	**17**	**-2.5**
S103A-z16	**26 ***	**1183**	**17**	**0.014**	**99.96**	**99.67**	**5.274**	**0.938**	**0.3445**	**0.0612**	**0.99870**	**0.1110**	**0.0010**	**1908**	**294**	**1865**	**152**	**1816**	**16**	**-5.9**
S103A-z16	**27 ***	**1165**	**19**	**0.017**	**99.92**	**99.43**	**5.213**	**0.903**	**0.3420**	**0.0592**	**0.99860**	**0.1110**	**0.0010**	**1896**	**284**	**1855**	**148**	**1808**	**17**	**-5.7**
S103A-z16	**28 ***	**1179**	**16**	**0.014**	**99.94**	**99.55**	**5.248**	**0.913**	**0.3449**	**0.0600**	**0.99860**	**0.1100**	**0.0010**	**1910**	**288**	**1860**	**148**	**1805**	**17**	**-6.8**
S103A-z16	**29 ***	**1176**	**18**	**0.016**	**99.96**	**99.68**	**5.066**	**0.835**	**0.3320**	**0.0547**	**0.99850**	**0.1110**	**0.0010**	**1848**	**265**	**1830**	**140**	**1810**	**17**	**-2.4**
S103A-z16	**30 ***	**1161**	**16**	**0.014**	**99.94**	**99.53**	**5.166**	**0.864**	**0.3352**	**0.0560**	**0.99850**	**0.1120**	**0.0010**	**1864**	**270**	**1847**	**142**	**1828**	**17**	**-2.3**
S103A-z16	**31 ***	**1111**	**14**	**0.013**	**99.97**	**99.74**	**5.064**	**0.825**	**0.3317**	**0.0540**	**0.99840**	**0.1110**	**0.0010**	**1847**	**262**	**1830**	**138**	**1811**	**17**	**-2.3**
S103A-z16	**32 ***	**1124**	**13**	**0.012**	**99.98**	**99.81**	**5.232**	**0.870**	**0.3402**	**0.0565**	**0.99850**	**0.1120**	**0.0010**	**1888**	**272**	**1858**	**142**	**1825**	**16**	**-3.9**
S103A-z16	**33 ***	**1138**	**18**	**0.016**	**99.98**	**99.82**	**5.050**	**0.808**	**0.3286**	**0.0525**	**0.99840**	**0.1110**	**0.0010**	**1832**	**255**	**1828**	**136**	**1823**	**17**	**-0.6**
S103A-z16	**34 ***	**1130**	**14**	**0.013**	**99.97**	**99.79**	**5.029**	**0.796**	**0.3250**	**0.0514**	**0.99840**	**0.1120**	**0.0010**	**1814**	**250**	**1824**	**134**	**1836**	**16**	**1.4**
S103A-z16	**35 ***	**1153**	**15**	**0.013**	**99.99**	**99.91**	**5.175**	**0.845**	**0.3362**	**0.0549**	**0.99850**	**0.1120**	**0.0010**	**1868**	**265**	**1849**	**139**	**1826**	**16**	**-2.7**
S103A-z16	**36 ***	**1134**	**20**	**0.017**	**99.98**	**99.88**	**4.989**	**0.770**	**0.3258**	**0.0503**	**0.99820**	**0.1110**	**0.0010**	**1818**	**244**	**1817**	**131**	**1817**	**17**	**-0.1**
S103A-z16	**37 ***	**1113**	**18**	**0.016**	**99.98**	**99.86**	**4.925**	**0.755**	**0.3205**	**0.0491**	**0.99820**	**0.1110**	**0.0010**	**1792**	**240**	**1807**	**129**	**1823**	**17**	**1.9**
S103A-z16	**38 ***	**1075**	**20**	**0.018**	**99.97**	**99.76**	**4.890**	**0.744**	**0.3218**	**0.0489**	**0.99810**	**0.1100**	**0.0010**	**1799**	**239**	**1800**	**128**	**1803**	**17**	**0.3**
S103A-z16	**39 ***	**1083**	**19**	**0.018**	**99.98**	**99.86**	**4.986**	**0.767**	**0.3257**	**0.0501**	**0.99820**	**0.1110**	**0.0010**	**1817**	**244**	**1817**	**130**	**1816**	**17**	**-0.1**
S103A-z16	**40 ***	**1067**	**19**	**0.018**	**99.98**	**99.83**	**4.854**	**0.716**	**0.3175**	**0.0468**	**0.99800**	**0.1110**	**0.0010**	**1777**	**229**	**1794**	**124**	**1814**	**17**	**2.3**
S103A-z16	**41 ***	**1063**	**27**	**0.025**	**99.96**	**99.7**	**4.940**	**0.732**	**0.3194**	**0.0473**	**0.99800**	**0.1120**	**0.0011**	**1787**	**231**	**1809**	**125**	**1835**	**17**	**3.0**
S103A-z16	**42 ***	**1037**	**27**	**0.026**	**99.94**	**99.56**	**4.650**	**0.645**	**0.3052**	**0.0423**	**0.99760**	**0.1100**	**0.0011**	**1717**	**209**	**1758**	**116**	**1808**	**17**	**5.7**
S103A-z16	**43 ***	**1040**	**28**	**0.027**	**99.96**	**99.69**	**4.984**	**0.732**	**0.3212**	**0.0472**	**0.99790**	**0.1130**	**0.0011**	**1795**	**230**	**1817**	**124**	**1841**	**17**	**2.8**
S103A-z16	**44 ***	**1003**	**31**	**0.031**	**99.96**	**99.71**	**4.804**	**0.689**	**0.3128**	**0.0448**	**0.99780**	**0.1110**	**0.0011**	**1754**	**220**	**1786**	**121**	**1822**	**17**	**4.2**
S103A-z16	**45 ***	**971**	**32**	**0.033**	**99.98**	**99.83**	**4.706**	**0.639**	**0.3058**	**0.0415**	**0.99750**	**0.1120**	**0.0011**	**1720**	**205**	**1768**	**114**	**1826**	**18**	**6.6**
S103A-z16	**46 ***	**1007**	**38**	**0.038**	**99.95**	**99.66**	**4.781**	**0.672**	**0.3079**	**0.0433**	**0.99760**	**0.1130**	**0.0011**	**1730**	**213**	**1782**	**118**	**1842**	**17**	**6.9**
S103A-z16	**47 ***	**982**	**40**	**0.040**	**99.94**	**99.55**	**4.661**	**0.635**	**0.3027**	**0.0412**	**0.99740**	**0.1120**	**0.0011**	**1705**	**204**	**1760**	**114**	**1827**	**18**	**7.6**
S103A-z16	**48 ***	**942**	**44**	**0.047**	**99.96**	**99.7**	**4.743**	**0.648**	**0.3070**	**0.0419**	**0.99740**	**0.1120**	**0.0011**	**1726**	**207**	**1775**	**115**	**1833**	**18**	**6.7**
S103A-z16	**49 ***	**927**	**46**	**0.050**	**99.93**	**99.49**	**4.709**	**0.635**	**0.3056**	**0.0412**	**0.99730**	**0.1120**	**0.0011**	**1719**	**203**	**1769**	**113**	**1828**	**18**	**6.8**
S103A-z16	**50 ***	**905**	**52**	**0.057**	**99.96**	**99.71**	**4.617**	**0.613**	**0.3015**	**0.0400**	**0.99720**	**0.1110**	**0.0011**	**1699**	**198**	**1752**	**111**	**1817**	**18**	**7.4**
S103A-z16	**51 ***	**872**	**46**	**0.052**	**99.96**	**99.69**	**4.526**	**0.571**	**0.2921**	**0.0368**	**0.99680**	**0.1120**	**0.0011**	**1652**	**184**	**1736**	**105**	**1838**	**18**	**11.5**
S103A-z16	**52 ***	**898**	**60**	**0.066**	**99.95**	**99.63**	**4.670**	**0.623**	**0.3020**	**0.0402**	**0.99710**	**0.1120**	**0.0011**	**1701**	**199**	**1762**	**112**	**1835**	**18**	**8.3**
S103A-z16	**53 ***	**866**	**62**	**0.072**	**99.98**	**99.87**	**4.547**	**0.581**	**0.2938**	**0.0375**	**0.99680**	**0.1120**	**0.0011**	**1661**	**187**	**1740**	**106**	**1836**	**18**	**10.8**
S103A-z16	**54 ***	**844**	**63**	**0.075**	**99.98**	**99.87**	**4.533**	**0.583**	**0.2929**	**0.0376**	**0.99690**	**0.1120**	**0.0011**	**1656**	**188**	**1737**	**107**	**1836**	**18**	**11.1**
S103A-z16	55	845	77	0.091	99.97	99.81	4.490	0.570	0.2903	0.0368	0.99680	0.1120	0.0011	1643	184	1729	105	1835	19	11.8
S103A-z16	56	849	81	0.096	99.99	99.89	4.441	0.546	0.2855	0.0350	0.99650	0.1130	0.0012	1619	176	1720	102	1845	19	13.8
S103A-z16	57	849	78	0.092	99.98	99.83	4.649	0.614	0.3013	0.0398	0.99700	0.1120	0.0012	1698	197	1758	110	1830	19	8.2
S103A-z16	58	826	87	0.105	99.98	99.86	4.397	0.533	0.2828	0.0343	0.99630	0.1130	0.0012	1606	172	1712	100	1844	19	14.6
S103A-z16	59	830	80	0.096	99.99	99.92	4.367	0.538	0.2833	0.0349	0.99640	0.1120	0.0012	1608	175	1706	102	1828	19	13.6
Sample S103A, zircon 17: Type 1B																				
S103A-z17	1	1608	2037	1.267	87.82	40.69	2.101	0.413	0.1934	0.0367	0.96880	0.0788	0.0038	1140	198	1149	135	1167	97	2.6
S103A-z17	2	1132	833	0.736	96.22	76.11	3.891	0.771	0.2724	0.0537	0.99520	0.1040	0.0020	1553	272	1612	160	1690	36	9.1
S103A-z17	3	1043	513	0.492	98.1	86.94	4.493	0.902	0.3052	0.0611	0.99730	0.1070	0.0016	1717	302	1730	167	1745	27	1.8
S103A-z17	4	1027	347	0.338	98.94	92.26	4.735	0.982	0.3244	0.0672	0.99810	0.1060	0.0013	1811	327	1773	174	1729	23	-5.5
S103A-z17	5	1001	255	0.255	99.43	95.74	4.924	1.050	0.3369	0.0719	0.99860	0.1060	0.0012	1872	347	1806	180	1732	21	-9.3
S103A-z17	6	1021	188	0.184	99.58	96.88	5.090	1.080	0.3429	0.0727	0.99870	0.1080	0.0012	1901	349	1834	180	1760	20	-9.2
S103A-z17	7	1040	131	0.126	99.66	97.45	5.274	1.150	0.3543	0.0775	0.99890	0.1080	0.0011	1955	369	1865	187	1765	19	-12.5
S103A-z17	8	1039	84	0.081	99.71	97.77	5.430	1.260	0.3719	0.0864	0.99900	0.1060	0.0011	2038	406	1890	199	1730	19	-20.8
S103A-z17	9	1040	69	0.066	99.79	98.44	5.298	1.160	0.3588	0.0788	0.99900	0.1070	0.0011	1976	374	1868	188	1751	18	-14.9
S103A-z17	10	1071	54	0.050	99.9	99.21	5.301	1.170	0.3596	0.0793	0.99910	0.1070	0.0010	1980	376	1869	188	1747	18	-15.6
S103A-z17	11	1094	52	0.047	99.93	99.49	5.247	1.110	0.3498	0.0740	0.99900	0.1090	0.0010	1934	353	1860	180	1779	17	-10.1
S103A-z17	12	1163	43	0.037	99.96	99.67	5.812	1.400	0.3849	0.0928	0.99930	0.1100	0.0010	2099	432	1948	209	1792	17	-20.1
S103A-z17	13	1136	40	0.035	99.95	99.65	5.353	1.160	0.3567	0.0770	0.99910	0.1090	0.0010	1967	366	1877	185	1780	17	-12.2
S103A-z17	14	1180	39	0.033	99.95	99.6	5.408	1.200	0.3613	0.0799	0.99920	0.1090	0.0010	1988	378	1886	189	1775	17	-14.0
S103A-z17	15	1176	33	0.028	99.93	99.48	5.621	1.290	0.3743	0.0857	0.99920	0.1090	0.0010	2050	402	1919	197	1782	17	-17.5
S103A-z17	16	1144	28	0.024	99.92	99.41	5.583	1.280	0.3726	0.0854	0.99920	0.1090	0.0010	2042	401	1914	197	1777	17	-17.4
S103A-z17	17	1113	24	0.021	99.98	99.81	5.479	1.200	0.3647	0.0797	0.99910	0.1090	0.0010	2004	377	1897	188	1782	16	-14.5
S103A-z17	18	1118	24	0.021	99.97	99.76	5.905	1.390	0.3896	0.0916	0.99930	0.1100	0.0010	2121	425	1962	204	1798	17	-21.1
S103A-z17	19	1088	22	0.020	99.96	99.7	5.453	1.190	0.3648	0.0794	0.99910	0.1080	0.0010	2005	375	1893	187	1773	17	-15.2
S103A-z17	20	1088	21	0.020	99.95	99.64	5.590	1.240	0.3730	0.0826	0.99910	0.1090	0.0010	2043	388	1915	191	1778	17	-17.4
S103A-z17	21	1078	19	0.017	99.97	99.78	5.437	1.140	0.3567	0.0746	0.99900	0.1110	0.0010	1967	354	1891	179	1808	17	-10.2
S103A-z17	22	1094	17	0.016	99.96	99.73	5.649	1.260	0.3751	0.0838	0.99920	0.1090	0.0010	2053	393	1924	193	1787	17	-17.4
S103A-z17	23	1111	18	0.016	99.95	99.6	5.531	1.190	0.3632	0.0781	0.99910	0.1100	0.0010	1997	369	1905	185	1807	17	-12.2
S103A-z17	24	1092	15	0.014	99.97	99.79	5.331	1.080	0.3507	0.0713	0.99900	0.1100	0.0010	1938	340	1874	174	1804	17	-8.6
S103A-z17	25	1093	17	0.016	99.98	99.87	5.692	1.230	0.3713	0.0803	0.99910	0.1110	0.0010	2035	378	1930	187	1819	16	-13.9
S103A-z17	26	1119	13	0.012	99.99	99.95	5.404	1.110	0.3539	0.0727	0.99910	0.1110	0.0010	1953	346	1885	176	1812	16	-9.0
S103A-z17	**27 ***	**1134**	**16**	**0.014**	**100**	**99.98**	**5.546**	**1.160**	**0.3617**	**0.0758**	**0.99910**	**0.1110**	**0.0010**	**1990**	**359**	**1908**	**180**	**1819**	**16**	**-11.0**
S103A-z17	**28 ***	**1122**	**15**	**0.014**	**99.99**	**99.93**	**5.538**	**1.150**	**0.3611**	**0.0752**	**0.99910**	**0.1110**	**0.0010**	**1988**	**356**	**1906**	**179**	**1819**	**16**	**-10.8**
S103A-z17	**29 ***	**1172**	**14**	**0.012**	**99.98**	**99.88**	**5.552**	**1.170**	**0.3605**	**0.0761**	**0.99910**	**0.1120**	**0.0010**	**1985**	**361**	**1909**	**182**	**1827**	**16**	**-10.0**
S103A-z17	**30 ***	**1146**	**15**	**0.013**	**99.97**	**99.8**	**5.456**	**1.130**	**0.3584**	**0.0739**	**0.99910**	**0.1100**	**0.0010**	**1974**	**351**	**1894**	**177**	**1806**	**16**	**-10.9**
S103A-z17	**31 ***	**1148**	**15**	**0.013**	**99.99**	**99.9**	**5.362**	**1.070**	**0.3492**	**0.0698**	**0.99900**	**0.1110**	**0.0010**	**1931**	**333**	**1879**	**171**	**1822**	**16**	**-6.9**
S103A-z17	**32 ***	**1162**	**16**	**0.013**	**100**	**99.98**	**5.561**	**1.160**	**0.3620**	**0.0757**	**0.99910**	**0.1110**	**0.0010**	**1992**	**358**	**1910**	**180**	**1822**	**16**	**-10.9**
S103A-z17	**33 ***	**1167**	**14**	**0.012**	**99.98**	**99.88**	**5.461**	**1.130**	**0.3601**	**0.0746**	**0.99910**	**0.1100**	**0.0010**	**1983**	**353**	**1895**	**178**	**1799**	**16**	**-11.9**
S103A-z17	**34 ***	**1197**	**12**	**0.010**	**99.98**	**99.86**	**5.341**	**1.050**	**0.3459**	**0.0682**	**0.99900**	**0.1120**	**0.0010**	**1915**	**327**	**1875**	**169**	**1832**	**16**	**-5.2**
S103A-z17	**35 ***	**1225**	**18**	**0.015**	**100**	**99.98**	**5.528**	**1.140**	**0.3581**	**0.0738**	**0.99910**	**0.1120**	**0.0010**	**1973**	**350**	**1905**	**177**	**1832**	**16**	**-8.9**
S103A-z17	**36 ***	**1212**	**13**	**0.011**	**99.99**	**99.91**	**5.444**	**1.080**	**0.3484**	**0.0694**	**0.99910**	**0.1130**	**0.0010**	**1927**	**332**	**1892**	**171**	**1853**	**16**	**-4.6**
S103A-z17	**37 ***	**1167**	**15**	**0.012**	**99.98**	**99.86**	**5.162**	**0.980**	**0.3355**	**0.0637**	**0.99900**	**0.1120**	**0.0010**	**1865**	**307**	**1846**	**161**	**1825**	**16**	**-2.5**
S103A-z17	**38 ***	**1198**	**12**	**0.010**	**99.98**	**99.88**	**5.561**	**1.160**	**0.3612**	**0.0757**	**0.99920**	**0.1120**	**0.0010**	**1988**	**358**	**1910**	**180**	**1827**	**15**	**-10.2**
S103A-z17	**39 ***	**1193**	**15**	**0.013**	**99.99**	**99.95**	**5.332**	**1.060**	**0.3469**	**0.0688**	**0.99910**	**0.1110**	**0.0009**	**1920**	**329**	**1874**	**170**	**1823**	**15**	**-6.2**
S103A-z17	**40 ***	**1206**	**16**	**0.013**	**100**	**99.98**	**5.348**	**1.060**	**0.3466**	**0.0689**	**0.99910**	**0.1120**	**0.0009**	**1918**	**330**	**1877**	**170**	**1830**	**15**	**-5.6**
S103A-z17	**41 ***	**1213**	**14**	**0.012**	**99.99**	**99.95**	**5.282**	**1.030**	**0.3419**	**0.0669**	**0.99910**	**0.1120**	**0.0009**	**1896**	**321**	**1866**	**167**	**1833**	**15**	**-3.9**
S103A-z17	**42 ***	**1234**	**12**	**0.010**	**100**	**99.98**	**5.339**	**1.060**	**0.3457**	**0.0686**	**0.99910**	**0.1120**	**0.0009**	**1914**	**329**	**1875**	**170**	**1832**	**15**	**-5.2**
S103A-z17	**43 ***	**1242**	**18**	**0.014**	**99.99**	**99.91**	**5.305**	**1.040**	**0.3435**	**0.0675**	**0.99910**	**0.1120**	**0.0009**	**1904**	**324**	**1870**	**168**	**1832**	**15**	**-4.5**

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
	cycle		ppm	ppm	ppm	^{206}Pb*	^{207}Pb*	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.		
S103A-z17	**44**	*	**1262**	**16**	**0.013**	**99.99**	**99.89**	**5.207**	**1.010**	**0.3390**	**0.0655**	**0.99910**	**0.1110**	**0.0009**	**1882**	**315**	**1854**	**165**	**1822**	**15**		**-3.8**
S103A-z17	**45**	*	**1283**	**16**	**0.013**	**99.99**	**99.91**	**5.368**	**1.070**	**0.3469**	**0.0690**	**0.99910**	**0.1120**	**0.0009**	**1920**	**330**	**1880**	**170**	**1836**	**15**		**-5.3**
S103A-z17	**46**	*	**1284**	**20**	**0.015**	**99.97**	**99.81**	**5.059**	**0.952**	**0.3277**	**0.0616**	**0.99900**	**0.1120**	**0.0009**	**1827**	**299**	**1829**	**160**	**1831**	**15**		**0.2**
S103A-z17	**47**	*	**1275**	**24**	**0.019**	**99.97**	**99.75**	**5.304**	**1.030**	**0.3423**	**0.0665**	**0.99910**	**0.1120**	**0.0009**	**1898**	**320**	**1869**	**166**	**1838**	**15**		**-3.8**
S103A-z17	**48**	*	**1283**	**21**	**0.016**	**99.97**	**99.76**	**5.040**	**0.919**	**0.3242**	**0.0591**	**0.99900**	**0.1130**	**0.0009**	**1810**	**288**	**1826**	**154**	**1844**	**15**		**2.1**
S103A-z17	**49**	*	**1348**	**23**	**0.017**	**99.94**	**99.57**	**5.261**	**1.020**	**0.3402**	**0.0662**	**0.99910**	**0.1120**	**0.0009**	**1888**	**319**	**1863**	**166**	**1835**	**15**		**-3.3**
S103A-z17	**50**	*	**1364**	**23**	**0.017**	**99.96**	**99.72**	**5.032**	**0.927**	**0.3260**	**0.0601**	**0.99900**	**0.1120**	**0.0009**	**1819**	**292**	**1825**	**156**	**1831**	**15**		**0.7**
S103A-z17	51		1391	22	0.016	99.96	99.71	5.068	0.950	0.3261	0.0611	0.99910	0.1130	0.0009	1819	297	1831	159	1844	15		1.5
S103A-z17	52		1365	22	0.016	99.94	99.53	4.984	0.900	0.3205	0.0579	0.99900	0.1130	0.0009	1792	283	1817	153	1845	15		3.3
S103A-z17	53		1380	23	0.017	99.94	99.55	5.018	0.917	0.3206	0.0586	0.99900	0.1140	0.0009	1792	286	1822	155	1857	14		4.0
S103A-z17	54		1380	23	0.016	99.97	99.79	5.123	0.946	0.3265	0.0602	0.99910	0.1140	0.0009	1821	293	1840	157	1861	14		2.4
S103A-z17	55		1361	21	0.015	99.95	99.61	5.060	0.941	0.3270	0.0608	0.99910	0.1120	0.0009	1824	295	1829	158	1836	15		0.8
S103A-z17	56		1371	18	0.013	99.94	99.57	4.874	0.856	0.3124	0.0549	0.99900	0.1130	0.0009	1753	270	1798	148	1850	15		6.0
S103A-z17	57		1378	20	0.014	99.97	99.79	5.171	0.975	0.3323	0.0626	0.99910	0.1130	0.0009	1850	303	1848	160	1846	14		-0.2
S103A-z17	58		1338	21	0.016	99.95	99.63	4.882	0.850	0.3129	0.0544	0.99890	0.1130	0.0009	1755	267	1799	147	1851	15		5.9
S103A-z17	59		1360	21	0.015	99.97	99.77	5.035	0.912	0.3218	0.0583	0.99900	0.1130	0.0009	1798	284	1825	153	1856	14		3.6
Sample S103A, zircon 18: Type 1B																						
S103A-z18	1		4890	16040	3.280	70.55	29.05	1.067	0.141	0.0547	0.0066	0.94200	0.1420	0.0063	343	41	737	69	2246	77		86.9
S103A-z18	2		2704	6048	2.237	84.06	41.31	1.662	0.244	0.1091	0.0154	0.97020	0.1110	0.0039	667	90	994	93	1808	65		66.3
S103A-z18	3		2188	3051	1.394	90.84	57.46	2.497	0.425	0.1605	0.0269	0.98920	0.1130	0.0028	960	150	1271	123	1845	45		51.5
S103A-z18	4		1933	1625	0.841	94.62	70.2	3.086	0.578	0.2018	0.0376	0.99460	0.1110	0.0022	1185	201	1429	144	1814	35		37.9
S103A-z18	5		1874	970	0.517	96.49	78.55	3.331	0.645	0.2189	0.0422	0.99650	0.1100	0.0018	1276	223	1488	151	1806	29		32.3
S103A-z18	6		1904	719	0.377	97.78	85.64	3.538	0.697	0.2286	0.0449	0.99770	0.1120	0.0015	1327	236	1536	156	1836	24		30.6
S103A-z18	7		2032	597	0.294	98.48	89.84	3.825	0.815	0.2450	0.0521	0.99850	0.1130	0.0013	1413	270	1598	171	1852	21		26.4
S103A-z18	8		2008	482	0.240	98.79	91.74	3.765	0.784	0.2433	0.0506	0.99860	0.1120	0.0012	1404	262	1585	167	1836	20		26.2
S103A-z18	9		1998	405	0.203	99.14	94.02	4.063	0.903	0.2603	0.0578	0.99900	0.1130	0.0012	1491	296	1647	181	1851	18		21.7
S103A-z18	10		1998	292	0.146	99.26	94.8	4.080	0.900	0.2617	0.0577	0.99900	0.1130	0.0011	1499	295	1650	180	1849	18		21.2
S103A-z18	11		1957	197	0.100	99.37	95.48	4.111	0.931	0.2699	0.0611	0.99910	0.1100	0.0011	1540	310	1657	185	1807	18		16.6
S103A-z18	12		1925	163	0.084	99.53	96.58	4.126	0.917	0.2696	0.0599	0.99910	0.1110	0.0010	1539	304	1659	182	1816	17		17.2
S103A-z18	**13**	*	**1905**	**138**	**0.072**	**99.57**	**96.86**	**4.310**	**0.996**	**0.2804**	**0.0648**	**0.99920**	**0.1110**	**0.0010**	**1594**	**326**	**1695**	**190**	**1823**	**17**		**14.2**
S103A-z18	**14**	*	**1886**	**107**	**0.057**	**99.58**	**96.9**	**4.244**	**0.969**	**0.2788**	**0.0636**	**0.99920**	**0.1100**	**0.0010**	**1585**	**321**	**1683**	**188**	**1806**	**17**		**13.8**
S103A-z18	**15**	*	**1877**	**86**	**0.046**	**99.66**	**97.48**	**4.190**	**0.940**	**0.2766**	**0.0620**	**0.99920**	**0.1100**	**0.0010**	**1574**	**313**	**1672**	**184**	**1797**	**16**		**14.0**
S103A-z18	**16**	*	**1893**	**83**	**0.044**	**99.77**	**98.32**	**4.310**	**0.981**	**0.2827**	**0.0643**	**0.99930**	**0.1110**	**0.0010**	**1605**	**323**	**1695**	**188**	**1809**	**16**		**12.7**
S103A-z18	**17**	*	**1934**	**74**	**0.038**	**99.75**	**98.17**	**4.245**	**0.956**	**0.2796**	**0.0629**	**0.99920**	**0.1100**	**0.0010**	**1590**	**317**	**1683**	**185**	**1801**	**16**		**13.2**
S103A-z18	**18**	*	**1956**	**66**	**0.034**	**99.86**	**98.94**	**4.590**	**1.100**	**0.2973**	**0.0712**	**0.99940**	**0.1120**	**0.0009**	**1678**	**354**	**1747**	**200**	**1831**	**15**		**9.5**
S103A-z18	**19**	*	**1870**	**63**	**0.033**	**99.86**	**98.95**	**4.340**	**0.972**	**0.2820**	**0.0632**	**0.99930**	**0.1120**	**0.0009**	**1601**	**318**	**1701**	**185**	**1826**	**15**		**13.9**
S103A-z18	**20**	*	**1861**	**65**	**0.035**	**99.84**	**98.79**	**4.335**	**0.968**	**0.2817**	**0.0629**	**0.99930**	**0.1120**	**0.0009**	**1600**	**316**	**1700**	**184**	**1826**	**15**		**14.0**
S103A-z18	**21**	*	**1872**	**58**	**0.031**	**99.88**	**99.15**	**4.455**	**1.020**	**0.2863**	**0.0657**	**0.99930**	**0.1130**	**0.0009**	**1623**	**329**	**1723**	**190**	**1846**	**15**		**13.7**
S103A-z18	**22**	*	**1929**	**55**	**0.029**	**99.9**	**99.26**	**4.366**	**0.993**	**0.2860**	**0.0651**	**0.99930**	**0.1110**	**0.0009**	**1621**	**326**	**1706**	**188**	**1811**	**15**		**11.8**
S103A-z18	**23**	*	**1870**	**51**	**0.027**	**99.89**	**99.21**	**4.481**	**1.030**	**0.2889**	**0.0661**	**0.99930**	**0.1120**	**0.0009**	**1636**	**331**	**1727**	**190**	**1840**	**15**		**12.5**
S103A-z18	**24**	*	**1843**	**54**	**0.029**	**99.89**	**99.18**	**4.616**	**1.100**	**0.3016**	**0.0717**	**0.99940**	**0.1110**	**0.0009**	**1699**	**355**	**1752**	**198**	**1816**	**15**		**7.3**
S103A-z18	**25**	*	**1861**	**50**	**0.027**	**99.94**	**99.58**	**4.449**	**0.994**	**0.2932**	**0.0655**	**0.99930**	**0.1100**	**0.0009**	**1657**	**327**	**1721**	**185**	**1800**	**15**		**9.0**
S103A-z18	**26**	*	**1934**	**46**	**0.024**	**99.94**	**99.56**	**4.561**	**1.060**	**0.3021**	**0.0703**	**0.99940**	**0.1090**	**0.0009**	**1702**	**348**	**1742**	**194**	**1791**	**15**		**5.7**
S103A-z18	**27**	*	**1907**	**55**	**0.029**	**99.95**	**99.66**	**4.479**	**0.997**	**0.2931**	**0.0653**	**0.99930**	**0.1110**	**0.0009**	**1657**	**325**	**1727**	**185**	**1813**	**15**		**9.7**
S103A-z18	**28**	*	**1857**	**73**	**0.039**	**99.93**	**99.47**	**4.539**	**1.030**	**0.2956**	**0.0669**	**0.99940**	**0.1110**	**0.0009**	**1669**	**333**	**1738**	**188**	**1822**	**15**		**9.5**
S103A-z18	**29**	*	**1861**	**93**	**0.050**	**99.91**	**99.33**	**4.579**	**1.050**	**0.2981**	**0.0684**	**0.99940**	**0.1110**	**0.0009**	**1682**	**340**	**1745**	**191**	**1822**	**15**		**8.7**
S103A-z18	**30**	*	**1863**	**124**	**0.067**	**99.91**	**99.35**	**4.645**	**1.080**	**0.3029**	**0.0702**	**0.99940**	**0.1110**	**0.0009**	**1706**	**347**	**1757**	**194**	**1819**	**15**		**7.1**
S103A-z18	**31**	*	**1828**	**104**	**0.057**	**99.91**	**99.29**	**4.494**	**0.998**	**0.2949**	**0.0655**	**0.99930**	**0.1110**	**0.0009**	**1666**	**326**	**1730**	**184**	**1808**	**15**		**8.9**
S103A-z18	**32**	*	**1800**	**109**	**0.061**	**99.9**	**99.26**	**4.590**	**1.030**	**0.2999**	**0.0675**	**0.99930**	**0.1110**	**0.0009**	**1691**	**335**	**1747**	**188**	**1816**	**15**		**7.8**
S103A-z18	**33**	*	**1796**	**90**	**0.050**	**99.87**	**99.03**	**4.777**	**1.120**	**0.3113**	**0.0729**	**0.99940**	**0.1110**	**0.0009**	**1747**	**358**	**1781**	**197**	**1821**	**15**		**4.6**
S103A-z18	**34**	*	**1735**	**89**	**0.051**	**99.94**	**99.54**	**4.766**	**1.100**	**0.3086**	**0.0710**	**0.99940**	**0.1120**	**0.0009**	**1734**	**350**	**1779**	**193**	**1832**	**15**		**6.1**
S103A-z18	**35**	*	**1696**	**82**	**0.048**	**99.9**	**99.24**	**4.639**	**1.040**	**0.3036**	**0.0680**	**0.99930**	**0.1110**	**0.0009**	**1709**	**336**	**1756**	**187**	**1813**	**15**		**6.5**
S103A-z18	**36**	*	**1696**	**89**	**0.052**	**99.86**	**98.93**	**4.634**	**1.050**	**0.3046**	**0.0689**	**0.99930**	**0.1100**	**0.0009**	**1714**	**340**	**1755**	**189**	**1805**	**16**		**5.7**
S103A-z18	**37**	*	**1649**	**102**	**0.062**	**99.89**	**99.2**	**4.629**	**1.020**	**0.3017**	**0.0665**	**0.99920**	**0.1110**	**0.0010**	**1700**	**329**	**1755**	**184**	**1820**	**16**		**7.5**
S103A-z18	**38**	*	**1616**	**124**	**0.077**	**99.84**	**98.79**	**4.653**	**1.040**	**0.3045**	**0.0680**	**0.99920**	**0.1110**	**0.0010**	**1714**	**336**	**1759**	**187**	**1813**	**16**		**6.2**
S103A-z18	**39**	*	**1580**	**147**	**0.093**	**99.84**	**98.85**	**4.688**	**1.030**	**0.3052**	**0.0674**	**0.99920**	**0.1110**	**0.0010**	**1717**	**333**	**1765**	**185**	**1823**	**16**		**6.6**
S103A-z18	**40**	*	**1563**	**143**	**0.092**	**99.87**	**99.02**	**4.768**	**1.070**	**0.3107**	**0.0698**	**0.99920**	**0.1110**	**0.0010**	**1744**	**343**	**1779**	**189**	**1821**	**16**		**4.8**
S103A-z18	**41**	*	**1516**	**135**	**0.089**	**99.88**	**99.09**	**4.831**	**1.100**	**0.3170**	**0.0721**	**0.99920**	**0.1110**	**0.0010**	**1775**	**353**	**1790**	**191**	**1808**	**16**		**2.1**
S103A-z18	**42**	*	**1503**	**142**	**0.095**	**99.84**	**98.8**	**4.659**	**1.020**	**0.3033**	**0.0660**	**0.99910**	**0.1110**	**0.0010**	**1707**	**327**	**1760**	**182**	**1823**	**17**		**7.2**
S103A-z18	**43**	*	**1405**	**157**	**0.112**	**99.87**	**99.07**	**4.802**	**1.060**	**0.3095**	**0.0680**	**0.99920**	**0.1130**	**0.0010**	**1738**	**335**	**1785**	**185**	**1841**	**16**		**6.4**
S103A-z18	**44**	*	**1420**	**205**	**0.144**	**99.84**	**98.78**	**4.707**	**1.040**	**0.3083**	**0.0682**	**0.99910**	**0.1110**	**0.0010**	**1732**	**336**	**1768**	**185**	**1812**	**17**		**5.0**
S103A-z18	**45**	*	**1453**	**249**	**0.171**	**99.73**	**98.04**	**4.621**	**0.993**	**0.3025**	**0.0650**	**0.99900**	**0.1110**	**0.0011**	**1704**	**322**	**1753**	**179**	**1812**	**17**		**6.8**
S103A-z18	**46**	*	**1409**	**241**	**0.171**	**99.76**	**98.22**	**4.701**	**1.010**	**0.3041**	**0.0655**	**0.99900**	**0.1120**	**0.0011**	**1711**	**324**	**1767**	**180**	**1834**	**17**		**7.6**
S103A-z18	**47**	*	**1369**	**228**	**0.166**	**99.8**	**98.57**	**4.711**	**1.020**	**0.3046**	**0.0661**	**0.99910**	**0.1120**	**0.0011**	**1714**	**326**	**1769**	**182**	**1835**	**17**		**7.5**
S103A-z18	**48**	*	**1314**	**221**	**0.168**	**99.81**	**98.63**	**4.854**	**1.060**	**0.3116**	**0.0683**	**0.99910**	**0.1130**	**0.0011**	**1748**	**336**	**1794**	**185**	**1848**	**17**		**6.1**
S103A-z18	**49**	*	**1288**	**205**	**0.159**	**99.7**	**97.8**	**4.817**	**1.060**	**0.3155**	**0.0694**	**0.99900**	**0.1110**	**0.0011**	**1768**	**340**	**1788**	**185**	**1811**	**18**		**2.7**
S103A-z18	**50**	*	**1308**	**212**	**0.162**	**99.71**	**97.89**	**4.787**	**1.030**	**0.3098**	**0.0667**	**0.99890**	**0.1120**	**0.0011**	**1740**	**328**	**1783**	**181**	**1833**	**18**		**5.8**
S103A-z18	**51**	*	**1258**	**206**	**0.164**	**99.77**	**98.33**	**4.638**	**0.961**	**0.3004**	**0.0622**	**0.99890**	**0.1120**	**0.0011**	**1693**	**308**	**1756**	**173**	**1832**	**18**		**8.6**
S103A-z18	**52**	*	**1206**	**203**	**0.168**	**99.78**	**98.37**	**4.821**	**1.040**	**0.3118**	**0.0671**	**0.99890**	**0.1120**	**0.0011**	**1750**	**330**	**1789**	**181**	**1834**	**18**		**5.2**
S103A-z18	**53**	*	**1225**	**208**	**0.170**	**99.78**	**98.38**	**5.063**	**1.150**	**0.3253**	**0.0740**	**0.99900**	**0.1130**	**0.0011**	**1815**	**360**	**1830**	**193**	**1847**	**18**		**2.0**
S103A-z18	54		1203	236	0.196	99.8	98.56	4.729	0.978	0.3040	0.0628	0.99880	0.1130	0.0011	1711	311	1772	173	1846	18		8.3
S103A-z18	55		1225	240	0.196	99.75	98.21	4.692	0.974	0.3039	0.0631	0.99880	0.1120	0.0011	1711	312	1766	174	1832	19		7.6
S103A-z18	56		1203	253	0.210	99.71	97.91	4.834	1.020	0.3096	0.0651	0.99880	0.1130	0.0012	1739	321	1791	177	1852	19		7.0
S103A-z18	57		1131	225	0.199	99.66	97.53	4.706	0.974	0.3037	0.0628	0.99870	0.1120	0.0012	1710	311	1768	173	1838	19		7.9
S103A-z18	58		1130	252	0.223	99.67	97.61	4.935	1.080	0.3174	0.0692	0.99880	0.1130	0.0012	1777	339	1808	184	1845	19		4.2
S103A-z18	59		1121	289	0.258	99.66	97.58	4.659	0.933	0.2981	0.0597	0.99860	0.1130	0.0012	1682	296	1760	167	1854	19		10.5
S103A-z18	60		1118	334	0.299	99.58	97.03	4.799	1.010	0.3082	0.0649	0.99870	0.1130	0.0012	1732	320	1785	177	1847	20		7.1
Sample F122A, zircon 1: Type 1A																						
F122A-z1	1		984	29	0.03	95.83	74.05	4.178	0.551	0.2945	0.0370	0.95810	0.1029	0.0039	1664	184	1670	108	1677	70		0.9
F122A-z1	2		904	16	0.02	96.97	79.57	4.058	0.523	0.2919	0.0361	0.96400	0.1008	0.0035	1651	180	1646	105	1639	64		-0.9

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
								$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$			
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.		
F122A-z1	3		825	8	0.01	98.44	89.03	4.589	0.596	0.3134	0.0399	0.97910	0.1062	0.0028	1758	196	1747	108	1735	48		-1.5
F122A-z1	4		794	10	0.01	99.14	93.91	4.510	0.543	0.2936	0.0349	0.98250	0.1114	0.0025	1659	174	1733	100	1822	41		10.1
F122A-z1	**5**	*	**768**	**8**	**0.01**	**99.4**	**95.72**	**4.689**	**0.570**	**0.3035**	**0.0365**	**0.98450**	**0.1121**	**0.0024**	**1709**	**180**	**1765**	**102**	**1833**	**39**		**7.7**
F122A-z1	**6**	*	**686**	**5**	**0.01**	**99.41**	**95.62**	**4.546**	**0.525**	**0.3087**	**0.0352**	**0.98090**	**0.1068**	**0.0024**	**1734**	**173**	**1739**	**96**	**1745**	**41**		**0.7**
F122A-z1	**7**	*	**686**	**6**	**0.01**	**99.71**	**97.93**	**5.061**	**0.636**	**0.3251**	**0.0405**	**0.98720**	**0.1129**	**0.0023**	**1815**	**197**	**1830**	**107**	**1847**	**36**		**2.0**
F122A-z1	**8**	*	**737**	**4**	**0.01**	**99.82**	**98.72**	**4.958**	**0.636**	**0.3190**	**0.0407**	**0.98890**	**0.1127**	**0.0021**	**1785**	**199**	**1812**	**108**	**1843**	**34**		**3.6**
F122A-z1	**9**	*	**778**	**5**	**0.01**	**99.89**	**99.21**	**4.972**	**0.650**	**0.3246**	**0.0422**	**0.99010**	**0.1111**	**0.0020**	**1812**	**206**	**1815**	**111**	**1818**	**33**		**0.4**
F122A-z1	**10**	*	**779**	**6**	**0.01**	**99.76**	**98.23**	**4.840**	**0.617**	**0.3159**	**0.0400**	**0.98880**	**0.1111**	**0.0021**	**1770**	**196**	**1792**	**107**	**1818**	**34**		**3.0**
F122A-z1	**11**	*	**785**	**5**	**0.01**	**99.51**	**96.4**	**5.018**	**0.700**	**0.3336**	**0.0462**	**0.98910**	**0.1091**	**0.0022**	**1856**	**223**	**1822**	**118**	**1784**	**37**		**-4.7**
F122A-z1	**12**	*	**803**	**4**	**0**	**99.76**	**98.27**	**5.057**	**0.681**	**0.3222**	**0.0431**	**0.99060**	**0.1138**	**0.0021**	**1801**	**210**	**1829**	**114**	**1861**	**33**		**3.7**
F122A-z1	**13**	*	**819**	**5**	**0.01**	**99.76**	**98.23**	**4.963**	**0.677**	**0.3271**	**0.0444**	**0.99060**	**0.1100**	**0.0021**	**1824**	**216**	**1813**	**115**	**1800**	**34**		**-1.6**
F122A-z1	**14**	*	**812**	**5**	**0.01**	**99.76**	**98.3**	**4.971**	**0.658**	**0.3180**	**0.0419**	**0.99040**	**0.1134**	**0.0021**	**1780**	**205**	**1814**	**112**	**1854**	**33**		**4.6**
F122A-z1	**15**	*	**793**	**3**	**0**	**99.76**	**98.3**	**5.301**	**0.740**	**0.3376**	**0.0469**	**0.99140**	**0.1139**	**0.0021**	**1875**	**226**	**1869**	**119**	**1863**	**33**		**-0.7**
F122A-z1	**16**	*	**798**	**4**	**0**	**99.78**	**98.42**	**5.186**	**0.718**	**0.3306**	**0.0456**	**0.99130**	**0.1138**	**0.0021**	**1841**	**221**	**1850**	**118**	**1860**	**33**		**1.1**
F122A-z1	**17**	*	**811**	**4**	**0**	**99.88**	**99.12**	**5.691**	**0.862**	**0.3606**	**0.0544**	**0.99320**	**0.1145**	**0.0020**	**1985**	**258**	**1930**	**131**	**1872**	**32**		**-7.0**
F122A-z1	**18**	*	**759**	**3**	**0**	**99.94**	**99.57**	**5.135**	**0.697**	**0.3287**	**0.0444**	**0.99180**	**0.1133**	**0.0020**	**1832**	**216**	**1842**	**115**	**1853**	**31**		**1.3**
F122A-z1	**19**	*	**749**	**2**	**0**	**99.82**	**98.67**	**5.009**	**0.667**	**0.3235**	**0.0428**	**0.99050**	**0.1123**	**0.0021**	**1807**	**209**	**1821**	**113**	**1837**	**33**		**1.9**
F122A-z1	**20**	*	**775**	**3**	**0**	**99.88**	**99.1**	**5.364**	**0.764**	**0.3424**	**0.0485**	**0.99210**	**0.1136**	**0.0020**	**1898**	**233**	**1879**	**122**	**1858**	**32**		**-2.5**
F122A-z1	**21**	*	**763**	**5**	**0.01**	**99.9**	**99.29**	**5.223**	**0.697**	**0.3305**	**0.0439**	**0.99110**	**0.1146**	**0.0020**	**1841**	**213**	**1856**	**114**	**1874**	**32**		**2.0**
F122A-z1	**22**	*	**729**	**4**	**0.01**	**99.75**	**98.17**	**5.189**	**0.707**	**0.3360**	**0.0455**	**0.99020**	**0.1120**	**0.0021**	**1867**	**220**	**1851**	**116**	**1832**	**35**		**-2.2**
F122A-z1	23		721	5	0.01	99.9	99.26	5.279	0.700	0.3290	0.0435	0.99090	0.1164	0.0021	1834	211	1865	113	1901	32		4.1
F122A-z1	24		742	6	0.01	99.9	99.27	5.533	0.779	0.3497	0.0491	0.99190	0.1148	0.0021	1933	234	1906	121	1876	32		-3.5
F122A-z1	25		729	7	0.01	99.82	98.68	5.170	0.677	0.3269	0.0426	0.99010	0.1147	0.0021	1823	207	1848	111	1875	33		3.2
F122A-z1	26		754	6	0.01	99.84	98.8	5.253	0.731	0.3418	0.0474	0.99140	0.1115	0.0020	1895	228	1861	119	1824	33		-4.5
F122A-z1	27		752	7	0.01	99.9	99.28	5.480	0.756	0.3404	0.0468	0.99190	0.1168	0.0021	1888	225	1898	118	1907	32		1.1
F122A-z1	28		736	11	0.01	99.94	99.57	5.089	0.653	0.3224	0.0412	0.99080	0.1145	0.0020	1802	201	1834	109	1872	31		4.3
F122A-z1	29		752	11	0.02	99.92	99.44	5.152	0.672	0.3229	0.0420	0.99120	0.1157	0.0020	1804	205	1845	111	1891	31		5.3
F122A-z1	30		757	14	0.02	99.84	98.92	5.523	0.750	0.3387	0.0458	0.99160	0.1183	0.0021	1880	221	1904	117	1930	32		3.0
F122A-z1	31		785	15	0.02	99.8	98.58	5.586	0.817	0.3563	0.0519	0.99240	0.1137	0.0020	1965	247	1914	126	1860	33		-6.5
F122A-z1	32		742	18	0.02	99.82	98.74	4.871	0.587	0.3096	0.0371	0.98870	0.1141	0.0021	1739	183	1797	102	1866	33		7.8
F122A-z1	33		766	22	0.03	99.72	97.97	5.353	0.726	0.3486	0.0470	0.99020	0.1114	0.0021	1928	225	1877	116	1822	34		-6.7
F122A-z1	34		761	26	0.03	99.82	98.74	5.919	0.853	0.3663	0.0526	0.99220	0.1172	0.0021	2012	248	1964	125	1914	32		-6.0
F122A-z1	35		752	27	0.04	99.96	99.72	5.764	0.806	0.3598	0.0502	0.99260	0.1162	0.0020	1981	238	1941	121	1898	31		-5.1
F122A-z1	36		784	35	0.04	99.98	99.87	5.502	0.744	0.3451	0.0465	0.99250	0.1156	0.0019	1911	223	1901	116	1890	30		-1.3
F122A-z1	37		821	34	0.04	99.95	99.62	5.618	0.782	0.3477	0.0482	0.99320	0.1172	0.0019	1924	231	1919	120	1914	29		-0.6
F122A-z1	38		838	43	0.05	99.93	99.53	6.157	0.943	0.3779	0.0577	0.99460	0.1182	0.0019	2066	270	1998	134	1929	28		-8.3
F122A-z1	39		875	44	0.05	99.9	99.28	5.734	0.831	0.3617	0.0523	0.99380	0.1150	0.0018	1990	247	1937	125	1880	29		-6.8
F122A-z1	40		872	54	0.06	99.89	99.2	5.474	0.739	0.3407	0.0459	0.99300	0.1165	0.0019	1890	221	1896	116	1903	29		0.8
F122A-z1	41		924	59	0.06	99.86	98.99	5.998	0.896	0.3705	0.0552	0.99440	0.1174	0.0019	2032	260	1975	130	1917	28		-7.0
F122A-z1	42		929	57	0.06	99.9	99.32	5.940	0.861	0.3711	0.0537	0.99420	0.1161	0.0018	2035	252	1967	126	1897	28		-8.5
F122A-z1	43		913	62	0.07	99.97	99.79	5.873	0.826	0.3615	0.0507	0.99430	0.1178	0.0018	1989	240	1957	122	1924	27		-3.9
F122A-z1	44		922	68	0.07	99.89	99.26	6.169	0.896	0.3747	0.0543	0.99430	0.1194	0.0018	2052	255	2000	127	1947	28		-6.3
F122A-z1	45		893	74	0.08	99.88	99.13	6.118	0.900	0.3768	0.0553	0.99440	0.1177	0.0018	2062	259	1993	128	1922	28		-8.5
F122A-z1	46		859	74	0.09	99.94	99.56	5.695	0.765	0.3514	0.0471	0.99360	0.1175	0.0018	1941	225	1931	116	1919	27		-1.4
F122A-z1	47		833	80	0.1	100	100	4.800	0.485	0.2922	0.0294	0.98890	0.1191	0.0018	1652	147	1785	85	1943	27		16.9
F122A-z1	48		1347	124	0.09	99.97	99.82	82.050	NaN	NaN	11.00	1.00000	0.1300	0.0017	NaN	NaN	4487	2411	2098	23		-1090.0
F122A-z1	49		946	101	0.11	99.93	99.51	5.758	0.754	0.3492	0.0456	0.99370	0.1196	0.0018	1931	218	1940	113	1950	26		1.1
F122A-z1	50		1022	107	0.1	99.96	99.7	5.694	0.777	0.3509	0.0478	0.99440	0.1177	0.0017	1939	228	1930	118	1921	26		-1.1
F122A-z1	51		971	102	0.1	99.97	99.8	6.677	0.963	0.4062	0.0585	0.99490	0.1192	0.0017	2198	268	2070	127	1944	26		-15.4
F122A-z1	52		1036	122	0.12	99.97	99.81	6.867	1.014	0.4143	0.0611	0.99510	0.1202	0.0018	2234	278	2094	131	1959	26		-16.7
F122A-z1	53		1041	116	0.11	99.92	99.43	6.564	0.932	0.3973	0.0563	0.99460	0.1198	0.0018	2156	260	2054	125	1954	26		-12.2
F122A-z1	54		1051	118	0.11	99.92	99.45	6.710	0.959	0.3991	0.0569	0.99490	0.1219	0.0018	2165	262	2074	126	1985	26		-10.7
F122A-z1	55		1053	128	0.12	99.91	99.36	6.560	0.937	0.3996	0.0570	0.99490	0.1191	0.0017	2167	262	2054	126	1942	26		-13.7
F122A-z1	56		1066	137	0.13	99.9	99.29	6.829	0.999	0.4101	0.0599	0.99520	0.1208	0.0017	2215	274	2090	130	1968	26		-14.8
F122A-z1	57		1113	143	0.13	99.9	99.31	7.209	1.094	0.4327	0.0655	0.99560	0.1208	0.0017	2318	295	2138	135	1969	25		-21.1
F122A-z1	58		1111	149	0.13	99.89	99.23	6.633	0.927	0.3958	0.0552	0.99490	0.1216	0.0017	2150	255	2064	123	1979	25		-10.1
F122A-z1	59		1048	140	0.13	99.97	99.83	7.036	0.988	0.4133	0.0579	0.99520	0.1235	0.0017	2230	264	2116	125	2007	24		-13.2
Sample F122A, zircon 2: Type 1A																						
F122A-z2	1		496	9	0.02	16.92	5.737	8.096	3.104	0.2372	0.0371	0.84580	0.2476	0.0655	1372	193	2242	347	3169	420		62.6
F122A-z2	2		544	9	0.02	25.39	8.723	9.732	2.644	0.3035	0.0427	0.80560	0.2326	0.0416	1708	211	2410	250	3070	286		50.3
F122A-z2	3		556	8	0.01	50.78	-5.364	-1.769	1.289	0.3140	0.0414	0.08407	-0.0409	-0.0307	1760	203	NaN	NaN	-1	0		NaN
F122A-z2	4		574	9	0.02	81.03	30.14	3.501	0.678	0.3037	0.0354	0.68880	0.0836	0.0118	1710	175	1528	153	1284	276		-37.8
F122A-z2	**5**	*	**572**	**14**	**0.02**	**91.9**	**60.19**	**4.711**	**0.634**	**0.3096**	**0.0358**	**0.88470**	**0.1104**	**0.0069**	**1739**	**176**	**1769**	**113**	**1805**	**114**		**4.2**
F122A-z2	**6**	*	**611**	**13**	**0.02**	**95.99**	**77.33**	**5.106**	**0.647**	**0.3136**	**0.0373**	**0.94410**	**0.1181**	**0.0049**	**1758**	**183**	**1837**	**108**	**1928**	**75**		**10.1**
F122A-z2	**7**	*	**587**	**11**	**0.02**	**97.01**	**81.57**	**5.121**	**0.666**	**0.3284**	**0.0407**	**0.95480**	**0.1131**	**0.0044**	**1831**	**197**	**1840**	**111**	**1850**	**70**		**1.2**
F122A-z2	**8**	*	**603**	**10**	**0.02**	**97.97**	**86.77**	**4.716**	**0.571**	**0.3043**	**0.0355**	**0.96080**	**0.1124**	**0.0038**	**1713**	**175**	**1770**	**102**	**1839**	**61**		**7.8**
F122A-z2	**9**	*	**620**	**17**	**0.03**	**98.39**	**89.3**	**4.851**	**0.596**	**0.3102**	**0.0370**	**0.96730**	**0.1134**	**0.0035**	**1742**	**182**	**1794**	**103**	**1855**	**56**		**7.0**
F122A-z2	**10**	*	**620**	**17**	**0.03**	**98.51**	**89.95**	**4.716**	**0.559**	**0.3045**	**0.0350**	**0.96620**	**0.1123**	**0.0034**	**1714**	**173**	**1770**	**99**	**1837**	**55**		**7.6**
F122A-z2	**11**	*	**616**	**15**	**0.02**	**98.95**	**92.62**	**4.769**	**0.576**	**0.3124**	**0.0369**	**0.97250**	**0.1107**	**0.0031**	**1752**	**181**	**1779**	**101**	**1811**	**51**		**3.7**
F122A-z2	**12**	*	**620**	**19**	**0.03**	**98.75**	**91.47**	**4.769**	**0.586**	**0.3068**	**0.0368**	**0.97200**	**0.1128**	**0.0033**	**1725**	**181**	**1779**	**103**	**1844**	**52**		**7.4**
F122A-z2	**13**	*	**582**	**20**	**0.03**	**98.93**	**92.39**	**4.695**	**0.567**	**0.3142**	**0.0370**	**0.97140**	**0.1084**	**0.0031**	**1762**	**182**	**1766**	**101**	**1772**	**52**		**0.7**
F122A-z2	**14**	*	**588**	**13**	**0.02**	**99.02**	**93.39**	**4.701**	**0.549**	**0.2947**	**0.0337**	**0.97260**	**0.1157**	**0.0031**	**1665**	**168**	**1768**	**98**	**1891**	**49**		**13.6**
F122A-z2	**15**	*	**580**	**20**	**0.03**	**99.31**	**95.1**	**4.714**	**0.558**	**0.3040**	**0.0354**	**0.97590**	**0.1124**	**0.0029**	**1711**	**175**	**1770**	**99**	**1839**	**47**		**7.9**
F122A-z2	**16**	*	**576**	**20**	**0.04**	**99.57**	**97.05**	**4.813**	**0.556**	**0.2957**	**0.0338**	**0.97910**	**0.1180**	**0.0028**	**1670**	**168**	**1787**	**97**	**1927**	**42**		**15.1**
F122A-z2	**17**	*	**581**	**19**	**0.03**	**99.3**	**95.08**	**5.119**	**0.676**	**0.3276**	**0.0426**	**0.98050**	**0.1133**	**0.0029**	**1827**	**207**	**1839**	**112**	**1854**	**47**		**1.7**
F122A-z2	**18**	*	**574**	**19**	**0.03**	**99.28**	**94.95**	**4.567**	**0.531**	**0.2916**	**0.0333**	**0.97400**	**0.1136**	**0.0030**	**1650**	**166**	**1743**	**97**	**1858**	**48**		**12.7**
F122A-z2	**19**	*	**567**	**26**	**0.05**	**99.45**	**96.13**	**5.161**	**0.691**	**0.3289**	**0.0435**	**0.98180**	**0.1138**	**0.0029**	**1833**	**211**	**1846**	**114**	**1861**	**46**		**1.7**
F122A-z2	**20**	*	**557**	**24**	**0.04**	**99.27**	**95.03**	**5.078**	**0.666**	**0.3175**	**0.0410**	**0.97940**	**0.1160**	**0.0031**	**1777**	**201**	**1833**	**111**	**1896**	**48**		**7.2**
F122A-z2	21		527	23	0.04	99.74	98.24	5.266	0.693	0.3211	0.0419	0.98450	0.1189	0.0028	1795	205	1863	112	1940	41		8.5
F122A-z2	22		507	24	0.05	99.77	98.41	5.019	0.639	0.3145	0.0397	0.98300	0.1158	0.0027	1763	195	1823	108	1892	42		7.8
F122A-z2	23		516	30	0.06	99.61	97.23	5.121	0.675	0.3250	0.0423	0.98190	0.1143	0.0029	1814	206	1840	112	1869	45		3.4

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
	cycle	ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
F122A-z2	24	506	34	0.07	99.38	95.84	4.972	0.627	0.3054	0.0379	0.97750	0.1181	0.0031	1718	187	1815	107	1927	48	12.3
F122A-z2	25	508	38	0.07	99.48	96.39	5.210	0.705	0.3240	0.0433	0.98090	0.1166	0.0031	1809	211	1854	115	1905	47	5.8
F122A-z2	26	480	42	0.09	99.61	97.24	4.441	0.505	0.2825	0.0316	0.97330	0.1140	0.0030	1604	159	1720	94	1865	47	15.8
F122A-z2	27	478	42	0.09	99.48	96.46	5.248	0.706	0.3253	0.0432	0.97970	0.1170	0.0032	1815	210	1860	115	1911	49	5.7
F122A-z2	28	457	45	0.1	99.46	96.37	5.394	0.747	0.3302	0.0451	0.98010	0.1185	0.0033	1839	219	1884	119	1933	49	5.5
F122A-z2	29	447	46	0.1	99.41	95.96	5.049	0.661	0.3135	0.0404	0.97610	0.1168	0.0033	1758	198	1828	111	1908	51	9.0
F122A-z2	30	441	42	0.1	99.48	96.42	5.710	0.846	0.3535	0.0518	0.98160	0.1171	0.0033	1951	247	1933	128	1913	51	-2.3
F122A-z2	31	419	56	0.13	99.21	94.4	4.657	0.596	0.3051	0.0381	0.96860	0.1107	0.0035	1717	188	1760	107	1811	58	5.9
F122A-z2	32	425	49	0.12	99.5	96.42	5.622	0.857	0.3616	0.0545	0.98160	0.1128	0.0033	1990	258	1920	132	1844	53	-9.2
F122A-z2	33	407	51	0.13	99.62	97.35	4.882	0.626	0.3078	0.0389	0.97580	0.1150	0.0032	1730	192	1799	108	1880	51	9.1
F122A-z2	34	381	57	0.15	99.48	96.49	5.112	0.655	0.3124	0.0394	0.97390	0.1187	0.0035	1752	193	1838	109	1937	52	10.9
F122A-z2	35	399	52	0.13	99.74	98.16	5.766	0.903	0.3648	0.0567	0.98500	0.1146	0.0031	2005	268	1941	136	1874	49	-8.1
F122A-z2	36	363	49	0.14	99.61	97.29	5.380	0.735	0.3331	0.0449	0.97780	0.1171	0.0034	1853	217	1882	117	1913	51	3.6
F122A-z2	37	360	48	0.13	99.42	96.16	5.432	0.731	0.3286	0.0435	0.97520	0.1199	0.0036	1832	211	1890	115	1954	53	7.2
F122A-z2	38	401	54	0.13	99.73	98.18	5.798	0.864	0.3493	0.0516	0.98340	0.1204	0.0033	1931	246	1946	129	1962	48	1.8
F122A-z2	39	381	55	0.14	99.91	99.42	5.661	0.779	0.3324	0.0454	0.98260	0.1235	0.0032	1850	220	1925	119	2008	45	9.1
F122A-z2	40	368	54	0.15	99.82	98.8	5.770	0.798	0.3368	0.0462	0.98150	0.1243	0.0033	1871	223	1942	120	2018	47	8.4
F122A-z2	41	372	56	0.15	99.78	98.51	5.495	0.753	0.3359	0.0456	0.98020	0.1186	0.0032	1867	220	1900	118	1936	49	4.1
F122A-z2	42	370	60	0.16	99.45	96.29	5.710	0.815	0.3515	0.0494	0.97740	0.1178	0.0036	1942	236	1933	123	1924	54	-1.0
F122A-z2	43	374	56	0.15	99.64	97.54	5.723	0.826	0.3508	0.0500	0.98030	0.1183	0.0034	1938	239	1935	125	1931	51	-0.4
F122A-z2	44	363	57	0.16	99.45	96.29	5.146	0.677	0.3157	0.0408	0.97330	0.1182	0.0036	1769	200	1844	112	1929	54	9.5
F122A-z2	45	380	57	0.15	99.59	97.18	6.033	0.941	0.3708	0.0573	0.98270	0.1180	0.0034	2033	269	1981	136	1926	52	-6.5
F122A-z2	46	391	63	0.16	99.77	98.57	6.496	1.012	0.3645	0.0564	0.98550	0.1293	0.0034	2004	266	2045	137	2088	47	4.7
F122A-z2	47	369	62	0.17	99.46	96.34	5.891	0.856	0.3627	0.0520	0.97810	0.1178	0.0036	1995	246	1960	126	1923	54	-4.4
F122A-z2	48	371	64	0.17	99.35	95.59	5.443	0.759	0.3356	0.0460	0.97450	0.1176	0.0037	1865	222	1892	120	1920	56	3.2
F122A-z2	49	378	50	0.13	99.68	97.88	6.274	0.998	0.3685	0.0581	0.98470	0.1235	0.0034	2023	274	2015	139	2007	49	-0.9
F122A-z2	50	361	61	0.17	99.6	97.32	6.102	0.948	0.3692	0.0567	0.98260	0.1199	0.0035	2026	267	1990	136	1954	52	-4.3
F122A-z2	51	366	61	0.17	99.78	98.55	6.185	0.925	0.3583	0.0532	0.98430	0.1252	0.0033	1974	252	2002	131	2032	47	3.3
F122A-z2	52	379	62	0.16	99.83	98.81	7.028	1.278	0.4261	0.0771	0.98970	0.1196	0.0031	2288	349	2115	162	1950	47	-20.7
F122A-z2	53	374	62	0.17	99.61	97.35	6.583	1.110	0.3973	0.0664	0.98600	0.1202	0.0034	2156	306	2057	149	1959	50	-11.9
F122A-z2	54	381	65	0.17	99.47	96.37	6.738	1.196	0.4134	0.0727	0.98620	0.1182	0.0035	2230	331	2078	157	1929	53	-18.5
F122A-z2	55	366	55	0.15	99.69	97.91	7.035	1.256	0.4202	0.0745	0.98810	0.1214	0.0033	2261	338	2116	159	1977	49	-17.1
F122A-z2	56	361	68	0.19	99.68	97.82	6.260	1.017	0.3856	0.0621	0.98520	0.1178	0.0033	2102	289	2013	142	1922	50	-11.0
F122A-z2	57	363	63	0.17	99.87	99.11	6.656	1.074	0.3896	0.0625	0.98700	0.1239	0.0032	2121	290	2067	142	2013	46	-6.3
F122A-z2	58	352	70	0.2	99.86	99.11	6.836	1.094	0.3885	0.0618	0.98650	0.1276	0.0033	2116	287	2090	142	2065	46	-2.9
F122A-z2	59	353	61	0.17	99.86	99.09	6.331	0.967	0.3696	0.0560	0.98500	0.1242	0.0033	2027	264	2023	134	2018	47	-0.5
Sample F122A, zircon 3: Type 3																				
F122A-z3	1	477	35	0.07	93.1	57.45	4.553	0.500	0.3983	0.0300	0.72580	0.0829	0.0063	2161	138	1741	91	1267	148	-83.4
F122A-z3	2	440	23	0.05	95.87	73.05	6.228	0.573	0.4677	0.0365	0.84940	0.0966	0.0047	2473	160	2008	81	1559	91	-71.0
F122A-z3	3	440	21	0.05	96.8	79.03	6.574	0.549	0.4621	0.0342	0.87730	0.1032	0.0041	2449	151	2056	74	1682	74	-55.0
F122A-z3	4	465	19	0.04	97.83	85.47	7.521	0.655	0.5051	0.0414	0.92550	0.1080	0.0036	2636	177	2175	78	1766	60	-60.3
F122A-z3	5	460	20	0.04	98.87	92.25	8.065	0.676	0.5206	0.0422	0.94630	0.1124	0.0031	2702	179	2238	76	1838	49	-57.8
F122A-z3	6	469	21	0.04	99.08	93.56	8.411	0.731	0.5433	0.0461	0.95520	0.1123	0.0029	2797	192	2276	79	1837	47	-64.7
F122A-z3	7	465	21	0.05	99.26	94.86	8.275	0.677	0.5262	0.0421	0.95380	0.1140	0.0028	2726	178	2262	74	1865	45	-56.8
F122A-z3	8	450	26	0.06	99.44	96.26	8.366	0.658	0.5045	0.0390	0.95520	0.1203	0.0028	2633	167	2271	71	1960	42	-42.0
F122A-z3	9	442	27	0.06	99.45	96.41	9.374	0.819	0.5519	0.0475	0.96540	0.1232	0.0028	2833	197	2375	80	2003	41	-51.4
F122A-z3	10	443	28	0.06	99.2	94.8	9.169	0.826	0.5493	0.0486	0.96510	0.1210	0.0029	2822	202	2355	82	1972	42	-53.5
F122A-z3	11	432	29	0.07	99.45	96.37	9.445	0.839	0.5664	0.0496	0.96690	0.1209	0.0027	2893	204	2382	82	1970	40	-58.5
F122A-z3	12	455	36	0.08	99.78	98.6	9.390	0.800	0.5377	0.0454	0.96930	0.1267	0.0027	2774	190	2377	78	2052	37	-43.5
F122A-z3	13	436	29	0.07	99.72	98.18	9.193	0.749	0.5344	0.0431	0.96510	0.1248	0.0027	2760	181	2357	75	2025	38	-44.8
F122A-z3	14	463	38	0.08	99.66	97.77	9.735	0.872	0.5689	0.0505	0.97180	0.1241	0.0026	2903	207	2410	83	2016	38	-55.0
F122A-z3	15	453	40	0.09	99.69	98.02	9.269	0.774	0.5295	0.0438	0.96820	0.1270	0.0027	2739	184	2365	77	2056	37	-41.0
F122A-z3	16	453	34	0.07	99.74	98.4	9.898	0.855	0.5503	0.0471	0.97150	0.1305	0.0027	2826	196	2425	80	2104	36	-42.6
F122A-z3	17	490	43	0.09	99.75	98.36	9.673	0.852	0.5537	0.0484	0.97270	0.1267	0.0026	2841	201	2404	81	2053	36	-47.6
F122A-z3	18	483	50	0.1	99.76	98.51	9.669	0.819	0.5420	0.0455	0.97060	0.1294	0.0026	2792	190	2404	78	2090	36	-41.5
F122A-z3	19	460	41	0.09	99.73	98.31	10.760	1.033	0.5961	0.0568	0.97760	0.1309	0.0027	3014	230	2503	89	2111	36	-53.8
F122A-z3	20	455	40	0.09	99.77	98.53	9.932	0.856	0.5594	0.0478	0.97180	0.1288	0.0026	2864	198	2428	80	2081	36	-46.8
F122A-z3	21	471	50	0.11	99.52	97.06	10.680	0.984	0.5904	0.0539	0.97400	0.1312	0.0027	2991	218	2496	86	2114	37	-52.1
F122A-z3	22	447	41	0.09	99.5	96.95	10.040	0.859	0.5521	0.0467	0.96940	0.1319	0.0028	2834	194	2438	79	2123	37	-41.6
F122A-z3	23	449	42	0.09	99.8	98.73	10.270	0.909	0.5670	0.0498	0.97430	0.1314	0.0026	2896	205	2460	82	2116	35	-46.0
F122A-z3	24	438	49	0.11	99.88	99.26	9.939	0.828	0.5468	0.0453	0.97170	0.1318	0.0026	2812	189	2429	77	2122	35	-40.3
F122A-z3	25	437	42	0.1	99.76	98.48	10.330	0.908	0.5739	0.0501	0.97380	0.1305	0.0026	2924	205	2465	81	2105	35	-48.6
F122A-z3	26	465	49	0.11	99.85	99.04	10.840	1.037	0.6034	0.0574	0.97930	0.1303	0.0025	3043	231	2509	89	2101	34	-56.7
F122A-z3	27	467	47	0.1	99.91	99.45	11.030	1.009	0.6020	0.0548	0.97760	0.1329	0.0026	3038	220	2526	85	2137	34	-53.1
F122A-z3	28	478	46	0.1	99.84	99.01	10.750	0.962	0.5877	0.0523	0.97620	0.1326	0.0026	2980	212	2502	83	2133	34	-49.9
F122A-z3	29	460	47	0.1	99.71	98.21	10.170	0.845	0.5600	0.0461	0.97100	0.1318	0.0026	2866	191	2451	77	2122	35	-43.6
Sample F122A, zircon 4: Type 3																				
F122A-z4	1	817	8	0.01	94.14	67.24	3.527	0.361	0.2415	0.0213	0.88230	0.1059	0.0051	1394	111	1533	81	1731	89	21.6
F122A-z4	2	824	4	0.01	96.15	76.52	4.111	0.451	0.2757	0.0280	0.93350	0.1082	0.0043	1570	141	1656	90	1769	72	12.7
F122A-z4	3	799	3	0	97.17	81.48	3.607	0.354	0.2469	0.0224	0.92950	0.1060	0.0038	1422	116	1551	78	1731	66	19.8
F122A-z4	4	681	3	0	98.19	88.32	4.365	0.428	0.2744	0.0257	0.95290	0.1154	0.0034	1563	130	1706	81	1886	54	19.3
F122A-z4	5	556	3	0	98.03	86.63	4.046	0.364	0.2724	0.0228	0.92790	0.1077	0.0036	1553	116	1643	73	1761	61	13.3
F122A-z4	6	537	3	0.01	98.28	88.19	3.914	0.333	0.2614	0.0207	0.92450	0.1086	0.0035	1497	106	1617	69	1776	59	17.6
F122A-z4	7	584	2	0	98.61	90.45	4.038	0.357	0.2651	0.0223	0.94220	0.1105	0.0033	1516	114	1642	72	1807	54	18.1
F122A-z4	8	596	2	0	99.05	93.45	4.254	0.376	0.2708	0.0232	0.95620	0.1139	0.0030	1545	118	1684	73	1863	47	19.2
F122A-z4	9	613	3	0.01	99.25	94.84	4.068	0.348	0.2570	0.0214	0.95850	0.1148	0.0028	1475	110	1648	70	1877	44	24.0
F122A-z4	10	630	3	0	99.34	95.44	3.925	0.325	0.2474	0.0199	0.95880	0.1151	0.0027	1425	103	1619	67	1881	42	27.0
F122A-z4	11	573	2	0	99.25	94.93	4.112	0.332	0.2552	0.0200	0.95320	0.1168	0.0029	1465	102	1657	66	1909	44	26.0
F122A-z4	12	527	2	0	99.2	94.24	3.772	0.297	0.2511	0.0190	0.94160	0.1090	0.0029	1444	98	1587	63	1782	48	21.1
F122A-z4	13	492	1	0	99.25	94.69	4.047	0.335	0.2626	0.0209	0.94560	0.1118	0.0030	1503	107	1644	67	1828	49	19.9

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
					$^{206}Pb^*$	$^{207}Pb^*$	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
	cycle	ppm	ppm	ppm																
F122A-z4	14	385	1	0	99.17	94.13	4.174	0.323	0.2724	0.0200	0.92340	0.1111	0.0033	1553	101	1669	63	1818	54	16.4
F122A-z4	15	335	1	0	99.15	94.09	4.578	0.365	0.2936	0.0222	0.92290	0.1131	0.0035	1660	111	1745	66	1849	56	11.6
F122A-z4	16	336	1	0	99.21	94.68	4.794	0.372	0.2967	0.0220	0.92520	0.1172	0.0035	1675	109	1784	65	1914	53	14.2
F122A-z4	17	465	6	0.01	99.36	95.72	4.740	0.398	0.2905	0.0237	0.95220	0.1183	0.0030	1644	119	1774	70	1931	46	16.8
F122A-z4	18	562	5	0.01	99.7	97.93	4.998	0.424	0.3059	0.0256	0.96650	0.1185	0.0026	1721	126	1819	72	1934	39	12.6
Sample F122A, zircon 6: Type 2B																				
F122A-z6	1	812	28	0.034	94.5	68.03	4.676	0.697	0.3308	0.0400	0.79800	0.1030	0.0092	1842	194	1763	125	1670	166	-11.9
F122A-z6	2	706	11	0.015	96.43	77.12	4.927	0.632	0.3464	0.0386	0.82860	0.1030	0.0074	1917	185	1807	108	1682	133	-16.2
F122A-z6	3	778	15	0.019	97.53	83.92	5.167	0.662	0.3428	0.0406	0.88920	0.1090	0.0064	1900	195	1847	109	1788	107	-7.2
F122A-z6	4	717	6	0.008	98.37	88.88	5.304	0.664	0.3507	0.0417	0.90910	0.1100	0.0058	1938	199	1870	107	1794	95	-9.3
F122A-z6	5	838	10	0.011	98.2	87.19	5.214	0.703	0.3652	0.0468	0.92190	0.1040	0.0054	2007	221	1855	115	1688	97	-22.0
F122A-z6	6	706	13	0.018	99.11	93.72	5.907	0.746	0.3851	0.0473	0.93320	0.1110	0.0051	2100	220	1962	110	1820	83	-18.0
F122A-z6	7	635	4	0.006	98.88	92.12	6.057	0.815	0.4016	0.0525	0.94000	0.1090	0.0050	2176	242	1984	117	1789	84	-25.6
F122A-z6	8	571	12	0.020	99.16	93.97	6.248	0.824	0.4139	0.0534	0.94290	0.1090	0.0048	2233	243	2011	115	1791	81	-29.2
F122A-z6	9	530	1	0.002	99.13	94	5.911	0.694	0.3766	0.0431	0.92990	0.1140	0.0050	2060	202	1963	102	1862	79	-12.4
F122A-z6	10	562	6	0.011	98.7	90.68	6.033	0.828	0.4123	0.0550	0.94570	0.1060	0.0048	2226	251	1981	120	1734	82	-33.6
F122A-z6	11	558	2	0.003	98.76	91.28	5.389	0.657	0.3602	0.0425	0.93680	0.1090	0.0046	1983	201	1883	104	1775	78	-13.6
F122A-z6	12	592	4	0.006	99.02	92.94	5.624	0.703	0.3778	0.0461	0.94850	0.1080	0.0043	2066	216	1920	108	1766	73	-19.8
F122A-z6	13	654	8	0.012	99.07	93.4	6.287	0.806	0.4134	0.0521	0.95610	0.1100	0.0042	2230	237	2017	112	1804	69	-28.0
F122A-z6	14	621	4	0.007	98.82	91.42	5.902	0.708	0.4045	0.0473	0.94620	0.1060	0.0041	2190	217	1962	104	1729	72	-31.5
F122A-z6	15	571	3	0.005	98.87	92.1	6.345	0.754	0.4163	0.0484	0.94950	0.1110	0.0041	2244	220	2025	104	1808	68	-28.6
F122A-z6	16	572	4	0.007	99.34	95.4	7.207	0.916	0.4581	0.0576	0.96420	0.1140	0.0039	2431	255	2137	113	1866	61	-36.4
F122A-z6	17	575	5	0.008	99.3	94.92	6.712	0.782	0.4448	0.0511	0.95780	0.1090	0.0037	2372	228	2074	103	1790	61	-39.0
F122A-z6	18	550	4	0.007	98.86	92.25	6.591	0.692	0.4218	0.0433	0.94370	0.1130	0.0040	2269	196	2058	93	1854	63	-26.5
F122A-z6	19	615	2	0.004	98.66	90.55	6.714	0.782	0.4518	0.0516	0.95600	0.1080	0.0037	2403	229	2074	103	1762	63	-43.7
F122A-z6	20	619	1	0.002	98.91	92.52	7.417	0.890	0.4765	0.0564	0.96400	0.1130	0.0036	2512	246	2163	107	1846	58	-43.7
F122A-z6	21	609	8	0.013	99.03	92.93	7.312	0.851	0.4960	0.0569	0.96210	0.1070	0.0034	2597	245	2150	104	1747	58	-59.4
F122A-z6	22	583	2	0.004	99.12	93.77	7.100	0.760	0.4647	0.0491	0.95820	0.1110	0.0034	2460	216	2124	95	1813	56	-43.1
F122A-z6	23	566	5	0.009	99.15	93.82	7.370	0.817	0.4929	0.0540	0.96170	0.1080	0.0033	2583	233	2157	99	1773	56	-55.7
F122A-z6	24	616	4	0.007	99.37	95.38	7.514	0.827	0.5012	0.0546	0.96500	0.1090	0.0032	2619	235	2175	99	1778	53	-57.8
F122A-z6	25	613	3	0.004	99.4	95.66	7.584	0.845	0.4955	0.0547	0.96780	0.1110	0.0031	2594	236	2183	100	1816	51	-52.3
F122A-z6	26	531	3	0.006	99.52	96.58	7.728	0.784	0.4944	0.0497	0.96050	0.1130	0.0032	2590	214	2200	91	1854	51	-48.4
F122A-z6	27	537	3	0.006	99.58	97.04	7.869	0.832	0.4985	0.0523	0.96580	0.1140	0.0032	2608	225	2216	95	1872	50	-47.9
F122A-z6	28	535	3	0.006	99.42	95.86	7.252	0.699	0.4690	0.0447	0.95740	0.1120	0.0031	2479	196	2143	86	1834	51	-42.5
F122A-z6	29	550	6	0.011	99.41	95.8	7.763	0.793	0.4995	0.0505	0.96210	0.1130	0.0032	2612	217	2204	92	1844	51	-50.8
F122A-z6	30	554	5	0.009	99.24	94.59	7.051	0.636	0.4609	0.0409	0.94720	0.1110	0.0032	2443	181	2118	80	1815	53	-41.7
F122A-z6	31	574	3	0.006	99.22	94.39	7.513	0.733	0.4973	0.0479	0.95500	0.1100	0.0032	2602	206	2175	88	1792	53	-55.2
F122A-z6	32	520	8	0.015	99.28	94.9	7.428	0.702	0.4799	0.0448	0.95210	0.1120	0.0033	2527	195	2164	85	1836	53	-45.7
F122A-z6	33	467	4	0.008	99.15	94.09	8.102	0.798	0.5192	0.0505	0.95260	0.1130	0.0034	2696	214	2242	89	1851	55	-56.1
F122A-z6	34	556	2	0.004	99.4	95.87	7.572	0.742	0.4723	0.0459	0.96000	0.1160	0.0032	2494	201	2182	88	1900	50	-37.8
F122A-z6	35	520	6	0.011	99.4	95.74	7.245	0.661	0.4651	0.0419	0.95370	0.1130	0.0031	2462	185	2142	81	1848	50	-40.1
F122A-z6	36	543	2	0.003	99.55	96.82	7.948	0.787	0.5030	0.0494	0.96360	0.1150	0.0031	2627	212	2225	89	1874	48	-49.1
F122A-z6	37	516	6	0.012	99.67	97.63	7.355	0.667	0.4670	0.0420	0.95660	0.1140	0.0030	2470	185	2155	81	1868	48	-38.9
F122A-z6	38	506	0	0.001	99.61	97.23	7.450	0.669	0.4712	0.0420	0.95440	0.1150	0.0031	2489	184	2167	80	1875	49	-39.6
F122A-z6	39	497	4	0.008	99.61	97.31	7.671	0.703	0.4805	0.0437	0.95610	0.1160	0.0031	2529	190	2193	82	1892	49	-40.9
F122A-z6	40	517	5	0.010	99.63	97.27	7.851	0.779	0.5156	0.0508	0.96390	0.1100	0.0029	2680	216	2214	89	1807	48	-59.3
F122A-z6	41	494	2	0.005	99.57	96.92	7.716	0.735	0.5000	0.0473	0.96060	0.1120	0.0030	2614	203	2199	86	1831	48	-52.2
F122A-z6	42	505	4	0.007	99.69	97.79	7.434	0.672	0.4744	0.0426	0.95780	0.1140	0.0030	2503	186	2165	81	1858	47	-42.1
F122A-z6	43	491	4	0.008	99.65	97.5	7.352	0.641	0.4754	0.0411	0.95370	0.1120	0.0030	2507	180	2155	78	1835	48	-44.3
F122A-z6	44	538	3	0.006	99.75	98.17	7.624	0.703	0.4868	0.0446	0.96160	0.1140	0.0029	2557	193	2188	83	1858	46	-45.7
F122A-z6	45	512	6	0.011	99.67	97.62	7.708	0.704	0.4902	0.0444	0.95980	0.1140	0.0029	2571	192	2197	82	1865	47	-46.1
F122A-z6	46	502	3	0.005	99.57	96.89	7.308	0.671	0.4816	0.0439	0.96090	0.1100	0.0028	2534	191	2150	82	1800	47	-49.5
F122A-z6	47	506	1	0.002	99.67	97.65	7.787	0.748	0.4973	0.0475	0.96580	0.1140	0.0028	2602	204	2207	86	1857	45	-49.0
F122A-z6	48	471	4	0.008	99.62	97.28	7.714	0.679	0.4948	0.0432	0.95690	0.1130	0.0029	2591	186	2198	79	1849	47	-49.0
F122A-z6	49	501	4	0.008	99.7	97.88	7.896	0.736	0.5024	0.0465	0.96420	0.1140	0.0028	2624	200	2219	84	1864	45	-49.8
F122A-z6	50	494	3	0.006	99.7	97.86	7.314	0.644	0.4716	0.0412	0.95970	0.1120	0.0028	2491	181	2151	79	1840	45	-42.8
F122A-z6	51	529	3	0.005	99.7	97.85	8.042	0.784	0.5097	0.0495	0.96880	0.1140	0.0028	2655	211	2236	88	1871	44	-51.4
F122A-z6	52	531	4	0.008	99.62	97.27	7.562	0.698	0.4902	0.0449	0.96390	0.1120	0.0028	2571	194	2180	83	1830	45	-49.3
F122A-z6	53	504	3	0.006	99.57	96.92	7.395	0.654	0.4769	0.0418	0.95950	0.1120	0.0028	2514	183	2160	79	1840	45	-44.3
F122A-z6	54	474	1	0.003	99.69	97.77	7.609	0.671	0.4857	0.0426	0.95950	0.1140	0.0028	2552	185	2186	79	1858	45	-45.4
F122A-z6	55	530	7	0.013	99.66	97.57	7.955	0.800	0.5032	0.0503	0.97150	0.1150	0.0027	2628	216	2226	91	1874	43	-49.2
F122A-z6	56	497	1	0.002	99.74	98.12	7.940	0.755	0.5069	0.0479	0.96720	0.1140	0.0028	2644	205	2224	86	1858	44	-51.7
F122A-z6	57	494	3	0.006	99.79	98.49	7.952	0.772	0.5126	0.0495	0.96940	0.1130	0.0027	2668	211	2226	88	1841	43	-55.0
F122A-z6	58	450	3	0.007	99.66	97.57	7.435	0.654	0.4816	0.0421	0.96010	0.1120	0.0028	2534	183	2165	79	1831	45	-46.7
F122A-z6	59	496	4	0.007	99.73	98.06	7.564	0.707	0.4844	0.0451	0.96710	0.1130	0.0027	2546	196	2181	84	1852	43	-45.6
Sample F122A, zircon 7: Type 1B																				
F122A-z7	1	928	15	0.016	94.49	67.39	4.689	1.080	0.3405	0.0780	0.99230	0.0999	0.0029	1889	375	1765	193	1622	53	-19.0
F122A-z7	2	882	8	0.009	96.42	77.11	4.862	1.090	0.3401	0.0756	0.99480	0.1040	0.0024	1887	364	1796	188	1691	42	-13.4
F122A-z7	3	895	7	0.008	97.3	81.83	5.339	1.300	0.3743	0.0911	0.99660	0.1030	0.0021	2050	427	1875	209	1687	37	-25.1
F122A-z7	4	934	5	0.006	97.78	84.78	5.384	1.360	0.3723	0.0937	0.99740	0.1050	0.0019	2040	440	1882	216	1712	34	-22.4
F122A-z7	5	884	6	0.007	98.47	89.36	5.349	1.240	0.3599	0.0832	0.99750	0.1080	0.0018	1982	394	1877	198	1763	30	-14.4
F122A-z7	6	853	7	0.008	98.42	88.99	5.933	1.540	0.4014	0.1040	0.99790	0.1070	0.0018	2176	479	1966	226	1752	31	-28.6
F122A-z7	7	753	4	0.005	98.41	88.79	5.583	1.300	0.3814	0.0884	0.99710	0.1060	0.0019	2083	413	1914	200	1734	32	-23.6
F122A-z7	8	718	6	0.008	98.62	90.24	5.823	1.390	0.3943	0.0937	0.99740	0.1070	0.0018	2143	433	1950	206	1751	32	-26.3
F122A-z7	9	756	6	0.008	98.52	89.58	5.820	1.450	0.3935	0.0977	0.99750	0.1070	0.0019	2139	452	1949	216	1754	32	-25.8
F122A-z7	10	720	4	0.005	98.83	91.78	5.688	1.300	0.3772	0.0860	0.99740	0.1090	0.0018	2063	402	1930	197	1789	30	-17.9
F122A-z7	11	719	5	0.007	98.71	90.8	5.909	1.450	0.4018	0.0987	0.99760	0.1070	0.0018	2177	454	1963	214	1743	31	-29.4
F122A-z7	12	690	4	0.006	98.87	91.94	5.709	1.300	0.3849	0.0874	0.99740	0.1080	0.0018	2099	407	1933	197	1759	30	-22.7
F122A-z7	13	753	3	0.004	98.98	92.6	5.726	1.380	0.3889	0.0939	0.99790	0.1070	0.0017	2118	436	1935	209	1745	29	-25.1
F122A-z7	14	834	5	0.006	98.96	92.57	5.998	1.510	0.3999	0.1000	0.99820	0.1090	0.0016	2169	462	1976	219	1779	28	-25.8

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
								$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$			
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.		
F122A-z7	15		842	6	0.007	99.2	94.29	5.473	1.220	0.3591	0.0797	0.99790	0.1110	0.0016	1978	378	1896	191	1808	26		-10.9
F122A-z7	16		825	5	0.006	99.13	93.73	6.059	1.510	0.4057	0.1010	0.99830	0.1080	0.0016	2195	463	1984	217	1771	26		-28.3
F122A-z7	17		837	5	0.006	99.37	95.41	5.894	1.390	0.3919	0.0926	0.99830	0.1090	0.0015	2131	429	1960	205	1784	25		-22.9
F122A-z7	18		888	3	0.004	99.5	96.4	5.719	1.300	0.3729	0.0847	0.99840	0.1110	0.0014	2043	398	1934	197	1820	24		-14.3
F122A-z7	19		907	7	0.008	99.49	96.31	6.032	1.470	0.3933	0.0956	0.99860	0.1110	0.0014	2138	442	1980	212	1820	23		-20.5
F122A-z7	20		930	4	0.005	99.6	97.09	6.221	1.550	0.4041	0.1010	0.99880	0.1120	0.0014	2188	462	2007	218	1827	22		-23.3
F122A-z7	21		928	3	0.004	99.53	96.56	5.590	1.240	0.3658	0.0811	0.99840	0.1110	0.0014	2010	383	1914	191	1813	23		-12.6
F122A-z7	22		928	6	0.006	99.41	95.75	5.988	1.460	0.3931	0.0958	0.99860	0.1100	0.0014	2137	443	1974	212	1807	23		-21.5
F122A-z7	23		977	6	0.006	99.46	96.11	6.157	1.540	0.4003	0.1000	0.99870	0.1120	0.0014	2171	462	1998	219	1825	23		-22.3
F122A-z7	24		981	7	0.007	99.62	97.23	5.842	1.360	0.3805	0.0882	0.99860	0.1110	0.0014	2079	412	1953	201	1822	22		-16.5
F122A-z7	25		977	7	0.007	99.55	96.72	5.786	1.340	0.3790	0.0876	0.99860	0.1110	0.0014	2072	409	1944	200	1811	23		-16.9
F122A-z7	26		962	6	0.006	99.62	97.21	5.994	1.470	0.3923	0.0961	0.99880	0.1110	0.0013	2133	445	1975	213	1813	22		-20.8
F122A-z7	27		953	4	0.004	99.49	96.29	6.040	1.480	0.3951	0.0966	0.99870	0.1110	0.0014	2147	446	1982	213	1814	23		-21.6
F122A-z7	**28**	*	**930**	**7**	**0.007**	**99.39**	**95.6**	**5.594**	**1.240**	**0.3646**	**0.0810**	**0.99830**	**0.1110**	**0.0014**	**2004**	**383**	**1915**	**192**	**1821**	**23**		**-11.7**
F122A-z7	**29**	*	**926**	**5**	**0.005**	**99.49**	**96.38**	**5.775**	**1.340**	**0.3723**	**0.0863**	**0.99850**	**0.1130**	**0.0014**	**2040**	**405**	**1943**	**201**	**1840**	**23**		**-12.7**
F122A-z7	**30**	*	**897**	**6**	**0.007**	**99.38**	**95.54**	**5.264**	**1.100**	**0.3448**	**0.0720**	**0.99810**	**0.1110**	**0.0014**	**1910**	**345**	**1863**	**178**	**1811**	**24**		**-6.3**
F122A-z7	**31**	*	**917**	**7**	**0.007**	**99.42**	**95.89**	**5.766**	**1.330**	**0.3731**	**0.0860**	**0.99850**	**0.1120**	**0.0014**	**2044**	**404**	**1941**	**200**	**1834**	**23**		**-13.3**
F122A-z7	**32**	*	**901**	**6**	**0.007**	**99.49**	**96.38**	**5.652**	**1.270**	**0.3654**	**0.0821**	**0.99840**	**0.1120**	**0.0014**	**2008**	**388**	**1924**	**194**	**1835**	**23**		**-11.0**
F122A-z7	**33**	*	**856**	**5**	**0.006**	**99.44**	**96.04**	**5.275**	**1.080**	**0.3396**	**0.0694**	**0.99800**	**0.1130**	**0.0014**	**1885**	**334**	**1865**	**174**	**1843**	**23**		**-2.6**
F122A-z7	**34**	*	**867**	**5**	**0.006**	**99.24**	**94.65**	**5.665**	**1.280**	**0.3676**	**0.0829**	**0.99820**	**0.1120**	**0.0015**	**2018**	**391**	**1926**	**195**	**1828**	**24**		**-12.1**
F122A-z7	**35**	*	**877**	**6**	**0.007**	**99.22**	**94.5**	**5.511**	**1.190**	**0.3585**	**0.0774**	**0.99800**	**0.1120**	**0.0015**	**1975**	**367**	**1902**	**186**	**1824**	**25**		**-9.6**
F122A-z7	**36**	*	**850**	**7**	**0.008**	**99.08**	**93.61**	**5.198**	**1.050**	**0.3357**	**0.0674**	**0.99760**	**0.1120**	**0.0016**	**1866**	**325**	**1852**	**171**	**1837**	**25**		**-1.8**
F122A-z7	**37**	*	**824**	**7**	**0.008**	**99.08**	**93.63**	**5.355**	**1.110**	**0.3445**	**0.0712**	**0.99770**	**0.1130**	**0.0016**	**1908**	**342**	**1878**	**177**	**1844**	**26**		**-4.0**
F122A-z7	**38**	*	**816**	**7**	**0.009**	**99.13**	**93.92**	**5.508**	**1.180**	**0.3541**	**0.0758**	**0.99780**	**0.1130**	**0.0016**	**1954**	**361**	**1902**	**184**	**1845**	**26**		**-6.9**
F122A-z7	**39**	*	**795**	**6**	**0.007**	**99.1**	**93.72**	**5.599**	**1.210**	**0.3603**	**0.0774**	**0.99780**	**0.1130**	**0.0016**	**1983**	**367**	**1916**	**185**	**1844**	**26**		**-8.8**
F122A-z7	**40**	*	**792**	**7**	**0.009**	**98.89**	**92.29**	**5.279**	**1.080**	**0.3424**	**0.0701**	**0.99730**	**0.1120**	**0.0017**	**1898**	**337**	**1866**	**175**	**1829**	**27**		**-4.4**
F122A-z7	**41**	*	**769**	**5**	**0.006**	**99.07**	**93.47**	**5.207**	**1.040**	**0.3398**	**0.0676**	**0.99730**	**0.1110**	**0.0016**	**1886**	**325**	**1854**	**170**	**1818**	**27**		**-4.3**
F122A-z7	**42**	*	**780**	**7**	**0.009**	**99.17**	**94.19**	**5.063**	**0.970**	**0.3264**	**0.0624**	**0.99720**	**0.1130**	**0.0016**	**1821**	**303**	**1830**	**162**	**1840**	**26**		**1.2**
F122A-z7	**43**	*	**786**	**7**	**0.009**	**98.97**	**92.85**	**5.318**	**1.100**	**0.3436**	**0.0710**	**0.99740**	**0.1120**	**0.0017**	**1904**	**341**	**1872**	**177**	**1836**	**27**		**-4.3**
F122A-z7	**44**	*	**747**	**7**	**0.010**	**98.8**	**91.76**	**5.165**	**1.010**	**0.3353**	**0.0656**	**0.99690**	**0.1120**	**0.0017**	**1864**	**317**	**1847**	**167**	**1827**	**28**		**-2.4**
F122A-z7	**45**	*	**761**	**7**	**0.009**	**98.82**	**91.91**	**5.044**	**0.972**	**0.3267**	**0.0628**	**0.99680**	**0.1120**	**0.0017**	**1822**	**305**	**1827**	**163**	**1832**	**28**		**0.6**
F122A-z7	**46**	*	**761**	**6**	**0.008**	**98.96**	**92.8**	**5.092**	**0.993**	**0.3284**	**0.0639**	**0.99700**	**0.1120**	**0.0017**	**1831**	**310**	**1835**	**166**	**1839**	**27**		**0.5**
F122A-z7	**47**	*	**742**	**7**	**0.010**	**98.89**	**92.37**	**5.194**	**1.030**	**0.3356**	**0.0667**	**0.99710**	**0.1120**	**0.0017**	**1865**	**322**	**1852**	**169**	**1836**	**28**		**-1.9**
F122A-z7	**48**	*	**731**	**8**	**0.011**	**98.93**	**92.58**	**4.931**	**0.921**	**0.3188**	**0.0594**	**0.99670**	**0.1120**	**0.0017**	**1784**	**290**	**1808**	**158**	**1835**	**28**		**3.2**
F122A-z7	**49**	*	**735**	**7**	**0.010**	**98.69**	**90.97**	**4.890**	**0.912**	**0.3202**	**0.0596**	**0.99640**	**0.1110**	**0.0018**	**1790**	**291**	**1801**	**157**	**1812**	**29**		**1.3**
F122A-z7	**50**	*	**725**	**6**	**0.009**	**98.69**	**91.03**	**4.841**	**0.892**	**0.3156**	**0.0580**	**0.99630**	**0.1110**	**0.0018**	**1768**	**284**	**1792**	**155**	**1820**	**29**		**3.3**
F122A-z7	**51**	*	**706**	**6**	**0.008**	**98.77**	**91.64**	**4.809**	**0.869**	**0.3079**	**0.0555**	**0.99630**	**0.1130**	**0.0018**	**1730**	**273**	**1786**	**152**	**1853**	**28**		**7.6**
F122A-z7	**52**	*	**721**	**6**	**0.009**	**98.5**	**89.71**	**4.899**	**0.932**	**0.3236**	**0.0614**	**0.99620**	**0.1100**	**0.0018**	**1807**	**299**	**1802**	**160**	**1796**	**30**		**-0.7**
F122A-z7	**53**	*	**695**	**7**	**0.010**	**98.78**	**91.77**	**4.670**	**0.791**	**0.2958**	**0.0499**	**0.99580**	**0.1140**	**0.0018**	**1671**	**248**	**1762**	**142**	**1872**	**28**		**12.2**
F122A-z7	**54**	*	**709**	**5**	**0.007**	**98.83**	**92**	**4.642**	**0.800**	**0.2977**	**0.0512**	**0.99590**	**0.1130**	**0.0018**	**1680**	**254**	**1757**	**144**	**1850**	**28**		**10.5**
F122A-z7	**55**	*	**704**	**6**	**0.009**	**98.77**	**91.71**	**4.707**	**0.819**	**0.2994**	**0.0520**	**0.99600**	**0.1140**	**0.0018**	**1688**	**258**	**1768**	**146**	**1865**	**28**		**10.8**
F122A-z7	**56**	*	**704**	**7**	**0.009**	**98.7**	**91.13**	**4.643**	**0.813**	**0.3000**	**0.0524**	**0.99590**	**0.1120**	**0.0018**	**1691**	**260**	**1757**	**146**	**1836**	**29**		**8.9**
F122A-z7	**57**	*	**715**	**7**	**0.009**	**98.75**	**91.57**	**4.657**	**0.806**	**0.2964**	**0.0511**	**0.99590**	**0.1140**	**0.0018**	**1673**	**254**	**1760**	**145**	**1864**	**28**		**11.6**
F122A-z7	**58**	*	**687**	**6**	**0.008**	**98.65**	**90.89**	**4.525**	**0.759**	**0.2908**	**0.0486**	**0.99540**	**0.1130**	**0.0018**	**1645**	**243**	**1736**	**140**	**1846**	**29**		**12.3**
F122A-z7	**59**	*	**672**	**9**	**0.013**	**98.82**	**92.01**	**4.674**	**0.802**	**0.2986**	**0.0511**	**0.99590**	**0.1140**	**0.0018**	**1684**	**254**	**1763**	**144**	**1857**	**28**		**10.6**
Sample F122A, zircon 8: Type 2A																						
F122A-z8	1		784	1266	1.616	93.7	65.67	8.260	1.390	0.5625	0.0940	0.99080	0.1060	0.0024	2877	388	2260	153	1740	42		-81.6
F122A-z8	2		680	1195	1.758	95.01	71.86	8.981	1.340	0.5866	0.0867	0.99100	0.1110	0.0022	2975	352	2336	136	1817	36		-80.1
F122A-z8	3		656	1308	1.994	94.81	70.99	9.635	1.490	0.6300	0.0969	0.99150	0.1110	0.0022	3150	383	2401	142	1815	37		-93.7
F122A-z8	4		641	1479	2.307	94.45	69.82	10.070	1.610	0.6486	0.1030	0.99190	0.1130	0.0023	3223	403	2441	148	1841	37		-96.3
F122A-z8	5		667	1599	2.395	94.72	71.92	10.280	1.650	0.6304	0.1000	0.99270	0.1180	0.0023	3151	396	2460	148	1930	35		-80.6
F122A-z8	6		701	1593	2.272	94.59	70.3	9.867	1.620	0.6380	0.1040	0.99260	0.1120	0.0022	3181	410	2422	152	1835	36		-93.7
F122A-z8	7		713	1658	2.325	94.74	71.43	9.693	1.520	0.6117	0.0954	0.99260	0.1150	0.0022	3077	382	2406	144	1879	34		-80.7
F122A-z8	8		745	1662	2.231	94.77	71.65	10.160	1.700	0.6379	0.1060	0.99380	0.1160	0.0021	3181	418	2450	155	1889	33		-87.2
F122A-z8	9		758	1732	2.285	95.03	72.76	9.892	1.580	0.6202	0.0985	0.99360	0.1160	0.0021	3111	392	2425	147	1890	32		-82.1
F122A-z8	10		769	1824	2.372	94.72	71.12	9.797	1.540	0.6253	0.0978	0.99310	0.1140	0.0021	3131	388	2416	145	1858	33		-87.2
F122A-z8	11		746	1809	2.426	94.87	71.69	9.712	1.480	0.6211	0.0940	0.99290	0.1130	0.0021	3114	374	2408	140	1855	33		-86.2
F122A-z8	12		768	1894	2.467	94.8	71.7	10.210	1.600	0.6429	0.1000	0.99340	0.1150	0.0021	3200	394	2454	145	1883	32		-89.5
F122A-z8	13		748	1936	2.590	95.11	72.99	10.310	1.550	0.6494	0.0970	0.99300	0.1150	0.0020	3226	379	2463	139	1882	32		-91.6
F122A-z8	14		725	1887	2.601	95.39	74.48	10.760	1.640	0.6680	0.1020	0.99360	0.1170	0.0020	3298	393	2503	142	1909	31		-93.7
F122A-z8	15		688	1847	2.684	95.34	74.13	10.950	1.660	0.6844	0.1030	0.99330	0.1160	0.0020	3361	395	2519	141	1897	31		-99.9
F122A-z8	16		672	1874	2.787	95.15	73.4	10.490	1.460	0.6532	0.0905	0.99180	0.1160	0.0021	3241	353	2479	129	1902	32		-90.4
F122A-z8	17		664	1884	2.838	95.38	74.71	11.090	1.580	0.6790	0.0963	0.99240	0.1180	0.0021	3340	370	2530	133	1932	31		-94.4
F122A-z8	18		664	1908	2.873	94.97	72.16	10.840	1.570	0.6913	0.0997	0.99190	0.1140	0.0021	3387	380	2509	135	1859	33		-106.9
F122A-z8	19		672	2000	2.975	94.58	70.56	10.550	1.460	0.6730	0.0923	0.99070	0.1140	0.0021	3317	356	2485	128	1860	34		-101.1
F122A-z8	20		625	1979	3.166	94.96	72.86	10.790	1.370	0.6626	0.0837	0.98990	0.1180	0.0021	3277	325	2505	118	1928	32		-90.0
F122A-z8	21		636	1985	3.120	95.25	74.24	11.620	1.620	0.7086	0.0981	0.99200	0.1190	0.0021	3453	370	2574	130	1941	32		-101.6
F122A-z8	22		627	2147	3.424	94.86	71.96	10.340	1.260	0.6511	0.0789	0.98840	0.1150	0.0021	3233	308	2465	113	1882	34		-92.1
F122A-z8	23		634	2196	3.465	94.92	72.44	11.140	1.460	0.6933	0.0900	0.99020	0.1170	0.0021	3395	342	2535	122	1904	33		-101.7
F122A-z8	24		603	2087	3.462	95.02	72.31	10.620	1.310	0.6792	0.0829	0.98870	0.1130	0.0021	3341	318	2491	114	1855	33		-103.7
F122A-z8	25		597	2219	3.717	95.41	74.81	11.410	1.420	0.6996	0.0865	0.98990	0.1180	0.0021	3419	328	2557	116	1930	32		-100.5
F122A-z8	26		587	2242	3.819	95.49	75.03	11.500	1.420	0.7097	0.0868	0.98980	0.1170	0.0021	3457	327	2564	115	1918	32		-104.9
F122A-z8	27		573	2297	4.008	95.02	72.63	10.710	1.210	0.6747	0.0757	0.98690	0.1150	0.0021	3324	291	2498	105	1882	33		-99.0
F122A-z8	28		591	2282	3.864	95.22	73.35	11.420	1.390	0.7239	0.0874	0.98900	0.1140	0.0021	3511	327	2558	114	1871	33		-114.9
F122A-z8	29		587	2400	4.086	95	72.88	11.270	1.280	0.6976	0.0784	0.98740	0.1170	0.0021	3411	298	2546	106	1913	32		-102.0
F122A-z8	30		606	2541	4.195	95.21	73.86	11.670	1.320	0.7195	0.0808	0.98790	0.1180	0.0021	3494	303	2578	106	1920	32		-107.5
F122A-z8	31		596	2491	4.181	95.2	73.54	11.580	1.290	0.7230	0.0798	0.98740	0.1160	0.0021	3507	299	2571	104	1897	32		-111.4
F122A-z8	32		604	2524	4.182	95.27	73.8	11.490	1.280	0.7193	0.0797	0.98760	0.1160	0.0020	3493	299	2564	104	1894	32		-110.5
F122A-z8	33		597	2581	4.326	95.09	72.91	11.470	1.250	0.7232	0.0783	0.98660	0.1150	0.0021	3508	293	2562	102	1880	32		-113.6
F122A-z8	34		590	2497	4.235	95.03	72.87	11.690	1.290	0.7283	0.0794	0.98700	0.1160	0.0021	3527	296	2580	103	1902	32		-112.2
F122A-z8	35		582	2478	4.257	95.31	74.02	11.600	1.240	0.7251	0.0771	0.98690	0.1160	0.0020	3515	288	2572	100	1895	31		-112.3

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
								$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$			
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.		
F122A-z8	36		596	2610	4.376	95.49	75.03	11.350	1.130	0.6999	0.0692	0.98540	0.1180	0.0020	3420	263	2553	93	1921	31		-101.5
F122A-z8	37		612	2633	4.305	95.62	75.44	11.520	1.190	0.7177	0.0734	0.98650	0.1160	0.0020	3487	275	2566	96	1902	30		-109.1
F122A-z8	38		604	2635	4.365	95.84	76.77	11.860	1.220	0.7251	0.0739	0.98700	0.1190	0.0020	3515	276	2594	96	1936	30		-107.0
F122A-z8	39		620	2590	4.180	95.79	76.45	12.040	1.300	0.7392	0.0790	0.98840	0.1180	0.0019	3567	293	2608	101	1928	29		-112.1
F122A-z8	40		608	2600	4.275	95.74	76.08	11.360	1.140	0.7032	0.0698	0.98630	0.1170	0.0019	3433	264	2553	93	1914	30		-103.4
F122A-z8	41		592	2536	4.282	95.57	75.06	11.000	1.070	0.6911	0.0668	0.98500	0.1150	0.0019	3387	255	2523	91	1887	30		-103.2
F122A-z8	42		598	2542	4.250	95.83	76.2	11.330	1.130	0.7115	0.0704	0.98610	0.1150	0.0019	3464	265	2551	93	1887	30		-109.3
F122A-z8	43		615	2437	3.965	95.74	76.02	11.660	1.210	0.7238	0.0749	0.98740	0.1170	0.0019	3510	280	2577	98	1908	30		-110.2
F122A-z8	44		587	2373	4.040	96.12	77.89	11.220	1.080	0.6910	0.0662	0.98570	0.1180	0.0019	3386	252	2542	90	1923	29		-98.8
F122A-z8	45		592	2255	3.807	96.21	78.14	11.510	1.180	0.7150	0.0727	0.98750	0.1170	0.0019	3477	273	2565	96	1907	29		-107.7
F122A-z8	46		592	2227	3.761	95.98	76.7	10.930	1.110	0.6942	0.0698	0.98660	0.1140	0.0019	3399	265	2517	94	1866	30		-106.9
F122A-z8	47		594	2209	3.719	96.06	77.05	10.850	1.100	0.6890	0.0690	0.98660	0.1140	0.0019	3379	263	2510	94	1868	30		-104.9
F122A-z8	48		568	2065	3.636	95.69	75.45	10.450	1.030	0.6612	0.0644	0.98500	0.1150	0.0019	3272	250	2476	91	1875	31		-95.8
F122A-z8	49		573	2009	3.508	94.46	69.76	10.350	1.120	0.6702	0.0714	0.98520	0.1120	0.0021	3307	276	2467	100	1833	34		-103.7
F122A-z8	50		559	1915	3.424	93.4	67.24	10.690	1.140	0.6451	0.0679	0.98360	0.1200	0.0023	3209	266	2496	99	1959	34		-81.7
F122A-z8	51		530	1599	3.017	94.41	70.18	10.580	1.200	0.6651	0.0744	0.98510	0.1150	0.0022	3287	288	2487	105	1886	35		-95.7
F122A-z8	52		502	1378	2.747	95.79	75.82	9.758	1.060	0.6206	0.0670	0.98550	0.1140	0.0021	3112	266	2412	100	1865	33		-84.9
F122A-z8	53		490	1331	2.716	96	76.6	9.566	1.030	0.6137	0.0655	0.98550	0.1130	0.0021	3085	262	2394	99	1849	33		-84.7
F122A-z8	54		492	1320	2.682	95.75	76.16	9.967	1.100	0.6162	0.0672	0.98640	0.1170	0.0021	3095	268	2432	102	1916	33		-78.0
F122A-z8	55		493	1315	2.667	95.81	76.86	10.280	1.120	0.6192	0.0668	0.98640	0.1200	0.0022	3107	266	2460	101	1962	32		-74.1
F122A-z8	56		473	1257	2.660	95.96	77.26	9.745	1.030	0.5958	0.0625	0.98560	0.1190	0.0021	3013	253	2411	98	1936	32		-70.1
F122A-z8	57		457	1221	2.672	96.33	78.88	9.449	0.984	0.5808	0.0600	0.98560	0.1180	0.0021	2952	245	2383	96	1926	32		-66.8
F122A-z8	58		468	1220	2.607	96.83	81.28	9.199	0.925	0.5667	0.0565	0.98530	0.1180	0.0020	2894	232	2358	92	1922	31		-63.1
F122A-z8	59		497	1214	2.444	96.73	80.94	9.623	1.070	0.5866	0.0645	0.98800	0.1190	0.0020	2976	262	2399	102	1941	31		-67.0
Sample F122A, zircon 9: Type 1A																						
F122A-z9	1		1223	87	0.071	92.39	57.62	2.812	0.678	0.2199	0.0521	0.98530	0.0927	0.0038	1282	275	1359	180	1483	78		15.0
F122A-z9	**2**	*	**969**	**68**	**0.070**	**97.1**	**81.3**	**4.131**	**1.040**	**0.2789**	**0.0699**	**0.99630**	**0.1070**	**0.0023**	**1586**	**352**	**1661**	**206**	**1756**	**40**		**10.9**
F122A-z9	**3**	*	**941**	**68**	**0.072**	**97.98**	**86.33**	**4.011**	**0.948**	**0.2699**	**0.0636**	**0.99680**	**0.1080**	**0.0020**	**1540**	**323**	**1636**	**192**	**1762**	**35**		**14.1**
F122A-z9	**4**	*	**985**	**78**	**0.080**	**98.39**	**89.01**	**4.549**	**1.200**	**0.3007**	**0.0789**	**0.99780**	**0.1100**	**0.0019**	**1695**	**391**	**1740**	**219**	**1795**	**32**		**6.4**
F122A-z9	**5**	*	**939**	**75**	**0.080**	**98.69**	**90.99**	**4.605**	**1.170**	**0.3001**	**0.0760**	**0.99800**	**0.1110**	**0.0018**	**1692**	**377**	**1750**	**212**	**1820**	**29**		**8.0**
F122A-z9	**6**	*	**962**	**82**	**0.086**	**98.95**	**92.63**	**4.490**	**1.110**	**0.2935**	**0.0727**	**0.99810**	**0.1110**	**0.0017**	**1659**	**362**	**1729**	**206**	**1815**	**28**		**9.7**
F122A-z9	7		1010	82	0.082	99.11	93.92	4.575	1.140	0.2900	0.0720	0.99840	0.1140	0.0016	1641	360	1745	207	1871	26		13.9
F122A-z9	8		1023	98	0.096	99.23	94.69	4.493	1.100	0.2831	0.0689	0.99840	0.1150	0.0016	1607	346	1730	202	1882	25		16.5
F122A-z9	9		1049	103	0.099	99.31	95.22	4.293	0.998	0.2717	0.0631	0.99840	0.1150	0.0015	1550	320	1692	191	1873	24		19.4
F122A-z9	10		1070	115	0.107	99.42	95.98	4.468	1.080	0.2821	0.0679	0.99860	0.1150	0.0015	1602	342	1725	200	1877	23		16.5
F122A-z9	11		1106	116	0.105	99.44	96.1	4.562	1.110	0.2876	0.0701	0.99870	0.1150	0.0014	1629	351	1742	203	1881	23		15.1
F122A-z9	12		1167	128	0.110	99.46	96.25	4.775	1.180	0.2985	0.0738	0.99880	0.1160	0.0014	1684	366	1781	208	1896	22		12.7
F122A-z9	13		1172	114	0.098	99.59	97.17	4.542	1.040	0.2817	0.0642	0.99870	0.1170	0.0014	1600	323	1739	190	1910	21		18.3
F122A-z9	14		1205	150	0.124	99.6	97.27	4.911	1.210	0.3026	0.0742	0.99890	0.1180	0.0013	1704	367	1804	207	1921	20		12.8
F122A-z9	15		1195	134	0.112	99.56	96.97	4.723	1.070	0.2902	0.0654	0.99870	0.1180	0.0013	1642	327	1771	189	1927	20		16.7
F122A-z9	16		1239	147	0.119	99.52	96.66	4.821	1.150	0.3020	0.0718	0.99890	0.1160	0.0013	1701	356	1789	200	1892	20		11.5
F122A-z9	17		1261	148	0.118	99.59	97.21	4.842	1.110	0.2969	0.0679	0.99890	0.1180	0.0013	1676	337	1792	193	1930	20		14.9
F122A-z9	18		1320	158	0.120	99.65	97.63	5.347	1.340	0.3261	0.0816	0.99910	0.1190	0.0013	1820	397	1876	214	1940	19		7.1
F122A-z9	19		1313	161	0.123	99.66	97.68	5.082	1.200	0.3091	0.0728	0.99900	0.1190	0.0013	1736	359	1833	200	1945	19		12.2
F122A-z9	20		1315	162	0.123	99.6	97.25	5.016	1.190	0.3111	0.0736	0.99900	0.1170	0.0012	1746	362	1822	200	1910	19		9.8
F122A-z9	21		1332	166	0.125	99.77	98.46	5.076	1.190	0.3066	0.0717	0.99910	0.1200	0.0012	1724	354	1832	198	1958	18		13.6
F122A-z9	22		1325	179	0.135	99.68	97.77	4.765	1.040	0.2979	0.0650	0.99890	0.1160	0.0012	1681	323	1779	183	1895	19		12.8
F122A-z9	23		1329	167	0.126	99.59	97.23	5.003	1.140	0.3058	0.0696	0.99900	0.1190	0.0012	1720	343	1820	193	1936	19		12.7
F122A-z9	24		1370	181	0.132	99.62	97.39	5.145	1.220	0.3176	0.0750	0.99910	0.1180	0.0012	1778	367	1844	201	1919	18		8.4
F122A-z9	25		1414	189	0.134	99.71	98	5.143	1.190	0.3124	0.0721	0.99910	0.1190	0.0012	1753	354	1843	196	1947	18		11.4
F122A-z9	26		1407	185	0.131	99.73	98.15	5.116	1.160	0.3121	0.0709	0.99910	0.1190	0.0012	1751	348	1839	193	1939	18		11.0
F122A-z9	27		1413	188	0.133	99.7	97.99	5.252	1.210	0.3185	0.0733	0.99910	0.1200	0.0012	1782	358	1861	196	1951	17		9.9
F122A-z9	28		1458	195	0.133	99.68	97.85	5.294	1.220	0.3222	0.0741	0.99910	0.1190	0.0012	1801	361	1868	197	1943	17		8.4
F122A-z9	29		1467	188	0.128	99.76	98.36	5.143	1.120	0.3119	0.0682	0.99910	0.1200	0.0011	1750	335	1843	186	1950	17		11.7
F122A-z9	30		1482	198	0.133	99.75	98.28	5.056	1.090	0.3057	0.0657	0.99900	0.1200	0.0011	1719	324	1829	182	1956	17		13.8
F122A-z9	31		1473	202	0.137	99.75	98.32	5.211	1.130	0.3123	0.0678	0.99910	0.1210	0.0011	1752	333	1854	185	1971	17		12.7
F122A-z9	32		1525	205	0.134	99.65	97.69	5.337	1.170	0.3163	0.0691	0.99910	0.1220	0.0012	1772	338	1875	187	1991	17		12.6
F122A-z9	33		1594	216	0.135	99.49	96.59	5.369	1.180	0.3212	0.0707	0.99900	0.1210	0.0012	1796	345	1880	188	1974	17		10.3
F122A-z9	34		1550	225	0.145	99.46	96.38	5.216	1.130	0.3162	0.0683	0.99900	0.1200	0.0012	1771	334	1855	184	1951	18		10.5
F122A-z9	35		1523	200	0.131	99.55	96.96	5.096	1.070	0.3090	0.0648	0.99900	0.1200	0.0011	1736	319	1836	178	1950	17		12.5
F122A-z9	36		1524	212	0.139	99.6	97.36	5.387	1.170	0.3217	0.0697	0.99910	0.1210	0.0011	1798	340	1883	186	1978	17		10.4
F122A-z9	37		1539	205	0.133	99.56	97.02	5.224	1.100	0.3166	0.0667	0.99900	0.1200	0.0011	1773	327	1857	180	1951	17		10.4
F122A-z9	38		1590	223	0.140	99.47	96.43	5.255	1.100	0.3175	0.0666	0.99900	0.1200	0.0011	1777	326	1862	179	1957	17		10.5
F122A-z9	39		1626	223	0.137	99.27	95.19	5.392	1.160	0.3259	0.0702	0.99900	0.1200	0.0012	1818	341	1884	185	1956	17		8.1
F122A-z9	40		1611	231	0.143	99.33	95.58	5.226	1.060	0.3128	0.0632	0.99890	0.1210	0.0012	1755	310	1857	172	1973	17		12.6
F122A-z9	41		1620	221	0.137	99.25	95.13	5.397	1.130	0.3215	0.0670	0.99900	0.1220	0.0012	1797	327	1884	179	1982	17		10.7
F122A-z9	42		1654	236	0.143	99.09	94.04	5.342	1.100	0.3222	0.0661	0.99880	0.1200	0.0012	1800	322	1876	176	1960	18		9.3
F122A-z9	43		1633	236	0.144	99.07	93.97	5.430	1.110	0.3253	0.0664	0.99880	0.1210	0.0012	1816	323	1890	175	1972	18		9.1
F122A-z9	44		1607	227	0.141	99.15	94.53	5.299	1.040	0.3148	0.0617	0.99880	0.1220	0.0012	1764	303	1869	168	1987	17		12.8
F122A-z9	45		1672	234	0.140	99.29	95.35	5.469	1.130	0.3287	0.0681	0.99900	0.1210	0.0011	1832	331	1896	178	1966	17		7.8
F122A-z9	46		1685	238	0.141	99.5	96.69	5.432	1.090	0.3230	0.0647	0.99900	0.1220	0.0011	1804	315	1890	172	1986	16		10.5
F122A-z9	47		1691	236	0.139	99.52	96.79	5.356	1.070	0.3210	0.0643	0.99900	0.1210	0.0011	1795	314	1878	171	1971	16		10.2
F122A-z9	48		1659	232	0.140	99.49	96.65	5.246	1.010	0.3129	0.0604	0.99890	0.1220	0.0011	1755	297	1860	165	1980	16		13.0
F122A-z9	49		1669	240	0.144	99.55	97.02	5.358	1.060	0.3197	0.0633	0.99900	0.1220	0.0011	1788	309	1878	170	1979	16		11.0
F122A-z9	50		1683	233	0.138	99.54	96.98	5.061	0.937	0.3013	0.0558	0.99890	0.1220	0.0011	1698	276	1830	157	1983	16		16.3
F122A-z9	51		1683	243	0.144	99.38	95.9	5.145	0.975	0.3104	0.0588	0.99890	0.1200	0.0011	1743	289	1844	161	1959	16		12.6
F122A-z9	52		1738	250	0.144	99.38	95.92	5.129	0.974	0.3067	0.0582	0.99890	0.1210	0.0011	1725	287	1841	161	1975	16		14.4
F122A-z9	53		1748	251	0.144	99.15	94.48	5.126	0.956	0.3053	0.0569	0.99870	0.1220	0.0011	1718	281	1840	159	1982	17		15.2
F122A-z9	54		1768	247	0.140	99.26	95.17	5.191	0.984	0.3100	0.0587	0.99880	0.1210	0.0011	1741	289	1851	161	1978	16		13.7
F122A-z9	55		1741	249	0.143	99.32	95.54	5.071	0.924	0.3014	0.0549	0.99880	0.1220	0.0011	1698	272	1831	155	1986	16		16.5
F122A-z9	56		1786	246	0.137	99.43	96.29	5.228	0.989	0.3099	0.0586	0.99890	0.1220	0.0011	1740	289	1857	161	1991	16		14.4

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
							$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$		
	cycle	ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.	
F122A-z9	57	1764	256	0.145	99.37	95.88	5.030	0.894	0.3006	0.0534	0.99880	0.1210	0.0011	1694	265	1824	151	1976	16	16.2
F122A-z9	58	1780	257	0.145	99.39	95.97	5.264	0.997	0.3135	0.0593	0.99890	0.1220	0.0011	1758	291	1863	162	1982	16	12.9
F122A-z9	59	1747	254	0.146	99.19	94.71	4.963	0.858	0.2972	0.0514	0.99860	0.1210	0.0011	1677	255	1813	146	1973	16	17.0
Sample F122A, zircon 10: Type 3																				
F122A-z10	1	502	39	0.077	93.17	64.08	5.747	0.982	0.3849	0.0640	0.97410	0.1080	0.0042	2099	298	1938	148	1771	71	-21.7
F122A-z10	2	446	16	0.036	97.65	85.21	7.039	1.180	0.4439	0.0737	0.98900	0.1150	0.0029	2368	329	2116	149	1880	45	-31.1
F122A-z10	3	431	14	0.031	98.59	90.91	8.189	1.540	0.5011	0.0941	0.99340	0.1190	0.0026	2618	404	2252	171	1934	39	-43.2
F122A-z10	4	427	11	0.025	99.1	94.13	7.980	1.390	0.4791	0.0830	0.99340	0.1210	0.0024	2523	362	2229	157	1968	36	-34.2
F122A-z10	5	426	13	0.030	99.31	95.55	8.864	1.700	0.5223	0.1000	0.99510	0.1230	0.0023	2709	424	2324	175	2001	34	-43.5
F122A-z10	6	438	9	0.021	99.31	95.72	9.677	1.980	0.5488	0.1120	0.99600	0.1280	0.0023	2820	467	2405	189	2069	32	-45.0
F122A-z10	7	436	11	0.025	99.53	97.07	9.199	1.710	0.5117	0.0953	0.99550	0.1300	0.0023	2664	406	2358	171	2103	31	-32.7
F122A-z10	8	428	18	0.041	99.6	97.54	9.788	1.900	0.5352	0.1040	0.99610	0.1330	0.0023	2763	435	2415	179	2133	30	-36.5
F122A-z10	9	444	15	0.033	99.53	97.12	9.724	1.900	0.5299	0.1030	0.99630	0.1330	0.0022	2741	436	2409	180	2139	30	-34.7
F122A-z10	10	443	22	0.049	99.65	97.88	10.090	1.950	0.5376	0.1040	0.99630	0.1360	0.0022	2773	435	2443	179	2179	29	-33.6
F122A-z10	11	446	19	0.042	99.8	98.8	10.440	2.080	0.5521	0.1100	0.99680	0.1370	0.0022	2834	456	2474	184	2191	28	-36.4
F122A-z10	12	450	22	0.049	99.73	98.44	11.840	2.690	0.6159	0.1400	0.99760	0.1390	0.0022	3094	557	2592	212	2220	27	-49.8
F122A-z10	13	445	22	0.050	99.7	98.25	10.910	2.240	0.5646	0.1160	0.99710	0.1400	0.0022	2886	478	2515	191	2229	27	-36.7
F122A-z10	14	429	25	0.059	99.84	99.05	11.040	2.230	0.5640	0.1140	0.99710	0.1420	0.0022	2883	470	2527	188	2252	27	-34.8
F122A-z10	15	429	31	0.071	99.93	99.59	10.990	2.130	0.5429	0.1050	0.99690	0.1470	0.0022	2796	439	2523	180	2310	26	-25.9
F122A-z10	16	450	33	0.073	99.86	99.26	12.880	2.830	0.6165	0.1350	0.99760	0.1520	0.0023	3096	540	2671	207	2364	26	-39.1
F122A-z10	17	432	40	0.092	99.87	99.29	12.560	2.660	0.6087	0.1290	0.99740	0.1500	0.0023	3065	516	2647	199	2342	26	-38.9
F122A-z10	18	555	60	0.108	99.91	99.51	19.130	7.980	0.8977	0.3740	0.99950	0.1550	0.0021	4130	1270	3049	402	2397	23	-99.3
F122A-z10	19	-103	-13	0.129	99.92	99.56	5.542	0.125	0.2556	0.0058	0.99700	0.1570	0.0003	1467	30	1907	20	2427	3	44.1
F122A-z10	20	398	46	0.116	99.95	99.72	13.710	2.920	0.6307	0.1340	0.99760	0.1580	0.0023	3152	531	2730	202	2431	25	-37.7
F122A-z10	21	411	53	0.128	99.92	99.59	13.650	2.780	0.6241	0.1270	0.99730	0.1590	0.0024	3126	505	2726	193	2441	25	-35.6
F122A-z10	22	409	56	0.136	99.9	99.49	13.650	2.740	0.6172	0.1240	0.99730	0.1600	0.0024	3099	494	2726	190	2459	25	-33.0
F122A-z10	23	398	64	0.160	99.89	99.44	13.610	2.610	0.6021	0.1160	0.99700	0.1640	0.0024	3038	465	2723	182	2497	25	-27.3
F122A-z10	24	399	57	0.144	99.93	99.64	14.660	3.080	0.6456	0.1360	0.99750	0.1650	0.0024	3211	531	2793	200	2504	25	-36.0
F122A-z10	25	376	56	0.150	99.9	99.5	14.290	2.820	0.6206	0.1220	0.99710	0.1670	0.0025	3112	487	2769	187	2528	25	-29.2
F122A-z10	26	369	61	0.166	99.89	99.47	16.430	3.710	0.7072	0.1600	0.99770	0.1680	0.0026	3448	603	2902	216	2543	25	-46.2
F122A-z10	27	349	56	0.160	99.84	99.23	14.440	2.800	0.6176	0.1200	0.99680	0.1700	0.0026	3100	477	2779	184	2553	26	-27.1
F122A-z10	28	355	59	0.168	99.81	99.07	15.410	3.190	0.6537	0.1350	0.99720	0.1710	0.0026	3243	526	2841	197	2568	26	-33.5
Sample F122A, zircon 15: Type 2A																				
F122A-z15	1	901	47	0.052	87.66	46.56	3.784	0.754	0.2702	0.0520	0.97160	0.1020	0.0048	1542	264	1589	160	1653	87	7.6
F122A-z15	2	663	15	0.022	94.4	68.76	5.069	1.120	0.3400	0.0744	0.99070	0.1080	0.0033	1887	358	1831	187	1768	55	-7.8
F122A-z15	3	561	10	0.017	96.74	79.86	5.446	1.160	0.3572	0.0753	0.99320	0.1110	0.0027	1969	358	1892	182	1809	45	-10.3
F122A-z15	4	546	7	0.013	97.83	85.56	5.890	1.360	0.3919	0.0902	0.99540	0.1090	0.0024	2132	418	1960	201	1783	40	-23.0
F122A-z15	5	539	4	0.008	98.49	89.95	5.814	1.300	0.3717	0.0830	0.99610	0.1130	0.0022	2037	390	1949	194	1856	36	-11.4
F122A-z15	6	522	4	0.008	98.6	90.43	5.778	1.290	0.3781	0.0840	0.99600	0.1110	0.0022	2067	393	1943	193	1813	36	-16.4
F122A-z15	7	522	3	0.005	98.94	92.6	7.039	1.980	0.4598	0.1290	0.99780	0.1110	0.0021	2439	569	2116	250	1816	34	-41.3
F122A-z15	8	494	4	0.008	99.19	94.38	5.824	1.260	0.3699	0.0797	0.99650	0.1140	0.0021	2029	375	1950	187	1867	33	-10.1
F122A-z15	9	507	3	0.005	99.11	93.75	6.042	1.390	0.3915	0.0901	0.99670	0.1120	0.0021	2130	417	1982	201	1831	34	-19.2
F122A-z15	10	486	3	0.007	99.28	94.91	6.506	1.610	0.4238	0.1050	0.99730	0.1110	0.0020	2278	474	2047	218	1821	33	-29.9
F122A-z15	11	459	4	0.009	99.55	96.82	6.304	1.450	0.4005	0.0918	0.99710	0.1140	0.0020	2172	422	2019	201	1867	31	-19.2
F122A-z15	12	479	3	0.007	99.56	96.87	6.581	1.630	0.4235	0.1050	0.99760	0.1130	0.0020	2276	475	2057	219	1843	31	-28.0
F122A-z15	13	464	1	0.003	99.78	98.4	6.210	1.420	0.3949	0.0902	0.99740	0.1140	0.0019	2146	417	2006	200	1865	30	-17.7
F122A-z15	14	458	3	0.007	99.8	98.59	6.477	1.510	0.4011	0.0936	0.99760	0.1170	0.0019	2174	431	2043	205	1913	29	-16.1
F122A-z15	15	468	3	0.006	99.83	98.79	6.727	1.710	0.4292	0.1090	0.99800	0.1140	0.0018	2302	492	2076	225	1859	29	-28.4
F122A-z15	16	456	1	0.003	99.82	98.72	6.500	1.540	0.4092	0.0969	0.99760	0.1150	0.0019	2211	443	2046	209	1883	29	-20.6
F122A-z15	17	461	3	0.006	99.84	98.85	6.568	1.600	0.4181	0.1020	0.99780	0.1140	0.0019	2252	463	2055	215	1863	29	-24.8
F122A-z15	18	455	2	0.005	99.82	98.7	6.472	1.520	0.4076	0.0959	0.99760	0.1150	0.0019	2204	439	2042	207	1882	30	-20.3
F122A-z15	19	452	3	0.006	99.79	98.52	6.132	1.370	0.3897	0.0872	0.99720	0.1140	0.0019	2121	405	1995	196	1866	30	-16.1
F122A-z15	20	439	3	0.006	99.79	98.51	6.495	1.590	0.4148	0.1010	0.99770	0.1140	0.0019	2237	461	2045	215	1857	30	-24.3
F122A-z15	21	426	1	0.002	99.74	98.08	6.083	1.380	0.3951	0.0898	0.99720	0.1120	0.0019	2146	415	1988	198	1827	31	-20.6
F122A-z15	22	449	3	0.007	99.79	98.49	6.755	1.750	0.4325	0.1120	0.99790	0.1130	0.0019	2317	503	2080	229	1853	30	-29.8
F122A-z15	23	438	2	0.005	99.79	98.48	6.772	1.710	0.4303	0.1090	0.99780	0.1140	0.0019	2307	490	2082	224	1866	30	-28.2
F122A-z15	24	428	2	0.005	99.85	98.95	6.153	1.400	0.3928	0.0891	0.99730	0.1140	0.0019	2136	412	1998	198	1858	30	-17.6
F122A-z15	25	436	2	0.004	99.92	99.42	6.725	1.700	0.4323	0.1090	0.99790	0.1130	0.0019	2316	492	2076	224	1845	30	-30.5
F122A-z15	26	427	2	0.005	99.93	99.51	6.351	1.500	0.4054	0.0954	0.99760	0.1140	0.0019	2194	438	2026	207	1858	30	-21.4
F122A-z15	27	425	2	0.004	99.87	99.09	6.517	1.610	0.4182	0.1040	0.99770	0.1130	0.0019	2252	471	2048	218	1849	30	-25.9
F122A-z15	28	416	2	0.006	99.92	99.42	6.388	1.540	0.4043	0.0975	0.99770	0.1150	0.0019	2189	448	2031	212	1873	30	-19.9
F122A-z15	29	415	2	0.006	99.95	99.68	6.643	1.630	0.4181	0.1030	0.99780	0.1150	0.0019	2252	467	2065	217	1884	29	-23.1
F122A-z15	30	413	1	0.004	99.93	99.52	6.585	1.570	0.4121	0.0980	0.99760	0.1160	0.0019	2224	447	2057	210	1894	30	-20.7
F122A-z15	31	424	1	0.003	99.93	99.51	6.651	1.670	0.4285	0.1070	0.99790	0.1130	0.0018	2299	485	2066	221	1841	30	-29.7
F122A-z15	32	420	3	0.006	99.94	99.59	6.251	1.440	0.4028	0.0927	0.99750	0.1130	0.0018	2182	426	2012	202	1841	30	-21.9
F122A-z15	33	436	1	0.002	99.95	99.61	6.509	1.580	0.4130	0.1000	0.99780	0.1140	0.0018	2229	457	2047	213	1869	29	-22.8
F122A-z15	34	435	3	0.006	99.89	99.23	6.592	1.610	0.4263	0.1040	0.99780	0.1120	0.0018	2289	470	2058	215	1835	29	-29.4
F122A-z15	35	456	1	0.003	99.89	99.18	6.683	1.630	0.4316	0.1050	0.99790	0.1120	0.0018	2313	474	2070	216	1837	29	-30.9
F122A-z15	36	486	2	0.005	99.9	99.25	6.302	1.460	0.4037	0.0938	0.99790	0.1130	0.0017	2186	431	2019	204	1852	28	-21.3
F122A-z15	37	539	2	0.003	99.88	99.11	5.664	1.230	0.3624	0.0789	0.99780	0.1130	0.0016	1994	373	1926	188	1854	26	-8.7
F122A-z15	38	576	2	0.004	99.91	99.33	6.079	1.460	0.3883	0.0930	0.99830	0.1140	0.0016	2115	432	1987	209	1857	25	-16.3
F122A-z15	39	560	1	0.002	99.94	99.57	6.350	1.510	0.4021	0.0955	0.99820	0.1150	0.0016	2179	439	2025	209	1872	26	-19.4
F122A-z15	40	533	4	0.008	99.96	99.69	6.411	1.530	0.4033	0.0962	0.99820	0.1150	0.0016	2184	442	2034	210	1885	26	-18.7
F122A-z15	41	520	5	0.010	99.94	99.55	6.272	1.460	0.3932	0.0913	0.99800	0.1160	0.0017	2138	422	2015	203	1891	26	-15.3
F122A-z15	42	520	7	0.013	99.94	99.54	6.490	1.570	0.4113	0.0992	0.99810	0.1140	0.0017	2221	453	2045	212	1871	27	-22.1
F122A-z15	43	496	7	0.014	99.88	99.12	6.474	1.560	0.4102	0.0986	0.99800	0.1140	0.0017	2216	451	2042	212	1872	27	-21.7
F122A-z15	44	498	10	0.021	99.93	99.52	6.383	1.510	0.3973	0.0939	0.99800	0.1170	0.0017	2157	433	2030	208	1903	27	-15.7
F122A-z15	45	485	11	0.023	99.96	99.72	6.797	1.720	0.4302	0.1090	0.99820	0.1150	0.0017	2306	489	2085	223	1874	27	-27.5
F122A-z15	46	458	11	0.023	99.96	99.7	6.647	1.620	0.4197	0.1020	0.99800	0.1150	0.0018	2259	465	2066	216	1878	28	-24.1
F122A-z15	47	425	14	0.034	99.99	99.93	6.066	1.310	0.3857	0.0836	0.99730	0.1140	0.0018	2103	389	1985	189	1865	29	-15.0

Grain	Mass cycle	U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
F122A-z15	48	403	18	0.044	99.97	99.77	6.739	1.600	0.4192	0.0992	0.99770	0.1170	0.0019	2257	451	2078	209	1905	29	-21.9
F122A-z15	49	382	21	0.055	99.93	99.51	6.159	1.350	0.3939	0.0861	0.99710	0.1130	0.0019	2141	398	1999	191	1854	30	-18.2
F122A-z15	50	359	19	0.053	99.88	99.15	6.401	1.430	0.3986	0.0887	0.99700	0.1160	0.0020	2163	409	2032	196	1903	31	-16.1
F122A-z15	51	332	20	0.060	99.95	99.64	6.114	1.240	0.3813	0.0774	0.99620	0.1160	0.0021	2082	361	1992	177	1900	32	-11.2
F122A-z15	52	326	29	0.088	99.99	99.91	6.562	1.440	0.4051	0.0885	0.99670	0.1170	0.0021	2193	406	2054	193	1918	32	-16.9
F122A-z15	53	309	29	0.095	99.97	99.8	6.365	1.350	0.3898	0.0827	0.99630	0.1180	0.0022	2122	384	2027	186	1933	33	-11.5
F122A-z15	54	289	33	0.113	99.97	99.8	6.791	1.500	0.4198	0.0929	0.99640	0.1170	0.0022	2260	422	2085	196	1916	34	-21.3
F122A-z15	55	278	33	0.119	99.88	99.16	6.690	1.460	0.4157	0.0909	0.99590	0.1170	0.0023	2241	414	2071	193	1907	35	-20.7
F122A-z15	56	270	36	0.133	99.84	98.91	6.759	1.550	0.4179	0.0956	0.99620	0.1170	0.0023	2251	435	2080	203	1916	36	-20.7
F122A-z15	57	262	43	0.164	99.94	99.55	7.064	1.650	0.4328	0.1010	0.99640	0.1180	0.0023	2318	455	2119	208	1932	36	-23.8
F122A-z15	58	261	46	0.176	99.98	99.89	6.565	1.400	0.4025	0.0860	0.99570	0.1180	0.0024	2181	395	2055	188	1931	36	-15.2
F122A-z15	59	243	48	0.199	99.95	99.66	6.302	1.230	0.3824	0.0746	0.99450	0.1200	0.0024	2087	348	2019	171	1949	37	-8.3
Sample F122A, zircon 16: Type 3																				
F122A-z16	1	785	19	0.024	90.45	50.73	4.144	0.851	0.3336	0.0658	0.96540	0.0901	0.0048	1856	318	1663	168	1427	102	-34.7
F122A-z16	2	640	7	0.011	97.4	83.29	5.675	1.240	0.3739	0.0816	0.99470	0.1100	0.0025	2048	383	1928	189	1801	41	-16.0
F122A-z16	3	701	6	0.008	98.77	91.89	6.626	1.740	0.4121	0.1080	0.99800	0.1170	0.0020	2225	495	2063	232	1905	30	-19.9
F122A-z16	4	702	9	0.013	99.12	94.07	6.555	1.640	0.4062	0.1020	0.99810	0.1170	0.0018	2198	465	2053	220	1911	28	-17.7
F122A-z16	5	688	8	0.011	99.36	95.74	6.484	1.580	0.3952	0.0962	0.99820	0.1190	0.0018	2147	444	2044	214	1941	26	-12.5
F122A-z16	6	644	10	0.015	99.46	96.35	7.467	2.060	0.4533	0.1250	0.99860	0.1190	0.0018	2410	553	2169	246	1948	26	-28.5
F122A-z16	7	575	11	0.019	99.5	96.67	7.410	1.890	0.4467	0.1140	0.99820	0.1200	0.0018	2381	508	2162	229	1961	27	-25.6
F122A-z16	8	559	10	0.018	99.59	97.25	7.653	2.030	0.4551	0.1210	0.99840	0.1220	0.0019	2418	534	2191	238	1985	27	-26.2
F122A-z16	9	511	7	0.013	99.6	97.33	7.466	1.870	0.4437	0.1110	0.99810	0.1220	0.0019	2367	495	2169	224	1986	28	-23.0
F122A-z16	10	500	9	0.017	99.69	97.92	7.435	1.900	0.4423	0.1130	0.99820	0.1220	0.0019	2361	506	2165	229	1984	27	-22.8
F122A-z16	11	490	9	0.018	99.73	98.21	7.208	1.750	0.4239	0.1030	0.99800	0.1230	0.0019	2278	467	2137	217	2005	27	-16.2
F122A-z16	12	482	10	0.020	99.59	97.31	7.145	1.730	0.4246	0.1030	0.99780	0.1220	0.0020	2281	464	2130	215	1986	28	-17.7
F122A-z16	13	497	11	0.022	99.51	96.71	7.503	2.020	0.4515	0.1210	0.99820	0.1210	0.0020	2402	538	2173	241	1964	29	-26.8
F122A-z16	14	461	11	0.025	99.51	96.71	7.451	1.920	0.4498	0.1160	0.99790	0.1200	0.0020	2394	514	2167	230	1958	30	-26.8
F122A-z16	15	464	11	0.023	99.57	97.15	7.523	1.960	0.4476	0.1160	0.99800	0.1220	0.0020	2385	518	2176	233	1984	29	-24.2
F122A-z16	16	467	9	0.020	99.64	97.59	7.520	1.960	0.4531	0.1180	0.99810	0.1200	0.0020	2409	524	2175	234	1962	29	-27.3
F122A-z16	17	451	9	0.020	99.56	97.08	6.908	1.640	0.4157	0.0989	0.99750	0.1210	0.0020	2241	450	2100	211	1964	30	-16.7
F122A-z16	18	457	8	0.018	99.56	97.15	7.828	2.090	0.4546	0.1210	0.99810	0.1250	0.0021	2416	537	2211	240	2027	29	-23.0
F122A-z16	19	442	9	0.020	99.68	97.9	7.116	1.690	0.4156	0.0983	0.99760	0.1240	0.0020	2240	448	2126	211	2017	29	-13.1
F122A-z16	20	446	10	0.022	99.73	98.17	7.664	2.020	0.4548	0.1200	0.99810	0.1220	0.0020	2417	530	2192	236	1989	29	-25.8
F122A-z16	21	437	8	0.019	99.58	97.26	7.279	1.770	0.4259	0.1030	0.99760	0.1240	0.0021	2287	467	2146	217	2014	30	-16.1
F122A-z16	22	444	8	0.019	99.74	98.31	7.414	1.840	0.4339	0.1080	0.99790	0.1240	0.0020	2323	485	2163	223	2013	29	-18.4
F122A-z16	23	427	12	0.027	99.68	97.93	7.273	1.740	0.4255	0.1020	0.99760	0.1240	0.0020	2286	460	2146	214	2014	29	-16.0
F122A-z16	24	439	7	0.015	99.75	98.37	7.494	1.890	0.4374	0.1100	0.99790	0.1240	0.0020	2339	494	2172	226	2018	29	-19.0
F122A-z16	25	418	10	0.024	99.51	96.79	6.855	1.560	0.4061	0.0922	0.99710	0.1220	0.0021	2197	423	2093	201	1992	31	-12.2
F122A-z16	26	424	9	0.021	99.57	97.14	7.111	1.720	0.4207	0.1020	0.99760	0.1230	0.0021	2264	462	2125	216	1994	30	-16.1
F122A-z16	27	405	9	0.021	99.6	97.38	6.941	1.560	0.4026	0.0903	0.99720	0.1250	0.0021	2181	415	2104	199	2029	30	-8.9
F122A-z16	28	421	8	0.019	99.6	97.34	6.824	1.560	0.4040	0.0925	0.99730	0.1230	0.0021	2187	425	2089	203	1993	30	-11.5
F122A-z16	29	411	9	0.023	99.59	97.31	6.665	1.430	0.3889	0.0834	0.99690	0.1240	0.0021	2118	387	2068	190	2019	30	-5.7
F122A-z16	30	409	10	0.025	99.64	97.63	6.967	1.580	0.4089	0.0926	0.99720	0.1240	0.0021	2210	424	2107	201	2008	30	-11.9
F122A-z16	31	404	11	0.026	99.61	97.43	6.832	1.530	0.4004	0.0894	0.99710	0.1240	0.0021	2171	412	2090	198	2011	30	-9.4
F122A-z16	32	391	9	0.023	99.61	97.47	6.289	1.240	0.3648	0.0715	0.99620	0.1250	0.0021	2005	338	2017	172	2029	30	1.4
F122A-z16	33	400	11	0.029	99.65	97.72	6.613	1.410	0.3897	0.0828	0.99690	0.1230	0.0021	2121	384	2061	188	2001	30	-7.1
F122A-z16	34	406	12	0.028	99.7	98.01	6.695	1.450	0.3888	0.0843	0.99710	0.1250	0.0021	2117	391	2072	192	2027	29	-5.2
F122A-z16	35	406	12	0.030	99.74	98.33	6.839	1.480	0.3927	0.0851	0.99720	0.1260	0.0021	2135	394	2091	192	2047	29	-5.1
F122A-z16	36	399	15	0.037	99.66	97.81	6.534	1.340	0.3771	0.0772	0.99670	0.1260	0.0021	2063	361	2050	181	2038	29	-1.4
F122A-z16	37	395	14	0.035	99.7	98.01	6.147	1.180	0.3602	0.0688	0.99630	0.1240	0.0020	1983	326	1997	167	2011	29	1.6
F122A-z16	38	422	16	0.038	99.74	98.31	6.618	1.420	0.3873	0.0829	0.99720	0.1240	0.0020	2110	385	2062	189	2014	28	-5.6
Sample F122A, zircon 17: Type 1A																				
F122A-z17	1	694	11	0.015	99.52	96.43	6.137	1.430	0.4103	0.0954	0.99750	0.1080	0.0018	2216	436	1996	203	1774	30	-29.5
F122A-z17	2	702	10	0.014	99.46	96.01	6.468	1.580	0.4308	0.1050	0.99770	0.1090	0.0018	2309	474	2042	215	1781	30	-35.4
F122A-z17	3	712	17	0.024	99.46	96.01	6.433	1.590	0.4277	0.1050	0.99780	0.1090	0.0018	2295	476	2037	217	1784	30	-34.2
F122A-z17	4	735	23	0.031	99.55	96.7	5.830	1.290	0.3867	0.0855	0.99750	0.1090	0.0017	2108	398	1951	192	1789	28	-20.9
F122A-z17	5	797	23	0.028	99.63	97.28	6.718	1.810	0.4396	0.1190	0.99860	0.1110	0.0016	2349	531	2075	238	1813	26	-35.4
F122A-z17	6	826	29	0.035	99.69	97.79	6.011	1.410	0.3854	0.0904	0.99830	0.1130	0.0016	2101	421	1977	204	1850	25	-16.0
F122A-z17	7	930	32	0.034	99.81	98.62	6.689	1.830	0.4289	0.1170	0.99890	0.1130	0.0014	2301	530	2071	242	1850	23	-29.0
F122A-z17	8	929	38	0.040	99.83	98.74	6.152	1.480	0.3932	0.0945	0.99860	0.1130	0.0014	2138	437	1998	210	1856	23	-17.8
F122A-z17	9	999	44	0.044	99.8	98.6	6.783	1.810	0.4260	0.1140	0.99900	0.1150	0.0014	2288	514	2083	236	1887	22	-25.3
F122A-z17	10	1008	50	0.050	99.83	98.76	6.358	1.580	0.4047	0.1010	0.99880	0.1140	0.0014	2191	462	2026	218	1863	22	-20.8
F122A-z17	11	1060	58	0.055	99.83	98.77	6.427	1.610	0.4025	0.1010	0.99890	0.1160	0.0014	2180	464	2036	221	1893	21	-17.9
F122A-z17	12	1082	62	0.057	99.8	98.57	6.184	1.500	0.3830	0.0930	0.99890	0.1170	0.0014	2090	434	2002	212	1912	21	-11.0
F122A-z17	13	1117	78	0.070	99.76	98.3	6.478	1.650	0.4045	0.1030	0.99900	0.1160	0.0014	2190	473	2043	224	1898	21	-18.1
F122A-z17	**14 ***	**1147**	**78**	**0.068**	**99.68**	**97.69**	**5.937**	**1.410**	**0.3797**	**0.0900**	**0.99870**	**0.1130**	**0.0013**	**2075**	**421**	**1967**	**206**	**1855**	**22**	**-13.9**
F122A-z17	**15 ***	**1250**	**83**	**0.066**	**99.61**	**97.21**	**5.715**	**1.400**	**0.3640**	**0.0891**	**0.99880**	**0.1140**	**0.0013**	**2001**	**421**	**1934**	**212**	**1862**	**21**	**-8.7**
F122A-z17	**16 ***	**1316**	**99**	**0.075**	**99.5**	**96.45**	**5.279**	**1.250**	**0.3422**	**0.0808**	**0.99870**	**0.1120**	**0.0013**	**1897**	**388**	**1866**	**202**	**1830**	**22**	**-4.3**
F122A-z17	**17 ***	**1428**	**119**	**0.083**	**99.65**	**97.5**	**5.227**	**1.270**	**0.3292**	**0.0801**	**0.99890**	**0.1150**	**0.0013**	**1835**	**389**	**1857**	**208**	**1882**	**20**	**2.9**
F122A-z17	**18 ***	**1413**	**129**	**0.091**	**99.6**	**97.12**	**5.012**	**1.200**	**0.3208**	**0.0764**	**0.99880**	**0.1130**	**0.0013**	**1794**	**373**	**1821**	**202**	**1853**	**21**	**3.7**
F122A-z17	**19 ***	**1482**	**140**	**0.094**	**99.58**	**96.98**	**4.655**	**1.080**	**0.3029**	**0.0701**	**0.99880**	**0.1110**	**0.0013**	**1706**	**347**	**1759**	**194**	**1823**	**21**	**7.3**
F122A-z17	**20 ***	**1560**	**149**	**0.096**	**99.67**	**97.66**	**5.146**	**1.300**	**0.3292**	**0.0831**	**0.99910**	**0.1130**	**0.0012**	**1835**	**403**	**1844**	**215**	**1854**	**20**	**1.2**
F122A-z17	**21 ***	**1551**	**159**	**0.102**	**99.69**	**97.81**	**4.979**	**1.170**	**0.3194**	**0.0753**	**0.99900**	**0.1130**	**0.0012**	**1787**	**368**	**1816**	**199**	**1850**	**20**	**4.0**
F122A-z17	**22 ***	**1596**	**170**	**0.106**	**99.68**	**97.71**	**5.185**	**1.250**	**0.3280**	**0.0793**	**0.99900**	**0.1150**	**0.0012**	**1829**	**385**	**1850**	**206**	**1875**	**19**	**2.9**
F122A-z17	**23 ***	**1592**	**171**	**0.108**	**99.8**	**98.55**	**5.575**	**1.430**	**0.3510**	**0.0898**	**0.99920**	**0.1150**	**0.0012**	**1939**	**428**	**1912**	**220**	**1883**	**19**	**-3.5**
F122A-z17	24	1535	177	0.115	99.78	98.46	5.492	1.400	0.3452	0.0877	0.99920	0.1150	0.0012	1912	420	1899	218	1886	19	-1.6
F122A-z17	25	1475	173	0.117	99.73	98.07	5.165	1.240	0.3247	0.0776	0.99910	0.1150	0.0012	1813	378	1847	203	1885	19	4.4
F122A-z17	26	1507	187	0.124	99.62	97.38	5.832	1.510	0.3577	0.0928	0.99920	0.1180	0.0012	1971	440	1951	225	1930	19	-2.5
F122A-z17	27	1476	191	0.129	99.39	95.87	5.170	1.110	0.3190	0.0685	0.99870	0.1180	0.0013	1785	335	1848	183	1919	20	8.0
F122A-z17	28	1565	209	0.134	99.23	94.83	5.571	1.300	0.3443	0.0802	0.99890	0.1170	0.0013	1907	384	1912	201	1917	20	0.6

Grain	Mass cycle		U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
F122A-z17	29		1582	230	0.145	99.49	96.54	5.578	1.260	0.3448	0.0779	0.99890	0.1170	0.0012	1910	373	1913	195	1916	19	0.4
F122A-z17	30		1631	245	0.150	99.69	97.85	5.950	1.410	0.3663	0.0866	0.99910	0.1180	0.0012	2012	409	1969	206	1923	18	-5.4
F122A-z17	31		1658	245	0.148	99.81	98.69	6.017	1.390	0.3686	0.0853	0.99920	0.1180	0.0011	2023	402	1978	202	1932	17	-5.5
F122A-z17	32		1681	253	0.150	99.83	98.83	5.988	1.360	0.3664	0.0832	0.99920	0.1190	0.0011	2012	393	1974	198	1934	16	-4.7
F122A-z17	33		1715	268	0.156	99.82	98.79	6.531	1.550	0.4002	0.0951	0.99930	0.1180	0.0011	2170	438	2050	209	1932	16	-14.5
F122A-z17	34		1761	294	0.167	99.86	99.02	6.643	1.580	0.3993	0.0951	0.99930	0.1210	0.0010	2166	438	2065	210	1966	16	-12.0
F122A-z17	35		1748	310	0.177	99.87	99.11	6.151	1.330	0.3737	0.0805	0.99920	0.1190	0.0010	2047	378	1997	188	1947	15	-6.0
F122A-z17	36		1809	317	0.175	99.89	99.26	6.829	1.610	0.4101	0.0967	0.99940	0.1210	0.0010	2215	442	2089	209	1968	15	-14.8
F122A-z17	37		1889	347	0.184	99.9	99.34	6.506	1.500	0.3903	0.0897	0.99930	0.1210	0.0010	2124	416	2047	202	1969	15	-9.3
F122A-z17	38		1851	331	0.179	99.92	99.41	6.230	1.370	0.3786	0.0831	0.99930	0.1190	0.0010	2070	389	2009	192	1946	15	-7.5
F122A-z17	39		1809	329	0.182	99.89	99.25	6.395	1.420	0.3829	0.0849	0.99930	0.1210	0.0010	2090	396	2032	195	1973	15	-6.9
F122A-z17	40		1797	319	0.177	99.86	99.02	6.123	1.310	0.3718	0.0798	0.99920	0.1190	0.0010	2038	375	1993	187	1948	15	-5.4
F122A-z17	41		1744	321	0.184	99.81	98.7	6.883	1.650	0.4186	0.1000	0.99930	0.1190	0.0010	2254	456	2097	213	1945	16	-18.9
F122A-z17	42		1725	296	0.172	99.69	97.84	6.132	1.320	0.3765	0.0808	0.99910	0.1180	0.0011	2060	378	1995	187	1928	16	-8.0
F122A-z17	43		1782	341	0.191	99.56	97.09	6.326	1.380	0.3794	0.0828	0.99920	0.1210	0.0011	2074	387	2022	191	1970	16	-6.1
F122A-z17	44		1849	353	0.191	99.53	96.85	6.124	1.310	0.3715	0.0792	0.99910	0.1200	0.0011	2037	372	1994	186	1949	16	-5.3
F122A-z17	45		1853	361	0.195	99.41	96.08	6.424	1.460	0.3901	0.0886	0.99920	0.1190	0.0011	2123	411	2036	200	1948	16	-10.6
F122A-z17	46		1824	380	0.209	99.21	94.75	6.550	1.480	0.3976	0.0901	0.99910	0.1190	0.0011	2158	416	2053	200	1949	17	-12.6
F122A-z17	47		1959	400	0.204	99.23	94.84	5.995	1.270	0.3655	0.0774	0.99910	0.1190	0.0011	2008	365	1975	184	1941	17	-4.0
F122A-z17	48		2004	432	0.216	99.22	94.86	5.917	1.200	0.3559	0.0723	0.99900	0.1210	0.0011	1963	344	1964	177	1965	16	0.1
F122A-z17	49		2063	440	0.213	99.24	94.95	6.240	1.360	0.3790	0.0824	0.99920	0.1190	0.0011	2072	385	2010	190	1947	16	-7.5
F122A-z17	50		2124	454	0.214	99.4	95.97	6.217	1.360	0.3788	0.0831	0.99930	0.1190	0.0010	2071	388	2007	192	1942	15	-7.7
F122A-z17	51		2182	488	0.223	99.5	96.69	6.186	1.300	0.3689	0.0773	0.99920	0.1220	0.0010	2024	364	2003	183	1980	15	-2.6
F122A-z17	52		2310	545	0.236	99.56	97.06	6.189	1.320	0.3717	0.0790	0.99930	0.1210	0.0010	2037	371	2003	186	1968	14	-4.1
F122A-z17	53		2261	538	0.238	99.57	97.06	6.402	1.410	0.3892	0.0854	0.99930	0.1190	0.0010	2119	396	2033	193	1946	14	-10.4
F122A-z17	54		2403	572	0.238	99.63	97.48	5.781	1.170	0.3551	0.0717	0.99930	0.1180	0.0009	1959	341	1944	175	1927	14	-1.9
F122A-z17	55		2561	659	0.257	99.79	98.6	6.194	1.320	0.3742	0.0797	0.99940	0.1200	0.0009	2049	374	2004	186	1957	13	-5.5
F122A-z17	56		2508	627	0.250	99.84	98.87	5.607	1.080	0.3409	0.0656	0.99930	0.1190	0.0009	1891	315	1917	166	1946	13	3.3
F122A-z17	57		2491	646	0.259	99.83	98.84	6.063	1.250	0.3707	0.0762	0.99940	0.1190	0.0009	2033	358	1985	179	1935	13	-5.9
F122A-z17	58		2403	598	0.249	99.88	99.15	6.239	1.280	0.3849	0.0791	0.99940	0.1180	0.0009	2099	368	2010	180	1920	13	-10.9
F122A-z17	59		2625	657	0.251	99.88	99.13	6.082	1.270	0.3744	0.0781	0.99940	0.1180	0.0008	2050	366	1988	182	1923	13	-7.7
Sample F122A, zircon 18: Type 1A																					
F122A-z18	1		1698	434	0.256	90.34	55.82	2.078	0.417	0.1348	0.0263	0.97920	0.1120	0.0046	815	150	1142	137	1830	74	59.0
F122A-z18	2		1038	128	0.123	95.43	73.31	3.307	0.685	0.2200	0.0452	0.99240	0.1090	0.0028	1282	239	1483	162	1783	46	30.9
F122A-z18	3		817	57	0.069	97.78	85.38	3.957	0.787	0.2617	0.0518	0.99530	0.1100	0.0021	1498	265	1625	161	1794	35	18.4
F122A-z18	4		689	31	0.046	98.77	91.57	4.214	0.790	0.2734	0.0511	0.99600	0.1120	0.0019	1558	259	1677	154	1829	31	16.7
F122A-z18	**5**	*	**628**	**25**	**0.040**	**99.12**	**93.82**	**4.602**	**0.909**	**0.2993**	**0.0590**	**0.99660**	**0.1110**	**0.0018**	**1688**	**293**	**1750**	**165**	**1824**	**30**	**8.5**
F122A-z18	**6**	*	**566**	**17**	**0.030**	**99.38**	**95.53**	**4.829**	**0.965**	**0.3176**	**0.0634**	**0.99670**	**0.1100**	**0.0018**	**1778**	**310**	**1790**	**168**	**1804**	**30**	**1.7**
F122A-z18	**7**	*	**530**	**13**	**0.025**	**99.36**	**95.39**	**4.991**	**1.020**	**0.3269**	**0.0670**	**0.99670**	**0.1110**	**0.0018**	**1823**	**325**	**1818**	**174**	**1811**	**30**	**-0.8**
F122A-z18	**8**	*	**495**	**12**	**0.024**	**99.69**	**97.79**	**5.217**	**1.080**	**0.3338**	**0.0688**	**0.99720**	**0.1130**	**0.0018**	**1857**	**333**	**1855**	**176**	**1854**	**28**	**-0.2**
F122A-z18	**9**	*	**478**	**8**	**0.017**	**99.73**	**98.02**	**4.844**	**0.918**	**0.3123**	**0.0591**	**0.99660**	**0.1120**	**0.0018**	**1752**	**290**	**1793**	**160**	**1840**	**28**	**5.5**
F122A-z18	**10**	*	**497**	**9**	**0.017**	**99.76**	**98.26**	**5.226**	**1.120**	**0.3393**	**0.0726**	**0.99740**	**0.1120**	**0.0017**	**1883**	**350**	**1857**	**183**	**1828**	**28**	**-3.5**
F122A-z18	**11**	*	**484**	**7**	**0.015**	**99.89**	**99.17**	**5.226**	**1.080**	**0.3413**	**0.0703**	**0.99730**	**0.1110**	**0.0017**	**1893**	**338**	**1857**	**176**	**1817**	**27**	**-4.8**
F122A-z18	**12**	*	**492**	**8**	**0.015**	**99.83**	**98.78**	**4.946**	**0.951**	**0.3196**	**0.0614**	**0.99690**	**0.1120**	**0.0017**	**1788**	**300**	**1810**	**162**	**1836**	**28**	**3.0**
F122A-z18	**13**	*	**516**	**7**	**0.013**	**99.83**	**98.8**	**5.217**	**1.100**	**0.3334**	**0.0699**	**0.99750**	**0.1130**	**0.0017**	**1855**	**338**	**1855**	**179**	**1856**	**27**	**0.1**
F122A-z18	**14**	*	**516**	**6**	**0.012**	**99.86**	**98.94**	**4.757**	**0.891**	**0.3091**	**0.0578**	**0.99690**	**0.1120**	**0.0017**	**1736**	**285**	**1777**	**157**	**1826**	**27**	**5.6**
F122A-z18	**15**	*	**560**	**7**	**0.012**	**99.9**	**99.24**	**5.309**	**1.160**	**0.3409**	**0.0745**	**0.99790**	**0.1130**	**0.0016**	**1891**	**358**	**1870**	**187**	**1847**	**26**	**-2.8**
F122A-z18	**16**	*	**564**	**5**	**0.009**	**99.9**	**99.25**	**5.218**	**1.120**	**0.3368**	**0.0725**	**0.99790**	**0.1120**	**0.0016**	**1871**	**350**	**1856**	**184**	**1838**	**26**	**-2.1**
F122A-z18	**17**	*	**577**	**4**	**0.007**	**99.92**	**99.39**	**5.231**	**1.110**	**0.3360**	**0.0711**	**0.99790**	**0.1130**	**0.0016**	**1867**	**343**	**1858**	**181**	**1847**	**25**	**-1.3**
F122A-z18	**18**	*	**585**	**4**	**0.007**	**99.96**	**99.69**	**5.149**	**1.090**	**0.3307**	**0.0702**	**0.99800**	**0.1130**	**0.0015**	**1842**	**340**	**1844**	**180**	**1847**	**25**	**0.3**
F122A-z18	**19**	*	**574**	**4**	**0.007**	**99.95**	**99.64**	**5.408**	**1.220**	**0.3472**	**0.0783**	**0.99820**	**0.1130**	**0.0015**	**1921**	**375**	**1886**	**193**	**1848**	**25**	**-4.6**
F122A-z18	**20**	*	**589**	**3**	**0.006**	**99.89**	**99.21**	**5.166**	**1.140**	**0.3383**	**0.0746**	**0.99810**	**0.1110**	**0.0015**	**1879**	**359**	**1847**	**188**	**1812**	**25**	**-4.2**
F122A-z18	**21**	*	**572**	**3**	**0.006**	**99.91**	**99.35**	**4.885**	**0.946**	**0.3105**	**0.0601**	**0.99750**	**0.1140**	**0.0016**	**1743**	**296**	**1800**	**163**	**1866**	**25**	**7.5**
F122A-z18	**22**	*	**578**	**5**	**0.009**	**99.96**	**99.71**	**5.226**	**1.100**	**0.3344**	**0.0705**	**0.99790**	**0.1130**	**0.0015**	**1860**	**340**	**1857**	**180**	**1853**	**25**	**-0.5**
F122A-z18	**23**	*	**588**	**4**	**0.007**	**99.93**	**99.53**	**5.393**	**1.180**	**0.3424**	**0.0748**	**0.99810**	**0.1140**	**0.0016**	**1898**	**359**	**1884**	**187**	**1868**	**25**	**-1.9**
F122A-z18	**24**	*	**573**	**2**	**0.004**	**99.97**	**99.76**	**5.292**	**1.120**	**0.3396**	**0.0719**	**0.99790**	**0.1130**	**0.0015**	**1885**	**346**	**1868**	**181**	**1849**	**25**	**-2.2**
F122A-z18	**25**	*	**567**	**4**	**0.006**	**99.99**	**99.94**	**5.467**	**1.200**	**0.3497**	**0.0766**	**0.99810**	**0.1130**	**0.0015**	**1933**	**366**	**1895**	**188**	**1854**	**24**	**-5.0**
F122A-z18	**26**	*	**549**	**3**	**0.006**	**99.97**	**99.76**	**4.994**	**1.000**	**0.3254**	**0.0653**	**0.99770**	**0.1110**	**0.0015**	**1816**	**318**	**1818**	**170**	**1821**	**25**	**0.3**
F122A-z18	**27**	*	**562**	**3**	**0.006**	**99.96**	**99.7**	**5.322**	**1.130**	**0.3369**	**0.0717**	**0.99790**	**0.1150**	**0.0016**	**1872**	**346**	**1872**	**182**	**1873**	**25**	**0.1**
F122A-z18	**28**	*	**543**	**2**	**0.004**	**99.98**	**99.82**	**5.201**	**1.070**	**0.3310**	**0.0679**	**0.99780**	**0.1140**	**0.0016**	**1843**	**329**	**1853**	**175**	**1864**	**25**	**1.3**
F122A-z18	**29**	*	**540**	**4**	**0.007**	**99.97**	**99.76**	**5.179**	**1.050**	**0.3297**	**0.0669**	**0.99770**	**0.1140**	**0.0016**	**1837**	**324**	**1849**	**173**	**1863**	**25**	**1.6**
F122A-z18	**30**	*	**543**	**2**	**0.004**	**99.97**	**99.75**	**5.249**	**1.110**	**0.3397**	**0.0719**	**0.99790**	**0.1120**	**0.0015**	**1885**	**346**	**1861**	**181**	**1833**	**25**	**-3.3**
F122A-z18	**31**	*	**535**	**2**	**0.004**	**99.99**	**99.94**	**5.124**	**1.050**	**0.3311**	**0.0675**	**0.99770**	**0.1120**	**0.0015**	**1844**	**327**	**1840**	**173**	**1836**	**25**	**-0.5**
F122A-z18	**32**	*	**544**	**3**	**0.005**	**99.97**	**99.75**	**5.506**	**1.210**	**0.3541**	**0.0780**	**0.99800**	**0.1130**	**0.0016**	**1954**	**371**	**1902**	**189**	**1844**	**25**	**-7.0**
F122A-z18	**33**	*	**531**	**2**	**0.004**	**99.97**	**99.75**	**5.236**	**1.080**	**0.3376**	**0.0694**	**0.99770**	**0.1120**	**0.0016**	**1875**	**335**	**1858**	**175**	**1840**	**25**	**-2.2**
F122A-z18	**34**	*	**525**	**2**	**0.004**	**99.98**	**99.88**	**5.432**	**1.150**	**0.3451**	**0.0733**	**0.99790**	**0.1140**	**0.0016**	**1911**	**351**	**1890**	**182**	**1867**	**25**	**-2.7**
F122A-z18	**35**	*	**539**	**3**	**0.006**	**99.96**	**99.69**	**5.224**	**1.070**	**0.3375**	**0.0693**	**0.99770**	**0.1120**	**0.0015**	**1875**	**334**	**1857**	**175**	**1836**	**25**	**-2.4**
F122A-z18	**36**	*	**567**	**3**	**0.006**	**99.98**	**99.88**	**5.484**	**1.210**	**0.3508**	**0.0772**	**0.99810**	**0.1130**	**0.0015**	**1939**	**368**	**1898**	**189**	**1854**	**24**	**-5.3**
F122A-z18	37		553	7	0.013	99.99	99.94	5.426	1.120	0.3399	0.0698	0.99790	0.1160	0.0016	1886	336	1889	176	1892	24	0.4
F122A-z18	38		540	6	0.010	99.98	99.83	5.274	1.050	0.3303	0.0660	0.99770	0.1160	0.0016	1840	320	1865	171	1892	24	3.1
F122A-z18	39		539	12	0.021	99.98	99.83	5.732	1.240	0.3583	0.0775	0.99810	0.1160	0.0016	1974	368	1936	187	1896	24	-4.8
F122A-z18	40		545	11	0.021	99.98	99.88	5.350	1.070	0.3347	0.0671	0.99780	0.1160	0.0016	1861	324	1877	172	1895	24	2.1
F122A-z18	41		553	15	0.028	99.98	99.83	5.305	1.060	0.3354	0.0669	0.99770	0.1150	0.0015	1864	323	1870	170	1876	24	0.7
F122A-z18	42		553	16	0.029	99.94	99.55	5.725	1.240	0.3562	0.0771	0.99810	0.1170	0.0016	1964	366	1935	187	1904	24	-3.7
F122A-z18	43		531	18	0.033	99.97	99.77	5.337	1.060	0.3334	0.0659	0.99770	0.1160	0.0016	1855	319	1875	169	1897	24	2.6
F122A-z18	44		536	23	0.043	100	100	5.455	1.090	0.3389	0.0679	0.99780	0.1170	0.0016	1881	327	1893	172	1907	24	1.6
F122A-z18	45		521	23	0.044	99.99	99.95	5.416	1.070	0.3395	0.0672	0.99770	0.1160	0.0016	1884	323	1887	170	1891	24	0.4
F122A-z18	46		536	28	0.051	99.98	99.89	5.661	1.180	0.3538	0.0736	0.99790	0.1160	0.0016	1953	351	1925	180	1896	24	-3.5
F122A-z18	47		534	31	0.057	99.99	99.95	5.510	1.090	0.3389	0.0670	0.99770	0.1180	0.0016	1882	323	1902	170	1925	24	2.6
F122A-z18	48		526	34	0.065	99.98	99.89	5.643	1.130	0.3464	0.0694	0.99780	0.1180	0.0016	1918	332	1923	173	1928	24	0.6
F122A-z18	49		534	38	0.071	100	100	5.631	1.130	0.3408	0.0683	0.99780	0.1200	0.0016	1891	329	1921	173	1953	24	3.6

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
					^{206}Pb*	^{207}Pb*	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
	cycle	ppm	ppm	ppm																
F122A-z18	50	529	38	0.073	99.99	99.95	5.560	1.080	0.3388	0.0656	0.99760	0.1190	0.0016	1881	316	1910	167	1942	24	3.6
F122A-z18	51	541	44	0.080	99.98	99.89	5.874	1.210	0.3545	0.0732	0.99790	0.1200	0.0016	1956	349	1957	179	1959	24	0.2
F122A-z18	52	533	45	0.085	100	100	5.880	1.220	0.3564	0.0738	0.99800	0.1200	0.0016	1965	351	1958	180	1951	24	-0.8
F122A-z18	53	524	48	0.091	100	100	5.571	1.070	0.3367	0.0644	0.99760	0.1200	0.0016	1871	310	1912	165	1956	24	5.0
F122A-z18	54	524	53	0.102	100	100	5.827	1.190	0.3552	0.0722	0.99790	0.1190	0.0016	1959	344	1950	176	1941	24	-1.1
F122A-z18	55	529	56	0.105	100	100	5.784	1.150	0.3470	0.0691	0.99780	0.1210	0.0016	1920	330	1944	172	1969	24	2.8
F122A-z18	56	518	58	0.112	100	100	5.635	1.090	0.3417	0.0663	0.99770	0.1200	0.0016	1895	319	1921	167	1950	24	3.2
F122A-z18	57	541	57	0.105	100	100	5.935	1.240	0.3583	0.0746	0.99800	0.1200	0.0016	1974	354	1966	181	1958	23	-1.0
F122A-z18	58	537	68	0.127	99.99	99.95	5.348	0.960	0.3198	0.0574	0.99730	0.1210	0.0016	1789	280	1877	154	1975	23	10.8
F122A-z18	59	551	63	0.115	99.98	99.9	5.861	1.180	0.3506	0.0707	0.99790	0.1210	0.0016	1937	337	1956	175	1975	23	2.2
Sample F122A, zircon 19: Type 3																				
F122A-z19	1	657	45	0.068	-20.47	-120.1	-103.0	25.200	-0.2808	0.0703	0.98620	2.6600	0.1104	-2125	631	NaN	-251	6579	56	84.2
F122A-z19	2	514	15	0.030	75.13	11.83	1.667	0.676	0.3289	0.0927	0.72460	0.0368	0.0103	1833	450	996	258	-1	0	NaN
F122A-z19	3	392	9	0.024	94.05	66.15	9.161	3.750	0.6493	0.2640	0.99500	0.1020	0.0042	3225	1030	2354	374	1667	75	-120.0
F122A-z19	4	491	7	0.014	98.02	86.83	6.343	1.710	0.4177	0.1120	0.99630	0.1100	0.0025	2250	511	2024	237	1802	42	-29.5
F122A-z19	5	779	0	-0.001	99.09	93.79	6.403	1.980	0.4042	0.1250	0.99870	0.1150	0.0018	2188	575	2033	272	1878	29	-19.5
F122A-z19	6	945	13	0.014	99.54	96.78	5.771	1.580	0.3653	0.0997	0.99880	0.1150	0.0015	2007	471	1942	236	1874	24	-8.2
F122A-z19	7	1274	140	0.110	99.75	98.35	5.704	1.490	0.3272	0.0854	0.99920	0.1260	0.0014	1825	415	1932	226	2049	19	12.6
F122A-z19	8	1324	198	0.150	99.72	98.18	6.482	1.800	0.3728	0.1040	0.99930	0.1260	0.0013	2043	487	2043	245	2044	18	0.1
F122A-z19	9	1262	264	0.209	99.73	98.28	6.730	1.830	0.3868	0.1050	0.99930	0.1260	0.0013	2108	488	2077	240	2046	18	-3.5
F122A-z19	10	1262	297	0.235	99.79	98.66	6.596	1.700	0.3763	0.0972	0.99920	0.1270	0.0013	2059	455	2059	228	2059	18	0.0
F122A-z19	11	1199	309	0.258	99.67	97.9	7.231	1.990	0.4151	0.1140	0.99930	0.1260	0.0013	2238	521	2140	246	2048	19	-11.0
F122A-z19	12	1127	300	0.266	99.57	97.25	7.161	1.910	0.4113	0.1100	0.99920	0.1260	0.0014	2221	501	2132	238	2047	19	-10.0
F122A-z19	13	1067	286	0.268	99.67	97.91	6.995	1.740	0.3971	0.0989	0.99900	0.1280	0.0014	2156	456	2111	221	2068	19	-5.0
F122A-z19	14	989	257	0.260	99.56	97.19	7.049	1.780	0.4048	0.1020	0.99900	0.1260	0.0015	2191	469	2118	225	2047	20	-8.3
F122A-z19	15	949	244	0.257	99.46	96.55	6.741	1.590	0.3867	0.0909	0.99870	0.1260	0.0015	2108	422	2078	208	2049	21	-3.3
F122A-z19	16	932	245	0.263	99.6	97.42	7.194	1.810	0.4117	0.1040	0.99890	0.1270	0.0015	2223	473	2136	225	2053	21	-9.8
F122A-z19	17	881	218	0.248	99.68	97.97	6.874	1.610	0.3933	0.0922	0.99870	0.1270	0.0015	2138	427	2095	208	2054	21	-4.8
F122A-z19	18	845	228	0.270	99.72	98.2	7.209	1.750	0.4104	0.0994	0.99880	0.1270	0.0015	2217	454	2138	216	2063	21	-8.8
F122A-z19	19	787	206	0.262	99.79	98.65	7.329	1.760	0.4164	0.0997	0.99870	0.1280	0.0015	2244	454	2152	214	2066	21	-10.2
F122A-z19	20	770	194	0.252	99.8	98.72	7.535	1.850	0.4266	0.1050	0.99870	0.1280	0.0016	2290	473	2177	220	2072	22	-12.5
F122A-z19	21	733	180	0.246	99.81	98.77	7.175	1.680	0.4125	0.0964	0.99850	0.1260	0.0016	2226	440	2133	208	2045	22	-10.5
F122A-z19	22	670	164	0.245	99.83	98.9	6.817	1.470	0.3928	0.0846	0.99820	0.1260	0.0016	2136	391	2088	191	2041	23	-5.5
F122A-z19	23	633	154	0.243	99.87	99.13	7.485	1.780	0.4259	0.1010	0.99850	0.1270	0.0017	2287	457	2171	213	2063	23	-12.9
F122A-z19	24	612	143	0.234	99.88	99.2	7.313	1.680	0.4156	0.0952	0.99830	0.1280	0.0017	2241	434	2150	205	2065	24	-10.1
F122A-z19	25	563	133	0.237	99.86	99.08	7.049	1.480	0.3972	0.0835	0.99780	0.1290	0.0018	2156	385	2118	187	2080	24	-4.3
F122A-z19	26	558	137	0.245	99.86	99.08	7.199	1.610	0.4175	0.0934	0.99810	0.1250	0.0017	2249	425	2136	200	2030	25	-12.8
F122A-z19	27	557	123	0.221	99.84	99.01	7.653	1.800	0.4302	0.1010	0.99820	0.1290	0.0018	2307	455	2191	211	2085	25	-12.6
F122A-z19	28	513	123	0.240	99.92	99.5	6.882	1.440	0.3962	0.0831	0.99760	0.1260	0.0018	2151	383	2096	186	2043	26	-6.2
F122A-z19	29	488	118	0.242	99.91	99.43	7.224	1.570	0.4115	0.0893	0.99770	0.1270	0.0019	2222	408	2139	194	2061	26	-9.2
F122A-z19	30	463	118	0.254	99.92	99.47	7.134	1.520	0.4053	0.0862	0.99750	0.1280	0.0019	2193	395	2128	190	2066	26	-7.3
Sample F122A, zircon 20: Type 2A																				
F122A-z20	1	701	81	0.115	77.41	18.81	2.472	0.646	0.3203	0.0670	0.82600	0.0560	0.0083	1791	327	1264	189	451	327	-341.9
F122A-z20	2	516	31	0.059	91.76	58.59	5.632	1.180	0.3883	0.0799	0.98180	0.1050	0.0042	2115	371	1921	181	1718	73	-27.1
F122A-z20	3	496	13	0.026	95.55	73.88	6.017	1.230	0.4002	0.0811	0.98990	0.1090	0.0032	2170	373	1978	178	1784	53	-25.5
F122A-z20	4	495	8	0.017	97.31	82.86	6.538	1.380	0.4289	0.0898	0.99370	0.1110	0.0026	2301	405	2051	185	1808	43	-32.5
F122A-z20	5	499	8	0.016	98.11	87.27	6.554	1.360	0.4353	0.0897	0.99470	0.1090	0.0023	2330	403	2053	182	1786	39	-36.4
F122A-z20	6	507	7	0.014	98.81	91.9	7.633	1.700	0.4894	0.1090	0.99650	0.1130	0.0021	2568	470	2189	200	1850	34	-47.2
F122A-z20	7	602	8	0.013	99.26	94.91	7.313	1.640	0.4601	0.1030	0.99740	0.1150	0.0019	2440	456	2150	201	1884	29	-35.6
F122A-z20	8	680	6	0.009	99.47	96.26	6.786	1.490	0.4312	0.0944	0.99780	0.1140	0.0017	2311	425	2084	194	1866	26	-28.5
F122A-z20	9	786	7	0.009	99.56	96.95	7.566	1.930	0.4739	0.1210	0.99860	0.1160	0.0015	2501	528	2181	229	1892	24	-38.9
F122A-z20	10	818	12	0.014	99.55	96.84	6.747	1.550	0.4283	0.0982	0.99840	0.1140	0.0015	2298	443	2079	203	1868	23	-27.4
F122A-z20	11	863	12	0.014	99.59	97.14	7.189	1.760	0.4533	0.1110	0.99870	0.1150	0.0014	2410	491	2135	218	1880	22	-33.9
F122A-z20	12	919	13	0.014	99.62	97.36	7.079	1.670	0.4460	0.1050	0.99870	0.1150	0.0014	2377	467	2121	209	1882	22	-31.5
F122A-z20	13	965	14	0.015	99.63	97.4	6.668	1.480	0.4208	0.0936	0.99860	0.1150	0.0013	2264	425	2068	196	1879	21	-24.3
F122A-z20	14	960	19	0.020	99.77	98.37	6.886	1.530	0.4289	0.0950	0.99870	0.1160	0.0013	2301	428	2097	196	1902	20	-25.0
F122A-z20	15	984	21	0.021	99.76	98.35	7.088	1.610	0.4403	0.1000	0.99890	0.1170	0.0013	2352	448	2122	203	1907	19	-27.9
F122A-z20	16	1023	24	0.024	99.85	98.92	7.116	1.650	0.4468	0.1040	0.99900	0.1150	0.0012	2381	462	2126	207	1888	19	-31.3
F122A-z20	17	1051	28	0.026	99.81	98.69	6.870	1.530	0.4269	0.0951	0.99890	0.1170	0.0012	2292	430	2095	197	1907	19	-24.0
F122A-z20	18	1134	31	0.027	99.79	98.54	6.980	1.640	0.4331	0.1010	0.99910	0.1170	0.0012	2320	456	2109	208	1909	18	-25.7
F122A-z20	19	1188	34	0.028	99.79	98.55	6.763	1.530	0.4162	0.0940	0.99910	0.1180	0.0012	2243	428	2081	200	1924	18	-19.7
F122A-z20	20	1279	43	0.033	99.85	98.96	7.240	1.850	0.4438	0.1130	0.99930	0.1180	0.0011	2367	506	2141	228	1931	17	-27.1
F122A-z20	21	1280	44	0.035	99.88	99.19	7.083	1.760	0.4294	0.1070	0.99930	0.1200	0.0011	2303	481	2122	221	1951	17	-21.5
F122A-z20	22	1213	47	0.039	99.9	99.3	7.446	1.880	0.4512	0.1140	0.99930	0.1200	0.0011	2401	507	2167	226	1952	17	-27.6
F122A-z20	23	1186	50	0.042	99.89	99.24	7.598	1.980	0.4608	0.1200	0.99930	0.1200	0.0011	2443	530	2185	234	1950	17	-30.5
F122A-z20	24	1169	53	0.045	99.89	99.23	7.413	1.870	0.4500	0.1130	0.99930	0.1190	0.0011	2395	503	2163	225	1948	17	-27.6
F122A-z20	25	1191	49	0.041	99.91	99.36	7.659	2.020	0.4624	0.1220	0.99940	0.1200	0.0011	2450	539	2192	237	1958	17	-30.3
F122A-z20	26	1188	60	0.051	99.93	99.55	7.683	2.050	0.4682	0.1250	0.99940	0.1190	0.0011	2476	549	2195	240	1941	17	-33.3
F122A-z20	27	1258	59	0.047	99.91	99.4	8.346	2.400	0.5089	0.1460	0.99950	0.1190	0.0011	2652	625	2269	261	1940	16	-45.0
F122A-z20	28	1463	74	0.051	99.92	99.46	7.384	1.980	0.4441	0.1190	0.99950	0.1210	0.0010	2369	531	2159	240	1965	15	-24.6
F122A-z20	29	1632	83	0.051	99.94	99.6	7.463	2.070	0.4424	0.1230	0.99960	0.1220	0.0010	2361	548	2169	248	1991	14	-22.2
F122A-z20	30	1771	92	0.052	99.94	99.58	7.554	2.160	0.4523	0.1290	0.99960	0.1210	0.0009	2406	573	2179	256	1973	14	-26.3
F122A-z20	31	1819	90	0.049	99.94	99.61	7.285	1.980	0.4370	0.1190	0.99960	0.1210	0.0009	2337	533	2147	243	1970	13	-22.2
F122A-z20	32	1896	100	0.053	99.96	99.74	7.330	1.990	0.4371	0.1190	0.99960	0.1220	0.0009	2338	533	2152	243	1980	13	-21.6
F122A-z20	33	1985	105	0.053	99.94	99.57	7.280	1.970	0.4348	0.1180	0.99960	0.1210	0.0009	2327	529	2146	242	1978	13	-21.0
F122A-z20	34	1961	106	0.054	99.95	99.67	7.007	1.800	0.4224	0.1090	0.99960	0.1200	0.0009	2271	492	2112	228	1961	13	-18.8
F122A-z20	35	2007	113	0.056	99.95	99.66	7.361	2.010	0.4433	0.1210	0.99970	0.1200	0.0009	2365	540	2156	244	1963	13	-24.5
F122A-z20	36	2006	123	0.061	99.95	99.63	7.179	1.900	0.4308	0.1140	0.99960	0.1210	0.0009	2309	513	2134	236	1969	13	-20.6
F122A-z20	37	2010	113	0.056	99.95	99.65	7.372	1.970	0.4381	0.1170	0.99970	0.1220	0.0009	2342	525	2158	239	1986	13	-21.4
F122A-z20	38	1957	117	0.060	99.95	99.66	6.987	1.740	0.4175	0.1040	0.99960	0.1210	0.0009	2249	473	2110	221	1977	13	-16.3

Grain	Mass cycle	U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
F122A-z20	39	1993	131	0.066	99.95	99.67	7.132	1.830	0.4281	0.1100	0.99960	0.1210	0.0008	2297	496	2128	229	1968	13	-19.9
F122A-z20	40	1992	126	0.063	99.98	99.85	7.380	1.960	0.4395	0.1160	0.99970	0.1220	0.0008	2348	522	2159	237	1983	12	-22.0
F122A-z20	41	1975	135	0.068	99.98	99.87	7.172	1.830	0.4273	0.1090	0.99960	0.1220	0.0008	2294	492	2133	227	1982	12	-18.7
F122A-z20	42	1994	137	0.069	99.97	99.8	7.108	1.800	0.4232	0.1070	0.99960	0.1220	0.0008	2275	486	2125	226	1983	12	-17.5
F122A-z20	43	2010	136	0.068	99.97	99.83	7.059	1.780	0.4214	0.1060	0.99960	0.1210	0.0008	2267	482	2119	224	1978	12	-17.4
F122A-z20	44	2000	150	0.075	99.97	99.83	7.066	1.780	0.4220	0.1070	0.99960	0.1210	0.0008	2270	483	2120	225	1978	12	-17.5
F122A-z20	45	2000	145	0.072	99.98	99.84	7.190	1.850	0.4308	0.1110	0.99960	0.1210	0.0008	2309	499	2135	229	1972	12	-20.4
F122A-z20	46	1949	153	0.079	99.97	99.79	6.991	1.720	0.4190	0.1030	0.99960	0.1210	0.0008	2256	468	2110	218	1971	12	-17.2
F122A-z20	47	1961	158	0.081	99.95	99.67	6.853	1.660	0.4080	0.0988	0.99960	0.1220	0.0008	2206	452	2093	215	1983	12	-13.3
F122A-z20	48	2003	161	0.080	99.97	99.79	6.807	1.620	0.4049	0.0965	0.99960	0.1220	0.0008	2191	443	2087	211	1985	12	-12.3
F122A-z20	49	1988	166	0.083	99.96	99.71	6.641	1.550	0.3981	0.0928	0.99960	0.1210	0.0008	2160	428	2065	206	1971	13	-11.3
F122A-z20	50	1915	170	0.089	99.94	99.61	6.978	1.700	0.4173	0.1020	0.99960	0.1210	0.0009	2248	463	2109	217	1975	13	-16.4
F122A-z20	51	1847	164	0.089	99.96	99.73	6.609	1.510	0.3981	0.0909	0.99950	0.1200	0.0009	2160	419	2061	201	1962	13	-11.9
F122A-z20	52	1834	159	0.086	99.96	99.73	6.893	1.630	0.4109	0.0974	0.99950	0.1220	0.0009	2219	445	2098	210	1981	13	-14.2
F122A-z20	53	1738	152	0.088	99.97	99.77	6.848	1.600	0.4090	0.0955	0.99950	0.1210	0.0009	2210	437	2092	207	1977	13	-14.0
F122A-z20	54	1751	162	0.092	99.97	99.82	6.951	1.670	0.4131	0.0991	0.99950	0.1220	0.0009	2229	452	2105	213	1986	13	-14.5
F122A-z20	55	1779	163	0.092	99.96	99.72	6.689	1.530	0.4008	0.0919	0.99950	0.1210	0.0009	2173	423	2071	202	1972	13	-12.0
F122A-z20	56	1827	186	0.102	99.96	99.75	6.550	1.470	0.3893	0.0872	0.99950	0.1220	0.0009	2120	405	2053	197	1986	13	-7.9
F122A-z20	57	1754	185	0.106	99.98	99.84	6.660	1.520	0.3998	0.0910	0.99950	0.1210	0.0009	2168	419	2067	201	1968	13	-12.0
F122A-z20	58	1734	180	0.104	99.98	99.89	6.586	1.480	0.3931	0.0885	0.99950	0.1220	0.0009	2137	410	2057	198	1979	13	-9.4
F122A-z20	59	1786	204	0.114	99.98	99.89	6.592	1.490	0.3940	0.0889	0.99950	0.1210	0.0009	2141	411	2058	199	1976	13	-9.8
Sample S162A, zircon 1: Type 3																				
S162A-z1	1	815	62	0.075	62.51	19.27	1.681	0.471	0.1029	0.0161	0.70190	0.1190	0.0241	631	94	1002	178	1934	364	70.6
S162A-z1	2	506	33	0.066	72.68	25.69	1.955	0.530	0.1317	0.0250	0.77760	0.1080	0.0185	798	143	1100	182	1760	314	58.0
S162A-z1	3	379	19	0.049	82.21	37.26	2.318	0.582	0.1580	0.0324	0.85790	0.1060	0.0138	946	180	1218	178	1739	237	49.0
S162A-z1	4	344	18	0.052	87.07	46.67	3.012	0.841	0.2029	0.0516	0.92810	0.1080	0.0112	1191	276	1411	213	1760	190	35.4
S162A-z1	5	362	13	0.036	89.23	51.88	3.060	0.888	0.2058	0.0559	0.94840	0.1080	0.0099	1207	299	1423	222	1763	168	34.6
S162A-z1	6	369	13	0.035	92.85	64.75	3.359	0.889	0.2080	0.0531	0.96970	0.1170	0.0076	1218	283	1495	207	1913	116	39.8
S162A-z1	7	412	12	0.030	95.35	74.87	3.628	0.991	0.2189	0.0587	0.98320	0.1200	0.0060	1276	310	1556	217	1959	89	38.4
S162A-z1	8	448	14	0.030	95.67	74.38	3.427	0.989	0.2285	0.0647	0.98390	0.1090	0.0056	1326	340	1511	227	1779	94	28.1
S162A-z1	9	453	13	0.028	95.84	73.86	3.423	1.030	0.2443	0.0719	0.98440	0.1020	0.0054	1409	373	1510	235	1654	98	16.5
S162A-z1	10	466	11	0.023	97.17	81.46	4.046	1.360	0.2771	0.0920	0.99200	0.1060	0.0045	1577	465	1643	273	1730	78	10.0
S162A-z1	11	441	9	0.020	97.4	83.11	3.720	1.060	0.2477	0.0697	0.99030	0.1090	0.0043	1427	360	1576	227	1782	72	22.2
S162A-z1	12	510	8	0.016	97.49	83.81	4.423	1.630	0.2904	0.1070	0.99470	0.1100	0.0042	1643	533	1717	306	1807	69	10.2
S162A-z1	13	510	10	0.020	97.96	86.79	4.251	1.400	0.2726	0.0896	0.99460	0.1130	0.0039	1554	454	1684	271	1850	62	18.0
S162A-z1	14	456	12	0.025	98.18	88.33	3.973	1.080	0.2478	0.0671	0.99280	0.1160	0.0038	1427	347	1629	221	1900	59	27.7
S162A-z1	15	441	9	0.021	98.23	88.73	4.501	1.360	0.2777	0.0833	0.99420	0.1180	0.0038	1580	420	1731	251	1919	58	19.9
S162A-z1	16	385	10	0.026	97.89	86.74	3.432	0.737	0.2133	0.0453	0.98650	0.1170	0.0041	1246	240	1512	169	1906	63	38.0
S162A-z1	17	378	7	0.020	98.04	88.09	4.469	1.180	0.2646	0.0695	0.99200	0.1220	0.0041	1514	354	1725	219	1992	59	26.9
S162A-z1	18	366	10	0.028	98.82	92.76	4.257	0.992	0.2427	0.0562	0.99230	0.1270	0.0037	1401	292	1685	192	2060	51	35.5
S162A-z1	19	369	9	0.025	98.65	91.82	4.639	1.170	0.2639	0.0664	0.99300	0.1270	0.0038	1510	339	1756	211	2063	53	30.0
S162A-z1	20	372	10	0.026	98.66	91.82	4.846	1.290	0.2774	0.0733	0.99370	0.1270	0.0038	1578	370	1793	223	2052	53	26.0
S162A-z1	21	368	11	0.030	98.79	92.79	4.626	1.080	0.2558	0.0597	0.99250	0.1310	0.0038	1468	306	1754	196	2114	50	34.1
S162A-z1	22	386	11	0.028	99.1	94.7	5.347	1.440	0.2888	0.0775	0.99510	0.1340	0.0036	1635	388	1876	230	2155	47	27.3
S162A-z1	23	358	12	0.033	98.62	92.07	4.505	0.972	0.2438	0.0523	0.99090	0.1340	0.0039	1406	271	1732	179	2151	51	38.4
S162A-z1	24	372	9	0.024	98.59	92.14	4.621	1.000	0.2410	0.0520	0.99150	0.1390	0.0039	1392	270	1753	181	2215	49	41.2
S162A-z1	25	387	12	0.030	98.97	94	4.715	1.060	0.2520	0.0562	0.99280	0.1360	0.0036	1449	290	1770	188	2173	47	37.1
S162A-z1	26	394	8	0.021	98.94	94.02	4.614	0.968	0.2400	0.0501	0.99210	0.1390	0.0037	1387	260	1752	175	2220	46	41.6
S162A-z1	27	417	11	0.026	98.94	94.18	4.882	1.080	0.2463	0.0544	0.99340	0.1440	0.0037	1419	281	1799	187	2273	44	41.7
S162A-z1	28	450	13	0.029	98.96	94.35	4.988	1.180	0.2488	0.0585	0.99460	0.1450	0.0036	1432	302	1817	200	2293	42	41.8
S162A-z1	29	449	11	0.024	98.63	92.57	4.587	1.010	0.2322	0.0510	0.99320	0.1430	0.0037	1346	267	1747	184	2267	44	44.9
S162A-z1	30	484	14	0.028	98.81	93.57	4.227	0.891	0.2104	0.0442	0.99330	0.1460	0.0035	1231	235	1679	173	2296	42	50.8
S162A-z1	31	525	17	0.032	98.96	94.21	3.931	0.819	0.2009	0.0417	0.99370	0.1420	0.0033	1180	224	1620	169	2251	41	51.9
S162A-z1	32	588	14	0.024	98.94	94.25	4.380	1.080	0.2178	0.0537	0.99580	0.1460	0.0033	1270	284	1709	204	2298	39	49.2
S162A-z1	33	581	18	0.032	99.29	96.16	3.763	0.755	0.1852	0.0370	0.99440	0.1470	0.0031	1095	202	1585	161	2316	36	57.2
S162A-z1	34	629	15	0.024	99.29	96.04	3.792	0.816	0.1900	0.0408	0.99520	0.1450	0.0030	1122	221	1591	173	2284	36	55.3
S162A-z1	35	686	21	0.030	99.21	95.67	3.777	0.852	0.1885	0.0424	0.99560	0.1450	0.0031	1113	230	1588	181	2292	36	55.9
S162A-z1	36	693	15	0.021	99.3	96.22	3.789	0.840	0.1842	0.0407	0.99570	0.1490	0.0031	1090	222	1591	178	2337	35	57.9
S162A-z1	37	720	16	0.022	99.38	96.71	3.937	0.937	0.1882	0.0447	0.99650	0.1520	0.0030	1111	242	1621	193	2366	34	57.6
S162A-z1	38	723	22	0.030	99.11	95.13	3.685	0.851	0.1846	0.0425	0.99590	0.1450	0.0030	1092	231	1568	184	2285	36	56.6
S162A-z1	39	767	14	0.019	99.35	96.42	3.574	0.826	0.1784	0.0412	0.99630	0.1450	0.0029	1058	225	1544	183	2291	34	58.2
S162A-z1	40	792	18	0.023	99.12	95.18	3.446	0.801	0.1723	0.0399	0.99610	0.1450	0.0030	1025	220	1515	183	2288	35	59.6
S162A-z1	41	861	23	0.026	98.93	94.29	3.719	0.939	0.1827	0.0460	0.99670	0.1480	0.0030	1082	251	1576	202	2319	35	57.8
Sample S162A, zircon 4: Type 1A																				
S162A-z4	1	166	6	0.035	86.4	47.96	5.804	1.280	0.3502	0.0675	0.89390	0.1200	0.0119	1935	322	1947	192	1959	177	1.4
S162A-z4	2	174	3	0.018	95.85	73.1	4.701	1.370	0.3504	0.0989	0.97200	0.0973	0.0066	1936	472	1767	244	1573	128	-26.8
S162A-z4	**3 ***	**176**	**2**	**0.014**	**97.96**	**85.55**	**3.664**	**0.897**	**0.2603**	**0.0624**	**0.97840**	**0.1020**	**0.0052**	**1492**	**319**	**1564**	**195**	**1662**	**94**	**11.5**
S162A-z4	**4 ***	**200**	**3**	**0.013**	**98.7**	**90.82**	**4.616**	**1.510**	**0.3109**	**0.1010**	**0.99170**	**0.1080**	**0.0045**	**1745**	**498**	**1752**	**274**	**1761**	**77**	**1.1**
S162A-z4	**5 ***	**186**	**3**	**0.018**	**99.14**	**93.71**	**4.027**	**1.090**	**0.2721**	**0.0731**	**0.98980**	**0.1070**	**0.0041**	**1552**	**371**	**1640**	**220**	**1755**	**71**	**13.1**
S162A-z4	**6 ***	**183**	**2**	**0.012**	**99.16**	**93.63**	**3.959**	**1.140**	**0.2773**	**0.0790**	**0.99050**	**0.1040**	**0.0041**	**1578**	**399**	**1626**	**233**	**1689**	**73**	**7.4**
S162A-z4	**7 ***	**183**	**1**	**0.008**	**99.53**	**96.55**	**4.268**	**1.220**	**0.2810**	**0.0797**	**0.99240**	**0.1100**	**0.0039**	**1596**	**401**	**1687**	**235**	**1802**	**64**	**12.9**
S162A-z4	**8 ***	**198**	**3**	**0.016**	**99.19**	**94.24**	**4.379**	**1.340**	**0.2856**	**0.0870**	**0.99220**	**0.1110**	**0.0042**	**1620**	**436**	**1708**	**253**	**1819**	**69**	**12.4**
S162A-z4	9	193	4	0.018	99.38	95.46	3.952	1.130	0.2621	0.0743	0.99150	0.1090	0.0041	1500	380	1624	231	1789	68	18.1
S162A-z4	**10 ***	**192**	**3**	**0.014**	**99.77**	**98.34**	**4.966**	**1.740**	**0.3212**	**0.1120**	**0.99550**	**0.1120**	**0.0037**	**1795**	**547**	**1814**	**295**	**1834**	**60**	**2.4**
S162A-z4	**11 ***	**199**	**2**	**0.009**	**99.76**	**98.23**	**4.950**	**1.800**	**0.3196**	**0.1160**	**0.99570**	**0.1120**	**0.0038**	**1788**	**567**	**1811**	**307**	**1837**	**61**	**3.0**
S162A-z4	**12 ***	**192**	**4**	**0.022**	**99.82**	**98.65**	**4.571**	**1.560**	**0.3017**	**0.1030**	**0.99510**	**0.1100**	**0.0037**	**1700**	**510**	**1744**	**285**	**1797**	**62**	**6.1**
S162A-z4	**13 ***	**176**	**3**	**0.015**	**99.35**	**95.41**	**4.343**	**1.390**	**0.2810**	**0.0895**	**0.99240**	**0.1120**	**0.0044**	**1596**	**450**	**1702**	**264**	**1834**	**71**	**14.6**
S162A-z4	**14 ***	**182**	**2**	**0.013**	**99.38**	**95.35**	**4.654**	**1.780**	**0.3195**	**0.1220**	**0.99430**	**0.1060**	**0.0043**	**1787**	**596**	**1759**	**320**	**1726**	**75**	**-4.0**
S162A-z4	**15 ***	**173**	**2**	**0.011**	**99.59**	**96.93**	**4.295**	**1.430**	**0.2881**	**0.0958**	**0.99320**	**0.1080**	**0.0042**	**1632**	**479**	**1692**	**275**	**1768**	**71**	**8.7**
S162A-z4	16	181	3	0.018	99.14	93.46	5.323	2.490	0.3759	0.1750	0.99530	0.1030	0.0047	2057	822	1873	400	1674	84	-26.7

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
	cycle		ppm	ppm	ppm	^{206}Pb*	^{207}Pb*	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.		
S162A-z4	**17**	*	**163**	**2**	**0.012**	**99.33**	**95.11**	**4.588**	**1.670**	**0.3048**	**0.1100**	**0.99310**	**0.1090**	**0.0047**	**1715**	**545**	**1747**	**303**	**1786**	**78**		**4.5**
S162A-z4	**18**	*	**164**	**1**	**0.007**	**99.55**	**96.77**	**4.439**	**1.540**	**0.2841**	**0.0985**	**0.99340**	**0.1130**	**0.0045**	**1612**	**494**	**1720**	**288**	**1853**	**72**		**14.7**
S162A-z4	**19**	*	**163**	**2**	**0.014**	**99.06**	**92.98**	**4.628**	**1.820**	**0.3206**	**0.1250**	**0.99250**	**0.1050**	**0.0050**	**1793**	**611**	**1754**	**328**	**1709**	**89**		**-5.6**
S162A-z4	20		173	1	0.007	98.8	91.65	6.950	4.200	0.4552	0.2740	0.99670	0.1110	0.0055	2418	1210	2105	536	1812	90		-40.2
S162A-z4	**21**	*	**160**	**2**	**0.012**	**98.61**	**89.67**	**3.920**	**1.380**	**0.2801**	**0.0974**	**0.98750**	**0.1010**	**0.0056**	**1592**	**490**	**1618**	**284**	**1652**	**103**		**4.1**
S162A-z4	**22**	*	**155**	**2**	**0.012**	**99.09**	**93.61**	**5.281**	**2.260**	**0.3445**	**0.1470**	**0.99400**	**0.1110**	**0.0052**	**1908**	**705**	**1866**	**366**	**1819**	**86**		**-5.7**
S162A-z4	**23**	*	**161**	**1**	**0.007**	**99.16**	**93.86**	**5.025**	**2.180**	**0.3382**	**0.1460**	**0.99410**	**0.1080**	**0.0051**	**1878**	**704**	**1824**	**368**	**1762**	**86**		**-7.6**
S162A-z4	24		163	2	0.014	99.76	98.2	5.900	2.910	0.3912	0.1920	0.99680	0.1090	0.0043	2129	891	1961	428	1789	72		-22.3
S162A-z4	**25**	*	**162**	**1**	**0.006**	**99.16**	**93.76**	**4.977**	**2.200**	**0.3420**	**0.1510**	**0.99410**	**0.1060**	**0.0051**	**1896**	**723**	**1815**	**374**	**1724**	**88**		**-11.5**
S162A-z4	**26**	*	**168**	**1**	**0.008**	**99.07**	**92.98**	**4.866**	**2.180**	**0.3417**	**0.1520**	**0.99380**	**0.1030**	**0.0051**	**1895**	**731**	**1796**	**377**	**1684**	**92**		**-14.5**
S162A-z4	**27**	*	**160**	**1**	**0.006**	**99.24**	**94.38**	**4.646**	**1.880**	**0.3162**	**0.1270**	**0.99330**	**0.1070**	**0.0050**	**1771**	**623**	**1758**	**338**	**1741**	**86**		**-2.0**
S162A-z4	**28**	*	**153**	**1**	**0.005**	**99.06**	**93.17**	**5.167**	**2.320**	**0.3510**	**0.1570**	**0.99400**	**0.1070**	**0.0053**	**1939**	**748**	**1847**	**382**	**1745**	**90**		**-12.9**
S162A-z4	**29**	*	**153**	**0**	**0.002**	**98.78**	**91.3**	**4.057**	**1.410**	**0.2736**	**0.0943**	**0.98840**	**0.1080**	**0.0057**	**1559**	**477**	**1646**	**284**	**1758**	**97**		**12.7**
S162A-z4	**30**	*	**163**	**2**	**0.012**	**99.11**	**93.86**	**5.102**	**2.200**	**0.3247**	**0.1390**	**0.99390**	**0.1140**	**0.0054**	**1813**	**678**	**1836**	**366**	**1863**	**86**		**3.1**
S162A-z4	**31**	*	**164**	**1**	**0.008**	**99.29**	**94.87**	**5.004**	**2.230**	**0.3331**	**0.1480**	**0.99460**	**0.1090**	**0.0051**	**1853**	**714**	**1820**	**377**	**1782**	**85**		**-4.6**
S162A-z4	32		162	1	0.003	99.1	93.62	5.802	2.950	0.3802	0.1930	0.99540	0.1110	0.0054	2077	899	1947	440	1811	88		-17.2
S162A-z4	**33**	*	**164**	**1**	**0.004**	**99.55**	**96.83**	**5.333**	**2.360**	**0.3353**	**0.1480**	**0.99540**	**0.1150**	**0.0049**	**1864**	**714**	**1874**	**378**	**1885**	**76**		**1.3**
S162A-z4	**34**	*	**171**	**1**	**0.003**	**99.73**	**98.09**	**5.068**	**2.220**	**0.3189**	**0.1390**	**0.99590**	**0.1150**	**0.0046**	**1784**	**680**	**1831**	**371**	**1884**	**72**		**6.1**
S162A-z4	35		164	2	0.012	99.74	98.1	6.041	3.050	0.3849	0.1940	0.99690	0.1140	0.0045	2099	903	1982	440	1861	72		-15.0
S162A-z4	36		165	0	0.001	99.82	98.73	6.078	3.070	0.3769	0.1900	0.99710	0.1170	0.0045	2062	890	1987	440	1910	69		-9.3
S162A-z4	37		177	1	0.008	99.74	98.18	6.885	4.140	0.4340	0.2600	0.99790	0.1150	0.0045	2324	1170	2097	533	1881	70		-28.1
S162A-z4	**38**	*	**175**	**1**	**0.006**	**99.39**	**95.67**	**5.314**	**2.420**	**0.3415**	**0.1550**	**0.99540**	**0.1130**	**0.0049**	**1894**	**745**	**1871**	**389**	**1846**	**79**		**-3.0**
S162A-z4	**39**	*	**165**	**1**	**0.006**	**99.74**	**98.12**	**4.499**	**1.650**	**0.2916**	**0.1070**	**0.99410**	**0.1120**	**0.0045**	**1649**	**533**	**1731**	**305**	**1831**	**72**		**11.3**
S162A-z4	40		180	1	0.008	99.74	98.22	6.846	3.940	0.4110	0.2360	0.99780	0.1210	0.0046	2220	1080	2092	509	1968	68		-15.1
S162A-z4	41		180	1	0.008	99.74	98.22	6.196	3.250	0.3739	0.1960	0.99730	0.1200	0.0046	2048	918	2004	458	1959	68		-5.3
S162A-z4	42		179	1	0.004	99.67	97.62	4.776	2.020	0.3083	0.1300	0.99570	0.1120	0.0044	1733	641	1781	355	1838	71		6.6
S162A-z4	43		191	1	0.007	99.59	97.24	5.962	3.020	0.3648	0.1840	0.99710	0.1190	0.0046	2005	871	1970	440	1934	69		-4.3
S162A-z4	44		187	1	0.005	99.69	97.73	5.284	2.380	0.3447	0.1550	0.99630	0.1110	0.0043	1909	743	1866	385	1819	70		-5.7
S162A-z4	45		205	0	0.002	99.47	96.43	6.329	3.330	0.3816	0.2010	0.99730	0.1200	0.0047	2084	936	2022	462	1960	69		-7.4
S162A-z4	46		215	1	0.003	99.55	97.02	8.613	6.120	0.5109	0.3630	0.99860	0.1220	0.0045	2660	1550	2298	646	1990	66		-41.2
S162A-z4	47		227	1	0.005	99.86	99.1	8.716	6.220	0.4988	0.3560	0.99900	0.1270	0.0041	2609	1530	2309	650	2053	58		-33.0
S162A-z4	48		222	1	0.004	99.72	98.17	6.662	3.440	0.3821	0.1970	0.99780	0.1260	0.0043	2086	919	2068	456	2050	60		-2.0
S162A-z4	49		240	1	0.006	99.87	99.22	7.583	4.220	0.4077	0.2270	0.99850	0.1350	0.0042	2204	1040	2183	499	2163	54		-2.2
S162A-z4	50		249	1	0.004	99.45	96.35	6.953	3.950	0.4157	0.2360	0.99810	0.1210	0.0042	2241	1080	2105	505	1976	62		-15.9
S162A-z4	51		266	1	0.005	99.33	95.87	8.790	6.190	0.4911	0.3460	0.99880	0.1300	0.0044	2575	1500	2316	642	2095	60		-27.9
S162A-z4	52		270	4	0.013	99.71	98.26	7.758	4.450	0.4181	0.2400	0.99860	0.1350	0.0041	2252	1090	2203	516	2159	53		-5.1
S162A-z4	53		293	1	0.004	99.51	97.08	9.358	6.410	0.5033	0.3450	0.99900	0.1350	0.0041	2628	1480	2374	629	2162	53		-26.3
S162A-z4	54		281	2	0.006	99.64	97.93	6.849	3.080	0.3558	0.1600	0.99800	0.1400	0.0040	1962	760	2092	399	2223	50		13.6
S162A-z4	55		302	3	0.010	99.86	99.22	8.443	4.360	0.4155	0.2140	0.99870	0.1470	0.0038	2240	977	2280	469	2316	45		3.9
S162A-z4	56		317	2	0.005	99.87	99.28	7.869	3.590	0.3755	0.1710	0.99850	0.1520	0.0038	2055	803	2216	411	2368	43		15.4
S162A-z4	57		334	2	0.007	99.88	99.37	8.873	4.190	0.4016	0.1890	0.99870	0.1600	0.0039	2177	871	2325	430	2458	41		13.5
S162A-z4	58		331	2	0.006	99.89	99.41	8.829	3.970	0.4043	0.1820	0.99860	0.1580	0.0037	2189	834	2320	410	2438	40		12.0
S162A-z4	59		340	2	0.004	99.93	99.63	8.769	3.730	0.3869	0.1650	0.99860	0.1640	0.0037	2109	766	2314	388	2501	38		18.4
Sample S162A, zircon 9: Type 3																						
S162A-z9	1		180	43	0.239	76.63	23.18	4.432	1.640	0.4217	0.1120	0.76470	0.0762	0.0183	2268	507	1718	307	1101	480		-126.4
S162A-z9	2		132	26	0.199	76.74	27.54	4.000	1.180	0.3041	0.0575	0.72010	0.0954	0.0197	1712	284	1634	241	1536	389		-13.0
S162A-z9	3		128	22	0.175	75.06	25.76	3.573	1.090	0.2714	0.0494	0.69250	0.0955	0.0212	1548	250	1544	242	1537	418		-0.8
S162A-z9	4		137	20	0.145	77.7	30.76	4.869	1.470	0.3344	0.0768	0.81380	0.1060	0.0186	1860	371	1797	254	1725	323		-9.0
S162A-z9	5		149	20	0.133	80.4	35.27	4.137	1.050	0.2727	0.0531	0.81970	0.1100	0.0160	1554	269	1662	207	1800	265		15.3
S162A-z9	6		162	21	0.129	83.73	41.31	4.473	1.050	0.2864	0.0564	0.86920	0.1130	0.0132	1624	283	1726	196	1852	211		13.9
S162A-z9	7		194	28	0.143	85.44	41.64	4.120	1.070	0.2967	0.0674	0.89750	0.1010	0.0116	1675	335	1658	212	1638	213		-2.5
S162A-z9	8		214	22	0.105	90.68	59.76	5.693	1.470	0.3267	0.0813	0.96780	0.1260	0.0082	1822	395	1930	223	2048	115		12.6
S162A-z9	9		222	20	0.089	92.63	66.41	6.344	1.710	0.3534	0.0934	0.98060	0.1300	0.0069	1951	445	2025	237	2101	93		8.3
S162A-z9	10		244	25	0.104	94.13	71.83	6.847	1.980	0.3771	0.1080	0.98790	0.1320	0.0059	2063	504	2092	256	2121	79		3.2
S162A-z9	11		265	23	0.085	95.6	78.79	6.711	1.640	0.3434	0.0832	0.98940	0.1420	0.0050	1903	399	2074	216	2248	62		17.7
S162A-z9	12		304	27	0.089	96.41	82.73	8.690	2.800	0.4267	0.1370	0.99540	0.1480	0.0045	2291	619	2306	294	2320	53		1.5
S162A-z9	13		300	26	0.085	95.66	78.9	6.868	1.770	0.3545	0.0908	0.99190	0.1410	0.0046	1956	432	2095	229	2234	57		14.4
S162A-z9	14		330	29	0.088	96.46	83.19	8.110	2.340	0.3914	0.1120	0.99530	0.1500	0.0042	2129	520	2243	260	2349	48		11.0
S162A-z9	15		350	23	0.066	96.71	84.03	8.981	2.870	0.4395	0.1400	0.99650	0.1480	0.0040	2348	626	2336	291	2325	46		-1.2
S162A-z9	16		368	32	0.088	96.82	84.66	8.051	2.260	0.3886	0.1090	0.99580	0.1500	0.0039	2116	505	2237	254	2349	44		11.6
S162A-z9	17		383	34	0.088	96.9	85.19	8.414	2.450	0.4008	0.1160	0.99630	0.1520	0.0038	2173	535	2277	264	2371	43		9.8
S162A-z9	18		403	33	0.081	97.15	86.22	9.104	2.950	0.4340	0.1400	0.99730	0.1520	0.0036	2324	632	2348	297	2370	41		2.3
S162A-z9	19		404	41	0.101	97.37	87.2	9.175	2.990	0.4372	0.1420	0.99750	0.1520	0.0035	2338	639	2356	299	2371	39		1.7
S162A-z9	20		438	48	0.109	97.7	89.28	9.925	3.340	0.4426	0.1490	0.99810	0.1630	0.0034	2362	665	2428	311	2483	35		5.8
S162A-z9	21		447	59	0.133	97.61	88.46	8.495	2.480	0.3963	0.1160	0.99730	0.1550	0.0033	2152	534	2285	266	2407	36		12.5
S162A-z9	22		455	60	0.132	97.75	89.11	8.708	2.580	0.4049	0.1200	0.99750	0.1560	0.0033	2192	549	2308	270	2413	36		10.8
S162A-z9	23		494	90	0.182	97.76	89.32	10.190	3.770	0.4664	0.1720	0.99850	0.1580	0.0032	2468	757	2452	342	2440	34		-1.3
S162A-z9	24		500	108	0.216	97.39	87.74	8.705	2.750	0.3969	0.1250	0.99790	0.1590	0.0033	2155	578	2308	288	2446	35		14.0
S162A-z9	25		539	133	0.246	97.52	88.18	8.918	3.010	0.4110	0.1390	0.99820	0.1570	0.0031	2220	634	2330	308	2427	34		10.1
S162A-z9	26		551	166	0.300	97.77	89.29	8.366	2.660	0.3853	0.1220	0.99820	0.1570	0.0030	2101	570	2271	289	2429	33		15.8
S162A-z9	27		566	185	0.328	97.54	88.34	8.221	2.640	0.3770	0.1210	0.99820	0.1580	0.0031	2062	565	2256	290	2436	33		17.9
S162A-z9	28		624	219	0.351	97.73	89.1	9.351	3.560	0.4321	0.1640	0.99880	0.1570	0.0029	2315	739	2373	349	2423	32		5.3
S162A-z9	29		644	283	0.439	98.09	90.89	9.744	3.690	0.4386	0.1660	0.99890	0.1610	0.0028	2344	743	2411	348	2467	30		5.9
S162A-z9	30		648	299	0.462	98.08	90.96	8.893	3.030	0.3951	0.1340	0.99870	0.1630	0.0028	2146	621	2327	311	2490	29		16.2
S162A-z9	31		652	320	0.490	98.07	90.9	9.793	3.590	0.4370	0.1600	0.99890	0.1630	0.0027	2337	718	2415	338	2482	29		6.9
S162A-z9	32		697	344	0.494	98.09	91.03	9.206	3.190	0.4081	0.1410	0.99880	0.1640	0.0027	2206	646	2359	317	2493	28		13.6
Sample S162A, zircon 10: Type 3																						
S162A-z10	1		406	225	0.553	50.55	-6.435	-0.752	1.620	0.1113	0.0291	0.36460	-0.0490	-0.1107	681	169	-1415	6620	-1	0		NaN
S162A-z10	2		230	106	0.462	69.38	8.254	0.769	1.290	0.1697	0.0349	0.41260	0.0329	0.0528	1010	192	579	742	-1	0		NaN
S162A-z10	3		212	57	0.269	79.47	25.39	2.036	1.160	0.2027	0.0448	0.54660	0.0728	0.0355	1190	240	1128	389	1009	988		-19.7

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
	cycle	ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
S162A-z10	4	192	44	0.227	75.39	7.926	0.790	1.500	0.2462	0.0679	0.31990	0.0233	0.0427	1419	351	591	854	-1	0	NaN
S162A-z10	5	201	32	0.159	81.29	25.12	1.680	0.986	0.1906	0.0405	0.51740	0.0639	0.0326	1125	219	1001	373	740	1080	-56.7
S162A-z10	6	176	21	0.118	86.4	42.43	2.763	0.968	0.2085	0.0424	0.67500	0.0961	0.0251	1221	226	1346	261	1550	490	23.3
S162A-z10	7	211	16	0.076	91.19	61.28	4.566	1.410	0.2614	0.0688	0.87880	0.1270	0.0187	1497	351	1743	257	2052	260	30.2
S162A-z10	8	180	20	0.109	92.37	64.89	3.149	0.696	0.1806	0.0299	0.78640	0.1260	0.0173	1071	163	1445	170	2049	242	51.7
S162A-z10	9	186	13	0.071	91.56	58.61	2.976	0.770	0.1997	0.0374	0.77130	0.1080	0.0179	1174	201	1402	197	1767	302	36.7
S162A-z10	10	204	13	0.063	91.81	57.5	3.025	0.870	0.2194	0.0476	0.79490	0.1000	0.0175	1279	251	1414	219	1624	325	23.4
S162A-z10	11	215	6	0.030	92.62	63.9	3.685	1.030	0.2288	0.0541	0.86770	0.1170	0.0163	1328	284	1568	224	1908	251	33.6
S162A-z10	12	224	7	0.031	93.1	64.42	3.154	0.821	0.2059	0.0436	0.84110	0.1110	0.0157	1207	233	1446	201	1817	256	36.7
S162A-z10	13	240	12	0.049	92.75	61.52	3.242	0.917	0.2273	0.0524	0.84370	0.1030	0.0157	1320	275	1467	219	1687	280	24.0
S162A-z10	14	244	6	0.025	94.28	69.48	3.759	1.090	0.2385	0.0617	0.90670	0.1140	0.0140	1379	321	1584	232	1869	220	29.1
S162A-z10	15	238	11	0.046	97.2	84.86	4.633	1.190	0.2516	0.0617	0.95050	0.1340	0.0107	1447	318	1755	214	2145	139	36.3
S162A-z10	16	239	8	0.035	96.05	77.03	3.054	0.656	0.1940	0.0364	0.88030	0.1140	0.0116	1143	197	1421	164	1867	184	42.3
S162A-z10	17	248	5	0.019	94.72	68.45	3.333	0.927	0.2414	0.0586	0.88710	0.1000	0.0129	1394	304	1489	217	1627	239	15.9
S162A-z10	18	234	8	0.033	94.6	68.34	3.288	0.904	0.2335	0.0559	0.88560	0.1020	0.0131	1353	292	1478	214	1663	236	20.7
S162A-z10	19	240	5	0.021	97.84	87.04	3.363	0.686	0.1982	0.0379	0.92820	0.1230	0.0093	1166	204	1496	160	2001	135	45.5
S162A-z10	20	257	2	0.008	96.86	80.09	3.315	0.796	0.2222	0.0490	0.91960	0.1080	0.0102	1294	259	1485	187	1769	172	29.6
S162A-z10	21	273	4	0.015	97.17	82.83	4.071	1.110	0.2539	0.0658	0.95100	0.1160	0.0098	1459	338	1648	222	1900	151	25.9
S162A-z10	22	256	4	0.015	97.93	87.53	3.629	0.784	0.2139	0.0438	0.94060	0.1230	0.0090	1250	233	1556	172	2001	130	41.2
S162A-z10	23	253	2	0.008	97.33	83.46	3.194	0.696	0.2019	0.0407	0.92320	0.1150	0.0096	1186	218	1456	168	1875	151	40.2
S162A-z10	24	254	4	0.018	98.05	88.33	4.336	1.120	0.2526	0.0632	0.96180	0.1250	0.0088	1452	325	1700	213	2022	126	31.5
S162A-z10	25	259	5	0.020	98.75	92.35	4.100	0.997	0.2341	0.0555	0.96650	0.1270	0.0079	1356	290	1654	198	2057	110	37.7
S162A-z10	26	258	3	0.012	99.46	96.49	3.551	0.733	0.2071	0.0419	0.96340	0.1240	0.0069	1213	224	1539	164	2020	98	43.7
S162A-z10	27	274	7	0.024	99.2	94.55	3.680	0.835	0.2297	0.0509	0.96460	0.1160	0.0070	1333	267	1567	181	1898	108	32.9
S162A-z10	28	283	7	0.024	98.67	91.49	3.678	0.845	0.2220	0.0494	0.95930	0.1200	0.0078	1292	260	1567	183	1959	116	37.5
S162A-z10	29	253	7	0.026	98	87.45	3.249	0.650	0.2004	0.0377	0.93050	0.1180	0.0086	1178	202	1469	155	1919	131	42.2
S162A-z10	30	263	3	0.011	98.5	90.7	3.286	0.673	0.1934	0.0379	0.94640	0.1230	0.0082	1140	205	1478	160	2004	118	47.0
S162A-z10	31	261	5	0.020	98.26	88.54	3.729	0.910	0.2381	0.0559	0.95560	0.1140	0.0082	1377	291	1578	195	1858	130	28.7
S162A-z10	32	276	7	0.025	99.08	93.62	4.090	1.100	0.2613	0.0687	0.97380	0.1130	0.0069	1497	351	1652	219	1856	110	21.7
S162A-z10	33	276	4	0.013	99.48	96.87	3.716	0.766	0.2009	0.0407	0.96770	0.1340	0.0070	1180	219	1575	165	2153	91	49.3
S162A-z10	34	267	2	0.008	99.35	95.76	3.881	0.853	0.2291	0.0494	0.96730	0.1230	0.0069	1330	259	1610	178	1998	99	36.9
S162A-z10	35	285	7	0.025	99	93.64	3.487	0.702	0.2057	0.0402	0.95610	0.1230	0.0073	1206	215	1524	159	1999	105	43.4
S162A-z10	36	307	5	0.017	98.31	89.2	3.950	1.010	0.2435	0.0605	0.96420	0.1180	0.0080	1405	313	1624	208	1921	122	29.9
S162A-z10	37	308	4	0.013	99.74	98.36	4.389	1.130	0.2498	0.0638	0.98210	0.1270	0.0062	1438	329	1710	213	2063	86	33.8
S162A-z10	38	294	1	0.004	99.88	99.23	4.081	0.916	0.2287	0.0509	0.97740	0.1290	0.0062	1328	267	1650	183	2090	84	40.3
S162A-z10	39	305	4	0.014	99.51	96.89	4.214	1.010	0.2397	0.0570	0.97710	0.1270	0.0065	1385	297	1677	198	2063	90	36.4
S162A-z10	40	281	5	0.016	98.89	92.93	4.036	0.964	0.2384	0.0557	0.96860	0.1230	0.0073	1379	290	1642	194	1997	106	34.3
S162A-z10	41	265	2	0.009	98.25	89.19	3.456	0.703	0.2060	0.0400	0.94460	0.1220	0.0081	1208	214	1517	160	1981	119	42.7
S162A-z10	42	302	6	0.021	98.73	92.29	3.570	0.746	0.2034	0.0412	0.95820	0.1270	0.0076	1194	221	1543	166	2061	106	46.0
S162A-z10	43	328	2	0.006	99.38	96.14	4.056	0.945	0.2285	0.0525	0.97470	0.1290	0.0067	1327	275	1645	190	2081	92	40.0
S162A-z10	44	303	5	0.015	99.4	96.41	4.380	1.010	0.2355	0.0538	0.97540	0.1350	0.0069	1363	281	1709	191	2163	89	40.9
S162A-z10	45	292	2	0.007	98.55	90.64	3.616	0.812	0.2216	0.0481	0.95890	0.1180	0.0076	1290	254	1553	179	1932	114	36.6
S162A-z10	46	302	3	0.010	98.27	89.59	3.958	0.923	0.2293	0.0518	0.96150	0.1250	0.0080	1331	271	1626	189	2032	113	38.1
S162A-z10	47	305	6	0.019	99.26	95.41	3.915	0.878	0.2230	0.0491	0.97100	0.1270	0.0068	1298	259	1617	181	2062	95	40.9
S162A-z10	48	303	3	0.009	99.23	95.21	3.792	0.841	0.2164	0.0471	0.96880	0.1270	0.0070	1263	249	1591	178	2058	97	42.5
S162A-z10	49	317	8	0.026	99.1	94.6	4.155	0.991	0.2297	0.0538	0.97260	0.1310	0.0073	1333	282	1665	195	2114	97	40.8
Sample S162A, zircon 12: Type 3																				
S162A-z12	1	2195	742	0.338	94.62	76.31	20.770	4.460	0.9926	0.2120	0.99140	0.1520	0.0043	4444	685	3128	208	2366	48	-123.8
S162A-z12	2	1804	574	0.318	97.53	88.91	29.570	6.810	1.2740	0.2930	0.99460	0.1680	0.0040	5295	831	3473	226	2542	40	-163.4
S162A-z12	3	1753	596	0.340	97.95	90.69	34.530	8.670	1.4820	0.3720	0.99560	0.1690	0.0040	5861	965	3625	248	2547	40	-206.0
S162A-z12	4	1679	472	0.281	98.19	91.83	43.050	13.300	1.8240	0.5640	0.99720	0.1710	0.0040	6692	1290	3844	307	2569	39	-272.6
S162A-z12	5	1520	509	0.335	98.11	91.42	35.650	8.440	1.5230	0.3600	0.99470	0.1700	0.0041	5966	920	3657	234	2555	41	-213.2
S162A-z12	6	1449	486	0.336	98.01	91	40.170	10.700	1.7150	0.4570	0.99580	0.1700	0.0041	6440	1080	3775	264	2556	41	-252.5
S162A-z12	7	1340	381	0.285	98.04	91.2	43.000	12.400	1.8160	0.5250	0.99660	0.1720	0.0041	6675	1200	3842	287	2574	40	-270.2
S162A-z12	8	1144	365	0.319	98.02	91.2	39.400	9.370	1.6480	0.3910	0.99450	0.1730	0.0043	6278	953	3756	235	2591	42	-233.1
S162A-z12	9	1066	311	0.292	97.85	90.34	39.740	9.660	1.6900	0.4100	0.99470	0.1700	0.0043	6380	983	3764	241	2562	42	-246.5
S162A-z12	10	1032	332	0.322	97.78	89.99	45.500	12.800	1.9510	0.5480	0.99610	0.1690	0.0042	6976	1200	3899	279	2549	42	-302.3
S162A-z12	11	992	303	0.306	97.88	90.34	42.760	10.600	1.8510	0.4590	0.99470	0.1680	0.0043	6755	1040	3837	246	2533	43	-284.6
S162A-z12	12	907	274	0.302	97.77	89.98	40.530	9.120	1.7310	0.3890	0.99350	0.1700	0.0044	6476	918	3784	223	2556	43	-255.7
S162A-z12	13	901	278	0.309	97.7	89.89	38.910	8.320	1.6300	0.3480	0.99290	0.1730	0.0044	6235	853	3743	212	2588	42	-230.0
S162A-z12	14	879	246	0.280	97.92	90.65	44.910	11.400	1.9050	0.4830	0.99520	0.1710	0.0043	6875	1070	3886	252	2567	42	-289.5
S162A-z12	15	814	217	0.267	97.96	90.88	39.670	8.480	1.6780	0.3580	0.99310	0.1710	0.0043	6350	862	3763	212	2572	42	-242.2
S162A-z12	16	835	235	0.281	97.91	90.5	39.150	8.420	1.6840	0.3610	0.99330	0.1690	0.0042	6364	868	3749	213	2544	42	-248.0
S162A-z12	17	799	227	0.284	98.1	91.39	43.650	10.200	1.8550	0.4320	0.99440	0.1710	0.0042	6764	976	3857	232	2564	41	-279.8
S162A-z12	18	786	240	0.305	97.93	90.68	42.940	9.650	1.8250	0.4100	0.99390	0.1710	0.0042	6696	934	3841	223	2564	42	-273.6
S162A-z12	19	790	222	0.281	97.65	89.4	48.380	12.400	2.0830	0.5350	0.99530	0.1680	0.0042	7259	1120	3959	256	2542	42	-331.0
S162A-z12	20	767	195	0.254	97.63	89.46	42.790	9.080	1.8160	0.3850	0.99290	0.1710	0.0043	6675	881	3838	210	2566	42	-271.5
S162A-z12	21	830	233	0.280	97.8	90.16	42.820	9.050	1.8160	0.3830	0.99300	0.1710	0.0043	6675	877	3838	210	2567	42	-271.4
S162A-z12	22	879	232	0.264	97.81	90.23	46.110	10.800	1.9540	0.4590	0.99460	0.1710	0.0042	6983	1000	3912	234	2569	41	-299.1
S162A-z12	23	770	231	0.300	97.78	90.04	42.450	9.140	1.8140	0.3900	0.99340	0.1700	0.0042	6669	893	3830	214	2555	41	-272.9
S162A-z12	24	739	173	0.234	97.89	90.38	39.060	7.970	1.6860	0.3440	0.99280	0.1680	0.0041	6369	825	3747	202	2538	41	-249.5
S162A-z12	25	796	227	0.285	98.09	91.27	44.500	11.100	1.9150	0.4780	0.99560	0.1690	0.0040	6896	1060	3876	248	2543	39	-296.0
S162A-z12	26	747	195	0.261	97.8	90.14	38.060	7.410	1.6180	0.3150	0.99220	0.1710	0.0042	6204	775	3721	193	2564	41	-231.2
S162A-z12	27	762	194	0.255	97.71	89.8	40.670	8.830	1.7240	0.3740	0.99390	0.1710	0.0041	6460	885	3787	215	2569	40	-252.0
S162A-z12	28	781	220	0.282	97.88	90.46	42.020	9.670	1.7890	0.4110	0.99480	0.1700	0.0040	6613	951	3819	228	2561	39	-266.8
S162A-z12	29	730	212	0.291	97.79	89.94	38.250	8.120	1.6580	0.3510	0.99370	0.1670	0.0040	6301	852	3726	210	2531	40	-244.8
Sample S162A, zircon 18: Type 3																				
S162A-z18	1	255	16	0.064	87.24	52.2	3.348	0.729	0.1835	0.0349	0.90040	0.1320	0.0126	1086	190	1492	170	2128	166	53.1
S162A-z18	2	209	6	0.031	95.39	73.21	2.560	0.573	0.1697	0.0350	0.92920	0.1090	0.0091	1010	193	1289	164	1790	151	47.0
S162A-z18	3	235	6	0.026	98.15	87.74	3.411	1.180	0.2214	0.0752	0.98290	0.1120	0.0071	1289	397	1507	271	1828	115	32.5

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
					^{206}Pb*	^{207}Pb*	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
	cycle	ppm	ppm	ppm																
S162A-z18	4	269	3	0.012	98.62	89.88	3.075	1.100	0.2160	0.0760	0.98420	0.1030	0.0065	1261	403	1426	274	1683	117	27.6
S162A-z18	5	273	3	0.012	99.33	95.48	3.740	1.370	0.2314	0.0843	0.99140	0.1170	0.0056	1342	441	1580	294	1914	86	33.1
S162A-z18	6	291	5	0.017	99.15	93.76	3.021	1.030	0.2049	0.0690	0.98810	0.1070	0.0056	1201	369	1413	260	1748	96	34.2
S162A-z18	7	327	2	0.006	98.73	90.8	3.890	1.920	0.2675	0.1310	0.99310	0.1050	0.0061	1528	667	1612	399	1722	106	12.6
S162A-z18	8	338	2	0.007	99.05	93.47	6.707	5.140	0.4285	0.3280	0.99780	0.1140	0.0057	2299	1480	2074	677	1857	91	-28.3
S162A-z18	9	351	2	0.007	99.27	94.83	3.725	1.620	0.2420	0.1050	0.99380	0.1120	0.0054	1397	543	1577	348	1826	88	26.1
S162A-z18	10	333	1	0.002	98.53	89.24	4.323	2.340	0.3061	0.1650	0.99350	0.1020	0.0063	1722	813	1698	447	1669	114	-3.6
S162A-z18	11	335	2	0.007	98.98	92.68	4.507	2.430	0.3014	0.1620	0.99530	0.1080	0.0057	1698	803	1732	449	1773	95	4.8
S162A-z18	12	337	3	0.010	99.19	94.15	4.546	2.400	0.3043	0.1600	0.99560	0.1080	0.0054	1713	791	1739	439	1772	90	3.8
S162A-z18	13	339	4	0.013	98.75	91	3.690	1.590	0.2527	0.1080	0.99190	0.1060	0.0058	1452	558	1569	345	1730	101	17.9
S162A-z18	14	347	3	0.010	98.8	92.5	5.984	3.280	0.3512	0.1920	0.99650	0.1240	0.0057	1940	916	1973	477	2009	82	4.0
S162A-z18	15	371	5	0.012	99.21	95.3	7.928	5.220	0.4306	0.2830	0.99830	0.1340	0.0052	2309	1280	2223	594	2145	68	-9.1
S162A-z18	16	381	6	0.016	99.34	96.36	7.474	3.990	0.3748	0.2000	0.99780	0.1450	0.0051	2052	936	2170	478	2283	61	11.8
S162A-z18	17	392	7	0.017	98.99	94.61	6.451	2.900	0.3167	0.1420	0.99660	0.1480	0.0055	1774	694	2039	395	2320	64	26.9
S162A-z18	18	382	7	0.018	99.31	96.5	8.381	4.220	0.3834	0.1930	0.99780	0.1590	0.0053	2092	898	2273	457	2440	57	16.7
S162A-z18	19	383	5	0.014	99.36	96.57	9.433	5.420	0.4574	0.2630	0.99830	0.1500	0.0050	2428	1160	2381	528	2341	57	-4.5
S162A-z18	20	376	6	0.017	98.85	94.45	8.063	3.620	0.3572	0.1600	0.99700	0.1640	0.0057	1969	761	2238	406	2494	58	24.4
S162A-z18	21	368	6	0.016	99.15	95.93	8.073	3.260	0.3512	0.1420	0.99680	0.1670	0.0054	1941	676	2239	365	2525	55	26.8
S162A-z18	22	408	7	0.018	99.52	97.73	10.790	5.760	0.4513	0.2410	0.99840	0.1730	0.0053	2401	1070	2505	496	2591	51	8.8
S162A-z18	23	396	7	0.018	99.33	96.87	12.400	7.740	0.5208	0.3250	0.99880	0.1730	0.0054	2702	1380	2635	586	2584	52	-5.6
S162A-z18	24	381	4	0.009	99.53	97.8	11.620	6.480	0.4874	0.2710	0.99860	0.1730	0.0052	2560	1180	2575	521	2587	50	1.4
S162A-z18	25	388	7	0.019	99.61	98.29	12.400	6.830	0.4865	0.2680	0.99870	0.1850	0.0053	2556	1160	2635	518	2697	47	6.4
S162A-z18	26	366	7	0.019	99.57	97.95	8.779	3.430	0.3679	0.1440	0.99720	0.1730	0.0051	2019	677	2315	356	2588	49	25.5
S162A-z18	27	391	6	0.015	99.74	98.8	13.110	7.360	0.5254	0.2950	0.99880	0.1810	0.0050	2722	1250	2687	530	2661	46	-2.9
S162A-z18	28	383	4	0.011	99.89	99.51	11.380	5.550	0.4616	0.2250	0.99840	0.1790	0.0049	2447	992	2555	455	2641	45	8.8
S162A-z18	29	381	5	0.014	99.9	99.56	12.180	6.180	0.4846	0.2460	0.99860	0.1820	0.0049	2547	1070	2618	476	2674	44	5.7
S162A-z18	30	386	7	0.017	99.63	98.45	10.390	3.920	0.3900	0.1470	0.99750	0.1930	0.0052	2123	682	2470	350	2770	44	27.4
S162A-z18	31	413	5	0.012	99.4	97.32	15.080	9.860	0.6037	0.3940	0.99910	0.1810	0.0051	3045	1590	2820	622	2664	47	-17.9
Sample S162A, zircon 19: Type 2B																				
S162A-z19	1	134	14	0.108	53.16	-14.57	-2.443	1.740	0.1909	0.0387	0.10960	-0.0928	-0.0707	1126	210	NaN	-1220	-1	0	-2.E+05
S162A-z19	2	112	8	0.073	73.33	16.9	2.242	1.170	0.2655	0.0477	0.50440	0.0612	0.0280	1518	243	1194	365	648	981	-151.3
S162A-z19	3	130	4	0.028	81.19	30.22	4.268	1.620	0.3724	0.1030	0.78000	0.0831	0.0198	2041	485	1687	313	1272	465	-70.7
S162A-z19	4	118	3	0.029	87.5	47.66	5.124	1.440	0.3451	0.0823	0.87730	0.1080	0.0145	1911	394	1840	238	1761	246	-9.8
S162A-z19	5	116	4	0.031	87.82	43.26	3.553	1.010	0.2942	0.0652	0.81790	0.0876	0.0143	1662	325	1539	225	1374	315	-23.8
S162A-z19	6	121	4	0.035	90.05	49.21	4.442	1.460	0.3632	0.1060	0.90320	0.0887	0.0125	1997	500	1720	272	1398	271	-50.0
S162A-z19	7	124	2	0.020	94.4	68.26	5.526	1.770	0.3793	0.1170	0.96260	0.1060	0.0092	2073	546	1905	276	1726	160	-23.5
S162A-z19	8	119	3	0.026	95.2	71.21	5.377	1.670	0.3780	0.1130	0.96370	0.1030	0.0085	2067	527	1881	265	1682	153	-26.8
S162A-z19	9	116	1	0.013	96.44	76.73	4.242	1.040	0.3051	0.0712	0.95250	0.1010	0.0075	1717	352	1682	201	1640	139	-5.3
S162A-z19	10	122	2	0.013	97.64	85.1	6.115	1.970	0.3881	0.1230	0.98370	0.1140	0.0066	2114	571	1992	281	1868	104	-15.5
S162A-z19	11	119	2	0.019	97.08	80.29	5.421	1.790	0.3870	0.1250	0.97840	0.1020	0.0069	2109	580	1888	282	1653	126	-32.4
S162A-z19	12	116	2	0.015	97.68	83.82	4.596	1.260	0.3271	0.0871	0.97360	0.1020	0.0063	1824	423	1749	228	1659	115	-11.5
S162A-z19	13	123	3	0.024	97.8	85.33	5.349	1.630	0.3581	0.1080	0.98190	0.1080	0.0063	1973	511	1877	261	1771	106	-13.3
S162A-z19	14	122	1	0.011	99.06	93.58	5.757	1.720	0.3642	0.1080	0.98860	0.1150	0.0052	2002	510	1940	258	1874	81	-8.0
S162A-z19	15	118	2	0.017	98.67	90.88	6.384	2.100	0.4166	0.1360	0.98870	0.1110	0.0055	2245	618	2030	289	1818	90	-27.9
S162A-z19	16	132	2	0.012	98.32	88.84	5.407	1.700	0.3488	0.1090	0.98720	0.1120	0.0056	1929	519	1886	270	1839	91	-5.7
S162A-z19	17	123	3	0.021	98.55	89.83	5.323	1.500	0.3597	0.1000	0.98540	0.1070	0.0051	1981	474	1873	241	1755	88	-14.9
S162A-z19	18	122	3	0.022	98.97	92.78	5.066	1.350	0.3332	0.0878	0.98670	0.1100	0.0048	1854	425	1830	226	1804	79	-3.2
S162A-z19	19	126	1	0.010	98.75	91.1	5.826	1.890	0.3933	0.1260	0.99010	0.1070	0.0049	2138	585	1950	281	1756	83	-25.6
S162A-z19	20	120	2	0.014	99.05	93.16	4.475	1.050	0.3009	0.0696	0.98320	0.1080	0.0046	1696	345	1726	194	1764	78	4.4
S162A-z19	21	141	2	0.015	99.23	94.73	8.096	3.660	0.5084	0.2290	0.99640	0.1150	0.0044	2650	979	2242	408	1888	69	-49.4
S162A-z19	22	132	1	0.009	99.45	96.16	5.678	1.680	0.3614	0.1070	0.99210	0.1140	0.0042	1989	505	1928	256	1863	67	-7.9
S162A-z19	23	133	3	0.019	99.52	96.57	6.285	2.100	0.4077	0.1360	0.99400	0.1120	0.0041	2204	623	2016	293	1829	66	-24.3
S162A-z19	24	130	2	0.014	99.16	93.8	5.277	1.520	0.3583	0.1020	0.98990	0.1070	0.0043	1974	486	1865	246	1746	75	-15.2
S162A-z19	25	142	2	0.015	98.96	92.63	6.423	2.350	0.4271	0.1550	0.99370	0.1090	0.0045	2293	702	2035	321	1784	75	-34.0
S162A-z19	26	137	1	0.008	98.97	92.99	5.379	1.510	0.3414	0.0949	0.98980	0.1140	0.0046	1893	456	1881	240	1868	72	-1.6
S162A-z19	27	145	1	0.010	99.29	95.01	5.640	1.710	0.3648	0.1100	0.99240	0.1120	0.0042	2005	521	1922	262	1834	68	-10.9
S162A-z19	28	146	2	0.011	99.05	92.99	5.410	1.690	0.3725	0.1150	0.99150	0.1050	0.0043	2041	542	1887	267	1720	74	-21.8
S162A-z19	29	139	3	0.018	99.14	93.86	5.326	1.520	0.3524	0.0997	0.99050	0.1100	0.0043	1946	475	1873	244	1793	71	-9.9
S162A-z19	30	146	2	0.012	99.28	94.88	6.179	2.090	0.4048	0.1370	0.99410	0.1110	0.0041	2191	627	2002	296	1811	67	-24.8
S162A-z19	31	144	2	0.011	98.92	92.11	5.745	1.920	0.3945	0.1310	0.99250	0.1060	0.0043	2144	607	1938	289	1725	75	-28.6
S162A-z19	32	144	1	0.006	99.37	95.47	5.604	1.720	0.3663	0.1120	0.99300	0.1110	0.0040	2012	528	1917	264	1815	66	-12.7
S162A-z19	33	147	2	0.016	99.32	95.23	7.324	2.920	0.4711	0.1870	0.99590	0.1130	0.0041	2488	820	2152	356	1844	65	-42.3
S162A-z19	34	140	1	0.011	99.47	96.12	4.693	1.170	0.3121	0.0774	0.98980	0.1090	0.0039	1751	380	1766	209	1784	65	2.1
S162A-z19	35	154	1	0.008	99.44	95.95	6.931	2.690	0.4513	0.1750	0.99600	0.1110	0.0039	2401	777	2103	345	1822	63	-38.2
S162A-z19	36	150	2	0.013	99.2	94.26	5.726	1.810	0.3769	0.1190	0.99310	0.1100	0.0041	2062	555	1935	273	1803	68	-16.8
S162A-z19	37	149	2	0.011	99.25	94.61	5.275	1.540	0.3475	0.1010	0.99210	0.1100	0.0040	1923	483	1865	249	1801	67	-7.8
S162A-z19	38	156	2	0.010	99.11	93.7	6.207	2.160	0.4052	0.1400	0.99420	0.1110	0.0042	2193	644	2005	304	1817	68	-24.5
S162A-z19	39	144	2	0.012	98.71	90.67	5.027	1.410	0.3477	0.0968	0.98870	0.1050	0.0044	1924	463	1824	238	1712	78	-14.3
S162A-z19	40	152	1	0.008	98.54	89.92	6.152	2.160	0.4076	0.1420	0.99280	0.1090	0.0046	2204	652	1998	307	1791	77	-27.2
S162A-z19	41	151	2	0.012	99.58	97.02	5.330	1.520	0.3394	0.0961	0.99310	0.1140	0.0038	1884	463	1874	243	1863	60	-1.3
S162A-z19	42	153	2	0.012	99.63	97.33	6.532	2.350	0.4227	0.1520	0.99590	0.1120	0.0037	2273	688	2050	317	1833	59	-28.5
S162A-z19	43	150	2	0.012	99.41	95.84	5.833	1.820	0.3740	0.1160	0.99380	0.1130	0.0039	2048	545	1951	270	1850	63	-12.5
S162A-z19	44	147	1	0.010	98.81	91.47	5.014	1.400	0.3399	0.0945	0.98950	0.1070	0.0043	1886	454	1822	237	1749	74	-9.0
S162A-z19	45	141	2	0.011	98.82	91.66	5.523	1.660	0.3675	0.1100	0.99120	0.1090	0.0044	2018	518	1904	259	1783	73	-15.3
S162A-z19	46	153	2	0.014	98.82	91.49	6.348	2.350	0.4334	0.1600	0.99420	0.1060	0.0042	2321	719	2025	325	1736	73	-40.2
S162A-z19	47	154	1	0.009	99.28	94.81	5.717	1.820	0.3764	0.1190	0.99370	0.1100	0.0039	2060	557	1934	274	1802	65	-16.7
S162A-z19	48	155	2	0.014	99.38	95.41	7.029	2.790	0.4728	0.1870	0.99610	0.1080	0.0038	2496	820	2115	353	1763	64	-50.3
S162A-z19	49	154	1	0.010	99.17	94.02	5.726	1.800	0.3832	0.1200	0.99330	0.1080	0.0039	2091	559	1935	272	1772	66	-21.1
S162A-z19	50	147	2	0.011	99.08	93.22	4.684	1.210	0.3220	0.0829	0.98930	0.1050	0.0040	1799	404	1764	217	1723	69	-5.1
S162A-z19	51	158	2	0.014	99.05	93.03	6.217	2.230	0.4249	0.1520	0.99460	0.1060	0.0040	2283	687	2007	314	1734	69	-37.7
S162A-z19	52	152	2	0.011	99.11	93.64	5.823	1.930	0.3876	0.1280	0.99390	0.1090	0.0040	2111	593	1950	287	1782	67	-21.7

Grain	Mass cycle		U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
S162A-z19	53		150	2	0.011	99.52	96.58	6.027	1.970	0.3872	0.1260	0.99500	0.1130	0.0037	2110	586	1980	284	1846	59	-16.8
S162A-z19	54		148	2	0.014	99.28	95.02	5.249	1.400	0.3321	0.0882	0.99170	0.1150	0.0039	1848	427	1861	228	1874	62	1.6
S162A-z19	55		164	2	0.011	98.8	91.14	6.073	2.200	0.4255	0.1540	0.99400	0.1030	0.0041	2286	694	1986	316	1688	73	-42.2
S162A-z19	56		154	2	0.014	99.27	94.79	5.474	1.600	0.3587	0.1040	0.99290	0.1110	0.0039	1976	495	1897	251	1810	63	-10.7
S162A-z19	57		159	1	0.006	99.48	96.34	6.129	2.030	0.3928	0.1300	0.99510	0.1130	0.0037	2136	600	1994	289	1851	59	-18.1
S162A-z19	58		152	2	0.013	99.58	97.01	5.955	1.840	0.3818	0.1180	0.99460	0.1130	0.0036	2085	548	1969	268	1850	58	-14.9
S162A-z19	59		156	2	0.011	99.07	93.31	6.216	2.190	0.4173	0.1470	0.99470	0.1080	0.0039	2248	667	2007	309	1766	67	-32.5
Sample S162A, zircon 22: Type 1A																					
S162A-z22	1		886	84	0.095	82.74	29.83	1.152	0.428	0.1138	0.0332	0.82250	0.0734	0.0156	695	192	778	202	1026	429	34.1
S162A-z22	2		593	39	0.066	95.3	71.68	3.082	1.040	0.2161	0.0712	0.98140	0.1030	0.0067	1261	377	1428	258	1687	119	27.8
S162A-z22	3		476	26	0.055	97.26	80.94	2.990	0.808	0.2191	0.0580	0.98050	0.0990	0.0053	1277	306	1405	206	1605	99	22.5
S162A-z22	4		483	17	0.036	98.07	86.4	4.033	1.370	0.2822	0.0951	0.99130	0.1040	0.0046	1602	478	1641	277	1690	83	5.8
S162A-z22	5		437	13	0.030	99.29	94.91	3.766	0.998	0.2465	0.0650	0.99190	0.1110	0.0037	1420	336	1585	213	1813	61	24.1
S162A-z22	**6**	*	**422**	**10**	**0.025**	**99.41**	**95.81**	**4.620**	**1.480**	**0.3005**	**0.0961**	**0.99490**	**0.1120**	**0.0036**	**1694**	**476**	**1753**	**268**	**1824**	**59**	**8.1**
S162A-z22	7		407	8	0.020	99.78	98.45	4.328	1.220	0.2688	0.0756	0.99470	0.1170	0.0034	1535	384	1699	233	1907	52	21.9
S162A-z22	**8**	*	**427**	**9**	**0.021**	**99.39**	**95.66**	**4.441**	**1.350**	**0.2856**	**0.0864**	**0.99430**	**0.1130**	**0.0037**	**1619**	**433**	**1720**	**252**	**1845**	**59**	**13.8**
S162A-z22	9		419	5	0.012	99.02	93.15	3.762	0.962	0.2458	0.0624	0.99010	0.1110	0.0040	1417	323	1585	205	1816	65	24.5
S162A-z22	**10**	*	**430**	**7**	**0.015**	**99.22**	**94.14**	**4.215**	**1.270**	**0.2911**	**0.0870**	**0.99320**	**0.1050**	**0.0037**	**1647**	**435**	**1677**	**247**	**1715**	**65**	**4.5**
S162A-z22	**11**	*	**455**	**10**	**0.023**	**99.31**	**94.91**	**4.112**	**1.220**	**0.2792**	**0.0825**	**0.99360**	**0.1070**	**0.0036**	**1588**	**416**	**1657**	**242**	**1746**	**61**	**10.3**
S162A-z22	**12**	*	**445**	**7**	**0.015**	**99.33**	**95.19**	**4.326**	**1.300**	**0.2841**	**0.0853**	**0.99420**	**0.1100**	**0.0036**	**1612**	**428**	**1698**	**249**	**1806**	**59**	**12.1**
S162A-z22	13		455	7	0.016	99.25	94.59	4.111	1.180	0.2708	0.0773	0.99340	0.1100	0.0036	1545	392	1656	234	1801	60	16.0
S162A-z22	14		497	5	0.010	99.63	97.39	4.319	1.250	0.2751	0.0797	0.99490	0.1140	0.0033	1567	403	1697	240	1862	53	17.9
S162A-z22	15		500	9	0.019	99.33	95.28	4.174	1.200	0.2681	0.0765	0.99370	0.1130	0.0036	1531	389	1669	235	1847	58	19.2
S162A-z22	**16**	*	**519**	**9**	**0.018**	**99.4**	**95.76**	**4.470**	**1.390**	**0.2883**	**0.0896**	**0.99490**	**0.1120**	**0.0035**	**1633**	**448**	**1725**	**259**	**1839**	**57**	**12.7**
S162A-z22	**17**	*	**497**	**6**	**0.013**	**99.7**	**97.84**	**4.742**	**1.570**	**0.3046**	**0.1000**	**0.99610**	**0.1130**	**0.0033**	**1714**	**496**	**1775**	**277**	**1847**	**53**	**8.2**
S162A-z22	**18**	*	**503**	**17**	**0.033**	**99.57**	**96.85**	**4.438**	**1.420**	**0.2891**	**0.0923**	**0.99540**	**0.1110**	**0.0034**	**1637**	**461**	**1720**	**265**	**1822**	**56**	**11.5**
S162A-z22	**19**	*	**511**	**15**	**0.029**	**99.43**	**95.81**	**4.674**	**1.650**	**0.3103**	**0.1090**	**0.99580**	**0.1090**	**0.0035**	**1742**	**536**	**1763**	**295**	**1787**	**59**	**2.9**
S162A-z22	20		478	12	0.025	99.41	95.88	4.231	1.280	0.2707	0.0816	0.99440	0.1130	0.0036	1544	414	1680	249	1854	58	18.8
S162A-z22	**21**	*	**477**	**17**	**0.035**	**99.64**	**97.33**	**4.068**	**1.220**	**0.2711**	**0.0808**	**0.99470**	**0.1090**	**0.0033**	**1546**	**410**	**1648**	**244**	**1780**	**56**	**14.8**
S162A-z22	22		471	16	0.033	99.73	98.06	4.030	1.130	0.2565	0.0714	0.99440	0.1140	0.0034	1472	366	1640	227	1864	54	23.5
S162A-z22	**23**	*	**503**	**17**	**0.033**	**99.73**	**98.05**	**4.816**	**1.690**	**0.3071**	**0.1070**	**0.99650**	**0.1140**	**0.0033**	**1727**	**529**	**1788**	**294**	**1860**	**53**	**8.2**
S162A-z22	24		486	22	0.045	99.77	98.37	4.373	1.320	0.2772	0.0832	0.99530	0.1140	0.0033	1577	420	1707	249	1871	53	17.7
S162A-z22	**25**	*	**490**	**19**	**0.040**	**99.82**	**98.65**	**4.441**	**1.450**	**0.2921**	**0.0950**	**0.99600**	**0.1100**	**0.0032**	**1652**	**474**	**1720**	**270**	**1804**	**53**	**9.6**
S162A-z22	26		477	22	0.047	99.72	98.05	4.414	1.330	0.2755	0.0828	0.99510	0.1160	0.0035	1569	418	1715	249	1899	54	19.6
S162A-z22	**27**	*	**505**	**24**	**0.047**	**99.67**	**97.67**	**4.700**	**1.630**	**0.3001**	**0.1040**	**0.99620**	**0.1140**	**0.0034**	**1692**	**515**	**1767**	**290**	**1857**	**55**	**10.1**
S162A-z22	28		486	30	0.061	99.66	97.63	4.686	1.520	0.2899	0.0935	0.99550	0.1170	0.0036	1641	467	1765	271	1914	55	16.1
S162A-z22	29		495	25	0.051	99.84	98.91	4.298	1.320	0.2674	0.0820	0.99520	0.1170	0.0035	1528	417	1693	253	1904	54	22.2
S162A-z22	30		469	23	0.048	99.63	97.4	3.691	0.980	0.2330	0.0616	0.99230	0.1150	0.0038	1350	322	1569	212	1878	59	31.1
S162A-z22	31		458	29	0.063	99.4	95.83	3.695	0.963	0.2324	0.0602	0.99090	0.1150	0.0041	1347	315	1570	208	1885	63	31.6
S162A-z22	32		482	29	0.060	99.89	99.21	3.696	0.990	0.2294	0.0613	0.99350	0.1170	0.0036	1331	321	1571	214	1909	55	33.5
S162A-z22	33		450	30	0.067	99.78	98.53	3.634	0.898	0.2205	0.0542	0.99180	0.1200	0.0038	1284	287	1557	197	1950	57	37.6
S162A-z22	34		471	28	0.060	99.54	96.89	4.146	1.240	0.2529	0.0756	0.99370	0.1190	0.0040	1453	389	1663	246	1940	60	28.0
S162A-z22	35		474	30	0.064	99.89	99.26	3.961	1.060	0.2366	0.0633	0.99340	0.1210	0.0037	1369	330	1626	217	1977	55	34.1
S162A-z22	36		473	40	0.084	99.71	98	3.864	1.060	0.2393	0.0656	0.99290	0.1170	0.0038	1383	341	1606	222	1912	59	30.7
S162A-z22	37		458	32	0.069	99.88	99.19	3.199	0.692	0.1982	0.0427	0.98940	0.1170	0.0037	1165	230	1457	167	1912	57	42.6
S162A-z22	38		493	34	0.068	99.95	99.61	3.920	1.110	0.2453	0.0695	0.99430	0.1160	0.0035	1414	360	1618	230	1893	55	28.1
S162A-z22	39		464	32	0.070	99.77	98.41	3.581	0.915	0.2186	0.0556	0.99200	0.1190	0.0038	1274	294	1545	203	1938	58	37.7
S162A-z22	40		475	36	0.075	99.59	97.14	3.749	1.040	0.2370	0.0652	0.99220	0.1150	0.0039	1371	340	1582	222	1875	62	29.8
S162A-z22	41		448	34	0.075	99.2	94.34	3.636	0.986	0.2361	0.0635	0.98980	0.1120	0.0043	1366	331	1557	216	1828	70	28.0
S162A-z22	42		437	29	0.066	98.93	93.03	3.536	0.891	0.2140	0.0534	0.98760	0.1200	0.0047	1250	283	1535	199	1954	71	39.6
S162A-z22	43		476	39	0.081	99.52	96.79	3.780	1.030	0.2293	0.0625	0.99190	0.1200	0.0042	1331	328	1589	220	1950	62	35.1
S162A-z22	44		442	38	0.085	99.28	95.1	3.066	0.651	0.1898	0.0399	0.98390	0.1170	0.0044	1121	216	1424	163	1913	68	45.1
S162A-z22	45		451	38	0.085	99.33	95.45	3.704	1.010	0.2295	0.0622	0.99070	0.1170	0.0044	1332	326	1572	218	1912	67	33.5
S162A-z22	46		425	37	0.086	99.39	95.73	3.161	0.723	0.2010	0.0455	0.98640	0.1140	0.0043	1181	244	1448	176	1865	68	40.1
S162A-z22	47		425	38	0.089	99.26	94.83	3.097	0.705	0.1989	0.0448	0.98520	0.1130	0.0044	1169	241	1432	175	1847	71	40.0
S162A-z22	48		441	39	0.089	99.37	95.67	3.432	0.876	0.2153	0.0546	0.98910	0.1160	0.0043	1257	290	1512	201	1890	68	36.8
S162A-z22	49		472	40	0.084	99.56	97	3.894	1.140	0.2412	0.0703	0.99270	0.1170	0.0041	1393	365	1612	237	1912	64	30.1
S162A-z22	50		431	42	0.097	99.56	96.9	3.278	0.772	0.2064	0.0483	0.98810	0.1150	0.0042	1209	258	1476	183	1883	65	39.2
S162A-z22	51		467	49	0.105	99.69	97.89	3.495	0.873	0.2124	0.0528	0.99060	0.1190	0.0041	1242	281	1526	197	1947	61	39.8
S162A-z22	52		426	38	0.090	99.2	94.48	2.874	0.573	0.1822	0.0358	0.97970	0.1140	0.0046	1079	195	1375	150	1870	72	45.8
S162A-z22	53		454	42	0.092	98.99	92.98	3.278	0.835	0.2121	0.0535	0.98640	0.1120	0.0047	1240	284	1476	198	1833	76	35.5
S162A-z22	54		419	44	0.104	99.5	96.4	3.113	0.718	0.2021	0.0462	0.98670	0.1120	0.0042	1186	248	1436	177	1828	68	38.4
S162A-z22	55		431	44	0.102	99.36	95.63	3.616	0.971	0.2240	0.0597	0.99000	0.1170	0.0044	1303	315	1553	213	1912	68	35.1
S162A-z22	56		431	47	0.108	99.62	97.33	3.225	0.765	0.2046	0.0482	0.98870	0.1140	0.0041	1200	258	1463	184	1869	64	39.2
S162A-z22	57		408	48	0.117	99.55	97	2.911	0.565	0.1758	0.0338	0.98240	0.1200	0.0044	1044	185	1385	147	1958	65	50.5
S162A-z22	58		439	52	0.118	99.37	95.65	3.208	0.751	0.2012	0.0467	0.98670	0.1160	0.0044	1182	251	1459	181	1890	69	40.9
S162A-z22	59		439	47	0.107	99.29	95.09	3.057	0.685	0.1939	0.0430	0.98450	0.1140	0.0045	1142	232	1422	171	1870	71	42.4
Sample S162A, zircon 23: Type 2A																					
S162A-z23	1		254	3	0.011	88.65	39.32	2.545	0.793	0.2687	0.0705	0.86430	0.0687	0.0108	1534	358	1285	227	889	324	-81.6
S162A-z23	2		270	2	0.009	95.61	72.26	4.209	1.140	0.3078	0.0812	0.97680	0.0992	0.0057	1730	400	1676	222	1608	108	-8.7
S162A-z23	3		276	1	0.004	97.25	81.57	4.481	1.160	0.3141	0.0800	0.98500	0.1030	0.0046	1761	393	1727	215	1687	82	-5.0
S162A-z23	4		313	3	0.010	98.64	90.94	7.116	2.730	0.4499	0.1720	0.99640	0.1150	0.0037	2395	765	2126	341	1876	59	-33.1
S162A-z23	5		293	1	0.004	98.57	90.26	5.097	1.430	0.3310	0.0925	0.99220	0.1120	0.0039	1843	448	1836	239	1827	63	-1.0
S162A-z23	6		321	3	0.010	98.68	90.74	5.695	1.980	0.3816	0.1320	0.99500	0.1080	0.0038	2084	617	1931	301	1770	63	-20.8
S162A-z23	7		298	2	0.008	98.87	92.21	5.990	2.060	0.3890	0.1330	0.99530	0.1120	0.0037	2118	617	1974	299	1827	60	-18.7
S162A-z23	8		311	1	0.005	98.52	90.12	7.066	2.980	0.4516	0.1900	0.99650	0.1130	0.0040	2403	842	2120	375	1856	64	-35.3
S162A-z23	9		291	1	0.004	98.71	91.21	5.940	2.100	0.3827	0.1350	0.99500	0.1130	0.0040	2089	628	1967	307	1842	64	-15.7
S162A-z23	10		286	2	0.008	98.67	90.77	6.889	2.930	0.4554	0.1930	0.99630	0.1100	0.0040	2419	854	2097	377	1795	67	-41.8
S162A-z23	11		283	2	0.008	98.74	91.45	6.855	2.810	0.4389	0.1790	0.99620	0.1130	0.0041	2346	804	2093	363	1853	65	-31.8
S162A-z23	12		281	2	0.006	99.28	95.07	6.571	2.530	0.4107	0.1580	0.99650	0.1160	0.0037	2218	720	2056	339	1896	58	-20.1

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
	cycle		ppm	ppm	ppm	^{206}Pb*	^{207}Pb*	^{207}Pb/ ^{235}U	1 s.e.	^{206}Pb/ ^{238}U	1 s.e.	Err. Corr.	^{207}Pb/ ^{206}Pb	1 s.e.	^{206}Pb/ ^{238}U	1 s.e.	^{207}Pb/ ^{235}U	1 s.e.	^{207}Pb/ ^{206}Pb	1 s.e.	
S162A-z23	13		297	1	0.004	99.27	95.07	8.458	4.350	0.5214	0.2680	0.99810	0.1180	0.0037	2705	1130	2281	467	1921	57	-50.2
S162A-z23	14		282	4	0.013	99.25	94.67	6.173	2.290	0.4008	0.1480	0.99610	0.1120	0.0037	2173	683	2001	324	1827	59	-22.3
S162A-z23	15		291	1	0.003	99.25	94.8	6.973	2.940	0.4457	0.1880	0.99710	0.1130	0.0036	2376	837	2108	375	1856	58	-33.6
S162A-z23	16		277	3	0.010	99.35	95.52	7.048	2.800	0.4418	0.1750	0.99690	0.1160	0.0036	2359	784	2117	354	1891	56	-29.6
S162A-z23	17		290	1	0.004	99.17	94.48	6.525	2.310	0.3999	0.1410	0.99600	0.1180	0.0038	2168	650	2049	312	1932	57	-14.4
S162A-z23	18		296	3	0.010	99.12	93.82	5.934	2.000	0.3868	0.1300	0.99530	0.1110	0.0036	2108	603	1966	292	1820	59	-18.6
S162A-z23	19		308	0	0.002	99.13	93.98	7.512	3.380	0.4803	0.2160	0.99750	0.1130	0.0036	2529	939	2174	403	1855	57	-44.1
S162A-z23	20		295	4	0.014	99.33	95.48	5.790	1.770	0.3550	0.1080	0.99520	0.1180	0.0035	1958	513	1945	264	1931	53	-1.6
S162A-z23	21		304	1	0.003	99.63	97.48	6.603	2.250	0.3981	0.1350	0.99680	0.1200	0.0033	2160	623	2060	300	1961	49	-11.9
S162A-z23	22		294	1	0.005	99.46	96.43	5.725	1.660	0.3435	0.0994	0.99530	0.1210	0.0034	1904	477	1935	251	1969	50	3.8
S162A-z23	23		291	2	0.007	99.34	95.53	5.886	1.820	0.3653	0.1120	0.99560	0.1170	0.0034	2007	531	1959	268	1909	52	-6.0
S162A-z23	24		309	2	0.006	99.39	95.94	6.195	1.930	0.3709	0.1150	0.99590	0.1210	0.0034	2034	541	2004	272	1973	50	-3.6
S162A-z23	25		321	2	0.007	99.56	97.11	6.957	2.390	0.4117	0.1410	0.99700	0.1230	0.0033	2223	646	2106	305	1994	48	-13.6
S162A-z23	26		312	2	0.008	99.34	95.63	5.720	1.610	0.3456	0.0972	0.99500	0.1200	0.0034	1914	466	1934	244	1957	50	2.6
S162A-z23	27		325	1	0.004	99.58	97.25	6.355	1.950	0.3748	0.1150	0.99640	0.1230	0.0032	2052	538	2026	269	2000	46	-3.0
S162A-z23	28		313	2	0.007	99.71	98.04	6.211	1.780	0.3690	0.1060	0.99610	0.1220	0.0031	2025	498	2006	251	1987	45	-2.2
S162A-z23	29		344	2	0.005	99.69	97.9	6.079	1.800	0.3685	0.1090	0.99650	0.1200	0.0030	2022	515	1987	259	1951	45	-4.3
S162A-z23	30		350	3	0.009	99.36	95.78	6.247	1.880	0.3723	0.1120	0.99610	0.1220	0.0032	2040	526	2011	264	1981	47	-3.5
S162A-z23	31		352	2	0.005	99.36	95.86	7.081	2.390	0.4180	0.1410	0.99700	0.1230	0.0032	2251	640	2122	300	1998	46	-15.1
S162A-z23	32		342	3	0.008	99.62	97.47	5.659	1.470	0.3365	0.0874	0.99540	0.1220	0.0030	1870	422	1925	225	1985	44	6.7
S162A-z23	33		349	2	0.005	99.63	97.56	6.388	1.890	0.3721	0.1100	0.99660	0.1250	0.0030	2039	515	2031	259	2022	43	-1.0
S162A-z23	34		365	3	0.009	99.43	96.24	6.545	2.030	0.3885	0.1210	0.99670	0.1220	0.0031	2116	560	2052	274	1989	45	-7.4
S162A-z23	35		362	2	0.006	99.27	95.33	5.882	1.560	0.3441	0.0913	0.99520	0.1240	0.0032	1907	438	1959	231	2014	46	6.2
S162A-z23	36		361	2	0.005	99.51	96.85	7.034	2.190	0.4071	0.1270	0.99690	0.1250	0.0031	2202	581	2116	277	2033	43	-9.8
S162A-z23	37		352	2	0.006	99.7	98.08	6.166	1.600	0.3490	0.0906	0.99590	0.1280	0.0030	1930	433	2000	227	2073	41	8.0
S162A-z23	38		362	2	0.005	99.6	97.37	7.128	2.210	0.4157	0.1290	0.99700	0.1240	0.0030	2241	585	2128	276	2019	43	-13.1
S162A-z23	39		370	2	0.005	99.65	97.79	6.245	1.610	0.3501	0.0901	0.99580	0.1290	0.0031	1935	430	2011	226	2090	42	8.6
S162A-z23	40		371	2	0.005	99.58	97.3	6.029	1.520	0.3443	0.0864	0.99540	0.1270	0.0031	1907	414	1980	219	2057	43	8.4
S162A-z23	41		344	2	0.006	99.56	97.17	5.267	1.130	0.3078	0.0659	0.99360	0.1240	0.0030	1730	325	1864	183	2016	43	16.2
S162A-z23	42		348	2	0.006	99.49	96.72	5.888	1.420	0.3397	0.0816	0.99480	0.1260	0.0031	1885	392	1959	209	2039	43	8.7
S162A-z23	43		359	2	0.005	99.6	97.48	6.059	1.450	0.3405	0.0812	0.99510	0.1290	0.0030	1889	390	1984	208	2085	41	10.8
S162A-z23	44		348	3	0.008	99.51	96.91	6.407	1.620	0.3610	0.0909	0.99550	0.1290	0.0031	1987	431	2033	222	2081	42	5.3
S162A-z23	45		352	2	0.005	99.48	96.72	6.161	1.510	0.3530	0.0861	0.99510	0.1270	0.0031	1949	410	1999	214	2051	43	5.8
S162A-z23	46		353	2	0.006	99.53	97.1	6.000	1.340	0.3339	0.0745	0.99430	0.1300	0.0031	1857	360	1976	195	2102	42	13.4
Sample S162A, zircon 24: Type 4																					
S162A-z24	1		159	4	0.024	90.39	46.55	2.610	0.875	0.2470	0.0697	0.86540	0.0766	0.0129	1423	360	1304	246	1112	336	-31.2
S162A-z24	**2**	*	**164**	**2**	**0.009**	**95.4**	**72.3**	**3.706**	**1.010**	**0.2579**	**0.0675**	**0.96090**	**0.1040**	**0.0079**	**1479**	**346**	**1573**	**219**	**1701**	**140**	**14.6**
S162A-z24	**3**	*	**164**	**2**	**0.010**	**97.61**	**84.14**	**4.114**	**1.110**	**0.2773**	**0.0731**	**0.97870**	**0.1080**	**0.0059**	**1578**	**369**	**1657**	**220**	**1759**	**101**	**11.6**
S162A-z24	**4**	*	**177**	**2**	**0.013**	**98.1**	**86.03**	**4.133**	**1.230**	**0.3031**	**0.0889**	**0.98360**	**0.0989**	**0.0053**	**1707**	**440**	**1661**	**243**	**1603**	**100**	**-7.4**
S162A-z24	**5**	*	**180**	**1**	**0.007**	**98.36**	**88.65**	**4.489**	**1.360**	**0.3009**	**0.0900**	**0.98760**	**0.1080**	**0.0051**	**1696**	**446**	**1729**	**251**	**1769**	**87**	**4.7**
S162A-z24	6		188	2	0.008	98.41	88.27	4.822	1.720	0.3475	0.1230	0.99040	0.1010	0.0050	1923	588	1789	300	1636	92	-20.3
S162A-z24	**7**	*	**179**	**2**	**0.009**	**98.9**	**92.25**	**4.292**	**1.200**	**0.2826**	**0.0786**	**0.98890**	**0.1100**	**0.0046**	**1605**	**395**	**1692**	**231**	**1802**	**76**	**12.4**
S162A-z24	8		171	2	0.012	98.77	91.67	4.323	1.160	0.2770	0.0735	0.98740	0.1130	0.0048	1576	371	1698	221	1851	77	16.7
S162A-z24	**9**	*	**188**	**1**	**0.005**	**99.01**	**92.96**	**4.641**	**1.450**	**0.3066**	**0.0949**	**0.99150**	**0.1100**	**0.0045**	**1724**	**468**	**1757**	**260**	**1796**	**74**	**4.6**
S162A-z24	**10**	*	**188**	**3**	**0.017**	**98.89**	**92.3**	**4.892**	**1.540**	**0.3187**	**0.0999**	**0.99130**	**0.1110**	**0.0046**	**1783**	**488**	**1801**	**266**	**1821**	**76**	**2.4**
S162A-z24	**11**	*	**191**	**1**	**0.005**	**98.89**	**92.18**	**4.956**	**1.580**	**0.3275**	**0.1030**	**0.99120**	**0.1100**	**0.0046**	**1826**	**502**	**1812**	**269**	**1795**	**77**	**-2.0**
S162A-z24	**12**	*	**191**	**2**	**0.011**	**99.38**	**95.75**	**5.480**	**1.920**	**0.3413**	**0.1190**	**0.99460**	**0.1160**	**0.0042**	**1893**	**574**	**1898**	**301**	**1903**	**65**	**0.6**
S162A-z24	**13**	*	**177**	**3**	**0.015**	**99.05**	**93.37**	**4.937**	**1.570**	**0.3192**	**0.1010**	**0.99190**	**0.1120**	**0.0045**	**1786**	**494**	**1809**	**269**	**1835**	**73**	**3.1**
S162A-z24	**14**	*	**179**	**3**	**0.014**	**98.07**	**86.03**	**3.928**	**1.140**	**0.2833**	**0.0806**	**0.98320**	**0.1010**	**0.0053**	**1608**	**405**	**1619**	**234**	**1635**	**98**	**1.9**
S162A-z24	15		189	2	0.012	98.41	89.1	5.989	2.460	0.3972	0.1620	0.99370	0.1090	0.0051	2156	748	1974	357	1789	84	-24.2
S162A-z24	**16**	*	**170**	**3**	**0.015**	**98.64**	**90.41**	**4.029**	**1.040**	**0.2724**	**0.0696**	**0.98420**	**0.1070**	**0.0049**	**1553**	**353**	**1640**	**211**	**1754**	**84**	**12.9**
S162A-z24	**17**	*	**180**	**2**	**0.012**	**97.53**	**81.88**	**4.129**	**1.330**	**0.3157**	**0.0996**	**0.98200**	**0.0948**	**0.0058**	**1769**	**488**	**1660**	**263**	**1525**	**114**	**-18.3**
S162A-z24	**18**	*	**176**	**2**	**0.011**	**98.26**	**87.82**	**4.910**	**1.640**	**0.3369**	**0.1110**	**0.98890**	**0.1060**	**0.0052**	**1872**	**538**	**1804**	**282**	**1726**	**91**	**-9.8**
S162A-z24	19		230	3	0.015	98.42	90.54	2.715	0.621	0.1548	0.0349	0.98220	0.1270	0.0055	928	195	1332	170	2059	76	58.8
Sample S162A, zircon 25: Type 4																					
S162A-z25	1		144	13	0.087	60.62	-53.4	-4.166	1.460	0.1613	0.0430	-0.60040	-0.1870	-0.0537	964	239	NaN	-470	-1	0	NaN
S162A-z25	**2**	*	**103**	**5**	**0.044**	**87.66**	**45.5**	**3.452**	**0.945**	**0.2573**	**0.0581**	**0.85680**	**0.0973**	**0.0138**	**1476**	**298**	**1516**	**215**	**1573**	**265**	**6.9**
S162A-z25	3		115	2	0.021	91.87	59.55	3.976	0.991	0.2672	0.0606	0.92410	0.1080	0.0103	1527	309	1629	202	1764	174	15.1
S162A-z25	**4**	*	**121**	**3**	**0.026**	**92.61**	**60.43**	**3.517**	**0.824**	**0.2527**	**0.0534**	**0.91640**	**0.1010**	**0.0095**	**1452**	**275**	**1531**	**185**	**1641**	**174**	**12.8**
S162A-z25	**5**	*	**131**	**2**	**0.016**	**94.3**	**68.56**	**4.433**	**1.160**	**0.2945**	**0.0732**	**0.95810**	**0.1090**	**0.0082**	**1664**	**365**	**1718**	**216**	**1786**	**136**	**7.8**
S162A-z25	**6**	*	**135**	**2**	**0.016**	**94.2**	**66.27**	**3.744**	**0.851**	**0.2710**	**0.0573**	**0.93780**	**0.1000**	**0.0079**	**1546**	**291**	**1581**	**182**	**1628**	**147**	**5.7**
S162A-z25	**7**	*	**144**	**2**	**0.014**	**94.22**	**65.66**	**3.408**	**0.738**	**0.2544**	**0.0509**	**0.93280**	**0.0972**	**0.0076**	**1461**	**262**	**1506**	**170**	**1570**	**146**	**7.7**
S162A-z25	**8**	*	**152**	**4**	**0.023**	**94.94**	**69.85**	**3.980**	**0.929**	**0.2824**	**0.0628**	**0.95700**	**0.1020**	**0.0069**	**1603**	**316**	**1630**	**189**	**1664**	**125**	**4.1**
S162A-z25	**9**	*	**156**	**3**	**0.022**	**95.66**	**73.79**	**4.088**	**0.893**	**0.2804**	**0.0588**	**0.96240**	**0.1060**	**0.0063**	**1593**	**296**	**1652**	**178**	**1727**	**109**	**8.7**
S162A-z25	**10**	*	**156**	**2**	**0.016**	**95.8**	**73.42**	**3.531**	**0.681**	**0.2553**	**0.0467**	**0.95030**	**0.1000**	**0.0060**	**1466**	**240**	**1534**	**153**	**1630**	**112**	**11.3**
S162A-z25	**11**	*	**163**	**3**	**0.018**	**96.74**	**79**	**3.835**	**0.750**	**0.2651**	**0.0500**	**0.96530**	**0.1050**	**0.0054**	**1516**	**255**	**1600**	**157**	**1713**	**94**	**12.9**
S162A-z25	**12**	*	**171**	**3**	**0.018**	**97.03**	**80.61**	**4.048**	**0.814**	**0.2787**	**0.0545**	**0.97120**	**0.1050**	**0.0051**	**1585**	**275**	**1644**	**164**	**1721**	**88**	**9.0**
S162A-z25	**13**	*	**174**	**3**	**0.016**	**96.71**	**78.34**	**4.129**	**0.876**	**0.2942**	**0.0607**	**0.97140**	**0.1020**	**0.0051**	**1662**	**302**	**1660**	**173**	**1657**	**93**	**-0.4**
S162A-z25	14		179	3	0.014	97.16	82.2	4.129	0.778	0.2674	0.0491	0.97300	0.1120	0.0049	1527	250	1660	154	1832	79	18.6
S162A-z25	**15**	*	**175**	**3**	**0.018**	**97.7**	**84.61**	**3.927**	**0.683**	**0.2657**	**0.0451**	**0.97140**	**0.1070**	**0.0044**	**1519**	**229**	**1619**	**141**	**1752**	**76**	**14.9**
S162A-z25	16		179	3	0.017	97.51	84.5	4.417	0.800	0.2777	0.0493	0.97620	0.1150	0.0045	1580	249	1715	150	1885	71	18.2
S162A-z25	17		183	4	0.022	97.37	83.79	4.504	0.811	0.2819	0.0497	0.97620	0.1160	0.0045	1601	250	1732	150	1893	70	17.4
S162A-z25	18		181	3	0.017	98.28	89.11	4.366	0.693	0.2678	0.0418	0.97690	0.1180	0.0040	1529	213	1706	131	1930	61	23.3
S162A-z25	19		193	3	0.017	98.51	91.18	5.186	0.873	0.2896	0.0482	0.98360	0.1300	0.0039	1639	241	1850	143	2096	53	24.6
Sample S162A, zircon 26: Type 2A																					
S162A-z26	1		174	26	0.148	-70.92	-170.7	NaN	NaN	-3.4980	5.8400	0.99740	1.2600	0.1501	NaN	NaN	NaN	-1690	5559	166	-155.5
S162A-z26	2		163	24	0.151	18.76	-79.04	-44.11	20.200	0.2020	0.1130	-0.34470	-1.5800	-0.9295	1186	604	NaN	-476	-1	-1	NaN
S162A-z26	3		181	11	0.060	60.47	-27.04	-4.844	2.610	0.3049	0.0739	-0.16430	-0.1150	-0.0639	1716	365	NaN	-691	-1	0	NaN
S162A-z26	4		163	12	0.072	74.2	3.523	0.466	1.340	0.3212	0.0645	0.24000	0.0105	0.0299	1795	315	388	930	-1	0	NaN

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
							$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$		
	cycle	ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.	
S162A-z26	5	162	6	0.036	79.47	23.86	2.380	0.840	0.2573	0.0401	0.56030	0.0671	0.0198	1476	206	1236	252	840	615	-84.9
S162A-z26	6	165	4	0.027	86.23	45.7	3.402	0.627	0.2217	0.0297	0.77900	0.1110	0.0129	1291	157	1505	145	1821	211	32.1
S162A-z26	7	165	10	0.060	91.22	56.3	3.376	0.596	0.2384	0.0350	0.85390	0.1030	0.0095	1378	182	1499	138	1674	170	19.6
S162A-z26	8	164	7	0.043	93.69	64.82	3.082	0.527	0.2175	0.0327	0.89200	0.1030	0.0079	1269	173	1428	131	1675	143	26.7
S162A-z26	9	162	9	0.058	96.28	76.7	3.607	0.684	0.2483	0.0447	0.94940	0.1050	0.0063	1430	231	1551	151	1721	109	18.9
S162A-z26	10	155	8	0.053	97.24	81.57	3.482	0.647	0.2428	0.0433	0.95630	0.1040	0.0057	1401	224	1523	147	1696	100	19.3
S162A-z26	11	162	8	0.047	97.64	83.58	3.386	0.659	0.2415	0.0453	0.96200	0.1020	0.0054	1395	235	1501	153	1655	99	17.5
S162A-z26	12	149	5	0.035	98.36	88.56	3.318	0.568	0.2249	0.0373	0.96220	0.1070	0.0050	1308	196	1485	134	1749	86	27.8
S162A-z26	13	156	3	0.017	98.14	87.62	4.038	0.833	0.2634	0.0531	0.97380	0.1110	0.0052	1507	271	1642	168	1819	85	19.2
S162A-z26	14	145	4	0.026	98.21	87.91	3.016	0.456	0.1988	0.0288	0.95020	0.1100	0.0052	1169	155	1412	115	1800	86	38.3
S162A-z26	15	153	3	0.017	97.92	86.04	3.590	0.679	0.2397	0.0439	0.96570	0.1090	0.0053	1385	228	1547	150	1777	90	24.5
S162A-z26	16	153	3	0.018	98.39	88.91	3.360	0.569	0.2240	0.0368	0.96360	0.1090	0.0049	1303	194	1495	132	1780	83	29.6
S162A-z26	17	154	2	0.014	99.19	94.3	3.461	0.579	0.2239	0.0369	0.97370	0.1120	0.0043	1302	194	1518	132	1834	69	32.0
S162A-z26	18	160	1	0.007	99.05	93.46	3.625	0.651	0.2304	0.0408	0.97680	0.1140	0.0044	1337	214	1555	143	1866	70	31.4
S162A-z26	19	170	2	0.013	98.83	92.02	3.812	0.763	0.2444	0.0482	0.98010	0.1130	0.0045	1409	250	1595	161	1850	72	26.5
S162A-z26	20	165	1	0.008	98.6	90.1	3.459	0.641	0.2343	0.0425	0.97310	0.1070	0.0046	1357	222	1518	146	1750	78	24.9
S162A-z26	21	167	3	0.016	99.37	95.51	3.766	0.732	0.2430	0.0468	0.98350	0.1120	0.0040	1402	243	1585	156	1838	64	26.3
S162A-z26	22	164	0	0.003	99.15	94	3.313	0.549	0.2166	0.0353	0.97450	0.1110	0.0041	1264	187	1484	129	1815	68	33.4
S162A-z26	23	181	2	0.011	98.98	92.87	3.352	0.594	0.2193	0.0382	0.97690	0.1110	0.0042	1278	202	1493	139	1814	69	32.5
S162A-z26	24	185	3	0.014	98.64	90.51	3.563	0.695	0.2376	0.0455	0.97800	0.1090	0.0044	1374	237	1541	155	1778	74	25.2
S162A-z26	25	181	1	0.005	98.53	89.34	3.171	0.574	0.2217	0.0392	0.97210	0.1040	0.0044	1291	207	1450	140	1692	78	26.1
S162A-z26	26	181	1	0.006	99.03	92.91	3.277	0.569	0.2230	0.0381	0.97620	0.1070	0.0040	1298	201	1476	135	1742	69	28.1
S162A-z26	27	192	1	0.007	99.23	94.49	3.838	0.814	0.2542	0.0534	0.98630	0.1100	0.0038	1460	275	1601	171	1791	64	20.6
S162A-z26	28	186	1	0.008	99.34	95.34	3.672	0.689	0.2371	0.0441	0.98360	0.1120	0.0038	1372	230	1565	150	1838	61	28.2
S162A-z26	29	204	1	0.006	99.14	94.19	3.980	0.821	0.2469	0.0504	0.98630	0.1170	0.0040	1423	261	1630	167	1910	61	28.4
S162A-z26	30	207	2	0.012	99.37	95.66	3.944	0.789	0.2469	0.0490	0.98700	0.1160	0.0037	1422	253	1623	162	1893	58	27.7
S162A-z26	31	207	2	0.009	99.12	93.99	3.747	0.711	0.2374	0.0446	0.98420	0.1140	0.0039	1373	232	1582	152	1872	61	29.6
S162A-z26	32	213	1	0.005	99.04	93.78	4.059	0.778	0.2443	0.0464	0.98550	0.1210	0.0039	1409	240	1646	156	1964	58	31.4
S162A-z26	33	228	1	0.006	99.48	96.55	4.171	0.837	0.2502	0.0500	0.98950	0.1210	0.0035	1440	258	1668	164	1970	52	30.0
S162A-z26	34	231	2	0.007	99.33	95.64	4.645	1.010	0.2754	0.0593	0.99080	0.1220	0.0036	1568	300	1757	181	1991	52	23.9
S162A-z26	35	233	2	0.008	99.33	95.67	4.194	0.792	0.2453	0.0460	0.98840	0.1240	0.0036	1414	238	1673	155	2015	51	33.2
S162A-z26	36	250	2	0.008	99.17	94.76	5.127	1.180	0.2951	0.0679	0.99230	0.1260	0.0036	1667	338	1841	196	2043	51	20.9
S162A-z26	37	256	3	0.010	99.17	94.87	4.592	0.891	0.2586	0.0499	0.98940	0.1290	0.0036	1483	255	1748	162	2081	50	32.1
S162A-z26	38	285	2	0.005	99.18	95.04	5.390	1.310	0.2995	0.0723	0.99370	0.1310	0.0035	1689	359	1883	207	2105	48	22.4
S162A-z26	39	271	3	0.009	99.27	95.63	4.937	1.020	0.2699	0.0554	0.99180	0.1330	0.0035	1540	281	1809	174	2134	46	31.2
S162A-z26	40	275	2	0.007	99.21	95.33	5.337	1.160	0.2887	0.0625	0.99280	0.1340	0.0035	1635	313	1875	186	2152	46	27.2
S162A-z26	41	277	3	0.009	99.3	95.77	5.057	1.020	0.2761	0.0555	0.99200	0.1330	0.0034	1572	280	1829	171	2136	45	29.7
S162A-z26	42	295	2	0.005	99.32	95.93	5.401	1.170	0.2925	0.0633	0.99340	0.1340	0.0033	1654	316	1885	186	2150	43	26.1
S162A-z26	43	298	3	0.008	99.32	96.12	5.364	1.070	0.2754	0.0546	0.99260	0.1410	0.0034	1568	276	1879	170	2243	42	33.8
S162A-z26	44	290	2	0.006	99.36	96.35	5.120	0.944	0.2640	0.0485	0.99160	0.1410	0.0034	1510	247	1839	157	2235	41	36.3
S162A-z26	45	318	3	0.008	99.49	97.16	5.990	1.340	0.3010	0.0673	0.99500	0.1440	0.0032	1696	333	1974	195	2280	39	29.1
S162A-z26	46	319	3	0.008	99.58	97.62	5.576	1.100	0.2805	0.0552	0.99370	0.1440	0.0032	1594	278	1912	170	2278	38	33.8
S162A-z26	47	323	2	0.007	99.77	98.7	5.467	1.020	0.2694	0.0503	0.99370	0.1470	0.0031	1538	255	1895	161	2314	36	37.6
S162A-z26	48	341	4	0.011	99.74	98.57	5.767	1.080	0.2775	0.0518	0.99390	0.1510	0.0031	1579	261	1942	162	2354	35	37.0
S162A-z26	49	336	1	0.002	99.75	98.66	5.574	0.958	0.2645	0.0454	0.99290	0.1530	0.0031	1513	231	1912	148	2378	35	40.7
Sample S162A, zircon 27: Type 3																				
S162A-z27	1	1762	791	0.449	41.54	-22.25	-1.197	0.418	0.0409	0.0106	-0.54920	-0.2120	-0.0636	259	66	NaN	-2160	-1	0	-1.E+05
S162A-z27	2	1394	289	0.207	73.12	7.69	0.218	0.189	0.0624	0.0164	0.38920	0.0254	0.0203	390	100	200	157	-1	0	-2.E+04
S162A-z27	3	1220	156	0.128	84.12	20.54	0.397	0.170	0.0713	0.0178	0.63220	0.0404	0.0135	444	107	340	124	-1	0	-4.E+04
S162A-z27	4	1167	117	0.101	92.11	49.95	0.799	0.231	0.0818	0.0211	0.90840	0.0708	0.0086	507	126	596	130	952	247	48.6
S162A-z27	5	1040	105	0.101	92.79	46.9	0.622	0.176	0.0794	0.0186	0.84980	0.0568	0.0085	493	111	491	110	485	329	-1.7
S162A-z27	6	927	89	0.096	94.23	51.92	0.727	0.230	0.0963	0.0267	0.89290	0.0548	0.0078	593	157	555	135	404	319	-48.9
S162A-z27	7	754	70	0.093	95.34	61.94	0.829	0.229	0.0913	0.0228	0.91390	0.0658	0.0074	563	135	613	127	801	236	31.0
S162A-z27	8	694	68	0.098	95.05	59.83	0.965	0.322	0.1090	0.0334	0.92780	0.0642	0.0080	667	194	686	167	748	263	11.4
S162A-z27	9	578	54	0.094	95.69	66.3	1.046	0.298	0.1035	0.0271	0.93020	0.0733	0.0077	635	158	727	148	1023	212	39.8
S162A-z27	10	533	61	0.114	94.44	59.57	1.200	0.397	0.1211	0.0365	0.92440	0.0719	0.0091	737	210	801	183	983	257	26.5
S162A-z27	11	485	53	0.109	95.6	67.51	1.284	0.377	0.1177	0.0319	0.93520	0.0791	0.0082	717	184	839	167	1175	206	41.1
S162A-z27	12	462	47	0.102	97.09	79.49	2.134	0.800	0.1611	0.0591	0.98170	0.0961	0.0069	963	328	1160	259	1549	134	40.7
S162A-z27	13	423	44	0.104	95.79	72.19	1.797	0.572	0.1381	0.0421	0.96310	0.0944	0.0081	834	238	1044	208	1516	162	47.9
S162A-z27	14	449	42	0.093	95.96	72.46	2.514	1.090	0.1988	0.0847	0.98120	0.0917	0.0077	1169	456	1276	316	1461	160	21.8
S162A-z27	15	433	49	0.112	96.71	78.23	2.343	0.778	0.1677	0.0544	0.97900	0.1010	0.0069	999	300	1226	236	1649	126	42.5
S162A-z27	16	458	45	0.098	96.84	80.43	3.422	1.580	0.2235	0.1020	0.99130	0.1110	0.0067	1300	537	1510	362	1817	110	31.4
S162A-z27	17	455	45	0.099	96.02	74.92	2.544	0.916	0.1801	0.0633	0.98000	0.1020	0.0073	1067	346	1285	262	1669	132	39.1
S162A-z27	18	476	50	0.104	97.4	83.69	3.176	1.270	0.2033	0.0806	0.99090	0.1130	0.0061	1193	432	1451	309	1853	97	39.0
S162A-z27	19	462	56	0.120	97.27	83.07	3.284	1.280	0.2092	0.0806	0.99020	0.1140	0.0062	1225	430	1477	303	1862	98	37.5
S162A-z27	20	454	51	0.112	96.61	80.11	2.697	0.834	0.1673	0.0507	0.98260	0.1170	0.0067	997	280	1328	229	1910	103	51.5
S162A-z27	21	474	52	0.110	97.48	84.39	3.590	1.460	0.2248	0.0905	0.99210	0.1160	0.0059	1307	477	1547	323	1892	92	34.1
S162A-z27	22	481	64	0.132	98.43	90.69	4.241	1.780	0.2386	0.0998	0.99550	0.1290	0.0051	1379	519	1682	345	2083	70	37.4
S162A-z27	23	465	56	0.119	98.46	91.34	4.363	1.740	0.2316	0.0918	0.99550	0.1370	0.0052	1343	481	1705	329	2185	66	42.6
S162A-z27	24	458	57	0.125	98.07	88.39	3.781	1.430	0.2215	0.0831	0.99340	0.1240	0.0053	1290	438	1589	303	2012	77	39.5
S162A-z27	25	454	65	0.144	97.55	86.15	4.113	1.570	0.2305	0.0872	0.99330	0.1290	0.0057	1337	457	1657	311	2090	78	39.8
S162A-z27	26	442	66	0.150	97.31	84.56	3.500	1.110	0.2022	0.0634	0.98920	0.1260	0.0058	1187	340	1527	250	2036	82	45.5
S162A-z27	27	475	64	0.135	97.91	87.62	3.959	1.470	0.2295	0.0849	0.99360	0.1250	0.0053	1332	445	1626	302	2031	75	38.1
S162A-z27	28	458	66	0.145	98.19	89.38	3.786	1.210	0.2142	0.0680	0.99250	0.1280	0.0050	1251	361	1590	257	2074	69	43.6
S162A-z27	29	474	75	0.158	98.58	92.01	4.387	1.530	0.2308	0.0801	0.99510	0.1380	0.0048	1339	420	1710	288	2200	60	43.2
S162A-z27	30	496	70	0.140	98.65	92.3	4.568	1.680	0.2435	0.0891	0.99570	0.1360	0.0046	1405	462	1743	306	2178	59	39.4
S162A-z27	31	483	75	0.154	98.95	93.89	4.381	1.490	0.2343	0.0793	0.99550	0.1360	0.0043	1357	414	1709	281	2172	56	41.5
S162A-z27	32	472	82	0.174	98.91	94.09	4.447	1.390	0.2229	0.0694	0.99510	0.1450	0.0045	1297	366	1721	259	2284	53	47.6
S162A-z27	33	470	85	0.181	99.13	95.2	4.311	1.240	0.2164	0.0620	0.99470	0.1450	0.0043	1263	328	1695	237	2282	51	49.1
S162A-z27	34	484	82	0.170	99.06	94.89	4.689	1.490	0.2339	0.0739	0.99570	0.1450	0.0043	1355	386	1765	265	2293	51	45.3
S162A-z27	35	473	91	0.193	98.77	93.07	4.537	1.400	0.2380	0.0730	0.99470	0.1380	0.0044	1376	380	1738	256	2206	55	41.7

Grain	Mass cycle	U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
S162A-z27	36	478	77	0.162	99.04	94.53	4.326	1.240	0.2253	0.0643	0.99460	0.1390	0.0041	1310	338	1698	236	2218	51	45.1
S162A-z27	37	498	104	0.208	98.64	92.39	4.403	1.290	0.2306	0.0671	0.99420	0.1390	0.0044	1338	351	1713	242	2209	55	43.6
S162A-z27	38	504	101	0.201	99	94.61	4.662	1.310	0.2293	0.0641	0.99490	0.1470	0.0042	1331	336	1760	235	2317	49	47.0
S162A-z27	39	509	111	0.218	99.46	97.04	4.687	1.320	0.2314	0.0651	0.99580	0.1470	0.0038	1342	341	1765	236	2311	44	46.4
Sample S162A, zircon 28: Type 3																				
S162A-z28	1	902	254	0.282	72.37	-4.64	-0.526	0.623	0.2719	0.0780	-0.17700	-0.0140	-0.0164	1550	395	-757	1330	-1	0	-6.E+04
S162A-z28	2	642	61	0.095	91.64	59.64	6.908	2.330	0.4488	0.1490	0.98810	0.1120	0.0058	2390	664	2100	299	1826	94	-37.1
S162A-z28	3	630	28	0.044	94.17	69.37	7.713	2.790	0.4819	0.1730	0.99370	0.1160	0.0047	2536	752	2198	325	1897	73	-40.8
S162A-z28	4	608	16	0.027	95.53	74.48	7.308	2.560	0.4683	0.1630	0.99480	0.1130	0.0040	2476	716	2150	313	1851	65	-40.8
S162A-z28	5	577	16	0.028	96.62	80.63	8.432	3.180	0.5071	0.1910	0.99690	0.1210	0.0036	2644	816	2279	342	1965	53	-42.3
S162A-z28	6	550	14	0.025	97.31	84.2	7.413	2.410	0.4404	0.1420	0.99650	0.1220	0.0033	2353	638	2163	290	1987	48	-22.0
S162A-z28	7	536	9	0.017	98.11	88.23	8.577	3.230	0.5195	0.1950	0.99790	0.1200	0.0029	2697	828	2294	342	1952	44	-46.9
S162A-z28	8	527	8	0.015	98.78	92.33	9.230	3.800	0.5424	0.2230	0.99860	0.1230	0.0027	2794	932	2361	377	2006	39	-48.6
S162A-z28	9	516	4	0.007	99.11	94.36	8.756	3.320	0.5105	0.1930	0.99850	0.1240	0.0026	2659	825	2313	345	2020	37	-38.7
S162A-z28	10	506	7	0.014	99.26	95.25	8.401	3.010	0.4944	0.1770	0.99840	0.1230	0.0025	2590	764	2275	325	2004	36	-35.6
S162A-z28	11	511	5	0.010	99.24	95.26	8.706	3.180	0.4920	0.1790	0.99850	0.1280	0.0026	2579	775	2308	332	2075	36	-29.6
S162A-z28	12	510	6	0.012	99.26	95.34	9.384	3.720	0.5352	0.2120	0.99870	0.1270	0.0026	2763	890	2376	364	2059	36	-42.2
S162A-z28	13	508	5	0.011	99.17	94.85	8.790	3.270	0.5024	0.1870	0.99840	0.1270	0.0026	2624	802	2316	340	2055	37	-33.8
S162A-z28	14	505	5	0.011	99.24	95.32	9.486	3.640	0.5303	0.2030	0.99860	0.1300	0.0026	2743	856	2386	352	2094	36	-38.2
S162A-z28	15	489	6	0.012	98.96	93.59	8.721	3.110	0.4950	0.1760	0.99820	0.1280	0.0027	2592	761	2309	325	2068	38	-30.8
S162A-z28	16	487	3	0.006	99.01	93.99	9.306	3.490	0.5228	0.1960	0.99840	0.1290	0.0027	2711	830	2369	344	2086	37	-36.8
S162A-z28	17	485	6	0.013	99.17	95.02	9.050	3.240	0.4959	0.1770	0.99840	0.1320	0.0027	2596	764	2343	327	2129	36	-26.8
S162A-z28	18	461	6	0.012	99.35	96.11	10.000	3.720	0.5414	0.2010	0.99860	0.1340	0.0027	2789	843	2435	344	2151	35	-36.7
S162A-z28	19	478	4	0.009	99.56	97.36	9.668	3.520	0.5167	0.1880	0.99860	0.1360	0.0026	2685	800	2404	335	2173	33	-28.9
S162A-z28	20	495	4	0.008	99.53	97.22	10.870	4.470	0.5799	0.2380	0.99890	0.1360	0.0026	2948	973	2512	383	2176	33	-44.4
S162A-z28	21	493	5	0.011	99.43	96.56	9.841	3.640	0.5371	0.1990	0.99860	0.1330	0.0026	2771	833	2420	341	2137	34	-36.6
S162A-z28	22	496	3	0.005	99.28	95.72	10.130	3.930	0.5497	0.2130	0.99870	0.1340	0.0026	2824	886	2446	358	2146	35	-39.2
S162A-z28	23	477	6	0.013	99.43	96.64	8.813	2.800	0.4695	0.1490	0.99810	0.1360	0.0026	2482	653	2319	289	2179	34	-16.7
S162A-z28	24	483	4	0.009	99.38	96.37	9.607	3.270	0.5035	0.1710	0.99840	0.1380	0.0027	2629	734	2398	313	2207	34	-23.3
S162A-z28	25	504	6	0.011	99.33	96.12	11.070	4.560	0.5835	0.2400	0.99890	0.1380	0.0026	2963	978	2529	383	2197	33	-43.7
S162A-z28	26	475	6	0.012	99.36	96.28	9.782	3.330	0.5147	0.1750	0.99840	0.1380	0.0027	2677	746	2414	314	2200	33	-26.6
S162A-z28	27	483	3	0.006	99.42	96.6	10.430	3.820	0.5525	0.2030	0.99870	0.1370	0.0026	2835	841	2473	340	2188	33	-36.8
S162A-z28	28	474	6	0.012	99.63	97.83	9.491	3.070	0.5004	0.1620	0.99840	0.1380	0.0025	2616	694	2387	297	2197	32	-23.2
S162A-z28	29	492	4	0.007	99.64	97.88	11.540	4.610	0.6042	0.2410	0.99900	0.1390	0.0025	3047	969	2568	373	2209	32	-47.8
S162A-z28	30	462	4	0.008	99.44	96.78	9.416	2.920	0.4856	0.1500	0.99810	0.1410	0.0026	2552	652	2379	284	2235	33	-17.2
S162A-z28	31	476	3	0.007	99.37	96.33	10.340	3.660	0.5462	0.1930	0.99860	0.1370	0.0026	2809	805	2466	328	2194	33	-34.7
S162A-z28	32	478	6	0.012	99.54	97.28	9.041	2.790	0.4769	0.1470	0.99820	0.1370	0.0026	2514	642	2342	282	2196	32	-17.5
S162A-z28	33	468	6	0.012	99.5	97.14	10.280	3.510	0.5267	0.1800	0.99850	0.1420	0.0026	2728	758	2460	316	2246	32	-26.4
Sample F28A, zircon 4: Type 1A																				
F28A-z4	1	604	12	0.020	96.44	77.31	4.229	1.030	0.2945	0.0711	0.99130	0.1040	0.0033	1664	354	1680	200	1699	59	2.3
F28A-z4	2	630	9	0.014	98.08	87.42	6.025	1.750	0.3877	0.1130	0.99690	0.1130	0.0026	2112	523	1979	254	1843	41	-17.2
F28A-z4	**3 ***	**690**	**10**	**0.015**	**98.44**	**89.6**	**5.473**	**1.490**	**0.3508**	**0.0953**	**0.99700**	**0.1130**	**0.0024**	**1939**	**455**	**1896**	**234**	**1850**	**38**	**-5.6**
F28A-z4	**4 ***	**681**	**8**	**0.012**	**98.43**	**89.51**	**5.488**	**1.440**	**0.3526**	**0.0926**	**0.99680**	**0.1130**	**0.0024**	**1947**	**441**	**1899**	**226**	**1846**	**38**	**-6.4**
F28A-z4	**5 ***	**642**	**7**	**0.011**	**98.27**	**88.34**	**5.678**	**1.520**	**0.3725**	**0.0997**	**0.99660**	**0.1110**	**0.0024**	**2041**	**468**	**1928**	**232**	**1809**	**40**	**-15.0**
F28A-z4	6	655	7	0.011	98.21	88.06	5.967	1.710	0.3887	0.1110	0.99700	0.1110	0.0025	2117	515	1971	249	1822	40	-19.0
F28A-z4	**7 ***	**662**	**7**	**0.010**	**98.14**	**87.61**	**5.507**	**1.460**	**0.3607**	**0.0952**	**0.99650**	**0.1110**	**0.0025**	**1986**	**451**	**1902**	**227**	**1811**	**41**	**-11.2**
F28A-z4	**8 ***	**641**	**7**	**0.010**	**98.23**	**88.29**	**5.431**	**1.360**	**0.3493**	**0.0873**	**0.99620**	**0.1130**	**0.0025**	**1931**	**417**	**1890**	**215**	**1844**	**39**	**-5.5**
F28A-z4	**9 ***	**641**	**7**	**0.010**	**98.18**	**88.05**	**5.403**	**1.330**	**0.3457**	**0.0851**	**0.99610**	**0.1130**	**0.0025**	**1914**	**407**	**1885**	**212**	**1854**	**39**	**-3.7**
F28A-z4	**10 ***	**624**	**9**	**0.014**	**97.85**	**85.62**	**4.950**	**1.170**	**0.3315**	**0.0780**	**0.99500**	**0.1080**	**0.0026**	**1846**	**378**	**1811**	**200**	**1771**	**43**	**-4.8**
F28A-z4	**11 ***	**593**	**6**	**0.009**	**97.76**	**85**	**5.006**	**1.120**	**0.3370**	**0.0752**	**0.99430**	**0.1080**	**0.0026**	**1872**	**363**	**1820**	**190**	**1762**	**44**	**-7.2**
F28A-z4	**12 ***	**640**	**4**	**0.007**	**98.01**	**86.91**	**5.439**	**1.290**	**0.3524**	**0.0835**	**0.99570**	**0.1120**	**0.0025**	**1946**	**398**	**1891**	**204**	**1831**	**40**	**-7.3**
F28A-z4	**13 ***	**763**	**10**	**0.013**	**97.85**	**86.07**	**4.518**	**0.941**	**0.2910**	**0.0603**	**0.99470**	**0.1130**	**0.0024**	**1647**	**301**	**1734**	**173**	**1842**	**39**	**12.0**
F28A-z4	14	912	12	0.013	97.82	85.86	3.976	0.833	0.2578	0.0537	0.99510	0.1120	0.0023	1478	275	1629	170	1830	38	21.5
F28A-z4	15	1038	18	0.017	97.23	82.03	3.231	0.667	0.2177	0.0446	0.99380	0.1080	0.0025	1270	236	1465	160	1760	42	30.7
F28A-z4	16	1134	16	0.014	96.82	79.55	2.602	0.480	0.1782	0.0325	0.99090	0.1060	0.0026	1057	178	1301	135	1730	46	42.1
F28A-z4	17	1263	21	0.017	96.33	76.39	2.385	0.461	0.1693	0.0324	0.99010	0.1020	0.0028	1008	179	1238	138	1664	50	42.5
F28A-z4	18	1407	24	0.017	95.53	72.11	2.138	0.426	0.1547	0.0304	0.98840	0.1000	0.0030	927	170	1161	138	1629	56	46.2
F28A-z4	19	1416	25	0.018	95.55	72.1	1.944	0.365	0.1415	0.0262	0.98670	0.0996	0.0030	853	148	1096	126	1617	57	50.4
F28A-z4	20	1398	24	0.017	96.43	76.58	1.938	0.360	0.1400	0.0257	0.98910	0.1000	0.0027	845	145	1094	124	1631	51	51.4
F28A-z4	21	1404	24	0.017	96.29	75.08	1.786	0.321	0.1348	0.0239	0.98700	0.0961	0.0028	815	136	1041	117	1550	54	50.4
F28A-z4	22	1448	30	0.021	96.57	77.25	1.889	0.353	0.1371	0.0253	0.98960	0.0999	0.0027	828	144	1077	124	1623	50	52.1
F28A-z4	23	1469	28	0.019	96.6	76.82	1.705	0.311	0.1282	0.0231	0.98820	0.0965	0.0027	777	132	1010	117	1557	52	53.1
F28A-z4	24	1586	30	0.019	96.09	72.82	1.495	0.276	0.1202	0.0219	0.98500	0.0902	0.0029	732	126	928	112	1429	61	51.5
F28A-z4	25	1690	35	0.021	96.27	73.24	1.333	0.239	0.1101	0.0193	0.98380	0.0878	0.0028	674	112	860	104	1378	62	53.8
F28A-z4	26	1804	35	0.019	96.55	74.7	1.192	0.201	0.0990	0.0163	0.98290	0.0873	0.0027	609	96	797	93	1367	60	58.1
F28A-z4	27	1892	45	0.024	97.12	77.39	1.124	0.192	0.0970	0.0163	0.98490	0.0841	0.0025	597	96	765	92	1294	58	56.4
F28A-z4	28	1968	45	0.023	96.98	76.16	1.049	0.174	0.0925	0.0150	0.98270	0.0823	0.0025	570	89	728	86	1253	60	56.9
F28A-z4	29	2037	50	0.025	96.53	72.88	0.964	0.156	0.0874	0.0138	0.97800	0.0799	0.0027	540	82	685	81	1196	66	57.1
F28A-z4	30	2049	45	0.022	96.45	72.01	0.962	0.163	0.0890	0.0147	0.97870	0.0784	0.0027	550	87	684	84	1157	69	54.7
F28A-z4	31	2050	47	0.023	96.69	73.75	0.920	0.147	0.0838	0.0131	0.97830	0.0796	0.0026	519	78	662	78	1187	65	58.5
F28A-z4	32	2100	55	0.026	97.11	75.94	0.904	0.148	0.0842	0.0135	0.98090	0.0779	0.0025	521	80	654	79	1145	63	56.7
F28A-z4	33	2166	49	0.022	96.94	74.83	0.887	0.146	0.0827	0.0133	0.97990	0.0778	0.0025	512	79	645	78	1142	65	57.4
F28A-z4	34	2174	54	0.025	97.43	78.23	0.901	0.149	0.0831	0.0135	0.98350	0.0787	0.0024	515	80	653	80	1164	59	58.0
F28A-z4	35	2089	57	0.027	97.33	76.91	0.818	0.126	0.0785	0.0118	0.97880	0.0755	0.0024	487	70	607	70	1083	63	57.1
F28A-z4	36	2227	51	0.023	97.33	77.17	0.830	0.129	0.0785	0.0119	0.97980	0.0766	0.0024	487	71	614	71	1112	62	58.3
F28A-z4	37	2246	55	0.024	97.66	79.93	0.867	0.136	0.0795	0.0122	0.98340	0.0791	0.0023	493	73	634	74	1175	56	60.3
F28A-z4	38	2265	61	0.027	97.4	77.79	0.835	0.131	0.0782	0.0120	0.98080	0.0775	0.0024	485	72	617	72	1134	61	59.4
F28A-z4	39	2199	53	0.024	97.57	79.23	0.826	0.127	0.0761	0.0114	0.98170	0.0787	0.0023	473	69	611	71	1166	58	61.6
F28A-z4	40	2202	49	0.022	97.42	77.65	0.795	0.124	0.0757	0.0116	0.97990	0.0761	0.0024	471	69	594	70	1098	62	59.2
F28A-z4	41	2249	62	0.027	97.59	79.23	0.767	0.113	0.0713	0.0103	0.97980	0.0781	0.0023	444	62	578	65	1149	59	63.5

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
								$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$		
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.	
F28A-z4	42		2253	50	0.022	97.58	79	0.765	0.116	0.0719	0.0107	0.98030	0.0772	0.0023	447	64	577	67	1127	60	62.4
F28A-z4	43		2313	58	0.025	97.24	75.94	0.702	0.104	0.0687	0.0099	0.97480	0.0741	0.0025	428	60	540	62	1044	67	60.9
F28A-z4	44		2374	59	0.025	97.25	76.23	0.705	0.106	0.0681	0.0100	0.97560	0.0751	0.0025	424	60	542	63	1070	66	62.3
F28A-z4	45		2348	59	0.025	97.32	76.53	0.671	0.097	0.0655	0.0091	0.97330	0.0743	0.0025	409	55	521	59	1049	67	62.9
F28A-z4	46		2410	60	0.025	97.01	73.76	0.666	0.103	0.0674	0.0101	0.97240	0.0717	0.0026	420	61	519	63	978	74	58.9
F28A-z4	47		2397	61	0.026	97	73.74	0.622	0.089	0.0626	0.0086	0.96730	0.0720	0.0026	391	52	491	56	987	74	62.2
F28A-z4	48		2431	65	0.027	97.26	75.33	0.618	0.091	0.0629	0.0089	0.97050	0.0712	0.0025	393	54	489	57	964	72	61.0
F28A-z4	49		2365	61	0.026	97.27	75.56	0.602	0.087	0.0608	0.0085	0.96960	0.0718	0.0025	381	52	479	55	980	72	62.9
F28A-z4	50		2327	61	0.026	97.1	74.1	0.574	0.081	0.0587	0.0079	0.96450	0.0709	0.0026	368	48	460	52	953	76	63.2
F28A-z4	51		2465	67	0.027	97.05	73.71	0.570	0.084	0.0586	0.0083	0.96620	0.0705	0.0027	367	50	458	54	944	78	62.8
F28A-z4	52		2515	67	0.026	97.3	75.44	0.565	0.083	0.0579	0.0082	0.96840	0.0707	0.0026	363	50	455	54	950	75	63.5
F28A-z4	53		2526	75	0.030	96.98	73.4	0.540	0.077	0.0551	0.0075	0.96250	0.0711	0.0027	346	46	438	51	959	79	65.7
F28A-z4	54		2633	63	0.024	96.82	70.78	0.508	0.075	0.0558	0.0079	0.95740	0.0660	0.0028	350	48	417	51	807	90	58.1
F28A-z4	55		2594	66	0.026	96.47	67.95	0.479	0.071	0.0540	0.0075	0.94900	0.0643	0.0030	339	46	397	48	751	98	56.3
F28A-z4	56		2530	67	0.026	96.7	69.85	0.477	0.070	0.0528	0.0073	0.95300	0.0655	0.0029	332	45	396	48	792	93	59.6
F28A-z4	57		2410	69	0.029	97.23	74.25	0.482	0.068	0.0513	0.0069	0.95930	0.0681	0.0027	323	42	399	46	873	82	64.6
F28A-z4	58		2484	64	0.026	97.09	73.01	0.465	0.065	0.0502	0.0067	0.95570	0.0671	0.0028	316	41	388	45	842	86	64.0
F28A-z4	59		2553	69	0.027	96.96	71.95	0.451	0.064	0.0491	0.0066	0.95290	0.0666	0.0029	309	41	378	45	825	90	64.0
Sample F28A, zircon 5: Type 4																					
F28A-z5	**1**	*	**630**	**23**	**0.037**	**63.63**	**20.01**	**4.918**	**1.370**	**0.3012**	**0.0750**	**0.92120**	**0.1180**	**0.0128**	**1697**	**372**	**1805**	**234**	**1932**	**194**	**13.8**
F28A-z5	**2**	*	**467**	**23**	**0.050**	**70.13**	**22.25**	**4.381**	**1.220**	**0.3147**	**0.0778**	**0.90910**	**0.1010**	**0.0118**	**1764**	**382**	**1709**	**231**	**1642**	**216**	**-8.5**
F28A-z5	3		348	31	0.089	73.72	21.83	3.180	0.855	0.2798	0.0600	0.83510	0.0824	0.0122	1590	302	1452	208	1256	290	-30.1
F28A-z5	4		299	30	0.100	79.06	31.13	4.507	1.290	0.3297	0.0852	0.92060	0.0991	0.0111	1837	413	1732	238	1608	209	-16.4
F28A-z5	**5**	*	**255**	**29**	**0.115**	**83.55**	**40.83**	**4.854**	**1.240**	**0.3128**	**0.0736**	**0.93800**	**0.1130**	**0.0100**	**1755**	**362**	**1794**	**215**	**1841**	**160**	**5.4**
F28A-z5	**6**	*	**226**	**38**	**0.168**	**85.52**	**44.31**	**4.879**	**1.200**	**0.3171**	**0.0722**	**0.93770**	**0.1120**	**0.0096**	**1776**	**354**	**1799**	**208**	**1825**	**156**	**3.1**
F28A-z5	7		210	31	0.146	87.87	52.29	5.425	1.290	0.3141	0.0704	0.95450	0.1250	0.0089	1761	345	1889	204	2033	125	15.3
F28A-z5	**8**	*	**207**	**32**	**0.154**	**88.06**	**50.91**	**5.363**	**1.390**	**0.3339**	**0.0820**	**0.95370**	**0.1160**	**0.0091**	**1857**	**396**	**1879**	**223**	**1903**	**141**	**2.8**
F28A-z5	**9**	*	**194**	**31**	**0.159**	**87.83**	**48.15**	**4.697**	**1.210**	**0.3197**	**0.0762**	**0.93870**	**0.1070**	**0.0095**	**1788**	**372**	**1767**	**215**	**1741**	**163**	**-3.1**
F28A-z5	10		194	30	0.155	87.15	44.09	4.485	1.280	0.3377	0.0887	0.93200	0.0963	0.0100	1876	428	1728	238	1554	195	-23.9
F28A-z5	**11**	*	**191**	**34**	**0.177**	**89.81**	**53.92**	**5.145**	**1.380**	**0.3393**	**0.0863**	**0.95490**	**0.1100**	**0.0088**	**1883**	**415**	**1844**	**228**	**1799**	**145**	**-5.4**
F28A-z5	**12**	*	**192**	**34**	**0.179**	**90.92**	**58.55**	**5.667**	**1.570**	**0.3517**	**0.0933**	**0.96630**	**0.1170**	**0.0083**	**1943**	**445**	**1926**	**238**	**1909**	**128**	**-2.0**
F28A-z5	**13**	*	**179**	**36**	**0.202**	**90.7**	**56.71**	**5.047**	**1.250**	**0.3291**	**0.0770**	**0.95180**	**0.1110**	**0.0085**	**1834**	**374**	**1827**	**210**	**1819**	**138**	**-1.0**
F28A-z5	**14**	*	**200**	**29**	**0.147**	**92.32**	**62.23**	**5.576**	**1.620**	**0.3562**	**0.1000**	**0.97330**	**0.1140**	**0.0076**	**1964**	**477**	**1912**	**250**	**1856**	**121**	**-6.8**
F28A-z5	15		216	30	0.138	93.6	66.4	6.513	2.260	0.4222	0.1440	0.98460	0.1120	0.0068	2271	651	2048	305	1830	110	-28.6
F28A-z5	16		218	24	0.111	93.56	65.22	5.466	1.640	0.3710	0.1080	0.97760	0.1070	0.0067	2034	509	1895	257	1747	115	-19.1
F28A-z5	17		229	24	0.103	94.19	66.87	5.988	2.080	0.4211	0.1430	0.98420	0.1030	0.0063	2265	650	1974	302	1681	113	-41.4
F28A-z5	18		218	19	0.089	93.66	64.14	4.625	1.230	0.3346	0.0862	0.96890	0.1000	0.0066	1860	416	1754	223	1629	123	-16.4
F28A-z5	19		233	20	0.088	94.06	67.01	5.948	1.970	0.4057	0.1320	0.98360	0.1060	0.0064	2195	606	1968	288	1737	110	-31.2
F28A-z5	20		229	20	0.087	94.58	69.85	6.044	1.940	0.3990	0.1260	0.98490	0.1100	0.0061	2165	579	1982	279	1797	101	-24.1
F28A-z5	21		245	19	0.079	94.2	67.86	6.633	2.480	0.4469	0.1650	0.98790	0.1080	0.0062	2382	734	2064	330	1760	106	-42.4
Sample F28A, zircon 6: Type 1B																					
F28A-z6	1		1144	32	0.028	60.09	-18.66	-1.164	0.329	0.0976	0.0146	-0.37730	-0.0865	-0.0230	600	86	NaN	-2030	-1	0	-1.E+05
F28A-z6	2		1406	27	0.019	80.84	26.21	1.432	0.325	0.1489	0.0260	0.80750	0.0697	0.0094	895	146	902	136	921	276	3.0
F28A-z6	3		1605	27	0.017	87.01	40.55	1.446	0.270	0.1243	0.0202	0.89240	0.0844	0.0071	755	116	908	112	1301	164	44.4
F28A-z6	4		1736	26	0.015	90.29	48.58	1.646	0.325	0.1418	0.0259	0.93540	0.0842	0.0059	855	146	988	125	1297	136	36.4
F28A-z6	5		1750	29	0.017	91.75	53.31	1.823	0.377	0.1554	0.0305	0.95490	0.0851	0.0052	931	170	1054	136	1317	119	31.4
F28A-z6	6		1610	20	0.013	92.26	53.28	1.617	0.298	0.1479	0.0254	0.94090	0.0793	0.0049	889	142	977	115	1179	123	26.3
F28A-z6	7		1991	30	0.015	93.14	58.35	1.735	0.338	0.1472	0.0275	0.96440	0.0855	0.0044	885	154	1022	126	1327	100	35.6
F28A-z6	8		2165	35	0.016	93.46	59.25	1.754	0.341	0.1509	0.0282	0.96780	0.0843	0.0041	906	158	1029	126	1299	95	32.4
F28A-z6	9		1912	28	0.015	93.57	61.83	2.593	0.522	0.2038	0.0400	0.97770	0.0923	0.0039	1196	214	1299	147	1473	80	20.6
F28A-z6	10		1593	23	0.015	92.75	57.37	3.010	0.543	0.2504	0.0436	0.97030	0.0872	0.0038	1440	225	1410	137	1365	84	-6.2
F28A-z6	**11**	*	**1686**	**20**	**0.012**	**92.94**	**62.57**	**4.502**	**0.848**	**0.3106**	**0.0575**	**0.98490**	**0.1050**	**0.0034**	**1744**	**283**	**1731**	**157**	**1716**	**60**	**-1.9**
F28A-z6	**12**	*	**1729**	**20**	**0.011**	**93.13**	**63.25**	**4.790**	**0.869**	**0.3306**	**0.0590**	**0.98540**	**0.1050**	**0.0032**	**1841**	**286**	**1783**	**152**	**1716**	**57**	**-8.4**
F28A-z6	13		1567	18	0.011	93.21	61.43	4.359	0.844	0.3291	0.0625	0.98270	0.0961	0.0034	1834	303	1705	160	1549	67	-21.2
F28A-z6	**14**	*	**1403**	**19**	**0.013**	**94.78**	**67.86**	**4.152**	**0.836**	**0.3130**	**0.0620**	**0.98550**	**0.0962**	**0.0033**	**1755**	**305**	**1665**	**165**	**1552**	**64**	**-15.0**
F28A-z6	**15**	*	**1444**	**16**	**0.011**	**96.12**	**75.34**	**3.636**	**0.670**	**0.2581**	**0.0470**	**0.98750**	**0.1020**	**0.0030**	**1480**	**241**	**1557**	**147**	**1664**	**54**	**12.4**
F28A-z6	**16**	*	**1497**	**15**	**0.010**	**97.14**	**80.81**	**3.874**	**0.748**	**0.2738**	**0.0524**	**0.99100**	**0.1030**	**0.0026**	**1560**	**265**	**1608**	**156**	**1672**	**48**	**7.5**
F28A-z6	**17**	*	**1529**	**16**	**0.010**	**97.81**	**84.85**	**4.196**	**0.844**	**0.2932**	**0.0586**	**0.99330**	**0.1040**	**0.0024**	**1657**	**292**	**1673**	**165**	**1693**	**43**	**2.4**
F28A-z6	18		1678	23	0.014	98.32	88.45	4.020	0.797	0.2689	0.0531	0.99460	0.1080	0.0022	1535	270	1638	161	1773	37	15.1
F28A-z6	**19**	*	**1777**	**19**	**0.011**	**98.6**	**89.96**	**3.979**	**0.803**	**0.2735**	**0.0550**	**0.99550**	**0.1060**	**0.0020**	**1559**	**279**	**1630**	**164**	**1723**	**35**	**10.7**
F28A-z6	20		1901	26	0.014	98.11	87.07	3.787	0.710	0.2562	0.0478	0.99440	0.1070	0.0021	1471	245	1590	151	1752	36	17.9
F28A-z6	**21**	*	**1888**	**24**	**0.013**	**97.8**	**84.7**	**4.181**	**0.874**	**0.2937**	**0.0611**	**0.99500**	**0.1030**	**0.0021**	**1660**	**304**	**1670**	**171**	**1683**	**38**	**1.5**
F28A-z6	**22**	*	**1995**	**31**	**0.015**	**97.88**	**85.31**	**3.732**	**0.675**	**0.2602**	**0.0468**	**0.99380**	**0.1040**	**0.0021**	**1491**	**240**	**1578**	**145**	**1697**	**37**	**13.6**
F28A-z6	**23**	*	**2113**	**24**	**0.011**	**97.68**	**84.55**	**4.383**	**0.907**	**0.2958**	**0.0610**	**0.99540**	**0.1070**	**0.0021**	**1670**	**303**	**1709**	**171**	**1757**	**36**	**5.6**
F28A-z6	**24**	*	**2162**	**30**	**0.014**	**97.24**	**81.26**	**3.955**	**0.816**	**0.2813**	**0.0577**	**0.99450**	**0.1020**	**0.0022**	**1598**	**290**	**1625**	**167**	**1660**	**40**	**4.2**
F28A-z6	**25**	*	**2176**	**35**	**0.016**	**97.26**	**81.95**	**4.628**	**1.040**	**0.3171**	**0.0712**	**0.99570**	**0.1060**	**0.0022**	**1776**	**348**	**1754**	**188**	**1729**	**38**	**-3.1**
F28A-z6	**26**	*	**2019**	**30**	**0.015**	**97.2**	**81.34**	**4.000**	**0.733**	**0.2786**	**0.0507**	**0.99290**	**0.1040**	**0.0023**	**1584**	**256**	**1634**	**149**	**1699**	**40**	**7.6**
F28A-z6	**27**	*	**2019**	**30**	**0.015**	**97.04**	**80.39**	**4.174**	**0.838**	**0.2924**	**0.0583**	**0.99370**	**0.1040**	**0.0023**	**1654**	**291**	**1669**	**164**	**1688**	**41**	**2.3**
F28A-z6	**28**	*	**1907**	**27**	**0.014**	**96.9**	**79.02**	**4.068**	**0.802**	**0.2956**	**0.0578**	**0.99280**	**0.0998**	**0.0024**	**1669**	**288**	**1648**	**161**	**1621**	**44**	**-3.4**
F28A-z6	**29**	*	**1943**	**34**	**0.017**	**97.15**	**81.01**	**3.925**	**0.737**	**0.2746**	**0.0512**	**0.99300**	**0.1040**	**0.0023**	**1564**	**259**	**1619**	**152**	**1691**	**41**	**8.5**
F28A-z6	**30**	*	**2008**	**29**	**0.014**	**97.09**	**80.75**	**4.138**	**0.826**	**0.2881**	**0.0572**	**0.99380**	**0.1040**	**0.0023**	**1632**	**286**	**1662**	**163**	**1700**	**41**	**4.5**
F28A-z6	**31**	*	**2081**	**29**	**0.014**	**97.39**	**82.72**	**4.404**	**0.944**	**0.3011**	**0.0643**	**0.99530**	**0.1060**	**0.0022**	**1697**	**318**	**1713**	**177**	**1733**	**38**	**2.4**
F28A-z6	**32**	*	**2074**	**38**	**0.018**	**97.22**	**81.61**	**3.785**	**0.700**	**0.2616**	**0.0481**	**0.99330**	**0.1050**	**0.0022**	**1498**	**246**	**1590**	**149**	**1713**	**39**	**14.0**
F28A-z6	**33**	*	**2086**	**27**	**0.013**	**97.29**	**81.23**	**4.420**	**0.952**	**0.3208**	**0.0687**	**0.99470**	**0.0999**	**0.0022**	**1794**	**335**	**1716**	**178**	**1623**	**41**	**-12.0**
F28A-z6	**34**	*	**2248**	**31**	**0.014**	**97.3**	**81.58**	**3.991**	**0.790**	**0.2843**	**0.0559**	**0.99390**	**0.1020**	**0.0022**	**1613**	**281**	**1632**	**161**	**1657**	**40**	**3.0**
Sample F28A, zircon 7: Type 3																					
F28A-z7	1		740	40	0.054	62.86	20.33	4.299	1.030	0.2498	0.0523	0.90700	0.1250	0.0126	1437	270	1693	197	2027	179	32.4
F28A-z7	2		638	25	0.040	70.38	30.37	5.448	1.240	0.2599	0.0556	0.95470	0.1520	0.0103	1489	284	1892	196	2369	116	41.5
F28A-z7	3		626	20	0.033	74.99	38.13	6.237	1.410	0.2657	0.0579	0.97280	0.1700	0.0089	1519	295	2010	198	2560	88	45.5

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
								$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$			
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.		
F28A-z7	4		647	18	0.027	76.28	38.92	6.173	1.460	0.2729	0.0624	0.97450	0.1640	0.0087	1555	316	2001	207	2498	90		42.3
F28A-z7	5		614	15	0.024	78.34	41.93	5.772	1.230	0.2533	0.0521	0.97280	0.1650	0.0082	1455	268	1942	185	2510	83		46.8
F28A-z7	6		604	15	0.025	80.16	44.34	6.211	1.420	0.2759	0.0611	0.97840	0.1630	0.0077	1570	309	2006	200	2490	80		41.5
F28A-z7	7		626	14	0.022	80.38	42.91	5.594	1.230	0.2671	0.0565	0.97390	0.1520	0.0076	1526	288	1915	189	2367	85		39.8
F28A-z7	8		697	15	0.022	80.37	41.9	5.449	1.280	0.2708	0.0616	0.97690	0.1460	0.0073	1545	313	1893	201	2299	86		36.8
F28A-z7	9		770	14	0.018	82.71	47.17	5.855	1.350	0.2747	0.0620	0.98400	0.1550	0.0064	1565	314	1955	200	2397	70		39.0
F28A-z7	10		1028	21	0.021	82.72	47.69	4.258	0.857	0.1958	0.0384	0.98120	0.1580	0.0061	1153	207	1685	165	2431	66		57.2
F28A-z7	11		1120	25	0.022	83.39	46.15	3.967	0.807	0.2035	0.0403	0.97910	0.1410	0.0059	1194	216	1627	165	2244	72		51.1
F28A-z7	12		1119	23	0.021	85.09	48.43	4.548	1.020	0.2420	0.0531	0.98450	0.1360	0.0054	1397	276	1740	186	2181	69		39.9
F28A-z7	13		1214	26	0.021	85.98	51.89	4.548	1.010	0.2264	0.0494	0.98770	0.1460	0.0050	1316	259	1740	184	2296	60		47.1
F28A-z7	14		1239	27	0.021	85.71	50.43	4.183	0.875	0.2160	0.0443	0.98520	0.1400	0.0050	1261	235	1671	171	2233	62		47.8
F28A-z7	15		1261	24	0.019	87.69	54.75	4.894	1.130	0.2524	0.0578	0.99030	0.1410	0.0045	1451	297	1801	195	2235	56		39.1
F28A-z7	16		1312	24	0.018	88.98	57.99	4.709	1.040	0.2413	0.0527	0.99120	0.1420	0.0041	1393	274	1769	185	2246	50		42.1
F28A-z7	17		1438	27	0.019	88.61	56.18	4.425	0.968	0.2353	0.0508	0.99060	0.1360	0.0041	1362	265	1717	181	2182	52		41.6
F28A-z7	18		1632	36	0.022	88.09	55.47	4.266	0.907	0.2218	0.0466	0.99090	0.1390	0.0040	1292	246	1687	175	2221	50		46.1
F28A-z7	19		1785	48	0.027	87.55	54.49	4.217	0.876	0.2169	0.0445	0.99100	0.1410	0.0039	1266	236	1677	170	2240	48		47.8
F28A-z7	20		1891	47	0.025	87.65	54.7	4.011	0.779	0.2065	0.0397	0.99070	0.1410	0.0037	1210	212	1636	158	2238	46		50.2
F28A-z7	21		2058	55	0.027	87.6	54.68	4.151	0.852	0.2129	0.0432	0.99210	0.1410	0.0036	1244	230	1664	168	2244	44		48.9
F28A-z7	22		2152	61	0.028	87.56	54.44	4.017	0.812	0.2072	0.0414	0.99200	0.1410	0.0036	1214	221	1638	164	2235	44		50.0
F28A-z7	23		2247	75	0.033	87.17	53.55	3.920	0.799	0.2024	0.0408	0.99190	0.1400	0.0036	1188	219	1618	165	2233	45		51.1
F28A-z7	24		2427	90	0.037	87.66	55.15	3.941	0.797	0.1994	0.0400	0.99260	0.1430	0.0035	1172	215	1622	164	2268	42		52.7
F28A-z7	25		2419	84	0.035	88.03	55	3.997	0.851	0.2105	0.0445	0.99320	0.1380	0.0034	1232	237	1634	173	2199	43		48.2
F28A-z7	26		2382	80	0.034	87.99	54.93	3.777	0.781	0.1988	0.0407	0.99280	0.1380	0.0034	1169	219	1588	166	2200	43		51.1
F28A-z7	27		2476	79	0.032	88.48	55.49	3.583	0.728	0.1933	0.0389	0.99250	0.1340	0.0033	1139	210	1546	161	2156	43		51.3
F28A-z7	28		2649	80	0.030	89.62	59.2	3.797	0.794	0.1979	0.0411	0.99420	0.1390	0.0031	1164	221	1592	168	2216	39		51.7
F28A-z7	29		2617	77	0.029	89.98	60.54	3.754	0.773	0.1923	0.0393	0.99440	0.1420	0.0031	1134	213	1583	165	2247	38		53.9
F28A-z7	30		2677	86	0.032	89.75	58.73	3.503	0.726	0.1887	0.0388	0.99380	0.1350	0.0031	1114	211	1528	164	2159	40		52.6
F28A-z7	31		2708	76	0.028	89.95	59.8	3.641	0.747	0.1919	0.0391	0.99430	0.1380	0.0030	1132	212	1558	164	2197	38		52.7
F28A-z7	32		2840	81	0.029	90.36	59.98	3.527	0.727	0.1931	0.0395	0.99420	0.1320	0.0029	1138	213	1533	163	2131	39		50.7
Sample F28A, zircon 8: Type 3																						
F28A-z8	1		112	1	0.013	58.84	-29.2	-2.291	0.333	0.1269	0.0062	0.19260	-0.1310	-0.0212	770	36	NaN	-262	-1	0		-2.E+05
F28A-z8	2		117	4	0.033	89.89	53.75	1.681	0.107	0.1127	0.0041	0.52270	0.1080	0.0059	688	24	1001	40	1769	99		64.3
F28A-z8	3		117	5	0.046	92.24	65.28	1.895	0.089	0.1050	0.0035	0.53280	0.1310	0.0053	644	20	1079	31	2110	71		72.9
F28A-z8	4		126	6	0.048	92.91	65.57	1.753	0.081	0.1056	0.0034	0.52940	0.1200	0.0048	647	20	1028	30	1962	72		70.3
F28A-z8	5		124	5	0.042	93.89	68.61	1.700	0.077	0.1046	0.0034	0.53200	0.1180	0.0046	642	20	1009	29	1924	70		69.9
F28A-z8	6		119	3	0.025	95.17	73.5	1.652	0.072	0.1027	0.0034	0.53430	0.1170	0.0044	630	20	990	28	1906	69		70.2
F28A-z8	7		127	4	0.030	96.57	79.92	1.716	0.071	0.1065	0.0035	0.56610	0.1170	0.0041	652	20	1015	26	1910	63		69.1
F28A-z8	8		124	2	0.012	97.8	86.33	1.692	0.065	0.1041	0.0034	0.58020	0.1180	0.0039	638	20	1005	25	1925	59		70.1
F28A-z8	9		114	4	0.034	98.38	89.28	1.602	0.062	0.1022	0.0034	0.57080	0.1140	0.0038	627	20	971	24	1859	61		69.4
F28A-z8	10		126	2	0.018	98.6	90.54	1.660	0.063	0.1073	0.0036	0.60100	0.1120	0.0036	657	21	994	24	1835	59		67.4
F28A-z8	11		115	1	0.011	98.96	92.9	1.624	0.061	0.1036	0.0035	0.59210	0.1140	0.0037	635	21	980	24	1860	59		69.0
F28A-z8	12		113	2	0.015	99.01	93.43	1.720	0.065	0.1062	0.0036	0.60250	0.1170	0.0038	651	21	1016	24	1918	58		69.4
F28A-z8	13		117	1	0.008	99.21	94.78	1.784	0.066	0.1083	0.0037	0.62280	0.1190	0.0037	663	22	1040	24	1948	56		69.3
F28A-z8	14		108	1	0.010	99.36	95.62	1.758	0.066	0.1087	0.0038	0.61240	0.1170	0.0037	665	22	1030	24	1916	57		68.6
F28A-z8	15		110	1	0.013	99.18	94.54	1.775	0.067	0.1085	0.0038	0.61330	0.1190	0.0038	664	22	1036	25	1936	57		69.0
F28A-z8	16		105	0	0.004	99.23	94.89	1.801	0.069	0.1094	0.0038	0.61300	0.1190	0.0039	669	22	1046	25	1948	58		69.0
F28A-z8	17		104	1	0.008	99.42	96.05	1.786	0.067	0.1095	0.0039	0.62130	0.1180	0.0038	670	22	1040	25	1930	57		68.6
F28A-z8	18		102	0	0.005	99.37	95.89	1.827	0.069	0.1084	0.0039	0.61270	0.1220	0.0040	663	22	1055	25	1989	58		70.0
F28A-z8	19		100	1	0.006	99.24	94.91	1.803	0.070	0.1105	0.0040	0.60880	0.1180	0.0039	676	23	1047	25	1932	59		68.4
F28A-z8	20		103	1	0.006	99.31	95.28	1.757	0.068	0.1100	0.0039	0.61320	0.1160	0.0038	673	23	1030	25	1894	59		67.8
F28A-z8	21		101	0	0.004	99.48	96.55	1.900	0.073	0.1128	0.0041	0.61910	0.1220	0.0040	689	24	1081	26	1988	58		68.8
F28A-z8	22		98	0	0.000	99.55	96.93	1.785	0.069	0.1106	0.0040	0.61140	0.1170	0.0039	676	23	1040	25	1912	59		68.0
F28A-z8	23		96	0	0.004	99.46	96.41	1.871	0.073	0.1125	0.0041	0.62100	0.1210	0.0040	687	24	1071	26	1965	59		68.4
F28A-z8	24		90	0	0.000	99.39	95.91	1.833	0.072	0.1115	0.0041	0.60500	0.1190	0.0041	682	24	1058	26	1945	61		68.3
F28A-z8	25		95	0	0.000	99.41	96.06	1.847	0.072	0.1117	0.0041	0.61680	0.1200	0.0040	683	24	1062	26	1954	60		68.4
F28A-z8	26		95	0	0.004	99.51	96.71	1.899	0.075	0.1147	0.0042	0.62520	0.1200	0.0040	700	25	1081	26	1958	59		67.7
F28A-z8	27		84	1	0.006	99.49	96.53	1.848	0.074	0.1132	0.0043	0.60070	0.1180	0.0041	691	25	1063	26	1933	62		67.6
F28A-z8	28		84	0	0.003	99.55	96.97	1.887	0.076	0.1130	0.0043	0.59970	0.1210	0.0042	690	25	1077	27	1972	62		68.4
F28A-z8	29		90	1	0.006	99.61	97.39	1.885	0.075	0.1144	0.0043	0.60830	0.1190	0.0041	698	25	1076	27	1949	62		67.6
F28A-z8	30		84	0	0.001	99.63	97.5	1.904	0.077	0.1156	0.0044	0.59890	0.1190	0.0042	705	26	1082	27	1948	63		67.2
F28A-z8	31		86	0	0.001	99.6	97.33	1.959	0.079	0.1173	0.0045	0.61120	0.1210	0.0042	715	26	1101	27	1973	62		67.2
F28A-z8	32		85	1	0.006	99.62	97.48	1.971	0.079	0.1176	0.0045	0.61370	0.1220	0.0042	717	26	1106	27	1979	62		67.3
F28A-z8	33		78	0	0.004	99.71	98.06	1.952	0.080	0.1154	0.0045	0.59440	0.1230	0.0044	704	26	1099	28	1995	64		68.2
F28A-z8	34		82	0	0.002	99.76	98.38	2.064	0.084	0.1217	0.0048	0.61250	0.1230	0.0043	740	27	1137	28	2001	63		66.6
F28A-z8	35		79	0	0.004	99.73	98.22	2.013	0.083	0.1197	0.0047	0.60850	0.1220	0.0043	729	27	1120	28	1986	63		66.8
F28A-z8	36		78	0	0.003	99.68	97.8	1.967	0.082	0.1215	0.0048	0.61380	0.1170	0.0042	739	28	1104	28	1918	64		65.0
F28A-z8	37		78	0	0.001	99.59	97.2	1.967	0.083	0.1206	0.0048	0.61060	0.1180	0.0043	734	28	1104	28	1931	65		65.5
F28A-z8	38		77	0	0.003	99.75	98.33	2.024	0.085	0.1217	0.0049	0.61160	0.1210	0.0044	740	28	1123	29	1966	65		65.9
F28A-z8	39		77	0	0.003	99.67	97.75	1.994	0.085	0.1207	0.0049	0.60700	0.1200	0.0044	735	28	1113	29	1953	66		65.9
F28A-z8	40		75	0	0.001	99.51	96.64	1.967	0.085	0.1205	0.0049	0.60660	0.1180	0.0044	734	28	1104	29	1931	67		65.5
F28A-z8	41		70	0	0.003	99.57	97.12	2.011	0.087	0.1213	0.0050	0.60300	0.1200	0.0045	738	29	1119	29	1959	67		65.8
Sample F28A, zircon 10: Type 1B																						
F28A-z10	1		486	52	0.107	48.24	-12.84	-5.862	2.830	0.4205	0.1750	-0.81950	-0.1010	-0.0281	2263	793	NaN	-591	-1	0		-6.E+05
F28A-z10	2		345	27	0.079	83.37	29.62	3.642	1.560	0.3801	0.1480	0.92640	0.0695	0.0112	2077	694	1559	340	913	331		-149.7
F28A-z10	3		281	21	0.074	94.48	68.27	5.534	1.740	0.3852	0.1190	0.98290	0.1040	0.0060	2100	552	1906	270	1700	107		-27.7
F28A-z10	4		416	14	0.034	97.17	81.82	4.704	1.430	0.3146	0.0951	0.99230	0.1080	0.0041	1763	466	1768	255	1773	69		0.6
F28A-z10	5		519	11	0.021	98.84	92.33	4.651	1.320	0.2884	0.0816	0.99620	0.1170	0.0029	1634	408	1759	237	1910	44		16.4
F28A-z10	6		605	6	0.010	99.08	93.79	5.183	1.600	0.3248	0.0998	0.99750	0.1160	0.0025	1813	486	1850	262	1892	39		4.8
F28A-z10	7		648	8	0.013	99.27	94.77	5.411	1.680	0.3565	0.1110	0.99790	0.1100	0.0022	1966	526	1887	267	1801	37		-10.6
F28A-z10	**8**	*	**852**	**13**	**0.016**	**99.62**	**97.28**	**4.923**	**1.530**	**0.3161**	**0.0983**	**0.99860**	**0.1130**	**0.0019**	**1771**	**481**	**1806**	**263**	**1848**	**30**		**4.8**

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
	cycle		ppm	ppm	ppm	^{206}Pb*	^{207}Pb*	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.		
F28A-z10	**9**	*	**991**	**11**	**0.011**	**99.67**	**97.69**	**4.988**	**1.480**	**0.3119**	**0.0927**	**0.99870**	**0.1160**	**0.0017**	**1750**	**456**	**1817**	**252**	**1895**	**27**		**8.7**
F28A-z10	**10**	*	**1154**	**15**	**0.013**	**99.7**	**97.86**	**5.088**	**1.550**	**0.3211**	**0.0980**	**0.99900**	**0.1150**	**0.0016**	**1795**	**478**	**1834**	**259**	**1879**	**25**		**5.1**
F28A-z10	**11**	*	**1266**	**16**	**0.013**	**99.79**	**98.53**	**5.041**	**1.520**	**0.3152**	**0.0951**	**0.99910**	**0.1160**	**0.0015**	**1766**	**466**	**1826**	**256**	**1895**	**23**		**7.7**
F28A-z10	12		1335	18	0.014	99.9	99.27	5.130	1.520	0.3193	0.0947	0.99920	0.1170	0.0014	1786	463	1841	252	1904	22		7.1
F28A-z10	13		1367	17	0.013	99.89	99.26	5.344	1.630	0.3261	0.0995	0.99930	0.1190	0.0014	1820	484	1876	261	1939	21		7.1
F28A-z10	14		1356	21	0.015	99.91	99.39	5.339	1.610	0.3284	0.0988	0.99930	0.1180	0.0014	1831	479	1875	257	1925	21		5.6
F28A-z10	**15**	*	**1350**	**22**	**0.016**	**99.93**	**99.49**	**5.276**	**1.600**	**0.3337**	**0.1010**	**0.99930**	**0.1150**	**0.0013**	**1856**	**488**	**1865**	**258**	**1874**	**21**		**1.0**
F28A-z10	**16**	*	**1368**	**17**	**0.013**	**99.96**	**99.7**	**5.481**	**1.690**	**0.3433**	**0.1060**	**0.99930**	**0.1160**	**0.0013**	**1903**	**509**	**1898**	**265**	**1892**	**20**		**-0.7**
F28A-z10	**17**	*	**1400**	**23**	**0.016**	**99.96**	**99.75**	**5.494**	**1.690**	**0.3467**	**0.1070**	**0.99930**	**0.1150**	**0.0013**	**1919**	**511**	**1900**	**265**	**1879**	**20**		**-2.4**
F28A-z10	**18**	*	**1471**	**22**	**0.015**	**99.98**	**99.85**	**5.392**	**1.670**	**0.3401**	**0.1050**	**0.99940**	**0.1150**	**0.0013**	**1887**	**507**	**1884**	**265**	**1880**	**20**		**-0.4**
F28A-z10	**19**	*	**1507**	**17**	**0.011**	**99.98**	**99.86**	**5.200**	**1.530**	**0.3279**	**0.0965**	**0.99930**	**0.1150**	**0.0013**	**1828**	**468**	**1853**	**251**	**1880**	**20**		**3.2**
F28A-z10	**20**	*	**1537**	**22**	**0.014**	**99.97**	**99.77**	**5.498**	**1.690**	**0.3437**	**0.1050**	**0.99940**	**0.1160**	**0.0013**	**1904**	**505**	**1900**	**263**	**1896**	**20**		**-0.5**
F28A-z10	**21**	*	**1575**	**25**	**0.016**	**99.96**	**99.68**	**5.156**	**1.510**	**0.3231**	**0.0944**	**0.99930**	**0.1160**	**0.0012**	**1805**	**460**	**1845**	**248**	**1892**	**19**		**5.3**
F28A-z10	**22**	*	**1661**	**23**	**0.014**	**99.98**	**99.82**	**4.898**	**1.400**	**0.3104**	**0.0886**	**0.99930**	**0.1140**	**0.0012**	**1743**	**436**	**1802**	**241**	**1871**	**19**		**7.8**
F28A-z10	**23**	*	**1734**	**25**	**0.014**	**99.98**	**99.83**	**4.890**	**1.380**	**0.3093**	**0.0876**	**0.99930**	**0.1150**	**0.0012**	**1737**	**431**	**1800**	**239**	**1875**	**19**		**8.4**
F28A-z10	24		1773	31	0.018	99.99	99.96	4.540	1.210	0.2843	0.0754	0.99930	0.1160	0.0012	1613	379	1738	221	1893	18		16.7
F28A-z10	**25**	*	**1844**	**27**	**0.015**	**99.99**	**99.92**	**4.723**	**1.330**	**0.2963**	**0.0837**	**0.99940**	**0.1160**	**0.0012**	**1673**	**416**	**1771**	**237**	**1890**	**18**		**13.1**
F28A-z10	26		1906	32	0.017	100	100	4.441	1.200	0.2780	0.0752	0.99930	0.1160	0.0011	1581	380	1720	224	1893	18		18.5
F28A-z10	27		1965	26	0.013	100	100	4.336	1.180	0.2753	0.0751	0.99940	0.1140	0.0011	1568	380	1700	225	1868	18		18.1
F28A-z10	28		2027	34	0.017	100	100	4.189	1.110	0.2641	0.0699	0.99930	0.1150	0.0011	1511	357	1672	217	1881	17		22.1
F28A-z10	29		2120	35	0.016	100	100	4.296	1.200	0.2723	0.0759	0.99940	0.1140	0.0011	1552	384	1693	230	1871	17		19.1
F28A-z10	30		2105	38	0.018	100	100	4.215	1.170	0.2664	0.0737	0.99940	0.1150	0.0011	1522	375	1677	227	1876	17		21.1
F28A-z10	31		2042	33	0.016	100	100	4.048	1.050	0.2543	0.0659	0.99930	0.1150	0.0011	1461	339	1644	211	1887	17		25.2
F28A-z10	32		2066	29	0.014	100	100	3.862	0.998	0.2494	0.0644	0.99930	0.1120	0.0011	1435	332	1606	208	1837	18		24.4
F28A-z10	33		2089	30	0.014	99.99	99.96	3.786	0.953	0.2409	0.0606	0.99930	0.1140	0.0011	1391	315	1590	202	1864	18		28.2
F28A-z10	34		2048	36	0.018	99.99	99.92	3.749	0.940	0.2366	0.0593	0.99920	0.1150	0.0011	1369	309	1582	201	1878	18		30.0
F28A-z10	35		1983	32	0.016	99.99	99.92	3.618	0.888	0.2349	0.0576	0.99920	0.1120	0.0011	1360	301	1553	195	1827	18		28.3
F28A-z10	36		2089	36	0.017	99.98	99.82	3.556	0.883	0.2319	0.0576	0.99920	0.1110	0.0011	1344	301	1540	197	1820	18		28.9
F28A-z10	37		2203	38	0.017	99.99	99.96	3.468	0.835	0.2255	0.0543	0.99920	0.1120	0.0011	1311	286	1520	190	1825	18		31.1
F28A-z10	38		2230	34	0.015	99.98	99.83	3.317	0.763	0.2161	0.0497	0.99910	0.1110	0.0011	1261	263	1485	179	1821	18		33.8
F28A-z10	39		2272	42	0.018	99.98	99.83	3.337	0.785	0.2186	0.0514	0.99910	0.1110	0.0011	1275	272	1490	184	1811	18		32.6
F28A-z10	40		2242	38	0.017	99.99	99.96	3.346	0.777	0.2174	0.0505	0.99910	0.1120	0.0011	1268	267	1492	181	1826	18		33.6
F28A-z10	41		2156	33	0.015	99.99	99.92	3.388	0.801	0.2189	0.0517	0.99920	0.1120	0.0011	1276	274	1502	185	1836	17		33.6
F28A-z10	42		2098	38	0.018	99.99	99.92	3.439	0.810	0.2199	0.0518	0.99920	0.1130	0.0011	1282	274	1513	185	1855	17		34.1
F28A-z10	43		2070	35	0.017	99.98	99.83	3.511	0.841	0.2285	0.0547	0.99920	0.1110	0.0011	1326	287	1530	189	1823	18		30.1
F28A-z10	44		2035	35	0.017	100	100	3.093	0.655	0.2021	0.0428	0.99890	0.1110	0.0011	1186	229	1431	163	1816	18		37.9
F28A-z10	45		2106	37	0.018	100	100	3.161	0.734	0.2080	0.0483	0.99910	0.1100	0.0011	1218	258	1448	179	1803	18		35.5
F28A-z10	46		2021	32	0.016	99.99	99.95	2.725	0.560	0.1809	0.0372	0.99880	0.1090	0.0011	1072	203	1335	153	1787	19		43.4
F28A-z10	47		2017	30	0.015	99.99	99.9	2.787	0.600	0.1865	0.0401	0.99890	0.1080	0.0011	1103	218	1352	161	1772	19		41.0
F28A-z10	48		1976	35	0.018	100	100	2.858	0.608	0.1906	0.0405	0.99880	0.1090	0.0011	1124	220	1371	160	1779	19		40.0
F28A-z10	49		1883	30	0.016	99.99	99.95	2.919	0.615	0.1934	0.0407	0.99880	0.1090	0.0012	1140	220	1387	159	1790	19		39.6
F28A-z10	50		1758	32	0.018	99.97	99.79	2.932	0.608	0.1933	0.0400	0.99870	0.1100	0.0012	1139	216	1390	157	1799	20		39.9
F28A-z10	51		1647	29	0.018	99.97	99.78	2.955	0.602	0.1976	0.0403	0.99860	0.1080	0.0012	1163	217	1396	155	1773	20		37.6
F28A-z10	52		1625	32	0.020	99.98	99.84	3.129	0.654	0.2072	0.0433	0.99860	0.1100	0.0012	1214	231	1440	161	1791	20		35.3
F28A-z10	53		1564	33	0.021	99.95	99.6	2.905	0.557	0.1947	0.0373	0.99820	0.1080	0.0012	1147	201	1383	145	1769	21		38.3
F28A-z10	54		1425	33	0.023	99.98	99.83	3.035	0.580	0.1997	0.0381	0.99820	0.1100	0.0013	1174	205	1417	146	1804	21		38.2
F28A-z10	55		1374	37	0.027	99.98	99.88	3.111	0.619	0.2093	0.0416	0.99830	0.1080	0.0013	1225	222	1436	153	1763	21		33.5
F28A-z10	56		1377	50	0.036	99.99	99.94	3.157	0.603	0.2096	0.0400	0.99810	0.1090	0.0013	1227	213	1447	147	1787	21		34.4
F28A-z10	57		1437	88	0.061	99.97	99.78	3.191	0.613	0.2072	0.0398	0.99820	0.1120	0.0013	1214	212	1455	148	1827	21		36.8
F28A-z10	58		1425	133	0.093	99.96	99.68	3.137	0.583	0.2066	0.0383	0.99810	0.1100	0.0013	1211	205	1442	143	1802	21		36.0
F28A-z10	59		1492	158	0.106	99.96	99.7	3.266	0.610	0.2101	0.0392	0.99820	0.1130	0.0013	1229	209	1473	145	1845	20		36.6
Sample F28A, zircon 11: Type 3																						
F28A-z11	1		721	9	0.013	51.08	28.19	9.353	1.190	0.2179	0.0235	0.91700	0.3110	0.0160	1271	124	2373	116	3528	79		70.1
F28A-z11	2		845	8	0.010	58.29	18.05	4.774	1.210	0.2653	0.0573	0.89140	0.1310	0.0151	1517	292	1780	213	2105	203		31.3
F28A-z11	3		849	11	0.012	69.29	26.08	4.630	1.160	0.2592	0.0599	0.94000	0.1300	0.0111	1486	307	1755	210	2092	151		32.4
F28A-z11	4		824	17	0.021	72.17	26.11	4.168	1.080	0.2679	0.0637	0.93480	0.1130	0.0104	1530	324	1668	213	1846	167		19.2
F28A-z11	5		745	17	0.022	73.73	28.19	4.325	1.070	0.2708	0.0619	0.93780	0.1160	0.0100	1545	314	1698	205	1893	155		20.7
F28A-z11	6		748	14	0.018	75.41	30.25	4.831	1.290	0.2991	0.0751	0.95290	0.1170	0.0095	1687	373	1790	225	1913	146		13.4
F28A-z11	7		715	21	0.029	75.4	30.6	4.331	1.020	0.2636	0.0572	0.93990	0.1190	0.0096	1508	292	1699	194	1943	144		25.0
F28A-z11	8		728	22	0.030	76.21	32.77	5.273	1.450	0.3034	0.0792	0.96320	0.1260	0.0093	1708	392	1865	234	2044	130		18.7
F28A-z11	9		678	24	0.035	79.07	39.25	5.773	1.440	0.2956	0.0710	0.97160	0.1420	0.0084	1669	353	1942	216	2247	102		29.1
F28A-z11	10		690	24	0.036	78.41	35.33	5.462	1.540	0.3180	0.0863	0.96850	0.1250	0.0088	1780	422	1895	243	2022	125		13.7
F28A-z11	11		669	16	0.024	78.78	35.92	4.954	1.270	0.2873	0.0700	0.96150	0.1250	0.0088	1628	350	1812	216	2030	125		22.4
F28A-z11	12		678	26	0.038	80.29	39.36	5.857	1.630	0.3219	0.0868	0.97420	0.1320	0.0083	1799	423	1955	242	2124	110		17.5
F28A-z11	13		695	25	0.036	79.87	36.86	5.572	1.670	0.3317	0.0959	0.97240	0.1220	0.0085	1847	464	1912	258	1983	125		7.9
F28A-z11	14		700	22	0.032	79.27	35.67	5.020	1.390	0.3033	0.0803	0.96530	0.1200	0.0087	1707	397	1823	235	1957	129		14.5
F28A-z11	15		731	23	0.031	81.2	40.66	5.489	1.500	0.3031	0.0804	0.97500	0.1310	0.0080	1706	398	1899	235	2116	107		22.0
F28A-z11	16		734	20	0.027	81.33	41.1	5.832	1.740	0.3189	0.0926	0.97960	0.1330	0.0079	1784	453	1951	258	2133	105		18.7
F28A-z11	17		745	17	0.023	79.98	35.74	4.550	1.260	0.2861	0.0759	0.96480	0.1150	0.0084	1622	380	1740	231	1885	132		15.8
F28A-z11	18		784	19	0.024	79.71	36.4	4.730	1.330	0.2844	0.0766	0.96840	0.1210	0.0084	1614	384	1773	235	1965	125		20.2
F28A-z11	19		810	20	0.025	80.43	37.64	5.400	1.740	0.3219	0.1010	0.97780	0.1220	0.0082	1799	492	1885	276	1981	120		10.5
F28A-z11	20		808	18	0.023	79.51	35.5	4.569	1.350	0.2820	0.0798	0.96900	0.1170	0.0086	1602	401	1744	245	1918	131		18.6
F28A-z11	21		812	23	0.028	78.65	32.72	4.322	1.320	0.2866	0.0834	0.96380	0.1090	0.0089	1625	418	1698	251	1789	148		10.4
F28A-z11	22		856	18	0.020	79.88	35.5	4.958	1.640	0.3131	0.1000	0.97510	0.1150	0.0084	1756	493	1812	280	1878	132		7.4
F28A-z11	23		840	22	0.026	81.18	38.25	4.708	1.380	0.2872	0.0815	0.97350	0.1190	0.0080	1627	408	1769	246	1940	120		18.2
F28A-z11	24		886	23	0.026	80.81	37.23	5.083	1.720	0.3160	0.1040	0.97900	0.1170	0.0081	1770	511	1833	288	1905	124		8.1
F28A-z11	25		871	20	0.023	80.94	35.84	4.447	1.430	0.2961	0.0917	0.97280	0.1090	0.0081	1672	456	1721	266	1781	135		6.9
F28A-z11	26		873	21	0.024	83.25	42.87	5.463	1.820	0.3169	0.1030	0.98450	0.1250	0.0073	1774	506	1895	286	2030	103		14.4
F28A-z11	27		927	20	0.021	83.9	41.94	5.156	1.810	0.3257	0.1120	0.98420	0.1150	0.0071	1817	544	1845	298	1877	112		3.6
F28A-z11	28		964	24	0.025	83.8	39.9	4.292	1.380	0.2928	0.0918	0.97770	0.1060	0.0072	1656	458	1692	266	1737	124		5.3
F28A-z11	29		981	23	0.024	84.36	44.05	4.981	1.640	0.2990	0.0968	0.98500	0.1210	0.0069	1686	480	1816	279	1969	102		16.3

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
					$^{206}Pb^*$	$^{207}Pb^*$	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
	cycle	ppm	ppm	ppm																
F28A-z11	30	954	21	0.022	83.59	39.67	4.208	1.330	0.2855	0.0878	0.97740	0.1070	0.0072	1619	440	1676	260	1747	123	8.3
F28A-z11	31	1019	20	0.020	85	46.26	4.964	1.590	0.2860	0.0901	0.98660	0.1260	0.0066	1622	452	1813	271	2041	93	23.2
F28A-z11	32	1038	25	0.025	84.97	44.35	4.374	1.320	0.2717	0.0801	0.98220	0.1170	0.0066	1549	406	1707	249	1907	102	21.1
F28A-z11	33	1099	21	0.019	86.07	48.41	5.151	1.740	0.2970	0.0990	0.98910	0.1260	0.0063	1676	492	1845	287	2040	88	20.2
F28A-z11	34	1067	23	0.021	85.84	46.29	4.510	1.400	0.2778	0.0848	0.98490	0.1180	0.0063	1580	428	1733	259	1922	97	20.0
F28A-z11	35	1068	18	0.017	85.26	42.35	4.215	1.420	0.2905	0.0959	0.98270	0.1050	0.0066	1644	479	1677	277	1718	115	4.9
F28A-z11	36	1106	25	0.022	85.89	45.68	4.504	1.470	0.2856	0.0914	0.98560	0.1140	0.0063	1619	458	1732	271	1870	99	15.1
F28A-z11	37	1145	25	0.022	86.44	47.63	4.620	1.520	0.2835	0.0918	0.98760	0.1180	0.0061	1609	461	1753	275	1929	93	18.7
F28A-z11	38	1151	19	0.017	86.86	48.46	4.683	1.600	0.2882	0.0973	0.98900	0.1180	0.0060	1633	487	1764	286	1924	91	17.1
F28A-z11	39	1193	24	0.020	86.23	44.73	4.187	1.450	0.2837	0.0964	0.98580	0.1070	0.0062	1610	484	1672	283	1750	106	9.1
F28A-z11	40	1198	26	0.022	86.85	47.73	4.629	1.670	0.2932	0.1050	0.98950	0.1150	0.0060	1657	521	1754	302	1872	94	13.0
F28A-z11	41	1163	21	0.018	86.81	47.16	3.865	1.180	0.2496	0.0744	0.98430	0.1120	0.0060	1436	384	1606	245	1837	97	24.3
F28A-z11	42	1262	26	0.021	87.08	46.99	3.828	1.220	0.2549	0.0795	0.98520	0.1090	0.0059	1464	409	1599	256	1782	100	20.0
F28A-z11	43	1293	25	0.019	86.82	46.99	4.209	1.460	0.2739	0.0934	0.98780	0.1110	0.0060	1561	473	1676	284	1823	98	16.2
F28A-z11	44	1284	27	0.021	86.95	46.81	3.718	1.170	0.2466	0.0764	0.98490	0.1090	0.0060	1421	395	1575	253	1789	100	22.9
F28A-z11	45	1326	25	0.019	86.63	46.56	3.954	1.340	0.2576	0.0858	0.98710	0.1110	0.0060	1477	440	1625	274	1821	99	21.1
F28A-z11	46	1339	25	0.019	86.2	44.52	3.812	1.320	0.2599	0.0881	0.98570	0.1060	0.0062	1489	451	1595	278	1738	107	16.0
F28A-z11	47	1379	28	0.020	86.22	44.99	3.809	1.310	0.2551	0.0860	0.98620	0.1080	0.0062	1465	441	1595	276	1771	104	19.3
F28A-z11	48	1408	29	0.021	85.93	43.77	3.596	1.210	0.2470	0.0813	0.98440	0.1060	0.0062	1423	420	1549	267	1725	108	19.5
F28A-z11	49	1489	27	0.018	86.34	44.33	3.643	1.280	0.2532	0.0874	0.98590	0.1040	0.0061	1455	450	1559	280	1703	108	16.3
F28A-z11	50	1441	27	0.019	86.9	47.87	3.978	1.350	0.2516	0.0841	0.98840	0.1150	0.0059	1447	433	1630	275	1875	93	25.5
F28A-z11	51	1513	24	0.016	85.56	41.64	3.441	1.220	0.2502	0.0866	0.98350	0.0997	0.0064	1440	447	1514	278	1619	119	12.3
F28A-z11	52	1526	25	0.017	85.74	44.69	3.715	1.300	0.2421	0.0833	0.98690	0.1110	0.0063	1397	432	1575	280	1821	102	25.8
F28A-z11	53	1536	32	0.021	86.39	45.92	4.306	1.790	0.2818	0.1160	0.99120	0.1110	0.0061	1600	583	1695	343	1813	100	13.2
F28A-z11	54	1521	31	0.021	86.92	48.16	3.922	1.400	0.2456	0.0867	0.98970	0.1160	0.0059	1416	449	1618	289	1893	92	28.1
F28A-z11	55	1555	25	0.016	85.5	42.92	3.344	1.140	0.2296	0.0770	0.98420	0.1060	0.0064	1332	404	1491	267	1726	111	25.2
F28A-z11	56	1599	31	0.019	84.98	41.72	3.675	1.410	0.2544	0.0962	0.98670	0.1050	0.0065	1461	494	1566	307	1711	115	16.3
F28A-z11	57	1633	29	0.018	84.46	40.14	3.529	1.380	0.2505	0.0966	0.98590	0.1020	0.0067	1441	498	1534	310	1664	122	14.9
F28A-z11	58	1692	34	0.020	85	42.11	3.496	1.300	0.2384	0.0869	0.98620	0.1060	0.0065	1379	452	1526	293	1738	113	23.0
F28A-z11	59	1748	33	0.019	86.26	46	4.008	1.600	0.2586	0.1020	0.99060	0.1120	0.0061	1483	522	1636	324	1839	99	21.7
Sample F28A, zircon 12: Type 3																				
F28A-z12	1	749	19	0.025	59.45	16.14	5.585	1.470	0.3725	0.0844	0.89030	0.1090	0.0131	2041	396	1914	227	1778	220	-17.3
F28A-z12	2	660	19	0.028	61.95	16.8	6.288	1.900	0.4439	0.1190	0.91220	0.1030	0.0127	2368	532	2017	265	1674	229	-49.7
F28A-z12	3	781	25	0.032	62.95	16.62	4.712	1.410	0.3517	0.0919	0.90130	0.0972	0.0126	1943	438	1769	250	1571	243	-27.4
F28A-z12	4	986	20	0.020	64.33	19.22	4.895	1.630	0.3250	0.1000	0.94490	0.1090	0.0119	1814	488	1801	280	1787	198	-1.7
F28A-z12	5	1183	27	0.023	67.53	24.12	4.898	1.500	0.2807	0.0814	0.96250	0.1270	0.0105	1595	410	1802	258	2051	147	25.1
F28A-z12	6	1352	23	0.017	68.55	21.8	3.717	1.120	0.2544	0.0712	0.94570	0.1060	0.0104	1461	366	1575	240	1731	179	17.4
F28A-z12	7	1384	27	0.019	69.88	24.17	3.786	1.090	0.2414	0.0655	0.95420	0.1140	0.0098	1394	340	1590	232	1860	156	27.8
F28A-z12	8	1368	22	0.016	71.54	23.66	3.283	0.940	0.2332	0.0622	0.94500	0.1020	0.0096	1351	325	1477	223	1663	174	20.8
F28A-z12	9	1424	27	0.019	71.7	25.26	3.334	0.912	0.2188	0.0560	0.94960	0.1100	0.0095	1276	296	1489	214	1808	156	32.4
F28A-z12	10	1426	23	0.016	73.63	26.65	3.426	0.982	0.2306	0.0625	0.95700	0.1080	0.0090	1338	327	1510	225	1762	152	26.6
F28A-z12	11	1387	21	0.015	74.74	26.49	3.429	1.030	0.2466	0.0699	0.95680	0.1010	0.0088	1421	361	1511	235	1640	162	14.9
F28A-z12	12	1433	21	0.014	76.69	31.55	3.860	1.120	0.2414	0.0676	0.97030	0.1160	0.0082	1394	351	1605	235	1895	127	29.4
F28A-z12	13	1564	24	0.016	75.95	27.39	3.052	0.896	0.2238	0.0620	0.95480	0.0989	0.0086	1302	326	1421	224	1604	163	20.8
F28A-z12	14	1617	23	0.014	78.48	33.05	3.265	0.896	0.2112	0.0555	0.96690	0.1120	0.0079	1235	295	1473	213	1834	127	35.8
F28A-z12	15	1609	26	0.016	78.51	28.95	2.562	0.718	0.2011	0.0529	0.95000	0.0924	0.0081	1181	284	1290	205	1475	166	21.8
F28A-z12	16	1646	27	0.016	79.63	32.07	2.615	0.710	0.1897	0.0489	0.95880	0.1000	0.0077	1120	265	1305	199	1624	144	33.8
F28A-z12	17	1644	34	0.021	81.4	36.92	2.978	0.791	0.1950	0.0498	0.96990	0.1110	0.0072	1149	269	1402	202	1812	118	39.9
F28A-z12	18	1686	29	0.017	81.67	37.06	3.095	0.865	0.2051	0.0554	0.97300	0.1090	0.0071	1203	296	1431	214	1790	117	35.9
F28A-z12	19	1606	27	0.017	81.23	35.97	2.993	0.795	0.2018	0.0515	0.96830	0.1080	0.0071	1185	276	1406	202	1758	121	35.6
F28A-z12	20	1605	29	0.018	80.12	33.32	2.720	0.702	0.1921	0.0470	0.95970	0.1030	0.0075	1133	254	1334	191	1674	134	35.2
F28A-z12	21	1624	31	0.019	80.19	36.76	3.111	0.773	0.1898	0.0453	0.96920	0.1190	0.0073	1120	245	1436	191	1940	110	46.0
F28A-z12	22	1680	33	0.020	80.13	35.59	3.188	0.869	0.2038	0.0535	0.97150	0.1130	0.0073	1195	287	1454	211	1856	117	38.9
F28A-z12	23	1628	34	0.021	80.12	35.3	2.787	0.662	0.1803	0.0407	0.96110	0.1120	0.0074	1069	222	1352	178	1834	119	45.2
F28A-z12	24	1755	29	0.016	79.89	33.94	2.714	0.682	0.1838	0.0440	0.96120	0.1070	0.0074	1088	239	1332	187	1750	127	41.1
F28A-z12	25	1735	41	0.023	80.45	35.24	2.837	0.722	0.1878	0.0457	0.96550	0.1100	0.0073	1109	248	1365	191	1792	121	41.4
F28A-z12	26	1720	36	0.021	80.88	36.44	2.734	0.671	0.1767	0.0415	0.96530	0.1120	0.0072	1049	227	1338	183	1836	116	46.4
F28A-z12	27	1705	40	0.023	80.56	33.15	2.360	0.592	0.1727	0.0409	0.95400	0.0991	0.0075	1027	225	1231	179	1608	140	39.1
F28A-z12	28	1733	36	0.021	81.47	36.66	2.552	0.625	0.1697	0.0396	0.96350	0.1090	0.0072	1010	218	1287	179	1784	120	46.8
F28A-z12	29	1750	31	0.018	81.7	35.88	2.425	0.607	0.1694	0.0404	0.96200	0.1040	0.0071	1009	223	1250	180	1693	126	43.6
F28A-z12	30	1825	40	0.022	82.69	37.31	2.346	0.578	0.1648	0.0387	0.96310	0.1030	0.0068	984	214	1226	175	1683	122	44.8
F28A-z12	31	1860	37	0.020	82.46	39.9	2.578	0.609	0.1599	0.0363	0.96910	0.1170	0.0068	956	202	1295	173	1911	105	53.7
F28A-z12	32	1870	36	0.019	82.13	35.7	2.209	0.527	0.1602	0.0361	0.95630	0.1000	0.0070	958	201	1184	167	1625	130	44.1
F28A-z12	33	1837	41	0.022	82.86	37.62	2.337	0.561	0.1640	0.0375	0.96270	0.1030	0.0067	979	208	1223	171	1685	120	45.1
F28A-z12	34	1923	41	0.021	83.14	39.6	2.459	0.580	0.1619	0.0366	0.96740	0.1100	0.0066	968	203	1260	170	1801	109	49.7
F28A-z12	35	1940	37	0.019	83.27	38.51	2.196	0.486	0.1528	0.0320	0.95810	0.1040	0.0066	917	179	1180	154	1701	117	49.4
F28A-z12	36	1943	41	0.021	82.66	36.93	2.227	0.524	0.1587	0.0355	0.95910	0.1020	0.0068	950	197	1189	165	1656	123	45.8
F28A-z12	37	1911	38	0.020	82.26	36.05	2.147	0.498	0.1546	0.0339	0.95610	0.1010	0.0069	927	189	1164	161	1637	126	46.5
F28A-z12	38	1864	47	0.025	82.65	37.24	2.092	0.455	0.1472	0.0302	0.95430	0.1030	0.0067	885	170	1146	150	1681	120	50.6
F28A-z12	39	1982	44	0.022	83.1	37.56	2.051	0.453	0.1468	0.0307	0.95580	0.1010	0.0066	883	172	1133	151	1648	121	49.6
F28A-z12	40	2011	47	0.024	83.19	39.59	2.178	0.467	0.1440	0.0294	0.96160	0.1100	0.0065	867	165	1174	149	1795	107	55.2
F28A-z12	41	2050	42	0.020	83.76	40.57	2.170	0.469	0.1435	0.0296	0.96410	0.1100	0.0063	865	167	1171	150	1793	105	55.2
F28A-z12	42	2185	62	0.028	83.27	36.25	1.757	0.381	0.1347	0.0273	0.94790	0.0946	0.0065	815	155	1030	140	1520	130	49.3
F28A-z12	43	2258	54	0.024	84.8	40.07	1.862	0.402	0.1361	0.0279	0.95910	0.0992	0.0061	823	158	1068	143	1609	114	52.0
F28A-z12	44	2364	64	0.027	85.72	42.32	1.915	0.412	0.1372	0.0282	0.96430	0.1010	0.0058	829	160	1086	144	1647	106	52.9
F28A-z12	45	2471	60	0.024	85.59	41.09	1.805	0.378	0.1346	0.0268	0.95960	0.0973	0.0057	814	152	1047	137	1573	110	51.3
F28A-z12	46	2510	60	0.024	87.21	46.14	1.903	0.390	0.1327	0.0261	0.96880	0.1040	0.0053	803	149	1082	136	1697	94	55.9
F28A-z12	47	2419	60	0.025	88.52	48.66	1.808	0.357	0.1289	0.0245	0.96920	0.1020	0.0049	782	140	1048	129	1657	90	56.0
F28A-z12	48	2497	62	0.025	89.39	51.26	1.891	0.380	0.1328	0.0258	0.97430	0.1030	0.0047	804	147	1078	133	1685	83	55.6
F28A-z12	49	2531	59	0.023	89.67	51.68	1.830	0.358	0.1301	0.0247	0.97360	0.1020	0.0046	788	141	1056	129	1662	83	55.8
F28A-z12	50	2604	68	0.026	89.94	52.75	1.865	0.376	0.1308	0.0256	0.97650	0.1030	0.0045	793	146	1069	133	1686	80	56.2

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
							$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$		
	cycle	ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.	
F28A-z12	51	2554	68	0.026	90.99	54.75	1.750	0.336	0.1279	0.0238	0.97510	0.0992	0.0042	776	136	1027	124	1609	79	54.9
F28A-z12	52	2624	66	0.025	91.57	57.51	1.817	0.348	0.1276	0.0238	0.97880	0.1030	0.0041	774	136	1052	125	1684	72	57.3
F28A-z12	53	2682	68	0.025	92.57	61.17	1.875	0.361	0.1299	0.0245	0.98240	0.1050	0.0038	787	140	1072	128	1709	66	57.2
F28A-z12	54	2656	66	0.025	93.11	62.98	1.821	0.345	0.1266	0.0235	0.98340	0.1040	0.0036	769	135	1053	124	1702	63	58.1
F28A-z12	55	2574	70	0.027	93.52	63.42	1.687	0.301	0.1229	0.0214	0.98060	0.0996	0.0035	747	123	1004	114	1616	65	56.9
F28A-z12	56	2709	62	0.023	94.09	67.04	1.835	0.335	0.1258	0.0226	0.98540	0.1060	0.0033	764	129	1058	120	1728	57	59.1
F28A-z12	57	2823	71	0.025	94.42	67.24	1.746	0.317	0.1260	0.0225	0.98470	0.1000	0.0032	765	129	1026	117	1633	59	56.3
F28A-z12	58	2758	71	0.026	94.8	68.74	1.715	0.303	0.1246	0.0216	0.98480	0.0999	0.0031	757	124	1014	113	1622	57	56.5
F28A-z12	59	2785	71	0.025	94.85	68.85	1.653	0.280	0.1207	0.0201	0.98360	0.0993	0.0030	735	115	991	107	1611	57	57.5
Sample F28A, zircon 13: Type 3																				
F28A-z13	1	813	22	0.027	34.83	3.164	1.495	1.070	0.2141	0.0653	0.53200	0.0506	0.0308	1250	347	928	433	225	1410	-504.2
F28A-z13	2	598	23	0.039	43.69	7.353	2.893	1.260	0.2477	0.0739	0.75170	0.0847	0.0245	1427	382	1380	329	1309	561	-10.0
F28A-z13	3	496	22	0.045	51.16	8.701	2.552	1.070	0.2457	0.0678	0.72350	0.0753	0.0220	1416	351	1287	307	1078	586	-34.9
F28A-z13	4	466	24	0.052	61.37	17.09	4.704	1.780	0.3174	0.1060	0.90890	0.1070	0.0170	1777	519	1768	317	1757	289	-1.3
F28A-z13	5	422	19	0.046	71.96	22.38	3.624	1.130	0.2824	0.0754	0.88690	0.0931	0.0134	1604	379	1555	247	1489	273	-8.7
F28A-z13	6	430	16	0.038	81.09	34.41	5.284	1.940	0.3782	0.1330	0.96330	0.1010	0.0100	2068	620	1866	314	1649	183	-29.7
F28A-z13	7	453	20	0.044	84.52	43.54	6.441	2.360	0.3992	0.1430	0.98040	0.1170	0.0084	2165	657	2038	322	1911	129	-15.7
F28A-z13	8	486	20	0.041	83.36	41.33	6.601	2.550	0.4110	0.1550	0.98150	0.1160	0.0086	2220	709	2060	341	1903	133	-19.7
F28A-z13	9	492	21	0.042	83.92	44.03	7.052	2.550	0.4095	0.1450	0.98360	0.1250	0.0082	2212	663	2118	322	2027	116	-10.9
F28A-z13	10	473	19	0.041	84.52	49.16	7.266	2.140	0.3593	0.1040	0.98430	0.1470	0.0076	1979	492	2145	263	2308	89	16.6
F28A-z13	11	518	25	0.048	83.07	46.6	9.169	3.480	0.4516	0.1690	0.98990	0.1470	0.0079	2402	751	2355	347	2315	92	-4.5
F28A-z13	12	516	18	0.035	82.76	47.05	8.803	3.060	0.4166	0.1430	0.98890	0.1530	0.0079	2245	649	2318	317	2382	88	6.8
F28A-z13	13	505	21	0.041	83.23	50.9	10.280	3.560	0.4312	0.1480	0.99210	0.1730	0.0075	2311	666	2461	321	2587	73	12.7
F28A-z13	14	513	20	0.040	81.69	46.69	10.190	3.790	0.4546	0.1670	0.99140	0.1630	0.0079	2416	741	2452	344	2483	82	3.3
F28A-z13	15	495	21	0.043	80.93	45.29	9.240	3.020	0.4149	0.1340	0.98850	0.1620	0.0080	2237	608	2362	299	2472	84	11.2
F28A-z13	16	519	27	0.052	80.64	45.47	10.370	3.740	0.4534	0.1610	0.99100	0.1660	0.0080	2410	716	2468	334	2516	81	5.0
F28A-z13	17	543	24	0.045	79.92	44.39	10.590	3.940	0.4625	0.1700	0.99120	0.1660	0.0082	2451	749	2488	345	2519	83	3.3
F28A-z13	18	555	28	0.051	79.54	44.3	9.504	3.030	0.4068	0.1280	0.98840	0.1690	0.0082	2200	585	2388	293	2552	81	16.2
F28A-z13	19	568	25	0.044	79.63	44.01	12.930	5.810	0.5630	0.2510	0.99410	0.1670	0.0081	2879	1030	2675	423	2524	82	-17.4
F28A-z13	20	559	29	0.051	78.88	44.76	11.570	4.180	0.4669	0.1670	0.99220	0.1800	0.0081	2470	734	2570	338	2650	75	8.2
F28A-z13	21	574	28	0.049	79.19	44.82	11.510	4.060	0.4721	0.1650	0.99190	0.1770	0.0079	2493	722	2565	330	2623	75	6.0
F28A-z13	22	576	37	0.065	78.23	43.07	11.280	4.010	0.4694	0.1650	0.99140	0.1740	0.0081	2481	724	2547	332	2599	77	5.5
F28A-z13	23	577	33	0.057	76.9	40.93	11.890	4.450	0.5004	0.1850	0.99160	0.1720	0.0084	2616	796	2596	351	2581	81	-1.6
F28A-z13	24	607	35	0.058	76.55	41.48	12.370	4.650	0.4990	0.1850	0.99230	0.1800	0.0084	2610	797	2633	353	2651	77	1.9
F28A-z13	25	608	34	0.057	77.28	43.7	12.820	4.690	0.4918	0.1780	0.99320	0.1890	0.0081	2579	770	2666	344	2734	70	6.9
F28A-z13	26	599	41	0.068	76	40.24	12.350	4.690	0.5086	0.1910	0.99210	0.1760	0.0084	2651	817	2631	357	2617	80	-1.5
F28A-z13	27	626	38	0.060	75.99	40.57	12.410	4.640	0.5040	0.1860	0.99220	0.1790	0.0083	2631	798	2636	351	2640	78	0.4
F28A-z13	28	609	39	0.065	76.89	43.86	12.890	4.510	0.4809	0.1660	0.99300	0.1940	0.0080	2531	725	2672	329	2780	68	10.8
F28A-z13	29	637	43	0.068	75.64	39.72	13.770	5.950	0.5680	0.2430	0.99390	0.1760	0.0084	2900	1000	2734	409	2613	80	-13.7
Sample F28A, zircon 16: Type 2A																				
F28A-z16	1	364	4	0.010	69.27	24.54	5.036	1.620	0.3056	0.0783	0.84700	0.1200	0.0206	1719	387	1825	273	1949	308	13.4
F28A-z16	2	448	5	0.011	81.59	33.73	5.155	2.210	0.3932	0.1560	0.94160	0.0951	0.0137	2138	723	1845	364	1530	272	-46.8
F28A-z16	3	459	3	0.007	92.83	61.36	4.853	1.820	0.3466	0.1270	0.97890	0.1020	0.0078	1918	608	1794	316	1653	142	-18.6
F28A-z16	4	477	4	0.008	96.92	79.82	5.504	2.310	0.3828	0.1600	0.99300	0.1040	0.0052	2090	744	1901	361	1702	92	-26.7
F28A-z16	5	496	3	0.005	98.52	90.15	5.894	2.440	0.3755	0.1550	0.99640	0.1140	0.0040	2055	727	1960	360	1861	64	-12.2
F28A-z16	6	525	4	0.007	98.9	92.29	6.911	3.490	0.4525	0.2280	0.99800	0.1110	0.0036	2406	1010	2100	448	1812	59	-39.4
F28A-z16	7	518	5	0.009	98.82	91.89	4.858	1.680	0.3152	0.1090	0.99570	0.1120	0.0036	1766	533	1795	292	1829	58	3.9
F28A-z16	8	555	4	0.008	99.06	93.38	6.446	3.010	0.4224	0.1970	0.99790	0.1110	0.0033	2271	893	2039	411	1811	55	-30.2
F28A-z16	9	584	3	0.006	99.3	95.17	6.939	3.380	0.4362	0.2120	0.99840	0.1150	0.0032	2333	953	2104	433	1886	50	-28.3
F28A-z16	10	586	4	0.008	99.4	95.85	5.433	2.050	0.3425	0.1290	0.99750	0.1150	0.0031	1899	620	1890	324	1881	48	-1.1
F28A-z16	11	574	5	0.009	99.57	97.04	5.890	2.410	0.3675	0.1500	0.99810	0.1160	0.0029	2018	707	1960	355	1899	45	-7.3
F28A-z16	12	581	6	0.011	99.32	95.16	6.626	3.130	0.4290	0.2020	0.99840	0.1120	0.0030	2301	912	2063	416	1832	49	-30.6
F28A-z16	13	617	3	0.006	99.5	96.53	6.711	3.110	0.4218	0.1960	0.99850	0.1150	0.0029	2269	887	2074	410	1886	45	-24.1
F28A-z16	14	680	8	0.012	99.69	97.98	6.983	3.370	0.4042	0.1950	0.99890	0.1250	0.0028	2189	895	2109	429	2033	40	-9.0
F28A-z16	15	661	6	0.010	99.67	97.58	7.240	3.900	0.4715	0.2540	0.99910	0.1110	0.0026	2490	1110	2141	480	1822	42	-44.3
F28A-z16	16	640	7	0.011	99.76	98.27	6.329	2.850	0.4043	0.1820	0.99880	0.1140	0.0026	2189	836	2022	395	1857	41	-21.1
F28A-z16	17	642	9	0.014	99.55	96.79	5.646	2.280	0.3642	0.1470	0.99830	0.1120	0.0027	2002	695	1923	349	1839	43	-10.3
F28A-z16	18	648	12	0.019	99.51	96.55	5.569	2.130	0.3511	0.1340	0.99810	0.1150	0.0027	1940	640	1911	329	1881	43	-3.6
F28A-z16	19	642	11	0.016	99.65	97.48	5.102	1.770	0.3241	0.1120	0.99790	0.1140	0.0026	1810	546	1836	294	1867	41	3.5
F28A-z16	20	696	8	0.012	99.73	98.07	6.865	3.320	0.4389	0.2120	0.99900	0.1130	0.0025	2346	949	2094	428	1855	39	-31.7
F28A-z16	21	726	16	0.022	99.79	98.51	5.633	2.150	0.3553	0.1360	0.99850	0.1150	0.0024	1960	645	1921	329	1880	38	-4.9
F28A-z16	22	780	22	0.028	99.84	98.84	6.156	2.670	0.3905	0.1690	0.99890	0.1140	0.0023	2125	785	1998	379	1869	36	-16.1
F28A-z16	23	775	19	0.025	99.89	99.24	5.582	2.040	0.3439	0.1250	0.99860	0.1180	0.0023	1906	602	1913	314	1922	35	1.0
F28A-z16	24	817	19	0.023	99.83	98.77	7.105	3.530	0.4454	0.2210	0.99920	0.1160	0.0023	2375	986	2125	442	1891	35	-30.6
F28A-z16	25	801	27	0.033	99.83	98.8	5.990	2.430	0.3758	0.1520	0.99880	0.1160	0.0023	2056	714	1974	353	1889	35	-10.4
F28A-z16	26	808	26	0.032	99.79	98.49	5.719	2.250	0.3605	0.1420	0.99870	0.1150	0.0023	1985	672	1934	340	1881	36	-6.4
F28A-z16	27	845	28	0.033	99.88	99.13	6.465	2.920	0.4034	0.1820	0.99910	0.1160	0.0022	2185	837	2041	397	1899	34	-17.8
F28A-z16	28	818	25	0.030	99.9	99.26	6.302	2.810	0.4008	0.1790	0.99910	0.1140	0.0021	2173	822	2019	391	1865	34	-19.4
F28A-z16	29	798	32	0.040	99.94	99.55	6.806	3.160	0.4317	0.2000	0.99920	0.1140	0.0021	2313	902	2087	411	1870	34	-28.2
F28A-z16	30	846	29	0.035	99.94	99.57	6.860	3.200	0.4209	0.1960	0.99920	0.1180	0.0022	2265	891	2093	413	1929	33	-20.7
F28A-z16	31	779	37	0.047	99.92	99.41	6.634	2.910	0.4130	0.1810	0.99910	0.1170	0.0022	2228	826	2064	387	1903	34	-20.3
F28A-z16	32	759	37	0.049	99.87	99.11	6.633	2.870	0.4008	0.1730	0.99900	0.1200	0.0023	2173	798	2064	382	1957	34	-13.0
F28A-z16	33	768	41	0.053	99.91	99.38	6.782	2.980	0.4125	0.1810	0.99900	0.1190	0.0023	2227	828	2083	389	1945	35	-17.1
F28A-z16	34	725	50	0.069	99.96	99.7	5.958	2.230	0.3570	0.1330	0.99870	0.1210	0.0023	1968	634	1970	325	1972	34	0.3
F28A-z16	35	706	40	0.057	99.91	99.34	5.581	2.040	0.3546	0.1290	0.99850	0.1140	0.0023	1956	616	1913	315	1867	36	-5.5
F28A-z16	36	733	52	0.071	100	100	7.628	3.780	0.4622	0.2290	0.99930	0.1200	0.0023	2449	1010	2188	445	1952	34	-30.7
F28A-z16	37	702	51	0.073	99.98	99.85	6.686	2.860	0.4026	0.1720	0.99900	0.1200	0.0023	2181	791	2071	378	1963	34	-13.1
F28A-z16	38	664	65	0.098	99.91	99.38	6.318	2.400	0.3780	0.1430	0.99860	0.1210	0.0024	2067	670	2021	332	1975	36	-5.4
F28A-z16	39	658	63	0.096	99.9	99.32	7.035	3.120	0.4259	0.1890	0.99890	0.1200	0.0024	2287	854	2116	394	1953	37	-20.4

Grain	Mass cycle		U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
Sample F28A, zircon 17: Type 2B																					
F28A-z17	1		510	20	0.040	63.87	15.96	3.194	0.963	0.2604	0.0617	0.82950	0.0890	0.0150	1492	315	1456	233	1404	323	-7.0
F28A-z17	2		548	16	0.030	70.85	23.79	3.886	1.000	0.2650	0.0605	0.90830	0.1060	0.0115	1515	308	1611	209	1738	199	14.4
F28A-z17	3		649	15	0.023	73.59	32.04	5.276	1.290	0.2731	0.0630	0.96010	0.1400	0.0096	1557	319	1865	208	2229	118	33.9
F28A-z17	4		660	14	0.022	71.52	25.17	4.037	0.962	0.2639	0.0569	0.92610	0.1110	0.0100	1510	290	1642	194	1815	164	18.8
F28A-z17	5		690	10	0.014	69.75	26.87	5.016	1.230	0.2757	0.0635	0.95320	0.1320	0.0098	1569	321	1822	208	2125	130	29.4
F28A-z17	6		756	14	0.018	70.54	28.17	4.929	1.170	0.2635	0.0590	0.95840	0.1360	0.0092	1508	301	1807	200	2172	118	34.2
F28A-z17	7		772	10	0.013	72.13	27.98	4.804	1.160	0.2803	0.0637	0.95670	0.1240	0.0087	1593	321	1786	202	2019	124	23.8
F28A-z17	8		765	13	0.017	74.08	29.29	4.697	1.090	0.2838	0.0622	0.95660	0.1200	0.0081	1611	312	1767	194	1957	121	20.0
F28A-z17	9		814	11	0.014	74.78	29.11	4.598	1.100	0.2907	0.0660	0.95990	0.1150	0.0077	1645	330	1749	200	1875	121	13.9
F28A-z17	10		1024	23	0.022	77.05	33.58	4.549	1.060	0.2646	0.0598	0.97340	0.1250	0.0067	1513	305	1740	195	2025	95	28.3
F28A-z17	11		1261	20	0.016	78.33	34.23	4.187	1.030	0.2547	0.0606	0.97770	0.1190	0.0061	1463	312	1672	201	1945	92	27.7
F28A-z17	12		1458	27	0.019	78.08	30.95	3.474	0.868	0.2418	0.0583	0.97180	0.1040	0.0061	1396	303	1521	197	1700	109	19.9
F28A-z17	13		1567	27	0.017	79.62	33.65	3.698	0.967	0.2494	0.0635	0.97900	0.1080	0.0057	1436	328	1571	209	1758	98	20.4
F28A-z17	14		1621	30	0.018	81.41	36.75	3.631	0.918	0.2397	0.0592	0.98170	0.1100	0.0053	1385	308	1556	201	1797	88	25.4
F28A-z17	15		1634	36	0.022	81.65	37.38	3.679	0.922	0.2402	0.0589	0.98270	0.1110	0.0052	1388	306	1567	200	1817	84	26.2
F28A-z17	16		1640	29	0.018	81.6	37.34	3.589	0.872	0.2339	0.0555	0.98190	0.1110	0.0051	1355	290	1547	193	1821	84	28.4
F28A-z17	17		1667	30	0.018	81.36	36.39	3.415	0.817	0.2282	0.0533	0.98020	0.1090	0.0051	1325	280	1508	188	1775	87	28.0
F28A-z17	18		1722	35	0.020	82.82	39.48	3.675	0.892	0.2378	0.0566	0.98430	0.1120	0.0048	1375	295	1566	194	1833	78	27.7
F28A-z17	19		1747	36	0.021	82.99	39.83	3.493	0.790	0.2254	0.0498	0.98230	0.1120	0.0048	1310	262	1526	178	1839	77	31.7
F28A-z17	20		1706	36	0.021	83.75	41.26	3.498	0.775	0.2249	0.0487	0.98310	0.1130	0.0046	1307	257	1527	175	1846	73	32.2
F28A-z17	21		1674	34	0.020	84.47	43.06	3.701	0.825	0.2332	0.0510	0.98530	0.1150	0.0044	1351	267	1572	178	1882	69	31.2
F28A-z17	22		1647	32	0.020	84.77	43.33	3.532	0.743	0.2252	0.0464	0.98390	0.1140	0.0043	1309	244	1534	167	1860	68	32.7
F28A-z17	23		1635	33	0.020	84.83	43.86	3.657	0.776	0.2292	0.0477	0.98490	0.1160	0.0042	1330	250	1562	169	1891	66	32.8
F28A-z17	24		1638	26	0.016	84.85	42.31	3.269	0.648	0.2187	0.0423	0.98040	0.1080	0.0042	1275	224	1474	154	1773	71	30.9
F28A-z17	25		1670	38	0.023	84.97	42.2	3.212	0.629	0.2177	0.0416	0.97980	0.1070	0.0042	1270	220	1460	152	1749	72	30.2
F28A-z17	26		1640	27	0.017	85.58	43.68	3.322	0.646	0.2226	0.0423	0.98120	0.1080	0.0041	1296	223	1486	152	1769	69	29.5
F28A-z17	27		1674	37	0.022	86.62	47.13	3.437	0.655	0.2186	0.0408	0.98410	0.1140	0.0039	1274	216	1513	150	1865	61	34.9
F28A-z17	28		1656	35	0.021	87.4	48.49	3.282	0.588	0.2117	0.0371	0.98290	0.1120	0.0037	1238	197	1477	139	1839	60	35.9
F28A-z17	29		1635	36	0.022	87.44	48.36	3.263	0.591	0.2125	0.0377	0.98310	0.1110	0.0037	1242	201	1472	141	1822	60	34.9
F28A-z17	30		1660	29	0.017	87.16	48.08	3.223	0.566	0.2069	0.0356	0.98200	0.1130	0.0037	1212	190	1463	136	1847	60	37.6
Sample F28A, zircon 18: Type 1B																					
F28A-z18	1		330	32	0.098	68.85	-33.69	-2.851	1.050	0.2189	0.0615	-0.69760	-0.0944	-0.0250	1276	325	NaN	-574	-1	0	-3.E+05
F28A-z18	2		253	29	0.113	89.92	47.98	3.516	1.020	0.2977	0.0805	0.94150	0.0857	0.0084	1680	400	1531	230	1330	189	-30.0
F28A-z18	3		227	28	0.125	92.77	58.31	4.478	1.380	0.3596	0.1070	0.96910	0.0903	0.0069	1980	506	1727	256	1432	145	-44.6
F28A-z18	4		212	32	0.153	95.31	71.1	4.633	1.190	0.3352	0.0841	0.97810	0.1000	0.0054	1864	406	1755	215	1629	99	-16.6
F28A-z18	5		277	22	0.080	97.29	82.31	6.357	2.420	0.4287	0.1630	0.99530	0.1080	0.0040	2300	734	2026	334	1758	68	-36.8
F28A-z18	6		322	18	0.055	97.91	85.96	5.091	1.540	0.3414	0.1030	0.99480	0.1080	0.0033	1894	494	1835	257	1769	56	-8.1
F28A-z18	7		382	14	0.038	98.18	87.8	5.522	1.870	0.3625	0.1220	0.99680	0.1100	0.0030	1994	578	1904	291	1808	49	-11.9
F28A-z18	8		422	16	0.037	98.47	89.56	5.357	1.740	0.3528	0.1140	0.99720	0.1100	0.0027	1948	545	1878	278	1801	44	-9.5
F28A-z18	9		455	12	0.025	98.69	90.82	5.321	1.740	0.3540	0.1160	0.99770	0.1090	0.0024	1954	551	1872	280	1783	41	-11.1
F28A-z18	**10**	*	**477**	**13**	**0.026**	**99.02**	**93.18**	**5.765**	**2.000**	**0.3748**	**0.1300**	**0.99830**	**0.1120**	**0.0022**	**2052**	**608**	**1941**	**300**	**1825**	**36**	**-14.5**
F28A-z18	11		527	14	0.027	99.41	95.84	6.352	2.410	0.4060	0.1540	0.99890	0.1130	0.0020	2197	706	2026	333	1856	32	-21.7
F28A-z18	12		541	10	0.019	99.19	94.25	5.840	2.070	0.3821	0.1360	0.99870	0.1110	0.0020	2086	632	1952	308	1814	34	-17.5
F28A-z18	13		550	12	0.021	99.31	95.16	6.371	2.430	0.4108	0.1570	0.99900	0.1120	0.0020	2219	717	2028	335	1840	32	-24.4
F28A-z18	**14**	*	**539**	**10**	**0.018**	**99.35**	**95.41**	**5.516**	**1.770**	**0.3576**	**0.1150**	**0.99860**	**0.1120**	**0.0019**	**1971**	**545**	**1903**	**276**	**1830**	**31**	**-8.9**
F28A-z18	**15**	*	**547**	**10**	**0.017**	**99.35**	**95.33**	**5.470**	**1.760**	**0.3563**	**0.1140**	**0.99860**	**0.1110**	**0.0019**	**1965**	**543**	**1896**	**276**	**1821**	**31**	**-9.2**
F28A-z18	16		580	8	0.014	99.43	95.9	5.985	2.120	0.3901	0.1380	0.99890	0.1110	0.0018	2123	641	1974	308	1820	30	-19.6
F28A-z18	**17**	*	**603**	**10**	**0.017**	**99.5**	**96.45**	**6.017**	**2.110**	**0.3822**	**0.1340**	**0.99900**	**0.1140**	**0.0018**	**2086**	**626**	**1978**	**306**	**1867**	**29**	**-13.8**
F28A-z18	18		614	9	0.015	99.62	97.25	6.582	2.610	0.4214	0.1670	0.99930	0.1130	0.0017	2267	758	2057	350	1853	28	-26.5
F28A-z18	**19**	*	**586**	**9**	**0.016**	**99.79**	**98.49**	**6.067**	**2.070**	**0.3801**	**0.1300**	**0.99910**	**0.1160**	**0.0017**	**2077**	**606**	**1985**	**298**	**1892**	**26**	**-11.4**
F28A-z18	**20**	*	**561**	**8**	**0.015**	**99.77**	**98.34**	**5.381**	**1.600**	**0.3446**	**0.1020**	**0.99870**	**0.1130**	**0.0017**	**1909**	**491**	**1882**	**254**	**1852**	**27**	**-3.6**
F28A-z18	21		548	9	0.017	99.79	98.5	6.166	2.140	0.3989	0.1380	0.99910	0.1120	0.0017	2164	637	2000	303	1834	27	-21.2
F28A-z18	**22**	*	**545**	**9**	**0.017**	**99.61**	**97.24**	**5.979**	**1.980**	**0.3750**	**0.1240**	**0.99890**	**0.1160**	**0.0018**	**2053**	**581**	**1973**	**288**	**1890**	**28**	**-10.1**
F28A-z18	**23**	*	**568**	**9**	**0.015**	**99.53**	**96.61**	**5.801**	**1.920**	**0.3741**	**0.1240**	**0.99890**	**0.1120**	**0.0018**	**2049**	**582**	**1947**	**287**	**1839**	**29**	**-13.4**
F28A-z18	**24**	*	**609**	**9**	**0.015**	**99.79**	**98.46**	**5.723**	**1.890**	**0.3680**	**0.1220**	**0.99910**	**0.1130**	**0.0016**	**2020**	**573**	**1935**	**286**	**1845**	**26**	**-11.0**
F28A-z18	**25**	*	**605**	**8**	**0.013**	**99.83**	**98.77**	**5.659**	**1.820**	**0.3605**	**0.1160**	**0.99900**	**0.1140**	**0.0016**	**1985**	**548**	**1925**	**277**	**1861**	**25**	**-7.8**
F28A-z18	**26**	*	**595**	**8**	**0.014**	**99.89**	**99.22**	**5.823**	**1.890**	**0.3730**	**0.1210**	**0.99910**	**0.1130**	**0.0016**	**2044**	**567**	**1950**	**281**	**1852**	**25**	**-12.1**
F28A-z18	**27**	*	**595**	**9**	**0.015**	**99.81**	**98.67**	**5.666**	**1.780**	**0.3594**	**0.1130**	**0.99900**	**0.1140**	**0.0016**	**1979**	**534**	**1926**	**271**	**1870**	**25**	**-6.8**
F28A-z18	28		613	9	0.014	99.78	98.37	6.051	2.070	0.3888	0.1330	0.99910	0.1130	0.0016	2117	618	1983	299	1846	26	-17.3
F28A-z18	29		615	7	0.012	99.85	98.89	5.997	1.990	0.3834	0.1270	0.99910	0.1130	0.0016	2092	592	1975	289	1855	25	-15.0
F28A-z18	**30**	*	**615**	**8**	**0.012**	**99.83**	**98.76**	**5.461**	**1.660**	**0.3502**	**0.1070**	**0.99900**	**0.1130**	**0.0016**	**1935**	**509**	**1894**	**262**	**1850**	**25**	**-5.3**
F28A-z18	31		620	8	0.013	99.77	98.32	6.203	2.170	0.3993	0.1400	0.99920	0.1130	0.0016	2166	645	2005	307	1843	25	-20.6
F28A-z18	**32**	*	**628**	**7**	**0.012**	**99.72**	**97.98**	**5.826**	**1.890**	**0.3711**	**0.1200**	**0.99910**	**0.1140**	**0.0016**	**2035**	**565**	**1950**	**281**	**1862**	**25**	**-10.8**
F28A-z18	**33**	*	**623**	**7**	**0.011**	**99.84**	**98.87**	**5.677**	**1.800**	**0.3645**	**0.1160**	**0.99910**	**0.1130**	**0.0015**	**2003**	**546**	**1928**	**274**	**1847**	**25**	**-9.9**
F28A-z18	**34**	*	**619**	**7**	**0.012**	**99.72**	**98.02**	**5.915**	**1.960**	**0.3780**	**0.1250**	**0.99910**	**0.1130**	**0.0016**	**2067**	**586**	**1963**	**288**	**1856**	**25**	**-13.3**
F28A-z18	35		629	6	0.010	99.7	97.81	5.856	1.960	0.3801	0.1270	0.99910	0.1120	0.0016	2077	594	1955	290	1828	26	-15.9
F28A-z18	**36**	*	**625**	**6**	**0.010**	**99.78**	**98.43**	**5.719**	**1.820**	**0.3700**	**0.1170**	**0.99910**	**0.1120**	**0.0015**	**2030**	**552**	**1934**	**274**	**1834**	**25**	**-12.4**
F28A-z18	**37**	*	**620**	**8**	**0.013**	**99.83**	**98.78**	**5.692**	**1.740**	**0.3614**	**0.1110**	**0.99900**	**0.1140**	**0.0015**	**1989**	**524**	**1930**	**265**	**1868**	**24**	**-7.5**
F28A-z18	**38**	*	**662**	**9**	**0.013**	**99.8**	**98.53**	**5.881**	**1.930**	**0.3741**	**0.1230**	**0.99920**	**0.1140**	**0.0015**	**2049**	**576**	**1958**	**285**	**1864**	**24**	**-11.6**
F28A-z18	**39**	*	**640**	**7**	**0.011**	**99.78**	**98.41**	**5.182**	**1.470**	**0.3360**	**0.0951**	**0.99890**	**0.1120**	**0.0015**	**1867**	**459**	**1850**	**241**	**1830**	**25**	**-2.3**
F28A-z18	**40**	*	**632**	**8**	**0.012**	**99.83**	**98.75**	**5.580**	**1.680**	**0.3576**	**0.1080**	**0.99900**	**0.1130**	**0.0015**	**1971**	**512**	**1913**	**260**	**1851**	**24**	**-7.5**
F28A-z18	**41**	*	**643**	**6**	**0.010**	**99.85**	**98.88**	**5.491**	**1.650**	**0.3523**	**0.1060**	**0.99900**	**0.1130**	**0.0015**	**1945**	**504**	**1899**	**258**	**1849**	**24**	**-6.0**
F28A-z18	**42**	*	**635**	**8**	**0.012**	**99.86**	**98.97**	**5.428**	**1.580**	**0.3456**	**0.1010**	**0.99900**	**0.1140**	**0.0015**	**1914**	**483**	**1889**	**250**	**1863**	**24**	**-3.1**
F28A-z18	**43**	*	**637**	**6**	**0.009**	**99.89**	**99.21**	**5.511**	**1.620**	**0.3522**	**0.1030**	**0.99900**	**0.1130**	**0.0015**	**1945**	**493**	**1902**	**252**	**1856**	**23**	**-5.6**
F28A-z18	44		667	6	0.010	99.89	99.22	5.800	1.860	0.3769	0.1210	0.99920	0.1120	0.0014	2062	567	1946	278	1826	23	-15.1
F28A-z18	**45**	*	**662**	**9**	**0.013**	**99.85**	**98.93**	**5.157**	**1.420**	**0.3307**	**0.0912**	**0.99890**	**0.1130**	**0.0015**	**1842**	**442**	**1846**	**235**	**1850**	**23**	**0.5**
F28A-z18	**46**	*	**651**	**7**	**0.011**	**99.92**	**99.41**	**5.475**	**1.610**	**0.3516**	**0.1030**	**0.99910**	**0.1130**	**0.0014**	**1942**	**492**	**1897**	**252**	**1847**	**23**	**-6.0**
F28A-z18	**47**	*	**634**	**8**	**0.013**	**99.93**	**99.48**	**5.237**	**1.450**	**0.3353**	**0.0931**	**0.99900**	**0.1130**	**0.0014**	**1864**	**449**	**1859**	**237**	**1853**	**23**	**-0.7**
F28A-z18	**48**	*	**669**	**6**	**0.009**	**99.9**	**99.25**	**5.840**	**1.850**	**0.3721**	**0.1180**	**0.99920**	**0.1140**	**0.0014**	**2039**	**554**	**1952**	**275**	**1862**	**23**	**-11.1**
F28A-z18	**49**	*	**654**	**7**	**0.011**	**99.9**	**99.26**	**5.169**	**1.390**	**0.3302**	**0.0890**	**0.99890**	**0.1140**	**0.0014**	**1839**	**431**	**1847**	**229**	**1857**	**23**	**1.1**

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
								$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$			
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.		
F28A-z18	**50**	*	**669**	**7**	**0.010**	**99.88**	**99.15**	**5.132**	**1.380**	**0.3262**	**0.0874**	**0.99890**	**0.1140**	**0.0014**	**1820**	**425**	**1841**	**228**	**1865**	**23**		**2.7**
F28A-z18	**51**	*	**676**	**8**	**0.011**	**99.97**	**99.78**	**5.287**	**1.480**	**0.3385**	**0.0946**	**0.99910**	**0.1130**	**0.0014**	**1879**	**456**	**1867**	**239**	**1853**	**22**		**-1.6**
F28A-z18	**52**	*	**649**	**7**	**0.012**	**99.95**	**99.61**	**5.401**	**1.520**	**0.3442**	**0.0968**	**0.99910**	**0.1140**	**0.0014**	**1907**	**464**	**1885**	**241**	**1861**	**22**		**-2.8**
F28A-z18	**53**	*	**658**	**6**	**0.009**	**99.91**	**99.34**	**5.137**	**1.390**	**0.3306**	**0.0897**	**0.99900**	**0.1130**	**0.0014**	**1841**	**435**	**1842**	**231**	**1843**	**22**		**0.1**
F28A-z18	**54**	*	**665**	**7**	**0.011**	**99.87**	**99.07**	**5.034**	**1.320**	**0.3223**	**0.0843**	**0.99890**	**0.1130**	**0.0014**	**1801**	**411**	**1825**	**222**	**1852**	**22**		**3.1**
F28A-z18	**55**	*	**670**	**5**	**0.008**	**99.9**	**99.29**	**5.205**	**1.430**	**0.3359**	**0.0923**	**0.99900**	**0.1120**	**0.0014**	**1867**	**445**	**1853**	**234**	**1838**	**22**		**-1.8**
F28A-z18	**56**	*	**658**	**6**	**0.010**	**99.93**	**99.47**	**5.013**	**1.290**	**0.3185**	**0.0817**	**0.99890**	**0.1140**	**0.0014**	**1782**	**400**	**1821**	**217**	**1866**	**22**		**5.1**
F28A-z18	**57**	*	**683**	**8**	**0.011**	**99.93**	**99.45**	**5.343**	**1.500**	**0.3449**	**0.0967**	**0.99910**	**0.1120**	**0.0014**	**1910**	**463**	**1876**	**240**	**1838**	**22**		**-4.5**
F28A-z18	**58**	*	**705**	**8**	**0.011**	**99.93**	**99.54**	**5.188**	**1.370**	**0.3238**	**0.0853**	**0.99900**	**0.1160**	**0.0014**	**1808**	**415**	**1851**	**224**	**1899**	**21**		**5.5**
F28A-z18	**59**	*	**689**	**6**	**0.009**	**99.86**	**98.94**	**4.790**	**1.200**	**0.3118**	**0.0783**	**0.99880**	**0.1110**	**0.0014**	**1749**	**385**	**1783**	**211**	**1823**	**22**		**4.6**
Sample F28A, zircon 20: Type 1B																						
F28A-z20	1		383	4	0.011	78.31	24.13	3.165	1.040	0.3148	0.0861	0.85600	0.0729	0.0125	1764	422	1449	255	1012	346		-85.2
F28A-z20	2		367	3	0.008	94.27	67.06	4.447	1.110	0.3149	0.0767	0.97680	0.1020	0.0055	1765	376	1721	207	1669	99		-6.5
F28A-z20	3		405	3	0.007	97.62	84.24	5.701	1.760	0.3830	0.1170	0.99360	0.1080	0.0038	2090	547	1932	266	1765	64		-21.6
F28A-z20	4		418	4	0.010	98.22	87.93	5.786	1.800	0.3847	0.1190	0.99510	0.1090	0.0034	2098	555	1944	270	1784	56		-20.7
F28A-z20	**5**	*	**430**	**4**	**0.009**	**98.8**	**91.92**	**4.988**	**1.230**	**0.3152**	**0.0773**	**0.99420**	**0.1150**	**0.0030**	**1766**	**379**	**1817**	**208**	**1876**	**48**		**6.7**
F28A-z20	**6**	*	**466**	**7**	**0.015**	**99.42**	**96.14**	**5.347**	**1.380**	**0.3253**	**0.0840**	**0.99630**	**0.1190**	**0.0027**	**1815**	**409**	**1876**	**221**	**1945**	**40**		**7.7**
F28A-z20	**7**	*	**480**	**8**	**0.016**	**99.32**	**95.2**	**5.559**	**1.570**	**0.3573**	**0.1010**	**0.99670**	**0.1130**	**0.0026**	**1969**	**478**	**1910**	**243**	**1846**	**41**		**-7.7**
F28A-z20	**8**	*	**460**	**6**	**0.013**	**99.39**	**95.68**	**5.317**	**1.390**	**0.3400**	**0.0888**	**0.99630**	**0.1130**	**0.0026**	**1887**	**427**	**1872**	**224**	**1855**	**41**		**-2.0**
F28A-z20	**9**	*	**437**	**7**	**0.016**	**99.66**	**97.59**	**5.369**	**1.360**	**0.3422**	**0.0868**	**0.99650**	**0.1140**	**0.0024**	**1897**	**417**	**1880**	**218**	**1861**	**39**		**-2.2**
F28A-z20	**10**	*	**433**	**7**	**0.016**	**99.44**	**96.05**	**5.263**	**1.310**	**0.3393**	**0.0846**	**0.99590**	**0.1120**	**0.0025**	**1883**	**407**	**1863**	**213**	**1840**	**41**		**-2.7**
F28A-z20	**11**	*	**419**	**9**	**0.022**	**99.51**	**96.51**	**5.094**	**1.170**	**0.3261**	**0.0749**	**0.99530**	**0.1130**	**0.0025**	**1819**	**364**	**1835**	**195**	**1853**	**40**		**2.1**
F28A-z20	**12**	*	**420**	**6**	**0.015**	**99.63**	**97.36**	**5.050**	**1.140**	**0.3211**	**0.0722**	**0.99550**	**0.1140**	**0.0024**	**1795**	**352**	**1828**	**191**	**1865**	**39**		**4.3**
F28A-z20	**13**	*	**450**	**8**	**0.019**	**99.75**	**98.21**	**4.712**	**0.993**	**0.3011**	**0.0633**	**0.99520**	**0.1130**	**0.0023**	**1697**	**314**	**1769**	**176**	**1856**	**37**		**9.7**
F28A-z20	**14**	*	**473**	**10**	**0.020**	**99.62**	**97.33**	**4.815**	**1.040**	**0.3073**	**0.0662**	**0.99540**	**0.1140**	**0.0024**	**1727**	**326**	**1787**	**182**	**1858**	**37**		**8.0**
F28A-z20	**15**	*	**451**	**7**	**0.016**	**99.55**	**96.76**	**4.416**	**0.859**	**0.2863**	**0.0555**	**0.99410**	**0.1120**	**0.0024**	**1623**	**278**	**1715**	**161**	**1830**	**38**		**12.8**
F28A-z20	**16**	*	**466**	**6**	**0.012**	**99.75**	**98.23**	**4.575**	**0.920**	**0.2939**	**0.0590**	**0.99520**	**0.1130**	**0.0022**	**1661**	**294**	**1745**	**168**	**1847**	**36**		**11.4**
F28A-z20	**17**	*	**495**	**5**	**0.010**	**99.91**	**99.35**	**4.781**	**0.987**	**0.2981**	**0.0615**	**0.99600**	**0.1160**	**0.0021**	**1682**	**305**	**1782**	**173**	**1900**	**33**		**13.0**
F28A-z20	**18**	*	**507**	**3**	**0.007**	**99.82**	**98.7**	**4.621**	**0.912**	**0.2910**	**0.0574**	**0.99550**	**0.1150**	**0.0022**	**1647**	**286**	**1753**	**165**	**1882**	**34**		**14.1**
F28A-z20	**19**	*	**514**	**4**	**0.007**	**99.72**	**97.97**	**5.015**	**1.140**	**0.3236**	**0.0732**	**0.99650**	**0.1120**	**0.0021**	**1808**	**357**	**1822**	**192**	**1838**	**34**		**1.9**
F28A-z20	**20**	*	**490**	**4**	**0.008**	**99.58**	**96.98**	**4.489**	**0.881**	**0.2901**	**0.0568**	**0.99490**	**0.1120**	**0.0022**	**1642**	**284**	**1729**	**163**	**1836**	**36**		**12.0**
F28A-z20	**21**	*	**527**	**3**	**0.005**	**99.75**	**98.21**	**4.586**	**0.908**	**0.2912**	**0.0575**	**0.99550**	**0.1140**	**0.0021**	**1648**	**287**	**1747**	**165**	**1868**	**34**		**13.4**
F28A-z20	**22**	*	**528**	**3**	**0.005**	**99.82**	**98.74**	**4.607**	**0.902**	**0.2904**	**0.0568**	**0.99560**	**0.1150**	**0.0021**	**1644**	**284**	**1751**	**163**	**1881**	**33**		**14.3**
F28A-z20	**23**	*	**526**	**2**	**0.004**	**99.88**	**99.17**	**4.980**	**1.050**	**0.3146**	**0.0661**	**0.99630**	**0.1150**	**0.0021**	**1763**	**324**	**1816**	**178**	**1877**	**33**		**6.9**
F28A-z20	**24**	*	**505**	**4**	**0.007**	**99.87**	**99.05**	**4.516**	**0.836**	**0.2870**	**0.0531**	**0.99510**	**0.1140**	**0.0021**	**1627**	**266**	**1734**	**154**	**1866**	**33**		**14.5**
F28A-z20	25		499	3	0.006	99.93	99.5	4.320	0.747	0.2698	0.0466	0.99460	0.1160	0.0021	1540	236	1697	143	1898	32		21.2
F28A-z20	**26**	*	**520**	**2**	**0.004**	**99.87**	**99.06**	**4.704**	**0.957**	**0.3035**	**0.0617**	**0.99610**	**0.1120**	**0.0020**	**1708**	**305**	**1768**	**170**	**1839**	**33**		**8.1**
F28A-z20	27		496	3	0.006	99.85	98.92	4.358	0.734	0.2694	0.0453	0.99410	0.1170	0.0021	1538	230	1704	139	1916	33		22.2
F28A-z20	28		517	2	0.004	99.83	98.76	4.308	0.764	0.2770	0.0490	0.99460	0.1130	0.0021	1576	247	1695	146	1845	33		16.4
F28A-z20	**29**	*	**515**	**2**	**0.004**	**99.92**	**99.38**	**4.405**	**0.798**	**0.2841**	**0.0514**	**0.99510**	**0.1120**	**0.0020**	**1612**	**258**	**1713**	**150**	**1840**	**33**		**14.0**
F28A-z20	30		484	4	0.007	99.88	99.1	4.095	0.664	0.2621	0.0424	0.99370	0.1130	0.0021	1501	217	1653	132	1853	33		21.3
F28A-z20	**31**	*	**502**	**3**	**0.005**	**99.85**	**98.86**	**4.501**	**0.846**	**0.2935**	**0.0551**	**0.99530**	**0.1110**	**0.0020**	**1659**	**274**	**1731**	**156**	**1820**	**33**		**10.1**
F28A-z20	**32**	*	**481**	**1**	**0.003**	**99.92**	**99.41**	**4.377**	**0.750**	**0.2788**	**0.0477**	**0.99450**	**0.1140**	**0.0020**	**1585**	**240**	**1708**	**142**	**1862**	**32**		**16.7**
F28A-z20	**33**	*	**485**	**2**	**0.004**	**99.87**	**99.09**	**4.321**	**0.738**	**0.2768**	**0.0472**	**0.99440**	**0.1130**	**0.0021**	**1575**	**238**	**1697**	**141**	**1852**	**33**		**16.8**
F28A-z20	**34**	*	**505**	**3**	**0.006**	**99.95**	**99.6**	**4.380**	**0.766**	**0.2830**	**0.0494**	**0.99480**	**0.1120**	**0.0020**	**1606**	**248**	**1708**	**145**	**1836**	**32**		**14.1**
F28A-z20	**35**	*	**488**	**2**	**0.004**	**99.92**	**99.41**	**4.211**	**0.677**	**0.2661**	**0.0427**	**0.99380**	**0.1150**	**0.0021**	**1521**	**218**	**1676**	**132**	**1876**	**32**		**21.2**
F28A-z20	**36**	*	**480**	**2**	**0.003**	**99.93**	**99.5**	**4.396**	**0.743**	**0.2793**	**0.0471**	**0.99440**	**0.1140**	**0.0020**	**1588**	**237**	**1712**	**140**	**1867**	**32**		**16.9**
F28A-z20	37		474	2	0.004	99.95	99.61	4.286	0.698	0.2702	0.0439	0.99400	0.1150	0.0020	1542	223	1691	134	1881	32		20.3
F28A-z20	38		473	2	0.004	99.92	99.42	4.295	0.702	0.2725	0.0445	0.99400	0.1140	0.0020	1553	225	1692	135	1869	32		19.0
F28A-z20	39		467	2	0.003	99.87	99.04	4.365	0.732	0.2787	0.0466	0.99420	0.1140	0.0021	1585	235	1706	139	1858	33		16.6
F28A-z20	40		486	2	0.003	99.82	98.72	4.025	0.622	0.2580	0.0398	0.99300	0.1130	0.0021	1480	204	1639	126	1851	33		22.4
F28A-z20	41		497	2	0.003	99.97	99.8	4.185	0.666	0.2653	0.0421	0.99390	0.1140	0.0020	1517	215	1671	130	1871	32		21.2
F28A-z20	42		492	3	0.006	99.91	99.35	4.436	0.744	0.2835	0.0475	0.99430	0.1130	0.0020	1609	238	1719	139	1856	32		15.0
F28A-z20	43		486	2	0.004	99.79	98.5	4.292	0.666	0.2708	0.0419	0.99300	0.1150	0.0021	1545	213	1692	128	1879	33		20.0
F28A-z20	44		512	3	0.006	99.94	99.54	4.050	0.611	0.2590	0.0390	0.99340	0.1130	0.0020	1485	200	1644	123	1855	31		22.3
F28A-z20	45		531	2	0.003	99.95	99.66	4.148	0.640	0.2611	0.0402	0.99400	0.1150	0.0019	1495	205	1664	126	1883	30		23.0
F28A-z20	46		538	2	0.004	99.93	99.5	4.054	0.599	0.2568	0.0379	0.99360	0.1140	0.0019	1474	194	1645	120	1872	30		23.8
F28A-z20	47		577	1	0.002	99.96	99.68	4.094	0.608	0.2580	0.0383	0.99410	0.1150	0.0019	1480	196	1653	121	1881	29		23.8
F28A-z20	48		583	2	0.003	99.99	99.93	4.023	0.589	0.2534	0.0370	0.99420	0.1150	0.0018	1456	190	1639	119	1882	28		25.3
F28A-z20	49		588	2	0.004	99.95	99.64	3.972	0.573	0.2536	0.0366	0.99410	0.1140	0.0018	1457	188	1628	117	1857	28		24.0
F28A-z20	50		643	1	0.002	99.92	99.43	3.972	0.588	0.2529	0.0374	0.99460	0.1140	0.0018	1454	192	1628	120	1862	28		24.5
F28A-z20	51		662	3	0.005	99.94	99.58	3.932	0.578	0.2560	0.0376	0.99470	0.1110	0.0017	1469	193	1620	119	1822	27		21.6
F28A-z20	52		715	3	0.004	99.96	99.73	3.921	0.570	0.2494	0.0362	0.99490	0.1140	0.0017	1435	187	1618	118	1865	27		25.7
F28A-z20	53		725	2	0.003	99.98	99.87	3.879	0.556	0.2491	0.0357	0.99490	0.1130	0.0016	1434	184	1609	116	1847	26		24.9
F28A-z20	54		743	2	0.003	99.94	99.57	3.945	0.573	0.2499	0.0362	0.99520	0.1140	0.0016	1438	187	1623	118	1872	26		25.8
F28A-z20	55		782	3	0.004	99.93	99.53	3.841	0.532	0.2417	0.0334	0.99490	0.1150	0.0016	1396	174	1601	112	1884	25		28.8
F28A-z20	56		843	2	0.002	99.96	99.72	4.082	0.605	0.2543	0.0377	0.99580	0.1160	0.0016	1461	194	1651	121	1902	24		25.9
F28A-z20	57		829	3	0.003	99.98	99.89	3.865	0.539	0.2420	0.0337	0.99540	0.1160	0.0015	1397	175	1606	113	1893	24		29.1
F28A-z20	58		823	2	0.003	99.99	99.95	3.879	0.535	0.2430	0.0334	0.99540	0.1160	0.0015	1402	173	1609	111	1892	24		28.8
F28A-z20	59		895	2	0.003	99.99	99.89	3.804	0.532	0.2432	0.0340	0.99560	0.1130	0.0015	1403	176	1594	112	1856	24		27.1
Sample F28A, zircon 21: Type 3																						
F28A-z21	1		4209	56	0.013	96.75	82.65	5.084	2.660	0.2778	0.1450	0.99840	0.1330	0.0040	1580	732	1833	444	2135	53		29.3
F28A-z21	2		4116	59	0.014	97.56	86.62	5.411	3.350	0.2923	0.1810	0.99900	0.1340	0.0037	1653	902	1887	531	2155	48		26.4
F28A-z21	3		4265	48	0.011	97.86	87.95	4.761	2.910	0.2610	0.1600	0.99900	0.1320	0.0036	1495	815	1778	513	2128	48		33.2
F28A-z21	4		4527	63	0.014	97.1	84.19	5.264	3.880	0.2903	0.2140	0.99910	0.1320	0.0041	1643	1070	1863	629	2118	54		25.4
F28A-z21	5		4359	52	0.012	97.68	86.53	3.592	1.900	0.2065	0.1090	0.99840	0.1260	0.0037	1210	581	1548	419	2045	53		44.7
F28A-z21	6		4647	63	0.014	98.16	89.11	4.194	2.870	0.2401	0.1640	0.99920	0.1270	0.0036	1387	854	1673	562	2052	50		35.9
F28A-z21	7		5077	68	0.013	98.17	89.49	4.368	3.080	0.2412	0.1700	0.99920	0.1310	0.0036	1393	882	1706	582	2116	48		37.9
F28A-z21	8		5226	85	0.016	98.6	91.97	4.119	2.920	0.2214	0.1570	0.99930	0.1350	0.0035	1289	828	1658	580	2163	45		44.5
F28A-z21	9		4887	73	0.015	98.65	91.93	4.003	2.860	0.2250	0.1610	0.99930	0.1290	0.0034	1308	846	1635	581	2085	46		41.1

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
								$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$			
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.		
F28A-z21	10		4910	85	0.017	98.81	92.84	3.368	2.070	0.1893	0.1160	0.99910	0.1290	0.0033	1118	629	1497	480	2085	45		50.4
F28A-z21	11		5343	70	0.013	98.6	91.56	3.761	2.720	0.2137	0.1540	0.99930	0.1280	0.0035	1249	821	1584	580	2066	48		43.4
F28A-z21	12		5641	95	0.017	98.75	92.61	3.548	2.470	0.1953	0.1360	0.99930	0.1320	0.0034	1150	732	1538	551	2122	46		49.9
F28A-z21	13		5592	96	0.017	98.91	93.46	3.239	2.160	0.1794	0.1200	0.99930	0.1310	0.0034	1064	655	1467	519	2110	45		53.7
F28A-z21	14		5437	96	0.018	98.88	93.19	3.332	2.370	0.1884	0.1340	0.99930	0.1280	0.0034	1113	728	1489	557	2075	46		50.4
F28A-z21	15		5328	83	0.016	98.39	91.18	3.075	1.950	0.1592	0.1010	0.99910	0.1400	0.0039	952	561	1426	486	2228	48		61.4
F28A-z21	16		5927	103	0.017	98.46	91.23	2.673	1.610	0.1438	0.0866	0.99890	0.1350	0.0039	866	488	1321	445	2161	50		63.9
F28A-z21	17		6199	106	0.017	98.97	93.91	2.919	1.990	0.1600	0.1090	0.99930	0.1320	0.0034	957	605	1387	515	2129	45		59.1
F28A-z21	18		6063	110	0.018	98.67	91.98	3.018	2.230	0.1704	0.1260	0.99930	0.1280	0.0037	1014	693	1412	564	2077	50		55.2
F28A-z21	19		5672	85	0.015	98.6	91.78	2.578	1.570	0.1419	0.0864	0.99890	0.1320	0.0037	855	488	1294	446	2122	49		63.6
F28A-z21	20		6049	116	0.019	98.69	92.44	2.545	1.620	0.1378	0.0878	0.99900	0.1340	0.0038	832	498	1285	465	2150	49		65.2
F28A-z21	21		6425	108	0.017	98.87	93.23	2.221	1.270	0.1234	0.0707	0.99890	0.1310	0.0036	750	406	1188	402	2106	48		68.1
F28A-z21	22		6537	109	0.017	98.97	93.81	2.658	1.920	0.1471	0.1060	0.99930	0.1310	0.0035	884	597	1317	533	2113	47		62.1
F28A-z21	23		6140	90	0.015	98.93	93.73	2.183	1.250	0.1184	0.0675	0.99890	0.1340	0.0036	722	389	1176	397	2147	47		70.0
F28A-z21	24		6124	92	0.015	99.03	94.79	2.631	1.650	0.1294	0.0812	0.99930	0.1470	0.0036	785	464	1309	462	2316	41		70.1
F28A-z21	25		6292	105	0.017	99.14	95	2.267	1.340	0.1211	0.0715	0.99910	0.1360	0.0034	737	411	1202	417	2174	44		69.8
F28A-z21	26		6463	101	0.016	99.18	95.25	1.943	0.984	0.1029	0.0520	0.99880	0.1370	0.0034	632	304	1096	339	2189	43		74.6
F28A-z21	27		6340	103	0.016	98.76	93.23	2.529	1.660	0.1285	0.0845	0.99920	0.1430	0.0038	780	483	1280	479	2260	46		69.4
F28A-z21	28		6444	102	0.016	98.86	93.71	2.197	1.360	0.1121	0.0692	0.99910	0.1420	0.0038	685	401	1180	431	2254	46		73.2
F28A-z21	29		6875	109	0.016	99.27	95.86	2.125	1.260	0.1094	0.0646	0.99920	0.1410	0.0034	669	375	1157	408	2239	42		73.7
F28A-z21	30		6681	88	0.013	99.28	95.73	1.882	0.967	0.1012	0.0520	0.99890	0.1350	0.0032	622	304	1075	341	2162	42		74.6
Sample F28A, zircon 22: Type 1B																						
F28A-z22	1		594	21	0.036	81.49	29.07	2.526	0.667	0.2376	0.0548	0.89480	0.0771	0.0091	1374	286	1279	192	1124	235		-24.7
F28A-z22	2		554	20	0.036	89.71	53.9	5.274	1.610	0.3444	0.1030	0.98380	0.1110	0.0061	1908	494	1865	260	1817	99		-5.8
F28A-z22	3		474	26	0.055	91.05	57.96	5.283	1.460	0.3412	0.0921	0.98180	0.1120	0.0059	1892	443	1866	235	1837	95		-3.5
F28A-z22	4		421	30	0.071	92.48	64.48	6.610	2.020	0.3922	0.1180	0.98840	0.1220	0.0057	2133	547	2061	269	1989	82		-8.5
F28A-z22	5		375	30	0.079	91.99	61.05	5.317	1.400	0.3411	0.0873	0.97870	0.1130	0.0061	1892	420	1872	224	1849	97		-2.7
F28A-z22	6		374	26	0.069	91.76	59.66	6.009	1.930	0.3965	0.1250	0.98350	0.1100	0.0064	2153	576	1977	279	1798	106		-23.3
F28A-z22	7		347	27	0.077	90.51	54.43	6.291	2.300	0.4400	0.1570	0.98230	0.1040	0.0071	2351	704	2017	320	1691	126		-46.7
F28A-z22	8		325	23	0.072	92.65	64.71	7.289	2.470	0.4387	0.1470	0.98790	0.1210	0.0064	2345	658	2147	303	1964	94		-23.1
F28A-z22	9		296	26	0.086	91.58	58.67	4.991	1.280	0.3351	0.0826	0.96830	0.1080	0.0069	1863	399	1818	217	1767	117		-6.2
F28A-z22	10		288	23	0.079	91.21	57.43	7.145	2.500	0.4813	0.1650	0.98210	0.1080	0.0071	2533	717	2130	311	1760	120		-53.3
F28A-z22	11		320	20	0.063	91.94	61.06	6.282	1.850	0.4000	0.1150	0.98110	0.1140	0.0065	2169	531	2016	258	1862	103		-19.5
F28A-z22	12		393	17	0.043	91.37	57.11	5.182	1.530	0.3607	0.1040	0.97900	0.1040	0.0063	1986	492	1850	251	1700	111		-19.5
F28A-z22	13		487	15	0.030	92.43	61.72	5.876	2.000	0.3896	0.1310	0.98940	0.1090	0.0054	2121	609	1958	296	1789	90		-21.8
F28A-z22	14		520	13	0.025	92.85	63.25	5.989	1.970	0.3957	0.1290	0.99030	0.1100	0.0050	2149	594	1974	286	1796	83		-23.1
F28A-z22	15		575	13	0.022	93.79	66.79	5.754	1.790	0.3784	0.1170	0.99140	0.1100	0.0045	2069	545	1940	269	1804	74		-17.2
F28A-z22	16		656	13	0.019	93.97	68.23	6.143	2.040	0.3906	0.1290	0.99370	0.1140	0.0042	2126	598	1996	290	1865	67		-16.4
F28A-z22	17		732	17	0.023	94.01	69.6	6.510	2.170	0.3907	0.1290	0.99490	0.1210	0.0041	2126	599	2047	293	1969	60		-9.4
F28A-z22	18		801	16	0.020	93.9	68.69	6.212	2.000	0.3814	0.1220	0.99470	0.1180	0.0039	2083	570	2006	282	1928	60		-9.4
F28A-z22	19		822	15	0.018	94.24	70.41	6.078	1.810	0.3662	0.1080	0.99470	0.1200	0.0037	2012	511	1987	259	1962	55		-2.9
F28A-z22	20		871	17	0.020	94.88	72.58	5.808	1.670	0.3559	0.1020	0.99510	0.1180	0.0034	1963	484	1948	249	1932	51		-1.8
F28A-z22	21		956	17	0.017	95.24	74.02	6.433	2.050	0.3954	0.1260	0.99650	0.1180	0.0031	2148	580	2037	280	1926	48		-13.6
F28A-z22	22		1024	21	0.021	95.33	74.32	5.658	1.560	0.3497	0.0957	0.99570	0.1170	0.0030	1933	457	1925	237	1916	46		-1.0
F28A-z22	23		1124	25	0.023	95.82	76.59	5.265	1.320	0.3230	0.0805	0.99560	0.1180	0.0028	1804	392	1863	214	1929	42		7.4
F28A-z22	**24**	*	**1198**	**23**	**0.019**	**95.89**	**76.35**	**4.960**	**1.210**	**0.3142**	**0.0763**	**0.99560**	**0.1150**	**0.0026**	**1761**	**374**	**1813**	**206**	**1872**	**41**		**6.8**
F28A-z22	**25**	*	**1243**	**30**	**0.024**	**95.88**	**76.23**	**5.175**	**1.290**	**0.3291**	**0.0817**	**0.99600**	**0.1140**	**0.0025**	**1834**	**396**	**1848**	**212**	**1865**	**40**		**1.9**
F28A-z22	**26**	*	**1354**	**29**	**0.021**	**96.33**	**78.58**	**5.015**	**1.210**	**0.3143**	**0.0753**	**0.99630**	**0.1160**	**0.0024**	**1762**	**369**	**1822**	**204**	**1891**	**37**		**7.8**
F28A-z22	**27**	*	**1331**	**30**	**0.023**	**96.46**	**78.98**	**4.852**	**1.110**	**0.3079**	**0.0703**	**0.99610**	**0.1140**	**0.0023**	**1730**	**346**	**1794**	**193**	**1869**	**37**		**8.5**
F28A-z22	**28**	*	**1288**	**25**	**0.019**	**96.45**	**79.03**	**4.917**	**1.090**	**0.3102**	**0.0688**	**0.99590**	**0.1150**	**0.0023**	**1742**	**338**	**1805**	**188**	**1879**	**36**		**8.3**
F28A-z22	**29**	*	**1264**	**25**	**0.020**	**96.39**	**78.87**	**5.041**	**1.120**	**0.3158**	**0.0702**	**0.99580**	**0.1160**	**0.0024**	**1769**	**344**	**1826**	**189**	**1892**	**37**		**7.4**
F28A-z22	**30**	*	**1273**	**31**	**0.025**	**96.2**	**77.63**	**4.605**	**0.970**	**0.2939**	**0.0616**	**0.99500**	**0.1140**	**0.0024**	**1661**	**307**	**1750**	**176**	**1859**	**38**		**12.1**
F28A-z22	**31**	*	**1295**	**26**	**0.020**	**96.13**	**77.42**	**4.777**	**1.030**	**0.3035**	**0.0649**	**0.99520**	**0.1140**	**0.0024**	**1709**	**321**	**1781**	**180**	**1867**	**38**		**9.7**
F28A-z22	32		1255	21	0.017	96.18	77.77	4.546	0.902	0.2865	0.0565	0.99460	0.1150	0.0024	1624	283	1739	165	1881	37		15.4
F28A-z22	**33**	*	**1280**	**26**	**0.021**	**96.1**	**77.08**	**4.645**	**0.961**	**0.2980**	**0.0613**	**0.99480**	**0.1130**	**0.0024**	**1681**	**305**	**1757**	**173**	**1849**	**38**		**10.3**
F28A-z22	**34**	*	**1277**	**26**	**0.020**	**95.88**	**76.09**	**4.425**	**0.857**	**0.2836**	**0.0546**	**0.99380**	**0.1130**	**0.0024**	**1610**	**274**	**1717**	**160**	**1850**	**39**		**14.6**
F28A-z22	35		1243	25	0.020	96.35	78.55	4.502	0.862	0.2839	0.0540	0.99440	0.1150	0.0023	1611	271	1731	159	1880	36		16.2
F28A-z22	36		1254	23	0.018	96.68	80.16	4.384	0.808	0.2769	0.0507	0.99440	0.1150	0.0022	1576	256	1709	152	1877	35		18.1
F28A-z22	37		1269	26	0.021	96.8	80.95	4.617	0.883	0.2882	0.0549	0.99510	0.1160	0.0022	1633	275	1752	160	1898	34		15.8
F28A-z22	38		1241	27	0.022	96.64	79.99	4.377	0.798	0.2757	0.0500	0.99430	0.1150	0.0022	1570	253	1708	151	1882	35		18.7
F28A-z22	**39**	*	**1227**	**26**	**0.021**	**96.81**	**80.69**	**4.590**	**0.865**	**0.2921**	**0.0548**	**0.99480**	**0.1140**	**0.0022**	**1652**	**273**	**1747**	**157**	**1864**	**35**		**12.9**
F28A-z22	40		1276	20	0.016	96.83	80.84	4.507	0.825	0.2854	0.0520	0.99460	0.1150	0.0022	1618	261	1732	152	1873	34		15.4
F28A-z22	**41**	*	**1292**	**31**	**0.024**	**96.96**	**81.47**	**4.733**	**0.918**	**0.3009**	**0.0581**	**0.99540**	**0.1140**	**0.0021**	**1696**	**288**	**1773**	**163**	**1865**	**33**		**10.3**
F28A-z22	**42**	*	**1320**	**25**	**0.019**	**97.08**	**82.02**	**4.531**	**0.847**	**0.2891**	**0.0538**	**0.99540**	**0.1140**	**0.0020**	**1637**	**269**	**1737**	**156**	**1859**	**33**		**13.5**
F28A-z22	**43**	*	**1407**	**31**	**0.022**	**97.41**	**84.02**	**4.674**	**0.874**	**0.2931**	**0.0546**	**0.99600**	**0.1160**	**0.0019**	**1657**	**272**	**1763**	**156**	**1890**	**30**		**14.0**
F28A-z22	**44**	*	**1518**	**30**	**0.020**	**97.69**	**85.31**	**4.656**	**0.897**	**0.2966**	**0.0570**	**0.99650**	**0.1140**	**0.0018**	**1675**	**283**	**1759**	**161**	**1862**	**29**		**11.4**
F28A-z22	**45**	*	**1491**	**35**	**0.023**	**97.77**	**85.57**	**4.575**	**0.865**	**0.2959**	**0.0558**	**0.99650**	**0.1120**	**0.0018**	**1671**	**277**	**1745**	**158**	**1834**	**29**		**10.1**
F28A-z22	**46**	*	**1593**	**33**	**0.021**	**97.72**	**85.51**	**4.704**	**0.920**	**0.2994**	**0.0584**	**0.99680**	**0.1140**	**0.0018**	**1688**	**290**	**1768**	**164**	**1863**	**28**		**10.6**
F28A-z22	**47**	*	**1608**	**38**	**0.024**	**97.99**	**87.03**	**4.630**	**0.872**	**0.2948**	**0.0554**	**0.99690**	**0.1140**	**0.0017**	**1665**	**276**	**1755**	**157**	**1862**	**27**		**11.9**
F28A-z22	**48**	*	**1641**	**33**	**0.020**	**97.84**	**85.94**	**4.527**	**0.873**	**0.2945**	**0.0566**	**0.99690**	**0.1110**	**0.0017**	**1664**	**282**	**1736**	**160**	**1824**	**28**		**10.0**
F28A-z22	**49**	*	**1693**	**32**	**0.019**	**97.84**	**86.02**	**4.811**	**0.986**	**0.3108**	**0.0636**	**0.99730**	**0.1120**	**0.0017**	**1744**	**313**	**1787**	**172**	**1837**	**27**		**5.8**
Sample S106A, zircon 1: Type 1A																						
S106A-z1	1		1308	19	0.01	99.31	95.01	4.044	0.343	0.2669	0.0223	0.98310	0.1099	0.0017	1525	114	1643	69	1798	28		17.1
S106A-z1	**2**	*	**1328**	**20**	**0.01**	**99.64**	**97.34**	**4.417**	**0.388**	**0.2893**	**0.0252**	**0.98750**	**0.1107**	**0.0015**	**1638**	**126**	**1716**	**73**	**1812**	**25**		**10.9**
S106A-z1	**3**	*	**1278**	**14**	**0.01**	**99.72**	**97.97**	**4.609**	**0.388**	**0.2946**	**0.0247**	**0.98740**	**0.1135**	**0.0015**	**1664**	**123**	**1751**	**70**	**1856**	**24**		**11.7**
S106A-z1	**4**	*	**1256**	**11**	**0.01**	**99.83**	**98.73**	**4.399**	**0.351**	**0.2861**	**0.0227**	**0.98680**	**0.1115**	**0.0014**	**1622**	**114**	**1712**	**66**	**1824**	**23**		**12.5**
S106A-z1	**5**	*	**1223**	**11**	**0.01**	**99.86**	**99.02**	**4.598**	**0.368**	**0.2933**	**0.0233**	**0.98730**	**0.1137**	**0.0014**	**1658**	**116**	**1749**	**67**	**1859**	**23**		**12.2**
S106A-z1	**6**	*	**1168**	**6**	**0.01**	**99.84**	**98.85**	**4.486**	**0.347**	**0.2901**	**0.0223**	**0.98580**	**0.1122**	**0.0015**	**1642**	**111**	**1728**	**64**	**1835**	**24**		**11.9**
S106A-z1	**7**	*	**1020**	**6**	**0.01**	**99.94**	**99.54**	**4.744**	**0.357**	**0.3040**	**0.0227**	**0.98450**	**0.1132**	**0.0015**	**1711**	**112**	**1775**	**63**	**1851**	**24**		**8.6**
S106A-z1	**8**	*	**860**	**5**	**0.01**	**99.9**	**99.27**	**4.707**	**0.341**	**0.3045**	**0.0219**	**0.98080**	**0.1121**	**0.0016**	**1714**	**108**	**1769**	**61**	**1834**	**26**		**7.5**

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
	cycle		ppm	ppm	ppm	^{206}Pb*	^{207}Pb*	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.		
S106A-z1	**9**	*	**746**	**5**	**0.01**	**99.88**	**99.12**	**4.626**	**0.319**	**0.2973**	**0.0203**	**0.97590**	**0.1128**	**0.0017**	**1678**	**101**	**1754**	**58**	**1846**	**27**		**10.3**
S106A-z1	**10**	*	**652**	**3**	**0**	**99.9**	**99.3**	**5.095**	**0.364**	**0.3213**	**0.0228**	**0.97490**	**0.1150**	**0.0018**	**1796**	**111**	**1835**	**61**	**1880**	**29**		**5.1**
S106A-z1	**11**	*	**567**	**3**	**0.01**	**99.92**	**99.4**	**4.887**	**0.328**	**0.3155**	**0.0210**	**0.96700**	**0.1124**	**0.0019**	**1768**	**103**	**1800**	**57**	**1838**	**31**		**4.4**
S106A-z1	**12**	*	**459**	**3**	**0.01**	**99.92**	**99.44**	**4.790**	**0.292**	**0.3094**	**0.0186**	**0.95310**	**0.1123**	**0.0021**	**1738**	**92**	**1783**	**51**	**1837**	**34**		**6.2**
S106A-z1	**13**	*	**415**	**3**	**0.01**	**99.97**	**99.76**	**5.164**	**0.327**	**0.3266**	**0.0204**	**0.95380**	**0.1147**	**0.0022**	**1822**	**99**	**1847**	**54**	**1875**	**35**		**3.3**
S106A-z1	**14**	*	**367**	**2**	**0.01**	**100**	**100**	**4.904**	**0.298**	**0.3155**	**0.0189**	**0.94530**	**0.1128**	**0.0023**	**1767**	**93**	**1803**	**51**	**1844**	**36**		**4.7**
S106A-z1	**15**	*	**330**	**2**	**0.01**	**99.96**	**99.74**	**5.181**	**0.317**	**0.3310**	**0.0199**	**0.93960**	**0.1135**	**0.0024**	**1843**	**96**	**1849**	**52**	**1857**	**38**		**0.9**
S106A-z1	**16**	*	**297**	**6**	**0.02**	**99.86**	**99.01**	**4.791**	**0.267**	**0.3060**	**0.0166**	**0.91670**	**0.1136**	**0.0026**	**1721**	**82**	**1783**	**47**	**1857**	**41**		**8.3**
S106A-z1	**17**	*	**296**	**5**	**0.02**	**99.82**	**98.73**	**5.333**	**0.323**	**0.3345**	**0.0198**	**0.92790**	**0.1156**	**0.0026**	**1860**	**95**	**1874**	**52**	**1890**	**41**		**1.8**
S106A-z1	18		294	9	0.03	99.88	99.16	5.255	0.310	0.3230	0.0186	0.92740	0.1180	0.0026	1804	91	1862	50	1926	40		7.2
S106A-z1	19		302	14	0.05	100	100	5.422	0.316	0.3176	0.0182	0.93340	0.1238	0.0026	1778	89	1888	50	2012	37		13.3
S106A-z1	20		322	20	0.06	100	100	5.525	0.312	0.3205	0.0178	0.93160	0.1250	0.0026	1792	87	1904	49	2029	37		13.3
S106A-z1	21		370	29	0.08	100	100	5.793	0.342	0.3270	0.0191	0.94490	0.1285	0.0025	1824	93	1945	51	2077	34		14.0
S106A-z1	22		443	47	0.11	99.97	99.82	6.094	0.387	0.3225	0.0203	0.96030	0.1370	0.0024	1802	99	1989	55	2190	31		20.3
S106A-z1	23		460	78	0.17	99.93	99.59	6.620	0.425	0.3406	0.0217	0.96300	0.1410	0.0025	1890	104	2062	57	2239	30		18.0
S106A-z1	24		491	98	0.2	99.95	99.72	8.020	0.545	0.3750	0.0253	0.96990	0.1551	0.0026	2053	119	2233	61	2403	28		17.0
S106A-z1	25		484	137	0.28	99.94	99.68	7.917	0.490	0.3545	0.0218	0.96470	0.1620	0.0027	1956	104	2222	56	2476	28		24.3
S106A-z1	26		512	154	0.3	99.96	99.82	8.992	0.613	0.3911	0.0265	0.97300	0.1667	0.0026	2128	123	2337	62	2525	27		18.4
S106A-z1	27		494	149	0.3	99.94	99.72	8.957	0.574	0.3826	0.0244	0.96860	0.1698	0.0027	2088	114	2334	59	2555	27		21.3
S106A-z1	28		467	152	0.33	99.9	99.49	8.950	0.543	0.3849	0.0232	0.96290	0.1687	0.0028	2099	108	2333	55	2544	28		20.4
S106A-z1	29		475	150	0.32	99.92	99.61	8.965	0.541	0.3763	0.0226	0.96320	0.1728	0.0028	2059	106	2334	55	2585	27		23.7
S106A-z1	30		460	147	0.32	99.97	99.84	9.372	0.570	0.3865	0.0234	0.96400	0.1759	0.0029	2107	109	2375	56	2614	27		22.7
S106A-z1	31		435	160	0.37	99.97	99.84	9.576	0.563	0.3903	0.0228	0.96030	0.1780	0.0029	2124	106	2395	54	2634	27		22.7
S106A-z1	32		418	153	0.37	99.98	99.89	9.878	0.581	0.4053	0.0237	0.95910	0.1768	0.0030	2193	109	2423	54	2623	28		19.3
S106A-z1	33		429	156	0.36	100	100	10.310	0.623	0.4146	0.0250	0.96200	0.1803	0.0030	2236	114	2463	56	2655	28		18.6
S106A-z1	34		416	157	0.38	100	100	9.831	0.546	0.3949	0.0218	0.95330	0.1805	0.0031	2146	101	2419	51	2658	28		22.6
S106A-z1	35		423	164	0.39	99.99	99.95	10.330	0.603	0.4068	0.0236	0.95880	0.1843	0.0031	2200	108	2465	54	2692	28		21.6
S106A-z1	36		376	153	0.41	99.97	99.84	9.895	0.517	0.3917	0.0203	0.94400	0.1832	0.0032	2131	94	2425	48	2682	29		24.1
S106A-z1	37		401	151	0.38	99.98	99.9	10.910	0.636	0.4262	0.0247	0.95700	0.1856	0.0032	2289	112	2515	54	2703	28		18.1
S106A-z1	38		374	150	0.4	100	100	10.250	0.535	0.3956	0.0205	0.94330	0.1879	0.0033	2149	95	2457	48	2724	29		24.8
S106A-z1	39		375	155	0.41	99.98	99.9	10.500	0.564	0.4058	0.0217	0.94620	0.1877	0.0033	2195	99	2480	50	2722	29		22.8
S106A-z1	40		366	136	0.37	99.93	99.7	10.830	0.594	0.4145	0.0226	0.94880	0.1894	0.0033	2236	103	2508	51	2737	29		21.6
S106A-z1	41		353	151	0.43	99.95	99.8	10.810	0.573	0.4121	0.0217	0.94340	0.1903	0.0034	2224	99	2507	49	2745	29		22.4
S106A-z1	42		374	157	0.42	99.99	99.95	11.090	0.623	0.4305	0.0240	0.95070	0.1869	0.0033	2308	108	2531	52	2715	29		17.8
S106A-z1	43		351	153	0.44	99.98	99.9	11.020	0.581	0.4176	0.0219	0.94190	0.1913	0.0034	2249	100	2524	49	2754	29		21.6
S106A-z1	44		341	156	0.46	100	100	10.910	0.559	0.4109	0.0209	0.93720	0.1926	0.0035	2219	96	2515	48	2764	30		23.2
S106A-z1	45		359	155	0.43	100	100	11.540	0.641	0.4377	0.0242	0.94820	0.1911	0.0034	2340	108	2567	52	2752	29		17.8
S106A-z1	46		338	140	0.41	99.99	99.95	11.020	0.584	0.4240	0.0223	0.94080	0.1884	0.0034	2279	101	2525	49	2729	30		19.5
S106A-z1	47		339	141	0.42	99.95	99.8	11.130	0.581	0.4179	0.0217	0.93780	0.1932	0.0035	2251	98	2534	49	2770	30		22.2
S106A-z1	48		327	145	0.44	99.95	99.79	11.030	0.562	0.4135	0.0209	0.93330	0.1935	0.0036	2231	95	2526	47	2772	30		23.0
S106A-z1	49		316	133	0.42	99.99	99.95	11.530	0.607	0.4323	0.0226	0.93700	0.1935	0.0036	2316	102	2567	49	2772	31		19.6
Sample S106A, zircon 2: Type 2A																						
S106A-z2	1		2040	103	0.05	99.61	97.14	3.652	0.438	0.2385	0.0285	0.99180	0.1111	0.0017	1379	148	1561	96	1817	28		26.8
S106A-z2	2		2013	74	0.04	99.87	99.01	3.614	0.400	0.2343	0.0258	0.99250	0.1119	0.0015	1357	135	1553	88	1830	25		28.6
S106A-z2	3		2068	69	0.03	99.93	99.47	3.687	0.413	0.2409	0.0269	0.99320	0.1110	0.0014	1391	140	1569	89	1816	24		26.0
S106A-z2	4		2122	59	0.03	100	100	3.686	0.403	0.2397	0.0261	0.99340	0.1115	0.0014	1385	136	1568	87	1824	23		26.7
S106A-z2	5		2144	39	0.02	99.99	99.92	3.842	0.433	0.2443	0.0275	0.99390	0.1141	0.0014	1409	142	1602	91	1865	22		27.2
S106A-z2	6		2045	33	0.02	99.97	99.75	3.762	0.414	0.2413	0.0265	0.99330	0.1131	0.0014	1394	137	1585	88	1849	23		27.3
S106A-z2	7		1948	27	0.01	99.94	99.58	3.643	0.382	0.2353	0.0246	0.99230	0.1123	0.0015	1362	128	1559	83	1836	24		28.6
S106A-z2	8		1883	23	0.01	99.9	99.29	3.635	0.381	0.2364	0.0247	0.99170	0.1115	0.0015	1368	129	1557	84	1824	24		27.7
S106A-z2	9		1746	25	0.01	99.91	99.35	3.757	0.395	0.2415	0.0253	0.99130	0.1128	0.0016	1395	131	1584	84	1845	25		27.1
S106A-z2	10		1552	19	0.01	99.9	99.3	3.688	0.359	0.2371	0.0230	0.98880	0.1128	0.0016	1371	120	1569	78	1846	26		28.5
S106A-z2	11		1401	23	0.02	99.96	99.69	3.946	0.393	0.2475	0.0245	0.98910	0.1157	0.0017	1425	127	1623	81	1890	26		27.4
S106A-z2	12		1208	21	0.02	99.92	99.45	3.724	0.337	0.2336	0.0210	0.98530	0.1156	0.0018	1353	110	1577	72	1890	28		31.4
S106A-z2	13		1136	22	0.02	99.89	99.17	4.182	0.426	0.2678	0.0271	0.98740	0.1132	0.0018	1530	138	1671	83	1852	29		19.5
S106A-z2	14		1092	27	0.02	99.95	99.65	4.017	0.361	0.2495	0.0223	0.98410	0.1168	0.0019	1436	115	1638	73	1907	29		27.5
S106A-z2	15		1063	40	0.04	99.92	99.44	4.035	0.358	0.2504	0.0220	0.98350	0.1169	0.0019	1441	114	1641	72	1909	29		27.3
S106A-z2	16		1114	53	0.05	99.88	99.11	3.889	0.341	0.2474	0.0216	0.98330	0.1140	0.0018	1425	111	1611	71	1864	29		26.2
S106A-z2	17		1193	86	0.07	99.91	99.39	4.048	0.359	0.2495	0.0220	0.98530	0.1177	0.0018	1436	114	1644	72	1921	27		28.1
S106A-z2	18		1399	123	0.09	99.88	99.18	3.932	0.352	0.2438	0.0217	0.98680	0.1170	0.0017	1406	113	1620	73	1911	26		29.4
S106A-z2	19		1721	193	0.11	99.87	99.09	3.947	0.383	0.2408	0.0232	0.99030	0.1189	0.0016	1391	121	1623	79	1939	24		31.4
S106A-z2	20		1843	238	0.13	99.93	99.51	4.264	0.420	0.2481	0.0243	0.99180	0.1247	0.0016	1429	126	1687	81	2024	22		32.7
S106A-z2	21		1827	269	0.15	99.86	99.09	4.885	0.522	0.2858	0.0304	0.99290	0.1240	0.0016	1621	153	1800	90	2014	23		22.1
S106A-z2	22		1747	252	0.14	99.92	99.5	5.299	0.603	0.3037	0.0345	0.99380	0.1265	0.0016	1710	170	1869	97	2050	22		18.9
S106A-z2	23		1615	224	0.14	99.94	99.63	5.123	0.559	0.2937	0.0319	0.99290	0.1265	0.0016	1660	159	1840	93	2050	23		21.6
S106A-z2	24		1559	230	0.15	99.91	99.39	5.132	0.555	0.2931	0.0316	0.99240	0.1270	0.0017	1657	158	1841	92	2057	24		22.0
S106A-z2	25		1510	219	0.14	99.95	99.69	5.150	0.533	0.2875	0.0297	0.99180	0.1299	0.0017	1629	149	1844	88	2097	23		25.2
S106A-z2	26		1447	209	0.14	99.99	99.93	5.423	0.563	0.2912	0.0301	0.99180	0.1351	0.0018	1647	150	1888	89	2165	23		27.0
S106A-z2	27		1376	212	0.15	99.94	99.61	5.321	0.537	0.2870	0.0288	0.99060	0.1345	0.0019	1627	145	1872	86	2157	24		27.8
S106A-z2	28		1280	204	0.16	99.9	99.43	5.943	0.636	0.3134	0.0334	0.99110	0.1376	0.0020	1757	164	1968	93	2197	25		22.9
S106A-z2	29		1136	171	0.15	99.97	99.83	5.871	0.590	0.3025	0.0303	0.98970	0.1408	0.0020	1704	150	1957	87	2237	25		27.1
S106A-z2	30		1044	180	0.17	99.97	99.83	6.129	0.618	0.3097	0.0311	0.98910	0.1435	0.0021	1739	153	1994	88	2270	26		26.6
S106A-z2	31		954	150	0.16	99.92	99.54	6.574	0.707	0.3303	0.0354	0.98960	0.1444	0.0022	1840	172	2056	95	2280	27		22.2
S106A-z2	32		885	167	0.19	99.97	99.8	5.977	0.564	0.3029	0.0284	0.98580	0.1431	0.0023	1706	141	1972	82	2265	27		28.0
S106A-z2	33		858	142	0.17	99.98	99.9	6.600	0.658	0.3218	0.0320	0.98670	0.1487	0.0024	1799	156	2059	88	2331	28		26.1
S106A-z2	34		772	141	0.18	99.93	99.6	6.383	0.577	0.3074	0.0277	0.98240	0.1506	0.0026	1728	136	2030	79	2352	29		30.2
S106A-z2	35		745	141	0.19	99.9	99.48	6.676	0.626	0.3181	0.0297	0.98280	0.1522	0.0026	1780	145	2069	83	2371	30		28.4
S106A-z2	36		720	139	0.19	99.86	99.26	6.740	0.636	0.3175	0.0298	0.98200	0.1540	0.0027	1777	146	2078	83	2390	30		29.2
S106A-z2	37		692	132	0.19	99.79	98.89	6.570	0.580	0.3078	0.0270	0.97800	0.1548	0.0029	1730	133	2055	78	2399	31		31.7
S106A-z2	38		670	144	0.22	100	100	7.115	0.653	0.3247	0.0297	0.98090	0.1590	0.0028	1812	144	2126	82	2445	30		29.6
S106A-z2	39		635	132	0.21	100	100	6.898	0.598	0.3134	0.0270	0.97760	0.1596	0.0029	1757	133	2098	77	2452	31		32.3

Grain	Mass cycle		U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
Sample S106A, zircon 3: Type 1A																					
S106A-z3	1		1147	64	0.06	99.03	93.02	4.936	0.598	0.3324	0.0398	0.98690	0.1077	0.0021	1850	193	1808	102	1761	36	-5.8
S106A-z3	2		1180	41	0.03	99.53	96.52	5.565	0.774	0.3703	0.0512	0.99260	0.1090	0.0018	2031	241	1911	120	1783	31	-16.2
S106A-z3	**3**	*	**1096**	**26**	**0.02**	**99.71**	**97.89**	**5.231**	**0.643**	**0.3341**	**0.0409**	**0.99190**	**0.1135**	**0.0018**	**1858**	**198**	**1858**	**105**	**1857**	**28**	**-0.1**
S106A-z3	**4**	*	**1176**	**18**	**0.02**	**99.83**	**98.77**	**5.324**	**0.698**	**0.3427**	**0.0448**	**0.99360**	**0.1127**	**0.0017**	**1900**	**215**	**1873**	**112**	**1843**	**27**	**-3.5**
S106A-z3	**5**	*	**1234**	**15**	**0.01**	**99.82**	**98.67**	**4.844**	**0.594**	**0.3196**	**0.0390**	**0.99270**	**0.1099**	**0.0016**	**1788**	**191**	**1793**	**103**	**1798**	**27**	**0.6**
S106A-z3	**6**	*	**1223**	**11**	**0.01**	**99.85**	**98.89**	**4.950**	**0.604**	**0.3183**	**0.0387**	**0.99290**	**0.1128**	**0.0016**	**1781**	**189**	**1811**	**103**	**1845**	**26**	**4.0**
S106A-z3	**7**	*	**1211**	**12**	**0.01**	**99.87**	**99.04**	**5.196**	**0.680**	**0.3384**	**0.0441**	**0.99380**	**0.1114**	**0.0016**	**1879**	**213**	**1852**	**111**	**1822**	**26**	**-3.6**
S106A-z3	**8**	*	**1214**	**12**	**0.01**	**99.92**	**99.43**	**5.313**	**0.700**	**0.3416**	**0.0449**	**0.99410**	**0.1128**	**0.0016**	**1894**	**216**	**1871**	**113**	**1845**	**26**	**-3.1**
S106A-z3	**9**	*	**1187**	**8**	**0.01**	**99.92**	**99.42**	**5.459**	**0.739**	**0.3519**	**0.0475**	**0.99440**	**0.1125**	**0.0016**	**1943**	**227**	**1894**	**116**	**1841**	**26**	**-6.4**
S106A-z3	**10**	*	**1142**	**9**	**0.01**	**99.86**	**98.92**	**5.060**	**0.654**	**0.3331**	**0.0429**	**0.99330**	**0.1102**	**0.0016**	**1853**	**208**	**1829**	**110**	**1802**	**27**	**-3.3**
S106A-z3	**11**	*	**1101**	**7**	**0.01**	**99.77**	**98.32**	**5.513**	**0.751**	**0.3517**	**0.0477**	**0.99360**	**0.1137**	**0.0017**	**1943**	**228**	**1903**	**117**	**1859**	**28**	**-5.2**
S106A-z3	**12**	*	**1081**	**9**	**0.01**	**99.85**	**98.9**	**5.356**	**0.688**	**0.3375**	**0.0432**	**0.99300**	**0.1151**	**0.0017**	**1874**	**208**	**1878**	**110**	**1882**	**27**	**0.5**
S106A-z3	**13**	*	**1021**	**7**	**0.01**	**99.84**	**98.8**	**5.453**	**0.730**	**0.3530**	**0.0471**	**0.99310**	**0.1120**	**0.0018**	**1949**	**225**	**1893**	**115**	**1833**	**28**	**-7.3**
S106A-z3	**14**	*	**966**	**6**	**0.01**	**99.95**	**99.66**	**5.387**	**0.695**	**0.3420**	**0.0440**	**0.99290**	**0.1142**	**0.0018**	**1896**	**211**	**1883**	**111**	**1868**	**28**	**-1.7**
S106A-z3	**15**	*	**933**	**8**	**0.01**	**99.95**	**99.65**	**5.764**	**0.800**	**0.3698**	**0.0512**	**0.99360**	**0.1130**	**0.0018**	**2028**	**241**	**1941**	**120**	**1849**	**28**	**-11.3**
S106A-z3	**16**	*	**859**	**9**	**0.01**	**99.97**	**99.76**	**5.492**	**0.707**	**0.3488**	**0.0447**	**0.99230**	**0.1142**	**0.0018**	**1929**	**214**	**1899**	**111**	**1867**	**29**	**-3.8**
S106A-z3	17		810	7	0.01	99.98	99.88	5.564	0.706	0.3457	0.0437	0.99200	0.1167	0.0019	1914	210	1911	109	1907	29	-0.4
S106A-z3	18		765	9	0.01	99.96	99.74	5.188	0.608	0.3272	0.0382	0.98990	0.1150	0.0019	1825	186	1851	100	1880	30	3.4
S106A-z3	19		764	11	0.01	100	100	5.865	0.763	0.3598	0.0467	0.99200	0.1182	0.0019	1981	221	1956	113	1930	29	-3.1
S106A-z3	20		746	13	0.02	100	100	5.749	0.746	0.3609	0.0467	0.99160	0.1155	0.0019	1986	221	1939	112	1888	30	-6.1
S106A-z3	21		695	13	0.02	100	100	5.505	0.623	0.3303	0.0372	0.98870	0.1209	0.0021	1840	181	1901	97	1969	30	7.5
S106A-z3	22		677	17	0.02	100	100	5.736	0.686	0.3488	0.0416	0.98970	0.1193	0.0020	1929	199	1937	103	1945	31	0.9
S106A-z3	23		658	16	0.02	100	100	5.566	0.638	0.3341	0.0381	0.98860	0.1208	0.0021	1858	184	1911	99	1969	31	6.5
S106A-z3	24		641	19	0.03	99.98	99.87	5.772	0.661	0.3381	0.0386	0.98840	0.1238	0.0022	1877	186	1942	99	2012	31	7.7
S106A-z3	25		652	24	0.04	99.94	99.6	5.654	0.626	0.3310	0.0365	0.98720	0.1239	0.0022	1843	177	1924	96	2013	31	9.7
S106A-z3	26		663	28	0.04	99.96	99.73	6.237	0.760	0.3645	0.0443	0.98970	0.1241	0.0022	2004	209	2010	107	2016	31	0.7
S106A-z3	27		639	25	0.04	99.98	99.88	6.077	0.694	0.3499	0.0398	0.98840	0.1260	0.0022	1934	190	1987	100	2042	31	6.1
S106A-z3	28		634	32	0.05	99.94	99.62	6.252	0.736	0.3586	0.0421	0.98890	0.1265	0.0022	1975	200	2012	103	2049	31	4.2
S106A-z3	29		609	33	0.05	99.94	99.62	5.994	0.640	0.3429	0.0364	0.98640	0.1268	0.0022	1901	175	1975	93	2054	31	8.6
S106A-z3	30		631	36	0.06	99.96	99.76	6.482	0.718	0.3488	0.0385	0.98790	0.1348	0.0023	1929	184	2043	97	2161	30	12.4
S106A-z3	31		636	42	0.07	99.98	99.89	6.837	0.810	0.3741	0.0442	0.98960	0.1326	0.0023	2049	207	2090	105	2132	30	4.6
S106A-z3	32		594	44	0.07	99.96	99.76	6.247	0.663	0.3465	0.0366	0.98670	0.1308	0.0023	1918	175	2011	93	2108	30	10.4
S106A-z3	33		584	52	0.09	100	100	6.740	0.731	0.3620	0.0391	0.98770	0.1350	0.0023	1992	185	2078	96	2164	30	9.2
S106A-z3	34		616	42	0.07	99.93	99.57	6.930	0.763	0.3651	0.0400	0.98780	0.1377	0.0024	2006	189	2102	98	2198	30	10.1
S106A-z3	35		590	55	0.09	99.85	99.11	6.947	0.756	0.3676	0.0398	0.98700	0.1370	0.0024	2018	188	2105	97	2190	30	9.1
S106A-z3	36		582	55	0.09	100	100	7.236	0.786	0.3709	0.0401	0.98790	0.1415	0.0024	2033	189	2141	97	2246	29	11.0
S106A-z3	37		600	61	0.1	99.98	99.9	7.483	0.823	0.3846	0.0422	0.98800	0.1411	0.0024	2098	196	2171	98	2241	29	7.5
S106A-z3	38		570	59	0.1	99.95	99.68	6.941	0.691	0.3521	0.0349	0.98510	0.1430	0.0025	1945	166	2104	88	2264	30	16.3
S106A-z3	39		560	61	0.11	99.96	99.79	7.412	0.770	0.3699	0.0383	0.98650	0.1453	0.0025	2029	180	2162	93	2292	29	13.4
S106A-z3	40		544	60	0.11	100	100	7.490	0.762	0.3764	0.0382	0.98600	0.1443	0.0025	2060	179	2172	91	2280	29	11.3
S106A-z3	41		553	67	0.12	99.98	99.9	7.775	0.810	0.3841	0.0399	0.98670	0.1468	0.0025	2095	186	2205	94	2309	29	10.8
S106A-z3	42		527	66	0.12	99.93	99.6	7.175	0.668	0.3570	0.0331	0.98250	0.1457	0.0025	1968	157	2133	83	2297	30	16.6
S106A-z3	43		511	71	0.14	99.93	99.6	7.674	0.749	0.3741	0.0363	0.98410	0.1488	0.0026	2048	170	2194	88	2332	30	14.2
S106A-z3	44		505	78	0.15	99.98	99.91	7.498	0.685	0.3656	0.0332	0.98210	0.1487	0.0026	2009	157	2173	82	2331	30	16.0
S106A-z3	45		495	76	0.15	99.96	99.8	7.485	0.688	0.3650	0.0334	0.98220	0.1487	0.0026	2006	158	2171	82	2332	30	16.3
S106A-z3	46		461	75	0.16	100	100	7.973	0.750	0.3852	0.0361	0.98290	0.1501	0.0026	2101	168	2228	85	2347	30	12.3
S106A-z3	47		477	84	0.18	100	100	7.666	0.687	0.3671	0.0328	0.98130	0.1514	0.0026	2016	154	2193	80	2362	30	17.0
S106A-z3	48		474	90	0.19	100	100	8.319	0.764	0.3838	0.0351	0.98230	0.1572	0.0027	2094	164	2266	83	2426	29	16.0
S106A-z3	49		473	93	0.2	99.98	99.91	8.155	0.716	0.3800	0.0332	0.98000	0.1556	0.0027	2076	155	2248	79	2409	30	16.1
					0.01	99.87	99.01														-3.2
Sample S106A, zircon 4: Type 3A																					
S106A-z4	1		1996	117	0.06	97.45	84.65	4.346	0.467	0.2638	0.0278	0.98220	0.1195	0.0024	1509	142	1702	89	1949	36	25.3
S106A-z4	2		1957	80	0.04	98.28	89.33	4.315	0.462	0.2573	0.0272	0.98700	0.1216	0.0021	1476	140	1696	88	1980	31	28.4
S106A-z4	3		1806	64	0.04	98.65	91.87	4.545	0.461	0.2571	0.0258	0.98830	0.1282	0.0020	1475	132	1739	84	2074	27	32.3
S106A-z4	4		1700	69	0.04	99.07	94.4	5.213	0.562	0.2889	0.0310	0.99150	0.1309	0.0018	1636	155	1855	92	2110	25	25.4
S106A-z4	5		1691	75	0.04	99.33	95.97	5.378	0.577	0.2923	0.0312	0.99240	0.1334	0.0018	1653	156	1881	92	2144	23	25.9
S106A-z4	6		1617	89	0.06	99.31	96.06	5.631	0.589	0.2903	0.0302	0.99220	0.1407	0.0018	1643	151	1921	90	2236	23	30.0
S106A-z4	7		1512	88	0.06	99.23	95.69	5.610	0.580	0.2869	0.0295	0.99150	0.1418	0.0019	1626	148	1918	89	2249	23	31.3
S106A-z4	8		1477	97	0.07	99.38	96.66	6.261	0.693	0.3051	0.0337	0.99290	0.1488	0.0020	1717	166	2013	97	2332	23	30.0
S106A-z4	9		1326	98	0.07	99.18	95.57	5.853	0.588	0.2861	0.0286	0.99000	0.1484	0.0021	1622	143	1954	87	2327	24	34.2
S106A-z4	10		1246	108	0.09	99.39	96.74	6.725	0.750	0.3226	0.0358	0.99240	0.1512	0.0021	1802	175	2076	99	2359	24	27.0
S106A-z4	11		1216	105	0.09	99.28	96.23	6.803	0.769	0.3220	0.0362	0.99200	0.1532	0.0022	1799	177	2086	100	2383	24	28.0
S106A-z4	12		1150	114	0.1	99.28	96.32	6.626	0.701	0.3057	0.0322	0.99040	0.1572	0.0023	1720	159	2063	93	2426	25	33.1
S106A-z4	13		1099	107	0.1	99.22	96.03	6.957	0.781	0.3196	0.0357	0.99110	0.1579	0.0024	1788	174	2106	100	2433	25	30.3
S106A-z4	14		1057	116	0.11	99.35	96.78	6.648	0.687	0.2968	0.0305	0.98990	0.1624	0.0024	1676	152	2066	91	2481	25	36.8
S106A-z4	15		1058	143	0.14	99.23	96.27	6.054	0.575	0.2662	0.0251	0.98740	0.1649	0.0025	1522	128	1984	83	2507	25	44.0
S106A-z4	16		1021	155	0.15	99.24	96.43	6.606	0.646	0.2785	0.0271	0.98810	0.1721	0.0026	1584	137	2060	86	2578	25	43.4
S106A-z4	17		973	160	0.16	99.2	96.3	6.488	0.629	0.2719	0.0262	0.98720	0.1730	0.0027	1551	133	2044	85	2587	26	44.9
S106A-z4	18		930	146	0.16	99.48	97.57	6.865	0.684	0.2863	0.0284	0.98830	0.1739	0.0026	1623	142	2094	88	2595	25	42.2
S106A-z4	19		847	136	0.16	99.53	97.86	7.090	0.684	0.2858	0.0274	0.98690	0.1799	0.0028	1621	137	2123	86	2652	26	43.8
S106A-z4	20		801	131	0.16	99.49	97.76	8.011	0.863	0.3126	0.0335	0.98920	0.1859	0.0029	1753	165	2232	97	2706	26	40.1
S106A-z4	21		745	121	0.16	99.39	97.32	7.807	0.809	0.3074	0.0317	0.98720	0.1842	0.0030	1728	156	2209	93	2691	27	40.7
S106A-z4	22		736	134	0.18	99.47	97.64	8.095	0.873	0.3216	0.0345	0.98810	0.1826	0.0030	1797	168	2242	97	2676	27	37.5
S106A-z4	23		688	118	0.17	99.61	98.25	8.128	0.846	0.3245	0.0336	0.98730	0.1817	0.0030	1811	164	2245	94	2668	27	36.7
S106A-z4	24		670	112	0.17	99.69	98.61	8.153	0.829	0.3254	0.0330	0.98670	0.1817	0.0030	1816	160	2248	92	2668	27	36.5
S106A-z4	25		654	118	0.18	99.31	97.1	8.447	0.835	0.3196	0.0314	0.98440	0.1917	0.0033	1788	153	2280	90	2756	29	40.1
S106A-z4	26		638	123	0.19	99.25	96.75	7.942	0.785	0.3071	0.0302	0.98370	0.1875	0.0033	1727	149	2224	89	2721	29	41.5
S106A-z4	27		617	107	0.17	99.47	97.7	9.051	0.992	0.3526	0.0385	0.98740	0.1862	0.0032	1947	183	2343	100	2709	29	32.5
S106A-z4	28		605	130	0.21	99.68	98.64	8.351	0.804	0.3180	0.0305	0.98420	0.1904	0.0033	1780	149	2270	87	2746	28	40.1

Grain	Mass cycle		U ppm	Th ppm	Th/U ppm	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
Sample S106A, zircon 5: Type 1A																					
S106A-z5	1		1174	38	0.03	98.97	92.55	5.679	0.469	0.3835	0.0311	0.97650	0.1074	0.0019	2093	145	1928	71	1756	33	-22.5
S106A-z5	2		1277	37	0.03	99.27	94.71	6.156	0.613	0.4092	0.0404	0.98690	0.1091	0.0018	2211	185	1998	87	1785	29	-28.2
S106A-z5	3		1309	37	0.03	99.32	95.09	5.446	0.490	0.3619	0.0322	0.98490	0.1091	0.0017	1991	153	1892	77	1785	28	-13.4
S106A-z5	4		1462	34	0.02	99.53	96.54	5.551	0.541	0.3651	0.0354	0.98940	0.1103	0.0016	2006	167	1909	84	1804	26	-13.1
S106A-z5	5		1533	44	0.03	99.49	96.3	5.313	0.494	0.3523	0.0325	0.98870	0.1094	0.0015	1945	155	1871	79	1789	25	-10.1
S106A-z5	6		1555	39	0.03	99.38	95.52	5.459	0.511	0.3604	0.0335	0.98870	0.1099	0.0015	1984	159	1894	80	1797	26	-12.1
S106A-z5	**7**	*	**1572**	**33**	**0.02**	**99.6**	**97.14**	**5.420**	**0.500**	**0.3481**	**0.0319**	**0.99020**	**0.1129**	**0.0015**	**1925**	**153**	**1888**	**79**	**1847**	**23**	**-4.9**
S106A-z5	**8**	*	**1566**	**44**	**0.03**	**99.53**	**96.59**	**5.110**	**0.448**	**0.3319**	**0.0289**	**0.98870**	**0.1117**	**0.0015**	**1848**	**140**	**1838**	**74**	**1827**	**24**	**-1.3**
S106A-z5	**9**	*	**1674**	**42**	**0.02**	**99.51**	**96.44**	**5.203**	**0.473**	**0.3432**	**0.0310**	**0.98960**	**0.1099**	**0.0014**	**1902**	**149**	**1853**	**77**	**1798**	**24**	**-6.7**
S106A-z5	**10**	*	**1678**	**49**	**0.03**	**99.62**	**97.22**	**4.997**	**0.431**	**0.3257**	**0.0279**	**0.98940**	**0.1113**	**0.0014**	**1818**	**136**	**1819**	**73**	**1820**	**23**	**0.1**
S106A-z5	**11**	*	**1731**	**46**	**0.03**	**99.65**	**97.41**	**5.264**	**0.476**	**0.3441**	**0.0310**	**0.99090**	**0.1109**	**0.0014**	**1906**	**148**	**1863**	**77**	**1815**	**22**	**-5.8**
S106A-z5	**12**	*	**1780**	**55**	**0.03**	**99.7**	**97.8**	**5.255**	**0.455**	**0.3404**	**0.0294**	**0.99060**	**0.1120**	**0.0013**	**1889**	**141**	**1862**	**74**	**1832**	**21**	**-3.5**
S106A-z5	**13**	*	**1777**	**51**	**0.03**	**99.65**	**97.53**	**5.515**	**0.493**	**0.3509**	**0.0313**	**0.99130**	**0.1140**	**0.0013**	**1939**	**149**	**1903**	**77**	**1864**	**21**	**-4.7**
S106A-z5	**14**	*	**1743**	**59**	**0.03**	**99.65**	**97.46**	**5.205**	**0.431**	**0.3361**	**0.0277**	**0.98960**	**0.1123**	**0.0013**	**1868**	**134**	**1853**	**71**	**1837**	**22**	**-2.0**
S106A-z5	**15**	*	**1743**	**61**	**0.03**	**99.7**	**97.82**	**5.332**	**0.463**	**0.3475**	**0.0300**	**0.99090**	**0.1113**	**0.0013**	**1922**	**144**	**1874**	**74**	**1820**	**21**	**-6.6**
S106A-z5	**16**	*	**1737**	**80**	**0.05**	**99.64**	**97.45**	**5.378**	**0.467**	**0.3441**	**0.0298**	**0.99080**	**0.1133**	**0.0013**	**1907**	**143**	**1881**	**74**	**1854**	**21**	**-3.3**
S106A-z5	**17**	*	**1780**	**75**	**0.04**	**99.69**	**97.74**	**5.333**	**0.460**	**0.3445**	**0.0296**	**0.99070**	**0.1123**	**0.0013**	**1908**	**142**	**1874**	**74**	**1837**	**21**	**-4.5**
S106A-z5	**18**	*	**1740**	**70**	**0.04**	**99.68**	**97.64**	**5.389**	**0.464**	**0.3502**	**0.0300**	**0.99070**	**0.1116**	**0.0013**	**1935**	**143**	**1883**	**74**	**1826**	**21**	**-6.9**
S106A-z5	**19**	*	**1762**	**83**	**0.05**	**99.65**	**97.48**	**5.482**	**0.469**	**0.3486**	**0.0297**	**0.99070**	**0.1140**	**0.0013**	**1928**	**142**	**1898**	**74**	**1865**	**21**	**-3.9**
S106A-z5	**20**	*	**1777**	**85**	**0.05**	**99.69**	**97.8**	**5.631**	**0.487**	**0.3568**	**0.0307**	**0.99100**	**0.1145**	**0.0013**	**1967**	**146**	**1921**	**75**	**1871**	**21**	**-6.0**
S106A-z5	**21**	*	**1753**	**99**	**0.06**	**99.66**	**97.57**	**5.401**	**0.451**	**0.3434**	**0.0285**	**0.99020**	**0.1141**	**0.0013**	**1903**	**137**	**1885**	**71**	**1865**	**21**	**-2.4**
S106A-z5	**22**	*	**1734**	**107**	**0.06**	**99.64**	**97.38**	**5.514**	**0.473**	**0.3561**	**0.0304**	**0.99060**	**0.1123**	**0.0013**	**1963**	**145**	**1903**	**74**	**1837**	**21**	**-8.0**
S106A-z5	**23**	*	**1642**	**107**	**0.06**	**99.56**	**96.86**	**5.417**	**0.442**	**0.3457**	**0.0280**	**0.98930**	**0.1136**	**0.0014**	**1914**	**134**	**1887**	**70**	**1859**	**21**	**-3.4**
S106A-z5	**24**	*	**1707**	**116**	**0.07**	**99.57**	**96.9**	**5.763**	**0.498**	**0.3701**	**0.0318**	**0.99080**	**0.1129**	**0.0013**	**2030**	**150**	**1941**	**75**	**1847**	**21**	**-11.6**
S106A-z5	**25**	*	**1716**	**123**	**0.07**	**99.61**	**97.16**	**5.490**	**0.444**	**0.3554**	**0.0286**	**0.98960**	**0.1120**	**0.0013**	**1960**	**136**	**1899**	**69**	**1833**	**21**	**-8.0**
S106A-z5	**26**	*	**1752**	**144**	**0.08**	**99.72**	**97.96**	**5.578**	**0.453**	**0.3595**	**0.0291**	**0.99040**	**0.1125**	**0.0013**	**1980**	**138**	**1913**	**70**	**1841**	**20**	**-8.7**
S106A-z5	27		1786	147	0.08	99.76	98.29	5.497	0.432	0.3456	0.0270	0.99030	0.1154	0.0013	1913	130	1900	67	1886	20	-1.7
S106A-z5	28		1712	140	0.08	99.76	98.33	5.979	0.494	0.3716	0.0306	0.99130	0.1167	0.0013	2037	144	1973	72	1906	20	-8.0
S106A-z5	29		1682	161	0.1	99.7	97.88	5.923	0.472	0.3681	0.0292	0.99030	0.1167	0.0013	2020	138	1965	69	1906	20	-7.0
S106A-z5	30		1695	160	0.09	99.64	97.51	6.131	0.490	0.3783	0.0301	0.99000	0.1175	0.0013	2068	141	1995	70	1919	20	-9.1
S106A-z5	31		1712	173	0.1	99.81	98.65	6.061	0.487	0.3760	0.0301	0.99080	0.1169	0.0013	2058	141	1985	70	1910	20	-9.0
S106A-z5	32		1661	172	0.1	99.86	99	5.990	0.470	0.3672	0.0287	0.99060	0.1183	0.0013	2016	135	1974	68	1931	19	-5.1
S106A-z5	33		1706	191	0.11	99.64	97.49	5.697	0.451	0.3571	0.0281	0.98970	0.1157	0.0013	1968	134	1931	68	1891	20	-4.7
S106A-z5	34		1737	202	0.12	99.78	98.45	5.784	0.461	0.3560	0.0282	0.99050	0.1179	0.0013	1963	134	1944	69	1924	20	-2.3
S106A-z5	35		1734	201	0.12	99.79	98.56	5.800	0.460	0.3577	0.0283	0.99060	0.1176	0.0013	1971	134	1946	69	1920	19	-3.1
S106A-z5	36		1746	226	0.13	99.72	98.06	5.793	0.454	0.3618	0.0282	0.99000	0.1161	0.0013	1991	134	1945	68	1898	20	-5.6
S106A-z5	37		1728	215	0.12	99.75	98.31	5.911	0.461	0.3618	0.0281	0.99030	0.1185	0.0013	1991	133	1963	68	1933	19	-3.5
S106A-z5	38		1719	211	0.12	99.74	98.23	5.979	0.459	0.3657	0.0280	0.98990	0.1186	0.0013	2009	132	1973	67	1935	19	-4.5
S106A-z5	39		1738	238	0.14	99.73	98.18	5.973	0.452	0.3630	0.0274	0.98970	0.1193	0.0013	1997	129	1972	66	1946	19	-3.0
S106A-z5	40		1650	224	0.14	99.77	98.4	6.033	0.461	0.3709	0.0282	0.98990	0.1180	0.0013	2034	133	1981	66	1926	19	-6.5
S106A-z5	41		1573	222	0.14	99.82	98.74	6.013	0.453	0.3660	0.0275	0.98980	0.1192	0.0013	2011	130	1978	66	1944	19	-4.0
S106A-z5	42		1650	232	0.14	99.79	98.56	6.012	0.447	0.3620	0.0268	0.98940	0.1204	0.0013	1992	127	1978	65	1963	19	-1.7
S106A-z5	43		1675	240	0.14	99.82	98.81	6.137	0.451	0.3651	0.0267	0.98940	0.1219	0.0013	2006	126	1995	64	1984	19	-1.3
S106A-z5	44		1683	256	0.15	99.78	98.49	6.264	0.473	0.3758	0.0283	0.98970	0.1209	0.0013	2057	132	2013	66	1969	19	-5.2
S106A-z5	45		1723	252	0.15	99.79	98.57	5.919	0.418	0.3568	0.0251	0.98810	0.1203	0.0013	1967	119	1964	61	1961	19	-0.3
S106A-z5	46		1639	255	0.16	99.84	98.95	6.097	0.425	0.3608	0.0251	0.98800	0.1226	0.0013	1986	119	1990	61	1994	19	0.5
S106A-z5	47		1577	268	0.17	99.87	99.11	6.177	0.432	0.3668	0.0256	0.98810	0.1221	0.0013	2014	121	2001	61	1987	19	-1.6
S106A-z5	48		1596	263	0.16	99.92	99.44	6.310	0.443	0.3661	0.0256	0.98840	0.1250	0.0013	2011	121	2020	62	2029	19	1.0
S106A-z5	49		1551	262	0.17	99.9	99.34	6.332	0.436	0.3665	0.0252	0.98770	0.1253	0.0014	2013	119	2023	60	2033	19	1.1
Sample S106A, zircon 6: Type 1A																					
S106A-z6	**1**	*	**1442**	**720**	**0.5**	**97.03**	**80.92**	**5.243**	**0.534**	**0.3541**	**0.0350**	**0.97120**	**0.1074**	**0.0026**	**1954**	**167**	**1860**	**87**	**1755**	**44**	**-13.2**
S106A-z6	**2**	*	**1240**	**375**	**0.3**	**98.25**	**88.02**	**5.268**	**0.546**	**0.3534**	**0.0360**	**0.98060**	**0.1081**	**0.0022**	**1951**	**171**	**1864**	**88**	**1768**	**37**	**-12.0**
S106A-z6	**3**	*	**1235**	**208**	**0.17**	**98.85**	**91.66**	**4.928**	**0.543**	**0.3376**	**0.0367**	**0.98580**	**0.1059**	**0.0020**	**1875**	**177**	**1807**	**93**	**1730**	**34**	**-9.6**
S106A-z6	**4**	*	**1200**	**142**	**0.12**	**99.23**	**94.26**	**4.765**	**0.525**	**0.3278**	**0.0358**	**0.98800**	**0.1054**	**0.0018**	**1828**	**174**	**1779**	**93**	**1722**	**31**	**-7.0**
S106A-z6	**5**	*	**1235**	**94**	**0.08**	**99.57**	**96.79**	**4.646**	**0.499**	**0.3135**	**0.0334**	**0.98990**	**0.1075**	**0.0016**	**1758**	**164**	**1758**	**90**	**1757**	**28**	**-0.1**
S106A-z6	**6**	*	**1302**	**76**	**0.06**	**99.6**	**96.97**	**4.402**	**0.448**	**0.2961**	**0.0299**	**0.98910**	**0.1078**	**0.0016**	**1672**	**149**	**1713**	**84**	**1763**	**27**	**5.9**
S106A-z6	**7**	*	**1328**	**60**	**0.05**	**99.69**	**97.63**	**4.353**	**0.443**	**0.2960**	**0.0300**	**0.99020**	**0.1067**	**0.0015**	**1671**	**149**	**1703**	**84**	**1743**	**26**	**4.7**
S106A-z6	**8**	*	**1374**	**51**	**0.04**	**99.76**	**98.18**	**4.337**	**0.439**	**0.2890**	**0.0291**	**0.99120**	**0.1088**	**0.0015**	**1636**	**146**	**1700**	**83**	**1780**	**24**	**9.1**
S106A-z6	**9**	*	**1468**	**50**	**0.03**	**99.9**	**99.26**	**4.108**	**0.385**	**0.2698**	**0.0252**	**0.99130**	**0.1105**	**0.0014**	**1540**	**128**	**1656**	**77**	**1807**	**22**	**16.6**
S106A-z6	**10**	*	**1569**	**52**	**0.03**	**99.88**	**99.08**	**4.139**	**0.399**	**0.2751**	**0.0264**	**0.99200**	**0.1091**	**0.0013**	**1567**	**134**	**1662**	**79**	**1785**	**22**	**13.8**
S106A-z6	**11**	*	**1548**	**47**	**0.03**	**99.91**	**99.31**	**4.304**	**0.414**	**0.2843**	**0.0273**	**0.99230**	**0.1098**	**0.0013**	**1613**	**137**	**1694**	**79**	**1796**	**22**	**11.5**
S106A-z6	12		1492	53	0.04	99.91	99.34	4.257	0.386	0.2745	0.0248	0.99150	0.1125	0.0013	1564	125	1685	75	1840	21	16.9
S106A-z6	13		1515	62	0.04	99.89	99.23	4.106	0.362	0.2656	0.0233	0.99110	0.1121	0.0013	1518	119	1655	72	1834	21	19.3
S106A-z6	14		1403	51	0.04	99.91	99.35	4.191	0.357	0.2728	0.0232	0.99030	0.1114	0.0013	1555	117	1672	70	1823	22	16.5
S106A-z6	15		1361	44	0.03	99.87	99.01	4.434	0.402	0.2919	0.0263	0.99080	0.1102	0.0014	1651	131	1719	75	1802	22	9.5
S106A-z6	16		1329	54	0.04	99.85	98.88	4.250	0.364	0.2757	0.0235	0.98940	0.1118	0.0014	1569	119	1684	70	1829	23	16.0
S106A-z6	17		1308	72	0.05	99.84	98.87	4.278	0.364	0.2742	0.0232	0.98910	0.1132	0.0014	1562	118	1689	70	1851	23	17.6
S106A-z6	18		1201	48	0.04	99.84	98.87	4.394	0.380	0.2794	0.0240	0.98880	0.1141	0.0015	1588	121	1711	71	1865	23	16.7
S106A-z6	19		1121	44	0.04	99.83	98.75	4.745	0.460	0.3015	0.0291	0.99020	0.1141	0.0015	1699	144	1775	81	1866	24	10.2
S106A-z6	20		963	43	0.04	99.81	98.65	4.779	0.455	0.2995	0.0283	0.98820	0.1157	0.0017	1689	141	1781	80	1892	26	12.2
S106A-z6	21		760	37	0.05	99.85	98.95	5.146	0.500	0.3181	0.0307	0.98680	0.1173	0.0018	1781	150	1844	83	1916	28	8.1
S106A-z6	22		667	35	0.05	99.72	98.06	5.613	0.610	0.3487	0.0376	0.98680	0.1168	0.0021	1928	180	1918	94	1907	32	-1.3
S106A-z6	23		563	29	0.05	99.85	98.95	5.260	0.521	0.3251	0.0320	0.98280	0.1173	0.0021	1814	156	1862	85	1916	33	6.1
S106A-z6	24		488	39	0.08	99.9	99.28	5.819	0.622	0.3534	0.0376	0.98420	0.1194	0.0023	1951	179	1949	93	1947	34	-0.3
S106A-z6	25		441	30	0.07	99.91	99.39	6.067	0.677	0.3645	0.0404	0.98440	0.1207	0.0024	2003	191	1986	97	1967	35	-2.2
S106A-z6	26		410	38	0.09	99.86	99.03	5.595	0.550	0.3313	0.0323	0.97750	0.1225	0.0025	1845	156	1915	85	1993	37	8.6
S106A-z6	27		404	34	0.08	99.82	98.85	6.535	0.748	0.3741	0.0425	0.98290	0.1267	0.0027	2049	199	2051	101	2052	37	0.2
S106A-z6	28		373	34	0.09	99.79	98.59	6.217	0.669	0.3661	0.0390	0.97870	0.1232	0.0027	2011	184	2007	94	2003	39	-0.4
S106A-z6	29		338	32	0.09	99.75	98.39	6.143	0.639	0.3583	0.0369	0.97570	0.1243	0.0028	1974	175	1996	91	2019	41	2.6
S106A-z6	30		324	32	0.1	99.68	97.98	6.398	0.675	0.3598	0.0375	0.97520	0.1290	0.0030	1981	178	2032	93	2084	41	5.7

Grain	Mass	U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)						%Disc.
	cycle	ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	
S106A-z6	31	323	29	0.09	99.94	99.62	7.251	0.867	0.4019	0.0478	0.98280	0.1308	0.0029	2178	220	2143	107	2109	39	-3.9
S106A-z6	32	306	33	0.11	99.82	98.9	7.072	0.805	0.3874	0.0438	0.97920	0.1324	0.0031	2111	203	2121	101	2130	41	1.1
S106A-z6	33	295	34	0.11	99.59	97.47	6.722	0.709	0.3752	0.0390	0.97170	0.1299	0.0032	2054	183	2075	93	2097	44	2.4
S106A-z6	34	317	37	0.12	99.9	99.41	7.570	0.912	0.4163	0.0498	0.98130	0.1319	0.0031	2243	227	2181	108	2124	41	-6.6
S106A-z6	35	281	35	0.12	99.87	99.21	7.045	0.758	0.3831	0.0408	0.97530	0.1334	0.0032	2091	190	2117	96	2143	42	2.9
S106A-z6	36	261	34	0.13	99.8	98.76	7.413	0.847	0.4025	0.0456	0.97660	0.1336	0.0033	2181	209	2163	102	2145	43	-2.0
Sample S106A, zircon 8: Type 3																				
S106A-z8	1	1734	376	0.22	96.57	80.1	3.381	0.251	0.2071	0.0144	0.93740	0.1184	0.0031	1213	77	1500	58	1932	46	40.7
S106A-z8	2	1384	226	0.16	98.66	91.88	4.685	0.387	0.2672	0.0217	0.97610	0.1272	0.0023	1526	110	1765	69	2059	32	29.0
S106A-z8	3	1383	176	0.13	99.01	94.06	5.304	0.489	0.2945	0.0269	0.98450	0.1306	0.0021	1664	134	1869	79	2106	28	23.8
S106A-z8	4	1437	160	0.11	99.47	96.81	5.244	0.469	0.2859	0.0254	0.98740	0.1330	0.0019	1621	127	1860	76	2138	25	27.3
S106A-z8	5	1446	150	0.1	99.67	98.04	5.581	0.519	0.2986	0.0277	0.99020	0.1356	0.0018	1684	137	1913	80	2171	23	25.4
S106A-z8	6	1593	166	0.1	99.63	97.76	5.245	0.463	0.2835	0.0249	0.98950	0.1342	0.0017	1609	125	1860	75	2153	22	28.5
S106A-z8	7	1723	171	0.1	99.8	98.82	5.454	0.487	0.2909	0.0259	0.99120	0.1360	0.0016	1646	129	1893	77	2177	21	27.6
S106A-z8	8	1668	168	0.1	99.9	99.4	5.452	0.473	0.2888	0.0250	0.99110	0.1369	0.0016	1636	125	1893	74	2188	20	28.5
S106A-z8	9	1698	167	0.1	99.95	99.71	5.348	0.450	0.2838	0.0238	0.99090	0.1367	0.0015	1610	120	1877	72	2186	20	29.7
S106A-z8	10	1639	174	0.11	99.94	99.62	5.213	0.413	0.2769	0.0219	0.98970	0.1365	0.0016	1576	111	1855	68	2184	20	31.3
S106A-z8	11	1591	170	0.11	99.92	99.52	4.963	0.369	0.2661	0.0197	0.98820	0.1353	0.0015	1521	100	1813	63	2168	20	33.5
S106A-z8	12	1596	170	0.11	99.96	99.77	5.076	0.370	0.2667	0.0194	0.98810	0.1380	0.0016	1524	99	1832	62	2203	20	34.5
S106A-z8	13	1611	179	0.11	99.98	99.91	4.975	0.352	0.2648	0.0187	0.98750	0.1363	0.0015	1514	95	1815	60	2180	19	34.2
S106A-z8	14	1581	170	0.11	99.96	99.78	4.956	0.338	0.2612	0.0178	0.98640	0.1376	0.0015	1496	91	1812	58	2197	20	35.7
S106A-z8	15	1506	166	0.11	99.9	99.38	4.952	0.328	0.2613	0.0172	0.98490	0.1374	0.0016	1496	88	1811	56	2195	20	35.6
S106A-z8	16	1498	165	0.11	99.9	99.42	4.946	0.323	0.2628	0.0171	0.98440	0.1365	0.0016	1504	87	1810	55	2183	20	34.8
S106A-z8	17	1421	160	0.11	99.9	99.4	5.173	0.336	0.2735	0.0177	0.98440	0.1372	0.0016	1559	90	1848	55	2192	20	32.5
S106A-z8	18	1323	144	0.11	99.89	99.34	5.003	0.317	0.2672	0.0169	0.98300	0.1358	0.0016	1526	86	1820	54	2174	20	33.4
S106A-z8	19	1333	159	0.12	99.87	99.19	5.015	0.316	0.2671	0.0167	0.98240	0.1362	0.0016	1526	85	1822	53	2179	21	33.6
S106A-z8	20	1332	156	0.12	99.91	99.46	5.029	0.312	0.2680	0.0165	0.98190	0.1361	0.0016	1531	84	1824	53	2178	20	33.3
S106A-z8	21	1351	169	0.13	99.9	99.43	5.114	0.312	0.2658	0.0161	0.98110	0.1395	0.0016	1520	82	1838	52	2221	20	35.4
S106A-z8	22	1299	172	0.13	99.87	99.2	5.074	0.307	0.2661	0.0160	0.98030	0.1383	0.0017	1521	82	1832	51	2206	21	34.8
S106A-z8	23	1242	162	0.13	99.85	99.09	5.063	0.299	0.2653	0.0155	0.97850	0.1384	0.0017	1517	79	1830	50	2207	21	35.0
S106A-z8	24	1197	159	0.13	99.87	99.25	5.204	0.302	0.2638	0.0152	0.97770	0.1431	0.0017	1509	78	1853	49	2265	21	37.3
S106A-z8	25	1152	174	0.15	99.8	98.85	4.961	0.279	0.2567	0.0143	0.97510	0.1402	0.0018	1473	73	1813	47	2229	22	37.8
S106A-z8	26	1131	155	0.14	99.87	99.24	5.070	0.290	0.2603	0.0148	0.97610	0.1413	0.0018	1491	76	1831	49	2243	22	37.5
S106A-z8	27	1126	155	0.14	99.93	99.58	5.222	0.300	0.2627	0.0150	0.97630	0.1442	0.0018	1504	77	1856	49	2278	22	38.0
S106A-z8	28	1084	156	0.14	99.86	99.22	5.154	0.291	0.2608	0.0146	0.97400	0.1433	0.0018	1494	75	1845	48	2268	22	38.2
S106A-z8	29	1057	148	0.14	99.88	99.3	5.284	0.307	0.2656	0.0153	0.97510	0.1443	0.0019	1518	78	1866	50	2279	22	37.4
S106A-z8	30	999	155	0.15	99.93	99.59	5.210	0.292	0.2629	0.0146	0.97230	0.1437	0.0019	1505	75	1854	48	2273	23	37.8
S106A-z8	31	973	157	0.16	99.89	99.37	5.205	0.287	0.2571	0.0141	0.96990	0.1468	0.0020	1475	72	1853	47	2309	23	40.3
S106A-z8	32	925	156	0.17	99.82	99.03	5.291	0.291	0.2575	0.0140	0.96740	0.1490	0.0021	1477	72	1867	47	2334	24	41.0
S106A-z8	33	880	159	0.18	99.66	98.14	5.663	0.337	0.2769	0.0163	0.96950	0.1483	0.0022	1576	82	1926	51	2327	25	36.3
S106A-z8	34	830	152	0.18	99.6	97.81	5.407	0.307	0.2624	0.0147	0.96420	0.1495	0.0023	1502	75	1886	49	2340	26	40.1
S106A-z8	35	822	148	0.18	99.65	98.14	5.790	0.352	0.2744	0.0165	0.96900	0.1531	0.0023	1563	84	1945	53	2381	26	38.6
S106A-z8	36	763	151	0.2	99.7	98.39	5.806	0.346	0.2744	0.0162	0.96680	0.1535	0.0024	1563	82	1947	52	2385	26	38.7
S106A-z8	37	768	146	0.19	99.68	98.31	5.814	0.353	0.2737	0.0164	0.96770	0.1541	0.0024	1560	83	1949	53	2392	26	39.1
S106A-z8	38	737	160	0.22	99.63	98.06	6.038	0.370	0.2800	0.0169	0.96710	0.1564	0.0024	1591	85	1981	53	2417	27	38.4
S106A-z8	39	712	149	0.21	99.68	98.37	5.969	0.348	0.2710	0.0156	0.96340	0.1597	0.0025	1546	79	1971	51	2453	27	41.5
Sample S106A, zircon 10: Type 1B																				
S106A-z10	1	1398	118	0.08	99.27	94.74	5.065	0.525	0.3354	0.0345	0.99100	0.1095	0.0015	1865	167	1830	88	1791	25	-4.8
S106A-z10	**2 ***	**1484**	**83**	**0.06**	**99.67**	**97.61**	**4.962**	**0.465**	**0.3185**	**0.0297**	**0.99220**	**0.1130**	**0.0013**	**1782**	**145**	**1813**	**79**	**1848**	**21**	**4.1**
S106A-z10	**3 ***	**1616**	**77**	**0.05**	**99.7**	**97.81**	**4.840**	**0.441**	**0.3152**	**0.0286**	**0.99240**	**0.1114**	**0.0013**	**1766**	**140**	**1792**	**77**	**1822**	**20**	**3.5**
S106A-z10	**4 ***	**1686**	**58**	**0.03**	**99.74**	**98.11**	**5.026**	**0.474**	**0.3239**	**0.0304**	**0.99350**	**0.1125**	**0.0012**	**1809**	**148**	**1824**	**80**	**1841**	**19**	**2.0**
S106A-z10	**5 ***	**1637**	**46**	**0.03**	**99.86**	**98.96**	**4.867**	**0.425**	**0.3127**	**0.0272**	**0.99330**	**0.1129**	**0.0011**	**1754**	**134**	**1797**	**74**	**1847**	**18**	**5.8**
S106A-z10	**6 ***	**1596**	**39**	**0.02**	**99.94**	**99.54**	**4.809**	**0.407**	**0.3114**	**0.0263**	**0.99340**	**0.1120**	**0.0011**	**1747**	**129**	**1786**	**71**	**1832**	**18**	**5.2**
S106A-z10	**7 ***	**1636**	**30**	**0.02**	**99.93**	**99.49**	**5.043**	**0.440**	**0.3182**	**0.0277**	**0.99400**	**0.1149**	**0.0011**	**1781**	**135**	**1827**	**74**	**1879**	**17**	**6.0**
S106A-z10	**8 ***	**1596**	**25**	**0.02**	**99.92**	**99.39**	**4.919**	**0.410**	**0.3149**	**0.0262**	**0.99340**	**0.1133**	**0.0011**	**1765**	**128**	**1805**	**70**	**1853**	**17**	**5.4**
S106A-z10	**9 ***	**1614**	**25**	**0.02**	**99.94**	**99.54**	**4.913**	**0.412**	**0.3202**	**0.0268**	**0.99370**	**0.1113**	**0.0010**	**1791**	**131**	**1805**	**71**	**1820**	**17**	**1.8**
S106A-z10	**10 ***	**1682**	**21**	**0.01**	**99.96**	**99.72**	**4.882**	**0.399**	**0.3146**	**0.0256**	**0.99350**	**0.1125**	**0.0010**	**1764**	**126**	**1799**	**69**	**1841**	**17**	**4.8**
S106A-z10	**11 ***	**1617**	**17**	**0.01**	**99.98**	**99.83**	**4.689**	**0.360**	**0.3052**	**0.0233**	**0.99270**	**0.1114**	**0.0010**	**1717**	**115**	**1765**	**64**	**1823**	**17**	**6.6**
S106A-z10	**12 ***	**1581**	**15**	**0.01**	**99.97**	**99.8**	**4.897**	**0.372**	**0.3080**	**0.0234**	**0.99260**	**0.1153**	**0.0011**	**1731**	**115**	**1802**	**64**	**1885**	**17**	**9.3**
S106A-z10	**13 ***	**1560**	**17**	**0.01**	**99.95**	**99.63**	**4.723**	**0.350**	**0.3032**	**0.0224**	**0.99210**	**0.1130**	**0.0011**	**1707**	**111**	**1771**	**62**	**1848**	**17**	**8.7**
S106A-z10	**14 ***	**1499**	**13**	**0.01**	**99.96**	**99.73**	**4.706**	**0.338**	**0.3021**	**0.0216**	**0.99160**	**0.1130**	**0.0011**	**1702**	**107**	**1768**	**60**	**1848**	**17**	**9.0**
S106A-z10	**15 ***	**1476**	**13**	**0.01**	**99.96**	**99.74**	**4.590**	**0.314**	**0.2946**	**0.0201**	**0.99070**	**0.1130**	**0.0011**	**1665**	**100**	**1747**	**57**	**1848**	**17**	**11.3**
S106A-z10	**16 ***	**1435**	**14**	**0.01**	**99.96**	**99.71**	**4.695**	**0.317**	**0.2980**	**0.0200**	**0.99040**	**0.1143**	**0.0011**	**1681**	**100**	**1766**	**56**	**1869**	**17**	**11.4**
S106A-z10	**17 ***	**1428**	**13**	**0.01**	**99.99**	**99.9**	**4.645**	**0.310**	**0.2946**	**0.0196**	**0.99040**	**0.1144**	**0.0011**	**1664**	**97**	**1757**	**56**	**1870**	**17**	**12.5**
S106A-z10	**18 ***	**1361**	**11**	**0.01**	**99.99**	**99.94**	**4.654**	**0.305**	**0.2963**	**0.0194**	**0.99000**	**0.1139**	**0.0011**	**1673**	**96**	**1759**	**55**	**1863**	**17**	**11.6**
S106A-z10	19	1346	10	0.01	100	99.97	4.427	0.267	0.2827	0.0170	0.98790	0.1136	0.0011	1605	85	1717	50	1857	17	15.3
S106A-z10	**20 ***	**1395**	**10**	**0.01**	**99.99**	**99.94**	**4.568**	**0.283**	**0.2890**	**0.0179**	**0.98870**	**0.1146**	**0.0011**	**1636**	**89**	**1743**	**52**	**1874**	**17**	**14.3**
S106A-z10	**21 ***	**1351**	**9**	**0.01**	**100**	**99.97**	**4.505**	**0.270**	**0.2878**	**0.0172**	**0.98780**	**0.1135**	**0.0011**	**1630**	**86**	**1732**	**50**	**1857**	**17**	**13.8**
S106A-z10	**22 ***	**1325**	**10**	**0.01**	**99.99**	**99.94**	**4.520**	**0.269**	**0.2866**	**0.0170**	**0.98760**	**0.1144**	**0.0011**	**1624**	**85**	**1735**	**49**	**1870**	**17**	**14.8**
S106A-z10	23	1325	9	0.01	100	100	4.401	0.250	0.2805	0.0159	0.98620	0.1138	0.0011	1594	80	1713	47	1861	17	16.2
S106A-z10	**24 ***	**1325**	**8**	**0.01**	**100**	**100**	**4.423**	**0.254**	**0.2852**	**0.0163**	**0.98650**	**0.1125**	**0.0011**	**1617**	**82**	**1717**	**48**	**1840**	**17**	**13.7**
S106A-z10	**25 ***	**1273**	**8**	**0.01**	**100**	**99.97**	**4.480**	**0.256**	**0.2863**	**0.0163**	**0.98620**	**0.1135**	**0.0011**	**1623**	**82**	**1727**	**47**	**1856**	**17**	**14.2**
S106A-z10	26	1272	7	0.01	99.99	99.91	4.479	0.252	0.2845	0.0159	0.98570	0.1142	0.0011	1614	80	1727	47	1867	17	15.3
S106A-z10	27	1250	6	0	99.98	99.88	4.423	0.242	0.2820	0.0153	0.98450	0.1138	0.0011	1601	77	1717	45	1860	17	15.7
S106A-z10	28	1205	5	0	99.98	99.87	4.465	0.246	0.2830	0.0155	0.98480	0.1144	0.0011	1607	78	1724	46	1871	17	16.0
S106A-z10	29	1192	6	0.01	100	100	4.344	0.228	0.2767	0.0145	0.98310	0.1139	0.0011	1575	73	1702	43	1862	17	17.4
S106A-z10	30	1178	7	0.01	100	99.97	4.325	0.223	0.2749	0.0141	0.98210	0.1141	0.0011	1566	71	1698	42	1866	18	18.1
S106A-z10	**31 ***	**1205**	**6**	**0.01**	**99.99**	**99.94**	**4.642**	**0.265**	**0.2966**	**0.0168**	**0.98560**	**0.1135**	**0.0011**	**1674**	**84**	**1757**	**48**	**1857**	**17**	**11.2**
S106A-z10	32	1177	7	0.01	99.99	99.94	4.334	0.224	0.2767	0.0142	0.98210	0.1136	0.0011	1575	72	1700	43	1858	18	17.2
S106A-z10	33	1182	6	0	99.98	99.87	4.398	0.230	0.2783	0.0145	0.98240	0.1146	0.0011	1583	73	1712	43	1873	18	17.4

Grain	Mass cycle		U ppm	Th ppm	Th/U	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
S106A-z10	34		1161	6	0.01	99.99	99.94	4.273	0.219	0.2756	0.0140	0.98140	0.1124	0.0011	1569	71	1688	42	1839	18	16.5
S106A-z10	35		1106	4	0	99.98	99.87	4.328	0.217	0.2740	0.0136	0.98030	0.1145	0.0011	1561	69	1699	41	1873	18	18.7
S106A-z10	36		1108	5	0	100	99.97	4.364	0.221	0.2770	0.0140	0.98090	0.1143	0.0011	1576	70	1706	42	1868	18	17.6
S106A-z10	37		1100	6	0.01	99.98	99.87	4.324	0.218	0.2771	0.0139	0.98050	0.1132	0.0011	1577	70	1698	42	1851	18	16.7
S106A-z10	38		1084	7	0.01	99.98	99.87	4.284	0.210	0.2737	0.0134	0.97920	0.1135	0.0011	1560	68	1690	40	1856	18	17.9
S106A-z10	39		1090	7	0.01	100	100	4.319	0.211	0.2751	0.0134	0.97920	0.1138	0.0011	1567	68	1697	40	1862	18	17.9
S106A-z10	40		1410	6	0	100	99.97	6.156	0.546	0.3890	0.0344	0.99470	0.1148	0.0011	2118	160	1998	77	1876	17	-15.2
S106A-z10	41		1372	5	0	99.99	99.93	6.114	0.541	0.3908	0.0345	0.99450	0.1134	0.0010	2127	160	1992	77	1855	17	-17.2
S106A-z10	42		1361	6	0	99.99	99.91	6.081	0.530	0.3869	0.0336	0.99440	0.1140	0.0011	2108	156	1988	76	1864	17	-15.4
S106A-z10	**43**	*	**1359**	**5**	**0**	**99.96**	**99.74**	**6.012**	**0.513**	**0.3824**	**0.0326**	**0.99400**	**0.1140**	**0.0011**	**2088**	**152**	**1978**	**74**	**1864**	**17**	**-14.1**
S106A-z10	**44**	*	**1368**	**6**	**0**	**99.97**	**99.8**	**5.900**	**0.498**	**0.3786**	**0.0319**	**0.99380**	**0.1130**	**0.0011**	**2070**	**149**	**1961**	**73**	**1849**	**17**	**-13.9**
S106A-z10	45		1368	6	0	99.98	99.84	6.070	0.526	0.3861	0.0334	0.99420	0.1140	0.0011	2105	155	1986	76	1864	17	-15.2
S106A-z10	46		1335	6	0	99.99	99.9	5.956	0.512	0.3849	0.0330	0.99400	0.1122	0.0011	2099	154	1969	75	1836	17	-16.8
S106A-z10	47		1304	6	0	99.99	99.9	6.032	0.508	0.3868	0.0325	0.99370	0.1131	0.0011	2108	151	1980	73	1850	17	-16.4
S106A-z10	**48**	*	**1276**	**7**	**0.01**	**99.99**	**99.93**	**5.846**	**0.475**	**0.3743**	**0.0303**	**0.99310**	**0.1133**	**0.0011**	**2050**	**142**	**1953**	**70**	**1853**	**17**	**-12.4**
S106A-z10	**49**	*	**1236**	**7**	**0.01**	**100**	**100**	**5.853**	**0.476**	**0.3753**	**0.0305**	**0.99310**	**0.1131**	**0.0011**	**2054**	**143**	**1954**	**71**	**1850**	**17**	**-12.9**
S106A-z10	**50**	*	**1238**	**6**	**0**	**99.99**	**99.94**	**6.015**	**0.496**	**0.3803**	**0.0313**	**0.99330**	**0.1147**	**0.0011**	**2078**	**146**	**1978**	**72**	**1875**	**17**	**-12.7**
S106A-z10	**51**	*	**1227**	**6**	**0**	**99.96**	**99.73**	**5.958**	**0.481**	**0.3754**	**0.0302**	**0.99280**	**0.1151**	**0.0011**	**2055**	**142**	**1970**	**70**	**1882**	**17**	**-10.7**
S106A-z10	**52**	*	**1214**	**8**	**0.01**	**99.96**	**99.72**	**5.830**	**0.464**	**0.3728**	**0.0296**	**0.99250**	**0.1134**	**0.0011**	**2043**	**139**	**1951**	**69**	**1855**	**18**	**-11.8**
S106A-z10	**53**	*	**1186**	**6**	**0.01**	**100**	**100**	**5.852**	**0.457**	**0.3707**	**0.0289**	**0.99230**	**0.1145**	**0.0011**	**2033**	**136**	**1954**	**68**	**1872**	**17**	**-10.0**
S106A-z10	**54**	*	**1158**	**7**	**0.01**	**99.99**	**99.9**	**5.791**	**0.442**	**0.3685**	**0.0281**	**0.99180**	**0.1140**	**0.0011**	**2022**	**132**	**1945**	**66**	**1864**	**18**	**-9.9**
S106A-z10	**55**	*	**1165**	**6**	**0**	**99.96**	**99.72**	**5.814**	**0.450**	**0.3732**	**0.0288**	**0.99190**	**0.1130**	**0.0011**	**2045**	**135**	**1949**	**67**	**1848**	**18**	**-12.4**
S106A-z10	**56**	*	**1163**	**7**	**0.01**	**99.97**	**99.79**	**5.670**	**0.423**	**0.3652**	**0.0272**	**0.99110**	**0.1126**	**0.0011**	**2007**	**128**	**1927**	**64**	**1842**	**18**	**-10.4**
S106A-z10	**57**	*	**1165**	**6**	**0.01**	**99.98**	**99.83**	**5.771**	**0.436**	**0.3667**	**0.0277**	**0.99140**	**0.1141**	**0.0011**	**2014**	**130**	**1942**	**65**	**1867**	**18**	**-9.1**
S106A-z10	**58**	*	**1091**	**8**	**0.01**	**99.99**	**99.9**	**5.668**	**0.415**	**0.3632**	**0.0265**	**0.99070**	**0.1132**	**0.0011**	**1998**	**125**	**1927**	**63**	**1851**	**18**	**-9.2**
S106A-z10	59		1100	6	0.01	99.99	99.9	5.742	0.422	0.3639	0.0267	0.99070	0.1145	0.0011	2001	126	1938	64	1871	18	-8.1
Sample S106A, zircon 11: Type 3																					
S106A-z11	1		1428	21	0.01	99.53	96.66	3.889	0.519	0.2490	0.0331	0.99220	0.1133	0.0019	1433	171	1611	108	1853	30	25.2
S106A-z11	2		1273	21	0.02	99.68	97.76	4.501	0.604	0.2840	0.0379	0.99320	0.1149	0.0018	1612	190	1731	111	1879	28	16.1
S106A-z11	3		1127	20	0.02	99.7	97.84	4.470	0.537	0.2836	0.0339	0.99130	0.1143	0.0018	1609	170	1725	100	1869	29	15.7
S106A-z11	4		1080	21	0.02	99.82	98.74	4.769	0.593	0.2992	0.0371	0.99240	0.1156	0.0018	1687	184	1780	104	1890	28	12.2
S106A-z11	5		979	21	0.02	99.91	99.39	4.811	0.532	0.2888	0.0318	0.99080	0.1208	0.0018	1635	159	1787	93	1969	27	19.2
S106A-z11	6		982	28	0.03	99.93	99.49	5.005	0.563	0.2990	0.0335	0.99110	0.1214	0.0018	1686	166	1820	95	1977	27	16.7
S106A-z11	7		918	33	0.04	99.96	99.71	5.069	0.547	0.3013	0.0324	0.99060	0.1220	0.0018	1698	160	1831	92	1986	26	16.5
S106A-z11	8		921	40	0.04	99.95	99.64	5.061	0.517	0.2910	0.0296	0.98990	0.1261	0.0018	1647	148	1830	87	2045	26	22.1
S106A-z11	9		977	56	0.06	99.93	99.57	5.135	0.521	0.2915	0.0294	0.99020	0.1278	0.0018	1649	147	1842	86	2067	25	22.9
S106A-z11	10		996	69	0.07	99.94	99.59	4.920	0.458	0.2837	0.0263	0.98860	0.1258	0.0018	1610	132	1806	79	2040	25	23.8
S106A-z11	11		1035	87	0.08	99.93	99.53	5.247	0.498	0.2948	0.0279	0.98950	0.1291	0.0018	1665	139	1860	81	2086	24	22.9
S106A-z11	12		1001	108	0.11	99.99	99.93	4.966	0.431	0.2772	0.0240	0.98810	0.1299	0.0017	1577	121	1814	73	2097	24	27.9
S106A-z11	13		997	103	0.1	99.97	99.78	5.137	0.455	0.2866	0.0253	0.98870	0.1300	0.0017	1625	127	1842	75	2098	23	25.5
S106A-z11	14		1010	118	0.12	99.97	99.8	5.611	0.505	0.2982	0.0267	0.98920	0.1364	0.0018	1683	133	1918	78	2183	23	26.0
S106A-z11	15		979	133	0.14	99.98	99.86	5.496	0.468	0.2930	0.0249	0.98790	0.1360	0.0018	1656	124	1900	73	2177	23	27.0
S106A-z11	16		952	149	0.16	99.98	99.87	5.619	0.482	0.2999	0.0257	0.98830	0.1359	0.0018	1691	127	1919	74	2176	23	25.3
S106A-z11	17		1001	157	0.16	99.95	99.68	6.018	0.545	0.3135	0.0283	0.98960	0.1392	0.0018	1758	139	1978	79	2217	23	23.6
S106A-z11	18		1014	179	0.18	99.97	99.81	5.912	0.515	0.3080	0.0267	0.98900	0.1392	0.0018	1731	132	1963	76	2217	22	24.9
S106A-z11	19		1034	192	0.19	99.95	99.7	5.939	0.513	0.3067	0.0264	0.98890	0.1404	0.0018	1724	130	1967	75	2233	22	25.9
S106A-z11	20		1031	194	0.19	99.94	99.63	5.952	0.513	0.3105	0.0267	0.98880	0.1390	0.0018	1743	131	1969	75	2215	22	24.3
S106A-z11	21		1016	201	0.2	99.99	99.94	5.994	0.501	0.3065	0.0256	0.98840	0.1418	0.0018	1723	126	1975	73	2250	22	26.6
S106A-z11	22		970	207	0.21	99.96	99.77	5.869	0.473	0.3020	0.0242	0.98730	0.1409	0.0018	1701	120	1957	70	2239	22	27.3
S106A-z11	23		986	206	0.21	99.94	99.66	5.995	0.494	0.3045	0.0250	0.98800	0.1428	0.0018	1714	124	1975	72	2261	22	27.5
S106A-z11	24		976	209	0.21	99.95	99.71	5.964	0.480	0.3047	0.0244	0.98730	0.1420	0.0018	1715	121	1971	70	2251	22	27.1
S106A-z11	25		1011	230	0.23	99.98	99.88	6.042	0.499	0.3124	0.0257	0.98830	0.1403	0.0018	1753	126	1982	72	2230	22	24.4
S106A-z11	26		1024	227	0.22	100	100	6.132	0.511	0.3119	0.0259	0.98910	0.1426	0.0018	1750	127	1995	73	2259	21	25.7
S106A-z11	27		996	224	0.22	99.99	99.95	5.837	0.460	0.3018	0.0237	0.98780	0.1403	0.0017	1700	117	1952	68	2231	21	27.0
S106A-z11	28		1027	244	0.24	99.98	99.89	5.760	0.448	0.2984	0.0231	0.98760	0.1400	0.0017	1684	115	1940	67	2227	21	27.7
S106A-z11	29		1075	264	0.25	99.99	99.95	5.990	0.480	0.3064	0.0245	0.98860	0.1418	0.0017	1723	121	1974	70	2249	21	26.6
Sample S106A, zircon 12: Type 3																					
S106A-z12	1		1350	43	0.03	98.13	88.15	4.851	0.623	0.3003	0.0378	0.98030	0.1172	0.0030	1693	187	1794	108	1914	45	13.2
S106A-z12	2		1183	40	0.03	98.85	92.93	6.206	0.943	0.3560	0.0536	0.98990	0.1264	0.0027	1963	255	2005	133	2049	38	4.9
S106A-z12	3		1113	45	0.04	99.11	94.6	6.000	0.860	0.3351	0.0477	0.98980	0.1299	0.0027	1863	230	1976	125	2096	36	12.8
S106A-z12	4		1079	42	0.04	99.38	96.32	6.663	1.010	0.3594	0.0542	0.99200	0.1344	0.0026	1979	257	2068	134	2157	33	9.6
S106A-z12	5		1052	46	0.04	99.32	96.22	7.368	1.159	0.3698	0.0579	0.99260	0.1445	0.0028	2028	272	2157	141	2282	33	12.9
S106A-z12	6		990	53	0.05	99.32	96.28	7.574	1.192	0.3761	0.0589	0.99250	0.1461	0.0028	2058	276	2182	141	2300	33	12.3
S106A-z12	7		952	53	0.06	99.61	97.95	10.010	1.950	0.4750	0.0923	0.99560	0.1528	0.0028	2506	404	2436	180	2378	31	-6.5
S106A-z12	8		881	56	0.06	99.74	98.65	11.420	2.367	0.5173	0.1070	0.99610	0.1602	0.0029	2688	455	2558	194	2457	31	-11.5
S106A-z12	9		864	61	0.07	99.72	98.63	14.040	3.470	0.6141	0.1517	0.99730	0.1658	0.0030	3086	606	2752	234	2515	31	-28.8
S106A-z12	10		861	67	0.08	99.9	99.52	14.870	3.847	0.6324	0.1635	0.99770	0.1706	0.0030	3159	646	2807	246	2563	29	-29.5
S106A-z12	11		880	64	0.07	99.85	99.27	14.220	3.506	0.6083	0.1498	0.99740	0.1695	0.0030	3063	601	2764	234	2553	30	-25.2
S106A-z12	12		820	78	0.1	99.87	99.38	15.140	3.772	0.6322	0.1574	0.99730	0.1737	0.0032	3158	622	2824	237	2593	30	-27.7
S106A-z12	13		833	74	0.09	99.76	98.9	18.420	5.683	0.7569	0.2334	0.99820	0.1765	0.0033	3633	857	3012	297	2620	31	-51.0
S106A-z12	14		801	82	0.1	99.56	97.87	18.090	5.643	0.7775	0.2423	0.99800	0.1687	0.0033	3708	879	2994	300	2545	33	-60.6
S106A-z12	15		768	80	0.1	99.86	99.34	16.430	4.385	0.6814	0.1818	0.99750	0.1748	0.0033	3350	697	2902	256	2605	31	-36.8
S106A-z12	16		767	96	0.13	99.89	99.47	22.540	8.073	0.9102	0.3259	0.99860	0.1796	0.0034	4172	1100	3207	348	2649	31	-79.1
S106A-z12	17		743	94	0.13	99.85	99.31	18.610	5.383	0.7564	0.2186	0.99770	0.1784	0.0035	3631	802	3022	279	2638	32	-49.6
S106A-z12	18		720	98	0.14	99.91	99.59	19.180	5.434	0.7658	0.2168	0.99760	0.1817	0.0036	3665	791	3051	273	2668	32	-49.4
Sample S106A, zircon 13: Type 1A																					
S106A-z13	**1**	*	**1307**	**20**	**0.02**	**99.15**	**93.99**	**4.428**	**0.531**	**0.2899**	**0.0344**	**0.98790**	**0.1108**	**0.0021**	**1641**	**172**	**1718**	**99**	**1812**	**34**	**10.7**
S106A-z13	**2**	*	**1252**	**13**	**0.01**	**99.5**	**96.41**	**4.657**	**0.579**	**0.3052**	**0.0377**	**0.99060**	**0.1107**	**0.0019**	**1717**	**186**	**1759**	**104**	**1810**	**31**	**5.8**
S106A-z13	**3**	*	**1228**	**21**	**0.02**	**99.78**	**98.38**	**4.775**	**0.583**	**0.3061**	**0.0372**	**0.99190**	**0.1131**	**0.0018**	**1722**	**184**	**1780**	**102**	**1850**	**28**	**7.9**

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
	cycle		ppm	ppm	ppm	^{206}Pb*	^{207}Pb*	$^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.		
S106A-z13	**4**	*	**1216**	**24**	**0.02**	**99.74**	**98.07**	**4.588**	**0.540**	**0.3020**	**0.0354**	**0.99100**	**0.1102**	**0.0017**	**1701**	**175**	**1747**	**98**	**1803**	**29**		**6.4**
S106A-z13	**5**	*	**1217**	**33**	**0.03**	**99.71**	**97.94**	**4.901**	**0.599**	**0.3144**	**0.0382**	**0.99180**	**0.1131**	**0.0018**	**1762**	**188**	**1802**	**103**	**1849**	**28**		**5.3**
S106A-z13	**6**	*	**1195**	**39**	**0.03**	**99.73**	**98.04**	**4.809**	**0.574**	**0.3112**	**0.0370**	**0.99150**	**0.1121**	**0.0017**	**1747**	**182**	**1787**	**100**	**1833**	**28**		**5.4**
S106A-z13	**7**	*	**1197**	**48**	**0.04**	**99.81**	**98.63**	**4.807**	**0.569**	**0.3111**	**0.0367**	**0.99190**	**0.1121**	**0.0017**	**1746**	**180**	**1786**	**99**	**1833**	**27**		**5.4**
S106A-z13	8		1203	51	0.04	99.91	99.35	4.883	0.564	0.3051	0.0351	0.99230	0.1161	0.0017	1717	173	1799	97	1897	26		10.8
S106A-z13	9		1203	75	0.06	99.91	99.36	5.061	0.588	0.3101	0.0359	0.99250	0.1184	0.0017	1741	177	1830	99	1932	25		11.3
S106A-z13	10		1194	86	0.07	99.94	99.57	5.115	0.585	0.3064	0.0349	0.99260	0.1211	0.0017	1723	172	1839	97	1972	25		14.4
S106A-z13	11		1156	86	0.07	99.9	99.31	5.084	0.569	0.3068	0.0342	0.99220	0.1202	0.0017	1725	169	1833	95	1959	25		13.6
S106A-z13	12		1211	94	0.08	99.89	99.25	5.336	0.620	0.3211	0.0372	0.99280	0.1205	0.0017	1795	182	1875	99	1964	25		9.8
S106A-z13	13		1204	118	0.1	99.84	98.93	5.218	0.570	0.3085	0.0336	0.99160	0.1227	0.0017	1733	165	1856	93	1995	25		14.9
S106A-z13	14		1181	122	0.1	99.9	99.35	5.526	0.634	0.3258	0.0373	0.99280	0.1230	0.0017	1818	181	1905	99	2000	24		10.4
S106A-z13	15		1140	132	0.12	99.92	99.46	5.259	0.543	0.3011	0.0310	0.99130	0.1267	0.0017	1697	154	1862	88	2052	24		19.7
S106A-z13	16		1166	144	0.12	99.92	99.46	5.542	0.609	0.3198	0.0350	0.99240	0.1257	0.0017	1789	171	1907	95	2039	24		14.1
S106A-z13	17		1168	139	0.12	99.97	99.78	5.855	0.656	0.3317	0.0371	0.99310	0.1280	0.0017	1847	179	1955	97	2071	23		12.5
S106A-z13	18		1172	166	0.14	99.94	99.64	5.370	0.538	0.3021	0.0301	0.99130	0.1289	0.0017	1702	149	1880	86	2084	23		20.9
S106A-z13	19		1223	177	0.15	99.91	99.43	5.332	0.538	0.3029	0.0305	0.99150	0.1277	0.0017	1706	151	1874	86	2066	23		19.8
S106A-z13	20		1210	201	0.17	99.95	99.66	5.871	0.628	0.3245	0.0346	0.99280	0.1312	0.0017	1812	169	1957	93	2114	23		16.4
S106A-z13	21		1188	199	0.17	99.96	99.68	4.667	0.463	0.3099	0.0307	0.99080	0.1092	0.0015	1740	151	1761	83	1787	25		3.0
S106A-z13	22		1171	209	0.18	99.72	98.25	5.589	0.546	0.3082	0.0300	0.99020	0.1315	0.0018	1732	148	1914	84	2118	24		20.7
S106A-z13	23		1191	209	0.18	99.16	95.19	6.404	0.679	0.3328	0.0350	0.99010	0.1396	0.0021	1852	170	2033	93	2222	26		19.1
S106A-z13	24		1156	211	0.18	98.99	94.52	6.457	0.634	0.3206	0.0313	0.98850	0.1461	0.0022	1793	153	2040	86	2301	26		25.3
S106A-z13	25		1113	205	0.18	99.16	95.48	6.458	0.624	0.3177	0.0305	0.98870	0.1474	0.0021	1778	149	2040	85	2316	25		26.5
S106A-z13	26		1139	232	0.2	99.33	96.12	6.040	0.569	0.3146	0.0294	0.98810	0.1392	0.0020	1763	144	1982	82	2218	25		23.4
S106A-z13	27		1161	220	0.19	99.34	96.33	6.508	0.640	0.3284	0.0321	0.98950	0.1437	0.0020	1831	156	2047	87	2272	24		22.3
S106A-z13	28		1101	211	0.19	99.66	98.03	6.498	0.640	0.3329	0.0327	0.99060	0.1416	0.0019	1852	158	2046	87	2247	23		20.2
S106A-z13	29		1070	232	0.22	99.86	99.18	6.447	0.596	0.3243	0.0299	0.99020	0.1442	0.0019	1811	145	2039	81	2278	22		23.5
S106A-z13	30		1050	224	0.21	100	100	6.222	0.542	0.3111	0.0270	0.98970	0.1451	0.0018	1746	133	2008	76	2289	22		27.0
S106A-z13	31		1088	246	0.23	99.98	99.89	6.391	0.576	0.3188	0.0286	0.99040	0.1454	0.0018	1784	140	2031	79	2292	21		25.3
S106A-z13	32		1092	262	0.24	99.86	99.23	6.194	0.536	0.3104	0.0268	0.98900	0.1447	0.0019	1743	132	2004	76	2284	22		27.0
S106A-z13	33		1072	251	0.23	99.47	97.27	7.190	0.646	0.3318	0.0297	0.98880	0.1572	0.0021	1847	144	2135	80	2425	23		27.3
S106A-z13	34		1083	269	0.25	98.93	94.66	7.557	0.695	0.3439	0.0314	0.98780	0.1594	0.0023	1906	151	2180	82	2449	24		25.6
S106A-z13	35		1052	262	0.25	99.09	94.96	6.450	0.553	0.3269	0.0278	0.98520	0.1431	0.0021	1824	135	2039	75	2265	25		22.3
S106A-z13	36		1007	257	0.26	99.81	98.91	7.215	0.624	0.3710	0.0320	0.98880	0.1410	0.0018	2034	150	2138	77	2240	22		10.7
S106A-z13	37		993	260	0.26	99.98	99.89	7.312	0.644	0.3427	0.0301	0.98980	0.1548	0.0019	1900	145	2150	79	2399	21		24.0
S106A-z13	38		968	265	0.27	99.99	99.95	7.135	0.592	0.3310	0.0274	0.98850	0.1564	0.0020	1843	133	2128	74	2417	21		27.3
S106A-z13	39		959	266	0.28	99.97	99.85	7.301	0.617	0.3376	0.0284	0.98890	0.1568	0.0020	1875	137	2149	75	2422	21		26.0
Sample S106A, zircon 14: Type 3																						
S106A-z14	1		1305	182	0.14	98.48	89.48	5.091	0.587	0.3404	0.0386	0.98090	0.1085	0.0024	1889	186	1835	98	1774	41		-7.4
S106A-z14	2		1289	132	0.1	98.76	91.49	5.168	0.606	0.3353	0.0388	0.98360	0.1118	0.0024	1864	187	1847	100	1829	38		-2.2
S106A-z14	3		1196	82	0.07	99.32	95.2	4.738	0.471	0.3040	0.0298	0.98220	0.1131	0.0021	1711	147	1774	83	1849	34		8.5
S106A-z14	4		1179	78	0.07	99.64	97.42	4.642	0.442	0.2971	0.0281	0.98380	0.1133	0.0019	1677	139	1757	80	1853	31		10.8
S106A-z14	5		1202	70	0.06	99.69	97.87	5.177	0.528	0.3209	0.0325	0.98640	0.1170	0.0020	1794	159	1849	87	1911	30		7.0
S106A-z14	6		1143	59	0.05	99.77	98.43	4.990	0.477	0.3051	0.0289	0.98480	0.1186	0.0020	1717	143	1818	81	1935	30		12.8
S106A-z14	7		1004	59	0.06	99.86	99.06	4.970	0.446	0.3014	0.0268	0.98280	0.1196	0.0020	1698	133	1814	76	1950	30		14.7
S106A-z14	8		1008	56	0.06	99.73	98.18	5.046	0.457	0.3016	0.0271	0.98150	0.1214	0.0021	1699	134	1827	77	1976	31		15.9
S106A-z14	9		984	50	0.05	99.82	98.82	4.970	0.421	0.2901	0.0244	0.97920	0.1242	0.0021	1642	122	1814	72	2018	31		21.1
S106A-z14	10		896	51	0.06	99.7	97.99	4.889	0.404	0.2893	0.0237	0.97550	0.1226	0.0022	1638	118	1800	70	1994	32		20.2
S106A-z14	11		834	51	0.06	99.63	97.55	5.173	0.445	0.3077	0.0261	0.97550	0.1219	0.0023	1729	129	1848	73	1985	34		14.7
S106A-z14	12		769	55	0.07	99.76	98.48	4.970	0.366	0.2807	0.0204	0.96680	0.1284	0.0024	1595	103	1814	62	2076	33		26.1
S106A-z14	13		723	49	0.07	99.81	98.79	5.044	0.367	0.2868	0.0206	0.96470	0.1275	0.0025	1626	103	1827	62	2064	34		24.0
S106A-z14	14		686	55	0.08	99.7	98.1	5.344	0.410	0.3037	0.0230	0.96470	0.1276	0.0026	1709	114	1876	66	2066	36		19.6
S106A-z14	15		549	48	0.09	99.6	97.49	4.705	0.291	0.2640	0.0159	0.93590	0.1293	0.0028	1510	81	1768	52	2088	38		31.0
S106A-z14	16		530	46	0.09	99.65	97.78	4.911	0.322	0.2766	0.0177	0.94230	0.1288	0.0028	1574	89	1804	55	2081	39		27.4
S106A-z14	17		483	43	0.09	99.7	98.1	4.965	0.316	0.2770	0.0172	0.93590	0.1300	0.0029	1576	87	1813	54	2098	40		28.0
S106A-z14	18		468	49	0.11	99.91	99.41	4.853	0.297	0.2702	0.0162	0.93430	0.1303	0.0029	1542	82	1794	52	2101	39		29.9
Sample S106A, zircon 15: Type 1B																						
S106A-z15	1		3155	530	0.17	97.84	85.78	2.464	0.225	0.1620	0.0142	0.96270	0.1103	0.0027	968	79	1262	66	1805	45		49.9
S106A-z15	2		2909	359	0.12	98.48	89.39	2.996	0.309	0.2014	0.0203	0.97800	0.1079	0.0023	1183	109	1406	78	1764	39		36.0
S106A-z15	3		2746	237	0.09	99.04	93.16	3.246	0.354	0.2156	0.0232	0.98540	0.1092	0.0020	1259	123	1468	85	1786	34		32.5
S106A-z15	4		2753	202	0.07	99.48	96.27	3.481	0.407	0.2264	0.0263	0.99040	0.1115	0.0018	1316	138	1523	92	1824	29		30.8
S106A-z15	5		2733	159	0.06	99.36	95.46	3.593	0.428	0.2317	0.0274	0.99040	0.1125	0.0019	1343	143	1548	95	1840	30		29.9
S106A-z15	6		2687	131	0.05	99.44	95.9	3.566	0.424	0.2384	0.0281	0.99070	0.1085	0.0018	1378	146	1542	94	1774	30		24.7
S106A-z15	7		2965	136	0.05	99.52	96.5	3.946	0.511	0.2587	0.0333	0.99290	0.1106	0.0017	1483	171	1623	105	1810	28		20.2
S106A-z15	8		2919	107	0.04	99.61	97.17	3.892	0.485	0.2555	0.0317	0.99290	0.1105	0.0016	1467	163	1612	101	1807	27		21.0
S106A-z15	9		2779	98	0.04	99.6	97.12	4.174	0.540	0.2698	0.0347	0.99350	0.1122	0.0016	1540	176	1669	106	1835	27		18.1
S106A-z15	10		2805	100	0.04	99.58	97.01	4.288	0.551	0.2715	0.0347	0.99350	0.1145	0.0017	1549	176	1691	106	1872	26		19.4
S106A-z15	**11**	*	**2783**	**83**	**0.03**	**99.75**	**98.18**	**4.657**	**0.652**	**0.2969**	**0.0415**	**0.99520**	**0.1137**	**0.0016**	**1676**	**206**	**1760**	**117**	**1860**	**25**		**11.2**
S106A-z15	12		2657	76	0.03	99.83	98.76	4.361	0.556	0.2796	0.0355	0.99450	0.1131	0.0015	1590	179	1705	105	1850	24		15.9
S106A-z15	**13**	*	**2836**	**67**	**0.02**	**99.85**	**98.87**	**4.606**	**0.609**	**0.2965**	**0.0391**	**0.99500**	**0.1126**	**0.0015**	**1674**	**195**	**1750**	**110**	**1843**	**24**		**10.4**
S106A-z15	**14**	*	**2840**	**67**	**0.02**	**99.77**	**98.3**	**4.292**	**0.524**	**0.2770**	**0.0337**	**0.99380**	**0.1124**	**0.0015**	**1576**	**170**	**1692**	**101**	**1838**	**25**		**16.0**
S106A-z15	**15**	*	**2759**	**62**	**0.02**	**99.84**	**98.8**	**5.642**	**0.917**	**0.3639**	**0.0590**	**0.99670**	**0.1125**	**0.0015**	**2000**	**279**	**1923**	**140**	**1840**	**24**		**-10.1**
S106A-z15	**16**	*	**2716**	**65**	**0.02**	**99.83**	**98.72**	**4.549**	**0.592**	**0.2973**	**0.0386**	**0.99480**	**0.1110**	**0.0015**	**1678**	**192**	**1740**	**108**	**1815**	**24**		**8.6**
S106A-z15	**17**	*	**2642**	**46**	**0.02**	**99.85**	**98.88**	**4.492**	**0.562**	**0.2888**	**0.0360**	**0.99450**	**0.1128**	**0.0015**	**1635**	**180**	**1729**	**104**	**1845**	**24**		**12.8**
S106A-z15	**18**	*	**2645**	**52**	**0.02**	**99.94**	**99.53**	**4.574**	**0.571**	**0.2919**	**0.0364**	**0.99490**	**0.1136**	**0.0014**	**1651**	**181**	**1745**	**104**	**1858**	**23**		**12.6**
S106A-z15	**19**	*	**2739**	**62**	**0.02**	**99.91**	**99.38**	**4.778**	**0.636**	**0.3066**	**0.0407**	**0.99540**	**0.1130**	**0.0014**	**1724**	**201**	**1781**	**112**	**1849**	**23**		**7.7**
S106A-z15	**20**	*	**2714**	**55**	**0.02**	**99.85**	**98.92**	**4.516**	**0.550**	**0.2885**	**0.0351**	**0.99430**	**0.1135**	**0.0015**	**1634**	**175**	**1734**	**101**	**1856**	**24**		**13.5**
S106A-z15	**21**	*	**2706**	**51**	**0.02**	**99.85**	**98.89**	**4.638**	**0.587**	**0.2987**	**0.0377**	**0.99460**	**0.1126**	**0.0015**	**1685**	**187**	**1756**	**106**	**1842**	**24**		**9.7**
S106A-z15	**22**	*	**2658**	**56**	**0.02**	**99.95**	**99.61**	**4.645**	**0.576**	**0.2976**	**0.0368**	**0.99480**	**0.1132**	**0.0014**	**1679**	**183**	**1757**	**104**	**1852**	**23**		**10.6**
S106A-z15	**23**	*	**2677**	**48**	**0.02**	**99.93**	**99.46**	**4.616**	**0.573**	**0.2975**	**0.0369**	**0.99480**	**0.1125**	**0.0014**	**1679**	**183**	**1752**	**104**	**1841**	**23**		**10.0**
S106A-z15	**24**	*	**2665**	**52**	**0.02**	**99.86**	**98.97**	**4.548**	**0.552**	**0.2949**	**0.0357**	**0.99410**	**0.1119**	**0.0015**	**1666**	**178**	**1740**	**101**	**1830**	**24**		**10.2**

Grain	Mass		U	Th	Th/U	%	%	Isotopic ratios							Ages (Ma)							%Disc.
								$^{207}Pb/$		$^{206}Pb/$			$^{207}Pb/$		$^{206}Pb/$		$^{207}Pb/$		$^{207}Pb/$			
	cycle		ppm	ppm	ppm	$^{206}Pb^*$	$^{207}Pb^*$	^{235}U	1 s.e.	^{238}U	1 s.e.	Err. Corr.	^{206}Pb	1 s.e.	^{238}U	1 s.e.	^{235}U	1 s.e.	^{206}Pb	1 s.e.		
S106A-z15	**25**	*	**2623**	**47**	**0.02**	**99.9**	**99.28**	**4.547**	**0.550**	**0.2925**	**0.0353**	**0.99420**	**0.1127**	**0.0015**	**1654**	**176**	**1740**	**101**	**1844**	**23**		**11.7**
S106A-z15	**26**	*	**2571**	**51**	**0.02**	**99.93**	**99.51**	**4.462**	**0.515**	**0.2871**	**0.0331**	**0.99380**	**0.1127**	**0.0015**	**1627**	**166**	**1724**	**96**	**1844**	**23**		**13.3**
S106A-z15	27		2595	53	0.02	99.97	99.77	4.482	0.506	0.2851	0.0321	0.99360	0.1140	0.0015	1617	161	1728	94	1865	23		15.1
S106A-z15	**28**	*	**2521**	**56**	**0.02**	**99.93**	**99.51**	**4.492**	**0.508**	**0.2862**	**0.0323**	**0.99340**	**0.1138**	**0.0015**	**1622**	**162**	**1729**	**94**	**1862**	**23**		**14.6**
S106A-z15	**29**	*	**2486**	**50**	**0.02**	**100**	**100**	**4.574**	**0.525**	**0.2917**	**0.0334**	**0.99390**	**0.1137**	**0.0014**	**1650**	**167**	**1745**	**96**	**1860**	**23**		**12.8**
S106A-z15	**30**	*	**2495**	**56**	**0.02**	**99.99**	**99.92**	**4.605**	**0.527**	**0.2907**	**0.0332**	**0.99380**	**0.1149**	**0.0015**	**1645**	**166**	**1750**	**95**	**1878**	**23**		**14.0**
S106A-z15	**31**	*	**2492**	**45**	**0.02**	**99.94**	**99.59**	**4.437**	**0.502**	**0.2866**	**0.0324**	**0.99330**	**0.1123**	**0.0015**	**1624**	**162**	**1719**	**94**	**1837**	**24**		**13.1**
S106A-z15	**32**	*	**2395**	**49**	**0.02**	**99.9**	**99.25**	**4.397**	**0.484**	**0.2849**	**0.0312**	**0.99250**	**0.1119**	**0.0015**	**1616**	**157**	**1712**	**91**	**1831**	**24**		**13.3**
S106A-z15	33		2318	53	0.02	99.92	99.42	4.455	0.478	0.2806	0.0300	0.99220	0.1152	0.0015	1594	151	1723	89	1882	24		17.2
S106A-z15	34		2295	51	0.02	99.98	99.83	4.427	0.462	0.2803	0.0292	0.99200	0.1146	0.0015	1593	147	1717	87	1873	24		16.9
S106A-z15	**35**	*	**2378**	**49**	**0.02**	**100**	**100**	**4.348**	**0.456**	**0.2810**	**0.0294**	**0.99210**	**0.1122**	**0.0015**	**1596**	**148**	**1702**	**87**	**1836**	**24**		**14.7**
S106A-z15	36		2187	50	0.02	99.95	99.67	4.235	0.412	0.2681	0.0260	0.99030	0.1146	0.0015	1531	132	1681	80	1873	24		20.5
S106A-z15	37		2176	54	0.02	99.89	99.21	4.270	0.431	0.2776	0.0279	0.99050	0.1116	0.0016	1579	141	1688	83	1825	25		15.2
S106A-z15	38		2184	48	0.02	99.96	99.74	4.321	0.429	0.2753	0.0272	0.99070	0.1138	0.0015	1568	138	1697	82	1861	24		17.7
S106A-z15	39		2104	52	0.02	99.96	99.74	4.368	0.433	0.2732	0.0270	0.99060	0.1160	0.0016	1557	137	1706	82	1895	24		20.1
Sample S106A, zircon 16: Type 1B																						
S106A-z16	**1**	*	**1151**	**38**	**0.03**	**99.14**	**93.71**	**4.401**	**0.707**	**0.2976**	**0.0473**	**0.98610**	**0.1072**	**0.0029**	**1680**	**235**	**1713**	**133**	**1753**	**49**		**4.8**
S106A-z16	**2**	*	**1129**	**23**	**0.02**	**99.38**	**95.43**	**4.671**	**0.791**	**0.3122**	**0.0524**	**0.98950**	**0.1085**	**0.0027**	**1752**	**258**	**1762**	**142**	**1775**	**45**		**1.5**
S106A-z16	**3**	*	**1088**	**18**	**0.02**	**99.58**	**96.82**	**4.424**	**0.709**	**0.3017**	**0.0480**	**0.98960**	**0.1063**	**0.0024**	**1700**	**238**	**1717**	**133**	**1737**	**42**		**2.4**
S106A-z16	**4**	*	**1105**	**14**	**0.01**	**99.75**	**98.16**	**5.126**	**0.936**	**0.3418**	**0.0621**	**0.99330**	**0.1088**	**0.0023**	**1895**	**299**	**1840**	**155**	**1779**	**38**		**-7.5**
S106A-z16	**5**	*	**1041**	**7**	**0.01**	**99.81**	**98.56**	**4.478**	**0.680**	**0.2968**	**0.0448**	**0.99060**	**0.1094**	**0.0023**	**1675**	**223**	**1727**	**126**	**1790**	**38**		**7.3**
S106A-z16	**6**	*	**1010**	**7**	**0.01**	**99.84**	**98.82**	**4.564**	**0.693**	**0.3039**	**0.0459**	**0.99100**	**0.1089**	**0.0022**	**1711**	**227**	**1743**	**127**	**1781**	**37**		**4.5**
S106A-z16	**7**	*	**976**	**8**	**0.01**	**99.79**	**98.35**	**4.517**	**0.693**	**0.3079**	**0.0470**	**0.99070**	**0.1064**	**0.0022**	**1730**	**232**	**1734**	**128**	**1739**	**38**		**0.6**
S106A-z16	**8**	*	**1030**	**5**	**0.01**	**99.95**	**99.61**	**4.780**	**0.765**	**0.3187**	**0.0508**	**0.99270**	**0.1088**	**0.0021**	**1783**	**248**	**1781**	**134**	**1779**	**35**		**-0.3**
S106A-z16	**9**	*	**998**	**5**	**0.01**	**99.87**	**98.99**	**4.209**	**0.580**	**0.2875**	**0.0394**	**0.98920**	**0.1062**	**0.0021**	**1629**	**197**	**1676**	**113**	**1735**	**37**		**6.9**
S106A-z16	10		1028	5	0.01	99.95	99.58	5.122	0.904	0.3562	0.0627	0.99390	0.1043	0.0020	1964	298	1840	150	1702	36		-17.9
S106A-z16	**11**	*	**1023**	**6**	**0.01**	**100**	**100**	**4.519**	**0.674**	**0.3103**	**0.0461**	**0.99190**	**0.1056**	**0.0020**	**1742**	**227**	**1734**	**124**	**1725**	**35**		**-1.1**
S106A-z16	**12**	*	**1053**	**7**	**0.01**	**99.95**	**99.62**	**4.717**	**0.733**	**0.3185**	**0.0493**	**0.99230**	**0.1074**	**0.0021**	**1783**	**241**	**1770**	**130**	**1756**	**35**		**-1.7**
S106A-z16	**13**	*	**1028**	**7**	**0.01**	**99.9**	**99.21**	**4.689**	**0.719**	**0.3149**	**0.0481**	**0.99180**	**0.1080**	**0.0021**	**1765**	**236**	**1765**	**128**	**1766**	**36**		**0.1**
S106A-z16	**14**	*	**1028**	**6**	**0.01**	**99.98**	**99.81**	**4.861**	**0.779**	**0.3259**	**0.0521**	**0.99300**	**0.1082**	**0.0020**	**1819**	**253**	**1796**	**135**	**1769**	**35**		**-3.2**
S106A-z16	**15**	*	**1029**	**5**	**0.01**	**99.92**	**99.4**	**4.279**	**0.612**	**0.2941**	**0.0418**	**0.99060**	**0.1055**	**0.0021**	**1662**	**208**	**1689**	**118**	**1724**	**36**		**4.1**
S106A-z16	**16**	*	**1055**	**6**	**0.01**	**99.92**	**99.42**	**4.843**	**0.776**	**0.3258**	**0.0520**	**0.99270**	**0.1078**	**0.0021**	**1818**	**253**	**1792**	**135**	**1763**	**35**		**-3.6**
S106A-z16	**17**	*	**1035**	**6**	**0.01**	**99.95**	**99.6**	**4.685**	**0.729**	**0.3180**	**0.0493**	**0.99230**	**0.1068**	**0.0021**	**1780**	**241**	**1765**	**130**	**1746**	**35**		**-2.2**
S106A-z16	**18**	*	**986**	**8**	**0.01**	**99.95**	**99.62**	**4.449**	**0.637**	**0.3012**	**0.0429**	**0.99090**	**0.1071**	**0.0021**	**1697**	**213**	**1721**	**119**	**1751**	**35**		**3.5**
S106A-z16	**19**	*	**970**	**6**	**0.01**	**99.87**	**99.02**	**4.637**	**0.686**	**0.3115**	**0.0459**	**0.99090**	**0.1080**	**0.0022**	**1748**	**226**	**1756**	**124**	**1765**	**36**		**1.1**
S106A-z16	**20**	*	**921**	**6**	**0.01**	**99.9**	**99.22**	**4.493**	**0.642**	**0.3010**	**0.0428**	**0.99040**	**0.1083**	**0.0021**	**1696**	**212**	**1730**	**119**	**1770**	**36**		**4.7**
S106A-z16	**21**	*	**902**	**8**	**0.01**	**99.89**	**99.19**	**4.395**	**0.612**	**0.2988**	**0.0413**	**0.98960**	**0.1067**	**0.0021**	**1685**	**205**	**1711**	**115**	**1744**	**37**		**3.9**
S106A-z16	**22**	*	**935**	**6**	**0.01**	**100**	**100**	**4.708**	**0.689**	**0.3140**	**0.0458**	**0.99150**	**0.1087**	**0.0021**	**1760**	**225**	**1769**	**123**	**1779**	**35**		**1.2**
S106A-z16	**23**	*	**908**	**10**	**0.01**	**99.97**	**99.8**	**4.246**	**0.571**	**0.2912**	**0.0390**	**0.98930**	**0.1058**	**0.0021**	**1647**	**195**	**1683**	**111**	**1728**	**36**		**5.3**
S106A-z16	**24**	*	**870**	**6**	**0.01**	**99.95**	**99.58**	**4.324**	**0.572**	**0.2898**	**0.0381**	**0.98850**	**0.1082**	**0.0022**	**1640**	**190**	**1698**	**109**	**1770**	**36**		**8.3**
S106A-z16	**25**	*	**806**	**6**	**0.01**	**100**	**100**	**4.449**	**0.590**	**0.2963**	**0.0391**	**0.98890**	**0.1089**	**0.0021**	**1673**	**194**	**1721**	**110**	**1781**	**36**		**6.9**
S106A-z16	**26**	*	**790**	**6**	**0.01**	**99.97**	**99.8**	**4.521**	**0.606**	**0.2977**	**0.0397**	**0.98880**	**0.1101**	**0.0022**	**1680**	**197**	**1735**	**111**	**1801**	**36**		**7.6**
S106A-z16	**27**	*	**757**	**6**	**0.01**	**99.94**	**99.56**	**4.557**	**0.611**	**0.3039**	**0.0405**	**0.98810**	**0.1087**	**0.0022**	**1711**	**200**	**1741**	**112**	**1778**	**38**		**4.3**
S106A-z16	28		727	5	0.01	100	100	4.092	0.478	0.2702	0.0314	0.98490	0.1098	0.0022	1542	159	1653	95	1797	37		16.0
S106A-z16	**29**	*	**757**	**5**	**0.01**	**100**	**100**	**4.759**	**0.668**	**0.3165**	**0.0442**	**0.98960**	**0.1090**	**0.0022**	**1773**	**217**	**1778**	**118**	**1784**	**37**		**0.7**
S106A-z16	**30**	*	**726**	**5**	**0.01**	**100**	**100**	**4.748**	**0.638**	**0.3077**	**0.0412**	**0.98860**	**0.1119**	**0.0023**	**1729**	**203**	**1776**	**113**	**1831**	**37**		**6.3**
S106A-z16	**31**	*	**682**	**6**	**0.01**	**99.97**	**99.78**	**4.076**	**0.475**	**0.2777**	**0.0322**	**0.98390**	**0.1064**	**0.0022**	**1580**	**162**	**1649**	**95**	**1739**	**38**		**10.3**
S106A-z16	**32**	*	**698**	**6**	**0.01**	**99.91**	**99.35**	**4.446**	**0.556**	**0.2917**	**0.0362**	**0.98560**	**0.1105**	**0.0023**	**1650**	**181**	**1721**	**104**	**1808**	**39**		**9.9**
S106A-z16	**33**	*	**749**	**7**	**0.01**	**99.91**	**99.32**	**4.494**	**0.604**	**0.3084**	**0.0412**	**0.98740**	**0.1057**	**0.0023**	**1733**	**203**	**1730**	**112**	**1726**	**39**		**-0.5**
S106A-z16	**34**	*	**692**	**10**	**0.01**	**99.89**	**99.12**	**4.530**	**0.587**	**0.3079**	**0.0396**	**0.98600**	**0.1067**	**0.0023**	**1730**	**195**	**1736**	**108**	**1744**	**40**		**0.9**
S106A-z16	**35**	*	**706**	**10**	**0.01**	**99.88**	**99.13**	**4.580**	**0.578**	**0.3055**	**0.0383**	**0.98560**	**0.1087**	**0.0023**	**1718**	**189**	**1746**	**105**	**1778**	**39**		**3.8**
S106A-z16	**36**	*	**791**	**13**	**0.02**	**100**	**100**	**4.415**	**0.557**	**0.2834**	**0.0356**	**0.98780**	**0.1130**	**0.0022**	**1609**	**179**	**1715**	**104**	**1848**	**36**		**14.6**
S106A-z16	**37**	*	**614**	**6**	**0.01**	**100**	**100**	**5.089**	**0.567**	**0.3310**	**0.0366**	**0.98170**	**0.1115**	**0.0024**	**1843**	**177**	**1834**	**94**	**1824**	**39**		**-1.2**
S106A-z16	**38**	*	**646**	**9**	**0.01**	**99.97**	**99.76**	**4.257**	**0.444**	**0.2845**	**0.0294**	**0.97620**	**0.1085**	**0.0025**	**1614**	**147**	**1685**	**86**	**1775**	**41**		**10.3**
S106A-z16	**39**	*	**703**	**9**	**0.01**	**99.94**	**99.51**	**4.914**	**0.633**	**0.3356**	**0.0429**	**0.98470**	**0.1062**	**0.0024**	**1865**	**207**	**1805**	**109**	**1735**	**41**		**-8.7**
S106A-z16	**40**	*	**678**	**8**	**0.01**	**100**	**100**	**4.467**	**0.501**	**0.2980**	**0.0332**	**0.98150**	**0.1087**	**0.0023**	**1681**	**165**	**1725**	**93**	**1778**	**39**		**6.2**
S106A-z16	41		682	12	0.02	100	100	4.756	0.554	0.3067	0.0355	0.98390	0.1125	0.0023	1724	175	1777	98	1840	38		7.2
S106A-z16	42		691	9	0.01	100	100	4.658	0.537	0.3086	0.0354	0.98370	0.1095	0.0023	1734	174	1760	96	1791	38		3.7
S106A-z16	43		702	9	0.01	99.97	99.81	4.816	0.548	0.3070	0.0347	0.98360	0.1138	0.0023	1726	171	1788	96	1861	37		8.3
S106A-z16	44		695	10	0.01	99.95	99.58	4.269	0.449	0.2886	0.0301	0.97990	0.1073	0.0023	1634	151	1687	87	1754	38		7.7
S106A-z16	45		708	11	0.02	99.97	99.81	4.571	0.490	0.2969	0.0316	0.98180	0.1117	0.0023	1676	157	1744	89	1827	37		9.4
S106A-z16	46		707	12	0.02	99.92	99.43	4.706	0.527	0.3017	0.0336	0.98340	0.1131	0.0023	1700	166	1768	94	1850	37		9.2
S106A-z16	47		710	11	0.02	99.95	99.62	4.733	0.530	0.3098	0.0345	0.98380	0.1108	0.0022	1740	170	1773	94	1813	37		4.6
S106A-z16	48		736	14	0.02	100	100	4.535	0.469	0.2905	0.0299	0.98200	0.1132	0.0022	1644	149	1737	86	1852	35		12.7
S106A-z16	49		709	8	0.01	99.93	99.48	4.851	0.542	0.3149	0.0349	0.98390	0.1118	0.0022	1765	171	1794	94	1828	36		4.0
S106A-z16	50		664	10	0.02	99.81	98.57	4.444	0.430	0.2920	0.0279	0.97640	0.1104	0.0023	1651	139	1721	80	1806	38		9.7
S106A-z16	51		777	13	0.02	99.96	99.69	5.858	0.779	0.3768	0.0499	0.99060	0.1128	0.0021	2061	234	1955	115	1844	33		-13.8
S106A-z16	52		757	11	0.01	100	100	5.967	0.793	0.3844	0.0509	0.99090	0.1126	0.0020	2097	237	1971	116	1841	32		-16.3
S106A-z16	53		771	16	0.02	99.92	99.41	5.760	0.744	0.3770	0.0485	0.98970	0.1108	0.0021	2062	227	1940	112	1813	34		-16.1
S106A-z16	54		740	15	0.02	99.84	98.8	5.418	0.628	0.3491	0.0402	0.98650	0.1126	0.0021	1930	192	1888	99	1841	34		-5.6
S106A-z16	55		718	15	0.02	99.96	99.71	5.452	0.631	0.3549	0.0409	0.98760	0.1114	0.0020	1958	195	1893	99	1823	33		-8.6
S106A-z16	56		735	11	0.02	99.9	99.26	5.862	0.736	0.3866	0.0483	0.98910	0.1100	0.0020	2107	224	1956	109	1799	34		-20.1
S106A-z16	57		723	15	0.02	99.94	99.57	5.611	0.643	0.3611	0.0412	0.98740	0.1127	0.0020	1988	195	1918	99	1843	33		-9.1
S106A-z16	58		676	16	0.02	99.92	99.44	5.470	0.588	0.3484	0.0372	0.98530	0.1139	0.0021	1927	178	1896	92	1862	33		-4.0
S106A-z16	59		674	15	0.02	99.92	99.43	5.664	0.630	0.3606	0.0399	0.98640	0.1139	0.0021	1985	189	1926	96	1863	33		-7.6
Sample S106A, zircon 18: Type 1A																						
S106A-z18	**1**	*	**1599**	**37**	**0.02**	**99.66**	**97.54**	**4.938**	**0.584**	**0.3205**	**0.0377**	**0.99200**	**0.1118**	**0.0017**	**1792**	**184**	**1809**	**100**	**1828**	**27**		**2.2**
S106A-z18	**2**	*	**1593**	**27**	**0.02**	**99.87**	**99.03**	**5.217**	**0.637**	**0.3371**	**0.0411**	**0.99380**	**0.1123**	**0.0015**	**1873**	**198**	**1855**	**104**	**1836**	**25**		**-2.3**
S106A-z18	**3**	*	**1674**	**22**	**0.01**	**99.94**	**99.54**	**5.139**	**0.607**	**0.3291**	**0.0388**	**0.99400**	**0.1133**	**0.0015**	**1834**	**188**	**1843**	**100**	**1852**	**23**		**1.1**
S106A-z18	**4**	*	**1800**	**21**	**0.01**	**99.92**	**99.42**	**5.121**	**0.613**	**0.3287**	**0.0392**	**0.99440**	**0.1130**	**0.0014**	**1832**	**190**	**1840**	**102**	**1848**	**23**		**1.0**

Grain	Mass cycle		U ppm	Th ppm	Th/U	% ^{206}Pb*	% ^{207}Pb*	Isotopic ratios $^{207}Pb/^{235}U$	1 s.e.	$^{206}Pb/^{238}U$	1 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	1 s.e.	Ages (Ma) $^{206}Pb/^{238}U$	1 s.e.	$^{207}Pb/^{235}U$	1 s.e.	$^{207}Pb/^{206}Pb$	1 s.e.	%Disc.
S106A-z18	**5**	*	**1823**	**19**	**0.01**	**99.9**	**99.28**	**4.739**	**0.519**	**0.3062**	**0.0334**	**0.99340**	**0.1123**	**0.0014**	**1722**	**165**	**1774**	**92**	**1836**	**23**	**7.1**
S106A-z18	**6**	*	**1888**	**19**	**0.01**	**99.93**	**99.46**	**4.717**	**0.501**	**0.3030**	**0.0321**	**0.99330**	**0.1129**	**0.0014**	**1706**	**159**	**1770**	**89**	**1847**	**22**	**8.7**
S106A-z18	**7**	*	**2024**	**22**	**0.01**	**99.93**	**99.47**	**4.822**	**0.523**	**0.3070**	**0.0332**	**0.99390**	**0.1139**	**0.0014**	**1726**	**164**	**1789**	**91**	**1863**	**22**	**8.4**
S106A-z18	**8**	*	**2008**	**21**	**0.01**	**99.99**	**99.94**	**4.818**	**0.530**	**0.3112**	**0.0342**	**0.99440**	**0.1123**	**0.0013**	**1747**	**168**	**1788**	**92**	**1837**	**21**	**5.6**
S106A-z18	**9**	*	**1974**	**21**	**0.01**	**99.98**	**99.87**	**4.573**	**0.460**	**0.2913**	**0.0292**	**0.99340**	**0.1138**	**0.0013**	**1648**	**146**	**1744**	**84**	**1862**	**21**	**13.0**
S106A-z18	**10**	*	**2088**	**25**	**0.01**	**99.99**	**99.94**	**4.811**	**0.508**	**0.3047**	**0.0321**	**0.99420**	**0.1145**	**0.0013**	**1715**	**159**	**1787**	**89**	**1872**	**21**	**9.6**
S106A-z18	**11**	*	**2026**	**21**	**0.01**	**99.98**	**99.82**	**4.643**	**0.473**	**0.2971**	**0.0302**	**0.99370**	**0.1133**	**0.0013**	**1677**	**150**	**1757**	**85**	**1854**	**21**	**10.9**
S106A-z18	**12**	*	**1938**	**22**	**0.01**	**99.97**	**99.82**	**4.576**	**0.454**	**0.2933**	**0.0290**	**0.99320**	**0.1131**	**0.0013**	**1658**	**145**	**1745**	**83**	**1850**	**21**	**11.7**
S106A-z18	**13**	*	**1964**	**23**	**0.01**	**99.98**	**99.87**	**4.649**	**0.474**	**0.3011**	**0.0306**	**0.99360**	**0.1120**	**0.0013**	**1697**	**152**	**1758**	**85**	**1832**	**21**	**8.4**
S106A-z18	**14**	*	**1928**	**21**	**0.01**	**99.99**	**99.94**	**4.586**	**0.451**	**0.2954**	**0.0290**	**0.99290**	**0.1126**	**0.0013**	**1668**	**144**	**1747**	**82**	**1842**	**21**	**10.7**
S106A-z18	**15**	*	**1881**	**23**	**0.01**	**99.98**	**99.87**	**4.551**	**0.438**	**0.2931**	**0.0281**	**0.99240**	**0.1126**	**0.0013**	**1657**	**140**	**1740**	**80**	**1842**	**21**	**11.4**
S106A-z18	**16**	*	**1841**	**22**	**0.01**	**100**	**100**	**4.667**	**0.462**	**0.2954**	**0.0291**	**0.99290**	**0.1146**	**0.0013**	**1668**	**145**	**1761**	**83**	**1873**	**21**	**12.4**
S106A-z18	**17**	*	**1841**	**22**	**0.01**	**99.98**	**99.87**	**4.673**	**0.470**	**0.3029**	**0.0304**	**0.99280**	**0.1119**	**0.0013**	**1706**	**150**	**1762**	**84**	**1830**	**22**	**7.7**
S106A-z18	**18**	*	**1847**	**24**	**0.01**	**99.96**	**99.72**	**4.548**	**0.441**	**0.2916**	**0.0282**	**0.99190**	**0.1131**	**0.0014**	**1650**	**141**	**1740**	**81**	**1850**	**22**	**12.3**
S106A-z18	**19**	*	**1776**	**21**	**0.01**	**99.99**	**99.93**	**4.647**	**0.451**	**0.2924**	**0.0283**	**0.99200**	**0.1153**	**0.0014**	**1653**	**141**	**1758**	**81**	**1884**	**22**	**13.9**
S106A-z18	**20**	*	**1713**	**20**	**0.01**	**99.98**	**99.86**	**4.568**	**0.445**	**0.2939**	**0.0286**	**0.99180**	**0.1127**	**0.0014**	**1661**	**142**	**1743**	**81**	**1844**	**23**	**11.3**
S106A-z18	**21**	*	**1667**	**15**	**0.01**	**100**	**100**	**4.533**	**0.433**	**0.2924**	**0.0279**	**0.99150**	**0.1124**	**0.0014**	**1654**	**139**	**1737**	**80**	**1839**	**23**	**11.4**
S106A-z18	**22**	*	**1719**	**18**	**0.01**	**100**	**100**	**4.746**	**0.482**	**0.3060**	**0.0310**	**0.99240**	**0.1125**	**0.0014**	**1721**	**153**	**1775**	**85**	**1840**	**23**	**7.4**
S106A-z18	23		1638	17	0.01	100	100	4.396	0.390	0.2766	0.0245	0.98970	0.1153	0.0015	1574	124	1712	73	1884	23	18.5
S106A-z18	**24**	*	**1604**	**17**	**0.01**	**100**	**100**	**4.763**	**0.462**	**0.3019**	**0.0292**	**0.99130**	**0.1144**	**0.0015**	**1701**	**145**	**1778**	**81**	**1871**	**23**	**10.4**
S106A-z18	**25**	*	**1541**	**26**	**0.02**	**100**	**100**	**4.551**	**0.418**	**0.2881**	**0.0264**	**0.99000**	**0.1146**	**0.0015**	**1632**	**132**	**1740**	**77**	**1873**	**23**	**14.5**
S106A-z18	26		1499	20	0.01	100	100	4.573	0.406	0.2850	0.0252	0.98900	0.1164	0.0015	1616	127	1744	74	1901	24	16.9
S106A-z18	**27**	*	**1406**	**22**	**0.02**	**99.99**	**99.92**	**4.573**	**0.407**	**0.2899**	**0.0257**	**0.98870**	**0.1144**	**0.0015**	**1641**	**128**	**1744**	**74**	**1871**	**24**	**13.9**
S106A-z18	28		1363	32	0.02	99.98	99.84	4.864	0.448	0.2960	0.0271	0.98930	0.1192	0.0016	1671	135	1796	77	1944	24	15.9
S106A-z18	29		1309	36	0.03	100	100	4.758	0.417	0.2861	0.0250	0.98810	0.1206	0.0016	1622	125	1777	74	1965	24	19.7
S106A-z18	30		1286	52	0.04	100	100	4.812	0.406	0.2821	0.0237	0.98680	0.1237	0.0017	1602	119	1787	71	2010	24	22.9
S106A-z18	31		1271	71	0.06	100	100	5.430	0.506	0.3130	0.0291	0.98900	0.1258	0.0017	1756	143	1890	80	2040	24	15.9
S106A-z18	32		1182	81	0.07	100	100	5.384	0.454	0.2981	0.0250	0.98600	0.1310	0.0018	1682	124	1882	72	2111	25	23.0
S106A-z18	33		1172	97	0.08	99.99	99.92	5.686	0.499	0.3082	0.0269	0.98680	0.1338	0.0019	1732	133	1929	76	2149	25	22.1
S106A-z18	34		1087	100	0.09	99.97	99.84	5.832	0.494	0.3107	0.0262	0.98520	0.1361	0.0020	1744	129	1951	73	2178	25	22.7
S106A-z18	35		1050	130	0.12	100	100	6.374	0.567	0.3304	0.0293	0.98640	0.1399	0.0020	1840	142	2029	78	2226	25	19.9
S106A-z18	36		1011	128	0.13	100	100	6.798	0.612	0.3420	0.0307	0.98650	0.1442	0.0021	1896	147	2085	80	2278	25	19.3
S106A-z18	37		965	143	0.15	100	100	6.636	0.550	0.3292	0.0272	0.98330	0.1462	0.0022	1834	132	2064	73	2302	26	23.3
S106A-z18	38		852	150	0.18	100	100	6.994	0.541	0.3371	0.0260	0.98040	0.1505	0.0023	1873	125	2111	69	2351	26	23.4
S106A-z18	39		689	117	0.17	99.99	99.94	6.812	0.416	0.3206	0.0194	0.96640	0.1541	0.0024	1793	95	2087	54	2392	27	28.6
Sample S106A, zircon 20: Type 3																					
S106A-z20	1		1759	44	0.03	99.8	98.57	4.189	0.398	0.2677	0.0254	0.99320	0.1135	0.0013	1529	129	1672	78	1856	20	19.8
S106A-z20	2		1831	58	0.03	99.86	99.02	4.364	0.400	0.2700	0.0247	0.99360	0.1173	0.0012	1541	125	1706	76	1915	19	22.0
S106A-z20	3		1857	79	0.04	99.87	99.07	4.452	0.395	0.2753	0.0243	0.99350	0.1173	0.0012	1567	123	1722	73	1916	18	20.5
S106A-z20	4		1915	86	0.05	99.95	99.69	4.594	0.407	0.2784	0.0246	0.99420	0.1197	0.0011	1583	124	1748	74	1952	17	21.3
S106A-z20	5		1874	106	0.06	99.93	99.5	4.291	0.348	0.2632	0.0213	0.99300	0.1183	0.0011	1506	109	1692	67	1930	17	24.6
S106A-z20	6		1931	121	0.06	99.93	99.55	4.583	0.384	0.2763	0.0231	0.99360	0.1203	0.0011	1573	117	1746	70	1961	17	22.3
S106A-z20	7		1855	123	0.07	99.95	99.64	4.708	0.381	0.2794	0.0226	0.99310	0.1222	0.0012	1588	114	1769	68	1989	17	22.7
S106A-z20	8		1843	126	0.07	99.94	99.57	4.620	0.358	0.2707	0.0209	0.99250	0.1238	0.0012	1544	106	1753	65	2012	17	26.1
S106A-z20	9		1783	130	0.07	99.98	99.86	4.727	0.364	0.2734	0.0210	0.99260	0.1254	0.0012	1558	106	1772	64	2034	17	26.3
S106A-z20	10		1742	136	0.08	99.95	99.65	4.822	0.380	0.2787	0.0219	0.99290	0.1255	0.0012	1585	110	1789	66	2036	17	25.0
S106A-z20	11		1777	145	0.08	99.97	99.83	4.879	0.380	0.2772	0.0215	0.99290	0.1276	0.0012	1577	109	1799	66	2066	16	26.6
S106A-z20	12		1665	141	0.08	99.98	99.87	5.211	0.398	0.2906	0.0222	0.99250	0.1301	0.0012	1644	111	1854	65	2099	16	24.5
S106A-z20	13		1600	135	0.08	99.97	99.84	5.476	0.418	0.2971	0.0226	0.99230	0.1337	0.0013	1677	113	1897	66	2147	16	24.8
S106A-z20	14		1490	142	0.1	99.98	99.87	5.615	0.415	0.3037	0.0224	0.99170	0.1341	0.0013	1710	111	1918	64	2152	17	23.4
S106A-z20	15		1464	146	0.1	99.97	99.85	5.832	0.430	0.3079	0.0226	0.99170	0.1374	0.0013	1730	112	1951	64	2194	16	24.0
S106A-z20	16		1530	144	0.09	99.98	99.91	5.864	0.443	0.3095	0.0233	0.99240	0.1374	0.0013	1738	115	1956	66	2195	16	23.7
S106A-z20	17		1570	151	0.1	99.98	99.88	5.938	0.458	0.3089	0.0238	0.99280	0.1394	0.0013	1735	117	1967	67	2220	16	24.9
S106A-z20	18		1502	154	0.1	99.97	99.85	6.040	0.464	0.3132	0.0240	0.99270	0.1399	0.0013	1756	118	1982	67	2226	16	24.1
S106A-z20	19		1471	168	0.11	99.98	99.91	6.272	0.488	0.3213	0.0250	0.99280	0.1416	0.0013	1796	122	2015	68	2247	16	23.0
S106A-z20	20		1426	172	0.12	99.99	99.94	6.268	0.457	0.3160	0.0230	0.99150	0.1439	0.0014	1770	113	2014	64	2274	16	25.3
S106A-z20	21		1351	177	0.13	100	100	6.524	0.473	0.3248	0.0235	0.99110	0.1457	0.0014	1813	114	2049	64	2296	17	24.1
S106A-z20	22		1247	167	0.13	100	100	6.434	0.441	0.3157	0.0216	0.98960	0.1478	0.0015	1769	106	2037	60	2321	17	27.2
S106A-z20	23		1229	167	0.14	100	100	6.658	0.467	0.3224	0.0226	0.99000	0.1498	0.0015	1801	110	2067	62	2344	17	26.5
S106A-z20	24		1199	177	0.15	99.98	99.91	6.704	0.461	0.3270	0.0224	0.98930	0.1487	0.0015	1824	109	2073	61	2331	17	24.9
S106A-z20	25		1183	165	0.14	99.97	99.81	6.960	0.509	0.3442	0.0251	0.99030	0.1467	0.0015	1907	120	2106	65	2307	17	20.0
S106A-z20	26		1141	173	0.15	99.99	99.97	6.981	0.507	0.3403	0.0247	0.99020	0.1488	0.0015	1888	119	2109	65	2332	17	21.9
S106A-z20	27		1080	167	0.15	99.97	99.85	7.116	0.494	0.3369	0.0233	0.98900	0.1532	0.0016	1872	113	2126	62	2382	18	24.6
S106A-z20	28		1013	162	0.16	99.96	99.78	6.962	0.454	0.3308	0.0215	0.98690	0.1527	0.0016	1842	104	2107	58	2376	18	25.8
S106A-z20	29		1026	171	0.17	99.98	99.88	7.510	0.516	0.3462	0.0237	0.98820	0.1573	0.0017	1917	114	2174	62	2427	18	24.3
S106A-z20	30		990	177	0.18	99.97	99.85	7.481	0.489	0.3442	0.0225	0.98650	0.1576	0.0017	1907	108	2171	59	2430	18	24.8
S106A-z20	31		942	172	0.18	99.96	99.79	7.545	0.487	0.3491	0.0225	0.98570	0.1568	0.0017	1930	107	2178	58	2421	19	23.4
S106A-z20	32		911	164	0.18	99.92	99.57	7.595	0.479	0.3445	0.0217	0.98470	0.1599	0.0018	1908	104	2184	57	2454	19	25.6
S106A-z20	33		867	173	0.2	99.94	99.69	7.621	0.468	0.3450	0.0211	0.98330	0.1602	0.0018	1911	101	2187	55	2458	19	25.7
S106A-z20	34		868	158	0.18	99.98	99.87	7.790	0.483	0.3530	0.0218	0.98340	0.1601	0.0018	1949	104	2207	56	2456	19	23.9
S106A-z20	35		855	159	0.19	99.99	99.97	7.822	0.471	0.3452	0.0207	0.98230	0.1643	0.0019	1911	99	2211	54	2501	19	27.2
S106A-z20	36		797	162	0.2	99.98	99.9	8.784	0.587	0.3926	0.0261	0.98520	0.1623	0.0019	2135	121	2316	61	2480	19	16.4
S106A-z20	37		793	160	0.2	99.98	99.9	7.842	0.465	0.3548	0.0210	0.98070	0.1603	0.0019	1957	100	2213	53	2459	20	23.6
S106A-z20	38		830	171	0.21	99.98	99.91	7.031	0.372	0.2989	0.0157	0.97660	0.1706	0.0019	1686	78	2115	47	2564	19	38.8
S106A-z20	39		603	129	0.21	99.99	99.92	8.448	0.464	0.4300	0.0235	0.96840	0.1425	0.0020	2306	106	2280	50	2257	24	-2.6

Notes:

Each SIMS mass cycle (sweep) represents 1 minute of analysis, with an average ionization depth of 0.07 µm on the zircon surface. Mass cycles indicated with an asterisk (*) are included in the calculated zircon rim age. U-Pb isotope ratios and ages are corrected for common Pb using the model of Stacey and Kramers (1975). NaN (not a number) refers to unmeasurable or uncalculable values.

Appendix 4: U-Pb geochronology (LA-ICP-MS) results for polished zircon in six metamorphic rocks from Hall Peninsula, Baffin Island.

Analysis[a]	^{238}U	^{232}Th	^{204}Pb		$^{206}Pb/^{204}Pb$	%Pb*[b]	Isotopic Ratios					
	(ppm)	(ppm)	(cps)	2 s.e.	(cps)		$^{207}Pb/^{206}Pb$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}Pb$	2 s.e.
S36A-1c	1201	667	2	20	105000	97.1	0.1732	0.0020	10.590	0.350	0.4360	0.0120
S36A-1r	1456	8	44	30	5068	98.8	0.1147	0.0015	4.683	0.130	0.2975	0.0070
S36A-4c	239	40	9	17	4389	99.9	0.1470	0.0018	8.930	0.220	0.4375	0.0077
S36A-5c	856	45	-9	18	-17333	98.8	0.1485	0.0031	8.120	0.430	0.3999	0.0120
S36A-6c	1386	54	-6	15	-45683	99.9	0.1465	0.0014	8.530	0.230	0.4266	0.0098
S36A-8c	486	188	12	24	7617	99.4	0.1577	0.0024	9.320	0.310	0.4322	0.0100
S36A-9r	1386	5	-13	34	-18254	100.0	0.1139	0.0043	5.158	0.610	0.3310	0.0180
S36A-9c	262	205	-4	14	-13000	100.0	0.1734	0.0027	12.640	0.370	0.5280	0.0110
S36A-10r	1604	464	-9	12	-37722	100.0	0.1679	0.0014	11.503	0.250	0.5002	0.0079
S36A-10c	1300	69	2	13	123500	99.7	0.1535	0.0013	9.087	0.210	0.4327	0.0068
S36A-11r	507	246	24	26	4733	99.5	0.1680	0.0030	10.700	0.430	0.4641	0.0140
S36A-11c	416	147	-8	12	-11425	100.0	0.1733	0.0017	11.911	0.270	0.5033	0.0079
S36A-12r	1255	436	13	16	24446	100.0	0.1729	0.0077	12.230	1.000	0.5209	0.0150
S36A-12c	873	116	-15	16	-10040	100.0	0.1302	0.0015	6.771	0.160	0.3865	0.0061
S36A-13c	198	100	-2	13	-20850	99.7	0.1731	0.0024	11.410	0.320	0.4852	0.0094
S36A-14r	361	120	-2	12	-30750	99.9	0.1316	0.0017	7.115	0.170	0.3964	0.0065
S36A-14c	672	239	2	11	56750	100.0	0.1289	0.0013	6.901	0.160	0.3919	0.0062
S36A-15r	462	119	9	13	9656	100.0	0.1415	0.0015	8.280	0.180	0.4303	0.0067
S36A-15c	136	88	-6	12	-5017	100.0	0.1626	0.0022	11.060	0.280	0.4986	0.0088
S36A-16r	929	274	6	17	33600	100.0	0.1473	0.0013	9.074	0.210	0.4573	0.0072
S36A-16c	647	194	29	18	4890	100.0	0.1467	0.0350	8.870	9.200	0.4450	0.0880
S36A-17c	1663	107	11	25	36555	100.0	0.1657	0.0021	10.708	0.310	0.4702	0.0110
S36A-19c	902	519	-2	12	-98100	99.9	0.1748	0.0016	11.800	0.290	0.4944	0.0087
S103A-1r	579	238	-1	13	-89900	100.0	0.1173	0.0013	5.844	0.140	0.3613	0.0057
S103A-1c	1283	730	3	12	64700	100.0	0.1176	0.0011	5.557	0.130	0.3453	0.0055
S103A-2r	1994	36	18	18	17733	99.4	0.1130	0.0010	4.822	0.120	0.3112	0.0062
S103A-2c	462	194	8	15	9700	99.7	0.1174	0.0015	5.620	0.150	0.3469	0.0071
S103A-3c	722	262	21	19	5305	99.9	0.1149	0.0052	5.245	0.590	0.3343	0.0110
S103A-5c	3250	982	15	15	33933	98.3	0.1155	0.0009	4.645	0.110	0.2905	0.0057
S103A-7r	534	276	13	13	6185	99.7	0.1172	0.0014	5.474	0.140	0.3367	0.0060
S103A-7c	490	280	2	13	33800	98.9	0.1182	0.0014	5.203	0.120	0.3168	0.0050
S103A-8r	553	138	10	15	9240	100.0	0.1156	0.0013	5.641	0.130	0.3527	0.0059
S103A-8c	569	186	6	25	15967	99.9	0.1169	0.0066	5.570	0.680	0.3446	0.0140
S103A-9r	357	223	7	12	6704	98.8	0.1163	0.0016	5.001	0.140	0.3100	0.0065
S103A-9c	973	487	29	31	6010	100.0	0.1162	0.0011	5.540	0.220	0.3447	0.0110
S103A-10c	1594	500	-12	12	-19592	99.5	0.1151	0.0011	5.229	0.120	0.3263	0.0057
S103A-11c	686	346	2	15	54300	99.9	0.1174	0.0012	5.567	0.130	0.3449	0.0061
S103A-12c	164	59	-6	12	-4373	100.0	0.1150	0.0021	5.640	0.160	0.3546	0.0065
S103A-13c	1886	19	23	14	11261	99.8	0.1124	0.0011	5.185	0.120	0.3314	0.0061
S103A-14r	401	155	-9	13	-6567	99.9	0.1159	0.0015	5.490	0.130	0.3432	0.0057
S103A-14c	326	137	-9	11	-5822	100.0	0.1168	0.0014	5.719	0.150	0.3517	0.0064
S103A-15c	440	255	2	16	36050	99.8	0.1175	0.0014	5.547	0.140	0.3447	0.0063
S103A-16r	876	184	14	33	10593	100.0	0.1154	0.0019	5.249	0.140	0.3330	0.0053
S103A-16c	407	284	12	22	5592	99.9	0.1194	0.0014	5.620	0.140	0.3465	0.0060
S103A-17r	500	267	8	11	10113	99.9	0.1185	0.0014	5.861	0.140	0.3596	0.0062
S103A-17c	471	250	9	19	9222	100.0	0.1177	0.0027	5.664	0.200	0.3522	0.0089
S103A-18c	480	419	111	24	602	96.4	0.1364	0.0041	5.820	0.200	0.3078	0.0130
S103A-19c	549	316	28	14	2771	98.7	0.1189	0.0016	5.087	0.150	0.3116	0.0061
F122A-1c	1472	223	51	22	4314	100.0	0.1268	0.0030	6.430	0.230	0.3705	0.0074
F122A-2c	113	111	14	8	1009	99.3	0.1301	0.0032	6.770	0.180	0.3790	0.0061
F122A-3r	538	442	10	9	6019	99.9	0.1371	0.0026	7.698	0.160	0.4070	0.0060
F122A-3c	357	266	20	8	2168	99.9	0.1387	0.0027	7.741	0.160	0.4061	0.0058
F122A-4r	1458	138	-4	12	-57675	100.0	0.1250	0.0024	6.831	0.150	0.3981	0.0066
F122A-4c	171	69	9	13	1993	99.9	0.1280	0.0026	6.760	0.210	0.3840	0.0092
F122A-6r	748	39	10	12	10890	100.0	0.1251	0.0023	6.624	0.130	0.3837	0.0054
F122A-6c	349	48	-2	7	-20773	100.0	0.1265	0.0026	6.857	0.150	0.3912	0.0057
F122A-7r	2462	197	72	10	3672	97.7	0.1250	0.0023	5.335	0.110	0.3087	0.0047
F122A-7c	1647	224	20	12	13280	100.0	0.1412	0.0026	8.160	0.170	0.4172	0.0062

Analysis[a]	Isotopic Ratios	Ages						% Disc.[c]	^{204}Pb-Corr. Isotopic Ratios[d]	
	Err. Corr.	^{207}Pb/^{206}Pb	2 s.e.	^{207}Pb/^{235}U	2 s.e.	^{206}Pb/^{238}U	2 s.e.		^{207}Pb/^{206}Pb	2 s.e.
S36A-1c	0.92930	2592	12	2488	30	2332	54	10.6	0.1506	0.0055
S36A-1r	0.82664	1868	13	1763	23	1679	34	11.6	0.1030	0.0019
S36A-4c	0.58608	2298	12	2328	22	2339	34	-3.7	0.1449	0.0011
S36A-5c	0.86462	2329	31	2242	40	2167	52	8.9	0.1361	0.0030
S36A-6c	0.84348	2305	10	2288	28	2293	46	1.7	0.1458	0.0039
S36A-8c	0.65009	2430	27	2369	37	2315	49	6.3	0.1513	0.0037
S36A-9r	0.67790	1854	52	1845	63	1843	79	1.0	0.1131	0.0043
S36A-9c	0.45762	2572	22	2651	32	2732	47	-9.0	0.1716	0.0021
S36A-10r	0.69157	2536	9	2564	21	2614	34	-3.1	0.1678	0.0010
S36A-10c	0.74094	2387	9	2346	21	2318	31	4.3	0.1512	0.0016
S36A-11r	0.93285	2542	34	2495	51	2470	67	4.7	0.1643	0.0050
S36A-11c	0.54886	2589	11	2597	21	2629	34	-0.9	0.1732	0.0011
S36A-12r	0.81131	2589	58	2622	56	2703	60	-3.6	0.1732	0.0078
S36A-12c	0.26432	2092	18	2082	22	2106	28	1.1	0.1291	0.0012
S36A-13c	0.77584	2584	14	2553	26	2551	41	2.8	0.1680	0.0021
S36A-14r	0.43003	2120	13	2125	21	2152	30	-0.7	0.1300	0.0010
S36A-14c	0.63676	2084	10	2100	20	2131	29	-1.7	0.1287	0.0008
S36A-15r	0.33170	2238	9	2262	20	2308	31	-2.7	0.1406	0.0007
S36A-15c	0.52624	2483	14	2527	23	2607	38	-5.0	0.1618	0.0013
S36A-16r	0.66586	2316	8	2346	21	2428	32	-3.3	0.1473	0.0008
S36A-16c	0.42332	2311	190	2324	210	2373	290	-1.5	0.1459	0.0350
S36A-17c	0.48526	2527	22	2498	28	2484	48	3.1	0.1669	0.0025
S36A-19c	0.85464	2606	8	2589	22	2589	37	1.8	0.1731	0.0014
S103A-1r	0.49239	1912	12	1953	21	1988	27	-4.8	0.1166	0.0008
S103A-1c	0.75449	1915	10	1909	20	1912	27	0.7	0.1167	0.0008
S103A-2r	0.88919	1845	8	1791	22	1746	31	6.5	0.1075	0.0022
S103A-2c	0.75511	1921	11	1918	23	1922	33	0.2	0.1141	0.0010
S103A-3c	0.48752	1878	55	1861	42	1859	36	2.1	0.1136	0.0037
S103A-5c	0.95174	1887	8	1756	20	1643	28	14.2	0.1012	0.0024
S103A-7r	0.73848	1913	12	1897	21	1872	28	1.9	0.1135	0.0010
S103A-7c	0.35346	1932	12	1852	20	1774	24	8.7	0.1090	0.0009
S103A-8r	0.58042	1889	11	1921	20	1947	28	-4.0	0.1156	0.0008
S103A-8c	0.45621	1914	74	1911	69	1908	64	0.3	0.1162	0.0045
S103A-9r	0.81303	1906	13	1815	25	1740	32	9.6	0.1067	0.0017
S103A-9c	0.82286	1903	9	1905	32	1908	53	-0.4	0.1154	0.0011
S103A-10c	0.83437	1883	12	1857	20	1821	28	3.0	0.1113	0.0013
S103A-11c	0.70250	1916	12	1910	20	1909	29	0.6	0.1154	0.0008
S103A-12c	0.41587	1880	21	1923	24	1956	31	-5.0	0.1138	0.0012
S103A-13c	0.71752	1841	13	1850	21	1845	30	-1.1	0.1101	0.0013
S103A-14r	0.42763	1903	14	1899	20	1903	27	0.5	0.1143	0.0009
S103A-14c	0.69357	1908	12	1934	22	1945	31	-3.1	0.1158	0.0008
S103A-15c	0.73918	1908	11	1908	21	1909	30	0.0	0.1150	0.0008
S103A-16r	0.35106	1872	21	1860	22	1853	26	1.3	0.1131	0.0009
S103A-16c	0.57413	1930	11	1920	22	1918	29	1.2	0.1168	0.0012
S103A-17r	0.44643	1933	14	1955	20	1980	30	-2.6	0.1170	0.0009
S103A-17c	0.53783	1919	32	1928	30	1945	44	-0.8	0.1162	0.0021
S103A-18c	0.83690	2197	43	1945	32	1732	66	24.4	0.1064	0.0032
S103A-19c	0.64776	1943	17	1834	23	1748	30	11.9	0.1074	0.0015
F122A-1c	0.79388	2058	37	2035	30	2031	34	2.4	0.1263	0.0027
F122A-2c	0.10622	2092	27	2080	22	2072	28	1.1	0.1241	0.0016
F122A-3r	0.62997	2189	19	2196	18	2201	27	-0.8	0.1354	0.0017
F122A-3c	0.58723	2219	20	2200	19	2197	27	1.9	0.1364	0.0021
F122A-4r	0.61905	2028	18	2089	19	2160	30	-7.3	0.1250	0.0013
F122A-4c	0.50162	2079	21	2081	26	2094	41	-0.2	0.1259	0.0015
F122A-6r	0.52237	2030	22	2063	17	2093	25	-3.7	0.1250	0.0015
F122A-6c	0.42431	2050	18	2092	19	2128	26	-5.1	0.1259	0.0013
F122A-7r	0.89822	2028	19	1875	17	1735	23	16.2	0.1062	0.0031
F122A-7c	0.75995	2242	21	2249	18	2247	28	-0.8	0.1410	0.0021

Analysis[a]	204Pb-Corr. Isotopic Ratios[d]					204Pb-Corr. Ages[c]					
	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}Pb$	2 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}U$	2 s.e.
S36A-1c	8.860	0.670	0.4240	0.0140	0.99118	2342	63	2313	68	2277	64
S36A-1r	4.190	0.240	0.2939	0.0078	0.98930	1677	33	1669	45	1660	39
S36A-4c	8.900	0.240	0.4379	0.0078	0.69571	2285	13	2325	25	2341	35
S36A-5c	7.410	0.450	0.3939	0.0120	0.97227	2177	35	2159	47	2145	56
S36A-6c	8.520	0.410	0.4269	0.0110	0.91100	2297	54	2289	54	2291	51
S36A-8c	8.900	0.390	0.4299	0.0110	0.94011	2358	49	2325	52	2305	53
S36A-9r	5.140	0.620	0.3308	0.0180	0.82824	1850	52	1842	63	1842	79
S36A-9c	12.640	0.380	0.5280	0.0110	0.45762	2572	22	2651	33	2732	48
S36A-10r	11.502	0.260	0.5002	0.0080	0.71044	2536	10	2565	21	2614	34
S36A-10c	8.940	0.330	0.4314	0.0077	0.92708	2358	18	2330	34	2312	35
S36A-11r	10.320	0.510	0.4634	0.0150	0.97011	2497	69	2472	69	2453	71
S36A-11c	11.920	0.280	0.5036	0.0080	0.62253	2588	11	2597	22	2629	34
S36A-12r	12.230	1.100	0.5209	0.0150	0.81131	2589	57	2622	57	2703	62
S36A-12c	6.768	0.160	0.3868	0.0062	0.44373	2085	18	2081	22	2108	29
S36A-13c	11.030	0.410	0.4846	0.0100	0.88185	2543	20	2529	34	2545	45
S36A-14r	6.993	0.200	0.3960	0.0069	0.71538	2099	14	2114	26	2150	32
S36A-14c	6.899	0.170	0.3924	0.0062	0.71145	2080	10	2099	22	2133	29
S36A-15r	8.267	0.200	0.4307	0.0068	0.49913	2235	9	2261	22	2309	31
S36A-15c	11.020	0.300	0.4994	0.0087	0.70289	2475	14	2525	25	2610	37
S36A-16r	9.096	0.210	0.4573	0.0072	0.72010	2315	9	2347	21	2428	32
S36A-16c	8.790	5.900	0.4456	0.0560	0.65482	2299	190	2315	200	2375	210
S36A-17c	10.708	0.350	0.4702	0.0120	0.48526	2527	29	2498	33	2484	52
S36A-19c	11.790	0.360	0.4937	0.0090	0.90482	2587	13	2585	28	2588	39
S103A-1r	5.822	0.150	0.3612	0.0059	0.65065	1905	13	1949	23	1987	28
S103A-1c	5.555	0.140	0.3454	0.0057	0.85139	1907	12	1909	22	1914	27
S103A-2r	4.590	0.210	0.3094	0.0068	0.96627	1753	39	1742	41	1737	34
S103A-2c	5.450	0.200	0.3464	0.0073	0.89316	1864	16	1886	30	1916	35
S103A-3c	5.229	0.590	0.3339	0.0087	0.71350	1857	32	1859	35	1857	40
S103A-5c	3.990	0.200	0.2851	0.0062	0.99564	1646	43	1628	41	1619	31
S103A-7r	5.309	0.180	0.3357	0.0063	0.88334	1859	16	1868	29	1867	31
S103A-7c	4.720	0.160	0.3133	0.0060	0.91991	1781	14	1771	28	1757	29
S103A-8r	5.641	0.150	0.3527	0.0060	0.58042	1889	13	1921	24	1947	29
S103A-8c	5.520	0.470	0.3439	0.0120	0.70483	1898	57	1905	55	1905	57
S103A-9r	4.520	0.210	0.3045	0.0075	0.96147	1750	29	1731	40	1715	37
S103A-9c	5.520	0.240	0.3463	0.0120	0.89418	1885	24	1902	37	1917	54
S103A-10c	5.029	0.210	0.3253	0.0064	0.94801	1819	22	1821	36	1815	31
S103A-11c	5.499	0.160	0.3446	0.0062	0.82131	1887	12	1900	25	1911	30
S103A-12c	5.560	0.160	0.3545	0.0066	0.53719	1858	19	1908	26	1955	31
S103A-13c	5.090	0.200	0.3305	0.0067	0.81744	1799	22	1831	35	1840	33
S103A-14r	5.387	0.150	0.3430	0.0061	0.70426	1868	14	1885	25	1902	29
S103A-14c	5.658	0.160	0.3516	0.0066	0.75785	1894	12	1926	24	1943	32
S103A-15c	5.440	0.170	0.3447	0.0066	0.88854	1879	12	1891	27	1908	31
S103A-16r	5.180	0.140	0.3325	0.0064	0.66701	1850	14	1848	23	1850	31
S103A-16c	5.520	0.200	0.3458	0.0068	0.80441	1907	19	1902	32	1914	33
S103A-17r	5.802	0.170	0.3596	0.0064	0.78306	1911	13	1946	25	1980	30
S103A-17c	5.635	0.250	0.3528	0.0095	0.66942	1900	37	1920	46	1948	47
S103A-18c	4.370	0.320	0.2969	0.0140	0.99680	1733	66	1697	82	1673	73
S103A-19c	4.518	0.180	0.3075	0.0065	0.97667	1756	24	1737	31	1728	32
F122A-1c	6.420	0.220	0.3710	0.0073	0.88614	2046	37	2038	31	2034	34
F122A-2c	6.430	0.160	0.3776	0.0071	0.72966	2015	22	2030	22	2063	33
F122A-3r	7.580	0.200	0.4063	0.0064	0.80539	2167	22	2179	23	2199	29
F122A-3c	7.627	0.200	0.4051	0.0063	0.76676	2180	26	2188	24	2192	29
F122A-4r	6.831	0.160	0.3981	0.0067	0.61905	2028	19	2089	20	2160	30
F122A-4c	6.620	0.230	0.3829	0.0093	0.68930	2043	21	2056	27	2089	42
F122A-6r	6.611	0.130	0.3837	0.0054	0.54244	2029	22	2062	18	2093	25
F122A-6c	6.815	0.150	0.3909	0.0058	0.53966	2041	18	2087	20	2127	27
F122A-7r	4.416	0.160	0.3020	0.0052	0.99132	1736	53	1716	30	1702	25
F122A-7c	8.179	0.210	0.4169	0.0066	0.81966	2240	26	2250	23	2246	30

Analysis[a]	^{238}U	^{232}Th	^{204}Pb		$^{206}Pb/^{204}Pb$	%Pb*[b]	Isotopic Ratios					
	(ppm)	(ppm)	(cps)	2 s.e.	(cps)		$^{207}Pb/^{206}Pb$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}Pb$	2 s.e.
F122A-8c	308	175	27	11	1693	99.9	0.1361	0.0030	7.700	0.180	0.4054	0.0060
F122A-9r	307	92	1140	120	54	80.6	0.3700	0.0220	28.500	2.700	0.5420	0.0240
F122A-9c	392	108	30	12	1647	97.9	0.1327	0.0026	6.270	0.130	0.3390	0.0052
F122A-10c	524	355	3	8	36544	100.0	0.2089	0.0038	17.400	0.340	0.5968	0.0085
F122A-11r	1040	402	16	7	8231	99.9	0.1413	0.0026	8.219	0.170	0.4195	0.0065
F122A-11c	1495	932	28	23	8818	99.0	0.1404	0.0026	7.470	0.290	0.3874	0.0140
F122A-12c	212	93	15	10	2040	99.8	0.1261	0.0027	6.630	0.160	0.3778	0.0064
F122A-15c	124	107	5	10	3698	99.5	0.1265	0.0030	6.470	0.150	0.3675	0.0059
F122A-16c	528	29	41	11	1849	99.9	0.1322	0.0026	7.144	0.150	0.3927	0.0063
F122A-17c	655	233	2	9	41000	99.9	0.1249	0.0024	6.340	0.130	0.3687	0.0052
F122A-18c	173	93	-4	7	-6346	99.8	0.1366	0.0029	7.699	0.170	0.4091	0.0059
F122A-19c	454	323	172	27	310	96.3	0.1620	0.0047	8.640	0.310	0.3846	0.0065
F122A-20c	443	257	2	11	29190	99.9	0.1241	0.0035	6.228	0.190	0.3600	0.0053
S162A-4c	642	7	3	12	30957	99.9	0.1828	0.0034	12.690	0.250	0.5092	0.0071
S162A-6r	382	2	13	7	3444	98.4	0.1379	0.0028	6.877	0.150	0.3635	0.0053
S162A-6c	421	4	16	9	4429	99.5	0.1711	0.0032	11.170	0.230	0.4768	0.0070
S162A-9c	461	947	1	11	102100	99.9	0.2025	0.0038	15.530	0.310	0.5554	0.0082
S162A-10c	516	3	11	9	6701	99.4	0.1654	0.0032	10.520	0.210	0.4605	0.0064
S162A-12c	1088	802	10	14	23900	99.3	0.1961	0.0036	14.720	0.370	0.5450	0.0110
S162A-18c	514	3	7	15	9414	100.0	0.1784	0.0032	12.750	0.250	0.5127	0.0071
S162A-19c	693	8	6	8	17143	99.9	0.1694	0.0032	11.590	0.230	0.4900	0.0070
S162A-21c	584	4	18	10	5211	98.6	0.1682	0.0031	10.490	0.250	0.4482	0.0082
S162A-22c	146	48	6	8	3058	99.6	0.1258	0.0030	6.520	0.160	0.3715	0.0058
S162A-23r	355	2	0	13	-	99.3	0.1712	0.0034	11.280	0.360	0.4745	0.0110
S162A-23c	2777	14	5	14	99000	100.0	0.1806	0.0032	12.960	0.310	0.5140	0.0100
S162A-26c	839	19	12	14	14983	99.9	0.1766	0.0033	11.960	0.260	0.4952	0.0088
S162A-27r	397	217	8	13	8200	97.1	0.1747	0.0034	10.100	0.210	0.4265	0.0066
S162A-27c	232	174	5	8	7472	99.0	0.1771	0.0035	11.870	0.270	0.4839	0.0085
S162A-28c	505	7	16	14	5800	99.0	0.1765	0.0035	11.200	0.240	0.4703	0.0073
F28A-2c	997	15	-9	24	-17433	100.0	0.1154	0.0020	5.381	0.140	0.3398	0.0058
F28A-4c	2967	49	-2	16	-216000	99.2	0.1144	0.0010	4.865	0.130	0.3091	0.0065
F28A-5r	2288	35	73	17	4334	98.0	0.1172	0.0012	4.624	0.130	0.2891	0.0070
F28A-5c	1000	204	14	12	10771	97.5	0.1451	0.0037	7.170	0.350	0.3587	0.0100
F28A-6c	863	15	40	20	2813	99.3	0.1171	0.0015	5.350	0.170	0.3260	0.0076
F28A-7c	494	446	3	15	27367	99.7	0.1273	0.0017	6.564	0.170	0.3744	0.0064
F28A-8c	169	104	49	14	600	98.1	0.1572	0.0022	8.930	0.230	0.4113	0.0073
F28A-10c	715	495	40	22	2231	98.2	0.1263	0.0023	5.937	0.150	0.3319	0.0068
F28A-11c	589	54	1835	74	64	78.5	0.3251	0.0034	18.200	0.460	0.4093	0.0069
F28A-12r	849	11	297	24	400	95.6	0.1509	0.0019	7.047	0.170	0.3372	0.0053
F28A-12c	3600	68	-8	17	-55988	98.9	0.1148	0.0010	4.960	0.150	0.3075	0.0077
F28A-13c	352	203	282	38	345	98.4	0.2871	0.0038	26.370	0.760	0.6610	0.0140
F28A-16c	326	115	-1	11	-55300	99.8	0.1317	0.0018	7.170	0.180	0.3916	0.0070
F28A-17c	11420	373	33	16	47303	97.7	0.1099	0.0009	3.862	0.110	0.2527	0.0058
F28A-18r	1815	30	-8	11	-34475	100.0	0.1153	0.0010	5.694	0.130	0.3564	0.0055
F28A-18c	683	96	4	17	30300	100.0	0.1287	0.0016	6.691	0.160	0.3803	0.0066
F28A-20r	299	128	8	12	6300	100.0	0.1257	0.0015	6.650	0.160	0.3842	0.0064
F28A-20c	154	76	8	13	3223	99.9	0.1273	0.0022	6.770	0.180	0.3831	0.0064
F28A-21c	1118	167	316	37	532	94.3	0.1567	0.0055	6.830	0.310	0.3131	0.0062
F28A-22c	820	116	282	46	572	95.6	0.1686	0.0023	8.820	0.250	0.3787	0.0080
S106A-1c	84	52	5	15	4200	99.8	0.2102	0.0037	17.580	0.550	0.6090	0.0140
S106A-2c	109	50	-9	17	-2611	98.8	0.1753	0.0031	12.050	0.460	0.4990	0.0150
S106A-3c	118	62	-16	14	-1806	99.4	0.1962	0.0036	14.920	0.550	0.5460	0.0140
S106A-4c	153	47	3	21	10133	98.2	0.1683	0.0030	10.030	0.280	0.4361	0.0091
S106A-5c	285	154	7	22	6714	100.0	0.1908	0.0029	15.820	0.560	0.5970	0.0150
S106A-6r	254	92	8	15	7700	99.8	0.2054	0.0025	15.910	0.420	0.5626	0.0100
S106A-6c	65	37	-24	28	-697	100.0	0.2059	0.0050	16.490	0.780	0.5850	0.0220
S106A-7c	55	39	3	29	4170	99.3	0.2076	0.0074	16.480	1.000	0.5710	0.0280
S106A-8r	137	101	9	14	4111	99.9	0.2113	0.0028	18.170	0.500	0.6260	0.0150
S106A-8c	116	87	-5	11	-6420	100.0	0.2104	0.0028	18.090	0.510	0.6280	0.0140

Analysis[a]	Isotopic Ratios	Ages						% Disc.[c]	^{204}Pb-Corr. Isotopic Ratios[d]	
	Err. Corr.	^{207}Pb/^{206}Pb	2 s.e.	^{207}Pb/^{235}U	2 s.e.	^{206}Pb/^{238}U	2 s.e.		^{207}Pb/^{206}Pb	2 s.e.
F122A-8c	0.43182	2177	26	2196	20	2193	27	-2.2	0.1333	0.0015
F122A-9r	0.95756	3795	87	3414	96	2782	98	30.5	0.1980	0.0120
F122A-9c	0.38050	2135	23	2015	19	1881	25	12.8	0.1149	0.0016
F122A-10c	0.76311	2898	18	2956	19	3016	34	-6.4	0.2090	0.0024
F122A-11r	0.86106	2244	21	2253	19	2257	29	-1.3	0.1402	0.0022
F122A-11c	0.90711	2233	21	2171	30	2110	62	6.8	0.1322	0.0062
F122A-12c	0.44765	2049	26	2064	22	2065	30	-1.6	0.1234	0.0019
F122A-15c	0.35306	2073	21	2043	21	2017	28	3.5	0.1223	0.0015
F122A-16c	0.44131	2125	21	2131	19	2135	29	-0.6	0.1308	0.0015
F122A-17c	0.44451	2022	19	2025	17	2023	24	-0.3	0.1229	0.0014
F122A-18c	0.27981	2189	22	2196	19	2211	27	-0.8	0.1341	0.0016
F122A-19c	0.77669	2450	44	2283	31	2096	30	15.0	0.1306	0.0019
F122A-20c	0.58251	2016	41	2007	25	1982	25	0.9	0.1215	0.0011
S162A-4c	0.65041	2675	19	2658	18	2652	30	1.9	0.1802	0.0036
S162A-6r	0.48662	2208	26	2094	19	1998	25	11.8	0.1234	0.0019
S162A-6c	0.77125	2575	19	2536	19	2512	31	3.9	0.1661	0.0036
S162A-9c	0.56327	2840	19	2847	21	2850	35	-0.9	0.2017	0.0061
S162A-10c	0.53110	2513	21	2481	19	2441	28	3.3	0.1601	0.0030
S162A-12c	0.95708	2797	19	2797	23	2799	46	-0.1	0.1899	0.0046
S162A-18c	0.59697	2644	23	2660	20	2668	31	-1.9	0.1779	0.0026
S162A-19c	0.55007	2556	22	2570	19	2570	30	-1.7	0.1667	0.0028
S162A-21c	0.73724	2541	23	2478	25	2387	37	6.4	0.1562	0.0074
S162A-22c	0.41857	2050	23	2046	22	2036	27	0.2	0.1219	0.0015
S162A-23r	0.61650	2563	28	2547	29	2502	46	1.7	0.1658	0.0045
S162A-23c	0.92460	2659	24	2677	25	2677	43	-1.9	0.1805	0.0110
S162A-26c	0.83401	2627	28	2605	24	2593	39	2.7	0.1764	0.0067
S162A-27r	0.62223	2611	18	2443	21	2292	30	16.4	0.1450	0.0035
S162A-27c	0.76845	2636	21	2592	21	2542	37	4.3	0.1682	0.0043
S162A-28c	0.51075	2627	21	2539	20	2485	32	8.9	0.1655	0.0040
F28A-2c	0.09749	1886	23	1881	23	1886	28	0.5	0.1143	0.0014
F28A-4c	0.92923	1873	8	1795	22	1735	32	8.6	0.1072	0.0027
F28A-5r	0.94181	1911	8	1756	25	1636	35	17.0	0.1002	0.0023
F28A-5c	0.87531	2286	44	2136	44	1980	50	15.7	0.1212	0.0031
F28A-6c	0.90384	1907	12	1875	27	1818	37	3.4	0.1122	0.0021
F28A-7c	0.02903	2061	15	2053	23	2049	30	0.7	0.1248	0.0013
F28A-8c	0.63994	2430	17	2328	24	2220	33	10.2	0.1394	0.0016
F28A-10c	0.41258	2053	23	1966	22	1847	33	9.4	0.1141	0.0019
F28A-11c	0.78401	3596	10	2999	24	2211	32	45.7	0.1388	0.0018
F28A-12r	0.46918	2352	20	2118	22	1873	26	22.9	0.1146	0.0007
F28A-12c	0.96733	1874	8	1812	25	1732	39	6.9	0.1063	0.0028
F28A-13c	0.85218	3400	13	3359	28	3272	55	4.0	0.2711	0.0084
F28A-16c	0.43303	2113	15	2130	23	2132	33	-2.2	0.1286	0.0011
F28A-17c	0.98338	1797	8	1607	23	1451	30	20.7	0.0913	0.0024
F28A-18r	0.55494	1886	8	1931	19	1966	26	-5.3	0.1154	0.0005
F28A-18c	0.56895	2079	14	2072	21	2077	31	0.9	0.1277	0.0011
F28A-20r	0.41694	2048	13	2066	21	2097	30	-2.1	0.1256	0.0010
F28A-20c	0.33183	2066	16	2078	24	2090	30	-1.8	0.1254	0.0010
F28A-21c	0.45761	2394	58	2074	40	1757	31	28.6	0.1076	0.0013
F28A-22c	0.77333	2540	16	2318	25	2069	38	21.3	0.1277	0.0022
S106A-1c	0.61231	2907	22	2972	32	3062	58	-6.5	0.2060	0.0027
S106A-2c	0.81868	2612	21	2606	36	2601	66	0.4	0.1634	0.0036
S106A-3c	0.77681	2802	26	2811	38	2804	63	-0.9	0.1902	0.0035
S106A-4c	0.62796	2553	20	2437	29	2332	42	11.7	0.1499	0.0029
S106A-5c	0.77234	2756	18	2864	36	3015	61	-12.3	0.1917	0.0022
S106A-6r	0.87688	2873	15	2869	28	2876	43	0.1	0.2035	0.0025
S106A-6c	0.47080	2867	49	2902	68	2968	98	-4.1	0.2035	0.0063
S106A-7c	0.46351	2896	72	2911	71	2907	120	-1.0	0.2010	0.0067
S106A-8r	0.75119	2916	14	2999	28	3133	59	-9.0	0.2102	0.0023
S106A-8c	0.79130	2907	14	2996	27	3140	55	-9.5	0.2098	0.0019

Analysis[a]	204Pb-Corr. Isotopic Ratios[d]					204Pb-Corr. Ages[c]					
	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}Pb$	2 s.e.	Err. Corr.	$^{207}Pb/^{206}Pb$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}U$	2 s.e.
F122A-8c	7.530	0.150	0.4051	0.0059	0.69651	2142	20	2178	18	2192	27
F122A-9r	11.900	1.100	0.4280	0.0150	0.96941	2782	98	2574	86	2302	69
F122A-9c	5.245	0.170	0.3316	0.0062	0.93734	1877	24	1857	26	1846	30
F122A-10c	17.400	0.350	0.5970	0.0084	0.77609	2898	19	2957	20	3017	34
F122A-11r	8.160	0.210	0.4190	0.0067	0.89225	2229	27	2251	24	2255	30
F122A-11c	7.020	0.410	0.3839	0.0150	0.98554	2123	86	2108	49	2093	67
F122A-12c	6.470	0.190	0.3770	0.0069	0.76616	2005	28	2042	28	2064	33
F122A-15c	6.140	0.190	0.3660	0.0067	0.78973	1994	22	1995	27	2010	32
F122A-16c	7.089	0.170	0.3926	0.0064	0.63055	2108	21	2121	22	2134	29
F122A-17c	6.235	0.150	0.3682	0.0054	0.69929	1999	20	2011	21	2022	25
F122A-18c	7.520	0.190	0.4079	0.0064	0.58968	2151	21	2173	22	2206	29
F122A-19c	6.670	0.170	0.3687	0.0058	0.95011	2105	26	2062	22	2022	27
F122A-20c	6.024	0.110	0.3590	0.0055	0.79104	1978	16	1979	15	1978	26
S162A-4c	12.590	0.410	0.5083	0.0084	0.87539	2655	34	2647	32	2653	36
S162A-6r	6.077	0.190	0.3576	0.0063	0.95521	2004	27	1987	27	1971	30
S162A-6c	10.790	0.360	0.4741	0.0080	0.91663	2517	37	2506	31	2500	35
S162A-9c	15.520	0.550	0.5573	0.0098	0.76275	2841	53	2846	38	2855	42
S162A-10c	10.120	0.320	0.4576	0.0078	0.89213	2454	32	2442	30	2428	35
S162A-12c	14.190	0.460	0.5400	0.0120	0.96071	2737	40	2751	30	2781	48
S162A-18c	12.790	0.280	0.5131	0.0074	0.69850	2633	26	2665	23	2669	32
S162A-19c	11.390	0.340	0.4896	0.0079	0.72444	2525	28	2558	28	2568	34
S162A-21c	9.540	0.390	0.4417	0.0093	0.96167	2415	90	2393	45	2357	42
S162A-22c	6.180	0.180	0.3701	0.0063	0.75758	1983	22	1999	25	2029	30
S162A-23r	10.790	0.460	0.4732	0.0120	0.88318	2514	47	2501	39	2496	49
S162A-23c	13.040	0.500	0.5152	0.0110	0.91998	2657	120	2681	45	2678	49
S162A-26c	12.030	0.470	0.4948	0.0100	0.89777	2618	76	2605	48	2591	47
S162A-27r	8.310	0.300	0.4141	0.0076	0.99249	2285	44	2266	37	2233	36
S162A-27c	11.020	0.440	0.4802	0.0098	0.93067	2534	43	2530	38	2529	44
S162A-28c	10.460	0.380	0.4652	0.0086	0.92497	2509	41	2476	34	2462	38
F28A-2c	5.320	0.160	0.3395	0.0063	0.50007	1868	23	1871	26	1884	30
F28A-4c	4.530	0.220	0.3066	0.0071	0.98736	1748	46	1732	41	1723	35
F28A-5r	3.890	0.210	0.2829	0.0075	0.99366	1630	43	1613	42	1609	38
F28A-5c	5.850	0.320	0.3491	0.0110	0.98555	1984	47	1954	50	1930	52
F28A-6c	5.080	0.260	0.3239	0.0084	0.96358	1831	35	1825	44	1808	41
F28A-7c	6.430	0.220	0.3730	0.0082	0.95912	2025	19	2042	26	2043	39
F28A-8c	7.780	0.310	0.4031	0.0088	0.93410	2219	20	2202	35	2182	40
F28A-10c	5.180	0.310	0.3261	0.0084	0.98218	1862	30	1844	51	1819	41
F28A-11c	6.170	0.230	0.3220	0.0070	0.98984	2211	22	1998	32	1799	34
F28A-12r	5.106	0.130	0.3228	0.0058	0.99227	1873	12	1836	21	1803	28
F28A-12c	4.540	0.250	0.3050	0.0086	0.98911	1733	49	1730	46	1715	42
F28A-13c	24.600	1.700	0.6520	0.0200	0.96013	3314	48	3282	71	3235	80
F28A-16c	6.990	0.220	0.3915	0.0076	0.78034	2079	15	2109	28	2129	35
F28A-17c	3.102	0.150	0.2463	0.0060	0.99269	1449	51	1430	37	1418	31
F28A-18r	5.693	0.130	0.3566	0.0054	0.61985	1886	8	1930	19	1966	26
F28A-18c	6.644	0.180	0.3799	0.0068	0.75010	2066	15	2066	25	2076	32
F28A-20r	6.624	0.170	0.3842	0.0065	0.56796	2036	14	2062	23	2097	30
F28A-20c	6.630	0.190	0.3820	0.0070	0.60864	2036	14	2063	25	2085	33
F28A-21c	4.390	0.130	0.2956	0.0071	0.97956	1757	21	1706	25	1668	35
F28A-22c	6.400	0.330	0.3612	0.0091	0.99713	2069	32	2028	45	1992	42
S106A-1c	17.230	0.660	0.6090	0.0160	0.82569	2874	23	2952	39	3068	64
S106A-2c	11.170	0.630	0.4920	0.0170	0.92958	2494	38	2521	56	2577	72
S106A-3c	14.340	0.670	0.5430	0.0170	0.92288	2740	30	2770	48	2804	70
S106A-4c	8.810	0.430	0.4295	0.0110	0.98016	2342	36	2322	49	2307	51
S106A-5c	15.820	0.570	0.5970	0.0150	0.77234	2756	20	2864	36	3015	61
S106A-6r	15.770	0.510	0.5611	0.0110	0.92640	2850	25	2856	38	2870	47
S106A-6c	16.630	0.880	0.5860	0.0230	0.41286	2853	72	2911	84	2971	100
S106A-7c	15.900	1.000	0.5700	0.0280	0.78361	2830	67	2858	77	2905	120
S106A-8r	18.280	0.660	0.6310	0.0150	0.83804	2907	18	3005	38	3163	62
S106A-8c	18.050	0.540	0.6280	0.0140	0.83696	2903	14	2993	29	3136	56

Analysis[a]	^{238}U	^{232}Th	^{204}Pb		$^{206}Pb/^{204}Pb$	%Pb*[b]	Isotopic Ratios					
	(ppm)	(ppm)	(cps)	2 s.e.	(cps)		$^{207}Pb/^{206}Pb$	2 s.e.	$^{207}Pb/^{235}U$	2 s.e.	$^{206}Pb/^{238}Pb$	2 s.e.
S106A-10r	128	48	-1	18	-25700	99.1	0.1820	0.0041	12.900	0.440	0.5154	0.0130
S106A-10c	51	18	2	18	4460	99.4	0.1716	0.0048	12.040	0.800	0.5010	0.0290
S106A-11c	306	189	7	15	10586	100.0	0.2061	0.0022	17.340	0.440	0.6058	0.0110
S106A-12c	73	41	37	19	446	99.9	0.2086	0.0070	18.070	0.960	0.6070	0.0210
S106A-13c	212	122	25	20	2036	99.4	0.2061	0.0030	15.090	0.400	0.5408	0.0110
S106A-14r	81	26	-10	14	-1372	96.8	0.1750	0.0033	10.310	0.370	0.4240	0.0120
S106A-14c	256	130	5	32	12160	99.9	0.1906	0.0047	13.740	0.670	0.5248	0.0200
S106A-15c	81	59	-10	21	-1650	99.2	0.1925	0.0069	15.100	0.880	0.5490	0.0230
S106A-16c	88	25	-17	17	-912	99.7	0.1501	0.0038	9.570	0.430	0.4505	0.0140
S106A-18r	61	33	-3	12	-5333	99.7	0.2122	0.0036	17.330	0.490	0.5858	0.0110
S106A-18c	46	25	-28	18	-381	99.4	0.2101	0.0036	16.790	0.480	0.5770	0.0120

Analysis[a]	Isotopic Ratios	Ages						% Disc.[c]	^{204}Pb-Corr. Isotopic Ratios[d]	
	Err. Corr.	^{207}Pb/^{206}Pb	2 s.e.	^{207}Pb/^{235}U	2 s.e.	^{206}Pb/^{238}U	2 s.e.		^{207}Pb/^{206}Pb	2 s.e.
S106A-10r	0.54019	2664	30	2672	36	2677	56	-0.9	0.1744	0.0030
S106A-10c	0.60667	2568	57	2614	73	2615	120	-4.3	0.1641	0.0040
S106A-11c	0.79882	2870	12	2952	25	3052	46	-9.1	0.2051	0.0014
S106A-12c	0.51027	2906	76	2996	82	3056	90	-9.5	0.2088	0.0069
S106A-13c	0.50270	2864	18	2822	27	2786	45	4.4	0.1985	0.0040
S106A-14r	0.79159	2601	20	2458	33	2273	55	13.8	0.1454	0.0041
S106A-14c	0.44055	2753	46	2731	70	2719	92	2.2	0.1899	0.0071
S106A-15c	0.57753	2768	75	2817	82	2819	99	-5.8	0.1846	0.0061
S106A-16c	0.51180	2360	43	2391	48	2395	65	-3.8	0.1460	0.0029
S106A-18r	0.51293	2919	16	2952	26	2970	46	-3.6	0.2078	0.0023
S106A-18c	0.56769	2891	16	2926	26	2932	49	-3.4	0.2005	0.0024

Analysis[a]	204Pb-Corr. Isotopic Ratios[d]					^{204}Pb-Corr. Ages[c]					
	^{207}Pb/^{235}U	2 s.e.	^{206}Pb/^{238}Pb	2 s.e.	Err. Corr.	^{207}Pb/^{206}Pb	2 s.e.	^{207}Pb/^{235}U	2 s.e.	^{206}Pb/^{238}U	2 s.e.
S106A-10r	12.240	0.580	0.5100	0.0140	0.84866	2597	31	2617	47	2655	61
S106A-10c	11.350	0.810	0.4960	0.0290	0.86437	2494	51	2545	74	2592	120
S106A-11c	17.290	0.450	0.6056	0.0120	0.80850	2868	12	2952	26	3050	46
S106A-12c	17.960	0.940	0.6050	0.0210	0.62152	2893	75	2989	81	3067	90
S106A-13c	14.660	0.680	0.5371	0.0130	0.87119	2812	38	2789	52	2770	55
S106A-14r	8.270	0.540	0.4100	0.0140	0.96988	2275	49	2252	61	2213	63
S106A-14c	13.690	0.800	0.5255	0.0210	0.80392	2741	90	2727	94	2722	98
S106A-15c	14.180	0.850	0.5430	0.0230	0.81267	2699	70	2762	80	2804	100
S106A-16c	9.110	0.420	0.4470	0.0140	0.72831	2298	38	2343	48	2380	66
S106A-18r	16.880	0.590	0.5868	0.0130	0.74675	2889	18	2926	34	2978	50
S106A-18c	16.190	0.650	0.5710	0.0130	0.80402	2830	20	2873	36	2908	51

Notes:

[a]Analyses are given in the format x-y, where x=sample number and y=zircon number; c=analysis spot aimed at core; r=analysis spot aimed at rim or edge of grain

[b]% of radiogenic Pb was estimated using the methods of Andersen (2002)

[c]Discordance was calculated using equation 5 in Guitreau and Blichert-Toft (2014)

[d]Common Pb corrections were conducted using the methods of Andersen (2002)

Appendix 5: Integrated trace element compositions of zircon rims and interiors analyzed by LA-ICP-MS depth profiling in metamorphic rocks from Hall Peninsula, Baffin Island.

Zrc	Interval[a]	Al ppm	P ppm	Ca ppm	Sc ppm	Ti ppm	Fe ppm	Sr ppm	Y ppm	Zr ppm	Sn ppm
Sample S36A											
z1	rim	1373.21	849.99	1521.32	679.54	930.83	990.84	37.76	2536.21	73866.63	1.43
z1	undated core	836.96	577.92	1215.77	358.40	175.56	4198.04	34.89	2531.01	66894.21	1.32
z3	disc rim	492.74	757.44	356.96	566.83	592.75	764.33	10.86	1107.80	62808.86	0.98
z3	core	361.90	543.19	790.18	330.21	120.39	461.65	14.86	960.62	54957.84	1.17
z4	core	29.16	366.26	236.10	351.70	12.68	8070.80	0.74	734.68	71227.62	0.57
z5	rim	1294.13	1029.78	2113.23	565.96	123.39	460.13	42.82	2686.57	74027.07	0.83
z5	core	422.69	737.84	480.95	400.08	38.98	134.65	11.78	1325.56	68708.87	0.58
z6	disc rim	2170.47	725.12	840.31	604.50	658.46	6427.82	20.76	1358.54	70866.92	0.57
z6	core	701.92	686.98	1236.55	399.99	78.94	3568.79	27.97	1386.76	68750.90	1.23
z8	rim	1206.41	618.85	263.40	486.75	50.97	1417.05	5.47	901.57	78524.55	1.08
z8	core	429.27	414.41	360.02	323.76	45.97	765.29	2.86	879.62	69652.57	1.56
z9	rim	17663.46	610.19	582.27	520.17	24.16	916.65	11.47	823.71	61060.34	0.57
z9	undated core	1506.97	664.37	201.34	526.98	10.49	173.25	1.95	828.04	71545.55	0.56
z10	rim	482.90	705.77	451.45	586.82	81.83	1424.24	10.23	1254.61	78347.22	0.79
z10	undated core	207.74	317.67	247.16	290.57	22.86	109.75	1.09	1010.15	70413.49	0.75
z11	rim	7.14	642.57	138.38	700.53	7.58	34.21	0.47	915.82	82480.32	0.29
z11	core	980.39	488.63	518.49	380.94	60.53	8479.39	11.51	1083.36	60649.28	0.73
z13	rim	34.84	391.52	111.85	384.94	9.31	84.41	0.48	882.40	79522.80	0.72
z13	undated core	130.47	330.99	184.16	344.64	20.33	56.05	1.15	815.72	72725.37	0.83
z14	disc rim	125.98	752.68	106.75	693.05	34.02	604.15	3.06	1017.33	82411.00	0.99
z14	core	1304.25	764.76	1074.50	393.18	128.68	3542.36	23.51	1784.65	73959.90	1.17
z15	rim	213.88	580.06	588.86	538.90	42.22	150.58	12.83	962.50	79521.63	0.63
z15	undated core	908.10	886.30	1031.92	506.15	82.79	942.91	25.40	2001.71	68837.25	1.06
z16	rim	16.42	365.34	129.28	427.27	7.80	331.17	1.56	551.85	80939.08	0.83
z16	undated core	364.86	366.67	512.90	283.22	27.78	1492.69	14.20	1843.52	65283.58	0.93
z17	rim	2055.54	612.95	2509.58	374.85	60.91	10017.47	24.80	1062.63	64949.09	0.51
z17	core	1027.93	860.55	625.56	312.76	37.15	820.50	5.91	1310.00	66439.43	0.67
z19	disc rim	203.07	509.96	142.69	435.80	13.63	377.69	1.41	719.09	68888.94	0.54
z19	undated core	315.31	354.38	364.05	318.91	22.89	1497.13	2.77	913.88	63781.90	1.33
Sample F122A											
z1	rim	664.75	700.29	312.34	593.22	646.51	4824.07	4.30	835.21	78969.69	0.69
z1	core	20.59	168.28	211.74	281.53	13.83	105.48	1.13	831.88	67030.85	0.52
z2	rim	922.95	406.53	165.03	380.02	20.64	7988.44	0.78	726.70	76736.52	0.92
z2	core	61.46	144.87	178.92	316.20	13.39	718.40	0.38	601.77	70902.75	0.72
z3	core	546.45	269.74	253.71	338.76	11.55	2081.79	0.51	540.21	74176.17	0.63
z4	core	42.48	508.41	289.43	337.60	59.47	221.19	6.75	1262.07	70440.33	0.79
z6	disc rim	1246.25	542.08	895.44	475.37	18.90	774.49	31.94	1090.67	74707.38	0.40
z6	undated core	8.50	150.82	180.43	300.35	4.46	51.47	1.39	533.06	75771.55	0.42
z7	rim	4245.68	633.92	386.04	647.81	19.75	1472.59	11.45	1565.68	80600.40	0.28
z7	undated core	2298.86	794.00	2832.48	390.53	46.34	2316.91	116.85	2112.22	72796.22	0.82
z9	rim	24.24	237.65	207.44	454.33	7.75	149.32	0.45	692.08	83069.67	0.41
z9	core	250.15	167.78	205.24	271.71	8.93	112.11	0.96	976.23	70329.24	0.69
z10	core	33.49	304.62	331.99	397.21	16.30	64.63	0.94	1374.71	73616.01	0.69
z12	undated core	87.03	289.91	261.80	277.73	6.59	38.02	0.56	1032.73	68123.36	0.60
z15	disc rim	16.25	369.11	193.95	589.69	8.54	37.57	0.20	674.97	83612.98	0.29
z15	core	137.67	169.12	225.82	313.03	8.77	179.50	0.37	558.51	73570.23	0.57
z16	core	14.67	214.81	168.16	435.42	7.11	41.58	0.30	402.40	77564.20	0.68
z17	rim	1319.80	313.92	939.17	447.36	51.85	498.64	40.49	1473.45	92188.31	0.40
z17	core	186.58	218.12	215.12	312.43	8.56	123.59	6.22	1264.50	70942.46	0.56
z18	rim	12.52	395.09	134.00	573.35	5.67	47.60	0.70	690.71	75610.03	0.25
z18	core	58.30	261.58	234.58	343.14	17.80	56.69	1.56	787.80	69503.67	0.68
z19	core	84.75	147.21	243.20	326.76	7.77	124.81	2.32	635.46	71789.40	0.84
z20	disc rim	673.04	524.68	2663.09	514.20	19.93	931.91	110.85	1372.47	74697.44	0.08
z20	core	29.32	424.21	518.48	329.36	10.92	103.75	10.61	1380.46	71229.14	0.40
Sample S103A											
z1	rim	12.04	373.60	1017.39	417.20	6.85	95.60	7.87	774.19	76524.05	0.46
z1	undated core	86.48	374.11	300.71	301.44	7.26	135.28	2.95	1561.29	61448.72	0.39

Zrc	Interval[a]	La ppm	Ce ppm	Pr ppm	Nd ppm	Sm ppm	Eu ppm	Gd ppm	Tb ppm	Dy ppm	Ho ppm	Er ppm	Tm ppm
Sample S36A													
z1	rim	34.59	283.75	59.81	332.12	136.24	108.75	159.47	36.62	335.16	84.99	328.24	72.49
z1	undated core	16.05	141.19	24.32	141.27	70.79	29.98	117.13	28.92	297.60	83.56	347.21	69.17
z3	disc rim	7.19	51.01	11.21	59.10	30.91	16.35	42.20	10.57	115.44	36.99	189.45	43.98
z3	core	4.99	37.19	6.90	38.53	19.14	8.81	31.21	8.77	103.87	34.11	168.03	42.46
z4	core	0.35	4.83	0.70	5.16	3.88	1.07	16.52	5.65	72.12	25.37	118.90	25.51
z5	rim	26.54	166.14	38.11	222.55	106.21	73.28	142.58	38.25	369.54	96.00	388.54	91.57
z5	core	4.70	32.68	6.71	38.62	17.80	8.47	38.81	12.18	138.70	43.64	189.02	41.34
z6	disc rim	11.19	75.16	16.59	101.71	43.98	20.69	58.82	15.34	153.42	48.09	227.37	52.72
z6	core	16.42	113.82	23.23	130.39	55.41	52.03	73.17	17.40	173.81	46.09	196.27	45.00
z8	rim	5.41	36.16	7.10	40.59	17.40	17.52	26.64	7.22	80.27	30.05	165.44	40.63
z8	core	3.24	38.96	5.60	31.05	17.74	7.60	31.06	8.81	92.95	28.87	133.05	28.01
z9	rim	6.20	34.37	5.08	23.07	6.92	9.20	11.69	4.10	65.85	28.04	154.63	40.25
z9	undated core	1.03	7.21	0.96	5.43	2.35	2.65	6.30	3.27	56.63	26.63	163.05	46.74
z10	rim	8.07	59.13	12.65	74.02	32.36	18.07	40.52	10.52	125.88	39.23	196.99	48.61
z10	undated core	0.19	18.69	0.34	2.72	3.36	0.60	17.04	6.03	83.86	32.12	161.22	36.97
z11	rim	0.10	0.26	0.11	0.85	0.55	0.21	4.63	3.12	64.19	29.43	172.45	44.06
z11	core	9.79	81.32	15.78	94.95	43.81	24.81	60.57	14.13	141.28	36.92	155.69	30.83
z13	rim	0.13	10.05	0.13	1.47	3.02	0.35	15.31	5.36	78.75	28.61	158.25	37.23
z13	undated core	1.32	22.69	2.17	13.48	8.69	2.80	24.30	7.00	83.53	27.39	123.39	24.88
z14	disc rim	2.64	18.99	4.60	30.33	12.71	13.43	21.36	6.78	89.74	36.00	192.00	50.77
z14	core	20.66	145.27	32.56	190.18	84.00	60.34	112.58	24.92	235.57	59.09	231.52	45.30
z15	rim	5.71	38.80	8.31	45.92	18.33	18.21	22.20	7.28	87.51	30.35	164.17	48.79
z15	undated core	16.01	111.13	22.43	128.57	56.38	38.87	84.76	21.90	231.80	67.87	281.70	57.58
z16	rim	0.23	1.73	0.38	0.66	0.85	0.40	2.79	2.04	38.30	17.20	105.47	31.69
z16	undated core	7.03	59.60	12.46	73.27	39.97	21.42	79.16	20.53	212.35	63.63	263.93	47.12
z17	rim	6.96	54.75	11.23	61.21	28.95	27.50	39.22	10.40	113.72	33.33	179.20	42.78
z17	core	14.95	56.20	9.32	48.02	20.48	15.39	45.29	12.61	138.76	44.34	195.96	41.97
z19	disc rim	2.96	22.62	4.26	21.32	10.71	6.10	16.51	5.14	70.43	23.34	130.93	41.08
z19	undated core	3.17	36.56	5.39	31.50	15.97	10.83	31.09	8.58	98.35	32.83	144.91	32.47
Sample F122A													
z1	rim	1.57	9.03	1.26	8.14	4.31	1.48	12.17	4.30	62.62	22.39	129.45	36.99
z1	core	0.24	7.12	0.45	2.98	2.96	0.41	13.23	4.77	68.96	27.33	130.47	31.37
z2	rim	2.85	39.60	4.61	25.47	18.07	9.37	27.89	7.69	80.57	23.26	92.70	21.65
z2	core	0.17	24.64	0.51	5.87	7.88	2.03	24.69	6.13	62.43	19.42	77.80	16.20
z3	core	0.58	14.00	1.20	7.89	6.02	1.70	14.67	4.24	50.26	17.02	75.48	17.26
z4	core	0.31	5.72	0.43	3.15	3.56	0.41	18.92	7.27	103.09	39.18	206.85	49.41
z6	disc rim	3.36	23.02	4.31	24.66	13.59	4.61	24.45	8.11	102.54	34.01	169.71	45.41
z6	undated core	0.07	1.41	0.09	0.64	0.55	0.10	4.43	2.00	35.20	15.60	88.35	24.67
z7	rim	4.46	35.10	6.19	36.66	21.38	7.14	42.75	12.86	169.26	49.83	196.47	36.40
z7	undated core	11.48	78.09	13.36	74.02	41.01	15.17	69.07	20.42	224.62	69.00	303.40	71.14
z9	rim	0.32	10.92	0.66	3.33	2.71	0.33	15.26	5.36	61.44	23.07	94.44	24.01
z9	core	0.60	21.33	1.16	7.96	7.93	1.54	25.39	8.02	97.41	32.20	145.01	31.18
z10	core	0.25	29.12	0.44	3.59	5.92	1.02	30.37	9.98	123.87	45.76	199.40	44.82
z12	undated core	0.41	12.02	0.81	6.07	5.69	1.03	21.07	6.91	93.27	33.31	149.22	33.60
z15	disc rim	0.09	2.27	0.13	0.74	0.31	0.22	4.86	2.47	42.75	19.99	114.97	32.49
z15	core	0.37	20.82	0.60	4.43	4.09	1.50	12.34	3.91	46.75	16.34	77.00	19.68
z16	core	0.09	1.12	0.12	1.00	2.52	0.27	17.28	5.44	51.87	11.92	37.71	6.66
z17	rim	5.45	40.57	6.26	31.92	19.51	6.59	36.04	10.93	129.98	44.69	195.41	44.14
z17	core	1.07	19.90	1.37	8.75	8.73	1.58	28.98	9.22	116.40	40.65	186.29	44.78
z18	rim	0.04	0.35	0.19	0.70	0.64	0.19	3.73	2.16	43.44	20.65	110.42	30.64
z18	core	0.87	10.01	1.16	7.78	7.05	1.06	22.29	6.77	75.97	26.00	106.44	24.09
z19	core	0.61	22.27	1.08	7.73	5.92	1.83	14.88	4.45	53.87	19.43	92.96	23.05
z20	disc rim	6.79	37.82	6.61	35.78	16.33	8.29	31.22	10.01	127.15	44.97	225.06	58.30
z20	core	0.32	5.55	0.41	2.69	4.01	0.49	22.31	8.53	118.72	45.03	220.27	50.16
Sample S103A													
z1	rim	0.25	3.93	0.21	1.49	1.60	0.28	9.62	4.11	62.19	24.36	128.39	32.58
z1	undated core	2.15	18.27	2.34	12.09	10.35	2.55	40.18	12.10	151.67	56.44	243.23	50.22

Zrc	Interval[a]	Yb ppm	Lu ppm	Hf ppm	Th ppm	U ppm	$(La/Yb)_N$[b]	Eu/Eu*[c]	Ce/Ce*[a]	Th/U
Sample S36A										
z1	rim	794.32	127.27	10981.08	11.13	1360.25	0.03	2.25	1.20	0.01
z1	undated core	614.21	103.66	7844.71	473.74	881.20	0.02	1.00	1.43	0.54
z3	disc rim	507.56	76.59	8997.90	15.48	763.17	0.01	1.38	1.12	0.02
z3	core	506.35	88.90	7782.78	69.48	745.02	0.01	1.10	1.30	0.09
z4	core	235.99	41.70	9187.34	63.17	306.69	0.00	0.35	1.78	0.21
z5	rim	936.54	147.77	11048.22	36.07	1227.47	0.02	1.82	1.06	0.03
z5	core	404.61	68.04	10780.53	54.81	747.95	0.01	0.96	1.18	0.07
z6	disc rim	645.12	98.82	11019.78	18.22	876.32	0.01	1.24	1.11	0.02
z6	core	485.60	88.52	10499.87	38.74	967.41	0.02	2.50	1.19	0.04
z8	rim	486.29	87.21	11644.22	27.56	934.93	0.01	2.48	1.21	0.03
z8	core	259.48	44.47	9732.12	165.98	650.77	0.01	0.98	1.75	0.26
z9	rim	486.02	83.78	9893.32	12.26	771.57	0.01	3.11	1.41	0.02
z9	undated core	592.34	116.72	11235.18	10.60	1101.28	0.00	1.99	1.63	0.01
z10	rim	527.95	91.34	11968.94	39.82	878.82	0.01	1.52	1.16	0.05
z10	undated core	366.40	67.85	10475.13	405.41	1353.85	0.00	0.20	13.81	0.30
z11	rim	533.60	93.74	14258.08	7.66	803.49	0.00	0.28	0.55	0.01
z11	core	311.32	55.77	8975.06	98.32	598.84	0.02	1.47	1.28	0.16
z13	rim	398.12	71.23	10785.19	98.84	948.35	0.00	0.13	16.73	0.10
z13	undated core	238.31	40.34	9455.39	106.34	405.96	0.00	0.55	2.61	0.26
z14	disc rim	569.41	105.24	14325.87	8.59	937.95	0.00	2.48	1.04	0.01
z14	core	435.06	74.42	10080.82	77.49	680.64	0.03	1.90	1.10	0.11
z15	rim	602.46	112.92	12514.93	7.44	1397.61	0.01	2.76	1.14	0.01
z15	undated core	545.78	90.71	10154.41	147.12	960.17	0.02	1.72	1.20	0.15
z16	rim	406.04	74.79	12055.17	15.03	926.87	0.00	0.72	1.15	0.02
z16	undated core	404.12	62.04	8853.78	180.27	522.11	0.01	1.14	1.21	0.35
z17	rim	493.56	77.97	12342.54	72.57	1621.96	0.01	2.50	1.21	0.04
z17	core	393.91	66.34	10126.37	250.83	1111.11	0.03	1.50	1.14	0.23
z19	disc rim	540.59	91.32	10775.21	13.10	1127.56	0.00	1.40	1.29	0.01
z19	undated core	334.10	55.18	8877.03	126.71	685.43	0.01	1.46	1.71	0.18
Sample F122A										
z1	rim	440.36	75.56	11849.05	24.96	624.36	0.00	0.58	1.49	0.04
z1	core	300.06	51.81	10071.71	190.89	850.88	0.00	0.17	4.07	0.22
z2	rim	209.96	33.51	9518.09	64.42	211.66	0.01	1.27	2.14	0.30
z2	core	152.09	25.48	7826.99	94.38	117.67	0.00	0.41	13.15	0.80
z3	core	173.13	28.92	9000.98	78.15	247.93	0.00	0.53	3.02	0.32
z4	core	515.77	96.48	11233.74	80.66	1308.13	0.00	0.12	3.20	0.06
z6	disc rim	510.86	81.01	11651.15	45.51	1069.40	0.00	0.77	1.26	0.04
z6	undated core	259.72	50.85	12966.39	47.64	1066.22	0.00	0.13	3.87	0.04
z7	rim	275.92	37.91	12002.24	13.68	804.47	0.01	0.71	1.37	0.02
z7	undated core	699.58	118.97	11692.60	109.11	1578.88	0.01	0.87	1.35	0.07
z9	rim	262.44	50.41	9676.60	66.62	762.04	0.00	0.12	4.28	0.09
z9	core	287.35	47.68	7585.92	97.57	361.41	0.00	0.30	4.73	0.27
z10	core	396.77	71.40	8704.43	386.55	559.05	0.00	0.19	16.76	0.69
z12	undated core	306.56	51.46	9501.91	139.77	350.72	0.00	0.25	3.84	0.40
z15	disc rim	365.73	64.92	12357.02	7.56	604.98	0.00	0.29	4.33	0.01
z15	core	204.37	37.30	8974.78	47.82	146.91	0.00	0.59	8.66	0.33
z16	core	51.13	7.91	11226.72	20.78	482.33	0.00	0.09	2.24	0.04
z17	rim	508.29	77.14	11496.99	211.47	1682.27	0.01	0.75	1.49	0.13
z17	core	413.02	70.35	9394.07	407.75	1213.90	0.00	0.28	3.44	0.34
z18	rim	369.90	57.18	10206.49	2.71	536.96	0.00	0.30	0.54	0.01
z18	core	227.71	38.83	7997.83	106.73	272.52	0.00	0.24	2.06	0.39
z19	core	239.28	47.02	9627.83	87.79	248.68	0.00	0.57	5.23	0.35
z20	disc rim	611.72	104.34	11692.38	77.58	1372.79	0.01	1.11	1.26	0.06
z20	core	449.69	75.49	10111.56	141.51	1000.58	0.00	0.13	3.19	0.14
Sample S103A										
z1	rim	333.97	62.30	11654.05	91.97	783.76	0.00	0.17	3.92	0.12
z1	undated core	433.69	79.13	8883.26	341.73	885.50	0.00	0.33	1.77	0.39

Zrc	Interval[a]	Al ppm	P ppm	Ca ppm	Sc ppm	Ti ppm	Fe ppm	Sr ppm	Y ppm	Zr ppm	Sn ppm
Sample S103A											
z2	disc rim	26.40	553.04	1969.05	473.84	8.11	158.11	17.54	1110.00	78297.60	0.73
z2	undated core	308.01	392.18	3770.79	290.52	17.14	453.80	54.68	781.78	64174.48	1.06
z3	undated rim	114.52	587.35	634.07	371.10	14.87	87.32	1.50	1793.84	69951.63	0.83
z4	undated rim	40.61	499.07	513.06	447.77	10.64	202.86	4.29	869.18	81364.75	0.68
z4	undated core	654.96	838.32	506.46	346.69	25.74	2719.02	4.67	1527.82	71555.12	0.52
z5	disc rim	484.78	912.21	4171.48	448.70	88.25	1324.19	83.94	1797.93	77969.66	0.82
z7	rim	7.29	520.40	220.57	484.83	7.34	64.15	1.90	737.46	71929.08	0.62
z7	undated core	155.34	514.52	210.75	383.56	12.63	178.23	3.66	1215.48	76054.82	0.86
z8	disc rim	6.37	472.46	218.31	489.96	10.06	51.42	0.79	746.27	81143.29	0.87
z8	undated core	529.31	544.93	512.99	339.57	16.42	614.42	7.51	2103.12	71306.36	0.52
z9	rim	486.47	712.17	743.58	419.57	31.74	2028.69	6.55	1705.75	81781.81	0.54
z10	rim	1059.39	1294.80	1306.14	652.39	53.03	451.45	38.13	3812.71	75723.53	3.95
z10	undated core	13.60	598.64	373.53	406.10	10.60	105.57	1.29	859.64	67161.26	0.65
z11	rim	7.02	505.60	279.57	433.31	5.60	963.27	0.55	698.70	77271.44	0.38
z11	undated core	71.49	341.14	247.03	328.37	8.16	196.06	1.07	1426.02	68395.00	0.72
z12	rim	35.70	632.85	128.84	440.84	10.06	97.41	0.78	1235.43	76371.40	0.49
z13	rim	2305.44	2042.91	3171.84	520.30	54.14	3887.52	66.21	1945.08	74139.33	0.76
z14	rim	261.00	434.97	202.75	391.52	5.29	601.77	1.96	775.88	78597.49	0.56
z15	rim	18.89	555.65	981.22	429.26	7.96	455.69	15.15	741.23	75724.06	0.57
z15	undated core	42.13	332.40	223.78	354.33	5.16	109.53	2.17	730.79	71469.58	0.69
z16	rim	13.93	420.86	111.82	383.92	12.58	149.07	0.37	662.52	77708.32	0.50
z16	undated core	46.67	257.76	238.69	358.77	8.70	85.60	0.98	1493.63	72394.54	0.38
Sample S162A											
z1	disc rim	1987.44	1182.34	2379.94	556.11	171.89	6650.57	127.69	1358.85	78505.74	0.51
z1	core	859.08	876.58	3132.05	521.64	97.64	11162.72	184.75	1477.68	70308.99	0.93
z2	undated rim	1116.49	200.07	246.48	390.16	20.98	2493.27	1.58	198.57	86072.73	0.87
z2	undated core	1846.84	418.84	283.17	441.93	65.00	3475.60	10.42	729.13	63772.01	0.56
z3	undated rim	761.91	374.94	349.95	475.78	27.07	699.01	2.69	507.58	82460.55	0.72
z3	undated core	3483.85	1382.07	2537.73	526.91	148.87	3671.45	118.80	2527.86	72683.51	0.74
z4	rim	102.59	208.54	226.12	395.38	8.23	122.68	0.67	179.12	78018.72	0.35
z4	core	77.26	249.24	255.89	394.17	9.10	72.32	0.53	140.67	65856.22	0.66
z6	undated rim	151.16	193.85	207.16	418.04	8.85	92.40	0.42	208.81	88613.65	0.57
z6	undated core	213.26	335.20	226.76	356.29	24.56	117.02	3.22	346.50	68300.10	0.66
z7	undated core	958.35	221.45	260.90	443.79	12.06	1852.52	0.90	197.41	75384.19	0.71
z8	undated rim	4184.66	782.72	1603.53	530.23	74.97	8025.85	66.72	1329.41	80608.03	0.74
z8	undated core	554.43	411.94	776.27	342.81	21.29	1453.28	35.49	931.34	71065.55	0.80
z9	undated rim	1318.92	215.15	227.69	422.11	16.29	3757.24	2.12	337.64	81384.61	0.54
z9	core	875.68	507.43	2275.30	392.35	536.56	3941.58	139.75	2087.41	72729.37	1.02
z13	undated core	1403.57	673.69	1569.73	372.61	38.75	4703.84	58.31	1566.47	69894.17	0.89
z14	undated rim	1776.10	277.84	270.24	429.89	372.26	3052.21	1.62	222.64	83252.44	0.49
z14	undated core	756.00	364.05	358.78	410.14	28.65	969.87	2.20	335.65	75854.52	0.85
z18	core	460.49	294.19	289.75	410.34	12.47	888.30	0.94	239.42	72470.13	0.65
z21	undated rim	726.78	207.51	255.79	406.36	28.90	510.93	2.36	276.31	85004.53	0.71
z21	undated core	496.27	638.43	815.54	448.45	42.73	976.20	23.88	939.69	71559.99	0.83
Sample F28A											
z1	undated rim	962.17	673.95	8543.41	881.29	22.22	3400.57	358.24	2325.12	78656.24	0.81
z1	undated core	5865.55	2160.89	16039.51	3655.50	7457.73	8115.21	1043.78	9996.32	96805.55	74.14
z2	undated rim	164.39	298.93	222.16	492.84	13.39	243.60	2.31	611.16	82137.63	0.77
z2	undated core	1815.36	713.58	3153.08	527.81	60.74	1693.87	28.99	1181.02	67235.69	0.59
z3	undated rim	3695.05	216.17	358.28	450.49	16.56	3649.25	2.48	425.61	80431.59	0.52
z3	undated core	1360.97	691.40	7607.86	699.43	56.87	4030.21	306.25	1737.80	67366.71	0.58
z5	rim	697.26	307.03	1314.17	469.22	28.12	992.86	13.22	717.85	78267.55	0.36
z5	undated core	1438.58	519.67	2870.22	684.63	42.35	2120.47	66.45	1346.35	69297.91	0.74
z7	core	905.60	694.37	986.70	968.89	116.05	4040.66	77.40	2308.33	69873.82	1.06
z8	core	492.15	908.86	1007.12	417.78	23.39	322.90	10.30	1567.37	70247.14	0.65
z10	rim	3041.06	848.06	5400.43	731.07	291.20	4625.42	254.38	1983.66	78632.64	1.13
z11	undated rim	14644.19	419.04	1884.85	397.11	100.51	8168.64	22.32	681.45	79271.76	1.60
z11	undated core	3554.12	1367.02	8011.02	912.33	72.60	4806.82	352.97	1985.23	69519.63	0.74
z12	disc rim	1703.34	726.92	8355.07	825.38	44.08	5338.66	503.97	1619.07	79971.38	0.71
z16	core	638.22	232.92	2264.88	312.84	18.73	1047.04	45.43	1021.75	72840.67	0.55

Zrc	Interval[a]	La ppm	Ce ppm	Pr ppm	Nd ppm	Sm ppm	Eu ppm	Gd ppm	Tb ppm	Dy ppm	Ho ppm	Er ppm	Tm ppm
Sample S103A													
z2	disc rim	0.52	4.99	0.83	4.68	2.33	0.60	7.08	3.76	71.32	35.62	211.91	70.20
z2	undated core	2.14	14.14	2.91	13.39	3.91	2.79	6.72	2.41	44.00	22.78	164.83	57.27
z3	undated rim	2.45	24.45	2.86	17.56	14.85	3.49	52.32	16.08	182.73	64.67	277.29	58.04
z4	undated rim	0.25	2.03	0.28	1.60	1.48	0.54	3.94	2.97	52.72	25.68	159.34	52.86
z4	undated core	5.15	50.64	7.08	40.74	28.84	11.55	64.37	16.80	176.95	51.38	201.65	41.67
z5	disc rim	10.67	75.15	12.46	69.21	38.61	16.29	70.40	18.86	186.12	52.55	243.39	64.56
z7	rim	0.08	0.75	0.11	0.47	0.69	0.13	3.43	2.42	49.67	22.72	142.16	44.84
z7	undated core	3.63	30.67	5.02	28.50	16.94	11.08	37.23	11.44	119.04	38.14	183.40	48.14
z8	disc rim	0.09	0.74	0.13	0.98	0.67	0.17	3.63	2.69	51.23	22.82	145.08	47.16
z8	undated core	4.01	42.74	6.02	36.45	27.00	7.64	68.76	20.54	228.40	73.55	311.44	65.12
z9	rim	11.81	115.11	16.99	88.41	62.36	35.99	116.89	29.82	231.55	61.52	215.86	46.98
z10	rim	27.43	219.65	30.49	168.02	96.85	112.30	179.43	47.11	459.25	116.85	441.66	100.22
z10	undated core	0.16	4.92	0.11	1.01	0.97	0.42	6.74	3.20	58.49	25.95	150.54	46.48
z11	rim	0.09	0.49	0.03	0.59	0.46	0.11	3.28	1.88	53.63	22.71	142.19	47.47
z11	undated core	1.71	11.98	1.32	8.57	8.11	2.64	33.68	10.79	135.47	49.78	224.78	50.51
z12	rim	0.45	6.93	0.58	4.46	6.13	0.99	25.44	8.40	111.48	41.78	207.04	51.92
z13	rim	12.30	80.40	12.99	67.14	40.81	11.14	65.96	18.74	187.41	60.18	287.23	85.02
z14	rim	0.78	9.20	0.77	5.44	4.62	1.04	13.19	4.75	66.94	24.96	127.84	32.87
z15	rim	0.20	2.88	0.26	1.20	1.87	0.61	8.06	3.61	53.68	23.17	126.04	37.29
z15	undated core	0.71	9.23	1.04	6.86	5.75	2.83	19.80	5.97	71.85	24.62	107.83	25.12
z16	rim	0.09	1.31	0.08	0.61	0.90	0.17	4.44	2.39	44.89	21.41	122.61	40.68
z16	undated core	0.79	24.54	1.20	8.73	10.00	1.96	43.38	13.04	151.98	53.89	218.40	46.30
Sample S162A													
z1	disc rim	30.12	251.00	48.17	235.66	58.42	198.77	90.92	20.58	173.83	40.22	148.31	26.34
z1	core	13.93	109.40	19.65	90.62	21.97	91.74	40.97	11.17	125.05	40.21	201.92	50.41
z2	undated rim	3.05	23.01	5.09	26.46	9.02	11.33	17.91	3.81	24.80	5.15	13.10	2.22
z2	undated core	6.11	50.55	10.71	62.56	25.12	52.29	56.59	12.09	96.70	20.19	66.75	9.82
z3	undated rim	4.09	34.16	7.70	44.79	16.93	15.93	29.87	7.70	72.76	16.46	50.49	9.46
z3	undated core	39.65	245.67	47.37	251.54	84.53	125.03	151.40	39.02	344.51	81.31	261.29	44.66
z4	rim	2.07	11.07	1.64	7.82	3.22	3.14	10.41	2.77	25.66	5.50	15.26	2.19
z4	core	1.19	6.56	1.03	5.60	3.91	2.33	20.51	4.72	28.85	3.72	9.06	1.04
z6	undated rim	0.84	7.86	1.82	10.54	5.29	4.25	13.66	3.67	29.03	6.38	17.94	3.42
z6	undated core	2.01	16.58	3.45	21.50	10.02	13.52	21.23	5.81	46.11	10.71	37.95	6.69
z7	undated core	0.34	2.85	0.54	3.59	2.86	2.06	9.87	2.82	26.33	6.99	22.18	4.26
z8	undated rim	25.14	202.00	38.82	218.31	74.30	89.63	88.29	19.52	169.29	40.45	157.50	29.70
z8	undated core	3.75	93.86	4.61	24.71	11.62	11.25	29.19	7.51	84.03	30.77	141.70	33.51
z9	undated rim	0.89	9.03	2.23	17.35	10.59	11.50	27.60	6.00	46.39	9.53	27.78	4.80
z9	core	7.66	127.34	16.18	111.73	50.08	66.00	103.39	21.73	188.74	57.75	271.12	65.76
z13	undated core	9.62	174.98	16.97	88.90	34.07	38.11	53.60	12.28	136.07	46.52	234.94	51.77
z14	undated rim	4.58	34.47	6.74	40.26	14.87	21.32	28.69	5.69	38.16	8.99	19.19	3.97
z14	undated core	7.42	51.61	10.60	56.41	21.71	32.51	37.21	7.68	56.80	10.51	30.78	4.86
z18	core	1.78	14.49	3.19	18.03	10.06	7.61	30.63	7.04	45.34	7.78	21.17	3.21
z21	undated rim	6.20	46.50	9.18	43.71	15.81	28.52	26.11	5.43	39.03	8.56	23.07	4.32
z21	undated core	7.53	47.48	7.82	42.40	14.11	26.00	33.39	8.43	89.44	26.51	128.13	31.07
Sample F28A													
z1	undated rim	18.48	70.39	11.04	52.51	22.85	32.45	45.37	17.04	211.16	75.24	349.37	79.15
z1	undated core	130.52	550.87	81.18	380.90	201.53	568.31	310.94	94.78	1091.56	328.61	1399.16	315.57
z2	undated rim	7.97	31.99	5.79	29.19	9.52	7.54	23.18	6.78	69.31	18.24	54.14	9.72
z2	undated core	91.83	429.87	69.52	317.48	72.16	76.25	68.82	11.95	115.43	30.20	97.31	15.49
z3	undated rim	7.73	20.43	2.75	13.41	5.89	7.90	17.66	5.51	51.00	12.61	38.63	7.26
z3	undated core	19.44	65.54	9.32	45.14	20.68	67.96	37.34	11.62	145.04	49.65	248.49	62.46
z5	rim	31.39	112.54	16.72	83.63	25.27	13.67	40.18	9.22	87.12	18.96	70.65	13.97
z5	undated core	15.20	67.47	11.08	57.89	22.39	13.98	34.02	8.70	111.65	40.16	208.46	55.50
z7	core	13.19	58.69	9.19	48.23	17.30	16.58	34.57	11.76	182.37	72.10	386.91	101.11
z8	core	17.64	39.08	4.44	20.58	8.30	4.13	28.21	10.39	141.44	46.55	219.42	46.46
z10	rim	64.43	252.30	42.59	197.48	53.43	54.64	71.22	16.42	170.39	59.70	279.67	73.34
z11	undated rim	83.58	149.38	25.86	112.46	36.05	76.78	34.84	8.18	83.96	18.22	61.03	10.63
z11	undated core	70.09	137.90	22.07	94.92	29.66	74.42	43.23	12.03	161.61	59.80	311.23	82.82
z12	disc rim	33.74	94.92	13.68	58.31	14.77	19.57	24.49	8.16	124.77	47.14	263.19	64.13
z16	core	5.80	32.16	4.43	24.37	10.87	3.50	26.17	7.39	89.64	31.45	155.95	37.72

Zrc	Interval[a]	Yb ppm	Lu ppm	Hf ppm	Th ppm	U ppm	$(La/Yb)_N$[b]	Eu/Eu*[c]	Ce/Ce*[d]	Th/U
Sample S103A										
z2	disc rim	887.17	182.06	16897.15	45.93	2065.11	0.00	0.42	1.50	0.02
z2	undated core	853.34	185.54	14992.42	27.38	1938.28	0.00	1.65	1.16	0.01
z3	undated rim	528.84	95.62	9922.72	518.28	1045.80	0.00	0.34	1.98	0.50
z4	undated rim	652.10	136.61	17522.63	58.57	1718.80	0.00	0.64	1.63	0.03
z4	undated core	455.61	70.23	10053.05	798.17	857.58	0.01	0.79	1.72	0.93
z5	disc rim	657.20	123.23	16501.75	708.96	1973.84	0.01	0.94	1.39	0.36
z7	rim	579.11	114.74	16347.36	24.53	1639.20	0.00	0.22	1.65	0.01
z7	undated core	564.93	111.52	13990.98	244.43	1259.70	0.00	1.31	1.47	0.19
z8	disc rim	602.90	120.73	16025.27	17.67	1630.86	0.00	0.27	1.43	0.01
z8	undated core	611.75	107.01	11062.98	650.73	1305.97	0.00	0.52	1.74	0.50
z9	rim	503.00	89.71	11727.39	577.33	984.83	0.02	1.27	1.64	0.59
z10	rim	1007.34	175.05	15717.51	223.26	2084.91	0.02	2.57	1.64	0.11
z10	undated core	551.20	115.57	13882.81	102.82	1693.31	0.00	0.37	8.58	0.06
z11	rim	584.54	109.95	17949.18	22.12	1697.84	0.00	0.19	2.21	0.01
z11	undated core	474.21	82.44	10176.57	285.58	836.64	0.00	0.42	1.86	0.34
z12	rim	550.17	91.80	11163.78	200.58	1059.57	0.00	0.21	2.82	0.19
z13	rim	1035.50	171.95	15087.83	640.40	2557.85	0.01	0.65	1.39	0.25
z14	rim	379.08	66.65	12062.49	153.69	828.84	0.00	0.38	2.63	0.19
z15	rim	448.77	78.18	12817.12	77.20	1140.36	0.00	0.41	2.59	0.07
z15	undated core	246.38	42.06	9575.78	115.84	436.78	0.00	0.73	2.17	0.27
z16	rim	564.07	102.78	13649.88	31.53	1379.11	0.00	0.22	3.63	0.02
z16	undated core	411.21	66.59	8942.81	266.22	451.62	0.00	0.24	5.01	0.59
Sample S162A										
z1	disc rim	229.96	35.90	12153.22	37.84	1840.49	0.09	8.32	1.29	0.02
z1	core	568.26	97.17	12694.41	53.29	4324.15	0.02	9.23	1.35	0.01
z2	undated rim	17.47	2.56	10462.34	2.92	378.30	0.13	2.67	1.13	0.01
z2	undated core	85.66	13.11	9156.66	4.75	605.79	0.05	4.10	1.19	0.01
z3	undated rim	58.73	9.44	11386.76	7.33	481.79	0.05	2.15	1.14	0.02
z3	undated core	391.54	65.11	11588.28	83.64	2460.46	0.07	3.34	1.21	0.03
z4	rim	16.22	2.70	9194.61	1.30	170.20	0.09	1.51	1.39	0.01
z4	core	8.54	1.12	9619.52	4.45	421.17	0.10	0.64	1.36	0.01
z6	undated rim	27.53	3.52	11432.78	2.42	294.65	0.02	1.45	1.13	0.01
z6	undated core	63.26	11.97	9760.01	2.82	399.98	0.02	2.76	1.21	0.01
z7	undated core	33.95	6.10	10862.69	4.53	318.53	0.01	1.06	1.31	0.01
z8	undated rim	276.34	44.41	12412.62	232.73	1326.11	0.07	3.38	1.28	0.18
z8	undated core	352.21	65.77	10703.91	641.99	1119.04	0.01	1.78	4.77	0.57
z9	undated rim	36.37	5.65	10961.09	13.30	197.82	0.02	1.95	1.08	0.07
z9	core	732.35	131.34	12968.37	889.24	1525.33	0.01	2.74	2.05	0.58
z13	undated core	532.57	98.04	10035.28	1333.66	1498.72	0.01	2.72	2.61	0.89
z14	undated rim	30.26	3.54	11525.79	2.91	401.10	0.11	3.10	1.25	0.01
z14	undated core	38.81	5.44	10938.21	4.54	540.69	0.14	3.47	1.18	0.01
z18	core	23.13	3.02	10098.32	7.12	426.08	0.06	1.22	1.15	0.02
z21	undated rim	43.51	5.70	11707.55	3.94	455.41	0.10	4.27	1.24	0.01
z21	undated core	333.80	65.87	10733.79	97.01	2945.05	0.02	3.52	1.36	0.03
Sample F28A										
z1	undated rim	753.95	128.15	10222.21	71.42	2707.36	0.02	3.02	1.18	0.03
z1	undated core	3023.18	440.63	11141.34	353.62	10247.78	0.03	6.92	1.28	0.03
z2	undated rim	76.14	11.45	11906.54	22.13	549.95	0.08	1.49	1.11	0.04
z2	undated core	108.47	12.93	10477.76	11.08	803.50	0.61	3.26	1.26	0.01
z3	undated rim	60.30	7.85	11268.49	16.98	412.02	0.09	2.19	1.08	0.04
z3	undated core	658.13	112.31	8340.16	47.72	2335.12	0.02	7.40	1.19	0.02
z5	rim	126.41	20.86	11422.26	25.42	354.17	0.18	1.31	1.19	0.07
z5	undated core	613.65	105.51	9014.74	32.50	1920.85	0.02	1.55	1.22	0.02
z7	core	1148.08	185.98	8254.00	87.92	4183.26	0.01	2.03	1.26	0.02
z8	core	432.17	68.78	10318.65	33.97	455.87	0.03	0.74	1.05	0.07
z10	rim	763.90	130.71	9865.70	33.21	1861.83	0.06	2.71	1.14	0.02
z11	undated rim	84.96	11.33	11933.77	23.74	436.86	0.71	6.53	0.78	0.05
z11	undated core	955.86	158.92	8903.07	42.91	2213.14	0.05	6.35	0.85	0.02
z12	disc rim	708.54	117.71	9041.30	64.76	2920.10	0.03	3.13	1.08	0.02
z16	core	381.38	73.80	10737.74	196.04	1444.81	0.01	0.61	1.48	0.14

Zrc	Interval[a]	Al ppm	P ppm	Ca ppm	Sc ppm	Ti ppm	Fe ppm	Sr ppm	Y ppm	Zr ppm	Sn ppm
Sample F28A											
z17	disc rim	7327.14	690.41	2935.65	625.93	115.29	6001.56	58.43	1886.12	70354.45	0.91
z18	rim	2682.02	402.89	342.00	601.49	22.76	2659.30	2.93	804.82	77529.23	0.44
z18	undated core	557.58	491.69	1692.93	632.61	19.74	994.43	80.00	1055.40	65811.62	0.83
z19	undated rim	4178.18	640.37	907.83	441.06	70.62	4459.83	7.20	723.30	82848.70	19.97
z19	undated core	3558.52	927.20	4679.29	541.61	37.59	3822.33	128.45	2414.19	71580.03	0.81
z20	rim	767.98	578.92	2054.53	600.75	19.34	1404.86	75.66	1041.63	78992.62	0.78
z20	undated core	3045.54	431.26	218.60	296.07	10.14	604.06	2.77	1007.37	66616.53	0.69
z21	core	3794.49	567.58	4366.70	640.03	36.19	3778.89	173.22	1125.09	70606.14	0.75
Sample S106A											
z1	rim	16.54	75.10	186.11	323.85	5.30	67.94	2.22	843.01	81587.49	0.27
z1	core	5.31	98.74	226.88	292.61	8.14	40.54	0.35	310.70	70877.53	0.57
z2	core	320.54	122.97	305.04	313.75	46.99	406.44	6.36	785.29	69882.82	0.44
z3	rim	4.18	345.98	267.67	362.31	3.42	202.83	8.15	742.27	95288.04	0.80
z3	core	57.28	134.51	186.76	299.05	30.99	75.64	0.51	389.75	72982.73	0.59
z4	core	87.33	159.07	224.27	330.69	33.64	997.74	1.04	642.33	79292.37	0.53
z5	rim	1004.94	253.07	2109.20	321.25	85.07	21048.94	80.45	3144.53	78678.93	1.02
z5	core	1084.36	162.13	242.27	298.80	112.54	1871.05	3.64	1138.72	72392.75	0.70
z6	rim	338.73	213.55	484.28	349.32	65.38	1500.27	5.23	1639.04	79950.18	0.73
z6	core	16.02	283.99	992.25	306.95	13.99	99.90	0.98	279.01	74780.76	1.10
z9	undated rim	53.60	307.59	1027.33	329.61	14.71	228.07	28.74	785.91	79875.74	0.81
z9	undated core	5.31	117.86	203.81	314.04	10.64	40.95	0.60	400.91	76527.42	0.75
z10	rim	256.73	169.29	480.09	302.39	72.81	183.21	6.05	1266.42	70501.14	0.73
z10	undated core	77.19	99.23	202.36	315.22	14.67	103.18	1.70	512.75	76030.28	0.49
z11	core	58.67	78.21	256.43	303.58	7.82	68.55	0.96	923.43	75082.30	0.36
z12	core	9.19	80.33	211.63	325.19	9.01	95.20	0.43	626.59	79416.49	0.43
z13	rim	16.14	157.28	92.46	321.96	5.20	181.56	0.63	606.74	76878.34	0.13
z13	core	64.85	101.29	203.64	314.77	6.58	60.81	0.46	675.05	76235.21	0.56
z14	core	62.22	131.32	251.02	288.97	12.20	179.17	2.18	655.27	71140.99	0.47
z15	rim	500.99	353.70	474.38	344.78	59.53	751.95	3.07	1053.88	75959.59	0.96
z15	undated core	45.73	80.94	238.97	304.74	10.46	254.60	0.48	343.83	73750.14	0.64
z16	rim	752.25	262.00	571.18	288.97	34.94	713.33	22.95	1073.83	71651.57	0.52
z16	undated core	2810.71	137.03	325.35	312.48	47.57	3906.92	12.42	1347.77	75395.60	0.81
z18	rim	20.70	246.27	325.48	346.17	4.86	147.37	3.42	714.79	84235.42	0.30
z18	core	5.65	91.45	268.33	285.11	7.30	36.43	0.44	452.48	68180.88	0.52

Zrc	Interval[a]	La ppm	Ce ppm	Pr ppm	Nd ppm	Sm ppm	Eu ppm	Gd ppm	Tb ppm	Dy ppm	Ho ppm	Er ppm	Tm ppm
Sample F28A													
z17	disc rim	61.06	263.63	47.95	228.90	73.46	145.44	90.60	20.26	191.83	58.47	255.49	60.97
z18	rim	2.03	9.82	2.11	10.53	5.82	8.62	11.73	4.84	68.12	22.98	108.51	25.12
z18	undated core	2.54	21.16	3.02	17.31	8.15	19.22	14.80	5.11	78.47	32.21	178.70	49.01
z19	undated rim	12.47	52.73	10.25	70.19	21.42	19.17	40.62	10.95	85.14	24.75	94.99	17.39
z19	undated core	110.55	529.21	91.92	510.97	154.55	119.83	181.92	29.53	240.80	61.46	223.59	44.18
z20	rim	10.60	35.00	8.16	41.39	11.98	12.58	20.50	7.98	101.29	34.68	161.22	42.51
z20	undated core	2.57	18.49	2.18	12.06	6.69	4.77	24.48	7.70	99.91	34.06	160.29	32.16
z21	core	22.53	105.27	13.43	59.20	18.14	313.77	26.45	7.54	93.53	31.56	163.60	43.05
Sample S106A													
z1	rim	3.22	22.58	1.04	3.26	2.91	1.12	12.97	3.54	51.41	23.78	115.08	37.35
z1	core	0.60	8.97	0.54	3.20	2.49	0.55	6.60	1.90	24.11	9.66	47.06	11.32
z2	core	19.50	82.23	8.58	45.10	20.36	4.50	33.50	8.26	85.12	26.05	116.85	28.69
z3	rim	0.83	2.75	0.24	1.11	0.47	0.09	5.60	2.20	48.29	21.92	148.65	47.13
z3	core	13.40	85.66	6.29	25.88	10.90	1.03	16.27	3.76	37.80	10.95	57.08	15.55
z4	core	1.15	22.38	1.32	8.31	5.59	0.73	12.94	3.83	47.00	18.17	97.20	27.34
z5	rim	210.26	1379.75	103.11	482.84	178.64	26.92	259.06	55.93	473.69	123.72	471.14	100.91
z5	core	27.33	126.47	12.12	56.80	24.48	3.07	36.41	9.96	102.40	33.96	169.67	43.19
z6	rim	98.14	368.56	37.22	174.05	78.73	6.25	121.88	25.66	219.67	58.30	193.54	49.12
z6	core	4.01	20.53	1.50	6.80	3.22	0.42	7.46	2.05	24.93	8.61	39.92	10.02
z9	undated rim	13.92	47.54	5.01	26.21	9.24	29.31	14.48	3.22	49.08	21.04	126.28	42.94
z9	undated core	0.19	7.72	0.08	0.72	1.22	0.42	6.53	2.11	28.84	11.92	66.24	18.16
z10	rim	74.51	206.20	23.97	122.08	52.89	5.23	108.54	22.06	212.91	45.00	180.33	37.53
z10	undated core	3.92	29.05	1.82	9.02	4.72	0.90	10.36	3.22	38.16	15.39	86.74	23.30
z11	core	1.22	26.29	1.19	6.87	5.19	1.26	19.48	5.79	70.94	26.55	137.23	35.39
z12	core	0.10	14.69	0.06	0.95	2.10	0.78	12.15	3.83	49.29	18.64	92.81	23.38
z13	rim	1.26	14.28	0.89	4.60	2.26	1.27	3.99	1.86	35.37	20.04	103.43	32.90
z13	core	0.50	16.76	0.35	2.40	2.57	0.92	12.72	3.84	51.24	20.21	104.47	26.28
z14	core	6.82	37.68	2.88	15.01	8.97	1.60	20.40	5.57	62.39	20.04	95.08	21.92
z15	rim	14.92	219.78	13.11	53.81	33.36	2.62	57.15	13.29	111.57	31.01	129.71	35.39
z15	undated core	0.37	13.32	0.31	1.82	2.05	0.62	7.91	2.26	29.24	10.59	52.74	12.56
z16	rim	35.32	117.88	19.02	91.96	47.02	18.23	60.61	13.14	135.80	36.76	147.62	40.00
z16	undated core	56.73	137.02	26.37	127.05	57.00	6.99	92.29	20.60	177.58	45.65	162.55	33.96
z18	rim	4.02	15.75	1.07	4.27	2.57	2.25	8.65	2.95	47.55	19.66	116.94	38.73
z18	core	0.04	9.88	0.06	0.88	1.55	0.54	7.96	2.57	34.28	13.40	67.35	17.70

Zrc	Interval[a]	Yb ppm	Lu ppm	Hf ppm	Th ppm	U ppm	$(La/Yb)_N$[b]	Eu/Eu*[c]	Ce/Ce*[d]	Th/U
Sample F28A										
z17	disc rim	588.69	97.25	9346.45	50.15	2099.84	0.07	5.45	1.13	0.02
z18	rim	227.80	35.38	12036.35	8.02	698.56	0.01	3.13	1.04	0.01
z18	undated core	584.36	108.71	8905.72	58.58	1264.53	0.00	5.29	1.63	0.05
z19	undated rim	142.82	23.21	14231.68	15.93	713.64	0.06	1.96	1.07	0.02
z19	undated core	411.06	63.57	10625.26	45.23	1483.00	0.19	2.18	1.21	0.03
z20	rim	464.29	79.13	11843.87	4.88	1525.31	0.02	2.44	0.88	0.00
z20	undated core	304.56	53.09	9054.49	143.01	356.52	0.01	1.01	1.79	0.40
z21	core	503.41	79.31	10023.58	18.16	1384.03	0.03	43.76	1.46	0.01
Sample S106A										
z1	rim	440.71	84.90	14200.31	174.36	411.05	0.01	0.47	3.01	0.42
z1	core	133.18	27.42	9588.36	42.02	76.67	0.00	0.39	3.58	0.55
z2	core	334.08	68.42	12250.15	75.74	329.57	0.04	0.52	1.56	0.23
z3	rim	680.83	124.20	19957.31	54.12	2231.13	0.00	0.10	1.48	0.02
z3	core	190.88	37.25	12810.71	40.21	408.84	0.05	0.24	2.28	0.10
z4	core	335.92	74.61	14054.02	67.14	485.99	0.00	0.25	3.89	0.14
z5	rim	1034.28	160.09	17732.47	55.03	1017.12	0.15	0.38	2.29	0.05
z5	core	493.16	114.05	14435.98	234.23	525.29	0.04	0.31	1.70	0.45
z6	rim	475.53	84.16	17812.83	93.91	920.44	0.15	0.19	1.49	0.10
z6	core	106.23	22.97	10047.17	33.76	86.55	0.03	0.26	2.05	0.39
z9	undated rim	557.91	100.95	15522.84	35.93	2070.51	0.02	7.72	1.39	0.02
z9	undated core	219.10	43.72	13878.22	43.43	407.97	0.00	0.36	14.80	0.11
z10	rim	455.56	73.63	15627.09	66.23	928.98	0.12	0.21	1.19	0.07
z10	undated core	289.19	57.14	12819.91	67.20	250.56	0.01	0.38	2.66	0.27
z11	core	395.45	86.10	13693.11	189.64	302.82	0.00	0.34	4.86	0.63
z12	core	271.56	52.72	12023.50	110.28	193.18	0.00	0.37	44.69	0.57
z13	rim	427.72	93.12	18316.80	131.56	1159.53	0.00	1.28	3.18	0.11
z13	core	307.46	63.35	12679.26	134.97	281.99	0.00	0.40	9.43	0.48
z14	core	239.08	46.54	10456.30	73.21	175.42	0.02	0.35	2.08	0.42
z15	rim	391.78	75.05	14296.27	71.66	914.99	0.03	0.18	3.57	0.08
z15	undated core	136.41	27.77	10757.92	51.43	96.52	0.00	0.41	8.96	0.53
z16	rim	491.06	91.43	14258.30	32.18	1367.50	0.05	1.04	1.10	0.02
z16	undated core	307.84	52.60	11583.63	46.18	218.97	0.13	0.29	0.87	0.21
z18	rim	549.23	100.00	16933.95	67.11	1692.73	0.01	1.32	1.82	0.04
z18	core	181.81	38.99	9476.37	67.41	134.82	0.00	0.38	39.22	0.50

[a]Notes on intervals: **rim**=trace element values averaged over depth interval of rim as dated by corresponding U-Pb depth profile; **disc rim**=trace element values averaged over depth interval of discordant rim identified on corresponding U-Pb depth profile; **undated rim**=in grains that were not dated or no rim (<1900 Ma) was encountered on the corresponding U-Pb depth profile, trace element values were averaged over the rim depth interval, as estimated from the trace element depth profile; **core**=in grains where a core (>1900 Ma) was encountered on the corresponding U-Pb depth profile, trace element values were averaged from beneath the rim to the base of the analysis crater, not including any mixed core-rim intervals; **undated core**=in grains that were not dated or no core (>1900 Ma) was encountered on the corresponding U-Pb depth profile, trace element values were averaged from beneath the rim to the base of the analysis crater, not including any mixed core-rim intervals.

[b]$(La/Yb)_N$=La/Yb ratio normalized to the chondrite values of Sun & McDonough (1989).
[c]$Eu/Eu^*=Eu_N/(0.5(Gd_N+Sm_N))$ where N denotes normalization to the chondrite values of Sun & McDonough (1989).
[d]$Ce/Ce^*=Ce_N/(0.5(La_N+Pr_N))$ where N denotes normalization to the chondrite values of Sun & McDonough (1989).

CHAPTER 4

Deciphering the Paleoproterozoic cooling history of the northeastern Trans-Hudson Orogen, Baffin Island (Canada), using $^{40}Ar/^{39}Ar$ step-heating and UV laserprobe thermochronology

Diane Skipton[1], D.A. Schneider[1], D.A. Kellett[2] and N.L. Joyce[3]

[1] *Department of Earth and Environmental Sciences, University of Ottawa, Ottawa, Ontario K1N 6N5, Canada*

[2] *Geological Survey of Canada, Natural Resources Canada, 1 Challenger Dr., Dartmouth, Nova Scotia B2Y 4A2, Canada*

[3] *Geological Survey of Canada, Natural Resources Canada, 601 Booth St., Ottawa, Ontario K1A 0E8, Canada*

Abstract

The previously unstudied cooling and exhumation history of mid-crustal rocks exposed on southeastern Baffin Island (Canada) provides new insights into the post-orogenic evolution of the Paleoproterozoic Trans-Hudson Orogen (THO). New $^{40}Ar/^{39}Ar$ step-heat analyses of biotite, muscovite and phlogopite grains and core-to-rim intragrain $^{40}Ar/^{39}Ar$ analyses of muscovite show a range of apparent ages compatible with slow regional cooling following syn-collisional peak metamorphism. Twenty-nine amphibolite- to granulite-facies rocks were dated using the $^{40}Ar/^{39}Ar$ step-heating laser (CO_2) method. $^{40}Ar/^{39}Ar$ spot analyses were performed along transects within large muscovite grains from three samples using an ultraviolet (UV) laser to investigate within-grain $^{40}Ar/^{39}Ar$ age variations. The step-heating apparent ages range from 1788 ± 3 to 1622 ± 2 Ma for biotite, 1720–1630 ± 3 Ma for phlogopite and 1729–1657 ± 3 Ma for muscovite. UV spot $^{40}Ar/^{39}Ar$ analyses in the three targeted muscovite grains range from 1661–1640 ± 3–4 Ma, 1675–1645 ± 3 Ma and 1680–1652 ± 6 Ma, with core-to-rim apparent age gradients of 20–30 Myr.

Previous U–Pb studies have resolved peak metamorphism in this region of the THO to between ca. 1860–1820 Ma and identified additional zircon and monazite populations at ca. 1800–1750 Ma that imply protracted late- to post-THO tectonism. Numerical diffusion models for Ar in muscovite were conducted to test different Proterozoic cooling and exhumation scenarios. Comparisons with our $^{40}Ar/^{39}Ar$ age data attest to cooling rates of ~1–2°C/Myr following peak metamorphism and ~1.5–2.5°C/Myr after ca. 1740 Ma. Anomalously old apparent $^{40}Ar/^{39}Ar$ ages, in cases equivalent to U–Pb zircon crystallization ages, likely result from variable incorporation of excess Ar. The results suggest that the mid-crustal rocks on southeastern Baffin Island remained hotter than ~420–450°C for ~150–200 Myr after peak metamorphism, with subsequent slow cooling and denudation rates that are typical of Proterozoic orogens. The apparent absence of orogenic collapse implies that, despite high temperatures and estimated maximum crustal thicknesses comparable to those of large, hot orogens, the THO remained gravitationally stable during its terminal phase.

1. Introduction

The $^{40}Ar/^{39}Ar$ dating method has been used extensively on potassium-bearing micas such as muscovite, biotite and phlogopite to decipher exhumation and cooling histories in collisional orogens. Comparisons with nearly equivalent U–Pb ages from minerals such as zircon, monazite, and titanite have led to interpretations of rapid cooling and exhumation rates via orogenic collapse in ancient, large, hot orogens such as the Grenville (e.g., Rivers, 2008; Schneider et al., 2013) and have helped to constrain rapid extrusion rates in active orogens such as the Himalaya (e.g., Kellett et al., 2013). However, $^{40}Ar/^{39}Ar$ mica ages that are nearly equivalent to U–Pb ages can also result from incorporation of excess argon during mica crystallization or through diffusion from the grain boundary network (cf., Kelley, 2002). Additionally, an $^{40}Ar/^{39}Ar$ mica age can reflect mica

crystallization close to or below the nominal closure temperature of Ar (e.g., Warren et al., 2012a; Cossette et al., 2015), which may be indistinguishable from U–Pb ages that record metamorphic growth or coupled dissolution–reprecipitation (recrystallization) of monazite and zircon at temperatures as low as ~450°C (e.g., Catlos et al., 2001; Seydoux-Guillaume et al., 2002; Pyle and Spear, 2003; Williams et al., 2011).

The step-heat method progressively releases Ar from the least to most retentive sites in a grain, yielding apparent $^{40}Ar/^{39}Ar$ ages for each heating step and increment of gas released. A "plateau age" is a statistical approach to evaluating the homogeneity of those step ages, calculated from several consecutive steps with equivalent ages, within error, and is typically considered to reflect the true cooling age of the grain or aliquot investigated (cf., McDougall and Harrison, 1999). However, $^{40}Ar/^{39}Ar$ laser spot age profiles of the grain are often required to confirm that the Ar isotopic distribution within a crystal truly represents temperature-controlled volume diffusion of ^{40}Ar out of the grain. As closure temperature depends on cooling rate, numerical diffusion models can be matched to measured core-to-rim Ar age profiles to relate that diffusion profile to a cooling rate (e.g., Warren et al., 2012a). Consequently, interpretations of $^{40}Ar/^{39}Ar$ ages and related cooling histories must be grounded in a well-constrained P-T-t-d framework in which the relative timing of mica crystallization is determined, and should ideally include measurements of within-grain Ar distribution using ultraviolet (UV) laser spot analyses and comparisons with numerical diffusion models.

We present $^{40}Ar/^{39}Ar$ step-heat ages for biotite, muscovite and phlogopite from a mid-crustal section of the Paleoproterozoic Trans-Hudson Orogen (THO) on Hall Peninsula, southeastern Baffin Island (Canada), together with UV laser spot transects across muscovite from three samples, and numerical thermal diffusion models. The study area comprises Paleoproterozoic

supracrustal sequences overlying Archean orthogneiss basement, and has an established tectono-metamorphic history involving peak amphibolite- to granulite-facies metamorphism and three regional deformation events (Steenkamp and St-Onge, 2014; Skipton and St-Onge, 2014; Skipton et al., 2016a, b). Given the nominal closure temperatures of Ar in biotite, muscovite and phlogopite of ~300°C, ~420–450°C and ~360–430°C, respectively (McDougall and Harrison, 1999; Harrison et al., 2009), which are much lower than peak metamorphic temperatures on Hall Peninsula, $^{40}Ar/^{39}Ar$ thermochronology of these minerals enables interpretation of the cooling history of this region. With limited information from highly dispersed K–Ar ages on a few samples from the study area (Wanless et al., 1968, 1974, 1979; Lowdon, 1960) and a similar paucity of K–Ar ages in the Québec–Labrador–Baffin segment of the THO (as compiled by St-Onge et al., 2006a), the low temperature history of the northeastern segment of the THO remains poorly understood. The crustal thickness and peak temperatures reached during THO peak orogenesis are emblematic of a large, hot orogen, as defined by Beaumont et al. (2006), and the THO has been closely compared with the Himalayan Orogen (St-Onge et al., 2006b). However, unlike other ancient large, hot orogens such as the Grenville, the THO does not appear to preserve extensional structures or evidence of rapid cooling indicative of orogenic collapse (e.g., Corrigan et al., 2009). Combining our new $^{40}Ar/^{39}Ar$ multi-mineral step-heating and UV laser muscovite data with numerical diffusion models is a robust method to thoroughly test different cooling scenarios, including those involving excess Ar, that may be applied in other orogens to more confidently constrain cooling histories. Our results support relatively slow cooling rates in the THO, suggesting that gravitational stability in the terminal phase of the THO was sufficient to prevent orogenic collapse or, possibly, that localized collapse structures and rapid cooling/exhumation signatures remain undiscovered.

2. Tectonic Setting

The Paleoproterozoic THO is an accretionary/collisional zone that separates the lower-plate Superior craton from the upper Churchill plate collage of Archean crustal blocks (Fig. 1; Hoffman, 1988; Lewry and Collerson, 1990). The upper Churchill plate in the Quebec–Baffin segment of the THO consists of the Rae craton and several microcontinents that were accreted to the southeastern Rae margin between ca. 1880–1840 Ma, prior to the collision of the Churchill collage with the lower-plate Superior craton at 1820–1795 Ma (St-Onge et al., 2007, 2009). The Meta Incognita microcontinent (MIM), now exposed on southern Baffin Island (Fig. 1), accreted to the Rae margin between ca. 1883 and 1865 Ma (St-Onge et al., 2006b). The Archean orthogneiss basement of the MIM is overlain by a Paleoproterozoic clastic-carbonate-shelf succession (Lake Harbour Group), and the basement and cover sequences are intruded by ca. 1865–1848 Ma monzogranite to quartz-diorite plutons (Cumberland Batholith; Scott and Wodicka, 1998; St-Onge et al., 2000, 2007; Corrigan et al., 2009). Hall Peninsula on Baffin Island forms the eastern edge of the MIM (Fig. 1), and also consists of Archean orthogneiss basement overlain by Paleoproterozoic supracrustal sequences that are intruded by Paleoproterozoic granitic-to-dioritic plutons (Blackadar, 1967; Scott, 1999; Machado et al., 2013; Steenkamp and St-Onge, 2014). Different cratonic parentages have been proposed for the Archean crystalline basement that underlies the MIM and Hall Peninsula, including the Superior craton, the Rae craton, the North Atlantic craton, the Core Zone in northern Labrador, the Aasiaat domain in West Greenland or a unique cratonic block (Jackson et al., 1990; Scott, 1999; St-Onge et al., 2000; St-Onge et al., 2009).

3. Geology of Hall Peninsula

Western Hall Peninsula comprises a Paleoproterozoic (ca. 2100–1906 Ma) clastic-carbonate sequence that hosts intrusions of monzogranite-to-quartz diorite emplaced at ca. 1892–1857 Ma (Fig. 2; Blackadar, 1967; Scott, 1999; Rayner, 2014, 2015). The strata also host leucogranite dikes, one of which crystallized at ca. 1867 Ma (Rayner, 2014). The eastern peninsula is dominated by an Archean (ca. 2920–2701 Ma; Scott, 1999; Rayner, 2014, 2015) orthogneiss complex comprising mostly tonalite and monzogranite with mafic enclaves (From et al., 2014). Sequences of Paleoproterozoic supracrustal rocks up to 10 km thick unconformably overlie the Archean basement, and also form panels up to ~3 km thick that are structurally interleaved with the basement (Steenkamp and St-Onge, 2014). The supracrustal sequences are dominantly clastic with mafic-to-intermediate sills and minor marble, calc-silicate and ironstone, and have an estimated maximum depositional age of ca. 1960 Ma (Rayner, 2014, 2015).

Peak metamorphic conditions range from mid-amphibolite-facies on the eastern peninsula to granulite-facies in the structurally-higher west (Steenkamp and St-Onge, 2014), forming three SE-striking metamorphic zones, which are characterized by peak metamorphic assemblages that define the dominant regional foliation (S_1) in pelite (Fig. 2; Skipton et al., 2016a). Pelite in the eastern mid-amphibolite-facies zone is characterized by the peak assemblage biotite + muscovite ± garnet ± sillimanite (fibrolite) ± K-feldspar with up to ~15% melt. Further west, in the upper-amphibolite-facies zone, pelite has the peak assemblage biotite + sillimanite + garnet + K-feldspar with ~10–20% melt. Pelite in the granulite-facies zone on the western peninsula is characterized by the peak assemblage sillimanite + K-feldspar + garnet ± orthopyroxene ± cordierite with ≥15% melt. Leucogranite dikes are hosted by granulite-facies strata, contain garnet ± cordierite and, commonly, pelitic enclaves, and are interpreted as melts of the host sequences (Dyck and St-Onge,

2014). Peak metamorphic conditions are estimated at 720–740 °C and 6.25–7.25 kbar in the eastern mid-amphibolite-facies zone, and increase progressively towards the west to 810–890 °C and 6.1–7.35 kbar in the granulite-facies zone (Skipton et al., 2016a). Evidence suggests that partial melting in the mid-amphibolite-facies zone generally occurred by vapour-absent muscovite dehydration whereas the granulite-facies zone attained temperatures sufficient for biotite dehydration melting (Dyck and St-Onge, 2014; Skipton et al., 2016a). In the central upper-amphibolite-facies zone, melt was likely generated through vapour-absent muscovite dehydration as well as, potentially, continuous (cordierite- and orthopyroxene-absent) biotite dehydration (Skipton et al., in 2016a).

Mineral-fabric relationships indicate post-thermal-peak mineral growth: minor post-S_1 biotite in all metamorphic zones, including biotite embaying garnet rims; and post-S_1 muscovite in the mid-amphibolite-facies zone (Skipton et al., 2016a). These retrograde minerals are interpreted to have grown during early cooling at amphibolite-facies conditions through reversal of mica dehydration reactions (Skipton et al., 2016a). As chlorite is absent and there is no pervasive hydrothermal veining or alteration (e.g., seritization), the area did not retrogress at greenschist-facies or undergo significant post-thermal-peak hydrothermal alteration. The remarkable preservation of high-grade metamorphic assemblages implies either rapid cooling or relatively dry post-thermal-peak conditions.

Grossular-enriched garnet cores, decompression textures such as cordierite replacing garnet, and retrograde mineral growth suggest an overall clockwise P–T path for Hall Peninsula (Skipton et al., 2016a). Recent *in situ* U–Pb monazite and U–Pb zircon depth-profiling dating have provided an estimate for the age of regional high-grade metamorphism on Hall Peninsula between ca. 1860–1820 Ma, probably representing prograde (near-peak) metamorphism at ca. 1860–1850 Ma, thermal peak conditions at ca. 1850–1830(?) Ma and early (near-peak) cooling at ca. 1820 Ma

(Fig. 3; Skipton et al., 2016b). These ages overlap with U–Pb zircon and monazite ages from previous studies of ca. 1886–1828 Ma (Fig. 3; Scott, 1999; Rayner, 2014, 2015).

The study area has undergone three regional deformation events: east-directed crustal shortening (D_1); thick-skinned east-directed folding and thrusting (D_2); and thick-skinned south-directed folding (D_3) (Steenkamp and St-Onge, 2014; Skipton et al., 2016a). The D_1 event produced the dominant regional metamorphic foliation (S_1), which strikes SSE, dips moderately to the WSW and is axial planar to east-vergent F_1 folds, along with lineations (L_1) that plunge towards SSE-NNW or approximately down-dip. During D_2, basement and cover were folded by east-vergent folds (F_2) and displaced by east-vergent thrusts (T_2) that juxtaposed Archean basement over Paleoproterozoic strata and placed higher-grade rocks over lower-grade rocks (Steenkamp and St-Onge, 2014; Dyck and St-Onge, 2014; Skipton et al., 2016a). D_3 produced map-scale folds (F_3) of basement and cover that are mostly south-vergent, along with decimetre-scale crenulations in micaceous pelites that define a crenulation cleavage (S_3). D_1 is interpreted as syn-thermal peak because D_1 fabrics are defined by peak metamorphic assemblages, whereas D_2 is inferred as syn- to post-thermal peak (Skipton et al., 2016a) and D_3 is considered post-thermal peak (Skipton and St-Onge, 2014). The age of D_1 is bracketed between a ca. 1873 Ma deformed monzogranite dike and a ca. 1830 Ma undeformed monzogranite dike that cross-cuts S_1 (Rayner, 2014, 2015). *In situ* U-Pb dating of S_1-aligned monazite grains constrain D_1 over a similar time period of ca. 1860–1820 Ma (Fig. 3; Skipton et al., 2016b). Minimum ages of D_2 and D_3 remain uncertain since cross-cutting intrusions have not been discovered.

Late- to post-orogenic tectonothermal activity in the study area is strongly suggested by regionally-occurring zircon rims and monazite domains with U–Pb ages of ca. 1800–1750 Ma (Fig. 3; Scott, 1999; Rayner, 2014, 2015; Skipton et al., 2016a, b). This younger population is

generally less abundant than ≥1820 Ma monazite and zircon and typically has no preferred structural alignment (Skipton et al., 2016a, b). Skipton et al. (2016b) interpret this younger population to have formed via fluid-assisted coupled dissolution-reprecipitation, probably triggered by the THO terminal collision (ca. 1820-1795 Ma; St-Onge et al., 2007) and related to post-kinematic pegmatitic dikes that are comparable to ca. 1795–1758 Ma dikes (Scott, 1997; Wodicka and Scott, 1997; St-Onge et al., 2006b) elsewhere in the northeast THO. Additionally, the relative abundance of ca. 1800–1750 Ma zircon and monazite in rocks deformed by post-thermal peak T_2 thrusts, F_2 folds and F_3 folds implies that these structures may have contributed to dissolution-reprecipitation of monazite and zircon (Skipton et al., 2016b). U-Pb titanite ages from Archean orthogneiss of ca. 1742–1730 Ma (ID-TIMS; Scott, 1999) suggest temperatures above ~550°C (Cherniak, 1993; Hawkins and Bowring, 1999) persisted at least 90 Myr following thermal peak. Potassium-Ar ages of biotite (ca. 1704–1507 Ma; Lowdon, 1960; Wanless et al., 1968, 1970), muscovite (ca. 1610 Ma; Lowdon, 1960) and hornblende (ca. 1670 Ma; Wanless et al., 1979) are variable but also support prolonged elevated thermal conditions (Fig. 3).

4. Methodology

4.1. Sampling strategy

To investigate the regional cooling history, we conducted step-heating analyses on individual grains separated from a suite of 29 samples collected across the peninsula, with peak metamorphic grades ranging from amphibolite- to granulite-facies (Fig. 2). The sample suite includes 20 pelites, 2 psammites, 4 marbles, 1 tonalitic gneiss, 1 amphibolite and 1 monzogranite (Table 1; refer to Appendix 1 for sample descriptions). Each sample contains ≥10% biotite ± muscovite or phlogopite, with no obvious signs of weathering or hydrothermal veining. Chlorite

is absent and the samples have not retrogressed to greenschist-facies; peak metamorphic minerals are preserved apart from those partially replaced by retrograde muscovite and biotite, interpreted to have grown at amphibolite-facies conditions (discussed below). The wide spatial distribution of biotite-bearing samples allows for a regional investigation of $^{40}Ar/^{39}Ar$ biotite step-heating ages. Step-heat analyses of phlogopite from four marbles and biotite–muscovite pairs from nine pelites provide a range of timing constraints on the regional cooling history. To investigate within-grain apparent age variations, muscovite from three pelites was selected for UV laser $^{40}Ar/^{39}Ar$ analyses on the basis of their paired biotite and muscovite step-heating ages, relatively wide spatial distribution (Fig. 2) and abundance of medium- to coarse-grained muscovite. Major element compositional maps were obtained for muscovite and biotite from these samples to evaluate intra-grain compositional trends and inform our $^{40}Ar/^{39}Ar$ age interpretations.

4.2. Compositional maps (EMPA)

We conducted compositional mapping on three muscovite grains and two biotite grains in thin sections of each sample analyzed with the UV laser technique (B75A, S92C, F122B). The mapped grains comprise S_1-aligned crystals, as well as grains that cross-cut S_1 (Appendix 1, Table A3.1; Figs. A3.1–3). Using the JEOL JXA-8230 Superprobe at the University of Ottawa (Canada), Al, Fe, Mg, K and Ca maps were obtained with the wavelength dispersive spectrometer (WDS) and Si, Ti, Cr and O maps were acquired using the energy dispersive spectrometer (EDS). The microprobe was operated with an accelerating voltage of 20 kV and a beam current of 40 nA using a spot size of 1 µm to create pixel maps up to ~300 x 300 pixels with a 20 µm pixel size and a 200 ms dwell time on each pixel. Following acquisition, the colour spectrum of each map was scaled to highlight the compositional variation within the mapped muscovite or biotite grain.

4.3. $^{40}Ar/^{39}Ar$ step-heat and UV laserprobe analyses

Each sample was crushed using a ceramic mortar and pestle. The crushed material was washed with water and acetone and then sieved to isolate the 250–500 μm fraction. The highest quality, most pristine muscovite, biotite and phlogopite grains were picked, avoiding grain fragments and grains with inclusions. The grains were packed into aluminum foil packets and arranged in 35 mm long vertical tubes in an aluminum canister, and then irradiated in the research nuclear reactor at McMaster University in Hamilton (Canada) for 320 h in position 8D with a medium total flux of ~1.3×10^{13} neutrons/cm^2/s operating at a 3 MW power level (cadmium-shielded). Neutron flux was monitored using the PP-20 hornblende monitor (Hb3gr equivalent) with an apparent age of 1074 ± 5 Ma (1σ; Jourdan et al., 2006). At least four PP-20 monitors were interspersed among the ten samples in each vertical tube of the irradiation can. The $^{40}Ar/^{39}Ar$ analyses were conducted at the Noble Gas Laboratory at the Geological Survey of Canada in Ottawa (Canada).

For step-heating analysis, individual grains were loaded into 1.5 mm diameter holes in a copper sample holder, which was placed into a CO_2 laser source chamber under an ultrahigh vacuum. A Photon Machines, Inc. Fusions 10.6 55 W CO_2 laser equipped with a beam-homogenizing lens was used to heat each muscovite grain for 30 s per step, and laser power was increased incrementally for each subsequent step. The heating schedules comprised 12–26 steps, ranging from 0.1 to 7 W. For the UV laser technique, each muscovite grain was loaded into a 5 mm diameter hole in an aluminum sample holder, which was loaded into a UV laser source chamber under ultrahigh vacuum. A pulsed wavelength-quadrupled New Wave Nd: YAG LUV266 (266 nm) UV laser was used to conduct single spot fusions forming two to three rim-core-rim transects on each grain, along with additional spots to ensure full coverage of potential

discrete age domains. For each spot, the laser was rastered over a 50 × 50 μm area at 85% laser power, 10 μm beam diameter, 10 μm raster spacing and 20 Hz repetition rate, penetrating to an approximate vertical depth of 10 μm. Each rim-core-rim transect included between 10 and 20 raster spots. Flat grain surfaces were targeted to ensure effective coupling between the laser and the muscovite grain, to avoid potential altered zones on uneven surfaces and to consistently sample the same mica sheet(s) within each grain.

The gas released during each incremental heating step or UV laser spot analysis was cleaned for 3–4 min using two SAES™ NP-10 getters held at ~400°C, and a room temperature getter containing HY-STOR® 201 calcium-nickel alloy pellets. The gas was then admitted to a Nu Instruments Limited Noblesse magnetic sector multicollector noble gas mass spectrometer. A Faraday cup was used to collect the ^{40}Ar signal while three ion-counting multipliers simultaneously collected ^{39}Ar, ^{37}Ar and ^{36}Ar using the MC-O multicollection method described in Kellett and Joyce (2014). Neutron flux gradients were evaluated by analyzing the PP-20 hornblende flux monitors and calculating J-factor values using linear interpolation between bracketing standards. Background values were measured in blank runs before and after each grain was analyzed and after every four incremental heating steps or UV laser spots. Background values are presented in the ^{40}Ar/^{39}Ar step-heating and UV laser data tables in Appendices 2 and 3, respectively, together with the correction factors applied to account for reactor-induced interference reactions. Atmospheric ^{40}Ar/^{36}Ar measurements were conducted periodically during each analysis session using aliquots of air transferred to the extraction line. Using these air shot analyses, detector intercalibration corrections relative to a reference detector were applied to all sample gas analyses to correct for efficiency differences between detectors as well as for mass fractionation. Data collection, reduction, error propagation, age calculation and plotting were completed using the

Mass Spec software (v. 7.93; Deino, 2001). Thorough descriptions of laboratory procedures, instrument specifications, data collection and correction factors are provided in Kellett and Joyce (2014).

In the following discussion of step-heating results, a plateau is defined as three or more consecutive heating steps yielding the same apparent age (within 1σ) that, together, comprise at least 30% of the total ^{39}Ar released. The plateau ages were calculated by weighting each included step by the inverse of the variance. In several cases, a second grain (aliquot 2) was analysed due to complexities in the initial gas-release spectrum from the first step-heating analysis (aliquot 1), including: (1) no calculable plateau age; (2) mostly steps of variable ages along with a plateau age comprising only 30–40% of total ^{39}Ar released; (3) an uneven gas split among the steps included in the plateau age (e.g., 1 step comprising >50% of ^{39}Ar released over the plateau); or (4) a gas-release spectrum with a non-typical shape (e.g., hump-shaped). In cases where no plateau was attained, the term pseudoplateau refers to the age of: (1) one heating step that represents >60% of the total ^{39}Ar released; or (2) the weighted age of four consecutive heating steps with similar ages, calculated by weighting each included step by the inverse of the variance. Integrated (total gas) ages were calculated by weighting all the individual steps by the fraction of ^{39}Ar released.

Ages presented here are based on an assumed ^{40}Ar/^{36}Ar ratio of 298.56 for atmospheric Ar (Lee et al., 2006) and were calculated using the $^{40}K_{total}$ decay constant 5.543×10^{-10} a^{-1} from Steiger and Jäger (1977). All uncertainties on step-heating and UV laser ages presented in the text and figures are reported at the 1σ level. The error in J-factor values is included in the calculated ages (plateau, pseudoplateau and integrated) presented in the discussion of step-heating results to allow comparison between samples that occupied different positions in the irradiation can. The J-factor

errors are not included in the discussion of intragrain UV laser results because intragrain analyses have identical J-factor values.

5. Microstructure and petrogenesis of biotite, muscovite and phlogopite

5.1. Biotite

In the mid- and upper-amphibolite-facies zones, biotite is fine- to medium-grained and typically comprises ~15–35% of metasedimentary rocks. Most biotite is S_1-aligned, but a younger, less abundant generation of biotite is commonly concentrated along embayed garnet rims and locally cross-cuts S_1 (Table 1; Fig. 4; Skipton et al., 2016a). In the western granulite-facies zone, biotite (≤15%) forms fine- to medium-sized grains that define S_1, as well as irregularly-shaped grains between quartz and feldspar in melt bands and variably-oriented grains that occur along embayed garnet rims (Fig. 4f). Although biotite grains with inclusions and intergrowths were avoided during grain selection for $^{40}Ar/^{39}Ar$ analysis, thin sections reveal that inclusions of monazite and zircon are common in biotite in several samples, and some biotite grains are intergrown with fibrolite (e.g., samples K2A, Y66C) or contain symplectic quartz intergrowths (e.g., sample S105A). In an upper-amphibolite-facies amphibolite (sample Y48A) that contains S_1-aligned, prograde biotite, ~30% of biotite grains in thin section contain intergrowths of chlorite.

Petrographical relationships and the P–T history modelled by Skipton et al. (2016a) suggest that biotite on Hall Peninsula grew during prograde metamorphism and was stable at the syn-S_1 thermal peak of ~720–740 °C and ~6.25–7.25 kbar in the mid-amphibolite-facies zone, whereas biotite in upper-amphibolite-to-granulite-facies pelites underwent breakdown in dehydration melting reactions as peak temperatures reached up to ~850 °C. Therefore, S_1-aligned biotite is interpreted as part of the peak assemblage in the mid-amphibolite-facies zone, whereas S_1-aligned

biotite in higher-grade rocks is probably prograde biotite that survived breakdown. Skipton et al. (2016a) also provide evidence for retrograde biotite growth in upper-amphibolite-to-granulite-facies pelite formed from the reversal of biotite dehydration melting reactions at temperatures above ~750 °C, which is the approximate minimum temperature for continuous (cordierite- and orthopyroxene-absent) biotite dehydration (Spear and Parrish, 1996). Post-S_1 retrograde biotite that embays garnet rims is interpreted to have grown at the expense of garnet in all three metamorphic zones through retrograde net transfer reactions that cease below ~675 °C (e.g., Grt + Kfs + H_2O = Sil + Bt + Qz; Spear and Parrish, 1996). Lower temperature retrograde biotite growth is not supported by mineral assemblages (e.g., absence of chlorite/chloritoid). Therefore, biotite crystallized or experienced maximum temperatures under P–T conditions for which retention of pre-thermal peak radiogenic Ar is unlikely, and is thus a good candidate for constraining the timing of cooling and exhumation (cf., McDougall and Harrison, 2009).

5.2. Muscovite

Muscovite in mid-amphibolite-facies pelite is fine- to medium-grained and defines S_1, but most samples contain a second generation of muscovite that forms fine- to coarse-grained crystals that typically cross-cut S_1 (Fig. 4a–e; Table 1). Muscovite comprises ~3–20% of each sample analyzed, but the proportion of S_1-aligned muscovite to the younger muscovite generation is variable. Some samples (B75A, H45A) contain dominantly S_1-aligned muscovite, with only ~5–15% of muscovite grains cross-cutting S_1. In other samples, the majority (~50–90%) of muscovite grains cross-cut S_1, forming coarse crystals that engulf aggregates of sillimanite (F122B, S92C) or variably sized crystals that form S_1-aligned bands along with minor sillimanite (S89A). Post-S_1 muscovite crystals can be oriented axial planar to or cross-cutting F_3 crenulations (F122B). Monazite and zircon inclusions in muscovite are uncommon, and symplectic quartz intergrowths

occur in one or both muscovite generations in thin sections of some samples (B75A, S89A, F122B; Fig. 4b).

As described above, the mid- and upper-amphibolite-facies zones are interpreted to have attained temperatures sufficient for vapour-absent muscovite dehydration melting (≥720°C), producing sillimanite, K-feldspar and melt, except perhaps in some areas on the east coast (e.g. sample H45A) where these reaction products are not observed (Skipton et al., 2016a). Muscovite that is aligned with S_1 is interpreted as prograde muscovite that survived breakdown during peak conditions (e.g., Tyler and Ashworth, 1982) or, possibly, as a peak metamorphic mineral in parts of the easternmost peninsula that may not have reached sufficient temperatures for muscovite breakdown. Textural features of post-S_1 muscovite, including muscovite grains that surround fibrolite and/or contain symplectic quartz intergrowths (Fig. 4b, d), are typical of retrograde muscovite that consumed K-feldspar through the reversal of the vapour-absent muscovite dehydration melting reaction (e.g., Evans and Guidotti, 1966; Ashworth, 1975; Palin et al., 2014; Skipton et al., 2016a). Post-S_1 muscovite in sample H45A, which contains no K-feldspar or melt and ~1% sillimanite, could possibly have been produced by retrograde reversal of vapour-present muscovite breakdown. The variable proportions of syn-S_1 (prograde) to post-S_1 (retrograde) muscovite probably result from different bulk compositions, as well as a slight eastward decrease in peak metamorphic grade within the mid-amphibolite-facies zone.

Prograde muscovite in the study area that experienced temperatures of ≥720°C under medium pressures (~6–7 kbar; Skipton et al., 2016a) is unlikely to retain any pre-peak radiogenic Ar based on the calculations of Warren et al. (2012a). These calculations assume a residence time at peak conditions of 20 Myr, which is shorter than the estimated age of peak (and near-peak) metamorphism at ca. 1860–1820 Ma on Hall Peninsula (Skipton et al., 2016a). However,

considering the small differences in Ar retention P–T zones between various residence times modeled by Warren et al. (2012a), and that the peak temperatures of our samples are well above the nominal Ar closure temperature, it is likely safe to assume that syn-S_1, prograde muscovite on Hall Peninsula has not retained any pre-peak radiogenic Ar. As textures suggest that post-S_1, retrograde muscovite replaced K-feldspar in many samples, retrograde muscovite probably grew at temperatures of ~650–700°C, which is the temperature range of the vapour-absent muscovite dehydration melting reaction modeled by Skipton et al. (2016a) for pelite in the mid-amphibolite-facies zone at pressures of 4–7 kbar. Alternatively, and particularly in samples that lack evidence for vapour-absent melting (e.g., H45A, S131C), retrograde muscovite may have grown via the reversal of vapour-present muscovite dehydration melting at temperatures close to the solidus, which Skipton et al. (2016a) have modelled at ~650°C for pressures between 4–7 kbar, consistent with the NaKFMASH solidus modeled by Spear et al. (1999). Additional evidence that retrograde muscovite crystallized at temperatures >500°C is that it co-exists with sillimanite that appears stable and it is not accompanied by any lower-temperature phases such as staurolite or chlorite. Therefore, prograde and retrograde muscovite on Hall Peninsula are both considered to have crystallized at sufficiently high temperature that they did not retain any "memory" of previous radiogenic Ar and that their $^{40}Ar/^{39}Ar$ ages reflect the retrograde history.

5.3. Phlogopite

In the four marble samples analyzed, phlogopite is fine- to medium-grained and occurs in modal abundances of ~5–15%. Phlogopite is aligned parallel to S_1 along with diopside and is typically concentrated in S_1-aligned bands that are rich in olivine and diopside. It is therefore interpreted to have grown during peak upper-amphibolite- to granulite-facies metamorphism. As peak metamorphic temperatures were well above the nominal closure temperature of Ar in

phlogopite (~360–430°C; cf., McDougall and Harrison, 2009), $^{40}Ar/^{39}Ar$ phlogopite ages are considered to record the cooling history.

6. Results

6.1. Biotite and muscovite compositional maps

The vast majority of muscovite and biotite grains exhibit uniform intragrain major element compositions. As such, all WDS maps are presented in Appendix 1 (Figs. A3.4–A3.9), together with a summary of mapping results in Table A3.1. No compositional differences were identified between S_1-aligned micas and those that cross-cut S_1. Some muscovite crystals in two samples exhibit very weak, gradational Al, Fe and Mg core–rim variations reflecting a ~10–20% difference in measured counts of each element, forming compositionally-distinct rims less than ~50 μm wide. In sample F122B, the edges of a post-S_1 muscovite grain surrounded by biotite exhibit slightly elevated Fe and Mg and lower Al relative to the grain interior, although this map pattern may be an artefact of abundant fibrolite in the muscovite interior (Fig. A3.8b). In the same sample, an S_1-aligned muscovite grain surrounded by biotite has lower Mg in the grain edges compared to the interior (Fig. A3.8c). In sample S92C, muscovite grains in different microstructural contexts each have rims with slightly higher Fe and Mg and lower Al than muscovite interiors, including one S_1-aligned crystal and two post-S_1 grains, one of which surrounds sillimanite (Fig. A3.9).

6.2. $^{40}Ar/^{39}Ar$ step-heating results

The $^{40}Ar/^{39}Ar$ step-heating results are summarized in Table 2 and the spatial distribution of apparent ages is illustrated on the maps in Fig. 5. Ca/K and $^{40}Ar/^{39}Ar$ age spectra are presented in Appendix 1 (Figs. A4.1–A4.4) and the full corresponding dataset is provided in Appendix 2. Due to the large number of step-heating analyses conducted (56), it is not possible to discuss each

analysis individually. Instead, the step-heating spectra for each mineral are divided into groups based on: (1) whether the spectrum defines a plateau age, as defined by the criteria above; (2) the percentage of ^{39}Ar gas released over the plateau; and (3) the evenness of the gas split over the plateau. Representative Ca/K and ^{40}Ar/^{39}Ar age spectra from each group are presented in Figs. 6–8 and age distribution plots are shown in Fig. 9. For samples with multiple aliquots, the "preferred" age reported in the discussion of results is that of the plateau or pseudoplateau that includes the highest proportion of the total ^{39}Ar released.

6.2.1. Biotite age spectra and distribution

The 25 biotite samples are divided into four groups according to different types of gas release spectra. Our confidence level in the calculated age decreases from Group I to Group IV. In the spectra produced by the eleven samples in Group I, the heating steps included in each plateau age comprise at least 85% of the total ^{39}Ar released. The gas splits between the steps included in the plateau ages are relatively even; each included step comprises <50% of total ^{39}Ar released over the plateau. The plateau ages calculated from the Group I biotite samples range from 1788 ± 3 Ma to 1622 ± 3 Ma (MSWD=0.44–1.56).

The eleven biotite samples in Group II exhibit spectra with plateau ages that each consist of 30–70% of the total ^{39}Ar released. A second aliquot was analyzed in four samples in this group, and each second aliquot also yielded a plateau age representing 30–70% of the total ^{39}Ar released. The plateau ages of Group II spectra range from 1737 ± 3 Ma to 1633 ± 19 Ma, with MSWDs of 0.78–1.84. We consider the calculated plateau ages of Group II spectra to be slightly less reliable than those of Group I spectra because they comprise lower amounts of ^{39}Ar gas released and several spectra are slightly hump-shaped or have early steps with significantly younger ages.

Group III consists of two biotite samples in which the first aliquots produced spectra with variably-aged steps and no statistical plateaux, whereas the second aliquots yielded spectra with plateau ages comprising 45–60% of the total ^{39}Ar released. The plateau ages of Group III samples are 1740 ± 3 Ma (MSWD=1.55) and 1691 ± 3 Ma (MSWD=0.27). Group IV consists of only one sample, in which the first and second aliquots both yielded spectra with variably-aged steps and no plateau ages. From four consecutive steps in the first aliquot, we calculated a pseudoplateau age of 1687 ± 3 Ma (MSWD=2.07).

Age probability distributions (Fig. 9) show that most of the biotite ^{40}Ar/^{39}Ar ages cluster between ca. 1670 and 1700 Ma, regardless of age spectrum type (group). The range of ages in Groups I and II are similar, although Group I samples have greater dispersion (200 Myr) in ages. ^{40}Ar/^{39}Ar ages older than 1700 Ma are mostly concentrated on northeastern Hall Peninsula, including ages from Groups I–III, and young ages of ca. 1664–1622 Ma from Groups I and II form an east-west trending swath on the southern peninsula (Fig. 5).

6.2.2. Muscovite age spectra and distribution

The muscovite samples are divided into three groups according to different types of spectra, with Group I having the most homogeneous ^{40}Ar/^{39}Ar spectra and Group III, the least. The three samples in Group I each yielded spectra with plateau ages comprising >65% of the total ^{39}Ar released. In two samples in Group I, additional aliquots were analyzed and produced spectra with plateau ages comprising 42–53% of total ^{39}Ar released. The plateau ages of Group I samples are 1700 ± 3 Ma (MSWD=1.89), 1698 ± 3 Ma (MSWD=1.70) and 1693 ± 3 Ma (MSWD=1.66).

The three samples in Group II are characterized by spectra with plateau ages comprising 30–55% of total ^{39}Ar released, with or without additional aliquots that yielded spectra with no plateau ages. The plateau ages are 1729 ± 3 Ma (MSWD=1.57), 1660 ± 20 Ma (MSWD=1.51) and

1657 ± 3 Ma (MSWD=2.16). Group III consists of three samples with poor gas splits during step-heating, resulting in spectra with no plateau ages or with plateau ages that are mostly (>70%) comprised of one gas release step. In two aliquots where no plateau age was attained, a single-step pseudoplateau age was calculated from the largest gas release step in each spectra, comprising 64–77% of the total ^{39}Ar released. Group III samples yielded ages of 1712 ± 3 Ma (MSWD=0.94), 1683 ± 3 Ma (MSWD=1.66) and 1691 ± 3 Ma (single-step age).

The age distribution plots (Fig. 9) show that most muscovite ages cluster between ca. 1670 and 1700 Ma, including ages in Groups I and III, whereas Group II ages have a broader spread between ca. 1660 and 1730 Ma. Biotite and muscovite ages have a similar range, but when biotite and muscovite ages were determined from the same sample, biotite ages are consistently older than muscovite ages by ~11–54 Myr and, in one case (F122A), by ~90 Myr. The only exception is sample S92C, in which the age of biotite is ~29 Myr younger than that of muscovite. Muscovite ages older than 1700 Ma are located on northeastern Hall Peninsula and the youngest muscovite ages (ca. 1660 Ma) are in the southeast, showing similar spatial distribution patterns as the biotite ages (Fig. 5).

6.2.3. Phlogopite age spectra and distribution

Each of the four phlogopite step-heating analyses produced plateau ages that comprise >75% of the total ^{39}Ar released, with a fairly even gas split between steps. In one sample (S59A), an earlier aliquot yielded a spectrum with a poor gas split and no plateau, but a single-step pseudoplateau age can be interpreted from one step comprising 82% of the total ^{39}Ar released. Most spectra include several early heating steps with low ^{39}Ar gas release volumes, ages that are older than the plateau ages and high Ca/K ratios. Two phlogopite samples yielded similar ages of 1666 ± 3 Ma (MSWD=0.36) and 1658 ± 3 Ma (MSWD=1.65) and the two other samples were

dated at 1630 ± 3 Ma (MSWD=0.77) and 1720 ± 3 Ma (MSWD=1.08). The ~90 Myr range of phlogopite ages is within the range of biotite ages and is similar to that of muscovite (Fig. 9). The younger phlogopite ages are concentrated on the southern peninsula and the older, ca. 1720 Ma age is located to the northeast, showing a similar spatial distribution as muscovite and biotite apparent ages (Fig. 5).

6.3. $^{40}Ar/^{39}Ar$ UV laserprobe results

The UV laserprobe analysis locations are shown on muscovite grain maps in Fig. 10, which are contoured by $^{40}Ar/^{39}Ar$ apparent age in 10 Myr intervals. Corresponding analytical data are presented in Appendix 3. The UV laser spot analyses demonstrate a decrease in apparent $^{40}Ar/^{39}Ar$ age of 20–30 Myr from core to rim in each grain (Fig. 10). Sample B75A exhibits a core-to-rim age decrease from 1661 ± 3 to 1640 ± 4 Ma, although there are three young spot analyses in the grain interior (1645–1643 ± 3 Ma). The average of rim and core ages in sample B75A is approximately equivalent to the step-heating muscovite age in the same sample (1657 ± 3 Ma; MSWD=2.16). In sample S92C, the ages of UV laser analyses decrease almost uniformly from 1675 ± 3 Ma in the core to 1645 ± 3 Ma in the rim. The preferred step-heating muscovite age in sample S92C is 1693 ± 3 Ma (MSWD=1.66), although the third aliquot with lower % ^{39}Ar released has a plateau age of 1665 ± 2 Ma (MSWD=1.10), which is closer to the UV laser ages. In sample F122B, the UV laser ages decrease from 1680 ± 6 Ma near the grain interior to 1652 ± 6 Ma at the grain edge, and there is one anomalously young analysis (ca. 1655 Ma) in the core. The preferred step-heating muscovite age for this sample (1691 ± 3 Ma) is older than the UV laser ages, although it is questionable since it is a one-step pseudoplateau age.

7. Numerical diffusion modelling

7.1. Methodology, rationale and assumptions

Several numerical diffusion models were conducted to investigate the $^{40}Ar/^{39}Ar$ ages that would be expected for thermally-activated bulk volume diffusion of Ar in muscovite that underwent various P–T histories. The MATLAB^{TM} program DiffArgP (Wheeler, 1996; Warren et al., 2012a, b) was used to forward model bulk grain ages and core-to-rim age profiles in muscovite. Muscovite is the ideal mineral to model in our study because: (1) Ar diffusion in muscovite is well-understood and muscovite $^{40}Ar/^{39}Ar$ ages are generally considered more reliable than those of biotite (e.g., McDougall and Harrison, 1999; Harrison et al., 2009); (2) muscovite has a lower Ar solubility than biotite (Kelley, 2002), leaving biotite more susceptible to incorporation of excess Ar; (3) the use of DiffArgP for modeling muscovite cooling histories is well-established (e.g., Wheeler, 1996; Warren et al., 2012a, b); and (4) nine muscovite step-heating ages with a wide spatial distribution and UV laser transects on three muscovite samples enable comparisons between our actual and modeled ages.

Core-to-rim UV laser age transects and step-heating ages of these three muscovite samples (B75A, F122B, S92C; Figs. 10, 11) were used as a benchmark for comparison with the bulk ages and core-to-rim age profiles derived by our DiffArgP models. In each sample, the $^{40}Ar/^{39}Ar$ UV laser results are generally consistent with the ages calculated from step-heating analyses, and each muscovite grain exhibits a core-to-rim apparent $^{40}Ar/^{39}Ar$ age decrease of 20–30 Myr. Young spot analyses in muscovite cores in samples B75A and F122B probably reflect the presence of crystal defects that provided short diffusion pathways for Ar (e.g., Lee, 1995; Kramar et al., 2003). Chemical maps (EMPA) of muscovite in the same samples (Appendix 1, Figs. A3.7–9) reveal them to be chemically homogeneous, with some grains exhibiting slight (10–20% intensity)

gradational depletions in Al and enrichments in Fe and Mg in the outermost ~10–50 μm of grain edges. These variations are of lower magnitude and are markedly less distinct than those documented in white micas with re-(or neo-)crystallized rims (e.g., Cossette et al., 2015), and may instead reflect weak cation diffusion with adjacent biotite and/or analytical interferences with included or adjacent minerals. The apparent age profiles generally show smooth core-to-rim decreases, lacking abrupt age increases that may indicate excess Ar (e.g., Pickles et al., 1997; McDougall and Harrison, 1999), and they are interpreted to represent Ar thermal diffusion profiles. For comparison with numerical diffusion models, a representative age profile was selected in each sample based on the greatest core-to-rim (~0.3 mm) age decrease coinciding with the most laser spots, and a second profile was chosen for sample S92C to reflect its longer radius (~0.6 mm) (Figs. 10, 11).

We used the following parameters for our models (ignoring parameter errors): activation energy (E_a) = 263 ± 29 kJ mol^{-1}; diffusion coefficient (D_0) = $2.3^{+70}_{-2.2}$ cm^2 s^{-1}; and activation volume (V_0) = 14 cm^3 mol^{-1} (Harrison et al., 2009). As natural Ar loss in muscovite primarily follows a cylindrical volume diffusion pattern (Hames and Bowring 1994), all models were run using a cylindrical grain shape. A Crank-Nicholson solver was used for time integration, with a time step that is 10 times larger than that recommended for a stable fully explicit method (Wheeler, 1996; Warren et al., 2012b). The ages calculated by the models assume that volume diffusion occurred in an open system where the concentration of Ar at the grain boundary equals 0, and where the diffusion radius is equal to the grain radius (e.g., Warren et al., 2012b). This assumption of open system diffusion behavior is supported by the core-to-rim decrease in apparent age revealed in our UV laser transects of muscovite (Fig. 10). Models were run with a 0.3 mm grain radius, apart from selected models that were run with a 0.6 mm radius, corresponding to the sizes of analyzed grains

(Fig. 10). Additionally, it was assumed that decompression occurred in parallel with cooling rate, such that 0 kbar was reached at the same time as 0°C. For each model, DiffArgP outputs a core-to-rim profile of apparent $^{40}Ar/^{39}Ar$ age (Fig. 11), as well as an integrated or "bulk" $^{40}Ar/^{39}Ar$ age for the muscovite grain. Each model was run at "meshlengths" of 30, 50 and 80, which correspond to increasing levels of accuracy. Following the methodology of Warren et al. (2012a), the three ages were consequently plotted against mesh separation (grain radius/meshlength), producing a linear equation that, when regressed to zero, yields the "true" bulk age for the model grain, as reported in Table 3. To fully explore different cooling scenarios for Hall Peninsula, we modeled $^{40}Ar/^{39}Ar$ diffusion in muscovite following three main P–T histories (Table 3), discussed below.

7.1.1. Model A: Simple linear cooling

Model A1 (reference model) simulates linear cooling at a constant rate of 2°C/Myr from 1736 Ma, a temperature of 600°C and a pressure of 5.5 kbar. The model assumes that muscovite grew before 1736 Ma but after the thermal peak of metamorphism, as a result of cooling below the solidus. Since muscovite-bearing rocks on the eastern peninsula reached peak metamorphism at amphibolite-facies conditions of ~720–740°C and ~6.25–7.25 kbar, and phase equilibria models of pelite estimate the solidus at ~650°C for pressures of ~5–7 kbar (Skipton et al., 2016a), we assume that muscovite crystallized at ~650°C and ~6 kbar. Because there are no conclusive geochronological constraints on the timing of muscovite crystallization, cooling in Model A1 begins at 1736 Ma from 5.5 kbar and 600°C, well above the closure temperature of Ar in muscovite (~420–450°C; Harrison et al., 2009). These parameters are based on three U-Pb titanite ages on the eastern peninsula, which yielded an average age of 1736 Ma (Scott, 1999), at a closure temperature of ~550–650°C for Pb in titanite (Cherniak, 1993; Hawkins and Bowring, 1999). The chosen pressure of 5.5 kbar seems reasonable as it corresponds to stability fields containing

retrograde assemblages (including muscovite) observed in pelite at ~600°C on phase equilibria models (Skipton et al., 2016a). However, as pressure conditions at 1736 Ma are uncertain, we tested various starting pressures in our models, and found that different pressures of ±1.5 kbar made negligible differences of ±2 Myr to bulk model ages (Appendix 1, Fig. A5.1).

To test whether a simple linear cooling history can produce the $^{40}Ar/^{39}Ar$ bulk ages and core-to-rim age profiles on Hall Peninsula, we conducted several additional variations of Model A1 by changing individual variables (Table 3; Fig. 11): cooling rates from 1 to 10°C/Myr (Models A2–7); starting temperatures from 550 to 650°C (Models A8–11); grain radius of 0.6 mm (Models A12–14); initial pressures from 4 to 7 kbar (Models A15, 16); and cooling beginning at 1800 Ma (Models A17–19). Two variables were changed in some models, including both cooling rate and grain radius (Models A13, 14) or starting temperature (Models A9, 10), or both starting time and temperature (Model A19).

As shown by simulations of Ar diffusion in muscovite grains with 0.1–1 mm radii at various P–T conditions (Warren et al., 2012a), muscovite that attains (or crystallizes at) temperatures ≥500–600°C (depending on residence time at crystallization conditions) at pressures <7 kbar is very unlikely to retain an Ar "memory" of any P–T history prior to reaching its theoretical closure temperature. Ar diffusion in muscovite should be highly efficient at such high temperatures, and its $^{40}Ar/^{39}Ar$ age therefore represents cooling, as opposed to the timing of crystallization (Harrison et al., 2009; Warren et al., 2012a). This would hold true even if muscovite grew along the prograde path, provided peak temperatures were high enough to preclude Ar retention. Therefore, the outcome of Model A also applies to muscovite on Hall Peninsula that may have grown pre-thermal peak and survived subsequent muscovite dehydration melting reactions at temperatures above ~625–650°C, as has been suggested in some mid-amphibolite-

facies pelites (Skipton et al., 2016a). Similarly, Model A may also apply to muscovite that grew syn-thermal peak in rocks that did not attain sufficient temperatures for muscovite dehydration reactions, provided the thermal peak was >500°C. This may have been the case for some mid-amphibolite-facies pelites on eastern Hall Peninsula (e.g., H45A), in which no sillimanite, K-feldspar or melt was observed (Skipton et al., 2016a).

7.1.2. Model B: Stepwise cooling

Model B1 (reference model) represents a stepwise cooling scenario that starts with cooling from 1736 Ma at 600°C and 5.5 kbar at a rate of 2°C/Myr—consistent with the starting conditions of Model A—followed by a faster cooling rate of 5°C/Myr beginning at 1670 Ma (Table 3; Fig. 11). Models B2 and B3 introduce faster cooling rates of 10 and 30°C/Myr at 1670 Ma. An age of 1670 Ma was selected for initiation of the second phase of cooling because it is an approximate average of step-heating and UV laser ages of the three "benchmark" muscovite samples. To test how this age affects the models, the second phase of cooling in Models B4 and B5 begins at 1660 and 1650 Ma, respectively, at a rate of 5°C/Myr. Model B6 is equivalent to Model B1, but run with a 0.6 mm grain radius. Depending on the starting time of the second phase of cooling (i.e., 1670, 1660, or 1650 Ma), it initiates at temperatures of ~430–470°C, as dictated by the 2°C/Myr cooling rate from 600°C at 1736 Ma.

Model B tests whether the $^{40}Ar/^{39}Ar$ ages of muscovite on Hall Peninsula could have been produced by slow cooling followed by an episode of rapid cooling and exhumation associated with a post-orogenic or separate tectonic event.

7.1.3. Model C: Late, low-temperature muscovite growth

Model C1 (reference model) simulates post-orogenic or a separate muscovite growth event at 1670 Ma at a temperature of 450°C and a pressure of 4.5 kbar, followed by a linear cooling rate

of 2°C/Myr. Individual variables are changed in Models C2–11 to test the effects of various cooling rates (1–10°C/Myr; Models C2–5), different muscovite crystallization temperatures (350–550°C; Models C6–8) and pressures (3 kbar; Model C10), a younger muscovite crystallization age (1660 Ma; Model C9), and a larger grain radius of 0.6 mm (Model C11) (Table 3; Fig. 11).

Model C evaluates the possibility that muscovite crystallized later than the main episode of THO tectonism, at relatively low temperatures and pressures. Petrographic textures in many samples suggest that muscovite grew abundantly via the retrograde reversal of muscovite dehydration reactions, probably at amphibolite-facies conditions (e.g., samples F122B, S89A, S92C). However, the origin and growth conditions of some retrograde, post-S_1 muscovite can be more ambiguous, especially where it is less abundant (e.g., F122A) and/or forms patchy intergrowths in K-feldspar (e.g., B72A). According to simulations of Ar diffusion (Warren et al., 2012a), a muscovite grain with a radius of 0.1–1 mm that crystallizes at temperatures below ~400–500°C (depending on residence time at crystallization conditions) and pressures of <7 kbar will probably yield an $^{40}Ar/^{39}Ar$ age that represents the timing of muscovite crystallization, provided the grain did not incorporate any (older) Ar into its lattice during crystallization. Therefore, Model C tests whether our apparent muscovite ages may reflect the crystallization ages of retrograde muscovite followed by linear cooling at various rates.

7.2. Results

This discussion of results uses the apparent step-heating and core-to-rim UV laser ages of three muscovite samples (B75A, F122B, S92C) as a benchmark for comparison with the bulk ages and core-to-rim age profiles outputted by our DiffArgP models. Comparisons between the modeled ages and other step-heating ages on Hall Peninsula are discussed further below. Our numerical diffusion modeling results demonstrate that if the age at which cooling begins is fixed (e.g., 1736

Ma in Model A), the two principal controls on the model output are (1) the temperature from which cooling begins (i.e., "starting temperature") and (2) the cooling rate. Both the starting temperature and cooling rate control the modeled bulk age and the age of the grain interior: higher starting temperatures and slower cooling rates result in younger ages, whereas lower starting temperatures and faster cooling rates produce older ages. The core-to-rim age gradient is controlled by the cooling rate: faster cooling rates result in flatter, more homogeneous core-to-rim age profiles, whereas slower cooling rates produce more curved core-to-rim age profiles with a greater difference between the core and rim ages, as would be expected for a longer period within the Ar diffusion temperature window.

7.2.1. Model A: Simple linear cooling

In Models A1–7, in which cooling begins at 1736 Ma and conditions of 600°C and 5.5 kbar at various cooling rates of 1–10°C, the bulk ages and core-to-rim age profiles that best match those of muscovite from Hall Peninsula were produced from models with cooling rates of 2–2.5°C/Myr (Models A1, A3; bulk ages=1647, 1666 Ma; Fig. 11a). Using a 0.6 mm grain radius and a cooling rate of 2°C/Myr, but otherwise the same parameters, the output of Model A12 closely matches the measured 0.6 mm core-to-rim age profile (Fig. 11g). Slower cooling rates produce ages that are much younger than muscovite in the study area. Faster cooling rates result in core-to-rim age profiles that are too old and, at rates faster than 5°C/Myr, exhibit core-to-rim age decreases of ≤10 Myr, which is considerably less than the ~20–30 Myr core-to-rim age decrease in our samples. Using the same model parameters except for a lower starting temperature of 550°C, cooling rates of 1.5–2°C/Myr yield the closest age matches to our samples (Models A8, A9; bulk ages=1673, 1648 Ma; Fig. 11a). In contrast, cooling from 650°C with model parameters that are otherwise the same as Model A1—including a cooling rate of 2°C/Myr—results in a much younger bulk age

(1621 Ma; Model A11). Running Model A1 from 1800 Ma (instead of 1736 Ma) with cooling rates of 1.5 and 1°C/Myr (Models A17, A18), or cooling from 650°C at 2°C/Myr (Model A19), produces ages that are older or younger than our benchmark samples, with greater core-to-rim age decreases of ≥50 Myr (Appendix 1, Fig. A5.1).

Overall, the models indicate that cooling from ~1736 Ma and conditions of ~550–600°C and ~5.5 kbar at rates of ~1.5–2.5°C/Myr is a likely scenario for Hall Peninsula. Faster or slower cooling rates would not produce the step-heating ages and ~20–30 Myr core-to-rim age decreases that are documented in our three "benchmark" muscovite samples (B75A, F122B, S92C).

7.2.2. Model B: Stepwise cooling

Model B1 follows the same cooling history as Model A1 until 1670 Ma, when faster cooling occurs at a rate of 5°C/Myr. It yields a similar bulk age (1664 Ma) and core-to-rim age profile (Fig. 11b). This is also the case for a 0.6 mm grain radius (Model B6). Introducing faster cooling rates of 10 and 30°C/Myr at 1670 Ma (Models B2, B3) produces similar bulk ages (1668, 1671 Ma), but smaller decreases in age from core to rim of ~5–10 Myr. If Model B1 is modified such that the second phase of cooling begins later, at 1660 or 1650 Ma (Models B4, B5), the core-to-rim age profiles are consistent with that of Model B1, but the bulk ages are slightly younger (1658, 1654 Ma). Together, the results of Models B1, B4 and B5 closely match the ages and within-grain age variations of our "benchmark" muscovite samples, suggesting that with our data we cannot dismiss the possibility of slow cooling (~2°C/Myr) followed by a slightly faster cooling rate of 5°C/Myr at 1670–1650 Ma on Hall Peninsula. However, faster cooling rates of >10°C/Myr during this possible second phase of cooling are implausible, as they would produce much lower within-grain age variation than is documented in our samples.

7.2.3. Model C: Late, low-temperature muscovite growth

In models where muscovite crystallizes at 1670 Ma and conditions of 400–450°C and 4.5 kbar, followed by cooling at 2–2.5°C/Myr (Models C1, C2, C7), the consequent bulk ages (1656, 1660, 1667 Ma) and core-to-rim age profiles are comparable to the step-heating ages and UV laser transect ages of our muscovite "benchmark" samples (Fig. 11e). The same applies for a grain radius of 0.6 mm (Model C11). If the model started at 1660 Ma and cooled from 450°C at 2°C/Myr (Model C9; bulk age=1646 Ma), it yields a core-to-rim age profile that is somewhat younger but with the same curvature, closely coinciding with that of sample B75A. In contrast, a slower cooling rate of 1°C/Myr (Model C3) yields younger bulk age (1632 Ma) and a strongly curved core-to-rim age profile. Faster cooling rates of 5 and 10°C/Myr produce bulk ages (1666, 1669 Ma) that are similar to the step-heating ages of our "benchmark" muscovite grains, but yield core-to-rim age decreases of ~8 and 18 Myr, respectively. An even flatter core-to-rim profile is yielded by running Model C1 with a starting temperature of 350°C (Model C6), which is below the estimated closure temperature of Ar in muscovite. Using a starting temperature of 550°C results in a bulk age of 1605 Ma (Model C8), much younger than muscovite step-heating ages on Hall Peninsula.

Together, the C set of models indicate that muscovite on Hall Peninsula could plausibly have crystallized as a low-temperature, late-tectonic phase at ~1670–1660 Ma at conditions of ~400–450°C and 4.5 kbar, and subsequently cooled at ~2–2.5°C/Myr. A cooling rate of 5°C/Myr may be possible, but faster cooling rates are unlikely as they would not produce the documented within-grain age variations. It is unlikely that muscovite crystallized at ~1670–1660 Ma at temperatures higher or lower than ~400–450°C, based on the poor agreement between models with starting temperatures of 350°C and 550°C and the ages of our "benchmark" muscovite samples. Therefore, if muscovite indeed crystallized at ~1670–1660 Ma at temperatures of ~400–450°C, the cooling rate on Hall Peninsula prior to this point in time would had to have been relatively

slow; assuming a temperature of ~600°C at 1736 Ma, the cooling rate from 1736 to 1670 or 1660 Ma would have been ~2.5°C/Myr, which is consistent with our conclusions from Model A.

8. Discussion

8.1. Late- to post-orogenic thermal evolution

8.1.1. Cooling rates estimated from data and models

According to simple cooling rate calculations for eastern Hall Peninsula based on the thermal peak of metamorphism (~1860–1820 Ma, ~720–740°C; Skipton et al., 2016a, b), titanite U–Pb ages (~1736 Ma; Scott, 1999) and a nominal closure temperature of Pb in titanite of 600°C (~550–650°C; Cherniak, 1993; Hawkins and Bowring, 1999), cooling rates ranged from ~1 to 2°C/Myr after peak metamorphism until ca. 1736 Ma. Comparisons between our "benchmark" muscovite ages (samples B75A, F122B, S92C) and numerical diffusion models (Models A and B) support continued slow cooling from 1736 Ma and 550–600°C at rates of 1.5–2.5°C/Myr approaching the window of closure temperatures for Ar in muscovite (~420–450°C; Harrison et al., 2009), at which point the cooling rate may have remained the same or, possibly, increased slightly to no faster than ~5°C/Myr. Based on Model C, it is also possible that some muscovite crystallized at ~1670–1660 Ma at temperatures of ~400–450°C, approximately within its closure temperature window, with subsequent cooling at 2–2.5°C/Myr or, possibly, up to 5°C/Myr. This scenario would also require relatively slow cooling rates of ~2.5°C/Myr prior to ~1670 Ma.

8.1.2. Local faster cooling rates?

The relatively slow cooling rates suggested by our numerical diffusion models are rooted in step-heating ages and UV laser core-to-rim age transects conducted on three muscovite samples that span a ~5000 km^2 area of the eastern peninsula. The three UV laser samples have step-heating

ages of ca. 1657, 1693 and 1691 Ma (not including additional aliquots), but muscovite step-heating ages in the study area range up to ca. 1729 Ma. Phlogopite step-heating ages are comparable (ca. 1720–1630 Ma), and biotite also yields a wide range of step-heating ages (ca. 1788–1633 Ma) that—like those of muscovite and phlogopite—tend to be older on the ENE part of the peninsula (Fig. 5). Such wide ranges in regional step-heating ages seem to contradict the consistently slow cooling history inferred from the muscovite core-to-rim age transects and corresponding models.

As chemical (EMPA) maps show that neither biotite nor muscovite exhibits chemically distinct domains indicative of neoblastic/recrystallized zones, and most plateau ages include several consecutive steps comprising high % ^{39}Ar released, it is highly unlikely that the range of step-heating ages reflects distinct mica growth/recrystallization events. Furthermore, petrographic evidence and previously modeled P–T histories strongly suggest that the micas crystallized at temperatures above the nominal closure temperatures for Ar and therefore yield ^{40}Ar/^{39}Ar cooling ages. The regional variation in step-heating ages may therefore imply corresponding differences in cooling histories, such as faster cooling in areas with distinctly old (>1700 Ma) step-heating ages. Our assumption that cooling began from 600°C at 1736 Ma is inferred from U–Pb titanite ages from three samples on the eastern peninsula, and may not necessarily apply regionally, as suggested by similar or older biotite and muscovite ages of ~1788–1722 Ma. Cooling at 5–10°C/Myr (from 1736 Ma and 600°C) could feasibly produce muscovite bulk grain ages of ~1700–1720 Ma (Models A6, A7). Spatial associations of older ^{40}Ar/^{39}Ar ages on the eastern peninsula raise the possibility that localized faster exhumation and cooling could have resulted from T_2 thrusts (e.g., S89A, H45A, S131C, S165B) and folding during D_2 (e.g., H45A, F122A, F122B) and/or D_3 (e.g., F122A, F122B, S165B, B75A). The older muscovite step-heating ages of ca. 1729–1700 Ma may reflect localized faster cooling through the closure temperature of Ar in

muscovite (~420–450°C; Harrison et al., 2009) at rates of ~1.9–3.5°C/Myr (assuming peak metamorphism at 720–740°C and 1860–1820 Ma), similar to cooling rates estimated from our numerical models. The older, ca. 1788–1722 Ma biotite step-heating ages may record faster cooling through the nominal closure temperature of ~300°C (cf., McDougall and Harrison, 1999) at rates of ~3.0–13.8°C/Myr (assuming peak metamorphism at 720–740°C and 1860–1820 Ma). However, several areas with established D_2 and D_3 structures have relatively young $^{40}Ar/^{39}Ar$ ages (e.g., S92C, B72A, Y48A, S162A), and the apparent absence of extensional structures on Hall Peninsula does not favour rapid exhumation and cooling.

8.1.3. Excess Ar

The range of apparent $^{40}Ar/^{39}Ar$ ages in our samples may not necessarily indicate different cooling rates because excess Ar contamination can produce anomalously old $^{40}Ar/^{39}Ar$ ages that defy other geochronological evidence or are geologically implausible (McDougall and Harrison, 1999; Kelley, 2002). Additionally, Camacho et al. (2012) proposed that the Ar retentivity of trioctahedral mica such as biotite and phlogopite may be increased by planar defect structures, resulting in variable and unlikely $^{40}Ar/^{39}Ar$ ages. Due to the wide range in step-heating ages, including several ages that are older than or equivalent to U–Pb ages of titanite, monazite and zircon rims (Fig. 3), we must consider the probability of excess Ar in our samples. Excess Ar is parent-less radiogenic argon (^{40}Ar) incorporated into a mineral during crystallization, introduced into the crystal lattice by diffusion or enclosed within inclusions of melt/fluid/minerals (Kelley, 2002). On Hall Peninsula, U–Pb titanite ages of ~1742–1730 Ma (Scott, 1999) and a regionally-occurring ca. 1800–1750 Ma monazite population attributed to coupled dissolution–reprecipitation (Skipton et al., 2016a, b) provide strong evidence that the region was hotter than the nominal closure temperatures of Ar in the dated minerals until ~1730 Ma, and suggest that step-heating

ages of ~1788–1720 Ma probably do not reflect true cooling ages. Furthermore, in all but one (S92C) of the nine samples in which both biotite and muscovite were dated, biotite yields an older step-heating age than muscovite in the same sample despite having a lower nominal closure temperature, with the age difference ranging from ~11–90 Myr. This implies the presence of excess Ar, which would likely be preferentially incorporated in biotite due to the greater solubility of Ar in biotite than muscovite (Roddick et al., 1980; review in Kelley, 2002). As opposed to the saddle-shaped spectra that are often attributed to excess Ar (Lanphere and Dalrymple, 1976; McDougall and Harrison, 1999), it is well-documented that biotite with excess Ar can exhibit flat release patterns (e.g., Pankhurst et al., 1973; Foland, 1983) like those of biotite on Hall Peninsula. This phenomenon is attributed to uniform distribution of excess Ar throughout the grain or to the homogenization of the original Ar distribution by irradiation damage (Pankhurst et al., 1973) or structural breakdown via dehydration/delamination during step-heating in vacuo (e.g., Hanson et al., 1975; Gaber et al., 1988). On inverse isochron plots, almost all heating steps in each sample cluster on the radiogenic x-axis with $^{39}Ar/^{40}Ar$ and $^{36}Ar/^{40}Ar$ ratios of ~0.013–0.014 and <0.0001, respectively (refer to inverse isochron ratios in Appendices 2 and 3). There is little variation in $^{39}Ar/^{40}Ar$ and $^{36}Ar/^{40}Ar$ ratios, which are typically within ± 0.001 and ± 0.00001 of each other, respectively, and there is no identifiable linear array indicating a distinct composition of trapped excess Ar. These relationships indicate that any excess Ar present is fully homogenized with the radiogenic Ar produced *in situ*, resulting in an ^{40}Ar-enriched isotopic composition that yields an apparent Ar age that is too old.

Despite efforts to select only pristine, inclusion-free grains, excess Ar in our samples may have been contained in fluid/melt inclusions that were not visible during microscopy and grain selection. Moreover, the K-feldspar- and biotite-rich Archean basement orthogneisses on the

eastern peninsula (Fig. 1) represent a reservoir of radiogenic Ar. They are a probable source of excess Ar in our samples, especially since anomalously old $^{40}Ar/^{39}Ar$ ages are more common in Paleoproterozoic supracrustal samples that are proximal to Archean basement (Figs. 2 and 5). Many of these supracrustal sequences are tectonically interleaved with slices of Archean basement by T_2 thrusts and are also deformed by F_2 folds and/or F_3 folds. Since the eastern peninsula experienced peak amphibolite-facies metamorphism with muscovite dehydration melting reactions in pelite followed by retrograde muscovite growth, fluids were present during and after metamorphism. Any fluids that were present in Archean basement rocks would likely have become enriched in Ar due to the increased solubility of Ar in fluids than in Ar-rich minerals (Kelley, 2002). In an open system, fluids from the Archean basement may have circulated into younger supracrustal rocks, perhaps aided by deformation (D_1, D_2, D_3), resulting in the partitioning of excess Ar from basement fluids into micas that contained comparatively less Ar (e.g., Kelley, 2002). Mica step-heating ages in the western granulite-facies zone are rarely older than 1700 Ma, implying that excess Ar contamination of mica there may not have been as extensive. Higher metamorphic temperatures, extensive biotite dehydration melting of pelite, and only minor amounts of retrograde biotite suggest relatively dry conditions following peak metamorphism. The absence of anomalously old Ar ages in the granulite-facies zone suggests that excess Ar did not diffuse into mineral grain boundaries through dynamic equilibrium in a closed system, as has been documented in other fluid-poor systems (cf., Kelley, 2002). It is more likely that the granulite-facies zone was an open system and the exposed levels did not receive significant influx of excess Ar-enriched fluids from Archean basement rocks, which are unexposed on the western peninsula.

8.1.4. Preferred thermal evolution

Due to the strong probability of excess Ar in biotite, particularly in samples yielding $^{40}Ar/^{39}Ar$ ages older than ca. 1700 Ma, we consider younger $^{40}Ar/^{39}Ar$ step-heating ages to be more representative of the cooling history of Hall Peninsula. The step-heating ages and UV laser transects of three muscovite samples on the eastern peninsula, complemented by numerical diffusion models and similar step-heating ages in several other samples, are considered the best possible dataset on which to base the interpreted thermal history. These integrated results suggest relatively slow cooling at rates of ~1–2°C/Myr after the thermal peak of metamorphism, then ~1.5–2.5°C/Myr from ca. 1736 Ma onwards, with a possible slight increase to up to 5°C/Myr beginning at ca. 1670–1660 Ma.

The data and numerical models allow for retrograde muscovite growth over a wide temperature window, from the solidus at ~650°C (Models A and B) to the approximate closure temperatures of Ar at ~400–450°C (Model C), and preclude the growth of muscovite after the youngest step-heating age of ca. 1657 Ma. However, microstructures, the previously modeled P–T history (Skipton et al., 2016a) and the overall absence of greenschist-facies minerals indicate that most, if not all, muscovite crystallized at temperatures >450°C. There is no known structural evidence for a tectonic episode at ca. 1670–1660 Ma that may have caused a sudden increase in cooling rate (Model B) and/or muscovite growth (Model C). Monotonic slow cooling (≤2.5°C/Myr) is further supported by step-heating ages of ca. 1633 Ma and 1622 Ma in biotite and ca. 1630 Ma in phlogopite that probably record continued cooling through the nominal closure temperatures of these minerals (~300°C and ~360–430°C, respectively; Harrison et al., 1985; McDougall and Harrison, 1999; Wells et al., 2008). Rather than rapid cooling, the preservation of peak or near-peak metamorphic assemblages across the study area is likely due to insufficient fluids for retrogression below the reversal of mica dehydration reactions at amphibolite-facies

conditions. This is consistent with minimal retrograde biotite (and no muscovite) in the drier granulite-facies zone and comparatively abundant retrograde biotite and especially muscovite in mid-amphibolite-facies rocks, as would be expected since fluid loss is proportional to metamorphic temperature and the degree of partial melting.

Therefore, our preferred interpretation is that peak metamorphism was followed by slow cooling at ~1–2°C/Myr until ca. 1736 Ma, and then at ~1.5–2.5°C/Myr under relatively dry conditions. Together with previously published U–Pb zircon, monazite and titanite ages, and petrological and U–Pb monazite constraints on amphibolite- to granulite-facies metamorphism during ca. 1860–1820 Ma (Fig. 3; Scott, 1999; Rayner, 2014, 2015; Skipton et al., 2016a, b), the new $^{40}Ar/^{39}Ar$ thermochronological data indicate that the study area remained hotter than ~400°C for ~150–200 Myr after peak orogenesis. Slow cooling is consistent with estimated cooling rates of ≤1°C/Myr throughout the Phanerozoic, suggested by (U–Th)/He thermochronology on apatite and zircon (Creason and Gosse, 2014; Creason, 2015).

8.2. Tectonic implications

8.2.1. THO cooling history

The $^{40}Ar/^{39}Ar$ ages reported here are comparable to $^{40}Ar/^{39}Ar$ and K–Ar ages elsewhere in the northern THO (Fig. 3). These include K–Ar biotite ages of ca. 1743–1690 Ma and 1777–1635 Ma from the southern MIM and the Torngat Orogen, respectively (Lowdon, 1960; Leech et al., 1963; Lowdon et al., 1963; Wanless, 1970; Hemming et al., 2000), and $^{40}Ar/^{39}Ar$ step-heating muscovite ages of ca. 1649 and 1640 Ma (Willigers et al., 2001) and ca. 1686–1676 Ma (Sidgren et al., 2006) from the Nagssugtoqidian Orogen (Fig. 3). The MIM, Nagssugtoqidian and Torngat orogens share similar timing of principal accretionary events and peak amphibolite- to granulite-facies metamorphism (ca. 1870–1830 Ma; Fig. 3). These regions also record late- to post-orogenic

tectonothermal activity in the form of post-kinematic pegmatites and growth/recrystallization of monazite, zircon and/or titanite at ca. 1800–1750 Ma, as well as crustal-scale ca. 1779–1774 Ma strike-slip zones in the Nagssugtoqidian Orogen and ca. 1798–1770 Ma flexural slip folds in the Torngat Orogen (Fig. 3). Therefore, the long-lived orogenic history of the THO is largely consistent across the northeastern portion of the orogen. The $^{40}Ar/^{39}Ar$ and K–Ar ages of Hall Peninsula are strikingly similar to those elsewhere in the northeastern THO (Fig. 3), and, accordingly, the dispersion of K–Ar ages may be attributed to excess Ar (and large analytical errors). Together, the data imply similar slow cooling histories for the Hall Peninsula and the broader northeastern THO. Comparable K–Ar ages elsewhere in the THO (e.g., Wanless, 1970) and the apparent lack of large extensional detachments (Corrigan et al., 2009) suggest that slow cooling was orogen-wide. One possible exception is rapid cooling and perhaps exhumation following a ca. 1770 Ma late-collisional event documented in a portion of the central THO in Manitoba (Canada) that is interpreted to have stabilized as a distinct tectonic block (Schneider et al., 2007). However, this is a localized occurrence and studies generally agree that the cratonic core of Laurentia, including the components of the THO, had amalgamated by ca. 1800 Ma (e.g., Whitmeyer and Karlstrom, 2007; Corrigan et al., 2009). Several extensive continental sedimentary basins that include deposition of thick mature clastic sequences beginning at ca. 1760–1720 Ma, such as in the Thelon Basin and Baraboo Quartzite, are inferred to reflect the stabilization and subsidence of Laurentia approaching cratonic stabilization (Holm et al., 1998; Rainbird et al., 2003; Medaris et al., 2007).

8.2.2. Denudation rates

Relatively slow Paleoproterozoic cooling rates (~1–2.5°C/Myr) following peak metamorphism in Hall Peninsula suggest correspondingly slow rates of denudation during the

Proterozoic. Areas of southern Baffin Island are covered by Ordovician carbonates, and although there are currently no Ordovician sequences on Hall Peninsula, carbonate xenoliths in kimberlites indicate that shallow marine carbonate strata covered the area during the Late Ordovician to Early Silurian and were removed via erosion after the Early Cretaceous (Zhang and Pell, 2013). Therefore, the mid-crustal rocks of Hall Peninsula were exhumed by the beginning of the Late Ordovician (ca. 461 Ma), and subsequent erosion removed an estimated <500 m of carbonate cover strata (Zhang and Pell, 2013), as well as an unknown thickness of underlying rocks. Phase equilibrium models of pelite suggest pressures of ~6.1–7.35 kbar at the thermal peak (Skipton et al., 2016a), corresponding to depths of ~23–28 km using a common crustal density of 2700 kg/m^3. Assuming that post-Early Cretaceous erosion removed no more than 1 km of the mid-crustal rocks along with the overlying Ordovician units, ~23–28 km of crustal material was removed between peak metamorphism (ca. 1860–1820 Ma) and the Late Ordovician (ca. 461 Ma). Dividing the estimated depth by the maximum allowable time for these rocks to reach the surface yields minimum denudation rates of ~0.01–0.02 km/Myr. A maximum denudation rate can be approximated by dividing the estimated depth by the minimum allowable time for exhumation, which can be obtained from our numerical diffusion models of Ar in muscovite that suggest a maximum overall cooling rate of ~2.5°C/Myr. In this scenario, the mid-crustal rocks would be exhumed and cooled to 0 kbar and 0°C by 1530 Ma at the latest, yielding maximum denudation rates of ~0.07–0.09 km/Myr.

The range of denudation rates estimated from our new $^{40}Ar/^{39}Ar$ data are comparable with those of ancient orogens such as the Grenville (~0.03–0.14 km/Myr; Cosca et al., 1991), but are considerably slower than the modern Himalaya (~3–7 km/Myr; Annen and Scaillet, 2006; Enkelmann et al., 2011). Even the estimated maximum possible cooling rate of 13.8°C/Myr on

Hall Peninsula—which is calculated using the oldest $^{40}Ar/^{39}Ar$ biotite step-heating age that probably contains excess Ar, as discussed above—is much slower than typical cooling rates in modern orogens (e.g., ~100–350 °C/Myr; Zeck et al., 1992). It is comparable to estimated cooling rates in other Proterozoic orogens, including the Grenville, of ~1–10°C/Myr (Dunlap, 2000). Slower denudation and cooling rates in ancient orogens have been attributed to partial resetting by long-term isothermal residence below the nominal closure temperatures for Ar (Dunlap, 2000). This is not precluded in our samples, although models show that the core-to-rim age decreases closely match the diffusion profiles that would be expected from cooling through the nominal closure temperature, without later partial resetting. Alternatively, slower cooling in ancient orogens may be due to the slowing of denudation rates with time as the crust thins and approaches isostatic equilibrium (Cosca et al., 1991). If rapid cooling occurred early in the THO's history, the evidence may not be preserved, especially if exhumed rocks reached upper crustal levels (e.g., core complexes) that have since been removed.

8.2.3. Orogenic collapse?

Rocks at the current level of exposure on Hall Peninsula are estimated to have been exhumed from depths of ~23–28 km, and adding the present-day crustal thickness of ~35–46 km (Snyder, 2010) yields a paleo-crustal thickness estimate of ~58–74 km. This is a minimum estimate since grossular-enriched zoning in garnet that was otherwise compositionally homogenized during metamorphism hints at a clockwise P–T evolution that possibly attained higher pressures than the ~6.1–7.35 kbar estimated at the thermal peak (Skipton et al., 2016a). Higher maximum pressure estimates of ~8–9 kbar farther south in the MIM and Cape Smith Belt (Bégin, 1992; St-Onge and Ijewliw, 1996; St-Onge et al., 2007) imply even greater crustal thicknesses. However, peak orogenic pressure estimates across most of the THO are ~3–7 kbar, corresponding to crustal

thicknesses during peak orogenesis of ~52–58 km (Corrigan et al., 2009 and references therein). These paleo-thickness estimates of peak orogenic crust are also minimums, since delamination of the lower crust / orogenic root is not ruled out. Teleseismic profiles reveal a relatively flat Moho under Hall Peninsula at a depth of ~35–46 km (Snyder, 2010). It has been proposed that large-scale post-accretion delamination of the lithospheric mantle under southern Baffin Island contributed to Cumberland Batholith magmatism during ca. 1865–1845 Ma (Whalen et al., 2010), which temporally coincided with peak metamorphism and crustal shortening (D_1) on Hall Peninsula (Skipton et al., 2016a, b). However, delamination of the orogenic root is a hallmark of orogenic collapse with associated rapid cooling, exhumation and extensional structures (e.g., Leech, 2001), whereas evidence in this study and elsewhere in the THO favours slow denudation and cooling. Therefore, orogenic root delamination is unlikely to have been significant enough to contribute to orogenic collapse, and possible lithospheric delamination that contributed to Cumberland Batholith magmatism may have also been too early in the THO evolution to significantly affect late- to post-orogenic uplift.

The estimated crustal thicknesses during peak orogenesis for much of the THO (~52–58 km; Corrigan et al., 2009 and references therein) and especially the study area (~58–74 km) are comparable to those of other hot collisional orogens, including the Grenville (~60–65 km; Mezger et al., 1991), Himalaya (~70–80 km; Nelson et al., 1996), Variscan (~60–70 km; Schulmann et al., 2008) and Svecofennian (~55–70 km; Nironen, 1997; Kukkonen and Lauri, 2009). The similarly over-thickened crust and widespread high-grade metamorphism of the THO seem to align with the definition of a large, hot orogen of Beaumont et al. (2006). However, in contrast to the slow cooling history interpreted for the THO that suggests erosionally driven exhumation, other large, hot ancient orogens record tectonically driven exhumation and often more rapid cooling signifying

orogenic collapse. For instance, the Grenville orogen has a late extensional tectonic architecture that extends to mid-crustal depths, and relatively fast cooling (up to ~11°C/Myr) of exposed mid-crustal blocks (Mezger et al., 1991; Cosca et al., 1995; Busch et al., 1997; Rivers, 2008; Schneider et al., 2013), attributed to the foundering of an upper-crustal orogenic plateau into a ductile mid-crustal channel (Rivers, 2012). In the Variscan, thermal relaxation of the thickened orogen led to gravity-driven extensional collapse via detachments, possibly accompanied by late-orogenic transpressional plate convergence, and disappearance of the orogenic root (Catalán et al., 2009; Fernández et al., 2012; Pascual et al., 2013). In the Svecofennian, thermal relaxation also led to gravitational collapse along detachments, some of which were reactivated crustal-scale thrust surfaces (Korja et al., 2009; Nikkila et al., 2015), although models by Kukkonen and Lauri (2009) suggest that gravitational collapse was limited to the upper crust. The Variscan, Svecofennian and Grenvillian orogens all contain metamorphic core complexes or "core complex-like systems" involving rapid domal uplift or vertical extrusion of mid-to-lower crustal rocks (Schulmann et al., 2008; Korja et al., 2009; Rivers, 2012; Pascual et al., 2013). These are not documented in the THO, possibly because upper-crustal levels have mostly been removed. In light of several detachments that extend to mid- to lower-crustal depths in similar hot, thickened orogens, the apparent absence of detachments and other evidence of gravitational collapse in the well-exposed mid-crustal rocks of the THO seems puzzling. We suggest that future studies remain vigilant for structures that may have accommodated widespread extension, and that possible detachments be investigated through comprehensive $^{40}Ar/^{39}Ar$ thermochronology, particularly UV laser age transects and numerical diffusion modeling to constrain cooling and exhumation rates.

Considering the available evidence, orogenic collapse of the THO may have been prevented by several combined factors that contributed to increased rheological stability. Lateral

flow of melt-weakened, ductile mid-crust between a thrust-sense lower boundary and a normal-sense upper boundary has been suggested during peak orogenesis in the Grenville (Rivers, 2008 and references therein) and the Variscides (Schulmann et al. 2008), analogous to so-called "channel flow" in the Himalaya (Grujic et al., 2002; Beaumont et al., 2006). This process is apparently absent from the THO, possibly due to the lower proportion of pelite and, consequently, lower melt volumes (St-Onge et al., 2006b). However, gravitational collapse was achieved in the Svecofennian despite the apparent lack of mid-crustal ductile flow in a channel structure (Kukkonen and Lauri, 2009; Nikkila et al., 2015). Although the estimated crustal thickness during peak orogenesis is up to ~74 km on the MIM (including Hall Peninsula), Corrigan et al. (2009) report values of ~52–58 km for most of the THO and suggest that the orogen may have been wide but with relatively modest thickness, at least during its terminal phase, as a result of early thermal softening. Thus, the THO may not have reached large-scale gravitational instability due to less melt-weakening and lower overall crustal thicknesses during its terminal phase.

9. Conclusions

1) Apparent $^{40}Ar/^{39}Ar$ biotite step-heating ages on Hall Peninsula range from ca. 1788 to 1622 Ma, but are mostly between ca. 1700 and 1670 Ma. Muscovite ages range from ca. 1729 to 1657 Ma, and phlogopite ages are from ca. 1720 to 1630 Ma. The older step-heating ages are mostly from amphibolite-facies pelite overlying and interleaved with Archean gneiss on the northeastern peninsula, and are likely attributed to excess Ar.
2) UV laser spot analyses conducted on three muscovite samples exhibit a ~20–30 Myr decrease in apparent $^{40}Ar/^{39}Ar$ age from core to rim. The UV laser spot ages range from

ca. 1661 to 1640 Ma (sample B75A), from ca. 1675 to 1645 Ma (sample B75A) and from ca. 1680 to 1652 Ma (sample F122B).

3) Numerical diffusion models of $^{40}Ar/^{39}Ar$ ages in muscovite suggest that Hall Peninsula underwent relatively slow cooling, from rates of ~1–2°C/Myr following peak metamorphism to rates of ~1.5–2.5°C/Myr after ca. 1736 Ma (from ~550–600°C) to the approximate window of closure temperatures for Ar in muscovite (~400–450°C) at ca. 1670–1660 Ma, at which point the cooling rate may have remained the same or, possibly, increased slightly to no faster than ~5°C/Myr.
4) Together with previously published U–Pb ages, the $^{40}Ar/^{39}Ar$ data in this study attest to Hall Peninsula remaining hotter than ~420°C for ~150–200 Myr after peak metamorphism (ca. 1860–1820 Ma), with corresponding slow denudation rates of 0.01–0.09 km/Myr.
5) Similar $^{40}Ar/^{39}Ar$ and K–Ar ages in much of the THO, and the apparent absence of extensional structures, imply orogen-wide slow cooling, which is in marked contrast with orogenic collapse recorded in similarly hot, thickened orogens. Although this hints at the existence of undiscovered collapse structures such as mid- to lower-crustal detachments, it is likely that the THO did not meet the conditions necessary for orogenic collapse, including extensive melt-weakening of over-thickened crust during its terminal phase.

Acknowledgements

Financial support for this work was provided by the Canada-Nunavut Geoscience Office (CNGO) as part of the Hall Peninsula Integrated Geoscience Project (HPIGP), and additional funding was provided by NSERC. D. Mate and H. Steenkamp (CNGO) are thanked for their support and logistical organization of field work. This work greatly benefitted from discussions

with M. St-Onge, A. Camacho and the HPIGP bedrock mapping group. C. Warren is thanked for helpful discussions on numerical diffusion modeling. Thanks are extended to G. Poirier for his help in acquiring EMPA chemical maps.

References

Annen, C., Scaillet, B., 2006. Thermal evolution of leucogranites in extensional faults: Implications for Miocene denudation rates in the Himalaya. Geological Society Special Publication 268, 309–326.

Ashworth, J.R., 1975. The sillimanite zone of the Huntly-Portsoy area in the north-east Dalradian, Scotland. Geological Magazine 112, 113–136.

Beaumont, C., Nguyen, M.H., Jamieson, R.A., Ellis, S., 2006. Crustal flow modes in large hot orogens, in: Law, R.D., Searle, M.P., Godin, L. (Eds) *Channel flow, Ductile Extrusion and Exhumation in Continental Collision Zones*. Geological Society, London, Special Publications 268, 91–145.

Bégin, N.J., 1992. Contrasting mineral isograd sequences in metabasites of the Cape Smith Belt, northern Quebec, Canada: three new bathograds for mafic rocks. Journal of Metamorphic Geology 10, 685–704.

Berman, R.G., Sanborn-Barrie, M., Rayner, N., Whalen, J., 2013. The tectonometamorphic evolution of Southampton Island, Nunavut: Insight from petrologic modeling and in situ SHRIMP geochronology of multiple episodes of monazite growth. Precambrian Research 232, 140–166.

Blackadar, R.G., 1967. Geological reconnaissance, southern Baffin Island, District of Franklin. Geological Survey of Canada, Paper 66–47.

Busch, J.P., Mezger, K., van der Pluijm, B.A., 1997. Suturing and extensional reactivation in the Grenville orogen, Canada. Geology 25, 507–510.

Camacho, A., Lee, J.K.W., Fitz Gerald, J.D., Zhao, J., Abdu, Y.A., Jenkins, D.M., Hawthorne, F.C., Kyser, T.K., Creaser, R.A., Armstrong, R., Heaman, L.W., 2012. Planar defects as Ar traps in trioctahedral micas: A mechanism for increased Ar retentivity in phlogopite. Earth and Planetary Science Letters 341–344, 255–267.

Catalán, J.R.M and 16 co-authors, 2009. A rootless suture and the loss of the roots of a mountain chain: The Variscan belt of NW Iberia, in: K. Schulmann, R. Scrivener, Lardeaux, J.-M. (Eds.), *Mechanics of the Variscan Orogeny; a modern view on orogenic research*, Comptes Rendus - Geoscience 341, 114–126.

Catlos, E., Harrison, T.M., Kohn, M.J., Grove, M., Lovera, O.M., Ryerson, F.J., Upreti, B.N., 2001. Geochronologic and thermobarometric constraints on the evolution of the Main Central Thrust, central Nepal Himalaya. Journal of Geophysical Research 106, 16177–16203.

Cherniak, D.J., 1993. Pb diffusion in titanite and preliminary results on the effects of radiation damage on Pb transport. Chemical Geology 110, 177–194.

Corrigan, D., Pehrsson, S., Wodicka, N., de Kemp, E., 2009: The Palaeoproterozoic THO: a prototype of modern accretionary processes. Geological Society, London, Special Publication 327, 457–479.

Cosca, M.A., Sutter, J.F., Essene, E.J., 1991. Cooling and inferred uplift/erosion history of the Grenville Orogen, Ontario: constraints from $^{40}Ar/^{39}Ar$ thermochronology. Tectonics 10, 959–977.

Cosca, M.A., Essene, E.J., Mezger, K., van der Pluijm, B.A., 1995. Constraints on the duration of tectonic processes: Protracted extrusion and deep-crustal rotation in the Grenville orogen. Geology 23, 361–364.

Cossette, É., Schneider, D.A., Warren, C.J., Grasemann, B., 2015. Lithological, rheological, and fluid infiltration control on $^{40}Ar/^{39}Ar$ ages in polydeformed rocks from the West Cycladic detachment system, Greece. Lithosphere 7(2), 189–205.

Creason, C.G., Gosse, J.C., 2014. Preliminary characterization of the Mesozoic–Cenozoic exhumation of Hall Peninsula, Baffin Island, Nunavut, based on apatite and zircon (U-Th)/He thermochronology, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 93–100.

Creason, C.G., 2015. Phanerozoic exhumation history of Hall Peninsula, Baffin Island: insights from apatite and zircon (U-Th-Sm)/He thermochronology and 3D thermokinematic modeling. MSc thesis, Dalhousie University, Halifax, Nova Scotia, 141 pp.

Deino, A.L., 2001: User's manual for Mass Spec v. 5.02. Berkeley Geochronology Center Special Publication 1a, Berkeley Geochronology Center, Berkeley California, 119 pp.

Dunlap, W.J., 2000: Nature's diffusion experiment: the cooling rate cooling-age correlation. Geology 28(2), 139–142.

Dyck, B.J., St-Onge, M.R., 2014. Dehydration-melting reactions, leucogranite emplacement and the Paleoproterozoic structural evolution of Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 73–84.

Enkelmann, E., Ehlers, T.A., Zeitler, P.K., Hallet, B., 2011. Denudation of the Namche Barwa Antiform, eastern Himalaya. Earth and Planetary Science Letters 307, 323–333.

Evans, B.W., Guidotti, C.V. 1966. The sillimanite-potash feldspar isograd in Western Maine, U.S.A. Contributions to Mineralogy and Petrology 12, 25–62.

Fernández, R.D., Catalán, J.R.M., Barreiro, J.G., Arenas, R., 2012. Extensional flow during gravitational collapse: a tool for setting plate convergence (Padrón Migmatitic Dome, Variscan Belt, NW Iberia). Journal of Geology 120, 83–103.

Foland, K.A., 1983. $^{40}Ar/^{39}Ar$ incremental heating plateaus for biotites with excess argon. Isotope Geoscience 1(1), 3–21.

From, R.E., St-Onge, M.R., Camacho, A.L., 2014. Preliminary characterization of the Archean orthogneiss complex of Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 53–62.

Gaber, L.J., Foland, K.A., Corbató, C.E., 1988. On the significance of argon release from biotite and amphibole during $^{40}Ar/^{39}Ar$ vacuum heating. Geochimica et Cosmochimica Acta 52, 2457–2465.

Grujic, D., Hollister, L., Parrish, R., 2002. Himalayan metamorphic sequence as an orogenic channel: insight from Bhutan. Earth and Planetary Science Letters 198, 177–191.

Hames, W.E., Bowring, S.A., 1994. An empirical evaluation of the argon diffusion geometry in muscovite. Earth and Planetary Science Letters 124, 161–169.

Hanson, G.N., Simmons, K.R., Bence, A.E., 1975. $^{40}Ar/^{39}Ar$ spectrum for biotite, hornblende and muscovite in a contact metamorphic zone. Geochimica et Cosmochimica Acta 39, 1269–1277.

Harrison, T.M., Duncan, I., McDougall, I., 1985. Diffusion of ^{40}Ar in biotite: Temperature, pressure and compositional effects. Geochimica et Cosmochimica Acta 49, 2461–2468.

Harrison, M.T., Célérier, J., Aikman, A.B., Hermann, J., Heizler, M.T., 2009. Diffusion of ^{40}Ar in muscovite. Geochimica et Cosmochimica Acta 73, 1039–1051.

Hawkins, D.P., Bowring, S.A., 1999. U-Pb monazite, xenotime and titanite geochronological constraints on the prograde to post-peak metamorphic thermal history of Paleoproterozoic migmatites from the Grand Canyon, Arizona. Contributions to Mineralogy and Petrology 134, 150–169.

Hemming, S.R., Gwiazda, R.H., Andrews, J.T., Broeckner, W.S., Jennings, A.E., Onstott, T.C., 2000. $^{40}Ar/^{39}Ar$ and Pb-Pb study of individual hornblende and feldspar grains from southeastern Baffin Island glacial sediments: implications for the provenance of the Heinrich layers. Canadian Journal of Earth Sciences 37, 879–890.

Hoffman, P.F., 1988. United Plates of America, the birth of a craton: Early Proterozoic assembly and growth of Laurentia. Annual Review of Earth and Planetary Sciences 16, 543–603.

Holm, D., Schneider, D.A., Coath, C.D., 1998. Age and deformation of Early Proterozoic quartzites in the southern Lake Superior region: Implications for extent of foreland deformation during final assembly of Laurentia. Geology 26, 907–910.

Jackson, G.D., Hunt, P.A., Loveridge, W.D., Parrish, R.R., 1990. Reconnaissance geochronology of Baffin Island, N.W.T. Radiogenic Age and Isotopic Studies: Report 3, Geological Survey of Canada, Paper 89-2, 123–148.

Jourdan, F., Verati, C., Féraud, G., 2006: Intercalibration of the Hb3gr $^{40}Ar/^{39}Ar$ dating standard. Chemical Geology 231, 177–189.

Kellett, D., Joyce, N., 2014. Analytical details of single- and multicollection $^{40}Ar/^{39}Ar$ measurements for conventional step-heating and total-fusion age calculation using the Nu Noblesse at the Geological Survey of Canada. Geological Survey of Canada, Technical Note 8, 27 pp.

Kelley, S., 2002. Excess argon in K–Ar and Ar–Ar geochronology. Chemical Geology 188, 1–22.

Korja, A., Kosunen, P., Heikkinen, P., 2009. A case study of lateral spreading: the Precambrian Svecofennian Orogen, in: Ring, U., Wernicke, B. (Eds), *Extending a Continent: Architecture, Rheology and Heat Budget*, Geological Society, London, Special Publication 321, 225–251.

Kramar, N., Cosca, M.A., Buffat, P.-A., Baumgartner, L.P., 2003. Stacking fault-enhanced argon diffusion in naturally deformed muscovite, in: D. Vance, W. Müller, I.M. Villa (Eds.),

Geochronology: Linking the Isotopic Record with Petrology and Textures, Geological Society of London, Special Publication 220, 249–260.

Kukkonen, I.T., Lauri, L.S., 2009. Modelling the thermal evolution of a collisional Precambrian orogen: High heat production migmatitic granites of southern Finland. Precambrian Research 168, 233–246.

Lanphere, M.A., Dalrymple, G.B., 1976. Identification of excess ^{40}Ar by the $^{40}Ar/^{39}Ar$ age spectrum technique. Earth and Planetary Science Letters 32, 141–148.

Lee, J.K.W., 1995. Multipath diffusion in geochronology. Contributions to Mineralogy and Petrology 120, 60–82.

Lee, J.-Y., Marti, K., Severinghaus, J.P., Kawamura, K., Yoo, H.-S., Lee, J.B., Kim, J.S., 2006. A redetermination of the isotopic abundances of atmospheric Ar. Geochimica et Cosmochimica Acta 70, 4507–4512.

Leech, G.B., Lowdon, J.A., Stockwell, C.H., Wanless, R.K., 1963. Age determinations and geological studies (including isotopic ages – report 4). Geological Survey of Canada, Paper 63-17, 146 pp.

Leech, M.L., 2001. Arrested orogenic development: eclogitization, delamination, and tectonic collapse. Earth and Planetary Science Letters 185, 149–159.

Lewry, J.F., Collerson, K.D. 1990: The THO: extent, subdivisions and problems, in: J.F. Lewry, M.R. Stauffer (Eds.), *The Early Proterozoic THO of North America*, Geological Association of Canada, Special Paper 37, 1–14.

Lowdon, J.A., 1960. Age determinations by the Geological Survey of Canada, Report 1 – isotopic ages. Geological Survey of Canada, Paper 60-17, 5–40.

Lowdon, J.A., Stockwell, C.H., Tipper, H.W., Wanless, R.K., 1963. Age determinations and geological studies. Geological Survey of Canada, Paper 62-17, 140 pp.

Machado, G., Bilodeau, C., Takpanie, R., St-Onge, M.R, Rayner, N.M., Skipton, D.R., Young, M., From, R., MacKay, C., Creason, C.G., Braden, Z.M., 2013. Hall Peninsula regional bedrock mapping, Baffin Island, Nunavut, in: Summary of Activities 2012, Canada-Nunavut Geoscience Office, 13–22.

McDougall, I., Harrison, T.M., 1999. Geochronology and Thermochronology by the $^{40}Ar/^{39}Ar$ Method. Oxford University Press, New York, New York, 269 pp. (2^{nd} Ed.).

Medaris, L.G., Van Schmus, W.R., Loofboro, J., Stonier, P.J., Zhang, X., Holm, D.K., Singer, B.S., Dott, R.H., 2007. Two Paleoproterozoic (Statherian) siliciclastic metasedimentary sequences in central Wisconsin: The end of the Penokean Orogeny and cratonic stabilization of the southern Lake Superior region. Precambrian Research 157, 188–202.

Mezger, K., van der Pluijm, B.A., Essene, E.J., Halliday, A.N., 1991. Synorogenic collapse: A perspective from the middle crust, the Proterozoic Grenville Orogen. Science 254 (5032), 695–698.

Nelson, K.D. and 27 co-authors, 1996. Partially molten middle crust beneath southern Tibet: Synthesis of project INDEPTH results. Science 274, 1684–1688.

Nikkila, K., Korja, A., Koyi, H., Eklund, O., 2015. Analog modeling of one-way gravitational spreading of hot orogens – A case study from the Svecofennian orogen, Fennoscandian Shield. Precambrian Research 268, 135–152.

Nironen, M., 1997. The Svecofennian Orogen: a tectonic model. Precambrian Research 86, 21–44.

Palin, R.M., Searle, M.P., St-Onge, M.R., Waters, D.J., Roberts, N.M.W., Horstwood, M.S.A., Parrish, R.R., Weller, O.M., Chen, S., Yang, J., 2014. Monazite geochronology and petrology of kyanite- and sillimanite-grade migmatites from the northwestern flank of the eastern Himalayan syntaxis. Gondwana Research 26, 323–347.

Pankhurst, R.J., Moorbath, S., Rex, D.C., Turner, G., 1973. Mineral age patterns in ca. 3700 my old rocks from West Greenland. Earth and Planetary Science Letters 20, 157–170.

Pascual, F.J.R., Arenas, R., Catalán, J.R.M., Fernández, L.R.R., Wijbrans, J.R., 2013. Thickening and exhumation of the Variscan roots in the Iberian Central System: Tectonothermal processes and $^{40}Ar/^{39}Ar$ ages. Tectonophysics 587, 207–22.

Pickles, C.S., Kelley, S.P., Reddy, S.M., Wheeler, J., 1997. Determination of high spatial resolution argon isotope variations in metamorphic biotites. Geochimica et Cosmochimica Acta 61, 3809–3833.

Pyle, J.M., Spear, F.S., 2003. Four generations of accessory-phase growth in low-pressure migmatites from SW New Hampshire. American Mineralogist 88, 338–351.

Rainbird, R.H., Hadlari, T., Aspler, L.B., Donaldson, J.A., LeCheminant, A.N., Peterson, T.D., 2003. Sequence stratigraphy and evolution of the Paleoproterozoic intracontinental Baker

Lake and Thelon basins, western Churchill Province, Nunavut, Canada. Precambrian Research 125, 21–53.

Rayner, N.M., 2014. New U-Pb geochronological results from Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 39–52.

Rayner, N.M., 2015. New (2013-2014) U-Pb geochronological results from northern Hall Peninsula, southern Baffin Island, Nunavut, in: Summary of Activities 2014, Canada-Nunavut Geoscience Office, 31–44.

Rayner, N.M., Sanborn-Barrie, M., Young, M.D., Whalen, J.B., 2012: U-Pb ages of Archean basement and Paleoproterozoic plutonic rocks, southern Cumberland Peninsula, eastern Baffin Island, Nunavut. Geological Survey of Canada, Current Research 2012-8, 28 pp.

Rivers, T., 2008. Assembly and preservation of lower, mid, and upper orogenic crust in the Grenville Province – Implications for the evolution of large hot long-duration orogens. Precambrian Research 167, 237–259.

Rivers, T., 2012. Upper-crustal orogenic lid and mid-crustal core complexes: signature of a collapsed orogenic plateau in the hinterland of the Grenville Province. Canadian Journal of Earth Sciences 49, 1–42.

Schneider, D.A., Heizler, M.T., Bickford, M.E., Wortman, G.L., Condie, K.C., Perilli, S., 2007. Timing constraints of orogeny to cratonization: Thermochronology of the Paleoproterozoic Trans-Hudson orogen, Manitoba and Saskatchewan, Canada. Precambrian Research 153, 65–95.

Schneider, D.A., Cope, N., Holm, D.K., 2013. Thermochronology of the Mont Laurier terrane, southern Canadian Grenville Province, and its bearing on defining orogenic architecture. Precambrian Research 226, 43–58.

Schulmann, K., Lexa, O., Štípská, P., Racek, M., Tajčmanová, L., Konopásek, J., Edel, J.-B., Peschler, A., Lehmann, J., 2008. Vertical extrusion and horizontal channel flow of orogenic lower crust: key exhumation mechanisms in large hot orogens? Journal of Metamorphic Geology 26, 273–297.

Scott, D.J., 1999. U-Pb geochronology of the eastern Hall Peninsula, southern Baffin Island, Canada: a northern link between the Archean of West Greenland and the Paleoproterozoic Torngat Orogen of northern Labrador. Precambrian Research 93, 5–26.

Scott, D.J., Wodicka, N., 1998. A second report on the U-Pb geochronology of southern Baffin Island. Geological Survey of Canada, Paper 1998-F, 47–57.

Seydoux-Guillaume, A.-M., Paquette, J.L., Wiedenbeck, M., Montel, J.-M., Heinrich, W., 2002. Experimental resetting of the U-Th-Pb systems in monazite. Chemical Geology 191, 165–181.

Sidgren, A.-S., Page, L., Garde, A.A., 2006. New hornblende and muscovite $^{40}Ar/^{39}Ar$ cooling ages in the central Rinkian fold belt, West Greenland. Geological Survey of Denmark and Greenland Bulletin 11, 115–123.

Skipton, D.R., St-Onge, M.R., 2014. Paleoproterozoic deformation and metamorphism in metasedimentary rocks west of Okalik Bay: a field template for the evolution of eastern Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 63–72.

Skipton, D.R., Schneider, D.A., McFarlane, C.R.M., St-Onge, M.R., Jackson, S. (2016b) Multi-stage zircon and monazite growth revealed by depth-profiling and in situ U-Pb geochronology: resolving the Paleoproterozoic tectonics of the Trans-Hudson Orogen on southeastern Baffin Island, Canada. Precambrian Research 285, 272–298.

Skipton, D.R., St-Onge, M.R., Schneider, D.A., McFarlane, C.R.M. (2016a) Tectonothermal evolution of the middle crust in the Trans-Hudson Orogen, Baffin Island, Canada: evidence from petrology and monazite geochronology of sillimanite-bearing migmatites. Journal of Petrology 57(8), 1437–1462.

Snyder, D.B., 2010. Mantle lithosphere structure beneath southeast Baffin Island, Nunavut, from teleseismic studies. Geological Survey of Canada Current Research 2010-8, 6 pp.

Spear, F.S., Parrish, R.R., 1996. Petrology and cooling rates of the Valhalla complex, British Columbia, Canada. Journal of Petrology 37, 733–765.

Spear, F.S, Kohn, M.J., Cheney, J.T., 1999. P-T paths from anatectic pelites. Contributions to Mineralogy and Petrology 134, 17–32.

St-Onge, M.R., Ijewliw, O.J., 1996. Mineral corona formation during high-P retrogression of granulitic rocks, Ungava Orogen, Canada. Journal of Petrology 37, 553–582.

St-Onge, M.R., Jackson, G.D., Henderson, I., 2006a. Geology, Baffin Island (south of 70°N and east of 80°W), Nunavut. Geological Survey of Canada, Open File 4931, scale 1:500 000.

St-Onge, M.R., Searle, M.P., Wodicka, N., 2006b. THO of North America and Himalaya–Karakorum–Tibetan Orogen of Asia: structural and thermal characteristics of the lower and upper plates. Tectonics 25, 1–22.

St-Onge, M.R., Van Gool, J.A.M., Garde, A.A., Scott, D.J., 2009. Correlation of Archaean and Palaeoproterozoic units between northeastern Canada and western Greenland: constraining the pre-collisional upper plate accretionary history of the THO. Geological Society, London, Special Publication 318, 193–235.

St-Onge, M.R., Scott, D.J., Lucas, S.B., 2000. Early partitioning of Quebec: microcontinent formation in the Paleoproterozoic. Geology 28, 323–326.

St-Onge, M.R., Wodicka, N., Ijewliw, O., 2007. Polymetamorphic evolution of the THO, Baffin Island, Canada: integration of petrological, structural and geochronological data. Journal of Petrology 48, 271–302.

Steenkamp, H.M., St-Onge, M.R., 2014. Overview of the 2013 regional bedrock mapping program on northern Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 27–38.

Steiger, R.H., Jäger, E., 1977. Subcommission on geochronology: convention on the use of decay constants in geo- and cosmochronology. Earth and Planetary Science Letters 36, 359–362.

Tyler, I.M., Ashworth, J.R., 1982. Sillimanite-potash feldspar assemblages in graphitic pelites, Strontian Island, Scotland. Contributions to Mineralogy and Petrology 81, 18–29.

Warren, C.J., Hanke, F., Kelley, S.P., 2012a. When can muscovite $^{40}Ar/^{39}Ar$ dating constrain the timing of metamorphic exhumation? Chemical Geology 291, 79–86.

Warren, C.J., Kelley, S.P., Sherlock, S.C., McDonald, C.S., 2012b. Metamorphic rocks seek meaningful cooling age: Interpreting $^{40}Ar/^{39}Ar$ ages in an exhumed ultra-high pressure terrane. Lithos 155, 30–48.

Wanless, R.K., 1970. Isotopic age map of Canada. Geological Survey of Canada, "A" Series Map 1265A.

Wanless, R.K., Stevens, R.D., Lachance, G.R., Edmonds, C.M., 1968. Age determinations and geological studies, in: K-Ar isotopic ages, Report 8, Geological Survey of Canada, Paper 67-2A, 11–141.

Wanless, R.K., Stevens, R.D., Lachance, G.R., Delabio, R.N., 1974. Age determinations and geological studies, in: K-Ar isotopic ages, Report 12, Geological Survey of Canada, Paper 74-2, 6–63.

Wanless, R.K., Stevens, R.D., Lachance, G.R., Delabio, R.N., 1979. Age determinations and geological studies, in: K-Ar isotopic ages, Report 14, Geological Survey of Canada, Paper 79-2, 1–67.

Wells, M.L., Spell, T.L., Hoisch, T.D., Arriola, T., Zanetti, K.A., 2008. Laser-probe $^{40}Ar/^{39}Ar$ dating of strain fringes: Mid-Cretaceous synconvergent orogen-parallel extension in the interior of the Sevier orogen. Tectonics 27 (TC3012), 1–20.

Whalen, J.B., Wodicka, N., Taylor, B.E., Jackson, G.D., 2010. Cumberland Batholith, Trans-Hudson Orogen, Canada: Petrogenesis and implications for Paleoproterozoic crustal and orogenic processes. Lithos 117, 99–118.

Wheeler, J., 1996. DiffArg: A program for simulating argon diffusion profiles in minerals. Computers and Geosciences 22(8), 919–929.

Whitmeyer, S.J., Karlstrom, K.E., 2007. Tectonic model for Proterozoic growth of North America. Geosphere 3(4), 220–259.

Whitney, D.L., Evans, B.W., 2010. Abbreviations for names of rock-forming minerals. American Mineralogist 95, 185–187.

Willigers, B.J.A., Krogstad, E.J., Wijbrans, J.R., 2001. Comparison of thermochronometers in a slowly cooled granulite terrain: Nagssugtoqidian Orogen, West Greenland. Journal of Petrology 42, 1729–1749.

Zeck, H. P., Monié, P., Villa, I. M., Hansen, B.T., 1992. Very high rates of cooling and uplift in the alpine belt of the Betic Cordilleras, southern Spain. Geology 20, 79–82.

Zhang, S., Pell, J., 2013. Study of sedimentary rock xenoliths from kimberlites on Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2012, Canada-Nunavut Geoscience Office, 107–112.

Table 1: Summary of $^{40}Ar/^{30}Ar$ thermochronology samples analyzed in this study from Hall Peninsula, southeastern Baffin Island, Canada.

Sample	Location (UTM)[a]		Lithotype	Mineral(s) Dated	Mineral Assemblage[b]	Meta. Grade[c]	Microstructure of Dated Minerals
	Easting	Northing					
B72A	719206	7036620	pelite	Bt, Ms	Qz Bt Kfs Pl Ms Sil	MA	Bt and Ms define S_1; ~40% of Ms grains surround fibrolite; rare Ms grains form patches in Kfs.
B75A	715902	7057019	pelite	Bt, Ms	Qz Bt Sil Pl Kfs Grt Ms	MA	Bt and Ms define S_1; Ms often contains Qz symplectite; ~5% of Ms cross-cuts S_1.
F1A	591078	7071446	marble	Phl	Cal Phl Di Ol Dol	G	Phl defines S_1.
F28A	649369	7011627	psammite	Bt	Qz Pl Kfs Grt Sil Bt	UA-G	Bt defines S_1.
F30A	598900	7039962	marble	Phl	Cal Di Phl Ol Dol	G	Phl defines S_1.
F38A	620176	7136270	pelite	Bt	Grt Pl Qz Bt Sil Ilm	UA	S_1 is weak; some Bt is S_1-aligned; most Bt is randomly oriented; ~30% of Bt grains occur adjacent to Grt, mostly cross-cutting S_1.
F122A	656326	7096385	pelite	Bt, Ms	Qz Pl Bt Ms	MA	Bt and Ms define S_1; some Ms grains cross-cut S_1.
F122B	656326	7096385	pelite	Bt, Ms	Bt Ms Sil Qz Pl Grt Kfs	MA	Bt and Ms define S_1; <5% of Bt cross-cuts S_1, typically adjacent to Grt; ~85% of Ms cross-cuts S_1 (& F_3 crenulations) and surrounds fibrolite, sometimes with Qz symplectite.
H45A	629652	7189559	pelite	Bt, Ms	Bt Ms Grt Qz Pl Ilm Tur	MA	Bt and Ms define S_1; ~15% of Ms grains cross-cut S_1 and are axial planar to $F_{3(?)}$ crenulations.
K2A	647759	7021586	pelite	Bt	Qz Kfs Pl Bt Sil Grt	UA	Bt defines S_1 and is locally intergrown with fibrolite.
S1A	651595	6991523	pelite	Bt	Grt Qz Kfs Pl Sil Ilm Bt	G	Bt defines S_1; ~20% of Bt forms anhedral grains in melt bands or cross-cuts S_1 adjacent to Grt.
S7A	550137	7075759	monzogranite	Bt	Qz Kfs Pl Bt Hbl	G	Bt defines S_1.
S35C	716313	7040987	pelite	Bt	Qz Kfs Bt Pl Sil Ms Gr	MA	Bt defines S_1; all Ms surrounds fibrolite, commonly cross-cuts S_1.
S53A	596256	7040077	marble	Phl	Cal Di Ol Phl Dol	G	Phl defines S_1.
S59A	615392	7132823	marble	Phl	Cal Di Ol Phl Dol	UA	Phl defines S_1.
S60A	593562	7040794	psammite	Bt	Qz Pl Kfs Grt Ilm Bt	G	Bt defines S_1, but ~30% of Bt surrounds Grt and cross-cuts S_1.
S74A	604020	7074888	pelite	Bt	Qz Pl Opx Grt Kfs Opq Bt	G	Bt defines S_1; several Bt grains are kinked.
S89A	623387	7195722	pelite	Bt, Ms	Qz Bt Pl Sil Grt Ms	MA	Bt and Ms define S_1; S_1-aligned Ms grains commonly contain Qz symplectite; ~75% of Ms grains are variably oriented and form S_1-aligned aggregates.
S92C	658933	7022280	pelite	Bt, Ms	Bt Kfs Pl Qz Ms Sil Mag	UA	Bt defines S_1; ~50% of Ms grains occur with Bt, both S_1-aligned and with variable orientations; ~50% of Ms surrounds sillimanite aggregates and cross-cuts S_1.
S105A	649651	7085294	tonalite gneiss	Bt	Qz Pl Bt Kfs	UA	Bt defines S_1; but ~40% of Bt grains have variable orientations; ~25% of Bt grains contain Qz symplectite.
S131C	671396	7174469	pelite	Bt, Ms	Qz Pl Bt Sil Ms	MA	Bt and Ms define S_1.
S145A	591234	7127541	pelite	Bt	Qz Grt Pl Crd Kfs Sil Ilm Bt	G	Bt defines S_1; ~25% of Bt grains cross-cut S_1 and are often adjacent to Grt.
S162A	700283	6961179	pelite	Bt	Qz Pl Grt Bt Kfs Sil Mag	UA	Bt defines S_1; ~30% of Bt is concentrated along Grt rims, mostly S_1-aligned but some cross-cuts S_1.
S165B	681368	7151854	psammite	Bt	Pl Qz Grt Bt St Ilm Rt	MA	Bt defines S_1.
Y48A	684447	7027213	amphibolite	Bt	Hbl Grt Qz Pl Opq Bt Chl	UA	Bt defines S_1; ~30% of Bt grains contain Chl intergrowths.
Y66C	693642	7002202	pelite	Bt	Sil Bt Grt Qz	UA	Bt defines S_1 and is often intergrown with fibrolite.
Y98A	616726	7015234	psammite	Bt	Qz Pl Kfs Grt Bt Opq	G	Bt defines S_1.
Z1A	575390	7122353	pelite	Bt	Kfs Pl Qz Grt Crd Sil Bt Ilm Spl	G	Bt defines S_1.
Z58B	639294	7134288	pelite	Bt, Ms	Pl Kfs Qz Grt Bt Ms	MA	Bt and Ms define S_1; ~5% of Bt grains surround Grt and cross-cut S_1; ~5% of Ms grains cross-cut S_1.

[a]NAD 83 Zone 19N (Canada)
[b]Minerals listed from most to least abundant, following mineral abbreviations in Whitney and Evans (2010)
[c]Refers to peak metamorphic grade; MA=mid-amphibolite-facies, UA=upper-amphibolite-facies, G=granulite-facies

Table 2: Summary of apparent $^{40}Ar/^{39}Ar$ step-heating ages in this study from Hall Peninsula, Baffin Island, Canada.

Sample	Mineral	Aliquot[a]	Group[b]	Plateau age[c]				Total gas age (Ma)
				Age (Ma)	MSWD	% ^{39}Ar	# steps	
Biotite								
B72A	Bt	1	II	1690 ±20	2.16	33.9	4	1690 ±20
B72A	Bt	2	II	1700 ±20*	1.19	68.1	13	1690 ±20
B75A	Bt	1	I	1694 ±3	0.48	87.2	7	1693 ±3
F28A	Bt	1	II	1697 ±3	1.65	39.4	9	1696 ±3
F38A	Bt	1	II	1706 ±3	1.37	32.4	5	1704 ±3
F122A	Bt	1	I	1788 ±3	1.09	99.8	16	1785 ±3
F122B	Bt	1	I	1745 ±3	1.56	97.7	17	1743 ±3
H45A	Bt	1	II	1737 ±3	1.83	44.8	7	1729 ±3
K2A	Bt	1	II	1695 ±3	1.3	48	8	1692 ±3
S1A	Bt	1	I	1717 ±2	0.82	97.7	14	1715 ±2
S7A	Bt	1	IV	1687 ±3*^	2.07	75.8	4	1685 ±3
S7A	Bt	2	IV	n/a	n/a	n/a	n/a	1676 ±3
S35C	Bt	1	I	1644 ±3	1.24	98.3	15	1643 ±3
S60A	Bt	1	I	1615 ±3	1.48	55.3	4	1613 ±3
S60A	Bt	2	I	1622 ±2*	1.19	94.5	13	1617 ±3
S74A	Bt	1	I	1689 ±2	1.29	99.7	20	1686 ±2
S89A	Bt	1	III	n/a	n/a	n/a	n/a	1738 ±3
S89A	Bt	2	III	1740 ±3*	1.55	57.4	13	1736 ±3
S92C	Bt	1	II	1664 ±2	0.78	53.5	9	1658 ±2
S105A	Bt	1	I	1693 ±3*	1.12	99.8	17	1686 ±3
S105A	Bt	2	I	1693 ±3	0.59	88.8	10	1692 ±3
S131C	Bt	1	II	1722 ±3	1.26	35.4	5	1717 ±3
S145A	Bt	1	II	1700 ±3	1.71	34.3	5	1692 ±3
S145A	Bt	2	II	1694 ±3*	1.84	46.3	7	1692 ±3
S162A	Bt	1	I	1679 ±3	0.85	99.7	16	1675 ±3
S165B	Bt	1	III	n/a	n/a	n/a	n/a	1686 ±3
S165B	Bt	2	III	1691 ±3*	0.27	46	3	1692 ±3
Y48A	Bt	1	II	1633 ±19*	1.32	67.8	11	1606 ±18
Y48A	Bt	2	II	1623 ±19	1.23	62.8	11	1601 ±18
Y66C	Bt	1	I	1742 ±3	0.44	96.8	12	1737 ±3
Y98A	Bt	1	I	1683 ±3	1.01	99.3	17	1683 ±3
Z1A	Bt	1	II	1661 ±3	0.83	58.3	4	1662 ±3
Z58B	Bt	1	II	1686 ±3	1.22	33.6	7	1677 ±3
Z58B	Bt	2	II	1698 ±3*	0.79	65.5	10	1698 ±3
Muscovite								
B72A	Ms	1	II	1660 ±20*	1.51	30.6	8	1660 ±20
B72A	Ms	2	II	n/a	n/a	n/a	n/a	1650 ±20
B75A	Ms	1	II	n/a	n/a	n/a	n/a	1664 ±3
B75A	Ms	2	II	1657 ±3*	2.16	55.4	6	1661 ±3
F122A	Ms	1	I	1698 ±3	1.7	85.9	13	1698 ±3
F122B	Ms	1	III	1691 ±3*^	n/a	77.2	1	1693 ±3
F122B	Ms	2	III	n/a	n/a	n/a	n/a	1685 ±3
H45A	Ms	1	III	1719 ±3^	n/a	64.1	1	1717 ±3
H45A	Ms	2	III	1712 ±3*	0.94	86.1	3	1710 ±4
S89A	Ms	1	II	1729 ±3	1.57	33	7	1718 ±3
S92C	Ms	1	I	1693 ±3*	1.66	91.9	12	1689 ±3
S92C	Ms	2	I	1687 ±3	1.89	42.3	3	1686 ±3
S92C	Ms	3	I	1665 ±2	1.1	47.3	8	1669 ±2
S131C	Ms	1	I	1700 ±3*	1.89	65	4	1698 ±3
S131C	Ms	2	I	1696 ±3	0.11	52.8	3	1701 ±3
Z58B	Ms	1	III	1677 ±3	2.55	50.7	4	1676 ±3
Z58B	Ms	2	III	1683 ±3*	1.66	84.1	7	1690 ±5
Phlogopite								
F1A	Phl	1		1658 ±3	1.65	78.3	3	1661 ±3
F30A	Phl	1		1666 ±3	0.36	98.1	13	1662 ±3
S53A	Phl	1		1630 ±3	0.77	98.1	17	1627 ±3
S59A	Phl	1		1712 ±4^	n/a	84.4	1	1713 ±3
S59A	Phl	2		1720 ±3*	1.08	81.8	7	1720 ±3

[a] Each aliquot is a separate analysis of an individual mineral grain; 1 and 2 refer to the first and second aliquots, respectively

[b] Refer to text for group definitions

[c] *denotes the preferred age for samples with multiple aliquots; ^denotes a pseudoplateau age; n/a means no plateau or pseudoplateau age was obtained

Table 3: Parameters used in numerical diffusion models of muscovite.

Model	Start t (Ma)	Start T (°C)	Start P (kbar)	Grain Radius (mm)	Cooling Rate (°C/Myr)	t2 [a] (Ma)	T2 (°C)	P2 (kbar)	Cooling Rate 2 (°C/Myr)	Bulk age [b] (Ma)	Estimated T_c [c] (°C)
Model A: Linear cooling											
A1	1736	600	5.5	0.3	2					1647	422
A2	1736	600	5.5	0.3	**1**					1547	411
A3	1736	600	5.5	0.3	**2.5**					1666	425
A4	1736	600	5.5	0.3	**3.5**					1688	432
A5	1736	600	5.5	0.3	**4**					1694	432
A6	1736	600	5.5	0.3	**5**					1703	435
A7	1736	600	5.5	0.3	**10**					1721	450
A8	1736	**550**	5.5	0.3	2					1673	424
A9	1736	**550**	5.5	0.3	**1.5**					1648	418
A10	1736	**550**	5.5	0.3	**2.5**					1687	428
A11	1736	**650**	5.5	0.3	2					1621	420
A12	1736	600	5.5	**0.6**	2					1658	444
A13	1736	600	5.5	**0.6**	**1.5**					1629	440
A14	1736	600	5.5	**0.6**	**2.5**					1675	448
A15	1736	600	**4**	0.3	2					1645	418
A16	1736	600	**7**	0.3	2					1649	426
A17	**1800**	600	5.5	0.3	**1.5**					1678	417
A18	**1800**	600	5.5	0.3	**1**					1611	411
A19	**1800**	**650**	5.5	0.3	2					1685	420
Model B: Stepwise cooling											
B1	1736	600	5.5	0.3	2	1670	468	0.429	5	1664	438
B2	1736	600	5.5	0.3	2	1670	468	0.429	**10**	1668	448
B3	1736	600	5.5	0.3	2	1670	468	0.429	**30**	1671	498
B4	1736	600	5.5	0.3	2	**1660**	448	0.411	5	1658	438
B5	1736	600	5.5	0.3	2	**1650**	428	0.392	5	1654	448
B6	1736	600	5.5	**0.6**	2	1670	468	0.429	5	1669	463
Model C: Late, low-T muscovite											
C1	1670	450	4.5	0.3	2					1656	422
C2	1670	450	4.5	0.3	**2.5**					1660	425
C3	1670	450	4.5	0.3	**1**					1632	412
C4	1670	450	4.5	0.3	**5**					1666	430
C5	1670	450	4.5	0.3	**10**					1669	440
C6	1670	**350**	4.5	0.3	2					1670	n/a
C7	1670	**400**	4.5	0.3	2					1667	n/a
C8	1670	**550**	4.5	0.3	2					1605	420
C9	**1660**	450	4.5	0.3	2					1646	422
C10	1670	450	**3**	0.3	2					1654	418
C11	1670	450	4.5	**0.6**	2					1662	434

Values shown in bold text are variables that differ from the reference models (A1, B1, C1)

[a]Refers to the time (age) at which the second phase of cooling begins in Model B

[b]Regressed bulk age calculated from three runs of each model at different meshlengths, as described in text, following the methodology of Warren et al. (2012a)

[c]Closure temperature of Ar in muscovite estimated from models, as follows: for Models A & C, T_c = start T - ([start t - bulk age]*[cooling rate]); for Model B, T_c = start T - ([start t - t2]*[cooling rate] + [t2 - bulk age]*[cooling rate 2]). T_c is not estimated for Models C6 & C7 since the starting Ts are below the typical range of Ar T_c in muscovite of 420–450ºC (Harrison et al., 2009)

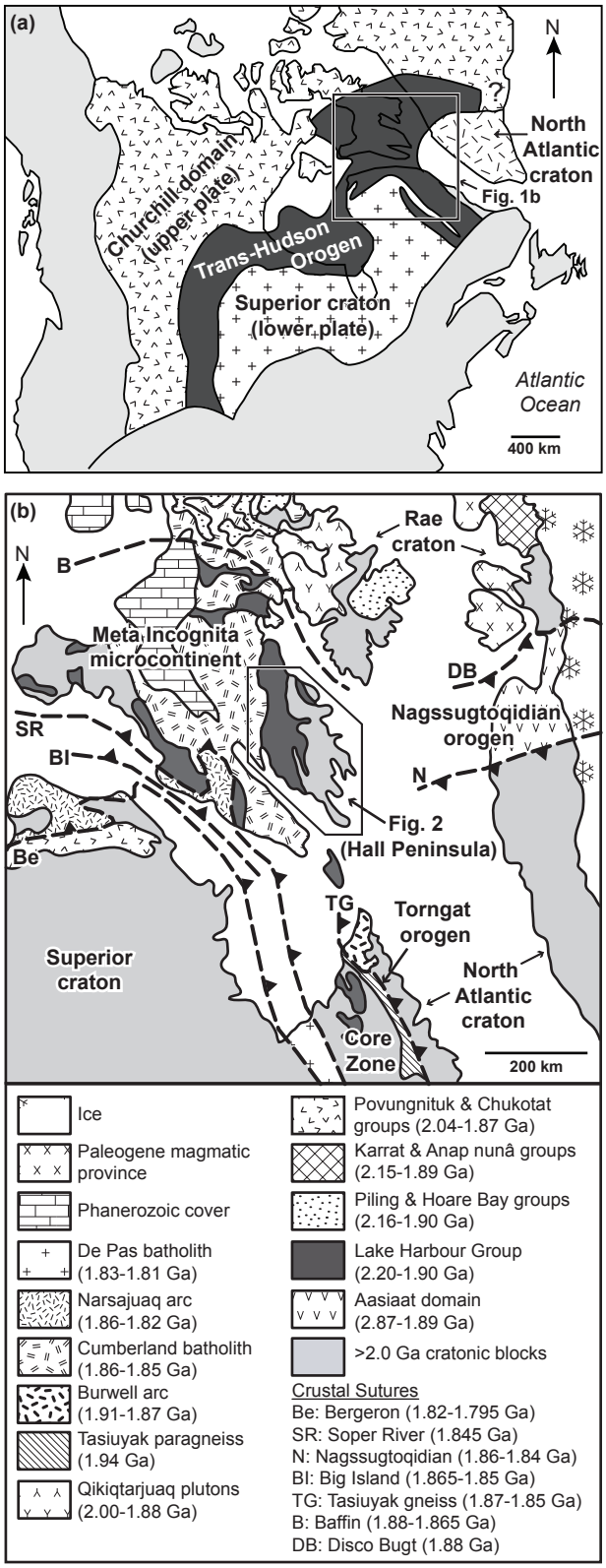


Fig. 1: (a) Simplified map of the Trans-Hudson Orogen (modified from Hoffman, 1998; St-Onge et al., 2007). (b) Generalized map of the northeastern Trans-Hudson Orogen (modified from St-Onge et al., 2009; Berman et al., 2013; Skipton et al., 2016a).

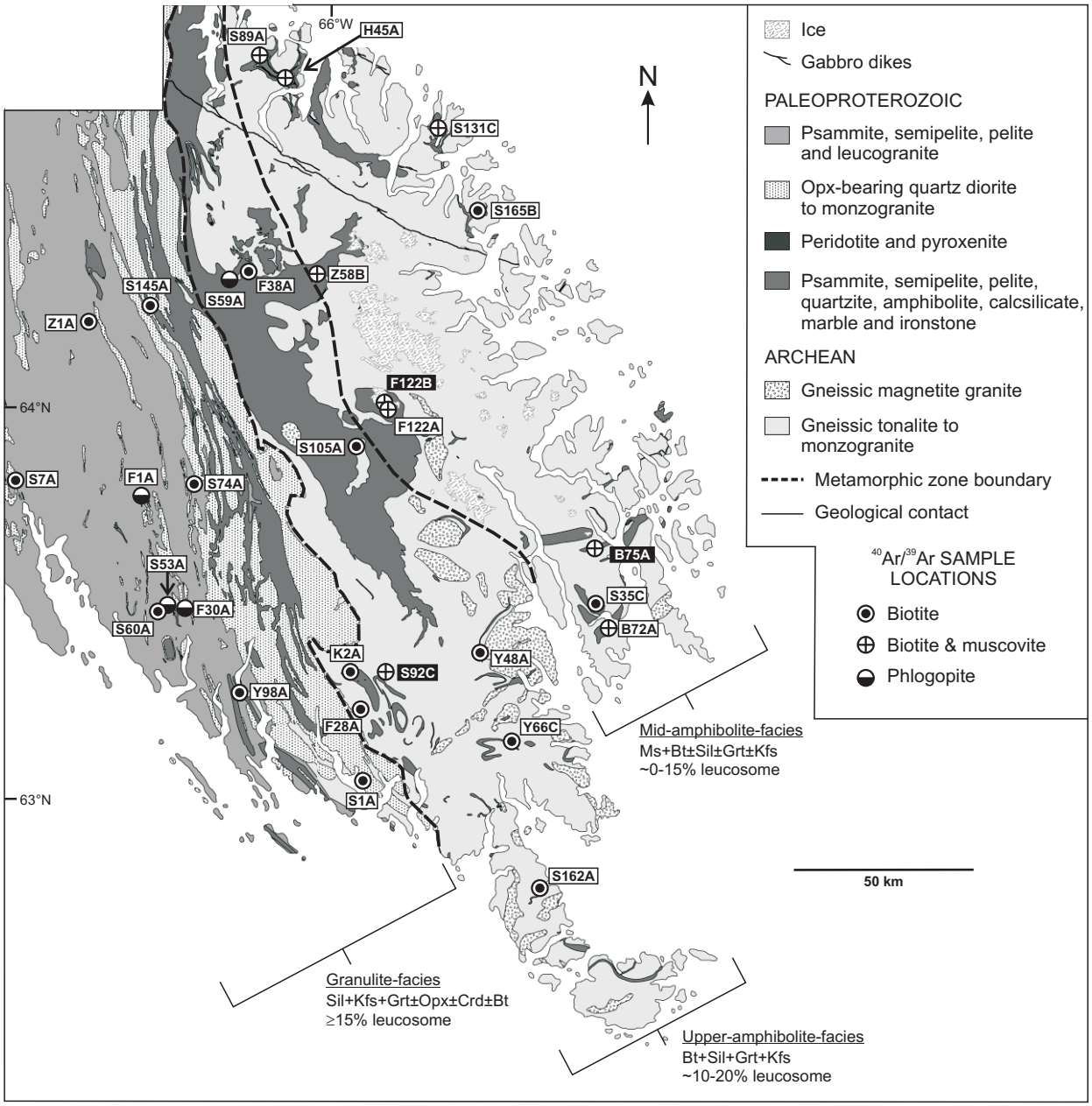


Fig. 2: Simplified geological map of Hall Peninsula, Baffin Island (modified after Machado et al., 2013; Steenkamp and St-Onge, 2014), showing $^{40}Ar/^{39}Ar$ sample locations. Bold dashed lines delineate the boundaries of metamorphic zones based on peak mineral assemblages in pelite (from Skipton et al., 2016a). Muscovite UV laser samples are labelled in black boxes.

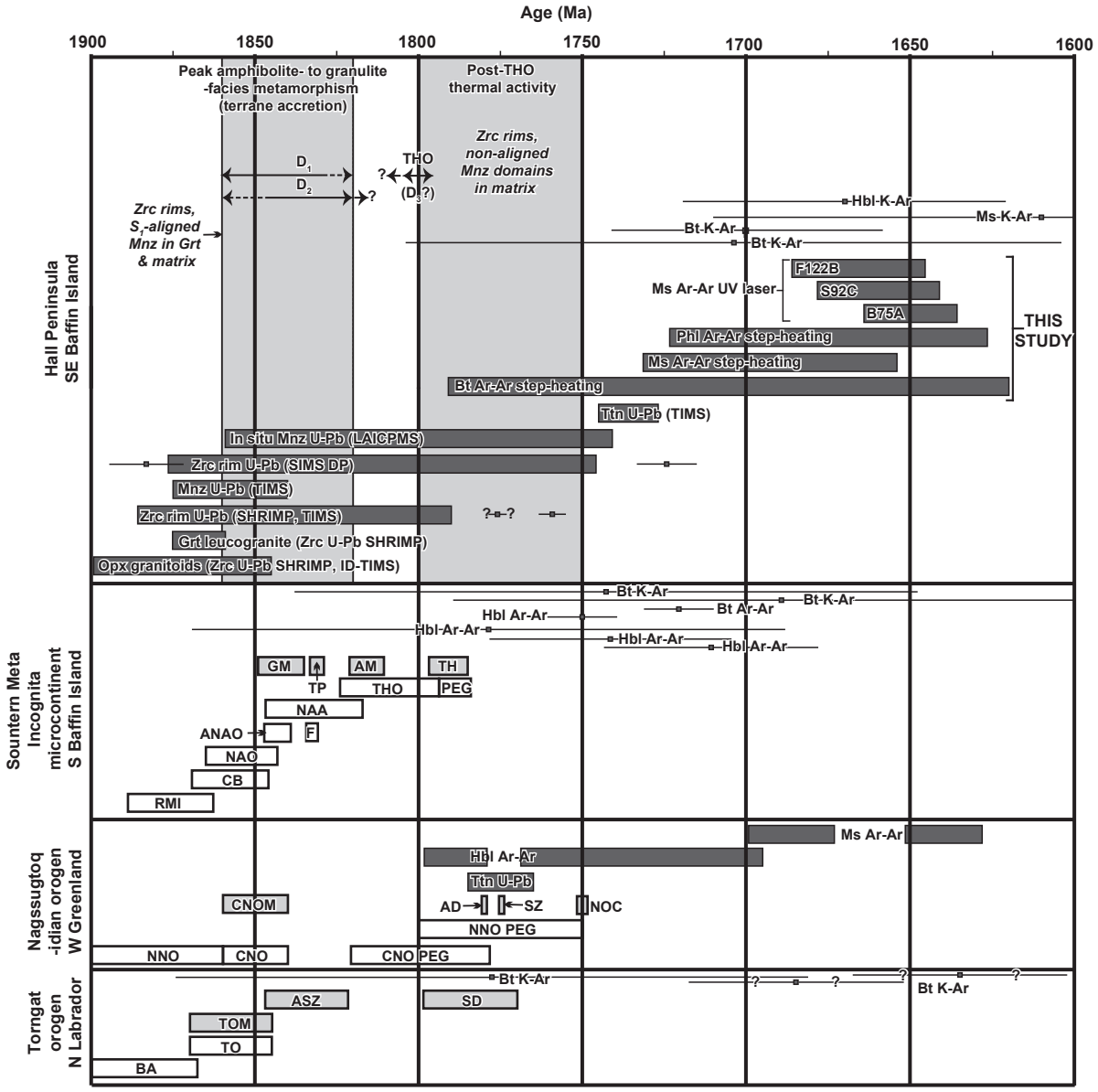

Age (Ma)
1900
1850
1800
1750
1700
1650
1600
Peak amphibolite- to granulite -facies metamorphism (terrane accretion)
Post-THO thermal activity
Zrc rims, non-aligned Mnz domains in matrix
Zrc rims, S1-aligned Mnz in Grt & matrix
D1
D2
THO
(D3?)
Hbl-K-Ar
Ms-K-Ar
Bt-K-Ar
Bt-K-Ar
F122B
S92C
B75A
Ms Ar-Ar UV laser
Phl Ar-Ar step-heating
Ms Ar-Ar step-heating
Bt Ar-Ar step-heating
THIS STUDY
Ttn U-Pb (TIMS)
In situ Mnz U-Pb (LAICPMS)
Zrc rim U-Pb (SIMS DP)
Mnz U-Pb (TIMS)
Zrc rim U-Pb (SHRIMP, TIMS)
Grt leucogranite (Zrc U-Pb SHRIMP)
Opx granitoids (Zrc U-Pb SHRIMP, ID-TIMS)
Hall Peninsula SE Baffin Island
Bt-K-Ar
Bt-K-Ar
Hbl Ar-Ar
Bt Ar-Ar
Hbl-Ar-Ar
Hbl-Ar-Ar
Hbl-Ar-Ar
GM
AM
TH
TP
THO
PEG
NAA
ANAO
F
NAO
CB
RMI
Sountern Meta Incognita microcontinent S Baffin Island
Ms Ar-Ar
Hbl Ar-Ar
Ttn U-Pb
CNOM
AD
SZ
NOC
NNO PEG
NNO
CNO
CNO PEG
Nagssugtoq -idian orogen W Greenland
Bt-K-Ar
Bt K-Ar
ASZ
SD
TOM
TO
BA
Torngat orogen N Labrador

Fig. 3 (previous page): Summary of the tectonic evolution of the northeastern THO on Hall Peninsula and the MIM on southern Baffin Island, the Torngat Orogen in northern Labrador and the Nagssugtoqidian Orogen in West Greenland (modified after Skipton et al., 2016b). The diagram shows geochronological and thermochronological data (dark grey bars and points with error bars), the ages of metamorphism and deformation (light grey bars), and the ages of collisional, accretionary and magmatic events (white bars). Light grey vertical bars indicate estimated ages of the main tectonothermal events on Hall Peninsula (from Skipton et al., 2016a, b). The Hall Peninsula U–Pb data are from Scott (1999; TIMS), Rayner (2014, 2015; SHRIMP) and Skipton et al. (2016a, b; LAICPMS, SIMS), and K–Ar data are from Lowdon (1960) and Wanless et al. (1968, 1970, 1979). References for all other data and tectonic events are provided in Appendix 1 (Table A1.1). TH, thermal event with no fabric; AM, amphibolite-facies metamorphism; TP, late- to post-orogenic thermal perturbation with no associated fabric; GM, granulite-facies metamorphism and fabric; PEG, pegmatite dikes; THO, THO terminal collision; F, felsic dikes; NAA, Narsajuaq arc plutonism (Andean margin suite); NAO, Narsajuaq arc plutonism (intraoceanic suite); ANAO, accretion of NAO to MIM; CB, Cumberland Batholith; RMI, accretion of MIM to Rae craton; NOC, post-orogenic cooling; SZ, orogen-scale strike-slip zones; AD, amphibolite-facies metamorphism and local deformation; CNOM, granulite-facies metamorphism; NNO PEG, CNO PEG, late- to post-kinematic pegmatites in the northern (NNO) and central (CNO) orogen; CNO, accretion of Rae craton and Aasiaat domain to North Atlantic craton; NNO, accretion of Aasiaat domain to Rae craton; SD, cross-orogen shortening; ASZ, Abloviak shear zone; TOM, thrusting and granulite-facies metamorphism; TO, collision of North Atlantic craton to MIM; BA, Burwell arc.

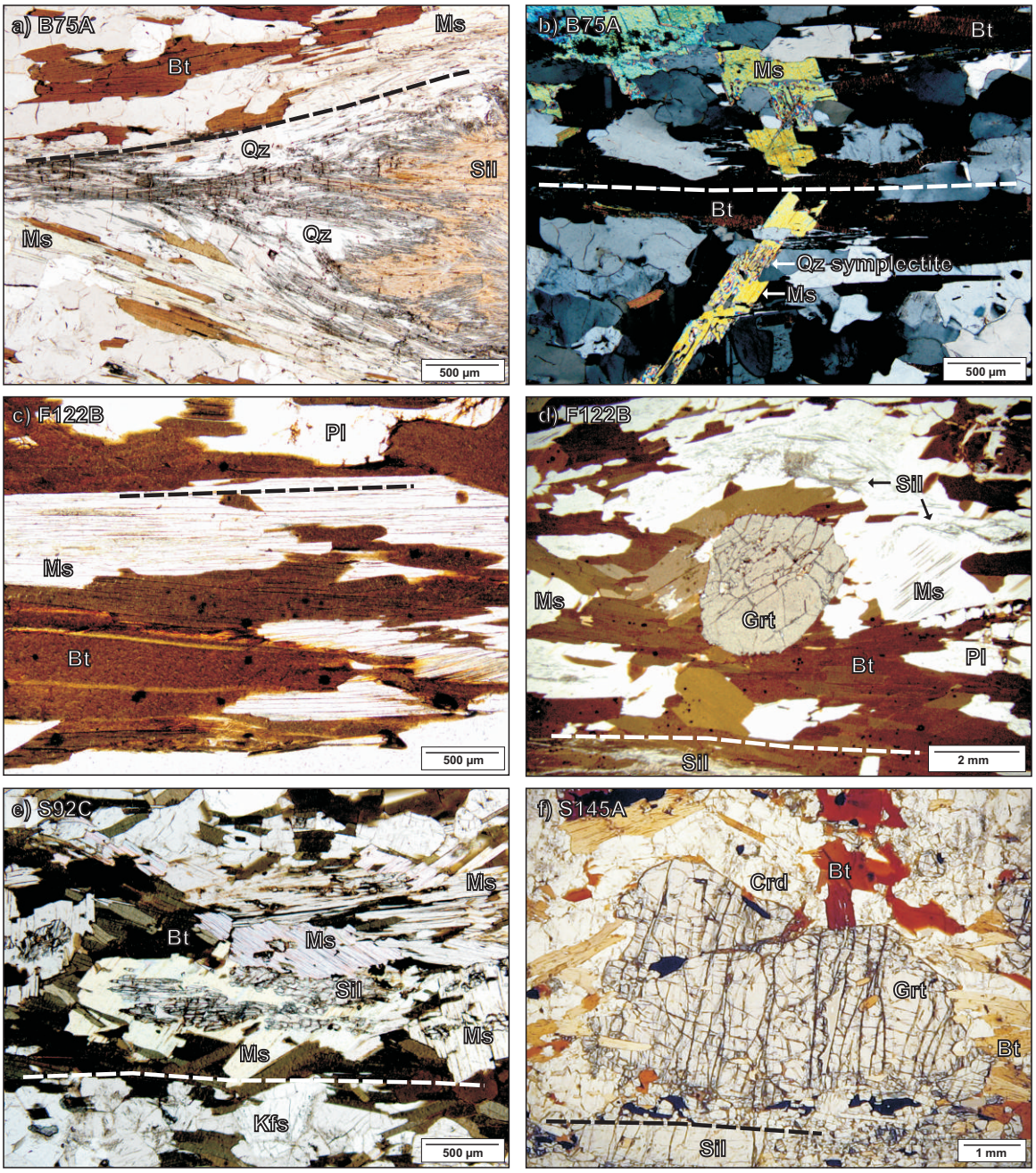

a) B75A
Ms
Bt
Qz
Sil
Qz
Ms
500 µm
b) B75A
Bt
Ms
Bt
Qz-symplectite
Ms
500 µm
c) F122B
Pl
Ms
Bt
500 µm
d) F122B
Sil
Ms
Ms
Grt
Bt
Pl
Sil
2 mm
e) S92C
Ms
Bt
Ms
Sil
Ms
Ms
Kfs
500 µm
f) S145A
Crd
Bt
Grt
Bt
Sil
1 mm

Fig. 4 (previous page): Photomicrographs of biotite and muscovite in pelitic rocks from Hall Peninsula, Baffin Island, under plane-polarized light, unless otherwise indicated. Black or white dashed line represents S_1 foliation. (a) Muscovite and biotite aligned with S_1, interpreted as prograde, surrounding fibrolite in mid-amphibolite-facies pelite. (b) Prograde biotite defining S_1, cross-cut by retrograde muscovite containing symplectic quartz intergrowths in mid-amphibolite-facies pelite (cross-polarized light). (c) Muscovite and biotite aligned with S_1, interpreted as prograde, in mid-amphibolite-facies pelite. (d) S_1 defined mainly by aligned fibrolite, plagioclase and prograde biotite cross-cut by retrograde, coarse-grained muscovite that surrounds fibrolite and biotite that is concentrated along the edges of a partially resorbed garnet porphyroblast in mid-amphibolite-facies pelite. (e) S_1 defined mainly by aligned biotite, sillimanite and bands of K-feldspar cross-cut by retrograde, coarse-grained muscovite that surrounds sillimanite aggregates in upper-amphibolite-facies pelite. (f) Biotite that is concentrated along the edges of a garnet porphyroblast in granulite-facies pelite. Some biotite is S_1-aligned but appears to embay garnet rims, suggesting it is syn-S_1 and early-retrograde, whereas other biotite grains are at high-angles to S_1, suggesting a post-S_1, retrograde origin.

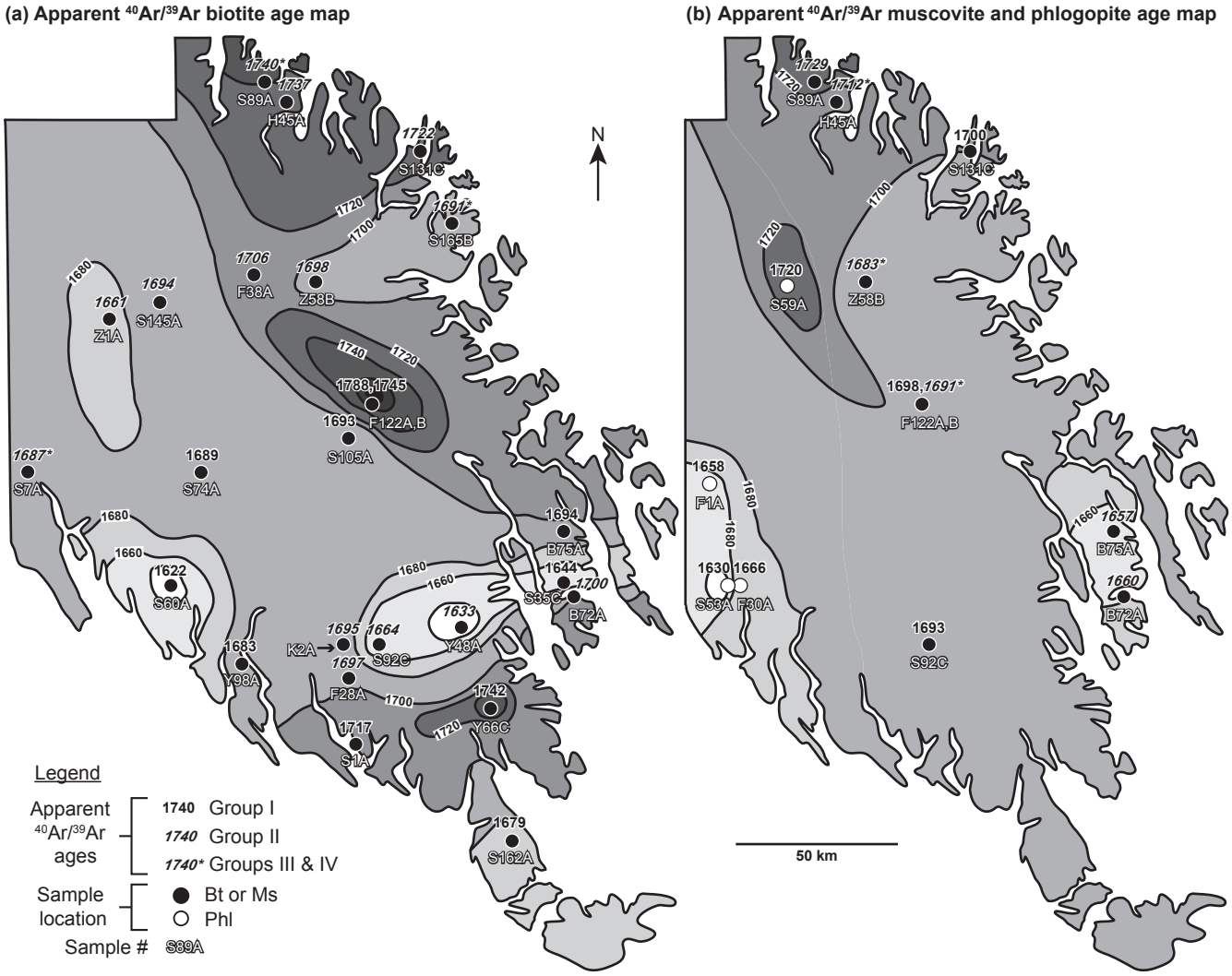


Fig. 5: Apparent $^{40}Ar/^{39}Ar$ step-heating age maps of (a) biotite and (b) muscovite and phlogopite on Hall Peninsula, contoured at 20 Myr intervals. Darker grays represent older ages. The preferred plateau or pseudoplateau age is indicated above each sample location. Age uncertainty (1σ) is 2–3 Myr, except in samples B72A and Y48A (1σ 19–20 Myr). Refer to Table 2, Figs. 6–8 and Appendices 1 and 2 for complete age information.

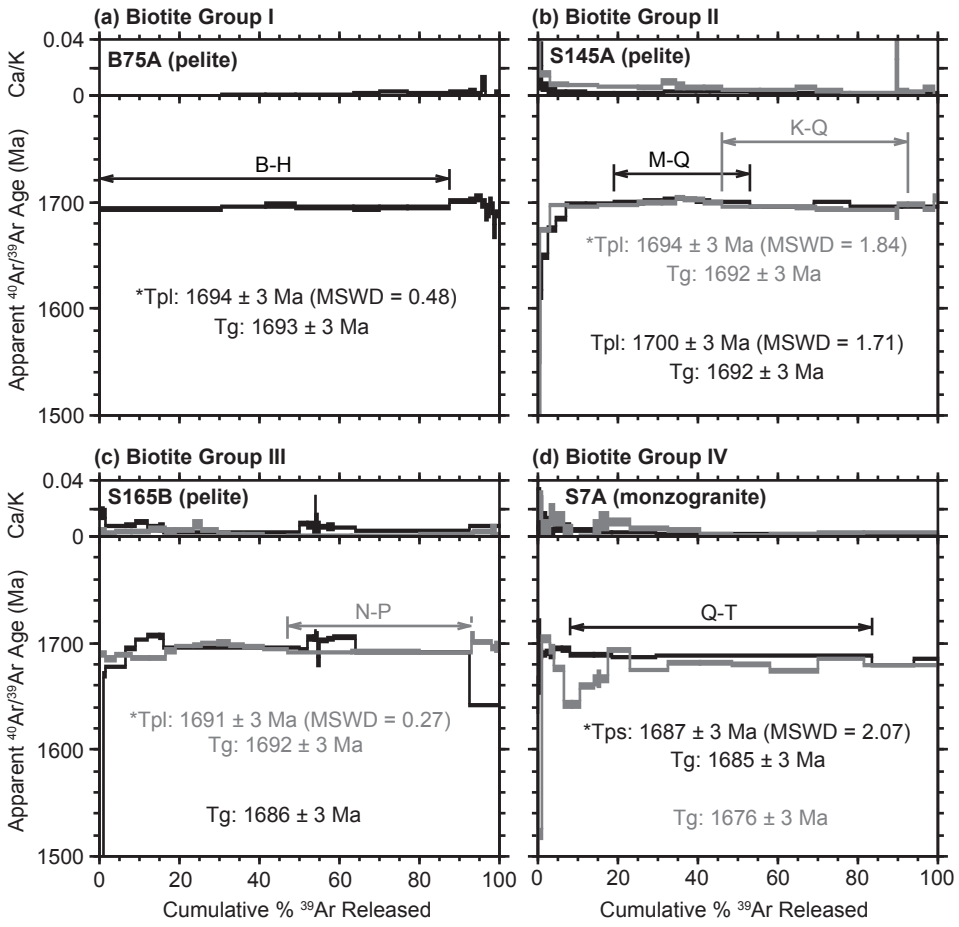


Fig. 6: (a–d) Representative $^{40}Ar/^{39}Ar$ step-heating spectra and Ca/K ratios for biotite in Groups I–IV. Second aliquots are shown in gray. Preferred ages are indicated with an asterisk (*). Uncertainties are given at the 1σ level. Tpl, plateau age calculated from the gas release interval shown by the arrow. Tg, total gas age.

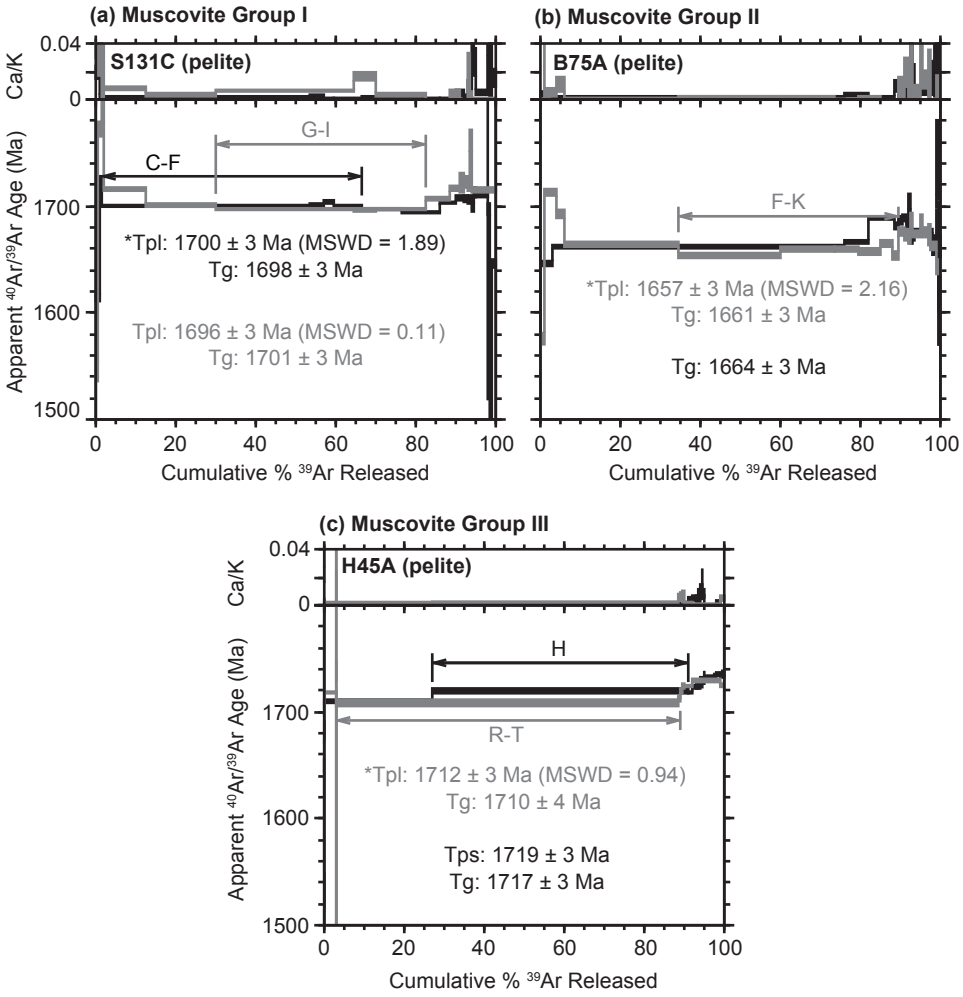


Fig. 7: (a–c) Representative $^{40}Ar/^{39}Ar$ step-heating spectra and Ca/K ratios for muscovite in Groups I–III, following the same logic as Fig. 6. Tps, pseudoplateau age calculated from the gas release interval shown by the arrow.

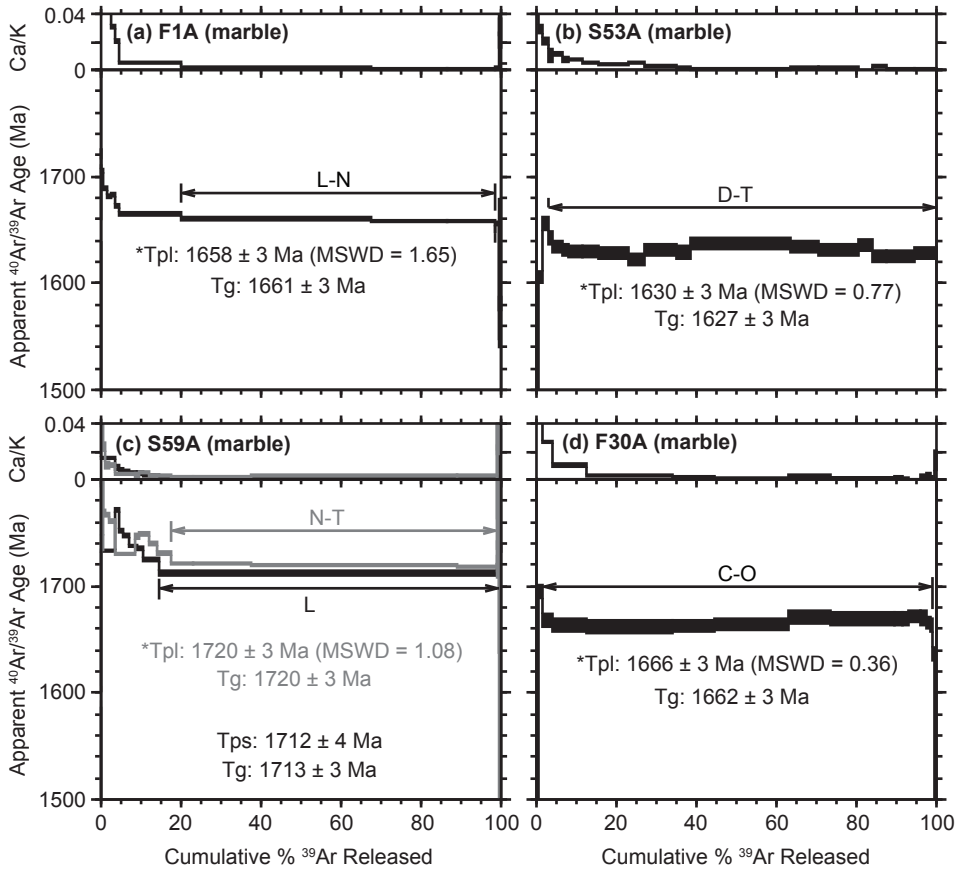


Fig. 8: (a–d) $^{40}Ar/^{39}Ar$ step-heating spectra and Ca/K ratios for phlogopite, following the same logic as Figs. 6 and 7.

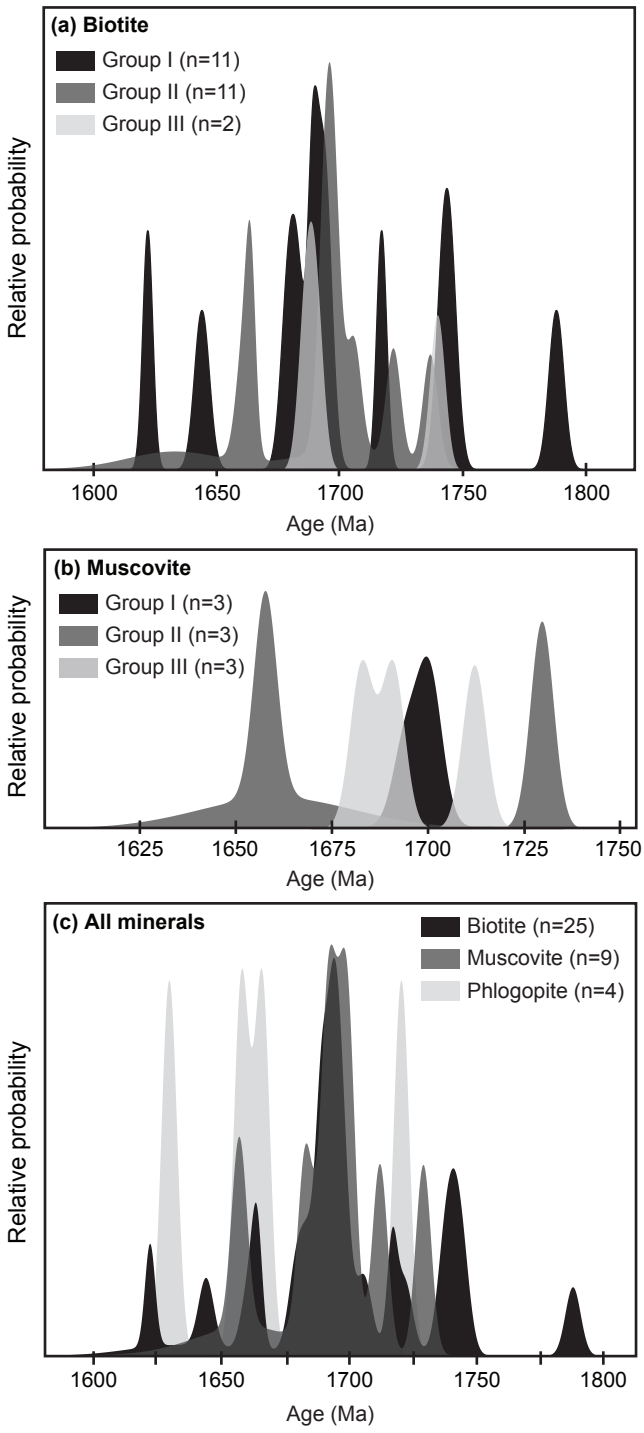


Fig. 9: Apparent $^{40}Ar/^{39}Ar$ step-heating ages relative probability diagrams: (a) biotite Groups I–III; (b) muscovite Groups I–III; and (c) all biotite, muscovite and phlogopite ages.

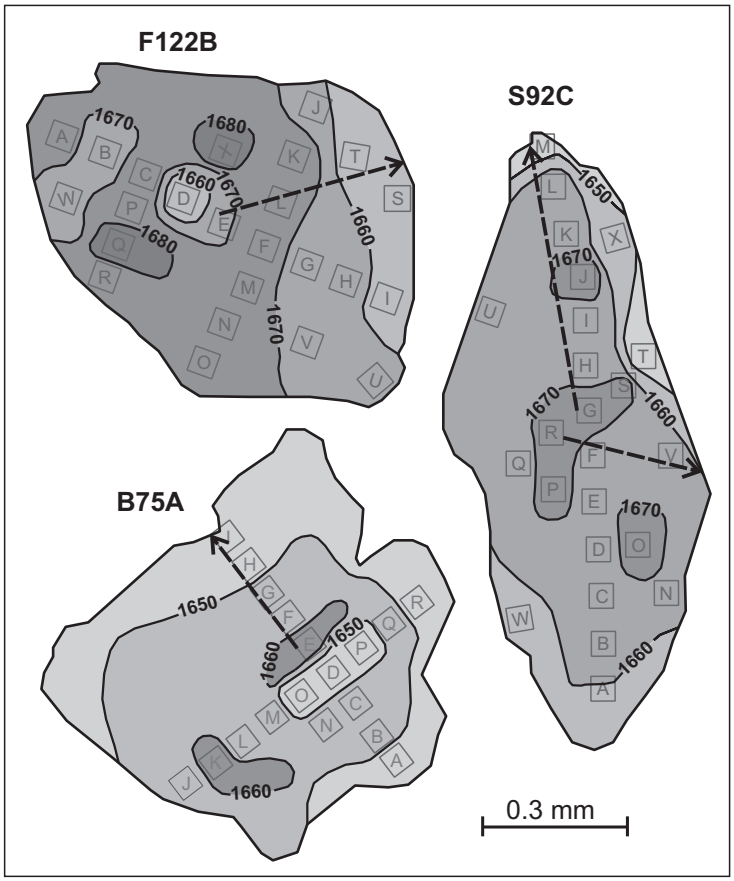


Fig. 10: Each of the muscovite grains analyzed, contoured by $^{40}Ar/^{39}Ar$ age at 10 Myr intervals as determined by UV laser spot analyses. Darker grays represent older domains. The 50 μm^2 laser spot analyses are represented by square boxes, each labelled with a letter that corresponds to an analysis in Appendix 3. Uncertainties (1σ) are 3 Myr for samples B75A and S92C and 6 Myr for sample F122B. Black dashed arrows indicate core-to-rim apparent age profiles used for comparisons with numerical diffusion models in Fig. 11.

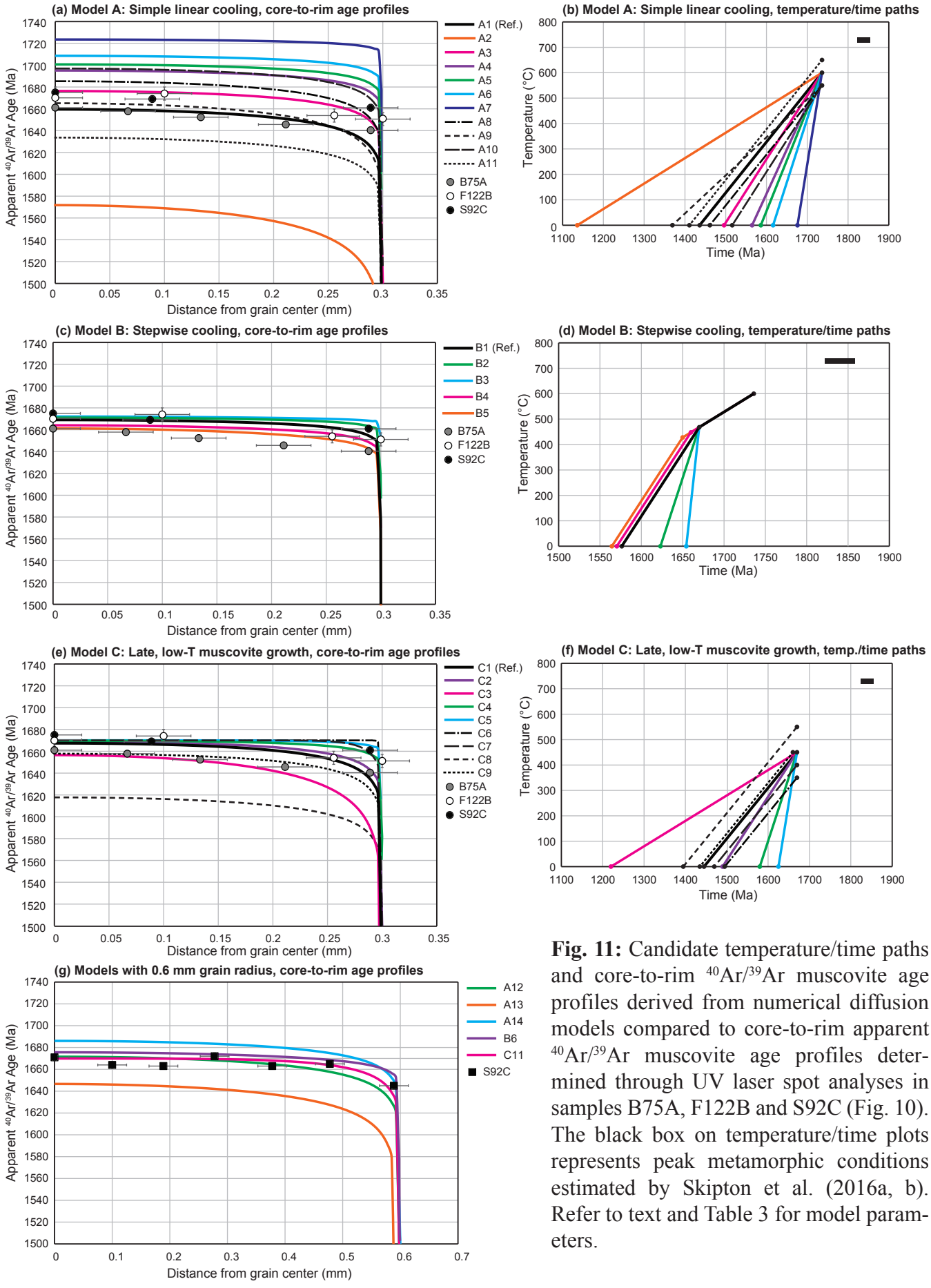


Fig. 11: Candidate temperature/time paths and core-to-rim $^{40}Ar/^{39}Ar$ muscovite age profiles derived from numerical diffusion models compared to core-to-rim apparent $^{40}Ar/^{39}Ar$ muscovite age profiles determined through UV laser spot analyses in samples B75A, F122B and S92C (Fig. 10). The black box on temperature/time plots represents peak metamorphic conditions estimated by Skipton et al. (2016a, b). Refer to text and Table 3 for model parameters.

Appendix 1 to:

Deciphering the Paleoproterozoic cooling history of the northeastern Trans-Hudson Orogen, Baffin Island (Canada), using $^{40}Ar/^{39}Ar$ step-heating and UV laser thermochronology

Diane Skipton[1], D.A. Schneider[1], D.A. Kellett[2] and N.L. Joyce[3]

[1] *Department of Earth and Environmental Sciences, University of Ottawa, Ottawa, Ontario, Canada*

[2] *Natural Resources Canada, Geological Survey of Canada, Dartmouth, Nova Scotia, Canada*

[3] *Natural Resources Canada, Geological Survey of Canada, Ottawa, Ontario, Canada*

Table of contents

A1. References for Figure 3 399

A2. Sample descriptions 402

A3. Muscovite and biotite chemical maps (EMPA) 412

A4. $^{40}Ar/^{39}Ar$ step-heating spectra 422

A5. Additional numerical diffusion models 426

A1. References for Figure 3

Table A1.1: Brief descriptions and references for geochronological and thermochronological data and tectonothermal events shown in Fig. 3 in manuscript.

Area	Event	Description	References
Meta Incognita micro -continent, S. Baffin	K-Ar & Ar-Ar	Hbl & Bt step-heating and Bt total fusion ages from the southern MIM	Lowdon (1960); Lowdon et al. (1963); Hemming et al. (2000)
	TH	Thermal event with no associated fabric	St-Onge et al. (2007)
	AM	Amphibolite-facies metamorphism; localized modification of pre-existing fabrics	St-Onge et al. (2007)
	TP	Thermal perturbation with no associated fabric	St-Onge et al. (2007)
	GM	Granulite-facies metamorphism and fabric development	St-Onge et al. (2007)
	PEG	Syenogranite pegmatite dykes	Scott (1997); Wodicka & Scott (1997)
	THO	Collision of Superior craton with composite Churchill plate (THO terminal collision)	Scott & Wodicka (1998); Wodicka & Scott (1997); St-Onge et al. (2007)
	F	Post-S_{1a} felsic dykes and plugs	St-Onge et al. (2007)
	NAA	Narsajuaq arc "Andean-margin suite" plutonism	Machado et al. (1993); Scott (1997); Scott & Wodicka (1998)
	ANAO	Accretion of the Narsajuaq arc "intraoceanic suite" to Meta Incognita microcont.	St-Onge et al. (2007)
	NAO	Narsajuaq arc "intraoceanic suite" plutonism	St-Onge et al. (1992); Machado et al. (1993)
	CB	Emplacement of Cumberland Batholith	Jackson et al. (1990); Wodicka & Scott (1997); Scott & Wodicka (1998); Scott (1999)
	RMI	Accretion of Meta Incognita microcontinent to Rae craton	St-Onge et al. (2006)
Nag. Orogen, W. Greenland	Ms & Hbl Ar-Ar	Ms & Hbl step-heating ages from the central Nagssugtoqidian Orogen and the Rinkian fold belt on the northen edge of the Nagssugtoqidian Orogen	Sidgren et al. (2006); Willigers et al. (2001)
	Ttn U-Pb	U-Pb titanite ages in Archean gneiss in N. Nagssugtoqidian Orogen	Connelly et al. (2000)
	NOC	Post-orogenic cooling across entire Nagssugtoqidian Orogen	Connelly et al. (2000); Willigers et al. (2001)
	SZ	Orogen-scale strike-slip shear zones	Connelly et al. (2000)
	AD	Amphibolite-facies metamorphism; localized deformation in N. Nag. Orogen	Mazur et al. (2012)
	CNOM	Granulite-facies metamorphism in central Nagssugtoqidian Orogen	Taylor & Kalsbeek (1990); Kalsbeek & Nutman (1996); Connelly et al. (2000)
	NNO PEG	NNO late- to post-kinematic pegmatites	Garde & Hollis (2010)
	CNO PEG	CNO late- to post-kinematic pegmatites; U-Pb zircon and titanite ages	Garde & Hollis (2010)
	CNO	Accretion of composite Rae craton and Aasiaat domain with North Atlantic craton	Taylor & Kalsbeek (1990); Kalsbeek & Nutman (1996); Connelly et al. (2000)
	NNO	Accretion of Aasiaat domain to Rae craton	Taylor & Kalsbeek (1990)
Torngat Orogen, N. Labrador	Bt K-Ar	Bt total fusion ages from the eastern Torngat Orogen	Leech et al. (1963); Wanless (1970)
	SD	Reactivation of Torngat Orogen (cross-orogen shortening; folding and shearing)	Van Kranendonk & Wardle (1997)
	ASZ	Abloviak Shear Zone (sinistral transpression)	Bertrand et al. (1993)
	TOM	Thrusting and granulite-facies metamorphism	Bertrand et al. (1993); Rivers et al. (1996); Van Kranendonk (1996); Connelly (2001)
	TO	Collision of North Atlantic craton with Meta Incognita microcontinent in E. Labrador	Bertrand et al. (1993); Rivers et al. (1996); Van Kranendonk (1996); Connelly (2001)
	BA	Emplacement of the Burwell arc	Scott & Machado (1995); Van Kranendonk & Wardle (1996)

Bertrand, J.-M., Roddick, J.C., Van Kranendonk, M. J., Ermanovics, I., 1993. U–Pb geochronology of deformation and metamorphism across a central transect of the Early Proterozoic Torngat Orogen, North River map area, Labrador. Canadian Journal of Earth Sciences 30, 1470–1489.

Connelly, J. N., 2001. Constraining the timing of metamorphism: U–Pb and Sm–Nd ages from a transect across the northern Torngat Orogen, Labrador, Canada. Journal of Geology 109, 57–77.

Connelly, J.N., van Gool, J.A.N., Mengel, F.C., 2000. Temporal evolution of a deeply eroded orogen: the Nagssugtoqidian Orogen, West Greenland. Canadian Journal of Earth Sciences 37, 1121-1142.

Garde, A.A., Hollis, J.A., 2010. A buried Palaeoproterozoic spreading ridge in the northern Nagssugtoqidian Orogen, West Greenland, in: Kusky, T.M., Zhai, M.-G., Xiao, W. (Eds.), The Evolving Continents: Understanding Processes of Continental Growth 338, Geological Society, London, Special Publications, pp. 213-234.

Hemming, S.R., Gwiazda, R.H., Andrews, J.T., Broeckner, W.S., Jennings, A.E., Onstott, T.C., 2000. $^{40}Ar/^{39}Ar$ and Pb-Pb study of individual hornblende and feldspar grains from southeastern Baffin Island glacial sediments: implications for the provenance of the Heinrich layers. Canadian Journal of Earth Sciences 37, 879–890.

Jackson, G.D., Hunt, P.A., Loveridge, W.D., Parrish, R.R., 1990. Reconnaissance geochronology of Baffin Island, N.W.T. Radiogenic Age and Isotopic Studies Report 3, Geological Survey of Canada, Paper 89-2, 123-148.

Kalsbeek, F., Nutman, A.P., 1996. Anatomy of the Early Proterozoic Nagssugtoqidian Orogen, West Greenland, explored by reconnaissance SHRIMP U–Pb dating. Geology 24, 515–518.

Leech, G.B., Lowdon, J.A., Stockwell, C.H., Wanless, R.K., 1963. Age determinations and geological studies (including isotopic ages – report 4). Geological Survey of Canada, Paper 63-17, 146 pp.

Lowdon, J.A., 1960. Age determinations by the Geological Survey of Canada, Report 1 – Isotopic ages. Geological Survey of Canada, Paper 60-17, 5–40.

Lowdon, J.A., Stockwell, C.H., Tipper, H.W., Wanless, R.K., 1963. Age determinations and geological studies. Geological Survey of Canada, Paper 62-17, 140 pp.

Machado, N., Scott, D. J., Lamothe, D., Philippe, S., Gariépy, C., 1993. U–Pb geochronology of the western Cape Smith Belt, Canada: New insights on the age of initial rifting and arc magmatism. Precambrian Research 63, 211–223.

Mazur, S., Anczkiewicz, R., Szczepański, J., van Gool, J.A.M., Thirlwall, M., 2012. Paleoproterozoic metamorphism and cooling of the northern Nagssugtoqidian orogen, West Greenland. Precambrian Research 196-197, 171-192.

Rivers, T., Mengel, F., Scott, D. J., Campbell, L.M., Goulet, N., 1996. Torngat Orogen – a Paleoproterozoic example of a narrow doubly vergent collisional orogen. In: Brewer, T. S. (ed.) Precambrian Crustal Evolution in the North Atlantic Region. Geological Society, London, Special Publications 112, 117–136.

Scott, D. J., 1997. Geology, U–Pb, and Pb–Pb geochronology of the Lake Harbour area, southern Baffin Island: Implications for the Paleoproterozoic tectonic evolution of north-eastern Laurentia. Canadian Journal of Earth Sciences 34, 140–155.

Scott, D.J., 1999. U-Pb geochronology of the eastern Hall Peninsula, southern Baffin Island, Canada: a northern link between the Archean of West Greenland and the Paleoproterozoic Torngat Orogen of northern Labrador. Precambrian Research 93, 5–26.

Scott, D.J., Machado, N., 1995. U–Pb geochronology of the northern Torngat Orogen, Labrador, Canada: A record of Paleoproterozoic magmatism and deformation. Precambrian Research 70, 169–190.

Scott, D.J., Wodicka, N., 1998. A second report on the U-Pb geochronology of southern Baffin Island. Geological Survey of Canada, Paper 1998-F, 47–57.

Sidgren, A.-S., Page, L., Garde, A.A., 2006. New hornblende and muscovite $^{40}Ar/^{39}Ar$ cooling ages in the central Rinkian fold belt, West Greenland. Geological Survey of Denmark and Greenland Bulletin 11, 115–123.

St-Onge, M.R., Lucas, S.B., Parrish, R.R., 1992. Terrane accretion in the internal zone of the Ungava orogen, northern Quebec: Part 1. Tectonostratigraphic assemblages and their tectonic implications. Canadian Journal of Earth Sciences 29, 746–764.

St-Onge, M.R., Searle, M.P., Wodicka, N., 2006. Trans-Hudson Orogen of North America and Himalaya–Karakorum–Tibetan Orogen of Asia: structural and thermal characteristics of the lower and upper plates. Tectonics 25, 1–22.

St-Onge, M.R., Wodicka, N., Ijewliw, O., 2007. Polymetamorphic evolution of the Trans-Hudson Orogen, Baffin Island, Canada: integration of petrological, structural and geochronological data. Journal of Petrology 48, 271–302.

Taylor, P. N., Kalsbeek, F., 1990. Dating the metamorphism of Precambrian marbles: Examples from Proterozoic mobile belts in Greenland. Chemical Geology 86, 21–28.

Van Kranendonk, M.J., Wardle, R.J., 1997. Crustal-scale flexural slip folding during late tectonic amplification of an orogenic boundary perturbation in the Paleoproterozoic Torngat Orogen, northeastern Canada. Canadian Journal of Earth Sciences 34, 1545-1565.

Van Kranendonk, M.J., 1996. Tectonic evolution of the Paleoproterozoic Torngat Orogen: evidence from P-T-t-d paths in the North River map area, Labrador. Tectonics 15, 843-869.

Van Kranendonk, M. J., Wardle, R. J., 1996. Burwell domain of the Palaeoproterozoic Torngat orogen, northeastern Canada: Tilted cross-section of a magmatic arc caught between a

rock and a hard place. In: Brewer, T.S. (ed.) Precambrian Crustal Evolution in the North Atlantic Region. Geological Society, London, Special Publications 112, 91–115.

Wanless, R.K., 1970. Isotopic age map of Canada. Geological Survey of Canada, "A" Series Map 1265A.

Willigers, B.J.A., Krogstad, E.J., Wijbrans, J.R., 2001. Comparison of thermochronometers in a slowly cooled granulite terrain: Nagssugtoqidian Orogen, West Greenland. Journal of Petrology 42, 1729-1749.

Wodicka, N., Scott, D.J., 1997. A preliminary report on the U-Pb geochronology of the Meta Incognita Peninsula, southern Baffin Island, Northwest Territories. Geological Survey of Canada Paper 1997-C, 167-178.

A2. Sample descriptions

A2.1. Sample B72A: Biotite K-feldspar muscovite sillimanite pelite (mid-amphibolite-facies)

Sample B72A is from a sequence of metasedimentary rocks surrounded by Archean basement on southeastern Hall Peninsula. S_1 dips shallowly to the east, possibly as a result of F_2 folding. The sample is fine- to medium-grained and contains quartz, K-feldspar, biotite, muscovite, sillimanite (fibrolite), plagioclase and graphite. S_1 is defined by aligned biotite, fibrolite, muscovite and graphite. Muscovite is not abundant (~5%) and typically occurs adjacent to biotite, and some muscovite grains contain symplectic quartz intergrowths. Some muscovite grains form patches in K-feldspar and ~40% of muscovite grains surround fibrolite.

A2.2. Sample B75A: Biotite muscovite sillimanite K-feldspar garnet pelite (mid-amphibolite-facies)

Sample B75A occurs in a south-dipping sequence of metasedimentary rocks surrounded by Archean tonalite orthogneiss on southeastern Hall Peninsula. This package of metasedimentary rocks, and the S_1 fabric, dips to the south due to F_3 folding. Whereas the basal contact with Archean basement orthogneiss may represent a stratigraphic unconformity, basement rocks were likely thrust eastward over the metasedimentary rocks during D_2, prior to folding during D_3. The major components of the pelite include biotite, quartz, sillimanite (fibrolite), plagioclase, K-feldspar, muscovite, garnet and tourmaline. Biotite defines a well-developed schistosity (S_1). Muscovite is less abundant than biotite, and most grains are S_1-aligned but some (~5%) muscovite cross-cuts S_1. Symplectic quartz intergrowths occur locally in both generations of muscovite. Fibrolite forms

elongate knots oriented parallel to the S_1 foliation that are surrounded by quartz, and muscovite commonly occurs at the edges of fibrolite+quartz aggregates.

A2.3. Sample F1A: Phlogopite diopside olivine marble (granulite-facies)

Sample F1A is from a sequence of metasedimentary rocks in contact with orthopyroxene-bearing monzogranite on southwestern Hall Peninsula. The sample contains medium- to coarse-grained calcite, diopside, phlogopite, olivine and dolomite. S_1 is defined by aligned phlogopite and diopside.

A2.4. Sample F28A: K-feldspar garnet biotite sillimanite pelite (upper-amphibolite- to granulite-facies

Sample F28A is from the eastern margin of a 1 km thick, west-dipping package of pelite and psammite that is structurally bounded by tonalite orthogneiss basement in the central upper-amphibolite-facies zone. It was collected from ~2 km east of the ~25 km wide belt of orthopyroxene-bearing granitoids on the central peninsula. The supracrustal rocks have a west-southwest-dipping S_1 fabric and the western contact with orthogneiss basement is interpreted as a T_2 thrust. Sample F28A comprises quartz, K-feldspar, plagioclase, garnet, biotite and sillimanite. The S_1 foliation is defined by compositional banding, in which bands of coarse-grained quartz (35%), plagioclase (30%) and K-feldspar (35%) alternate with finer-grained bands of biotite, garnet and sillimanite. Biotite (~15%) and sillimanite are S_1-aligned, and garnet (~4%) forms anhedral, S_1-aligned porphyroblasts up to 1.5 cm long, as well as a lesser population of smaller, equant grains. Garnet contains S_1-aligned inclusion trails of biotite, plagioclase and quartz. Bands of coarse-grained quartz, plagioclase and K-feldspar are interpreted as crystallised melt.

A2.5. Sample F30A: Diopside phlogopite olivine marble (granulite-facies)

Sample F30A is from a shallowly west-dipping sequence of marble and metasedimentary rocks in contact with orthopyroxene monzogranite on southwestern Hall Peninsula. The sample contains fine- to medium-grained calcite, diopside, phlogopite, olivine and dolomite. S_1 is defined by aligned phlogopite grains and diffuse, 1–2 cm wide bands enriched in phlogopite, olivine and diopside. Approximately 25% of olivine grains are partially replaced by serpentine that occurs along within-grain fractures, and ~5% of olivine grains are fully serpentinized.

A2.6. Sample F38A: Garnet biotite sillimanite pelite (upper-amphibolite-facies)

Sample F38A is from an extensive supracrustal sequence of interbedded pelite, semi-pelite and psammite with minor amphibolite on central Hall Peninsula with a well-developed west-

dipping S_1 fabric. Very coarse-grained sillimanite was observed in outcrop and leucogranite lenses and S_1-parallel dikes occur locally. The sample consists of garnet, biotite, plagioclase, sillimanite and ilmenite. The S_1 fabric undulates around garnet porphyroblasts and is mainly defined by aligned prismatic sillimanite, some aligned biotite, and lenses of plagioclase and quartz that are inferred as melt. Garnet forms equant porphyroblasts up to 2 cm wide that are rich in inclusions of quartz, plagioclase and fine-grained sillimanite. The inclusions are aligned parallel to S_1 in the matrix, but locally form non-S_1-parallel, nearly spiral-shaped inclusion trails. Coarse-grained biotite grains surround garnet and cross-cut the S_1 foliation.

A2.7. Sample F122A: Biotite (± muscovite) psammite (mid-amphibolite-facies)

Sample F122A is from a sequence of interbedded pelite and psammite in the mid-amphibolite-facies zone that is underlain by Archean tonalite orthogneiss. The sequence is folded by a map-scale F_3 fold, such that S_1 is north-dipping overall, and S_1 is folded by south-vergent F_3 crenulations in pelite. Sample F122A comprises quartz, plagioclase, biotite and minor (<2%) muscovite. S_1 is defined by aligned biotite grains, and by discontinuous bands of biotite up to 1 mm thick alternating with quartz- and plagioclase-rich bands. Muscovite forms fine grains adjacent to biotite that are S_1 aligned but more commonly cross-cut S_1. Quartz and plagioclase are generally fine- to medium-grained. Quartz also forms discontinuous bands of coarse-grained, elongate crystals aligned with S_1, along with lesser plagioclase. These bands are up to 2 cm thick in hand sample and may represent melt.

A2.8. Sample F122B: Biotite muscovite sillimanite garnet pelite (mid-amphibolite-facies)

Sample F122B is from a sequence of pelite and psammite strata that overlies Archean tonalitic orthogneiss in the eastern mid-amphibolite-facies zone. The sequence is folded by a map-scale F_3 fold, such that S_1 is north-dipping overall, and S_1 is folded by south-vergent F_3 crenulations in pelite. The sample comprises biotite, muscovite, sillimanite (fibrolite), garnet, plagioclase and quartz. S_1 is defined by aligned biotite, fibrolite bands, plagioclase and minor muscovite. Plagioclase and quartz are concentrated in ≤1 cm thick bands aligned parallel to S_1 that also contain rare K-feldspar (<2% of sample). The muscovite grains that define S_1 are medium-grained, but most (~85%) muscovite cross-cuts S_1 and is coarse-grained. This post-S_1 muscovite includes crystals that engulf fibrolite knots as well as less common muscovite grains with symplectic quartz intergrowths, located in plagioclase- and quartz-rich bands. The post-S_1 muscovite grains that engulf fibrolite are often oriented axial planar to F_3 crenulations, but some also cross-cut F_3. Garnet

porphyroblasts (~2%) are ≤2 mm wide and are wrapped by S_1. Garnet cores contain inclusions of plagioclase and biotite, whereas garnet rims are inclusion-free and their irregular shape suggests partial resorption. Most biotite grains are S_1-aligned, and a later generation of biotite cross-cuts S_1, including most grains that are adjacent to resorbed garnet rims.

A2.9. Sample H45A: Biotite muscovite garnet pelite (mid-amphibolite-facies)

Collected from a ~500 m thick sequence of pelite, amphibolite and calc-silicate on the northeast peninsula, this sample has a well-developed S_1 fabric. The supracrustal package and underlying orthogneiss basement comprise one of several imbricated T_2 thrust sheets. Sample H45A is from the second-lowest mapped thrust sheet. In contrast to the west-dipping S_1 fabric that is typical of most of Hall Peninsula, the S_1 fabric of sample H45A strikes east-west with a near-vertical dip, consistent with the orientation of all units in this thrust sheet. The pelite from which sample H45A was collected has a strong southwest-dipping crenulation cleavage defined by west-plunging crenulations of the S_1 fabric. The field evidence suggests that the H45A thrust sheet was folded in the north-south direction following T_2 thrusting. Notably, structurally-higher thrust sheets further west truncate this fold, suggesting that the north-south folding in this area pre-dates younger T_2 thrusts. Therefore, this fold is not classified as an F_3 fold, although it has a similar orientation to F_3 folds elsewhere.

The main components of sample H45A are biotite, muscovite, garnet, quartz, plagioclase, ilmenite and tourmaline. Garnet forms equant porphyroblasts containing spiral-shaped inclusion trails of biotite, ilmenite, quartz and muscovite. The S_1 matrix fabric is defined by biotite and muscovite, and by biotite- and muscovite bands alternating with quartz- and feldspar-rich bands. The S_1 fabric is crenulated due to the map-scale fold with an east-striking axial plane that affects the H45A thrust sheet. Post-S_1 coarse-grained muscovite occurs axial planar to the crenulations.

A2.10. Sample K2A: K-feldpsar biotite sillimanite garnet pelite (upper-amphibolite-facies)

Sample K2A is from an F_2-folded, west-dipping supracrustal sequence that is surrounded by Archean basement on south-central Hall Peninsula. The sample comprises quartz, K-feldspar, plagioclase, biotite, sillimanite (fibrolite) and garnet. S_1 is defined by aligned biotite, fibrolite, garnet and some elongate quartz and feldspar grains. S_1 is also defined by compositional banding that consists of alternating, 1–2 cm thick quartz-K-feldspar-plagioclase-rich bands and biotite-fibrolite-garnet rich bands. Garnet forms ~5 X 7 mm, lozenge-shaped porphyroblasts, whereas the

other minerals are fine- to medium-grained. Quartz shows undulose extinction and, along with feldspar grains, exhibits subgrain formation and bulging along grain boundaries.

A2.11. Sample S1A: Garnet K-feldspar sillimanite biotite pelite (granulite-facies)

This sample was collected from a ~5 km thick package of interbedded pelite, semi-pelite and psammite on the southwestern peninsula in the granulite-facies zone. The metasedimentary sequence contains extensive leucogranite bodies and is intruded by several orthopyroxene monzogranite sills. The area has a well-developed, bedding-parallel, west-dipping S_1 foliation and several younger folds (F_{1b}). Sample S1A contains mainly garnet, K-feldspar, quartz, plagioclase and sillimanite with lesser biotite (~5%) and ilmenite. The S_1 fabric is defined by aligned garnet porphyroblasts and prismatic sillimanite, as well as lenses of coarse-grained K-feldspar, quartz and plagioclase, which are interpreted as melt. Some matrix biotite grains are S_1-aligned, whereas many are randomly oriented and are often concentrated along garnet rims. Garnet porphyroblasts are up to 1.5 cm wide and contain inclusions of biotite, quartz and fine-grained sillimanite that are generally oriented parallel to S_1 in the matrix.

A2.12. Sample S7A: Biotite hornblende monzogranite (granulite-facies)

Sample S7A was collected from medium-grained monzogranite that contains K-feldspar phenocrysts up to 1 cm long. It also contains quartz, plagioclase, biotite and hornblende, along with minor magnetite. Minor orthopyroxene (~2%) occurs in outcrop. Biotite schlieren define a weak subvertical foliation that strikes south-southeast.

A2.13. Sample S35C: K-feldspar biotite sillimanite muscovite pelite (mid-amphibolite-facies)

Sample S35C is a pelite from a southwest-dipping supracrustal sequence dominated by metasedimentary rocks on the southeastern coast of Hall Peninsula. The supracrustal sequence is bounded by Archean basement and is interpreted as part of a T_2 thrust imbricate. The sample is mostly fine- to medium-grained and consists of quartz, K-feldspar, biotite, plagioclase, sillimanite (fibrolite), and minor muscovite and graphite. S_1 dips toward the southwest and is defined by aligned biotite and fibrolite, and by compositional banding that comprises 1–2 cm thick biotite-fibrolite-rich bands alternating with quartz-K-feldspar-plagioclase-rich bands. Fibrolite forms S_1-aligned aggregates that are contained within coarse-grained plagioclase, quartz and variably-oriented muscovite that typically cross-cuts S_1. S_1-aligned, 2–3 mm wide bands of medium- to coarse-grained quartz, K-feldspar and plagioclase are interpreted as melt. Quartz and feldspar have undulose extinction and grain boundaries exhibit bulging and subgrain formation.

A2.14. Sample S53A: Diopside olivine phlogopite marble (granulite-facies)

Sample S53A is from a shallowly northwest-dipping sequence of marble and metasedimentary rocks on southwestern Hall Peninsula. The sample contains medium- to coarse-grained calcite, diopside, phlogopite, olivine and dolomite. S_1 is defined by aligned phlogopite and diopside.

A2.15. Sample S59A: Diopside olivine phlogopite marble (upper-amphibolite-facies)

Sample S59A is from a west-dipping sequence of metasedimentary rocks and quartz diorite on north-central Hall Peninsula. The sample contains medium-grained calcite, diopside, phlogopite, olivine and dolomite. S_1 is defined by aligned phlogopite and diopside.

A2.16. Sample S60A: K-feldspar garnet biotite psammite (granulite-facies)

Sample S60A is from an extensive sequence of interbedded psammite, semi-pelite and psammite with minor marble in the granulite-facies zone on the southwestern peninsula. The metasedimentary package has a well-developed, west-dipping, bedding-parallel S_1 foliation and is folded by a large F_{1b} (or F_2?) fold that measures at least 10 km from limb to limb. The sequence hosts voluminous garnet ± cordierite leucogranite intrusions and several orthopyroxene monzogranite sills. Sample S60A contains garnet, quartz, plagioclase, K-feldspar, biotite, ilmenite and graphite. Garnet forms equant porphyroblasts up to 2 mm wide. The S_{1a} foliation is mainly defined by aligned biotite, but ~30% of biotite surrounds garnet and cross-cuts S_{1a}.

A2.17. Sample S74A: Orthopyroxene garnet K-feldspar biotite pelite (granulite-facies)

Sample S74A was collected from a west-dipping sequence of metasedimentary rocks that host garnet-bearing leucogranite. The sample comprises quartz, plagioclase, orthopyroxene, garnet, K-feldspar, opaque mineral(s) and biotite. S_1 is defined by aligned biotite, and some biotite grains are kinked around quartz and feldspar. Quartz and feldspar exhibit subgrain formation, suturing and bulging along grain boundaries and show undulose extinction. All minerals are fine- to medium-grained, except for garnet and orthopyroxene, which are coarse-grained. Garnet forms 2–5 mm wide anhedral porphyroblasts that contain numerous quartz and S_1-aligned biotite inclusions. Orthopyroxene typically occurs adjacent to garnet, and forms irregularly shaped, 2 mm wide grains.

A2.18. Sample S89A: Biotite sillimanite garnet muscovite pelite (mid-amphibolite-facies)

Sample S89A is from a ~500 m thick, northwest-dipping supracrustal sequence that is structurally bounded by Archean orthogneiss in the mid-amphibolite-facies zone. The strata and

their underlying basement form one of several T_2 thrust imbricates the northeast coast of the peninsula (Ptarmigan Fjord area). Sample S89A has a northwest-dipping S_1 that is defined by bands of fine-grained muscovite ± sillimanite alternating with bands of coarser-grained biotite, muscovite, quartz, plagioclase and garnet. Muscovite grains in biotite-rich bands are S_1-aligned and medium-grained, similar to biotite, and comprise ~25% of muscovite in the sample. Within the bands of fine-grained muscovite (~75% of muscovite), many muscovite grains occur at high angles to S_1. Sillimanite (~6%) occurs as fine needles in quartz and garnet and less often as fine-grained aggregates in muscovite bands. Garnet (~2%) forms anhedral or elongate, S_1-aligned grains up to 3 mm wide with randomly-oriented inclusions of quartz, biotite, sillimanite, monazite, zircon and magnetite. Garnet grains typically have irregularly-shaped rims that are in contact with biotite.

A2.19. Sample S92C: Biotite K-feldspar muscovite sillimanite pelite (upper-amphibolite-facies)

This sample was collected from a 3 m wide slice of pelite with tonalite orthogneiss occurring both structurally above and below. It is likely that tonalite basement was thrust eastward over the pelite during D_2, similar to larger-scale thrust imbricates that occur elsewhere in eastern Hall Peninsula. The principal minerals are biotite, muscovite, K-feldspar, plagioclase, quartz and sillimanite. The west-dipping S_1 is defined by aligned biotite and prismatic sillimanite, and a well-developed gneissosity (S_1) is defined by 0.5–2 mm thick bands of K-feldspar, quartz and plagioclase alternating with bands of biotite–muscovite±sillimanite. Leucosome bands of quartz and feldspar are consistent with melt. Muscovite occurs as fine grains that cross-cut S_1, and as larger grains cross-cutting S_1 that surround aggregates of prismatic, S_1-parallel sillimanite crystals. Some muscovite grains contain sillimanite inclusions or symplectic quartz intergrowths.

A2.20. Sample S105A: Biotite tonalite gneiss (upper-amphibolite-facies)

Sample S105A was collected from tonalitic orthogneiss in the eastern mid-amphibolite-facies zone that is inferred as Archean based on crystallization ages of similar basement rocks in the region. The sample is medium- to coarse-grained and consists of quartz, plagioclase, and biotite. It has a west-dipping S_1 fabric that is mainly defined by aligned biotite grains. Biotite is concentrated in S_1-parallel clots, and quartz and plagioclase also form patchy, S_1-aligned aggregates. Biotite grains are mostly aligned with S_1, but ~40% of biotite grains have variable orientations. Some biotite grains (~25%) contain quartz symplectite. Quartz exhibits undulose

extinction, subgrain formation and sutured grain boundaries, and plagioclase is weakly- to -moderately sericitized.

A2.21. Sample S131C: Biotite muscovite sillimanite pelite (mid-amphibolite-facies)

Sample S131C is a pelite from a supracrustal sequence of mainly amphibolite and meta-calc-silicate that was folded during D_2 and is bounded by Archean orthogneiss. The sample is fine- to medium-grained and contains quartz, plagioclase, biotite, sillimanite (fibrolite) and muscovite. S_1 is north-striking and subvertical, and is defined by aligned biotite, muscovite and fibrolite knots.

A2.22. Sample S145A: Garnet cordierite K-feldspar sillimanite pelite (granulite-facies)

Sample S145A, from the western granulite-facies metamorphic zone, was collected from a ~10 km thick sequence of pelite, psammite and quartzite that contains 1 m to 1 km-thick foliation-parallel intrusions of orthopyroxene tonalite and clinopyroxene gabbro. The sequence is folded by F_1 and has a west-southwest-dipping, axial planar S_1 fabric. Sample S145A contains garnet, cordierite, sillimanite, quartz, K-feldspar, plagioclase, ilmenite and minor biotite. S_1 is defined by compositional banding, whereby garnet-, cordierite- and sillimanite-rich bands alternate with bands (~10 vol%) of coarse-grained K-feldspar (~35%), plagioclase (25%) and quartz (40%). S_1 is also defined by aligned garnet, sillimanite, ilmenite, cordierite, quartz, plagioclase and K-feldspar. Garnet (~20%) forms 3-15 mm diameter porphyroblasts that are elongate parallel to S_1. Garnet contains inclusions of biotite and plagioclase, and fine sillimanite inclusions are concentrated in the rims of large garnet crystals. The inclusions are mostly aligned with S_1 in the matrix. Matrix sillimanite forms prismatic crystals defining S_1. Cordierite generally occurs with garnet and sillimanite, and locally appears to be embaying garnet rims. Biotite (~5%) forms S_1-aligned grains that are concentrated in garnet- and sillimanite-rich bands. A second biotite generation cross-cuts S_1 and is often adjacent to garnet.

A2.23. Sample S162A: Garnet biotite K-feldspar sillimanite pelite (upper-amphibolite-facies)

Sample S162A is from a ~2 km thick package of pelite, diorite and amphibolite on the southeast coast of the peninsula. The supracrustal rocks have a well-developed, bedding-parallel S_1 foliation. Tonalite orthogneiss basement occurs structurally above and below the supracrustal sequence, suggesting that basement was thrust (T_2) over the supracrustal rocks. The area has been folded by thick-skinned, upright, open, F_3 folds with east-west-striking axial planes, resulting in an overall east-west-striking map pattern for the package of supracrustal rocks. Sample S162A comprises garnet, biotite, quartz, plagioclase, K-feldspar, sillimanite, magnetite and minor pyrite.

The S_1 fabric is defined by aligned biotite and elongate garnet porphyroblasts. Some biotite grains (~30%) are concentrated along garnet rims, often cross-cutting S_1. Garnet porphyroblasts are up to 1 cm wide and contain inclusions of biotite, quartz and sillimanite that form inclusion trails that are parallel to S_1 in the matrix. Sillimanite only occurs in garnet, forming prismatic crystals, and is not apparent in the matrix.

A2.24. Sample S165B: Garnet biotite staurolite pelite (mid-amphibolite-facies)

Sample S165B is from a ~2 km thick sequence of pelite, psammite, calc-silicate and amphibolite on the east coast of Hall Peninsula. Tonalite orthogneiss basement occurs structurally above and below the supracrustal sequence, and the western contact between the supracrustal rocks and the orthogneiss basement is mylonitized, suggesting that the basement was thrusted over the supracrustal rocks during T_2. The supracrustal rocks have a bedding-parallel S_1 fabric. The area has been folded in the north-south direction (F_3), reorienting S_1 so that it dips towards the south-southeast. Sample S165B contains mainly quartz, plagioclase, garnet and biotite, with minor staurolite, ilmenite and rutile. Garnet forms equant porphyroblasts up to 1 cm wide that contain spiral-shaped inclusion trails of quartz, plagioclase, biotite, ilmenite and staurolite. The S_1 fabric in the matrix is mainly defined by biotite. Rutile and staurolite both form fine-grained S_1-aligned tabular crystals in the matrix.

A2.25. Sample Y48A: Garnet biotite amphibolite (upper-amphibolite-facies)

Sample Y48A is from a sequence of metasedimentary rocks, quartz diorite and amphibolite structurally bounded by Archean orthogneiss basement. The sample is medium-grained and contains hornblende, garnet, quartz, plagioclase, opaque mineral(s), biotite, and minor chlorite. S_1 dips toward the southwest and is weakly defined by compositional banding comprising alternating ~1 cm wide hornblende-rich and quartz-plagioclase-rich bands. S_1 is also weakly defined by aligned biotite and opaque mineral(s), and elongate hornblende forms a lineation within the plane of S_1. Garnet (~30%) forms subhedral to euhedral, 0.5–2 mm wide porphyroblasts with cores that contain quartz inclusions. Approximately 30% of biotite grains contain thin intergrowths of chlorite.

A2.26. Sample Y66C: Sillimanite biotite garnet pelite (upper-amphibolite-facies)

Sample Y66C is from a package of metasedimentary rocks and diorite bounded by Archean basement on southeastern Hall Peninsula. The sample is comprised of ~3 mm to 1 cm wide, oval-shaped garnet porphyroblasts surrounded by a fine-grained matrix of sillimanite, biotite and minor

quartz. S_1 is southwest-dipping and is defined by aligned sillimanite (fibrolite aggregates), biotite and garnet. Sillimanite mostly occurs as fibrolite but also forms prismatic crystals. Biotite is fine- to medium-grained and is often intergrown with sillimanite (fibrolite). Garnet cores contain randomly oriented inclusions of biotite, quartz and strongly sericitized feldspar.

A2.27. Sample Y98A: K-feldspar garnet biotite psammite (granulite-facies)

Sample Y98A is from a sequence of pelite and psammite that hosts garnet-bearing leucogranite on southwestern Hall Peninsula. It contains garnet porphyroblasts within a fine- to medium-grained matrix of quartz, plagioclase, K-feldspar, biotite, opaque mineral(s) and minor graphite. Garnet forms irregularly-shaped grains that are up to 3 X 2 cm in size and contain numerous inclusions of quartz and feldspar. Garnet is surrounded by biotite-poor haloes. S_1 is east-dipping and is defined by aligned biotite and garnet, and by weak compositional banding comprising ~1–3 cm wide biotite-rich and garnet-rich bands. Quartz and feldspar exhibit undulose extinction, subgrain formation and bulged grain boundaries.

A2.28. Sample Z1A: K-feldspar garnet cordierite sillimanite biotite pelite (granulite-facies)

Sample Z1A is from a sequence of interbedded pelite and psammite in the granulite-facies zone on the northwestern peninsula that contains abundant leucogranite dikes/intrusions and is locally intruded by orthopyroxene monzogranite sills. The area has a strong, bedding-parallel, north-striking sub-vertical S_1 foliation. Sample Z1A contains K-feldspar, plagioclase, quartz, garnet, cordierite, prismatic sillimanite, biotite, ilmenite and spinel. The S_1 fabric in the matrix is defined mainly by aligned biotite, some elongate cordierite grains and by lenses of coarse-grained K-feldspar, plagioclase and quartz, which are interpreted as partial melt (e.g., Sawyer, 1999). Garnet forms equant- to elongate porphyroblasts that contain inclusions of fine-grained sillimanite, cordierite, biotite and quartz. The inclusions are typically aligned parallel to S_1 in the matrix.

A2.29. Sample Z58B: K-feldspar garnet biotite muscovite pelite (mid-amphibolite-facies)

Sample Z58B is from an extensive sequence of metasedimentary rocks overlying Archean basement on northeastern Hall Peninsula. The sample contains ~1–2 cm-sized garnet porphyroblasts within a medium-grained matrix of plagioclase, K-feldspar, quartz, biotite and muscovite. Discontinuous lenses of coarse-grained K-feldspar, plagioclase and quartz are interpreted as melt. S_1 dips toward the northwest and is defined by aligned biotite and muscovite in the matrix, as well as melt lenses. Approximately 5% of biotite grains occur adjacent to garnet

rims and are variably oriented, cross-cutting S_1, and ~5% of muscovite grains cross-cut S_1 in the matrix.

A3. Muscovite and biotite chemical maps (EMPA)

Table A3.1: Summary of grain size, microstructure and compositional map patterns for minerals mapped using EMPA.

Mineral & Grain Number	Grain Size*	Microstructure	WDS Map Pattern
Sample B75A			
Bt 1	m	S_1-aligned; surrounded by Qz, Pl, Kfs	uniform
Bt 2	f	S_1-aligned; surrounded by Qz, Pl, Kfs	uniform
Ms 1	m	S_1-aligned; intergrown with Qz, fibrolite	uniform
Ms 2	m	x-cuts S_1; contains Qz symplectite	uniform
Ms 3	f	S_1-aligned; intergrown with Bt	uniform
Sample F122B			
Bt 1	m	S_1-aligned; surrounded by Bt, Pl	uniform
Bt 2	m	x-cuts S_1; embays Grt, surrounded by Bt	slightly high Al, low Fe along edge adjacent to Bt
Ms 1	m	x-cuts S_1; surrounded by Bt, Pl	uniform
Ms 2	c	x-cuts S_1; surrounded by Bt; engulfs fibrolite	slightly low Al, high Fe & Mg along rims
Ms 3	m	S_1-aligned; surrounded by Bt, Pl	slightly low Mg along rims
Ms 4	c	x-cuts S_1; surrounds Bt, fibrolite knots	uniform
Sample S92C			
Bt 1	m	x-cuts S_1; surrounded by Bt, Ms	uniform
Bt 2	m	S_1-aligned; surrounded by Bt, Kfs, Pl	uniform
Ms 1	c	x-cuts S_1; surrounded by Bt; engulfs Sil	slightly low Al, high Fe & Mg along rims
Ms 2	m	S_1-aligned; surrounded by Bt, Kfs, Pl	slightly low Al, high Fe & Mg along rims
Ms 3	f	x-cuts S_1; surrounded by Bt, Qz	slightly low Al, high Mg along rims

*f=fine-grained, m=medium-grained, c=coarse-grained

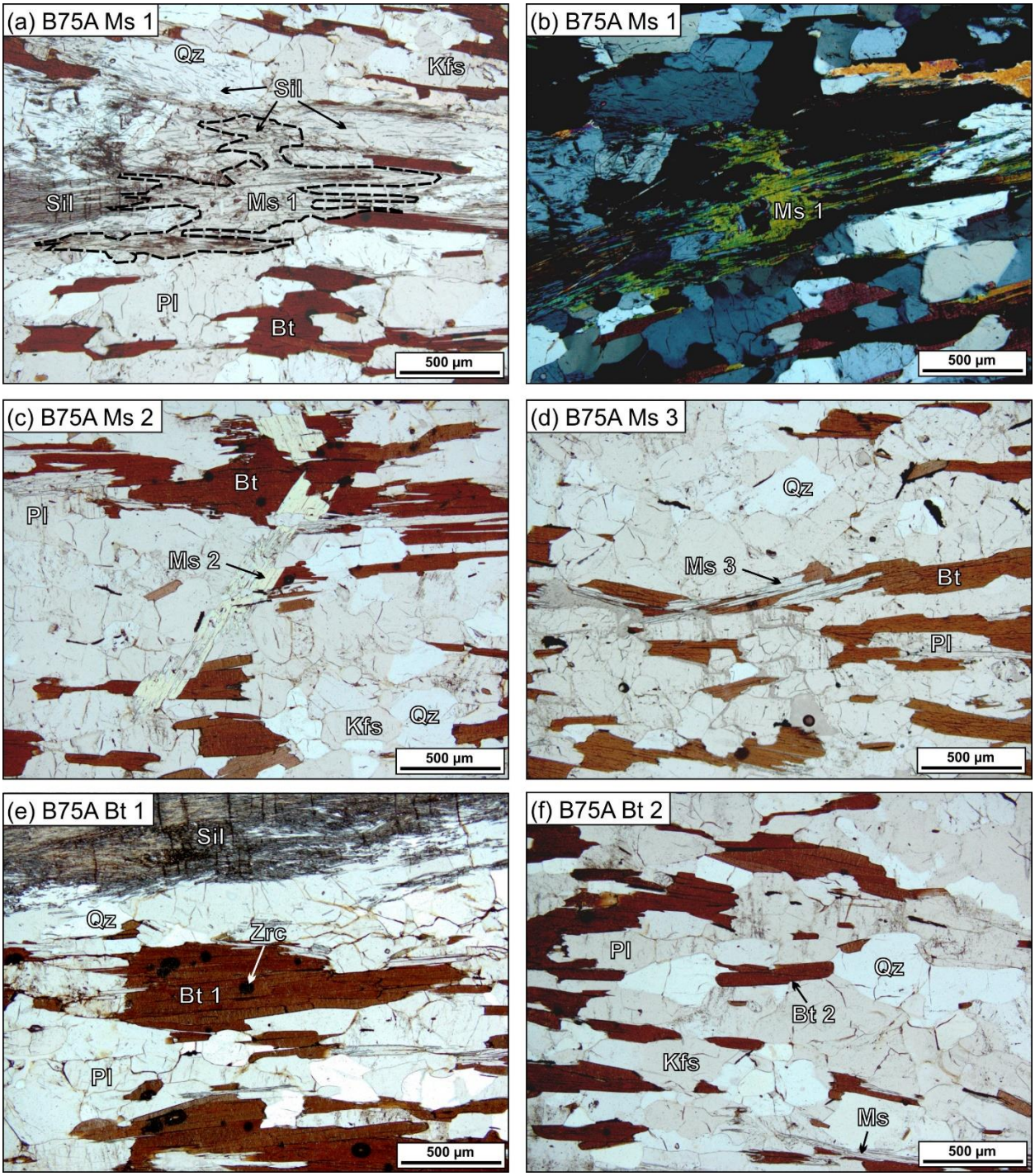


Figure A3.1: Photomicrographs of biotite and muscovite grains in sample B75A mapped by EMPA. S_1 fabric is oriented approximately left-to-right in all photomicrographs.

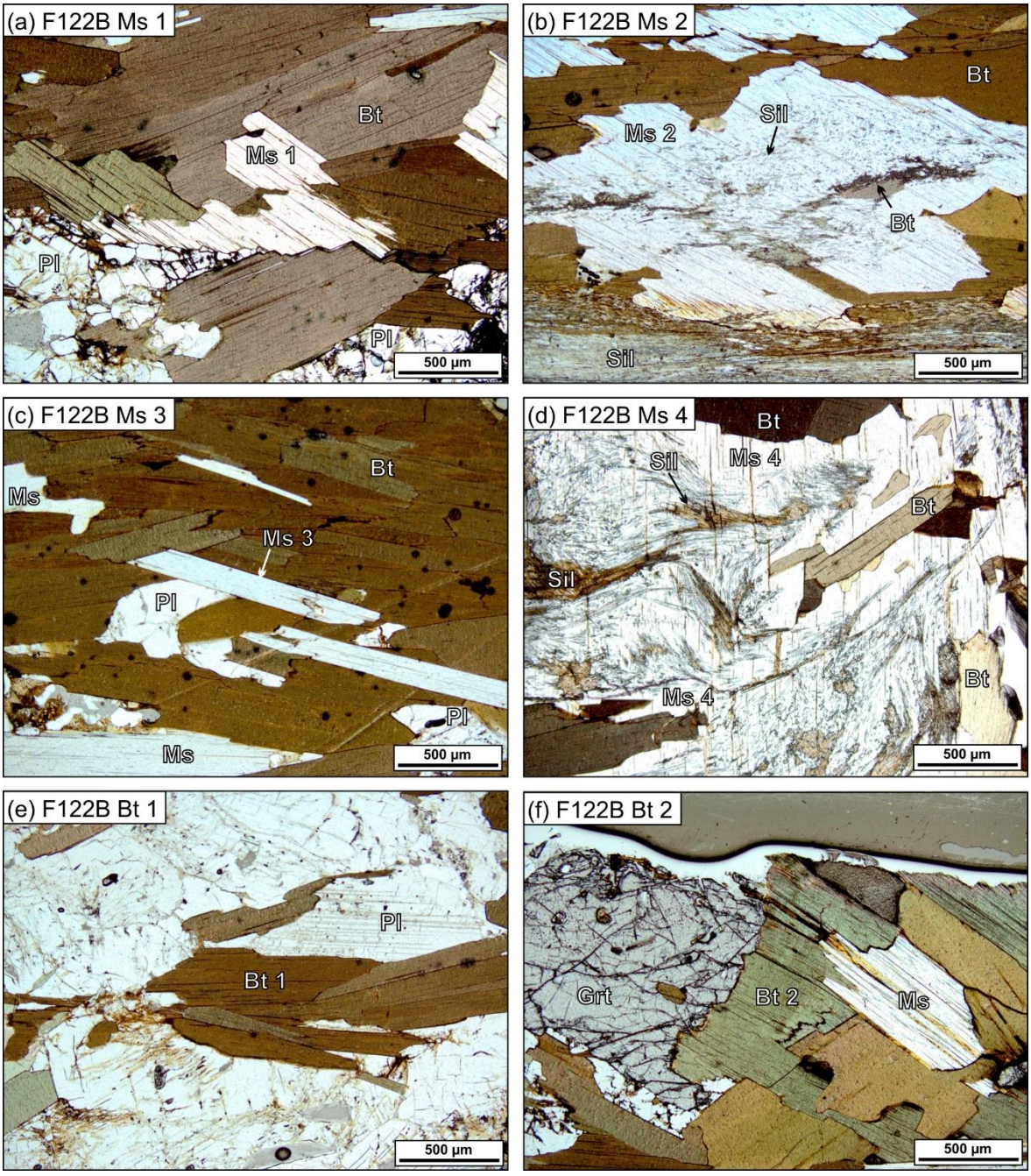


Fig. A3.2: Photomicrographs of biotite and muscovite grains in sample F122B mapped by EMPA. S_1 fabric is oriented approximately left-to-right in all photomicrographs.

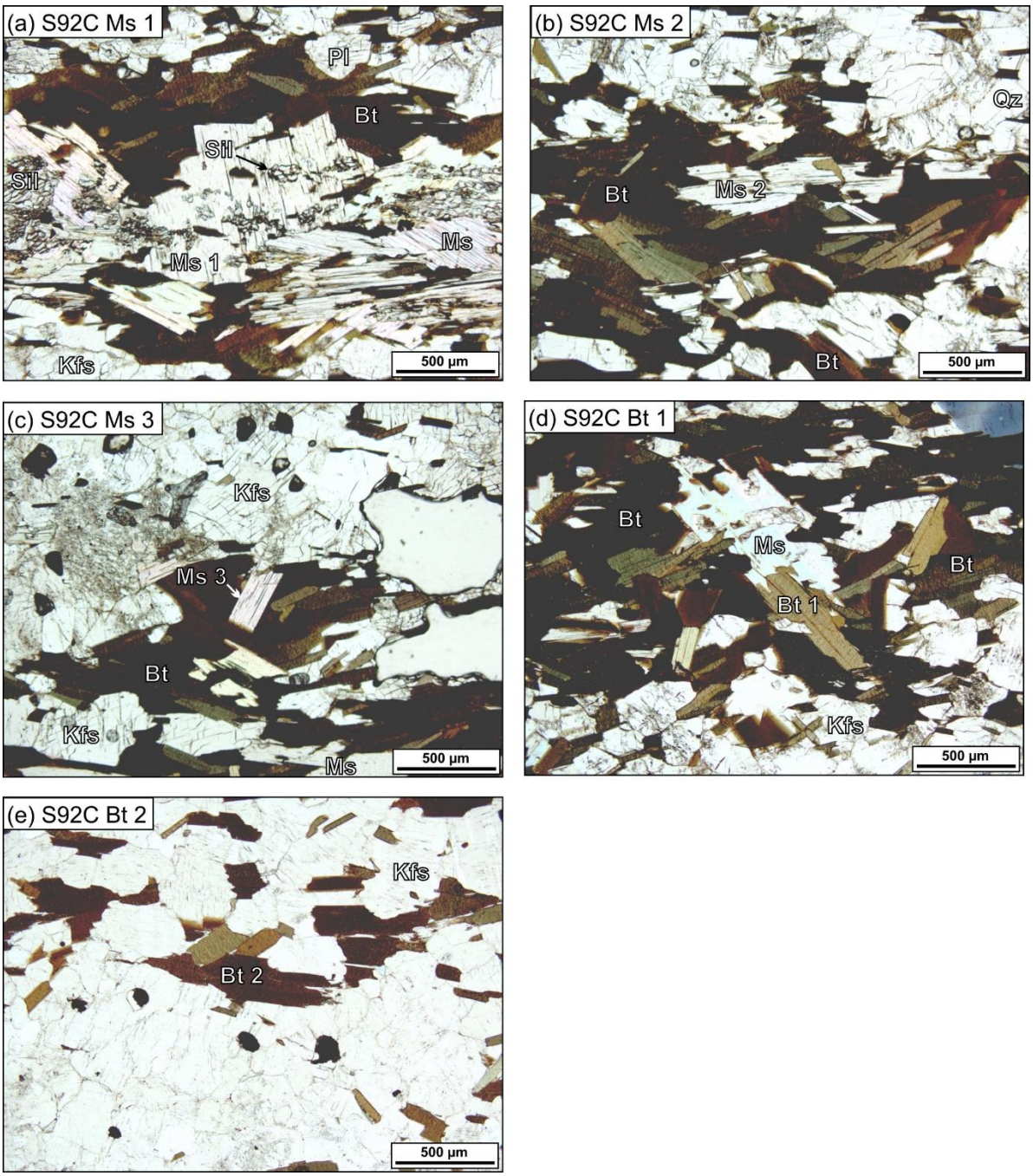
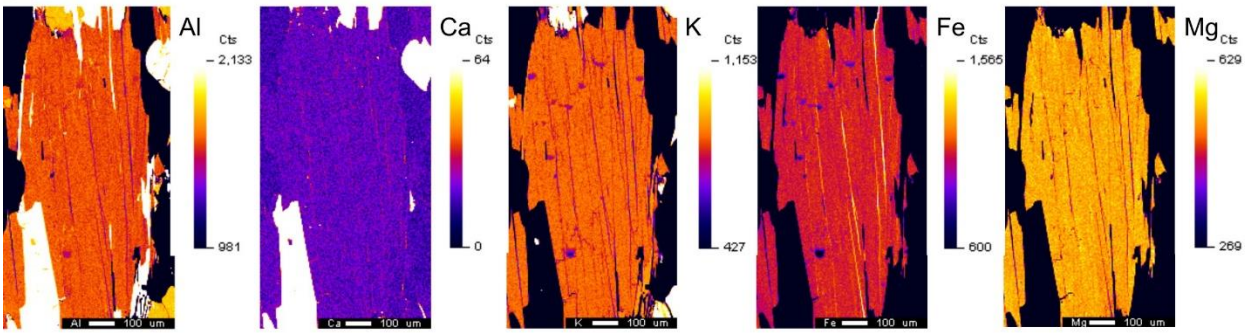


Fig. A3.3: Photomicrographs of biotite and muscovite grains in sample S92C mapped by EMPA. S_1 fabric is oriented approximately left-to-right in all photomicrographs.

(a) B75A Bt 1



(b) B75A Bt 2

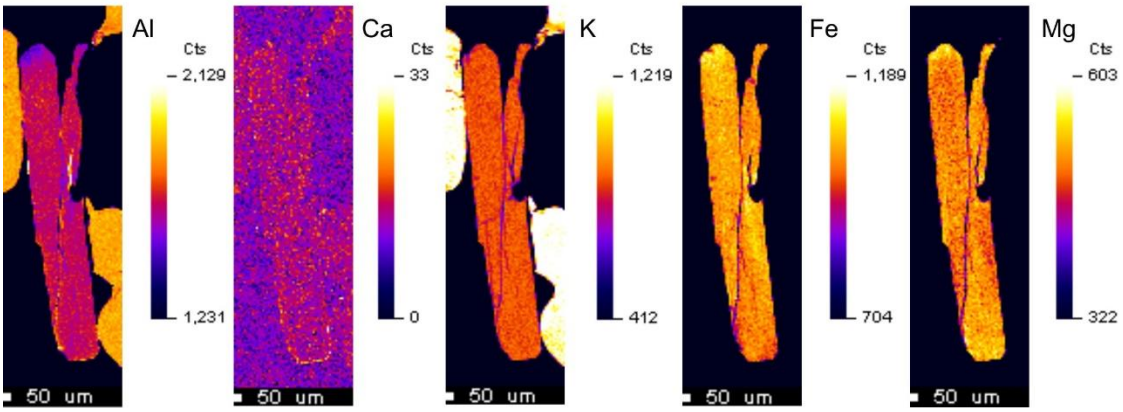
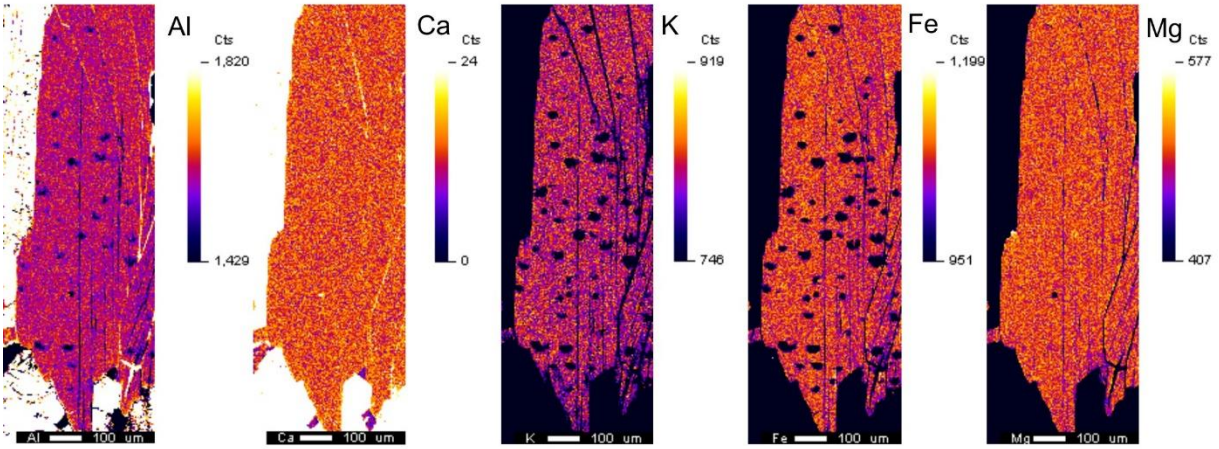


Figure A3.4: Chemical maps of biotite in sample B75A acquired by EMPA wavelength dispersive spectrometry (WDS). Dark spots in (a) represent surface contamination (dust) on the thin section.

(a) F122B Bt 1



(b) F122B Bt 2

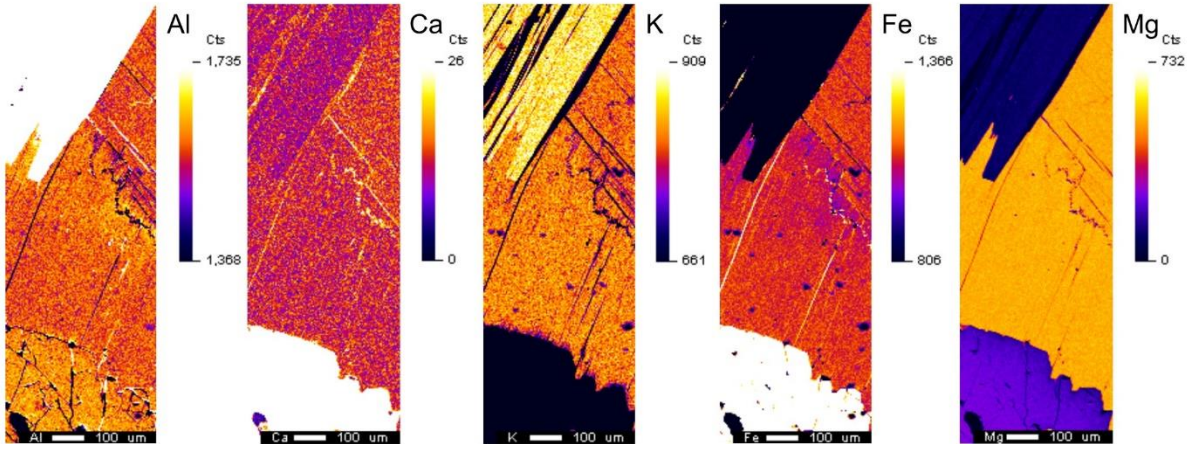


Figure A3.5: Chemical maps of biotite in sample F122B acquired by EMPA wavelength dispersive spectrometry (WDS). Dark spots represent surface contamination (dust) on the thin section.

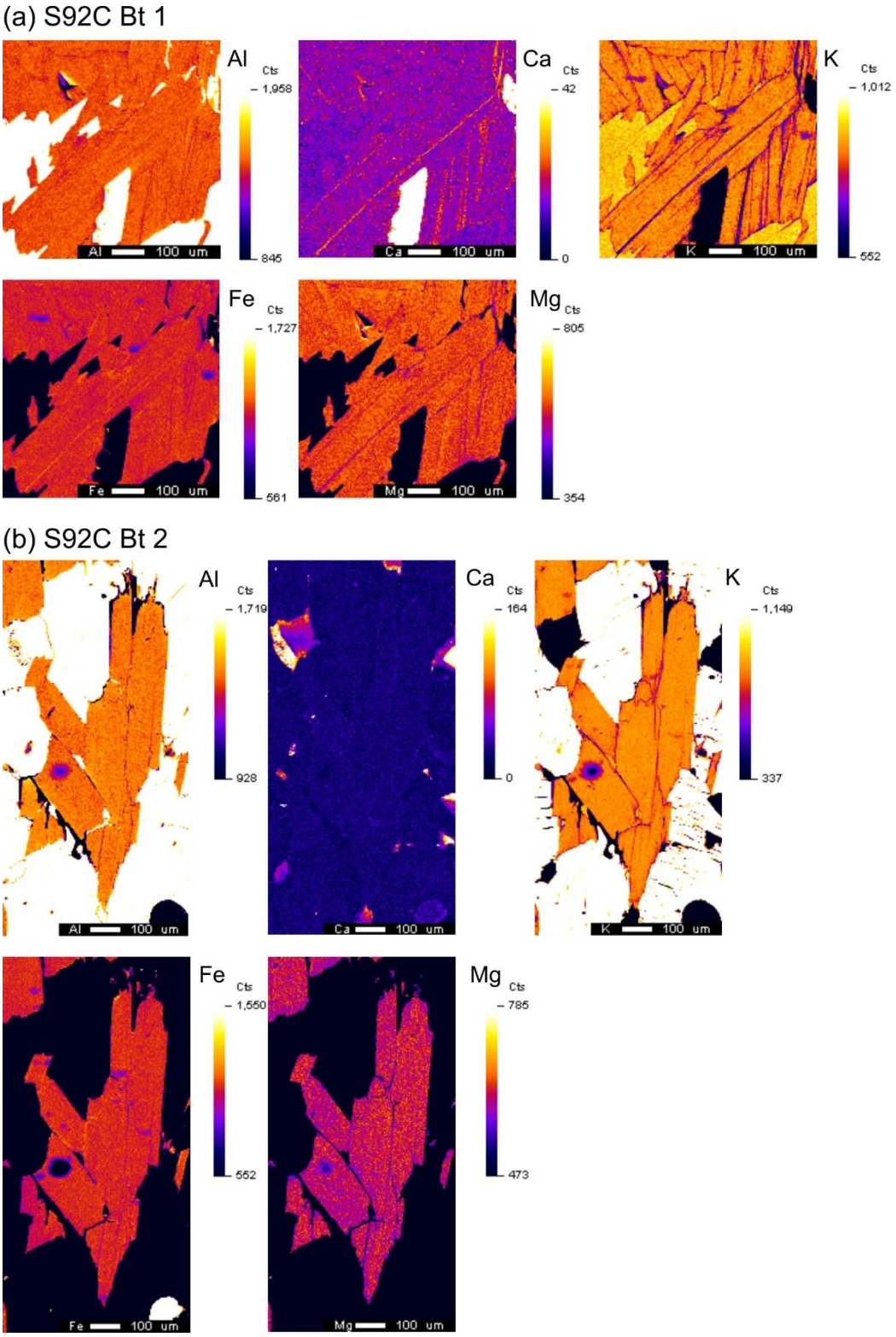


Figure A3.6: Chemical maps of biotite in sample S92C acquired by EMPA wavelength dispersive spectrometry (WDS). Dark spot in (b) is a zircon/monazite inclusion.

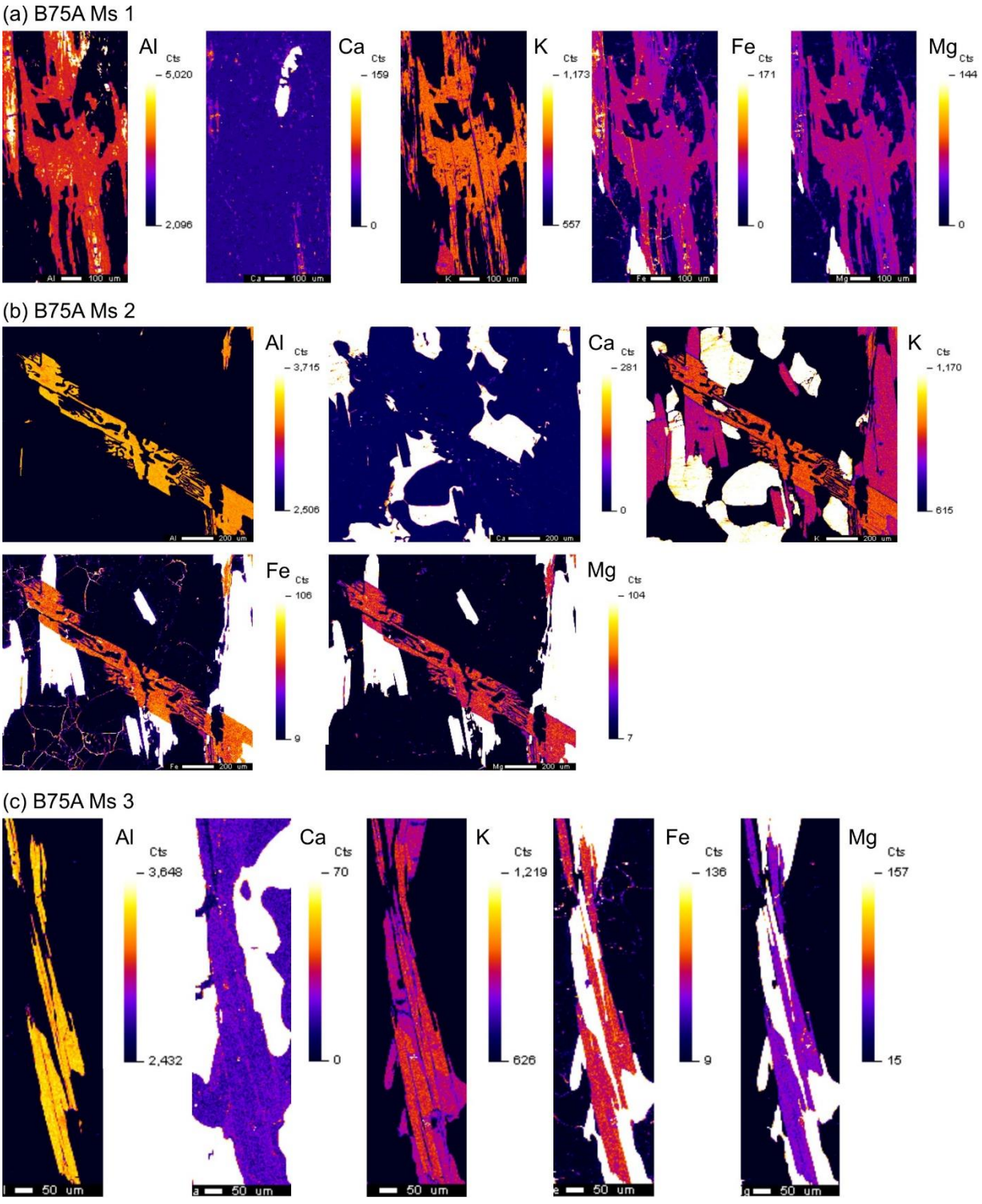


Figure A3.7: Chemical maps of muscovite in sample B75A acquired by EMPA wavelength dispersive spectrometry (WDS).

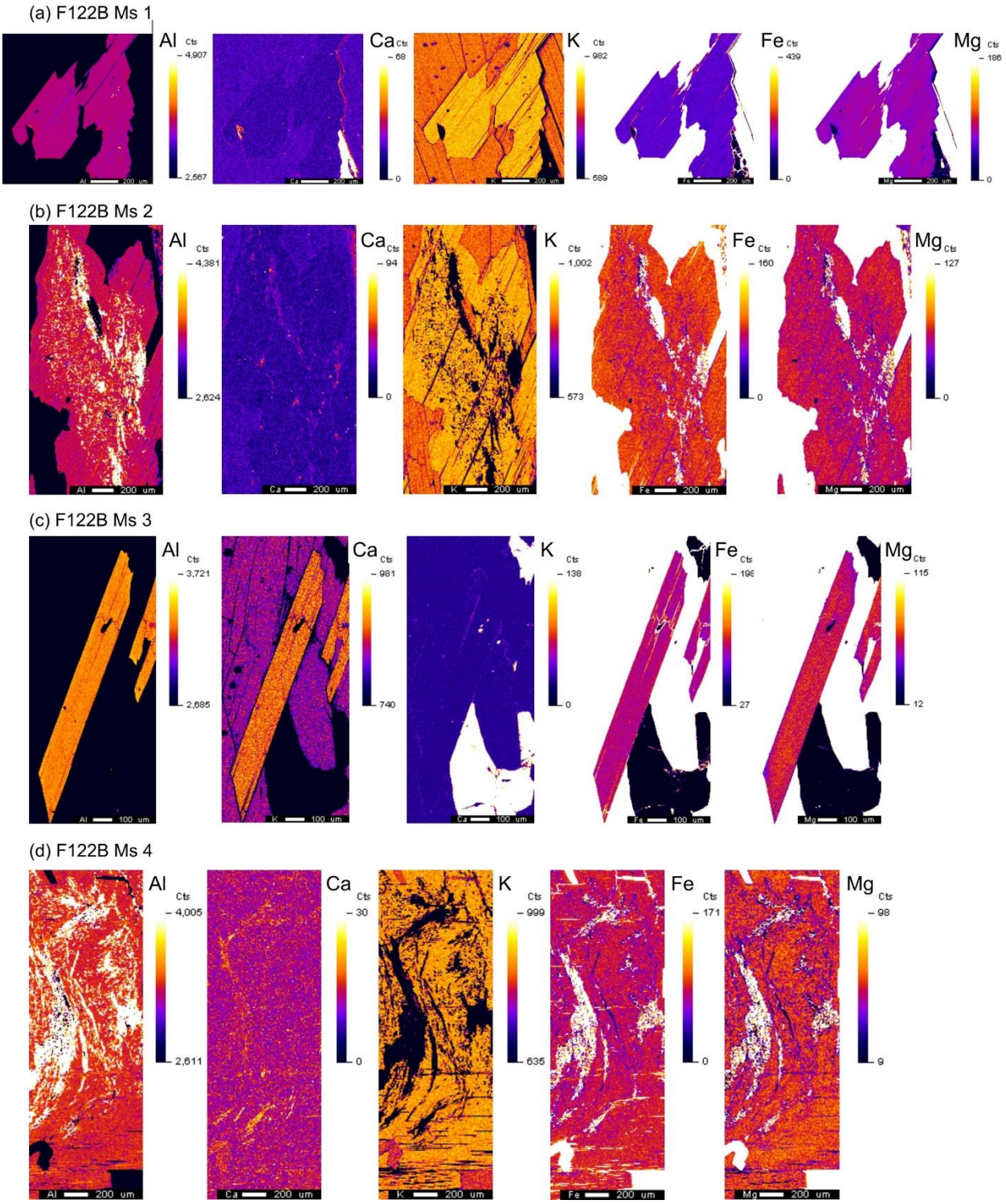


Figure A3.8: Chemical maps of muscovite in sample F122B acquired by EMPA wavelength dispersive spectrometry (WDS).

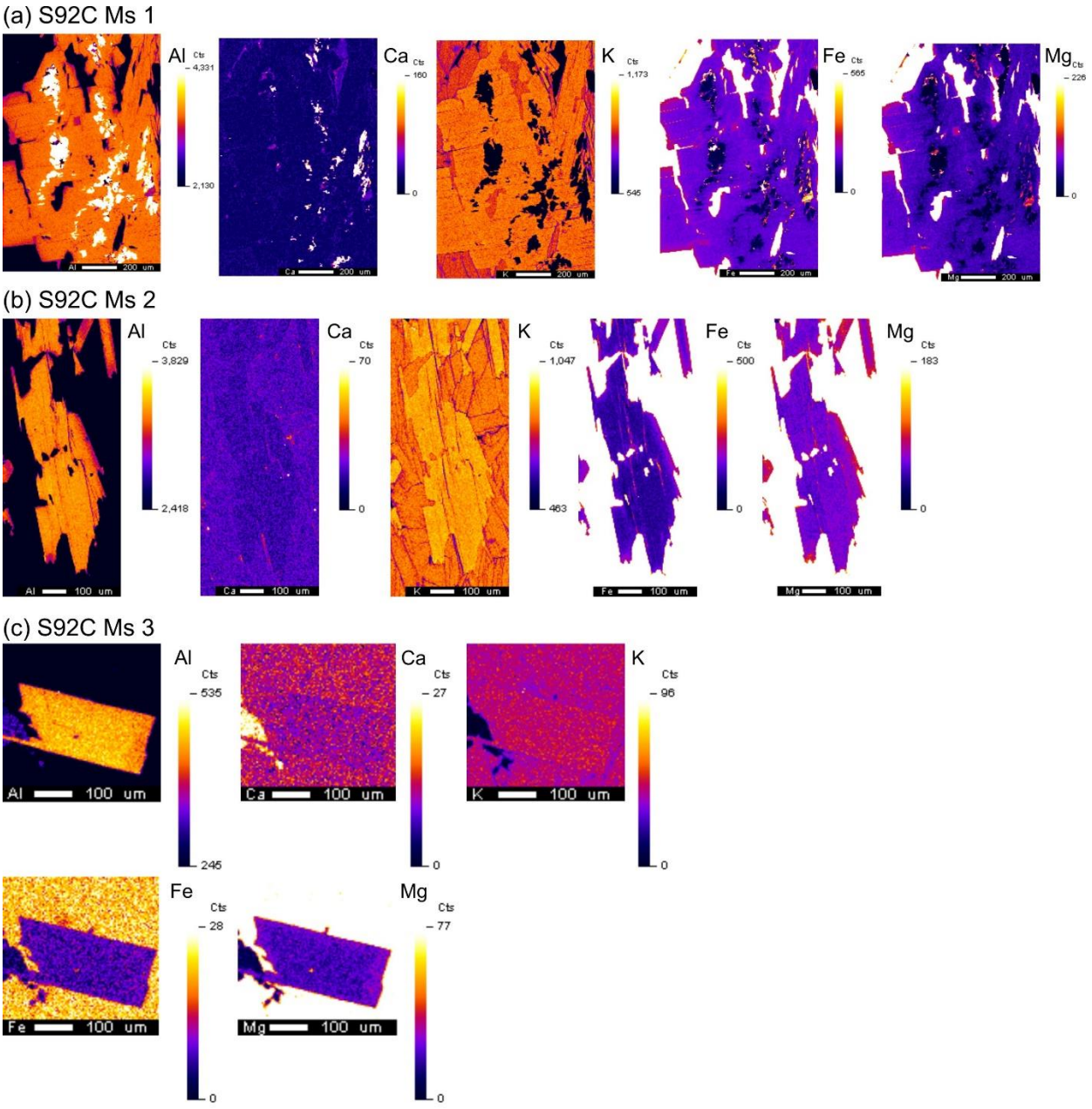


Figure A3.9: Chemical maps of muscovite in sample S92C acquired by EMPA wavelength dispersive spectrometry (WDS).

A4. $^{40}Ar/^{39}Ar$ step-heating spectra

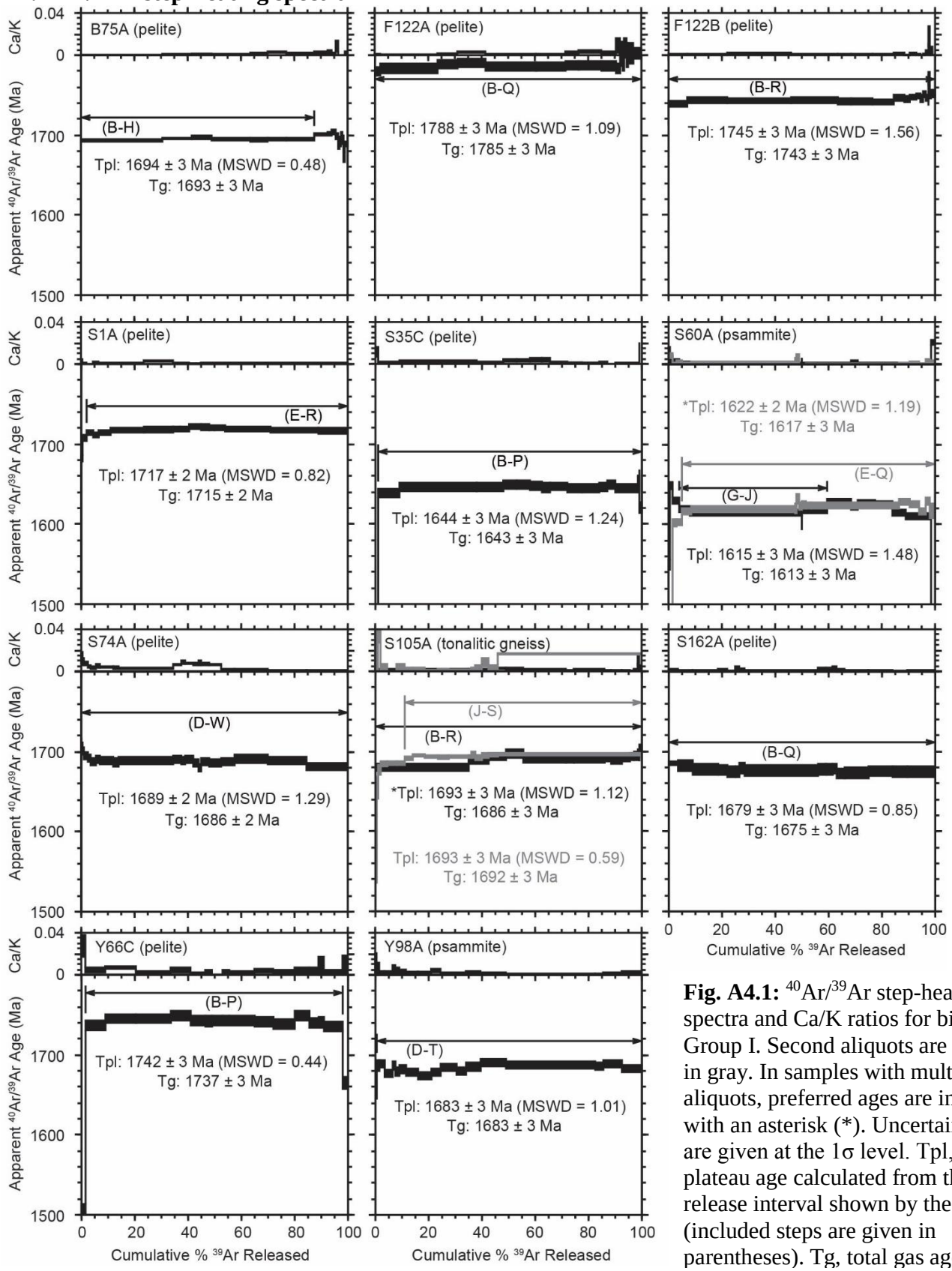


Fig. A4.1: $^{40}Ar/^{39}Ar$ step-heating spectra and Ca/K ratios for biotite in Group I. Second aliquots are shown in gray. In samples with multiple aliquots, preferred ages are indicated with an asterisk (*). Uncertainties are given at the 1σ level. Tpl, plateau age calculated from the gas release interval shown by the arrow (included steps are given in parentheses). Tg, total gas age.

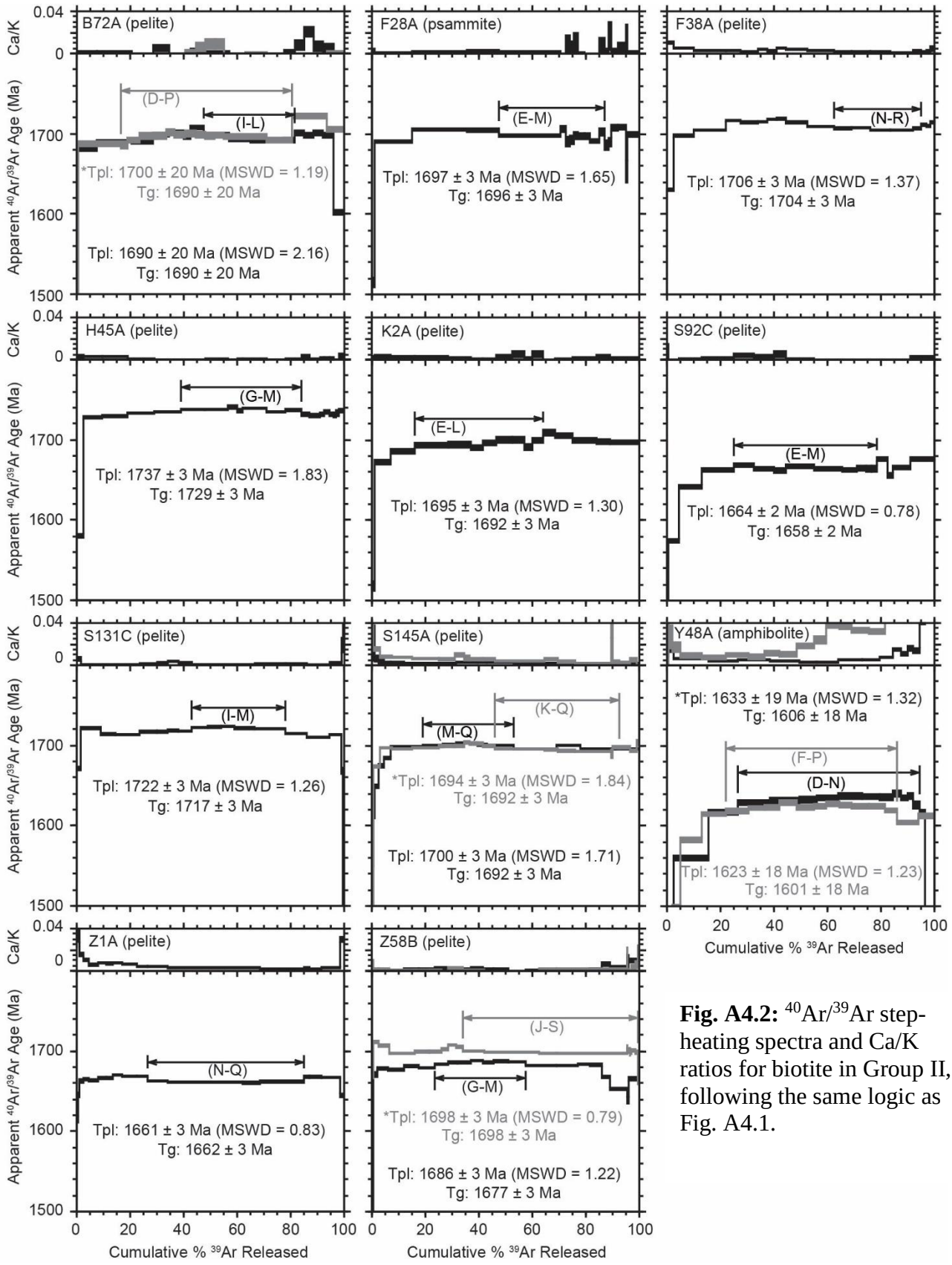


Fig. A4.2: $^{40}Ar/^{39}Ar$ step-heating spectra and Ca/K ratios for biotite in Group II, following the same logic as Fig. A4.1.

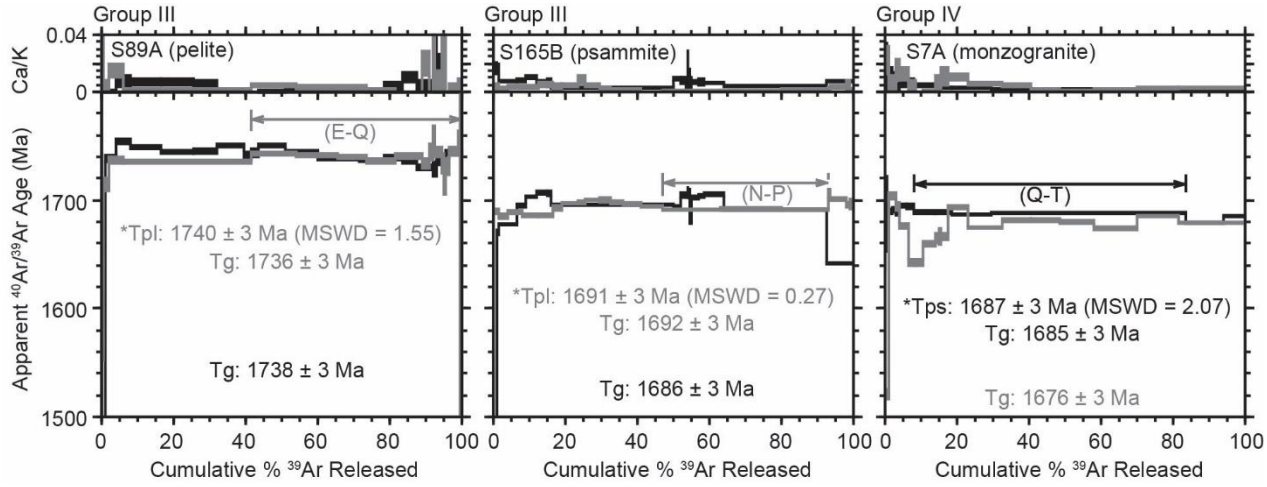


Fig. A4.3: $^{40}Ar/^{39}Ar$ step-heating spectra and Ca/K ratios for biotite in Groups III and IV, following the same logic as Fig. A4.1. Tps, pseudoplateau age calculated from the gas release interval shown by the arrow (included step is given in parentheses).

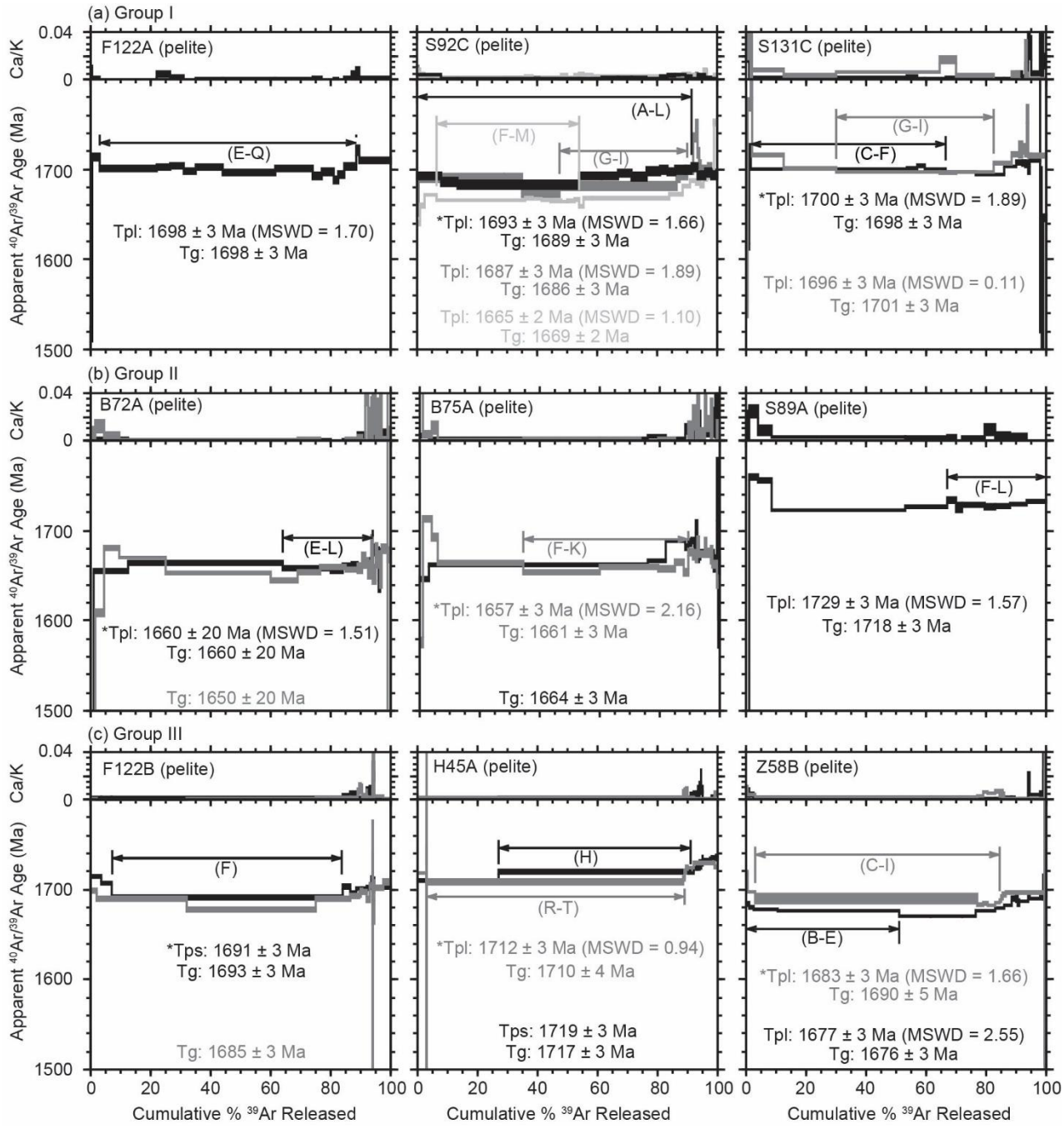


Fig. A4.4: $^{40}Ar/^{39}Ar$ step-heating spectra and Ca/K ratios for muscovite in Groups I–III, following the same logic as Figs. A4.1 and A4.3. The third aliquot in sample S92C is shown in light gray.

A5. Additional numerical diffusion models

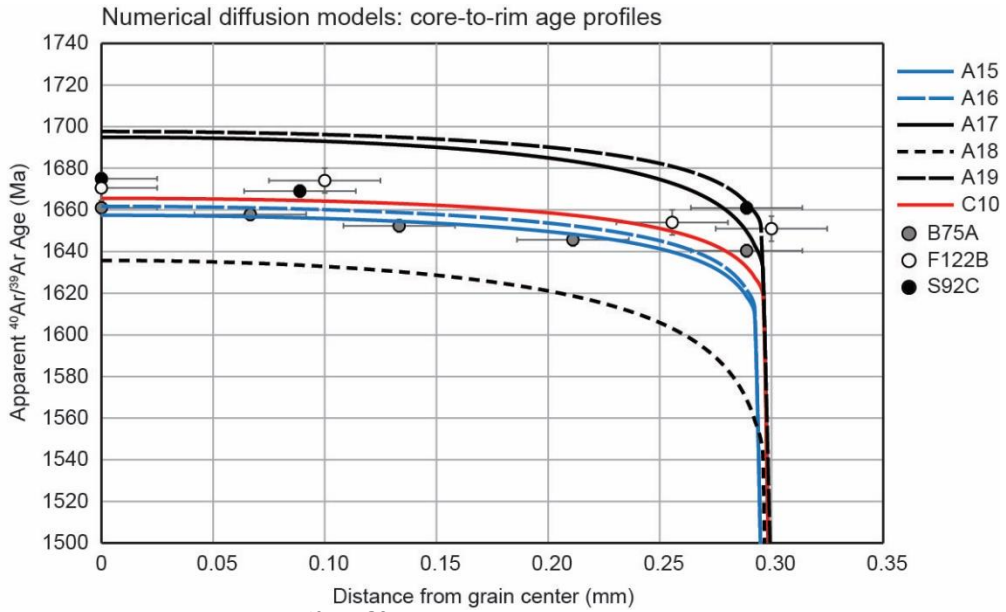


Fig. A5.1: Core-to-rim $^{40}Ar/^{39}Ar$ age profiles outputted by selected numerical diffusion models compared to apparent core-to-rim $^{40}Ar/^{39}Ar$ age profiles determined in muscovite samples B75A, F122B and S92C by UV laser spot analyses. Models A15 and A16 are equivalent to Model A1, except they are run with initial pressures of 4 and 7 kbar, respectively, showing the pressure has little effect on model results. Models A17–A19 are the same as Model A1 except cooling begins at 1800 Ma and occurs at slower rates (1.5 and 1°C/Myr in Models A17 and A18, respectively) or begins at a higher temperature (650°C in Model A19), showing that cooling from 1800 Ma at slow rates can produce ages that are somewhat similar to those in our study. Model C10 is equivalent to Model C1 except it is run with a lower initial pressure of 3 kbar, again showing that pressure has little effect on model results. Refer to Table 3 in the manuscript for complete model parameters.

Appendix 2: $^{40}Ar/^{39}Ar$ step-heating data and ages for biotite, muscovite and phlogopite from 29 samples from Hall Peninsula, Baffin Island.

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Bt: B72A (3063-01)										
A	64a	0.20	21.459	0.479	125056	527	2346.68	8.37	41.6426	12.6264
B	64a	0.30	21.459	0.479	1292594	2307	17975.31	22.70	182.3062	13.5893
C	64a	0.40	21.459	0.479	2421167	4218	33447.47	30.25	373.3739	20.1039
D	64a	0.50	21.459	0.479	1576772	2780	21784.62	25.21	238.7906	12.0010
E	64a	0.60	21.459	0.479	1076952	1922	14768.84	20.19	186.0575	16.1107
F	64a	0.70	21.459	0.479	1087211	1935	14889.65	21.45	175.3573	9.4026
G	64a	0.70	21.459	0.479	437365	906	6008.21	12.28	90.2971	9.8117
H	64a	0.80	21.459	0.479	1034914	1849	14090.35	18.93	162.5926	10.7614
I*	64a	0.90	21.459	0.479	1758119	3057	24066.46	25.22	292.2916	8.9004
J*	64a	1.00	21.459	0.479	1514072	2641	20855.28	23.96	230.1675	14.5602
K*	64a	1.10	21.459	0.479	2432513	4191	33572.41	32.77	316.3985	35.5338
L*	64a	1.20	21.459	0.479	741227	1377	10230.94	15.16	132.0530	9.1185
M	64a	1.30	21.459	0.479	681010	1275	9362.69	13.90	133.5636	8.1173
N	64a	1.50	21.459	0.479	618619	1191	8542.23	13.90	119.5023	11.8425
O	64a	1.70	21.459	0.479	671428	1259	9241.00	17.67	98.7313	14.6557
P	64a	2.00	21.459	0.479	755981	1391	10392.40	16.41	142.5896	7.9156
Q	64a	5.00	21.459	0.479	673313	1277	10029.88	18.93	164.9089	17.6847
Bt: B72A (3063-02)										
A	64a	0.20	21.459	0.479	34792	554	1175.23	5.28	23.4901	9.7429
B	64a	0.30	21.459	0.479	53755	503	841.82	5.03	-3.9654	9.4016
C	64a	0.40	21.459	0.479	3469482	8842	48073.85	35.29	559.7713	12.8610
D*	64a	0.50	21.459	0.479	432522	1224	6014.58	13.90	52.0407	11.8028
E*	64a	0.60	21.459	0.479	1027670	2659	14173.17	17.67	164.3298	14.5296
F*	64a	0.70	21.459	0.479	1268721	3262	17435.11	22.71	213.4248	11.3021
G*	64a	0.75	21.459	0.479	860573	2248	11816.83	15.16	158.9923	12.5763
H*	64a	0.80	21.459	0.479	640749	1710	8769.47	15.16	91.1657	12.4681
I*	64a	0.90	21.459	0.479	905380	2365	12415.09	17.68	150.0923	11.9323
J*	64a	1.00	21.459	0.479	860190	2242	11779.63	18.93	85.7526	14.8630
K*	64a	1.10	21.459	0.479	761221	1999	10429.67	16.42	116.1915	12.3239
L*	64a	1.20	21.459	0.479	683703	1815	9365.17	15.16	105.8061	10.7675
M*	64a	1.30	21.459	0.479	768164	2012	10550.23	16.42	136.5345	10.7675
N*	64a	1.50	21.459	0.479	1786257	4546	24552.90	26.48	276.6189	14.8996
O*	64a	1.70	21.459	0.479	1698362	4325	23358.77	23.96	274.6803	12.9349
P*	64a	2.00	21.459	0.479	1987634	5053	27345.92	27.74	327.9295	12.7074
Q	64a	5.00	21.459	0.479	2910912	7374	38118.16	31.51	516.8069	19.6674
R	64a	7.00	21.459	0.479	1409071	3304	18920.47	22.70	237.6073	14.3077
Bt: B75A (3079-01)										
A	64c	0.20	22.161	0.050	174541	538	3457.17	10.01	63.5088	10.0344
B*	64c	0.40	22.161	0.050	18287200	22784	260397.60	183.80	3024.3480	61.4095
C*	64c	0.50	22.161	0.050	6777906	8394	96285.85	47.88	1094.7940	23.1621
D*	64c	0.60	22.161	0.050	4603272	5787	65301.44	89.45	916.6669	58.1055
E*	64c	0.70	22.161	0.050	8653338	10587	123013.80	59.23	1443.3930	29.0319
F*	64c	0.70	22.161	0.050	3855433	4769	54875.20	54.19	751.7832	26.7596
G*	64c	0.80	22.161	0.050	4349014	5324	61880.28	37.82	774.0648	25.6406
H*	64c	0.90	22.161	0.050	6253149	7606	88900.48	65.52	1075.1810	26.7596
I	64c	1.00	22.161	0.050	3115394	3795	44128.14	32.79	503.8785	18.3194
J	64c	1.10	22.161	0.050	961092	1306	13624.55	18.96	156.8145	15.9121
K	64c	1.20	22.161	0.050	974691	1314	13788.82	22.72	205.1542	23.2043
L	64c	1.30	22.161	0.050	573842	922	8131.77	20.21	137.4283	24.4351
M	64c	1.40	22.161	0.050	161014	565	2553.76	8.26	-13.1550	10.9350
N	64c	1.50	22.161	0.050	211670	614	3297.23	9.26	-29.3815	13.1840
O	64c	1.70	22.161	0.050	435469	756	6425.72	12.65	34.3162	10.3268
P	64c	2.00	22.161	0.050	269769	625	4090.81	10.51	4.8969	9.9326
Q	64c	2.50	22.161	0.050	209573	568	2971.63	8.89	-5.6019	14.4537
R	64c	5.00	22.161	0.050	527788	802	7464.05	16.41	52.2673	14.8138
Bt: F28A (3083-01)										
A	64c	0.20	22.227	0.050	224756	527	3664.08	9.64	63.7858	8.3671
B	64c	0.30	22.227	0.050	2613932	2982	37322.94	35.29	450.3020	15.5053
C	64c	0.40	22.227	0.050	3776093	4264	53340.75	40.33	666.0557	24.5352
D	64c	0.50	22.227	0.050	2300597	2642	32485.34	30.25	399.8097	25.6406
E*	64c	0.60	22.227	0.050	4238779	4781	60254.90	39.07	725.1208	17.0307
F*	64c	0.70	22.227	0.050	436594	763	6216.76	12.66	52.6701	10.9091
G*	64c	0.70	22.227	0.050	218069	544	3114.20	9.29	32.6041	10.9091
H*	64c	0.80	22.227	0.050	257434	590	3678.00	8.91	26.7127	9.3848
I*	64c	0.90	22.227	0.050	319154	610	4540.20	10.91	45.9857	9.6569
J*	64c	1.00	22.227	0.050	443400	751	6320.86	13.91	65.4474	11.1332
K*	64c	1.10	22.227	0.050	404454	702	5750.58	12.65	87.9682	12.4401
L*	64c	1.20	22.227	0.050	648993	893	9325.57	15.16	117.4378	15.0519
M*	64c	1.30	22.227	0.050	364236	663	5144.30	12.03	70.3318	8.9064
N	64c	1.40	22.227	0.050	262549	581	3746.90	10.00	55.3893	7.8936
O	64c	1.50	22.227	0.050	233598	540	3337.31	9.88	50.1399	7.2007
P	64c	1.70	22.227	0.050	426039	695	6005.90	12.39	79.1437	5.7535
Q	64c	2.00	22.227	0.050	590837	864	8288.88	13.89	94.7030	10.2671
R	64c	2.50	22.227	0.050	93345	523	1381.82	6.75	-26.9645	21.1644
S	64c	5.00	22.227	0.050	774825	1031	11002.30	17.66	133.8532	13.0618
Bt: F38A (3274-01)										
A	68b	0.10	21.235	0.060	5827	583	244.74	3.45	5.1864	5.9828
B	68b	0.20	21.235	0.060	49100	585	2286.36	8.43	27.4177	5.2204

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Bt: B72A (3063-01)																
A	-35.3948	20.9729	14.9280	2.9942	5946	350	44.5	1.0	98.3	6.9	409.98	2.00	127.3	1.9	0.00827	0.90
B	-6.3978	21.6110	12.3796	3.2283	5946	350	44.5	1.0	98.3	6.9	409.98	2.00	127.3	1.9	0.06337	6.87
C	11.3473	20.3675	10.3382	3.1365	5946	350	44.5	1.0	98.3	6.9	409.98	2.00	127.3	1.9	0.11792	12.79
D	-39.1674	21.6144	8.0115	3.0461	5946	350	44.5	1.0	98.3	6.9	409.98	2.00	127.3	1.9	0.07680	8.33
E	35.9370	19.6413	3.3193	3.1358	4389	320	45.2	1.2	82.6	5.6	404.62	1.70	126.7	1.8	0.05207	5.65
F	0.0000	18.9801	-1.0653	3.0342	4389	320	45.2	1.2	82.6	5.6	404.62	1.70	126.7	1.8	0.05250	5.69
G	-26.3000	20.3161	0.7185	3.0396	4389	320	45.2	1.2	82.6	5.6	404.62	1.70	126.7	1.8	0.02118	2.30
H	11.1025	21.0110	-0.0743	3.2135	4389	320	45.2	1.2	82.6	5.6	404.62	1.70	126.7	1.8	0.04968	5.39
I*	-4.8697	19.4462	15.0203	3.1190	3703	340	45.5	1.1	94.7	4.5	409.87	1.80	120.2	1.9	0.08485	9.20
J*	-41.1002	20.0919	10.2006	3.0203	3703	340	45.5	1.1	94.7	4.5	409.87	1.80	120.2	1.9	0.07353	7.97
K*	-31.3644	21.4325	7.4747	3.0942	3703	340	45.5	1.1	94.7	4.5	409.87	1.80	120.2	1.9	0.11836	12.83
L*	-4.5302	19.4552	1.9216	3.2517	3703	340	45.5	1.1	94.7	4.5	409.87	1.80	120.2	1.9	0.03607	3.91
M	35.0570	22.3018	-6.9814	2.8781	3956	370	41.3	1.1	92.1	4.8	398.96	2.00	129.3	1.7	0.03301	3.58
N	87.9991	21.0273	-10.1695	2.8676	3956	370	41.3	1.1	92.1	4.8	398.96	2.00	129.3	1.7	0.03012	3.27
O	31.5620	21.6598	-9.7490	2.8688	3956	370	41.3	1.1	92.1	4.8	398.96	2.00	129.3	1.7	0.03258	3.53
P	26.6056	21.0287	-3.1881	3.1576	3956	370	41.3	1.1	92.1	4.8	398.96	2.00	129.3	1.7	0.03664	3.97
Q	-17.8001	19.0220	18.4504	3.0771	4446	350	43.6	1.1	70.2	11.0	407.29	1.70	122.1	1.8	0.03536	3.83
Bt: B72A (3063-02)																
A	40.9732	22.6420	3.7126	2.8277	3069	360	42.0	1.1	93.5	7.1	394.90	1.80	118.7	1.6	0.00414	0.40
B	-67.0515	22.8415	10.3857	3.1866	3172	340	40.1	1.1	102.6	4.4	401.44	1.70	116.3	1.6	0.00297	0.29
C	-75.3035	22.1640	12.1004	3.0168	3172	340	40.1	1.1	102.6	4.4	401.44	1.70	116.3	1.6	0.16949	16.29
D*	-102.9329	22.1442	-1.1718	3.0461	3172	340	40.1	1.1	102.6	4.4	401.44	1.70	116.3	1.6	0.02121	2.04
E*	-68.3663	22.8484	5.9949	2.8201	3172	340	40.1	1.1	102.6	4.4	401.44	1.70	116.3	1.6	0.04997	4.80
F*	-46.0201	21.9827	2.1834	2.8539	2734	390	42.9	1.2	89.7	6.4	400.08	1.80	115.2	1.7	0.06147	5.91
G*	-53.0079	22.6244	3.8240	2.9420	2734	390	42.9	1.2	89.7	6.4	400.08	1.80	115.2	1.7	0.04166	4.00
H*	-98.9714	22.5916	0.2961	3.1877	2734	390	42.9	1.2	89.7	6.4	400.08	1.80	115.2	1.7	0.03092	2.97
I*	-43.5141	20.7644	4.0092	2.9419	2734	390	42.9	1.2	89.7	6.4	400.08	1.80	115.2	1.7	0.04377	4.21
J*	-6.3486	21.3576	3.7749	2.8703	4090	370	43.2	1.2	92.2	5.4	393.60	1.80	112.8	1.6	0.04153	3.99
K*	30.4804	22.6623	6.2916	2.9670	4090	370	43.2	1.2	92.2	5.4	393.60	1.80	112.8	1.6	0.03677	3.53
L*	41.0130	22.6750	8.6727	2.8087	4090	370	43.2	1.2	92.2	5.4	393.60	1.80	112.8	1.6	0.03302	3.17
M*	46.3773	22.0390	0.8883	2.9439	4090	370	43.2	1.2	92.2	5.4	393.60	1.80	112.8	1.6	0.03720	3.57
N*	-53.1181	23.9813	5.5148	2.9631	4232	380	42.7	1.1	83.2	5.5	396.73	1.80	114.9	1.4	0.08656	8.32
O*	-15.5304	24.0144	1.7149	2.9468	4232	380	42.7	1.1	83.2	5.5	396.73	1.80	114.9	1.4	0.08235	7.91
P*	-44.6945	23.9984	29.9928	3.1661	4232	380	42.7	1.1	83.2	5.5	396.73	1.80	114.9	1.4	0.09641	9.27
Q	-36.0729	24.7054	250.3343	5.0643	4232	380	42.7	1.1	83.2	5.5	396.73	1.80	114.9	1.4	0.13439	12.92
R	-12.3456	23.7864	74.5582	3.9891	2656	350	42.4	1.1	92.4	6.8	386.23	1.90	120.9	1.7	0.06671	6.41
Bt: B75A (3079-01)																
A	-52.2119	20.4034	77.2830	3.5034	3535	360	44.9	1.1	93.0	4.8	411.99	1.80	126.7	1.6	0.01219	0.40
B*	-186.8109	68.0474	47.3856	13.9953	3535	360	44.9	1.1	93.0	4.8	412.00	1.80	126.7	1.6	0.91807	30.26
C*	9.9605	19.1406	16.0593	3.1200	3535	360	44.9	1.1	93.0	4.8	411.99	1.80	126.7	1.6	0.33947	11.19
D*	-19.0035	23.1181	19.4755	5.2803	3535	360	44.9	1.1	93.0	4.8	411.99	1.80	126.7	1.6	0.23023	7.59
E*	11.8080	20.6610	5.5664	3.1522	8238	370	79.9	1.5	64.7	12.0	405.85	2.00	132.7	1.7	0.43370	14.29
F*	19.5157	26.6669	2.3102	3.5966	8238	370	79.9	1.5	64.7	12.0	405.85	2.00	132.7	1.7	0.19347	6.38
G*	68.4409	20.6724	5.0505	3.3233	8238	370	79.9	1.5	64.7	12.0	405.85	2.00	132.7	1.7	0.21817	7.19
H*	60.4931	20.6733	9.1181	3.2471	8238	370	79.9	1.5	64.7	12.0	405.85	2.00	132.7	1.7	0.31343	10.33
I	44.1692	20.6778	-10.4333	3.0802	6956	380	73.8	1.5	96.6	5.0	408.36	2.00	138.9	1.8	0.15558	5.13
J	3.5207	23.2350	-6.9802	3.5359	6956	380	73.8	1.5	96.6	5.0	408.36	2.00	138.9	1.8	0.04804	1.58
K	-11.2345	20.6744	-8.6148	3.2551	6956	380	73.8	1.5	96.6	5.0	408.36	2.00	138.9	1.8	0.04861	1.60
L	33.6255	22.5839	1.8189	3.5628	6956	380	73.8	1.5	96.6	5.0	408.36	2.00	138.9	1.8	0.02867	0.94
M	-47.8117	21.0962	-59.3609	3.0766	26615	400	46.2	1.1	136.0	6.3	414.85	1.80	184.2	1.9	0.00900	0.30
N	-61.9977	19.1559	-65.4456	3.3014	26615	400	46.2	1.1	136.0	6.3	414.85	1.80	184.2	1.9	0.01162	0.38
O	-40.6952	20.4407	-61.1820	3.0661	26615	400	46.2	1.1	136.0	6.3	414.85	1.80	184.2	1.9	0.02265	0.75
P	-59.5847	17.9453	-58.3809	3.2378	26615	400	46.2	1.1	136.0	6.3	414.85	1.80	184.2	1.9	0.01442	0.48
Q	-24.1776	20.0350	16.3719	3.0056	3980	340	44.1	1.1	123.1	12.0	412.97	1.70	128.5	1.6	0.01048	0.35
R	-10.9154	20.0390	20.1825	3.1943	3980	340	44.1	1.1	123.1	12.0	412.97	1.70	128.5	1.6	0.02632	0.87
Bt: F28A (3083-01)																
A	-12.9043	20.5218	26.4275	3.1231	4034	320	42.3	1.1	91.0	3.6	407.81	1.80	127.9	1.8	0.01292	1.38
B	-10.8837	20.7909	30.8311	3.1920	4902	340	43.7	1.1	74.2	12.0	406.66	1.70	125.3	1.6	0.13159	14.09
C	13.9233	20.1184	0.2214	2.9053	4902	340	43.7	1.1	74.2	12.0	406.66	1.70	125.3	1.6	0.18806	20.13
D	26.9228	21.4925	12.8765	2.9493	4902	340	43.7	1.1	74.2	12.0	406.66	1.70	125.3	1.6	0.11453	12.26
E*	28.0245	20.1267	9.4946	2.9372	4902	340	43.7	1.1	74.2	12.0	406.66	1.70	125.3	1.6	0.21244	22.74
F*	-29.1315	20.9721	-12.2376	3.5651	6388	330	49.1	1.3	109.5	6.6	406.00	1.90	130.3	2.0	0.02192	2.35
G*	2.1113	23.6634	2.0909	3.0893	6388	330	49.1	1.3	109.5	6.6	406.00	1.90	130.3	2.0	0.01098	1.18
H*	-0.5913	20.3438	0.4059	3.2464	6388	330	49.1	1.3	109.5	6.6	406.00	1.90	130.3	2.0	0.01297	1.39
I*	21.5428	20.9889	0.7134	3.2476	6388	330	49.1	1.3	109.5	6.6	406.00	1.90	130.3	2.0	0.01601	1.71
J*	-17.6626	19.4806	-0.9717	2.8972	5224	380	43.2	1.2	99.3	5.9	408.33	1.70	131.0	1.7	0.02229	2.39
K*	-37.6977	20.8286	2.4232	3.1709	5224	380	43.2	1.2	99.3	5.9	408.33	1.70	131.0	1.7	0.02027	2.17
L*	-19.5282	18.8347	-8.0816	2.9590	5224	380	43.2	1.2	99.3	5.9	408.33	1.70	131.0	1.7	0.03288	3.52
M*	18.6014	18.8431	4.7851	3.1795	5224	380	43.2	1.2	99.3	5.9	408.33	1.70	131.0	1.7	0.01814	1.94
N	-11.4184	19.7646	6.8396	3.1016	5927	330	43.6	1.0	98.7	3.0	406.74	1.60	124.4	1.9	0.01321	1.41
O	26.9857	21.8861	2.7679	3.0069	5927	330	43.6	1.0	98.7	3.0	406.74	1.60	124.4	1.9	0.01177	1.26
P	-8.1224	20.4664	1.2179	3.0844	5927	330	43.6	1.0	98.7	3.0	406.74	1.60	124.4	1.9	0.02117	2.27
Q	23.8636	19.0988	10.1246	3.2847	5927	330	43.6	1.0	98.7	3.0	406.74	1.60	124.4	1.9	0.02922	3.13
R	-0.6772	19.7868	0.4921	3.0560	5843	340	40.4	1.0	98.8	6.5	408.43	1.60	128.3	1.5	0.00487	0.52
S	-7.9585	19.7899	1.5378	2.9674	5843	340	40.4	1.0	98.8	6.5	408.43	1.60	128.3	1.5	0.03879	4.15
Bt: F38A (3274-01)																
A	24.2283	17.9895	7.2119	2.0219	14168	420	51.0	1.4	45.7	2.8	157.25	1.10	63.1	1.3	0.00086	0.02
B	90.6122	17.3193	22.1232	2.1222	14168	420	51.0	1.4	45.7	2.8	157.25	1.10	63.1	1.3	0.00806	0.21

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Bt: B72A (3063-01)															
A	636.1	127.6	-0.0662	-0.0151	0.0089	-0.0296	0.0175	0.0347	2.E-06	0.0177	0.0054	53.29	0.29	51.39	0.48
B	68.9	18.0	-0.0144	-0.0004	0.0012	-0.0007	0.0024	-0.0041	2.E-07	0.0101	0.0008	71.91	0.16	71.70	0.17
C	30.9	9.4	0.0306	0.0003	0.0006	0.0007	0.0012	0.0024	1.E-07	0.0112	0.0006	72.39	0.14	72.29	0.14
D	36.8	14.0	-0.1364	-0.0018	0.0010	-0.0035	0.0019	0.0011	2.E-07	0.0110	0.0006	72.38	0.15	72.27	0.16
E	22.5	21.2	0.3021	0.0024	0.0013	0.0048	0.0026	0.0110	3.E-07	0.0126	0.0011	72.92	0.16	72.85	0.18
F	-7.2	20.4	0.0000	0.0000	0.0013	0.0000	0.0025	0.0065	3.E-07	0.0118	0.0006	73.02	0.17	73.04	0.18
G	12.0	50.6	-1.0212	-0.0044	0.0034	-0.0086	0.0066	0.0255	7.E-07	0.0150	0.0016	72.79	0.21	72.76	0.26
H	-0.5	22.8	-4.1668	0.0008	0.0015	0.0015	0.0029	0.0050	3.E-07	0.0115	0.0008	73.45	0.16	73.45	0.18
I*	62.4	13.0	-0.0090	-0.0002	0.0008	-0.0004	0.0016	0.0079	2.E-07	0.0121	0.0004	73.05	0.15	72.86	0.15
J*	48.9	14.5	-0.1124	-0.0020	0.0010	-0.0039	0.0019	0.0014	2.E-07	0.0110	0.0007	72.60	0.15	72.45	0.16
K*	22.3	9.2	-0.1171	-0.0009	0.0006	-0.0018	0.0013	-0.0078	1.E-07	0.0094	0.0011	72.46	0.14	72.39	0.15
L*	18.8	31.8	-0.0658	-0.0004	0.0019	-0.0009	0.0037	0.0129	4.E-07	0.0129	0.0009	72.45	0.17	72.39	0.20
M	-74.6	30.7	-0.1401	0.0037	0.0024	0.0073	0.0047	0.0220	5.E-07	0.0143	0.0009	72.74	0.17	72.96	0.20
N	-119.1	33.6	-0.2414	0.0103	0.0025	0.0202	0.0048	0.0208	5.E-07	0.0140	0.0014	72.42	0.18	72.77	0.21
O	-105.5	31.1	-0.0903	0.0034	0.0023	0.0067	0.0046	0.0011	5.E-07	0.0107	0.0016	72.66	0.19	72.97	0.22
P	-30.7	30.4	-0.2328	0.0026	0.0020	0.0050	0.0040	0.0183	4.E-07	0.0137	0.0008	72.74	0.18	72.83	0.20
Q	184.0	30.7	-0.0269	-0.0018	0.0019	-0.0035	0.0037	0.0320	4.E-07	0.0164	0.0018	67.13	0.18	66.58	0.20
Bt: B72A (3063-02)															
A	315.9	240.6	0.3079	0.0349	0.0193	0.0683	0.0378	0.0516	4.E-06	0.0200	0.0083	29.60	0.49	28.66	0.87
B	1233.7	378.6	-0.1801	-0.0797	0.0271	-0.1561	0.0532	-0.1052	5.E-06	-0.0047	0.0112	63.86	0.71	60.16	1.33
C	25.2	6.3	-0.1736	-0.0016	0.0005	-0.0031	0.0009	0.0053	9.E-08	0.0116	0.0003	72.17	0.19	72.09	0.19
D*	-19.5	50.7	2.4507	-0.0171	0.0037	-0.0335	0.0072	-0.0119	7.E-07	0.0087	0.0020	71.91	0.26	71.96	0.30
E*	42.3	19.9	-0.3182	-0.0048	0.0016	-0.0095	0.0032	0.0048	3.E-07	0.0116	0.0010	72.51	0.21	72.38	0.22
F*	12.5	16.4	-0.5881	-0.0026	0.0013	-0.0052	0.0025	0.0090	3.E-07	0.0122	0.0006	72.77	0.21	72.73	0.22
G*	32.4	24.9	-0.3867	-0.0045	0.0019	-0.0088	0.0038	0.0160	4.E-07	0.0135	0.0011	72.83	0.21	72.73	0.22
H*	3.4	36.4	-9.3268	-0.0113	0.0026	-0.0221	0.0050	-0.0018	5.E-07	0.0104	0.0014	73.07	0.23	73.05	0.26
I*	32.3	23.7	-0.3028	-0.0035	0.0017	-0.0069	0.0033	0.0079	3.E-07	0.0121	0.0010	72.93	0.22	72.83	0.23
J*	32.1	24.4	-0.0469	-0.0005	0.0018	-0.0011	0.0036	-0.0206	4.E-07	0.0073	0.0013	73.02	0.22	72.92	0.24
K*	60.3	28.5	0.1352	0.0029	0.0022	0.0057	0.0043	0.0019	4.E-07	0.0111	0.0012	72.99	0.22	72.80	0.24
L*	92.6	30.0	0.1319	0.0044	0.0024	0.0086	0.0047	0.0025	5.E-07	0.0113	0.0011	73.00	0.23	72.73	0.24
M*	8.4	27.9	1.4567	0.0044	0.0021	0.0086	0.0041	0.0132	4.E-07	0.0129	0.0010	72.81	0.22	72.78	0.24
N*	22.5	12.1	-0.2687	-0.0022	0.0010	-0.0042	0.0019	0.0031	2.E-07	0.0113	0.0006	72.75	0.20	72.68	0.20
O*	7.3	12.6	-0.2527	-0.0007	0.0010	-0.0013	0.0020	0.0062	2.E-07	0.0118	0.0006	72.71	0.20	72.68	0.20
P*	109.7	11.6	-0.0416	-0.0016	0.0009	-0.0032	0.0017	0.0064	2.E-07	0.0120	0.0005	72.68	0.20	72.35	0.20
Q	656.7	13.3	-0.0040	-0.0009	0.0006	-0.0019	0.0013	0.0096	1.E-07	0.0136	0.0005	76.37	0.20	74.40	0.21
R	394.1	21.1	-0.0046	-0.0007	0.0013	-0.0013	0.0025	0.0066	3.E-07	0.0126	0.0008	74.47	0.20	73.29	0.21
Bt: B75A (3079-01)															
A	2235.4	101.5	-0.0188	-0.0151	0.0059	-0.0296	0.0116	0.0205	1.E-06	0.0184	0.0029	50.49	0.21	43.81	0.36
B*	18.2	5.4	-0.1100	-0.0007	0.0003	-0.0014	0.0005	0.0052	5.E-08	0.0116	0.0002	70.23	0.10	70.17	0.10
C*	16.7	3.2	0.0173	0.0001	0.0002	0.0002	0.0004	0.0038	4.E-08	0.0114	0.0002	70.39	0.09	70.34	0.09
D*	29.8	8.1	-0.0272	-0.0003	0.0004	-0.0006	0.0007	0.0195	7.E-08	0.0140	0.0009	70.49	0.13	70.40	0.13
E*	4.5	2.6	0.0592	0.0001	0.0002	0.0002	0.0003	0.0061	3.E-08	0.0117	0.0002	70.34	0.09	70.33	0.09
F*	4.2	6.6	0.2357	0.0004	0.0005	0.0007	0.0010	0.0177	1.E-07	0.0137	0.0005	70.26	0.11	70.24	0.11
G*	8.2	5.4	0.3781	0.0011	0.0003	0.0022	0.0007	0.0106	7.E-08	0.0125	0.0004	70.28	0.10	70.25	0.10
H*	10.3	3.7	0.1851	0.0007	0.0002	0.0013	0.0005	0.0082	5.E-08	0.0121	0.0003	70.34	0.10	70.31	0.10
I	-23.6	7.0	-0.1181	0.0010	0.0005	0.0020	0.0009	0.0045	9.E-08	0.0114	0.0004	70.60	0.10	70.67	0.10
J	-51.2	26.0	-0.0141	0.0003	0.0017	0.0005	0.0033	0.0054	3.E-07	0.0115	0.0012	70.54	0.14	70.69	0.16
K	-62.5	23.6	0.0364	-0.0008	0.0015	-0.0016	0.0029	0.0255	3.E-07	0.0149	0.0017	70.69	0.15	70.87	0.17
L	22.4	43.8	0.5158	0.0041	0.0028	0.0081	0.0054	0.0365	6.E-07	0.0169	0.0030	70.57	0.21	70.50	0.25
M	-2324.5	120.7	0.0225	-0.0187	0.0083	-0.0367	0.0162	-0.0680	2.E-06	-0.0052	0.0043	63.05	0.30	69.98	0.48
N	-1984.9	100.3	0.0264	-0.0188	0.0058	-0.0369	0.0114	-0.0941	1.E-06	-0.0089	0.0040	64.20	0.26	70.12	0.40
O	-952.1	47.8	0.0186	-0.0063	0.0032	-0.0124	0.0062	-0.0211	6.E-07	0.0053	0.0016	67.77	0.18	70.61	0.23
P	-1427.1	79.2	0.0285	-0.0146	0.0044	-0.0285	0.0086	-0.0404	9.E-07	0.0012	0.0024	65.95	0.23	70.20	0.33
Q	550.9	101.2	-0.0412	-0.0081	0.0067	-0.0159	0.0132	-0.0808	1.E-06	-0.0019	0.0049	70.52	0.28	68.87	0.41
R	270.4	42.8	-0.0151	-0.0015	0.0027	-0.0029	0.0053	-0.0249	5.E-07	0.0070	0.0020	70.71	0.19	69.90	0.23
Bt: F28A (3083-01)															
A	721.3	85.3	-0.0136	-0.0035	0.0056	-0.0069	0.0110	0.0317	1.E-06	0.0174	0.0023	61.34	0.22	59.18	0.33
B	82.6	8.6	-0.0098	-0.0003	0.0006	-0.0006	0.0011	0.0072	1.E-07	0.0121	0.0004	70.04	0.10	69.79	0.11
C	0.4	5.5	1.7548	0.0003	0.0004	0.0005	0.0007	0.0106	8.E-08	0.0125	0.0005	70.79	0.10	70.79	0.10
D	39.6	9.1	0.0583	0.0008	0.0007	0.0016	0.0013	0.0091	1.E-07	0.0123	0.0008	70.82	0.10	70.70	0.11
E*	15.8	4.9	0.0824	0.0005	0.0003	0.0009	0.0007	0.0077	7.E-08	0.0120	0.0003	70.35	0.09	70.30	0.09
F*	-196.9	57.4	0.0664	-0.0047	0.0034	-0.0092	0.0066	-0.0110	7.E-07	0.0085	0.0018	70.23	0.19	70.81	0.26
G*	67.1	99.2	0.0282	0.0007	0.0076	0.0013	0.0149	-0.0021	2.E-06	0.0105	0.0035	70.02	0.27	69.82	0.40
H*	11.0	88.3	-0.0406	-0.0002	0.0055	-0.0003	0.0108	-0.0205	1.E-06	0.0073	0.0026	69.99	0.23	69.96	0.35
I*	15.7	71.5	0.8425	0.0047	0.0046	0.0093	0.0091	-0.0036	9.E-07	0.0101	0.0021	70.30	0.22	70.25	0.30
J*	-15.4	45.8	0.5071	-0.0028	0.0031	-0.0055	0.0060	-0.0019	6.E-07	0.0104	0.0018	70.15	0.19	70.19	0.24
K*	42.1	55.1	-0.4340	-0.0066	0.0036	-0.0128	0.0071	0.0268	7.E-07	0.0153	0.0022	70.33	0.20	70.20	0.26
L*	-86.7	31.7	0.0674	-0.0021	0.0020	-0.0041	0.0040	0.0122	4.E-07	0.0126	0.0016	69.59	0.15	69.85	0.18
M*	93.0	61.8	0.1085	0.0036	0.0037	0.0071	0.0072	0.0166	7.E-07	0.0137	0.0017	70.80	0.21	70.52	0.28
N	182.5	82.8	-0.0466	-0.0030	0.0053	-0.0060	0.0103	0.0222	1.E-06	0.0148	0.0021	70.07	0.24	69.52	0.35
O	82.9	90.1	0.2720	0.0081	0.0066	0.0158	0.0129	0.0247	1.E-06	0.0150	0.0022	70.00	0.26	69.75	0.38
P	20.3	51.4	-0.1861	-0.0014	0.0034	-0.0027	0.0067	0.0145	7.E-07	0.0132	0.0010	70.94	0.19	70.87	0.24
Q	122.2	39.6	0.0658	0.0029	0.0023	0.0056	0.0045	0.0029	5.E-07	0.0114	0.0012	71.28	0.16	70.91	0.20
R	35.6	221.2	-0.0384	-0.0005	0.0143	-0.0010	0.0281	-0.1796	3.E-06	-0.0195	0.0153	67.55	0.50	67.44	0.83
S	14.0	27.0	-0.1444	-0.0007	0.0018	-0.0014	0.0035	0.0085	4.E-07	0.0122	0.0012	70.42	0.15	70.38	0.17
Bt: F38A (3274-01)															
A	2946.7	827.2	0.0937	0.0990	0.0735	0.1940	0.1441	0.0293	1.E-05	0.0212	0.0244	23.81	2.41	15.02	3.44
B	967.6	92.9	0.1143	0.0396	0.0076	0.0777	0.0148	-0.0031	2.E-06	0.0120	0.0023	21.48	0.27	18.59	0.38

Sample No.[a]	Derived Results				Inverse Isochron Data				
	%^{40}Ar*	Age (Ma)		w/±J	^{36}Ar/^{40}Ar		^{39}Ar/^{40}Ar		^{36}Ar/^{39}Ar
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Bt: B72A (3063-01)									
A	96.43	1341	9	23	0.00012	20.05409	0.01877	0.55231	0.01604
B	99.71	1681	3	25	0.00001	26.06966	0.01391	0.21861	0.00559
C	99.87	1690	2	25	0.00000	30.35928	0.01382	0.19631	0.00509
D	99.85	1689	2	25	0.00001	37.97627	0.01382	0.21091	0.00388
E	99.91	1698	3	25	0.00000	94.94240	0.01371	0.22482	0.00149
F	100.03	1701	3	25	0.00000	-283.84040	0.01370	0.22898	0.00049
G	99.95	1697	4	25	0.00000	422.23540	0.01374	0.29096	0.00035
H	100.00	1707	3	25	0.00000	-4008.88500	0.01362	0.22355	0.00004
I*	99.75	1698	2	25	0.00001	20.77507	0.01369	0.20302	0.00717
J*	99.80	1692	2	25	0.00001	29.58073	0.01377	0.20889	0.00493
K*	99.91	1691	2	25	0.00000	41.29297	0.01380	0.19802	0.00363
L*	99.92	1691	3	25	0.00000	169.56430	0.01380	0.23757	0.00086
M	100.31	1700	3	25	-0.00001	-41.12277	0.01375	0.23896	0.00357
N	100.49	1697	3	25	-0.00002	-28.11252	0.01381	0.25208	0.00523
O	100.43	1700	3	25	-0.00001	-29.40102	0.01376	0.26783	0.00447
P	100.13	1698	3	25	0.00000	-98.59129	0.01375	0.24246	0.00142
Q	99.18	1601	3	24	0.00003	16.68613	0.01490	0.26756	0.00806
Bt: B72A (3063-02)									
A	96.83	865	21	26	0.00011	76.46963	0.03378	1.65573	0.02006
B	94.22	1496	22	32	0.00019	30.63286	0.01566	1.11131	0.02577
C	99.90	1687	3	25	0.00000	24.91126	0.01386	0.26522	0.00983
D*	100.08	1685	5	25	0.00000	-267.16070	0.01391	0.36538	0.00082
E*	99.83	1691	3	25	0.00001	46.91741	0.01379	0.28726	0.00497
F*	99.95	1696	3	25	0.00000	130.32540	0.01374	0.28820	0.00176
G*	99.87	1696	3	25	0.00000	76.79257	0.01373	0.29103	0.00305
H*	99.98	1701	4	25	0.00000	982.92960	0.01369	0.31804	0.00023
I*	99.87	1698	3	25	0.00000	73.23291	0.01371	0.29749	0.00313
J*	99.87	1699	4	25	0.00000	75.81024	0.01369	0.30620	0.00293
K*	99.75	1697	4	25	0.00001	47.23044	0.01370	0.30621	0.00477
L*	99.62	1696	4	25	0.00001	32.43426	0.01370	0.31095	0.00699
M*	99.97	1697	4	25	0.00000	338.49540	0.01373	0.30464	0.00067
N*	99.91	1696	3	25	0.00000	53.61834	0.01375	0.27642	0.00437
O*	99.97	1696	3	25	0.00000	171.99050	0.01375	0.27455	0.00137
P*	99.55	1691	3	25	0.00002	10.55781	0.01376	0.27372	0.02237
Q	97.43	1721	3	25	0.00009	2.03895	0.01310	0.26647	0.11812
R	98.42	1705	3	25	0.00005	5.35581	0.01343	0.26339	0.03897
Bt: B75A (3079-01)									
A	86.78	1224	7	8	0.00044	4.54311	0.01981	0.42282	0.04940
B*	99.92	1692	2	3	0.00000	29.53663	0.01424	0.14320	0.00367
C*	99.93	1695	1	3	0.00000	19.44977	0.01421	0.13346	0.00591
D*	99.87	1696	2	3	0.00000	27.17512	0.01419	0.18593	0.00313
E*	99.98	1695	1	3	0.00000	56.96028	0.01422	0.13148	0.00200
F*	99.98	1693	2	3	0.00000	158.64180	0.01423	0.15828	0.00061
G*	99.97	1694	2	3	0.00000	66.38794	0.01423	0.13684	0.00165
H*	99.96	1694	2	3	0.00000	35.78969	0.01422	0.14223	0.00291
I	100.10	1700	2	3	0.00000	-29.46819	0.01417	0.14268	0.00353
J	100.22	1700	2	3	-0.00001	-50.63018	0.01418	0.19446	0.00187
K	100.26	1703	3	4	-0.00001	-37.74127	0.01415	0.21292	0.00226
L	99.91	1697	4	5	0.00000	198.15590	0.01417	0.29601	0.00044
M	111.00	1689	8	8	-0.00037	-5.19675	0.01586	0.47742	0.04968
N	109.23	1691	6	7	-0.00031	-5.05528	0.01558	0.40373	0.04120
O	104.19	1699	4	4	-0.00014	-5.01610	0.01476	0.26246	0.02291
P	106.46	1693	5	6	-0.00022	-5.55327	0.01516	0.34609	0.02795
Q	97.67	1672	7	7	0.00008	18.34335	0.01418	0.40375	0.00994
R	98.86	1688	4	4	0.00004	15.82039	0.01414	0.26735	0.00547
Bt: F28A (3083-01)									
A	96.49	1515	6	6	0.00012	11.82097	0.01630	0.35251	0.01322
B	99.65	1690	2	3	0.00001	10.35673	0.01428	0.14816	0.00848
C	100.00	1705	2	3	0.00000	1484.83500	0.01413	0.13589	0.00006
D	99.83	1704	2	3	0.00001	22.93927	0.01412	0.14786	0.00389
E*	99.93	1698	1	3	0.00000	31.02164	0.01422	0.13011	0.00315
F*	100.84	1706	4	5	-0.00003	-29.16000	0.01424	0.26848	0.00391
G*	99.71	1690	6	7	0.00001	147.78130	0.01428	0.38872	0.00108
H*	99.95	1692	6	6	0.00000	793.84290	0.01429	0.33367	0.00020
I*	99.93	1697	5	5	0.00000	458.71390	0.01423	0.30706	0.00026
J*	100.07	1696	4	4	0.00000	-299.82770	0.01426	0.27776	0.00034
K*	99.82	1696	4	5	0.00001	130.61520	0.01422	0.28025	0.00082
L*	100.37	1691	3	4	-0.00001	-36.62072	0.01437	0.21307	0.00243
M*	99.61	1701	4	5	0.00001	66.56836	0.01412	0.29633	0.00168
N	99.22	1685	5	6	0.00003	45.34993	0.01427	0.34678	0.00312
O	99.65	1689	6	6	0.00001	109.06300	0.01429	0.37559	0.00131
P	99.91	1707	4	5	0.00000	253.49590	0.01410	0.26296	0.00040
Q	99.49	1707	3	4	0.00002	32.46849	0.01403	0.22240	0.00296
R	99.84	1652	13	14	0.00001	608.92680	0.01480	0.74334	0.00069
S	99.94	1699	3	4	0.00000	193.14200	0.01420	0.20857	0.00044
Bt: F38A (3274-01)									
A	63.08	499	100	100	0.00124	29.79535	0.04200	10.10417	0.33254
B	86.56	600	11	11	0.00045	9.67769	0.04657	1.24700	0.11759

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Bt: F38A (3274-01)										
C	68b	0.25	21.235	0.060	72409	517	1723.69	7.12	34.5805	8.6375
D	68b	0.30	21.235	0.060	1632845	1314	23197.56	26.47	323.9390	11.4409
E	68b	0.35	21.235	0.060	5909686	4045	80150.10	44.11	1004.0180	15.5527
F	68b	0.40	21.235	0.060	9666229	6213	130528.70	60.48	1758.1930	68.0783
G	68b	0.45	21.235	0.060	4380753	2778	58552.78	40.33	719.2294	21.4846
H	68b	0.50	21.235	0.060	5237585	3386	70118.32	49.15	887.4113	23.9934
I	68b	0.55	21.235	0.060	2986121	2062	39951.35	31.52	485.7637	9.1375
J	68b	0.60	21.235	0.060	2624946	1959	35048.93	32.78	416.2250	16.4749
K	68b	0.70	21.235	0.060	3063992	2290	40852.29	36.55	522.3458	19.3886
L	68b	0.80	21.235	0.060	6469927	4374	86637.07	46.63	1080.5180	23.0825
M	68b	0.90	21.235	0.060	7777488	4962	104649.90	52.92	1262.0440	21.8480
N*	68b	1.00	21.235	0.060	5152534	3217	69457.28	44.11	875.4523	23.0825
O*	68b	1.10	21.235	0.060	5526170	3470	74452.16	45.37	894.1839	31.7913
P*	68b	1.20	21.235	0.060	5892096	3859	79547.99	50.41	992.1222	26.8161
Q*	68b	1.50	21.235	0.060	7131687	4958	96311.79	54.19	1109.0690	16.9724
R*	68b	1.70	21.235	0.060	2078565	1640	28004.55	27.74	330.7242	13.3686
S	68b	2.00	21.235	0.060	1738952	1422	23333.99	26.47	265.1634	14.9746
T	68b	3.00	21.235	0.060	1171753	1002	15762.13	22.69	181.9663	11.6817
U	68b	5.00	21.235	0.060	1038550	886	13907.22	20.18	158.6902	12.2350
Bt: F122A (3085-01)										
A	64c	0.20	22.254	0.050	37928	508	833.87	5.67	32.1258	10.1039
B*	64c	0.30	22.254	0.050	751140	3578	9901.47	13.91	109.8092	12.7940
C*	64c	0.40	22.254	0.050	7614673	35712	100394.00	55.44	1168.8520	18.1174
D*	64c	0.50	22.254	0.050	2648777	12433	34803.12	32.78	411.8946	18.3750
E*	64c	0.60	22.254	0.050	3552756	16657	46605.37	40.34	531.1074	14.7915
F*	64c	0.70	22.254	0.050	6828063	31970	89863.02	55.45	1094.0640	23.2483
G*	64c	0.75	22.254	0.050	3721855	17436	49029.52	39.08	573.6564	22.0231
H*	64c	0.80	22.254	0.050	1914877	8994	25190.24	25.24	324.6817	17.5358
I*	64c	0.90	22.254	0.050	2906534	13621	38243.43	31.53	456.9865	17.5358
J*	64c	1.00	22.254	0.050	1905848	8949	25076.49	27.76	300.6377	15.2131
K*	64c	1.10	22.254	0.050	518136	2495	6833.50	13.94	61.7087	17.5358
L*	64c	1.20	22.254	0.050	365279	1786	4779.63	11.89	63.6599	9.4285
M*	64c	1.30	22.254	0.050	258286	1323	3379.79	9.26	54.5458	10.6881
N*	64c	1.50	22.254	0.050	308682	1537	3994.09	10.64	54.3318	9.8042
O*	64c	1.70	22.254	0.050	263369	1354	3442.93	9.64	43.8960	10.4876
P*	64c	2.00	22.254	0.050	636618	3038	8334.01	12.65	52.6450	14.8630
Q*	64c	5.00	22.254	0.050	982375	4645	12784.72	17.67	123.0145	13.6978
Bt: F122B (3072-01)										
A	64a	0.20	21.715	0.056	487206	1624	6550.23	12.65	81.6488	13.1118
B*	64a	0.40	21.715	0.056	7768083	24328	103732.90	52.69	1206.1880	32.5122
C*	64a	0.50	21.715	0.056	17194870	53753	229365.10	171.52	2759.8700	61.5763
D*	64a	0.60	21.715	0.056	27212870	84772	363303.00	208.28	4575.7040	110.3964
E*	64a	0.70	21.715	0.056	20009440	62132	267265.70	165.40	3280.1930	52.9691
F*	64a	0.70	21.715	0.056	6217902	19236	83000.41	45.36	945.9099	35.7217
G*	64a	0.80	21.715	0.056	9166984	28273	122428.40	62.99	1442.0210	39.4529
H*	64a	0.90	21.715	0.056	9069017	27903	121150.40	61.73	1533.6650	30.7640
I*	64a	1.00	21.715	0.056	4550321	13950	60576.23	42.85	722.2380	11.4625
J*	64a	1.10	21.715	0.056	2206992	6772	29403.11	29.00	327.3882	10.5489
K*	64a	1.20	21.715	0.056	2545864	7788	33852.83	31.52	412.2723	18.7843
L*	64a	1.30	21.715	0.056	1710559	5242	22727.33	22.71	268.0084	15.2970
M*	64a	1.40	21.715	0.056	1141779	3516	15204.43	21.45	183.0615	18.0437
N*	64a	1.50	21.715	0.056	1461853	4460	19360.05	25.23	242.8567	16.9102
O*	64a	1.70	21.715	0.056	963412	2967	12805.81	17.68	130.4417	19.1927
P*	64a	1.90	21.715	0.056	248952	917	3332.80	10.29	5.6900	23.8998
Q*	64a	2.10	21.715	0.056	176614	735	2314.66	8.14	44.2107	8.9534
R*	64a	2.30	21.715	0.056	214587	813	2838.66	9.64	51.0840	9.2691
S	64a	2.50	21.715	0.056	631172	1962	8358.40	15.16	62.5521	19.5335
T	64a	4.00	21.715	0.056	836381	2560	11070.78	17.67	136.7485	11.0188
U	64a	5.00	21.715	0.056	648945	2007	8564.13	15.16	105.7431	8.7447
Bt: H45A (3275-01)										
A	68b	0.10	21.253	0.060	36440	542	577.53	4.73	-4.5948	9.4279
B	68b	0.20	21.253	0.060	1146141	917	17011.49	21.43	211.8891	7.4303
C	68b	0.25	21.253	0.060	2905333	1903	38335.56	37.80	491.1390	15.4012
D	68b	0.30	21.253	0.060	4446506	2755	58675.93	40.32	670.5246	44.1617
E	68b	0.35	21.253	0.060	4432089	2858	58401.70	36.57	687.2295	15.9438
F	68b	0.40	21.253	0.060	4426986	3001	58265.13	34.05	813.9954	44.3538
G*	68b	0.45	21.253	0.060	4058911	2938	53251.16	40.35	638.5122	14.7566
H*	68b	0.50	21.253	0.060	3744249	2906	49142.65	36.57	571.2898	18.3469
I*	68b	0.55	21.253	0.060	1460009	1248	19108.62	22.70	248.1564	10.9156
J*	68b	0.60	21.253	0.060	1098976	955	14454.21	21.45	188.7137	9.1185
K*	68b	0.70	21.253	0.060	3933821	2645	51574.00	37.81	599.6767	26.8161
L*	68b	0.80	21.253	0.060	3067201	2015	40351.83	35.29	494.2106	11.8404
M*	68b	0.90	21.253	0.060	2692500	1742	35327.13	34.03	426.6860	19.3442
N	68b	1.00	21.253	0.060	1465070	1073	19312.97	25.22	239.3697	13.1513
O	68b	1.10	21.253	0.060	1653332	1244	21825.88	27.74	287.4828	12.9129
P	68b	1.20	21.253	0.060	743528	741	9807.22	16.42	111.1310	10.6796
Q	68b	1.50	21.253	0.060	873195	817	11473.80	18.91	150.2307	9.2691
R	68b	1.70	21.253	0.060	679318	696	8944.64	15.14	95.7227	9.4820
S	68b	2.00	21.253	0.060	483832	627	6371.25	15.14	75.7952	11.1311
T	68b	3.00	21.253	0.060	343331	557	4518.48	11.87	53.3499	7.6506
U	68b	5.00	21.253	0.060	843590	732	11072.63	18.92	104.8745	15.3116

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Bt: F38A (3274-01)																
C	34.4405	17.6001	42.4365	2.2254	12212	370	18.5	0.9	40.5	3.7	156.33	1.00	62.2	1.3	0.00608	0.16
D	115.7571	18.4960	95.4534	2.6377	12212	370	18.5	0.9	40.5	3.7	156.33	1.00	62.2	1.3	0.08179	2.16
E	173.4771	18.5236	42.5672	2.5024	12212	370	18.5	0.9	40.5	3.7	156.33	1.00	62.2	1.3	0.28258	7.46
F	189.2507	17.6769	16.0575	2.2006	12212	370	18.5	0.9	40.5	3.7	156.33	1.00	62.2	1.3	0.46020	12.15
G	57.7420	18.0803	3.1967	2.1023	6268	320	24.1	1.1	44.3	1.9	159.47	1.20	61.7	1.3	0.20644	5.45
H	40.7886	19.0511	6.2288	2.1032	6268	320	24.1	1.1	44.3	1.9	159.47	1.20	61.7	1.3	0.24721	6.52
I	66.2224	19.3242	2.0604	2.1027	6268	320	24.1	1.1	44.3	1.9	159.47	1.20	61.7	1.3	0.14085	3.72
J	22.9191	19.5334	-3.4063	2.1022	6268	320	24.1	1.1	44.3	1.9	159.47	1.20	61.7	1.3	0.12357	3.26
K	92.0612	18.9468	-0.6445	2.1971	11990	340	22.6	1.0	45.0	4.4	158.15	1.20	61.7	1.3	0.14403	3.80
L	147.9850	21.2290	4.5967	2.1056	11990	340	22.6	1.0	45.0	4.4	158.15	1.20	61.7	1.3	0.30545	8.06
M	130.3339	19.3414	-0.4928	2.1970	11990	340	22.6	1.0	45.0	4.4	158.15	1.20	61.7	1.3	0.36896	9.74
N*	25.9648	18.2715	5.9885	2.1993	11990	340	22.6	1.0	45.0	4.4	158.15	1.20	61.7	1.3	0.24488	6.46
O*	49.2311	18.2198	4.0214	1.9913	10389	320	22.2	1.2	55.1	4.5	155.39	1.20	60.6	1.1	0.26249	6.93
P*	36.7690	18.2812	7.0951	1.8987	10389	320	22.2	1.2	55.1	4.5	155.39	1.20	60.6	1.1	0.28046	7.40
Q*	29.4522	19.2155	2.6846	1.9961	10389	320	22.2	1.2	55.1	4.5	155.39	1.20	60.6	1.1	0.33956	8.96
R*	28.6635	19.4087	2.5450	1.9034	10389	320	22.2	1.2	55.1	4.5	155.39	1.20	60.6	1.1	0.09873	2.61
S	3.6777	18.0373	1.1676	1.9640	9521	370	16.9	0.9	41.0	5.7	155.51	1.10	61.0	1.2	0.08227	2.17
T	7.4758	18.6521	-1.6979	1.8694	9521	370	16.9	0.9	41.0	5.7	155.51	1.10	61.0	1.2	0.05557	1.47
U	28.7745	17.6699	0.3183	1.9588	9521	370	16.9	0.9	41.0	5.7	155.51	1.10	61.0	1.2	0.04903	1.29
Bt: F122A (3085-01)																
A	-31.8349	23.6972	6.5253	3.3121	5136	310	43.3	1.2	86.7	4.2	403.32	1.90	117.6	1.5	0.00294	0.18
B*	-21.9073	23.7099	11.1642	3.3418	5136	310	43.3	1.2	86.7	4.2	403.32	1.90	117.6	1.5	0.03491	2.14
C*	-61.6536	23.6738	23.7487	3.1845	5136	310	43.3	1.2	86.7	4.2	403.32	1.90	117.6	1.5	0.35395	21.66
D*	-7.4545	23.5119	-1.5670	3.1691	4366	340	45.1	1.4	90.5	5.2	397.53	2.00	118.1	1.8	0.12270	7.51
E*	52.7241	24.1857	3.2577	3.1254	4366	340	45.1	1.4	90.5	5.2	397.53	2.00	118.1	1.8	0.16431	10.06
F*	29.0306	22.3889	3.9243	3.2817	4366	340	45.1	1.4	90.5	5.2	397.53	2.00	118.1	1.8	0.31682	19.39
G*	1.5095	22.9382	-0.2592	3.1018	4366	340	45.1	1.4	90.5	5.2	397.53	2.00	118.1	1.8	0.17286	10.58
H*	16.4329	22.4722	-2.9994	3.1700	5706	360	47.6	1.5	88.4	6.3	394.89	1.90	116.3	1.7	0.08881	5.43
I*	63.3454	23.1300	-5.5549	3.3237	5706	360	47.6	1.5	88.4	6.3	394.89	1.90	116.3	1.7	0.13483	8.25
J*	18.8384	23.0894	0.5802	3.2749	5706	360	47.6	1.5	88.4	6.3	394.89	1.90	116.3	1.7	0.08841	5.41
K*	29.3295	25.0248	0.7531	3.3611	5706	360	47.6	1.5	88.4	6.3	394.89	1.90	116.3	1.7	0.02409	1.47
L*	7.9131	21.2303	0.2470	3.0412	3759	330	42.4	1.1	86.6	6.4	399.83	1.60	116.2	1.4	0.01685	1.03
M*	-26.8563	23.1751	3.5812	3.0636	3759	330	42.4	1.1	86.6	6.4	399.83	1.60	116.2	1.4	0.01192	0.73
N*	8.4498	22.5416	1.4202	3.1358	3759	330	42.4	1.1	86.6	6.4	399.83	1.60	116.2	1.4	0.01408	0.86
O*	-2.5799	21.8760	1.0004	3.0471	3759	330	42.4	1.1	86.6	6.4	399.83	1.60	116.2	1.4	0.01214	0.74
P*	23.1390	21.2432	-4.2122	2.9048	5110	330	42.6	1.1	96.3	5.4	396.83	1.60	121.4	1.7	0.02938	1.80
Q*	21.3631	22.5493	-7.7332	3.4386	5110	330	42.6	1.1	96.3	5.4	396.83	1.60	121.4	1.7	0.04507	2.76
Bt: F122B (3072-01)																
A	-6.2392	13.4594	40.0645	4.4351	3106	360	48.0	1.2	100.5	6.6	315.69	1.80	145.3	1.7	0.02309	0.43
B*	18.6260	12.4377	71.2093	5.0279	3106	360	48.0	1.2	100.5	6.6	315.70	1.80	145.3	1.7	0.36572	6.79
C*	68.4484	49.4581	-27.2266	17.5080	3106	360	48.0	1.2	100.5	6.6	315.70	1.80	145.3	1.7	0.80866	15.02
D*	276.8274	46.6560	-1.4393	17.4073	3106	360	48.0	1.2	100.5	6.6	315.70	1.80	145.3	1.7	1.28088	23.79
E*	37.8175	49.2451	-68.7848	16.8369	6834	340	77.5	1.3	113.2	5.8	318.40	1.50	149.1	1.8	0.94228	17.50
F*	-12.1259	12.5188	16.3014	4.2269	6834	340	77.5	1.3	113.2	5.8	318.36	1.50	140.1	1.8	0.29263	5.43
G*	21.7451	12.0538	9.3714	4.0073	6834	340	77.5	1.3	113.2	5.8	318.36	1.50	140.1	1.8	0.43164	8.02
H*	21.0141	13.5095	16.6588	4.1504	6834	340	77.5	1.3	113.2	5.8	318.36	1.50	140.1	1.8	0.42713	7.93
I*	30.6447	12.2400	-5.9433	3.9637	5345	330	59.4	1.3	118.9	6.5	317.58	1.40	148.2	1.7	0.21357	3.97
J*	-21.5168	12.2333	-3.0333	3.9190	5345	330	59.4	1.3	118.9	6.5	317.58	1.40	148.2	1.7	0.10366	1.93
K*	17.9648	11.7569	-2.2441	4.1437	5345	330	59.4	1.3	118.9	6.5	317.58	1.40	148.2	1.7	0.11935	2.22
L*	-0.1227	12.2417	-3.9827	4.0459	5345	330	59.4	1.3	118.9	6.5	317.58	1.40	148.2	1.7	0.08013	1.49
M*	-14.9691	13.6336	-1.2577	3.9303	5391	330	49.4	1.3	111.8	7.6	319.68	1.70	146.6	1.6	0.05361	1.00
N*	-8.3451	13.6373	2.5277	3.9663	5391	330	49.4	1.3	111.8	7.6	319.68	1.70	146.6	1.6	0.06826	1.27
O*	13.9316	13.6434	3.7237	3.9036	5391	330	49.4	1.3	111.8	7.6	319.68	1.70	146.6	1.6	0.04515	0.84
P*	-23.2034	12.7256	-3.0332	3.8278	5391	330	49.4	1.3	111.8	7.6	319.68	1.70	146.6	1.6	0.01175	0.22
Q*	-0.9211	13.0743	-1.3809	3.9041	3772	340	51.6	1.1	101.1	5.0	316.63	1.80	150.2	1.8	0.00816	0.15
R*	24.6295	13.9734	-11.0228	3.9413	3772	340	51.6	1.1	101.1	5.0	316.63	1.80	150.2	1.8	0.01001	0.19
S	6.8804	14.4383	3.2057	3.8816	3772	340	51.6	1.1	101.1	5.0	316.63	1.80	150.2	1.8	0.02947	0.55
T	27.4655	13.5263	-0.1356	4.0444	3772	340	51.6	1.1	101.1	5.0	316.63	1.80	150.2	1.8	0.03903	0.72
U	-32.8845	13.3487	7.9402	3.9611	3749	370	49.3	1.1	104.6	3.4	321.31	1.60	143.1	1.8	0.03019	0.56
Bt: H45A (3275-01)																
A	16.4302	18.9383	25.7795	2.0490	9903	380	17.3	0.8	45.2	3.0	162.55	1.30	60.8	1.2	0.00204	0.10
B	12.5177	18.8488	84.4960	2.3628	9903	380	17.3	0.8	45.2	3.0	162.55	1.30	60.8	1.2	0.05998	2.89
C	48.0198	18.8216	31.7358	2.1393	9903	380	17.3	0.8	45.2	3.0	162.55	1.30	60.8	1.2	0.13516	6.52
D	55.5532	18.7679	30.5919	2.1370	9903	380	17.3	0.8	45.2	3.0	162.55	1.30	60.8	1.2	0.20687	9.98
E	12.4268	16.7513	6.9141	2.0952	18782	400	111.9	1.6	52.3	5.1	163.79	1.10	63.0	1.3	0.20590	9.94
F	-28.2430	17.4757	3.8212	2.0945	18782	400	111.9	1.6	52.3	5.1	163.79	1.10	63.0	1.3	0.20542	9.91
G*	-28.1442	16.6609	5.0150	2.0959	18782	400	111.9	1.6	52.3	5.1	163.79	1.10	63.0	1.3	0.18774	9.06
H*	-7.6388	16.6833	3.2605	2.1877	18782	400	111.9	1.6	52.3	5.1	163.79	1.10	63.0	1.3	0.17326	8.36
I*	-18.2499	17.3777	0.4407	1.9438	15423	320	55.1	1.1	47.7	4.5	165.50	1.20	64.8	1.2	0.06737	3.25
J*	-17.3819	19.8464	-1.2875	1.9411	15423	320	55.1	1.1	47.7	4.5	165.50	1.20	64.8	1.2	0.05096	2.46
K*	-16.1853	18.2890	2.0072	2.0324	15423	320	55.1	1.1	47.7	4.5	165.50	1.20	64.8	1.2	0.18183	8.77
L*	-26.4747	17.5954	3.7948	2.1263	15423	320	55.1	1.1	47.7	4.5	165.50	1.20	64.8	1.2	0.14227	6.86
M*	-3.1749	17.8181	6.2231	1.9180	13397	330	35.0	1.1	47.4	4.2	163.85	1.20	60.1	1.3	0.12455	6.01
N	17.6324	17.9807	5.2607	2.0049	13397	330	35.0	1.1	47.4	4.2	163.85	1.20	60.1	1.3	0.06809	3.29
O	-8.1073	18.8195	4.9018	2.0955	13397	330	35.0	1.1	47.4	4.2	163.85	1.20	60.1	1.3	0.07695	3.71
P	-8.5486	18.9621	0.9062	2.0075	13397	330	35.0	1.1	47.4	4.2	163.85	1.20	60.1	1.3	0.03458	1.67
Q	-11.4983	20.0499	4.4776	1.8588	11655	340	16.3	0.8	43.5	5.0	164.05	1.30	60.8	1.2	0.04045	1.95
R	-9.9572	19.8852	4.4905	1.9456	11655	340	16.3	0.8	43.5	5.0	164.05	1.30	60.8	1.2	0.03154	1.52
S	-21.2104	18.2633	4.4569	1.9442	11655	340	16.3	0.8	43.5	5.0	164.05	1.30	60.8	1.2	0.02246	1.08
T	-50.2518	18.9331	1.9555	1.9427	11655	340	16.3	0.8	43.5	5.0	164.05	1.30	60.8	1.2	0.01593	0.77
U	9.1615	19.3817	2.6904	1.9435	12076	340	18.9	0.8	48.9	2.5	161.98	1.20	60.4	1.2	0.03904	1.88

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Bt: F38A (3274-01)															
C	2462.0	129.5	0.0226	0.0200	0.0102	0.0392	0.0200	0.0280	2.E-06	0.0201	0.0050	42.01	0.35	34.66	0.51
D	411.5	11.4	0.0338	0.0050	0.0008	0.0098	0.0016	0.0148	2.E-07	0.0140	0.0005	70.39	0.10	69.16	0.10
E	53.1	3.1	0.1137	0.0022	0.0002	0.0042	0.0005	0.0102	5.E-08	0.0125	0.0002	73.73	0.06	73.57	0.07
F	12.3	1.7	0.3288	0.0014	0.0001	0.0028	0.0003	0.0163	3.E-08	0.0135	0.0005	74.05	0.06	74.02	0.06
G	5.5	3.6	0.5040	0.0010	0.0003	0.0019	0.0006	0.0093	6.E-08	0.0123	0.0004	74.82	0.07	74.80	0.07
H	8.9	3.0	0.1827	0.0006	0.0003	0.0011	0.0005	0.0115	5.E-08	0.0127	0.0003	74.70	0.07	74.67	0.07
I	5.2	5.3	0.8967	0.0017	0.0005	0.0032	0.0009	0.0086	1.E-07	0.0122	0.0002	74.74	0.08	74.73	0.08
J	-9.7	6.0	-0.1877	0.0007	0.0006	0.0013	0.0011	0.0071	1.E-07	0.0119	0.0005	74.89	0.09	74.92	0.09
K	-1.6	5.4	-3.9853	0.0023	0.0005	0.0044	0.0009	0.0124	9.E-08	0.0128	0.0005	75.00	0.09	75.00	0.09
L	5.3	2.4	0.8982	0.0017	0.0002	0.0033	0.0005	0.0104	5.E-08	0.0125	0.0003	74.68	0.06	74.66	0.06
M	-0.5	2.1	-7.3784	0.0012	0.0002	0.0024	0.0004	0.0081	4.E-08	0.0121	0.0002	74.32	0.06	74.32	0.06
N*	8.6	3.2	0.1210	0.0004	0.0003	0.0007	0.0005	0.0112	5.E-08	0.0126	0.0003	74.18	0.07	74.15	0.07
O*	5.4	2.7	0.3416	0.0007	0.0002	0.0013	0.0005	0.0077	5.E-08	0.0120	0.0004	74.22	0.06	74.21	0.07
P*	8.9	2.4	0.1446	0.0005	0.0002	0.0009	0.0005	0.0104	5.E-08	0.0125	0.0003	74.07	0.07	74.04	0.07
Q*	2.8	2.1	0.3061	0.0003	0.0002	0.0006	0.0004	0.0048	4.E-08	0.0115	0.0002	74.05	0.07	74.04	0.07
R*	9.1	6.8	0.3142	0.0010	0.0007	0.0020	0.0014	0.0065	1.E-07	0.0118	0.0005	74.22	0.09	74.19	0.10
S	5.0	8.4	0.0879	0.0002	0.0008	0.0003	0.0015	0.0039	2.E-07	0.0114	0.0006	74.52	0.10	74.51	0.11
T	-10.8	11.9	-0.1228	0.0005	0.0012	0.0009	0.0023	0.0051	2.E-07	0.0115	0.0007	74.34	0.12	74.37	0.13
U	2.3	14.1	2.5224	0.0021	0.0013	0.0041	0.0025	0.0042	3.E-07	0.0114	0.0009	74.68	0.13	74.67	0.13
Bt: F122A (3085-01)															
A	782.5	397.2	-0.1361	-0.0382	0.0284	-0.0748	0.0557	0.1563	6.E-06	0.0385	0.0121	45.48	0.68	43.14	1.37
B*	112.8	33.8	-0.0547	-0.0022	0.0024	-0.0043	0.0047	0.0011	5.E-07	0.0111	0.0013	75.86	0.38	75.52	0.39
C*	23.7	3.2	-0.0724	-0.0006	0.0002	-0.0012	0.0005	0.0053	5.E-08	0.0116	0.0002	75.85	0.36	75.77	0.36
D*	-4.5	9.1	0.1327	-0.0002	0.0007	-0.0004	0.0013	0.0068	1.E-07	0.0118	0.0005	76.11	0.36	76.12	0.37
E*	7.0	6.7	0.4515	0.0011	0.0005	0.0022	0.0010	0.0040	1.E-07	0.0114	0.0003	76.23	0.36	76.21	0.36
F*	4.4	3.7	0.2064	0.0003	0.0002	0.0006	0.0005	0.0087	5.E-08	0.0122	0.0003	75.98	0.36	75.97	0.36
G*	-0.5	6.3	-0.1625	0.0000	0.0005	0.0001	0.0009	0.0059	9.E-08	0.0117	0.0004	75.91	0.36	75.91	0.36
H*	-11.9	12.6	-0.1529	0.0007	0.0009	0.0013	0.0017	0.0131	2.E-07	0.0129	0.0007	76.02	0.37	76.05	0.37
I*	-14.5	8.7	-0.3182	0.0017	0.0006	0.0032	0.0012	0.0076	1.E-07	0.0119	0.0005	76.00	0.36	76.04	0.36
J*	2.3	13.1	0.9058	0.0008	0.0009	0.0015	0.0018	0.0076	2.E-07	0.0120	0.0006	76.00	0.37	75.99	0.37
K*	11.0	49.2	1.0866	0.0043	0.0037	0.0084	0.0072	-0.0100	7.E-07	0.0090	0.0026	75.82	0.40	75.79	0.42
L*	5.2	63.6	0.8940	0.0017	0.0044	0.0032	0.0087	0.0155	9.E-07	0.0133	0.0020	76.42	0.42	76.41	0.46
M*	106.0	90.7	-0.2092	-0.0079	0.0069	-0.0156	0.0134	0.0311	1.E-06	0.0161	0.0032	76.42	0.44	76.10	0.52
N*	35.6	78.5	0.1660	0.0021	0.0056	0.0041	0.0111	0.0168	1.E-06	0.0136	0.0025	77.28	0.44	77.18	0.50
O*	29.1	88.5	-0.0720	-0.0007	0.0064	-0.0015	0.0125	0.0118	1.E-06	0.0127	0.0030	76.50	0.45	76.41	0.52
P*	-50.5	34.9	-0.1533	0.0028	0.0025	0.0054	0.0050	-0.0254	5.E-07	0.0063	0.0018	76.39	0.38	76.54	0.40
Q*	-60.5	26.9	-0.0771	0.0017	0.0018	0.0033	0.0035	-0.0057	4.E-07	0.0096	0.0011	76.84	0.38	77.02	0.39
Bt: F122B (3072-01)															
A	611.7	67.7	-0.0043	-0.0010	0.0021	-0.0019	0.0040	0.0036	4.E-07	0.0125	0.0020	74.38	0.29	72.55	0.35
B*	68.7	4.9	0.0073	0.0002	0.0001	0.0004	0.0002	0.0047	2.E-08	0.0116	0.0003	74.89	0.24	74.68	0.24
C*	-11.9	7.6	-0.0701	0.0003	0.0002	0.0006	0.0004	0.0080	4.E-08	0.0120	0.0003	74.97	0.24	75.00	0.24
D*	-0.4	4.8	-5.3662	0.0008	0.0001	0.0015	0.0003	0.0112	3.E-08	0.0126	0.0003	74.90	0.24	74.90	0.24
E*	-25.7	6.3	-0.0153	0.0001	0.0002	0.0003	0.0004	0.0096	4.E-08	0.0123	0.0002	74.87	0.24	74.94	0.24
F*	19.6	5.1	-0.0208	-0.0001	0.0002	-0.0003	0.0003	0.0039	3.E-08	0.0114	0.0004	74.91	0.24	74.85	0.24
G*	7.7	3.3	0.0647	0.0002	0.0001	0.0003	0.0002	0.0063	2.E-08	0.0118	0.0003	74.88	0.23	74.85	0.23
H*	13.8	3.4	0.0352	0.0002	0.0001	0.0003	0.0002	0.0115	2.E-08	0.0127	0.0003	74.86	0.23	74.81	0.23
I*	-9.8	6.5	-0.1439	0.0005	0.0002	0.0010	0.0004	0.0074	4.E-08	0.0119	0.0002	75.12	0.24	75.14	0.24
J*	-10.3	13.3	0.1979	-0.0007	0.0004	-0.0014	0.0008	0.0027	8.E-08	0.0111	0.0004	75.06	0.24	75.09	0.25
K*	-6.6	12.2	-0.2233	0.0005	0.0003	0.0010	0.0007	0.0088	7.E-08	0.0122	0.0006	75.20	0.24	75.22	0.24
L*	-17.5	17.8	0.0009	0.0000	0.0005	0.0000	0.0011	0.0067	1.E-07	0.0118	0.0007	75.26	0.24	75.31	0.25
M*	-8.3	25.9	0.3321	-0.0010	0.0009	-0.0019	0.0018	0.0080	2.E-07	0.0120	0.0012	75.10	0.25	75.12	0.27
N*	13.1	20.5	-0.0921	-0.0004	0.0007	-0.0008	0.0014	0.0108	1.E-07	0.0125	0.0009	75.51	0.25	75.47	0.26
O*	29.1	30.5	0.1044	0.0011	0.0011	0.0021	0.0021	-0.0034	2.E-07	0.0102	0.0015	75.23	0.25	75.14	0.27
P*	-91.0	114.9	0.2134	-0.0070	0.0038	-0.0136	0.0075	-0.0523	8.E-07	0.0017	0.0072	74.70	0.36	74.96	0.50
Q*	-59.7	168.7	0.0186	-0.0004	0.0056	-0.0008	0.0111	0.0505	1.E-06	0.0191	0.0039	76.30	0.42	76.48	0.65
R*	-388.3	138.9	-0.0623	0.0087	0.0049	0.0170	0.0096	0.0476	1.E-06	0.0180	0.0033	75.59	0.38	76.75	0.57
S	38.4	46.4	0.0599	0.0008	0.0017	0.0016	0.0034	-0.0195	3.E-07	0.0075	0.0023	75.51	0.27	75.40	0.30
T	-1.2	36.5	-5.6500	0.0025	0.0012	0.0049	0.0024	0.0098	2.E-07	0.0124	0.0010	75.55	0.26	75.55	0.28
U	92.7	46.3	-0.1155	-0.0038	0.0016	-0.0075	0.0031	0.0087	3.E-07	0.0123	0.0010	75.77	0.27	75.49	0.30
Bt: H45A (3275-01)															
A	4463.8	356.7	0.0178	0.0284	0.0328	0.0558	0.0643	-0.1605	7.E-06	-0.0080	0.0163	63.10	1.07	49.77	1.47
B	496.7	13.9	0.0041	0.0007	0.0011	0.0014	0.0022	0.0049	2.E-07	0.0125	0.0004	67.37	0.10	65.89	0.11
C	82.8	5.6	0.0422	0.0013	0.0005	0.0025	0.0010	0.0116	1.E-07	0.0128	0.0004	75.79	0.09	75.54	0.09
D	52.1	3.6	0.0507	0.0009	0.0003	0.0019	0.0006	0.0037	6.E-08	0.0114	0.0008	75.78	0.07	75.62	0.07
E	11.8	3.6	0.0501	0.0002	0.0003	0.0004	0.0006	0.0062	6.E-08	0.0118	0.0003	75.89	0.07	75.85	0.07
F	6.6	3.6	-0.2062	-0.0005	0.0003	-0.0010	0.0006	0.0193	6.E-08	0.0140	0.0008	75.98	0.07	75.96	0.07
G*	9.4	3.9	-0.1566	-0.0005	0.0003	-0.0010	0.0006	0.0075	6.E-08	0.0120	0.0003	76.22	0.08	76.19	0.08
H*	6.6	4.5	-0.0654	-0.0002	0.0003	-0.0003	0.0007	0.0054	7.E-08	0.0116	0.0004	76.19	0.08	76.17	0.08
I*	2.3	10.2	-1.1554	-0.0010	0.0009	-0.0019	0.0018	0.0135	2.E-07	0.0130	0.0006	76.41	0.11	76.40	0.12
J*	-8.9	13.4	0.3767	-0.0012	0.0014	-0.0024	0.0027	0.0141	3.E-07	0.0131	0.0006	76.03	0.13	76.06	0.14
K*	3.9	3.9	-0.2250	-0.0003	0.0004	-0.0006	0.0007	0.0055	7.E-08	0.0116	0.0005	76.28	0.08	76.26	0.08
L*	9.4	5.3	-0.1946	-0.0007	0.0004	-0.0013	0.0009	0.0091	9.E-08	0.0122	0.0003	76.01	0.08	75.98	0.08
M*	17.6	5.4	-0.0142	-0.0001	0.0005	-0.0002	0.0010	0.0080	1.E-07	0.0121	0.0005	76.22	0.09	76.16	0.09
N	27.2	10.4	0.0935	0.0009	0.0009	0.0018	0.0018	0.0097	2.E-07	0.0124	0.0007	75.86	0.11	75.78	0.12
O	22.5	9.6	-0.0461	-0.0004	0.0009	-0.0007	0.0017	0.0144	2.E-07	0.0132	0.0006	75.75	0.11	75.68	0.12
P	9.2	20.5	-0.2632	-0.0009	0.0019	-0.0017	0.0038	0.0036	4.E-07	0.0113	0.0011	75.81	0.15	75.78	0.16
Q	39.0	16.2	-0.0716	-0.0010	0.0017	-0.0020	0.0034	0.0138	4.E-07	0.0131	0.0008	76.10	0.14	75.98	0.15
R	50.2	21.8	-0.0619	-0.0011	0.0022	-0.0022	0.0044	-0.0006	4.E-07	0.0107	0.0011	75.95	0.15	75.79	0.16
S	70.0	30.5	-0.1328	-0.0033	0.0029	-0.0065	0.0056	0.0063	6.E-07	0.0119	0.0017	75.94	0.21	75.73	0.22
T	43.3	43.0	-0.7170	-0.0111	0.0042	-0.0218	0.0082	0.0061	8.E-07	0.0118	0.0017	75.98	0.23	75.85	0.27
U	24.3	17.6	0.0950	0.0008	0.0018	0.0016	0.0034	-0.0076	4.E-07	0.0095	0.0014	76.19	0.15	76.11	0.16

Sample No.[a]	Derived Results				Inverse Isochron Data				
	%^{40}Ar*	Age (Ma)		w/±J	^{36}Ar/^{40}Ar		^{39}Ar/^{40}Ar		^{36}Ar/^{39}Ar
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Bt: F38A (3274-01)									
C	82.51	995	11	11	0.00059	5.29407	0.02381	0.82462	0.11670
D	98.26	1630	2	3	0.00006	2.76608	0.01421	0.13965	0.01677
E	99.79	1697	1	3	0.00001	5.89140	0.01356	0.08783	0.00906
F	99.95	1704	1	3	0.00000	13.83618	0.01350	0.07924	0.00377
G	99.98	1716	1	3	0.00000	66.63173	0.01337	0.09362	0.00064
H	99.96	1714	1	3	0.00000	34.03442	0.01339	0.09535	0.00129
I	99.98	1715	1	3	0.00000	103.79030	0.01338	0.10485	0.00044
J	100.04	1718	1	3	0.00000	-61.39554	0.01335	0.11965	0.00076
K	100.01	1719	1	3	0.00000	-316.77310	0.01333	0.11658	0.00015
L	99.98	1714	1	3	0.00000	46.65592	0.01339	0.08642	0.00113
M	100.00	1709	1	3	0.00000	-386.58980	0.01346	0.08142	0.00013
N*	99.97	1706	1	3	0.00000	36.99521	0.01348	0.08906	0.00118
O*	99.98	1707	1	3	0.00000	50.02256	0.01347	0.08750	0.00090
P*	99.96	1704	1	3	0.00000	26.94680	0.01350	0.09114	0.00175
Q*	99.99	1704	1	3	0.00000	75.18843	0.01351	0.08944	0.00072
R*	99.96	1707	1	3	0.00000	75.27880	0.01347	0.12665	0.00065
S	99.98	1711	2	4	0.00000	168.97990	0.01342	0.13987	0.00028
T	100.04	1709	2	4	0.00000	-109.73080	0.01345	0.16745	0.00040
U	99.99	1714	2	4	0.00000	636.96250	0.01339	0.16829	0.00007
Bt: F122A (3085-01)									
A	94.86	1214	28	28	0.00017	50.74835	0.02199	1.50282	0.02355
B*	99.56	1779	6	6	0.00001	29.92343	0.01318	0.49658	0.01527
C*	99.91	1783	5	6	0.00000	13.42008	0.01318	0.47224	0.03471
D*	100.02	1788	5	6	0.00000	-201.31590	0.01314	0.47876	0.00229
E*	99.97	1789	5	6	0.00000	96.60103	0.01312	0.47679	0.00477
F*	99.98	1786	5	6	0.00000	84.46852	0.01316	0.47228	0.00550
G*	100.00	1785	5	6	0.00000	-1144.14400	0.01317	0.47522	0.00040
H*	100.05	1787	5	6	0.00000	-105.07420	0.01316	0.48027	0.00437
I*	100.06	1787	5	6	0.00000	-59.52609	0.01316	0.47585	0.00775
J*	99.99	1786	6	6	0.00000	577.20870	0.01316	0.48242	0.00079
K*	99.96	1783	6	7	0.00000	449.58260	0.01319	0.52302	0.00099
L*	99.98	1792	7	7	0.00000	1257.69000	0.01309	0.54861	0.00035
M*	99.59	1788	8	8	0.00001	85.47453	0.01309	0.58093	0.00528
N*	99.86	1804	7	8	0.00000	221.59260	0.01294	0.56464	0.00198
O*	99.89	1792	8	8	0.00000	304.87270	0.01307	0.58532	0.00148
P*	100.20	1794	6	6	-0.00001	-68.99814	0.01309	0.50082	0.00659
Q*	100.24	1801	6	6	-0.00001	-44.45210	0.01301	0.49261	0.01021
Bt: F122B (3072-01)									
A	97.54	1707	5	6	0.00008	11.07500	0.01345	0.38522	0.02604
B*	99.73	1739	4	5	0.00001	7.07002	0.01335	0.31729	0.04373
C*	100.05	1744	4	5	0.00000	-64.11992	0.01334	0.32144	0.00474
D*	100.00	1742	4	5	0.00000	-1054.22800	0.01335	0.31676	0.00029
E*	100.10	1743	4	5	0.00000	-24.44660	0.01336	0.31663	0.01246
F*	99.92	1741	4	5	0.00000	25.94432	0.01335	0.31416	0.01174
G*	99.97	1741	3	5	0.00000	42.90872	0.01336	0.31270	0.00709
H*	99.95	1741	3	5	0.00000	24.99456	0.01336	0.31187	0.01215
I*	100.04	1746	4	5	0.00000	-66.43525	0.01331	0.31464	0.00450
J*	100.04	1745	4	5	0.00000	-129.34770	0.01332	0.32230	0.00226
K*	100.03	1747	4	5	0.00000	-183.43480	0.01330	0.31978	0.00160
L*	100.07	1748	4	5	0.00000	-101.46490	0.01329	0.32234	0.00287
M*	100.03	1745	4	5	0.00000	-312.55190	0.01332	0.33875	0.00090
N*	99.95	1751	4	5	0.00000	157.20440	0.01324	0.33177	0.00179
O*	99.88	1746	4	5	0.00000	104.90550	0.01329	0.33752	0.00268
P*	100.36	1743	7	8	-0.00001	-126.71470	0.01339	0.48065	0.00223
Q*	100.23	1765	10	10	-0.00001	-281.99170	0.01311	0.54490	0.00113
R*	101.54	1770	8	9	-0.00005	-35.72297	0.01323	0.50866	0.00790
S	99.85	1749	5	5	0.00001	120.95760	0.01324	0.35989	0.00222
T	100.01	1752	4	5	0.00000	-2753.61800	0.01324	0.34515	0.00010
U	99.63	1751	4	5	0.00001	49.84780	0.01320	0.35632	0.00539
Bt: H45A (3275-01)									
A	78.88	1302	27	28	0.00071	8.08665	0.01585	1.69886	0.16119
B	97.80	1580	2	3	0.00007	2.79789	0.01484	0.14928	0.01534
C	99.67	1728	1	3	0.00001	6.74872	0.01320	0.11838	0.00537
D	99.79	1729	1	3	0.00001	6.99206	0.01320	0.09253	0.00593
E	99.95	1732	1	3	0.00000	30.39191	0.01318	0.08989	0.00152
F	99.97	1734	1	3	0.00000	55.44756	0.01316	0.08951	0.00093
G*	99.96	1737	1	3	0.00000	41.88138	0.01312	0.10480	0.00119
H*	99.97	1737	1	3	0.00000	67.30886	0.01313	0.10752	0.00083
I*	99.99	1740	2	4	0.00000	447.92320	0.01309	0.14637	0.00011
J*	100.04	1735	2	4	0.00000	-150.25250	0.01315	0.17193	0.00029
K*	99.98	1738	1	3	0.00000	101.68700	0.01311	0.09948	0.00045
L*	99.96	1734	1	3	0.00000	56.17298	0.01316	0.10939	0.00070
M*	99.93	1737	1	3	0.00000	30.88191	0.01312	0.11606	0.00117
N	99.89	1731	2	4	0.00000	38.21149	0.01318	0.14974	0.00094
O	99.91	1730	2	4	0.00000	42.85722	0.01320	0.14770	0.00089
P	99.96	1731	2	4	0.00000	221.34940	0.01319	0.19482	0.00023
Q	99.85	1734	2	4	0.00001	41.55290	0.01314	0.18958	0.00111
R	99.80	1731	2	4	0.00001	43.30101	0.01317	0.19788	0.00123
S	99.72	1730	3	5	0.00001	43.58632	0.01317	0.27067	0.00142
T	99.83	1732	4	5	0.00001	98.70742	0.01316	0.30872	0.00086
U	99.90	1736	2	4	0.00000	72.20694	0.01313	0.19162	0.00054

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Bt: K2A (3082-02)										
A	64c	0.20	22.201	0.050	23767	479	613.83	4.38	21.8662	9.8356
B	64c	0.30	22.201	0.050	243586	876	4225.99	11.38	61.4443	12.5257
C	64c	0.40	22.201	0.050	1623286	4632	23625.65	25.21	281.3522	13.8522
D	64c	0.50	22.201	0.050	2333738	6565	33621.91	28.99	399.9607	18.7160
E*	64c	0.60	22.201	0.050	3306904	9085	47115.35	39.08	527.8470	12.9984
F*	64c	0.70	22.201	0.050	2354707	6433	33535.38	30.27	411.2148	16.5661
G*	64c	0.75	22.201	0.050	1177677	3228	16808.34	22.72	191.8860	10.3516
H*	64c	0.80	22.201	0.050	1343834	3641	19079.86	25.23	201.2518	13.8667
I*	64c	0.90	22.201	0.050	1615371	4301	22900.75	25.24	285.1665	11.6366
J*	64c	1.00	22.201	0.050	1223867	3246	17366.64	21.47	201.9819	14.2761
K*	64c	1.10	22.201	0.050	817693	2201	11667.63	18.96	103.3009	19.1927
L*	64c	1.20	22.201	0.050	1091402	2863	15491.58	20.21	168.1315	11.3533
M	64c	1.30	22.201	0.050	1248833	3200	17614.53	22.71	185.2267	13.3618
N	64c	1.50	22.201	0.050	1754888	4420	24795.94	23.97	340.5935	20.1169
O	64c	1.70	22.201	0.050	2479955	6165	35236.80	31.52	411.0008	15.4963
P	64c	2.00	22.201	0.050	1321009	3310	18798.23	23.97	195.4485	20.1169
Q	64c	5.00	22.201	0.050	2858778	6914	40625.12	27.74	491.3278	14.7566
Bt: S1A (3076-01)										
A	64b	0.20	21.463	0.036	99042	583	1616.31	6.04	80.6291	10.4500
B	64b	0.40	21.463	0.036	132217	635	3085.01	8.77	27.8205	12.0922
C	64b	0.50	21.463	0.036	641841	1900	8802.49	15.16	118.7344	12.5198
D	64b	0.60	21.463	0.036	2416255	6844	32898.62	31.51	391.2117	11.2560
E*	64b	0.70	21.463	0.036	3762857	10615	50922.61	39.07	604.5107	12.8926
F*	64b	0.70	21.463	0.036	2506154	7079	34029.98	30.26	410.4847	12.3239
G*	64b	0.80	21.463	0.036	7217782	20281	97729.63	50.40	1148.6600	18.4326
H*	64b	0.90	21.463	0.036	18438720	51812	248798.20	189.90	3129.0370	91.9911
I*	64b	1.00	21.463	0.036	15617190	43849	210498.60	177.65	2472.7410	116.5255
J*	64b	1.10	21.463	0.036	4279726	12005	57681.53	39.07	618.6350	17.7602
K*	64b	1.20	21.463	0.036	5178981	14505	69819.92	46.63	826.4705	24.8935
L*	64b	1.30	21.463	0.036	6389035	17871	85874.84	51.66	999.4361	16.6074
M*	64b	1.40	21.463	0.036	4332755	12119	58239.26	44.10	707.8872	13.9025
N*	64b	1.50	21.463	0.036	3089724	8649	41597.65	36.55	506.5976	28.3161
O*	64b	1.70	21.463	0.036	6247264	17436	84098.58	51.66	1037.5790	24.6350
P*	64b	2.00	21.463	0.036	24756540	69099	333690.20	226.65	4106.1340	79.8065
Q*	64b	2.50	21.463	0.036	26452710	73727	357215.40	226.65	4354.6940	67.6567
R*	64b	5.00	21.463	0.036	16133350	45014	217953.10	177.65	2623.3460	104.2795
Bt: S7A (3277-01)										
A	68b	0.10	21.260	0.060	2005	527	37.73	1.74	0.9693	9.0657
B	68b	0.20	21.260	0.060	7406	549	312.70	3.40	6.4579	5.4930
C	68b	0.25	21.260	0.060	6799	492	448.66	4.13	19.0086	7.0810
D	68b	0.30	21.260	0.060	14961	534	442.27	3.64	13.1424	7.4315
E	68b	0.35	21.260	0.060	18154	486	417.08	3.76	6.6845	4.9545
F	68b	0.40	21.260	0.060	16232	485	274.27	3.02	10.8261	6.7278
G	68b	0.45	21.260	0.060	54862	494	794.09	5.86	25.4791	7.1036
H	68b	0.50	21.260	0.060	44952	500	609.79	4.98	23.2257	5.7952
I	68b	0.55	21.260	0.060	124279	521	1654.09	7.11	49.7119	8.5233
J	68b	0.60	21.260	0.060	213728	573	2971.93	9.87	84.9596	10.3893
K	68b	0.70	21.260	0.060	314492	554	4278.09	11.88	106.0956	12.4615
L	68b	0.80	21.260	0.060	667089	702	9121.83	17.66	232.8614	12.4615
M	68b	0.90	21.260	0.060	662678	706	9047.50	13.89	216.7986	11.6471
N	68b	1.00	21.260	0.060	764688	769	10487.07	16.41	235.3665	11.4532
O	68b	1.10	21.260	0.060	1488334	1140	20292.20	25.22	484.8573	19.3886
P	68b	1.20	21.260	0.060	1300457	987	17740.70	22.70	418.5161	18.1648
Q*	68b	1.50	21.260	0.060	4273129	2593	58572.12	41.59	1402.0530	31.7773
R*	68b	1.70	21.260	0.060	3245380	1933	44454.41	36.55	1129.5760	22.9593
S*	68b	2.00	21.260	0.060	7742349	4539	106309.20	57.96	2569.6960	26.6935
T*	68b	3.00	21.260	0.060	38636250	23644	529416.10	251.22	12691.9100	140.8583
U	68b	5.00	21.260	0.060	7276504	4789	99941.15	51.66	2427.5720	24.2026
V	68b	7.00	21.260	0.060	4138872	3176	56921.67	41.58	1387.0480	18.3194
Bt: S7A (3277-02)										
A	68b	0.30	21.260	0.060	267137	550	4201.10	12.26	106.8887	6.3963
B	68b	0.40	21.260	0.060	508912	657	6880.05	13.88	181.8782	12.4249
C	68b	0.50	21.260	0.060	368979	580	5035.06	11.62	122.7250	9.7825
D	68b	0.60	21.260	0.060	637076	717	8838.46	15.14	209.5728	10.9156
E	68b	0.70	21.260	0.060	475998	640	6822.22	15.14	182.6964	9.5597
F	68b	0.80	21.260	0.060	464325	670	6578.49	12.63	169.7555	9.8494
G	68b	0.90	21.260	0.060	980107	941	13773.60	21.44	286.3876	21.8480
H	68b	1.00	21.260	0.060	303402	554	4225.14	10.87	115.1215	10.8748
I	68b	1.10	21.260	0.060	141506	503	1977.66	8.74	67.4742	14.5296
J	68b	1.20	21.260	0.060	432926	584	6034.02	12.62	142.6903	11.8697
K	68b	1.50	21.260	0.060	1450069	1102	19765.81	21.43	505.7668	16.5703
L	68b	1.70	21.260	0.060	2536736	1877	35222.80	34.03	862.1463	12.8542
M	68b	2.00	21.260	0.060	2108412	1675	29073.79	28.99	705.0422	20.3087
N	68b	2.20	21.260	0.060	2123060	1688	29305.26	27.73	714.5213	14.8620
O	68b	2.50	21.260	0.060	2506483	1828	34656.37	30.25	840.6577	30.0119
P	68b	3.00	21.260	0.060	3172306	2134	43890.65	36.55	1072.9150	25.1890
Q	68b	5.00	21.260	0.060	3122555	1998	42707.72	37.81	965.4094	25.1890
R	68b	7.00	21.260	0.060	4780301	2830	66033.87	40.33	1508.2490	19.2812
Bt: S35C (3074-01)										
A	64b	0.20	21.429	0.042	640117	3161	9975.29	16.42	178.8821	9.8857
B*	64b	0.30	21.429	0.042	4849590	23279	69987.54	41.59	878.1840	27.2963

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Bt: K2A (3082-02)																
A	-10.0982	23.5120	-27.5410	3.5595	15921	330	41.9	0.9	91.0	6.3	384.86	1.70	149.6	1.9	0.00216	0.16
B	-16.5793	22.0751	-24.9489	3.5715	15921	330	41.9	0.9	91.0	6.3	384.86	1.70	149.6	1.9	0.01490	1.10
C	24.3970	22.8062	-3.3021	3.9708	15921	330	41.9	0.9	91.0	6.3	384.86	1.70	149.6	1.9	0.08330	6.17
D	36.3163	22.1051	-18.3946	3.7458	15921	330	41.9	0.9	91.0	6.3	384.86	1.70	149.6	1.9	0.11854	8.78
E*	38.6182	24.1616	23.4713	3.7698	6557	360	68.3	1.4	97.0	6.8	387.21	2.10	114.7	1.7	0.16611	12.30
F*	2.1935	24.7941	9.3202	3.3315	6557	360	68.3	1.4	97.0	6.8	387.21	2.10	114.7	1.7	0.11823	8.75
G*	-24.6103	25.4523	9.9443	3.3258	6557	360	68.3	1.4	97.0	6.8	387.21	2.10	114.7	1.7	0.05926	4.39
H*	-20.1307	23.5039	11.1065	3.3981	6557	360	68.3	1.4	97.0	6.8	387.21	2.10	114.7	1.7	0.06727	4.98
I*	19.7561	22.8034	3.1927	3.3385	9955	360	79.9	1.5	81.9	7.6	383.95	1.70	122.2	1.6	0.08074	5.98
J*	41.6196	22.1060	-0.5994	3.1481	9955	360	79.9	1.5	81.9	7.6	383.95	1.70	122.2	1.6	0.06123	4.53
K*	-10.6932	22.0781	5.3336	3.4122	9955	360	79.9	1.5	81.9	7.6	383.95	1.70	122.2	1.6	0.04114	3.05
L*	31.9901	22.8128	-0.2814	3.2789	9955	360	79.9	1.5	81.9	7.6	383.95	1.70	122.2	1.6	0.05462	4.04
M	-31.4288	22.7952	-10.8392	3.4019	6629	380	67.2	1.3	106.1	9.7	386.64	1.70	129.2	1.9	0.06210	4.60
N	-16.1472	22.8045	-8.7352	3.2644	6629	380	67.2	1.3	106.1	9.7	386.64	1.70	129.2	1.9	0.08742	6.47
O	8.9830	24.2922	-9.4572	3.3937	6629	380	67.2	1.3	106.1	9.7	386.64	1.70	129.2	1.9	0.12423	9.20
P	13.5725	22.8228	-3.3890	3.5817	6629	380	67.2	1.3	106.1	9.7	386.64	1.70	129.2	1.9	0.06628	4.91
Q	2.3904	22.1002	6.1054	3.2339	2990	320	48.3	1.1	80.5	5.1	385.21	1.70	119.4	1.6	0.14323	10.60
Bt: S1A (3076-01)																
A	2.8875	13.6850	238.9536	6.4084	3405	370	53.3	1.2	106.4	6.5	318.97	1.80	147.7	1.8	0.00570	0.08
B	-22.5634	13.2400	25.5931	3.7451	3405	370	53.3	1.2	106.4	6.5	318.97	1.80	147.7	1.8	0.01088	0.15
C	4.3330	13.6905	34.3831	4.0368	3405	370	53.3	1.2	106.4	6.5	318.97	1.80	147.7	1.8	0.03103	0.44
D	-2.4679	13.6921	3.6985	3.7402	3405	370	53.3	1.2	106.4	6.5	318.97	1.80	147.7	1.8	0.11599	1.65
E*	-14.2105	13.0792	7.9148	3.6613	4676	400	57.4	1.3	108.4	5.4	320.88	1.60	141.5	2.0	0.17953	2.55
F*	14.9962	12.6208	-4.7464	3.5773	4676	400	57.4	1.3	108.4	5.4	320.88	1.60	141.5	2.0	0.11998	1.71
G*	-1.6264	12.6205	-0.9863	3.6776	4676	400	57.4	1.3	108.4	5.4	320.88	1.60	141.5	2.0	0.34456	4.90
H*	56.5511	48.5545	18.1670	14.0212	4676	400	57.4	1.3	108.4	5.4	320.90	1.60	141.5	2.0	0.87717	12.47
I*	189.9475	58.5708	48.5658	14.7494	5775	400	80.8	1.4	114.7	6.9	311.40	3.10	135.2	1.6	0.74214	10.55
J*	2.4717	12.6318	4.5739	3.6939	5775	400	80.8	1.4	114.7	6.9	321.42	1.60	136.0	1.9	0.20336	2.89
K*	17.7274	12.6368	2.5274	3.5200	5775	400	80.8	1.4	114.7	6.9	321.42	1.60	136.0	1.9	0.24616	3.50
L*	-23.2792	13.5761	4.3274	3.5309	5775	400	80.8	1.4	114.7	6.9	321.42	1.60	136.0	1.9	0.30276	4.31
M*	-1.4480	12.9546	12.4029	3.4223	6554	340	76.4	1.3	104.0	5.9	320.18	1.70	132.3	1.8	0.20533	2.92
N*	-7.4826	12.5129	3.5384	3.5215	6554	340	76.4	1.3	104.0	5.9	320.18	1.70	132.3	1.8	0.14666	2.09
O*	6.5788	13.8837	6.1522	3.5374	6554	340	76.4	1.3	104.0	5.9	320.18	1.70	132.3	1.8	0.29650	4.22
P*	120.0762	51.5769	14.5104	14.8061	6554	340	76.4	1.3	104.0	5.9	320.20	1.70	132.3	1.8	1.17647	16.73
Q*	36.7129	48.8142	-45.4503	15.1552	4396	370	55.1	1.3	101.8	6.5	317.40	1.80	139.3	1.9	1.25941	17.91
R*	36.7206	54.5036	0.2998	14.1249	4396	370	55.1	1.3	101.8	6.5	317.40	1.80	139.3	1.9	0.76842	10.93
Bt: S7A (3277-01)																
A	-19.2356	18.3393	-1.2610	2.0504	9521	370	16.9	0.9	41.0	5.7	155.51	1.10	61.0	1.2	0.00013	0.00
B	-25.4938	19.4390	13.1222	2.0940	11216	360	17.2	0.9	40.1	2.7	157.90	1.30	58.3	1.1	0.00110	0.03
C	28.1679	20.3607	10.4694	1.8054	11216	360	17.2	0.9	40.1	2.7	157.90	1.30	58.3	1.1	0.00158	0.05
D	-18.9466	19.5626	9.3013	1.8996	11216	360	17.2	0.9	40.1	2.7	157.90	1.30	58.3	1.1	0.00156	0.05
E	-25.7819	18.8878	8.5810	1.7173	11216	360	17.2	0.9	40.1	2.7	157.90	1.30	58.3	1.1	0.00147	0.04
F	-21.8901	18.5542	4.2428	1.8053	10033	340	16.8	0.8	35.6	4.6	156.14	1.10	60.3	1.1	0.00097	0.03
G	20.3875	17.6065	2.5489	1.9910	10033	340	16.8	0.8	35.6	4.6	156.14	1.10	60.3	1.1	0.00280	0.08
H	46.4583	18.3913	1.6905	1.7993	10033	340	16.8	0.8	35.6	4.6	156.14	1.10	60.3	1.1	0.00215	0.06
I	9.9651	18.3067	3.3674	1.9874	10033	340	16.8	0.8	35.6	4.6	156.14	1.10	60.3	1.1	0.00583	0.17
J	17.9659	19.7882	11.7669	1.8623	11963	370	18.5	1.0	41.7	4.6	155.69	1.20	59.4	1.2	0.01048	0.30
K	41.9654	19.0381	8.2463	1.8616	11963	370	18.5	1.0	41.7	4.6	155.69	1.20	59.4	1.2	0.01508	0.44
L	55.8852	19.1971	6.2632	2.0444	11963	370	18.5	1.0	41.7	4.6	155.69	1.20	59.4	1.2	0.03216	0.94
M	39.1952	20.2130	5.5577	1.9530	11963	370	18.5	1.0	41.7	4.6	155.69	1.20	59.4	1.2	0.03190	0.93
N	10.4320	18.8204	4.4681	1.9886	11523	350	18.7	1.0	42.4	4.4	157.25	1.10	61.0	1.1	0.03697	1.08
O	47.7369	18.6694	4.8679	1.9873	11523	350	18.7	1.0	42.4	4.4	157.25	1.10	61.0	1.1	0.07154	2.08
P	54.7832	19.4024	4.5891	1.7981	11523	350	18.7	1.0	42.4	4.4	157.25	1.10	61.0	1.1	0.06255	1.82
Q*	118.9015	18.4715	13.8786	2.0868	11523	350	18.7	1.0	42.4	4.4	157.25	1.10	61.0	1.1	0.20650	6.01
R*	49.9765	18.8711	17.6999	1.8026	11771	370	19.4	0.9	43.0	3.7	155.28	1.20	57.9	1.1	0.15673	4.56
S*	125.9329	18.9759	48.4436	2.2031	11771	370	19.4	0.9	43.0	3.7	155.28	1.20	57.9	1.1	0.37481	10.91
T*	545.8737	69.6955	292.5821	11.0791	11771	370	19.4	0.9	43.0	3.7	155.28	1.20	57.9	1.1	1.86653	54.32
U	63.6661	18.3168	184.9336	3.2558	11771	370	19.4	0.9	43.0	3.7	155.28	1.20	57.9	1.1	0.35236	10.26
V	10.1396	19.1772	20.5343	2.2113	10190	340	17.1	0.8	38.4	5.0	157.51	1.20	60.6	1.3	0.20069	5.84
Bt: S7A (3277-02)																
A	46.6217	19.9392	19.8859	1.9860	12774	340	18.2	1.0	39.1	4.1	146.58	1.10	58.3	1.1	0.01481	1.15
B	19.1676	19.5157	2.8944	1.8548	10239	350	18.5	0.8	38.9	4.5	147.12	1.20	58.7	1.2	0.02426	1.88
C	38.5821	19.4982	0.8053	1.8539	10239	350	18.5	0.8	38.9	4.5	147.12	1.20	58.7	1.2	0.01775	1.38
D	53.4207	19.4884	2.6028	1.9439	10239	350	18.5	0.8	38.9	4.5	147.12	1.20	58.7	1.2	0.03116	2.42
E	5.0700	19.4212	-0.8754	1.7668	10239	350	18.5	0.8	38.9	4.5	147.12	1.20	58.7	1.2	0.02405	1.87
F	-32.3968	18.2777	15.8409	2.0127	10316	350	18.1	0.9	40.3	4.4	150.58	1.00	59.2	1.3	0.02319	1.80
G	-17.1874	19.2918	10.2146	2.1931	10316	350	18.1	0.9	40.3	4.4	150.58	1.00	59.2	1.3	0.04856	3.77
H	4.0804	20.3543	7.0746	2.0114	10316	350	18.1	0.9	40.3	4.4	150.58	1.00	59.2	1.3	0.01490	1.16
I	-37.4651	18.4931	0.8522	2.0102	10316	350	18.1	0.9	40.3	4.4	150.58	1.00	59.2	1.3	0.00697	0.54
J	32.2711	20.2012	6.6433	1.7985	9359	330	16.8	0.8	36.7	2.6	145.50	1.10	57.5	1.1	0.02127	1.65
K	99.7797	20.4411	14.6530	1.8963	9359	330	16.8	0.8	36.7	2.6	145.50	1.10	57.5	1.1	0.06969	5.41
L	94.4618	19.7015	11.2908	1.9910	9359	330	16.8	0.8	36.7	2.6	145.50	1.10	57.5	1.1	0.12418	9.65
M	56.7506	20.6534	13.3929	1.8995	9359	330	16.8	0.8	36.7	2.6	145.50	1.10	57.5	1.1	0.10250	7.96
N	-2.6002	20.4010	4.9981	1.7993	8750	350	17.7	0.9	17.2	7.9	149.53	1.10	57.1	1.1	0.10332	8.03
O	-10.7807	20.1844	6.6565	1.9851	8750	350	17.7	0.9	17.2	7.9	149.53	1.10	57.1	1.1	0.12219	9.49
P	4.9605	21.0044	61.1833	2.2037	8750	350	17.7	0.9	17.2	7.9	149.53	1.10	57.1	1.1	0.15474	12.02
Q	43.0657	18.2777	69.8973	2.2055	8750	350	17.7	0.9	17.2	7.9	149.53	1.10	57.1	1.1	0.15057	11.70
R	65.5043	19.1464	31.4059	2.1433	8739	330	17.8	0.9	38.1	3.9	144.78	1.10	57.9	1.2	0.23281	18.09
Bt: S35C (3074-01)																
A	54.1423	21.5901	135.6230	4.6687	9181	370	47.4	1.2	87.4	6.8	394.51	1.70	117.9	1.7	0.03517	1.16
B*	51.8559	22.2098	58.2587	3.7227	9181	370	47.4	1.2	87.4	6.8	394.51	1.70	117.9	1.7	0.24675	8.15

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Bt: K2A (3082-02)															
A	-4486.7	580.8	0.0102	-0.0165	0.0383	-0.0322	0.0751	0.1979	8.E-06	0.0356	0.0160	38.72	0.83	52.11	1.94
B	-590.4	84.5	0.0185	-0.0039	0.0052	-0.0077	0.0102	0.0294	1.E-06	0.0145	0.0030	57.64	0.26	59.40	0.36
C	-14.0	16.8	-0.2061	0.0010	0.0010	0.0020	0.0019	0.0073	2.E-07	0.0119	0.0006	68.71	0.21	68.75	0.22
D	-54.7	11.1	-0.0551	0.0011	0.0007	0.0021	0.0013	0.0077	1.E-07	0.0119	0.0006	69.41	0.20	69.57	0.21
E*	49.8	8.0	0.0459	0.0008	0.0005	0.0016	0.0010	0.0024	1.E-07	0.0112	0.0003	70.19	0.20	70.04	0.20
F*	27.8	9.9	0.0066	0.0001	0.0007	0.0001	0.0014	0.0090	1.E-07	0.0123	0.0005	70.22	0.20	70.13	0.20
G*	59.2	19.8	-0.0690	-0.0015	0.0015	-0.0029	0.0030	0.0036	3.E-07	0.0114	0.0006	70.07	0.21	69.89	0.22
H*	58.2	17.8	-0.0506	-0.0011	0.0012	-0.0021	0.0024	-0.0016	2.E-07	0.0105	0.0007	70.43	0.21	70.26	0.22
I*	13.9	14.6	0.1726	0.0009	0.0010	0.0017	0.0020	0.0102	2.E-07	0.0125	0.0005	70.54	0.20	70.49	0.21
J*	-3.5	18.1	-1.9372	0.0024	0.0013	0.0047	0.0025	0.0056	3.E-07	0.0116	0.0008	70.47	0.21	70.48	0.21
K*	45.7	29.3	-0.0559	-0.0009	0.0019	-0.0018	0.0037	-0.0115	4.E-07	0.0089	0.0016	70.08	0.22	69.94	0.24
L*	-1.8	21.2	-3.1721	0.0021	0.0015	0.0040	0.0029	0.0009	3.E-07	0.0109	0.0007	70.45	0.21	70.45	0.22
M	-61.5	19.3	0.0809	-0.0018	0.0013	-0.0035	0.0025	-0.0004	3.E-07	0.0105	0.0008	70.90	0.20	71.08	0.21
N	-35.2	13.2	0.0516	-0.0007	0.0009	-0.0013	0.0018	0.0184	2.E-07	0.0137	0.0008	70.77	0.19	70.88	0.19
O	-26.8	9.6	-0.0265	0.0003	0.0007	0.0005	0.0014	0.0060	1.E-07	0.0117	0.0004	70.38	0.19	70.46	0.19
P	-18.0	19.1	-0.1117	0.0007	0.0012	0.0014	0.0024	-0.0016	2.E-07	0.0104	0.0011	70.27	0.20	70.32	0.21
Q	15.0	8.0	0.0109	0.0001	0.0005	0.0001	0.0011	0.0081	1.E-07	0.0121	0.0004	70.37	0.18	70.32	0.18
Bt: S1A (3076-01)															
A	14783.9	400.3	0.0003	0.0018	0.0085	0.0035	0.0166	0.0671	2.E-06	0.0499	0.0065	61.28	0.43	17.14	1.24
B	829.6	121.4	-0.0246	-0.0073	0.0043	-0.0143	0.0084	-0.0192	9.E-07	0.0090	0.0039	42.86	0.24	40.38	0.43
C	390.6	45.9	0.0035	0.0005	0.0016	0.0010	0.0030	0.0122	3.E-07	0.0135	0.0014	72.92	0.25	71.75	0.28
D	11.2	11.4	-0.0186	-0.0001	0.0004	-0.0001	0.0008	0.0069	8.E-08	0.0119	0.0003	73.45	0.22	73.41	0.22
E*	15.5	7.2	-0.0501	-0.0003	0.0003	-0.0005	0.0005	0.0068	5.E-08	0.0119	0.0003	73.89	0.22	73.84	0.22
F*	-14.0	10.5	-0.0881	0.0004	0.0004	0.0009	0.0007	0.0082	7.E-08	0.0121	0.0004	73.65	0.22	73.68	0.22
G*	-1.0	3.8	0.0460	0.0000	0.0001	0.0000	0.0003	0.0063	3.E-08	0.0118	0.0002	73.85	0.21	73.85	0.21
H*	7.3	5.6	0.0868	0.0002	0.0002	0.0004	0.0004	0.0110	4.E-08	0.0126	0.0004	74.11	0.22	74.09	0.22
I*	23.1	7.0	0.1091	0.0009	0.0003	0.0018	0.0005	0.0060	6.E-08	0.0117	0.0006	74.19	0.22	74.12	0.22
J*	7.9	6.4	0.0151	0.0000	0.0002	0.0001	0.0004	0.0001	4.E-08	0.0107	0.0003	74.20	0.21	74.17	0.21
K*	3.6	5.0	0.1957	0.0003	0.0002	0.0005	0.0004	0.0067	4.E-08	0.0118	0.0004	74.18	0.21	74.16	0.21
L*	5.0	4.1	-0.1501	-0.0003	0.0002	-0.0005	0.0003	0.0055	3.E-08	0.0116	0.0002	74.40	0.21	74.38	0.21
M*	21.3	5.9	-0.0033	0.0000	0.0002	0.0000	0.0004	0.0084	4.E-08	0.0122	0.0002	74.40	0.22	74.33	0.22
N*	8.5	8.5	-0.0590	-0.0002	0.0003	-0.0004	0.0006	0.0087	6.E-08	0.0122	0.0007	74.28	0.22	74.25	0.22
O*	7.3	4.2	0.0298	0.0001	0.0002	0.0002	0.0003	0.0096	3.E-08	0.0123	0.0003	74.29	0.21	74.26	0.21
P*	4.4	4.4	0.2309	0.0004	0.0002	0.0007	0.0003	0.0095	3.E-08	0.0123	0.0002	74.19	0.21	74.17	0.21
Q*	-12.7	4.2	-0.0225	0.0001	0.0001	0.0002	0.0003	0.0090	3.E-08	0.0122	0.0002	74.05	0.21	74.09	0.21
R*	0.1	6.5	3.4172	0.0002	0.0003	0.0003	0.0005	0.0079	5.E-08	0.0120	0.0005	74.02	0.22	74.02	0.22
Bt: S7A (3277-01)															
A	-3341.9	5436.1	0.4256	-0.5098	0.4866	-0.9992	0.9537	0.1262	1.E-04	0.0257	0.2403	53.13	14.17	63.04	21.59
B	4196.4	671.2	-0.0542	-0.0815	0.0622	-0.1598	0.1219	0.0121	1.E-05	0.0207	0.0176	23.68	1.77	11.14	2.66
C	2333.5	403.0	0.0751	0.0628	0.0454	0.1231	0.0890	0.1617	9.E-06	0.0424	0.0158	15.15	1.11	8.19	1.63
D	2103.1	429.9	-0.0568	-0.0428	0.0442	-0.0840	0.0867	0.0893	9.E-06	0.0297	0.0168	33.83	1.24	27.54	1.78
E	2057.4	412.2	-0.0838	-0.0618	0.0453	-0.1212	0.0888	0.0086	9.E-06	0.0160	0.0119	43.53	1.23	37.37	1.73
F	1546.9	658.4	-0.1439	-0.0798	0.0677	-0.1564	0.1326	0.1533	1.E-05	0.0395	0.0245	59.18	1.88	54.55	2.71
G	321.0	250.7	0.2232	0.0257	0.0222	0.0503	0.0435	0.1232	4.E-06	0.0321	0.0089	69.09	0.80	68.13	1.10
H	277.2	295.1	0.7667	0.0762	0.0302	0.1493	0.0591	0.1593	6.E-06	0.0381	0.0095	73.72	1.02	72.90	1.34
I	203.6	120.2	0.0826	0.0060	0.0111	0.0118	0.0217	0.1125	2.E-06	0.0301	0.0052	75.13	0.45	74.53	0.57
J	395.9	62.7	0.0426	0.0060	0.0067	0.0118	0.0131	0.1017	1.E-06	0.0286	0.0035	71.92	0.31	70.73	0.36
K	192.8	43.5	0.1420	0.0098	0.0045	0.0192	0.0087	0.0815	9.E-07	0.0248	0.0029	73.51	0.24	72.94	0.27
L	68.7	22.4	0.2489	0.0061	0.0021	0.0120	0.0041	0.0872	4.E-07	0.0255	0.0014	73.13	0.16	72.93	0.17
M	61.4	21.6	0.1968	0.0043	0.0022	0.0085	0.0044	0.0780	4.E-07	0.0240	0.0013	73.24	0.14	73.06	0.15
N	42.6	19.0	0.0651	0.0010	0.0018	0.0019	0.0035	0.0692	4.E-07	0.0224	0.0011	72.92	0.14	72.79	0.15
O	24.0	9.8	0.2736	0.0024	0.0009	0.0046	0.0018	0.0780	2.E-07	0.0239	0.0010	73.35	0.11	73.27	0.11
P	25.9	10.1	0.3331	0.0031	0.0011	0.0061	0.0021	0.0762	2.E-07	0.0236	0.0010	73.30	0.11	73.22	0.11
Q*	23.7	3.6	0.2390	0.0020	0.0003	0.0040	0.0006	0.0782	6.E-08	0.0239	0.0005	72.96	0.07	72.88	0.07
R*	39.8	4.1	0.0788	0.0011	0.0004	0.0022	0.0008	0.0868	9.E-08	0.0254	0.0005	73.00	0.07	72.88	0.08
S*	45.6	2.1	0.0725	0.0012	0.0002	0.0023	0.0003	0.0794	4.E-08	0.0242	0.0003	72.83	0.06	72.69	0.06
T*	55.3	2.1	0.0521	0.0010	0.0001	0.0020	0.0003	0.0781	3.E-08	0.0240	0.0003	72.98	0.06	72.81	0.06
U	185.0	3.3	0.0096	0.0006	0.0002	0.0012	0.0004	0.0785	4.E-08	0.0243	0.0002	72.81	0.06	72.25	0.06
V	36.1	3.9	0.0138	0.0002	0.0003	0.0003	0.0007	0.0807	7.E-08	0.0244	0.0003	72.71	0.08	72.60	0.08
Bt: S7A (3277-02)															
A	473.4	47.3	0.0654	0.0111	0.0047	0.0218	0.0093	0.0821	1.E-06	0.0254	0.0015	63.59	0.23	62.17	0.26
B	42.1	27.0	0.1848	0.0028	0.0028	0.0055	0.0056	0.0928	6.E-07	0.0264	0.0018	73.97	0.18	73.84	0.19
C	16.0	36.8	1.3367	0.0077	0.0039	0.0150	0.0076	0.0809	8.E-07	0.0244	0.0019	73.28	0.20	73.23	0.23
D	29.5	22.0	0.5726	0.0060	0.0022	0.0118	0.0043	0.0768	4.E-07	0.0237	0.0012	72.08	0.15	71.99	0.16
E	-12.8	25.9	-0.1616	0.0007	0.0028	0.0015	0.0056	0.0955	6.E-07	0.0268	0.0014	69.77	0.18	69.81	0.20
F	240.8	30.6	-0.0571	-0.0049	0.0028	-0.0097	0.0054	0.0869	6.E-07	0.0258	0.0015	70.58	0.17	69.86	0.19
G	74.2	15.9	-0.0469	-0.0012	0.0014	-0.0024	0.0027	0.0590	3.E-07	0.0208	0.0016	71.16	0.13	70.93	0.14
H	167.4	47.6	0.0161	0.0010	0.0048	0.0019	0.0094	0.0963	1.E-06	0.0272	0.0026	71.81	0.23	71.31	0.27
I	43.1	101.6	-1.2265	-0.0189	0.0094	-0.0371	0.0183	0.1384	2.E-06	0.0341	0.0073	71.55	0.41	71.42	0.51
J	110.1	29.8	0.1355	0.0053	0.0033	0.0105	0.0066	0.0756	7.E-07	0.0236	0.0020	71.75	0.18	71.42	0.20
K	74.1	9.6	0.1900	0.0050	0.0010	0.0099	0.0020	0.0875	2.E-07	0.0256	0.0008	73.36	0.10	73.14	0.10
L	32.1	5.7	0.2334	0.0027	0.0006	0.0053	0.0011	0.0813	1.E-07	0.0245	0.0004	72.02	0.09	71.92	0.09
M	46.1	6.5	0.1182	0.0020	0.0007	0.0038	0.0014	0.0798	1.E-07	0.0243	0.0007	72.52	0.09	72.38	0.09
N	17.1	6.1	-0.0145	-0.0001	0.0007	-0.0002	0.0014	0.0809	1.E-07	0.0244	0.0005	72.45	0.09	72.39	0.09
O	19.2	5.7	-0.0452	-0.0003	0.0006	-0.0006	0.0011	0.0802	1.E-07	0.0243	0.0009	72.32	0.08	72.26	0.08
P	139.4	5.0	0.0023	0.0001	0.0005	0.0002	0.0009	0.0800	1.E-07	0.0244	0.0006	72.28	0.08	71.86	0.08
Q	163.7	5.2	0.0172	0.0010	0.0004	0.0020	0.0008	0.0688	9.E-08	0.0226	0.0006	73.11	0.08	72.62	0.08
R	47.6	3.3	0.0582	0.0010	0.0003	0.0019	0.0006	0.0715	6.E-08	0.0228	0.0003	72.39	0.06	72.25	0.06
Bt: S35C (3074-01)															
A	1359.6	46.9	0.0111	0.0054	0.0022	0.0106	0.0042	0.0277	4.E-07	0.0179	0.0010	64.17	0.33	60.11	0.36
B*	83.2	5.3	0.0248	0.0007	0.0003	0.0015	0.0006	0.0100	6.E-08	0.0125	0.0004	69.29	0.34	69.04	0.34

Sample No.[a]	Derived Results				Inverse Isochron Data				
	$\%^{40}Ar^*$	Age (Ma)		w/±J	$^{36}Ar/^{40}Ar$		$^{39}Ar/^{40}Ar$		$^{36}Ar/^{39}Ar$
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Bt: K2A (3082-02)									
A	134.60	1387	36	36	-0.00116	-13.08024	0.02583	2.13921	0.14533
B	103.06	1517	6	7	-0.00010	-14.32014	0.01735	0.44939	0.02012
C	100.06	1672	3	4	0.00000	-119.75350	0.01455	0.30469	0.00223
D	100.24	1685	3	4	-0.00001	-20.34345	0.01441	0.29423	0.01322
E*	99.79	1692	3	4	0.00001	16.07482	0.01425	0.28699	0.01636
F*	99.88	1694	3	4	0.00000	35.79721	0.01424	0.28773	0.00725
G*	99.75	1690	3	4	0.00001	33.43229	0.01427	0.30563	0.00735
H*	99.75	1696	3	4	0.00001	30.57970	0.01420	0.30149	0.00796
I*	99.94	1699	3	4	0.00000	105.07010	0.01418	0.28816	0.00234
J*	100.02	1699	3	4	0.00000	-511.94820	0.01419	0.29262	0.00047
K*	99.80	1691	4	4	0.00001	63.87806	0.01427	0.31437	0.00361
L*	100.01	1699	3	4	0.00000	-1127.28700	0.01419	0.29298	0.00021
M	100.26	1708	3	4	-0.00001	-31.41356	0.01411	0.28689	0.00729
N	100.15	1705	3	4	0.00000	-37.31292	0.01413	0.26979	0.00630
O	100.11	1699	3	4	0.00000	-35.84511	0.01421	0.26423	0.00653
P	100.08	1697	3	4	0.00000	-105.61000	0.01423	0.28115	0.00211
Q	99.94	1697	3	4	0.00000	53.09325	0.01421	0.25132	0.00438
Bt: S1A (3076-01)									
A	27.97	565	35	35	0.00241	2.74593	0.01632	0.69759	0.18113
B	94.22	1126	9	9	0.00019	14.63710	0.02333	0.55809	0.02823
C	98.40	1682	4	5	0.00005	11.74649	0.01372	0.34256	0.02179
D	99.95	1707	3	4	0.00000	101.31790	0.01362	0.29900	0.00265
E*	99.94	1713	3	4	0.00000	46.30487	0.01353	0.29235	0.00588
F*	100.06	1711	3	4	0.00000	-75.15989	0.01358	0.29616	0.00359
G*	100.00	1713	3	4	0.00000	-365.64490	0.01354	0.28569	0.00076
H*	99.97	1717	3	4	0.00000	77.63442	0.01349	0.29119	0.00349
I*	99.91	1717	3	4	0.00000	30.43136	0.01348	0.29320	0.00884
J*	99.97	1718	3	4	0.00000	80.77687	0.01348	0.28858	0.00338
K*	99.99	1718	3	4	0.00000	140.40590	0.01348	0.28795	0.00194
L*	99.98	1721	3	4	0.00000	81.76657	0.01344	0.28613	0.00334
M*	99.91	1721	3	4	0.00000	27.63036	0.01344	0.28980	0.00977
N*	99.97	1719	3	4	0.00000	99.80063	0.01346	0.29342	0.00268
O*	99.97	1720	3	4	0.00000	57.76767	0.01346	0.28579	0.00472
P*	99.98	1718	3	4	0.00000	103.01480	0.01348	0.28727	0.00263
Q*	100.05	1717	3	4	0.00000	-33.26256	0.01350	0.28586	0.00817
R*	100.00	1716	3	4	0.00000	6063.01800	0.01351	0.29069	0.00004
Bt: S7A (3277-01)									
A	118.71	1534	354	354	-0.00063	-165.37520	0.01883	26.66995	0.15643
B	47.07	384	83	83	0.00177	17.58804	0.04223	7.49057	0.41695
C	54.07	290	53	53	0.00154	18.72007	0.06600	7.29748	0.38363
D	81.43	832	43	43	0.00062	20.72728	0.02957	3.66580	0.16795
E	85.88	1055	37	37	0.00047	20.17640	0.02298	2.82441	0.12571
F	92.19	1389	48	48	0.00026	42.61630	0.01690	3.18492	0.06582
G	98.62	1615	17	17	0.00005	78.43370	0.01447	1.16395	0.00888
H	98.89	1689	20	20	0.00004	107.56060	0.01357	1.38119	0.00834
I	99.19	1713	9	9	0.00003	59.22503	0.01331	0.60010	0.00494
J	98.36	1656	5	6	0.00006	15.85573	0.01391	0.42697	0.01063
K	99.22	1689	4	5	0.00003	22.65371	0.01360	0.32885	0.00416
L	99.72	1689	3	4	0.00001	32.91939	0.01367	0.22042	0.00153
M	99.75	1691	2	4	0.00001	35.42083	0.01365	0.18689	0.00171
N	99.83	1687	2	4	0.00001	44.87696	0.01371	0.18601	0.00121
O	99.90	1694	2	4	0.00000	41.56824	0.01363	0.14598	0.00097
P	99.90	1694	2	4	0.00000	39.86168	0.01364	0.14877	0.00097
Q*	99.90	1688	1	3	0.00000	15.30879	0.01371	0.09340	0.00257
R*	99.84	1688	1	3	0.00001	10.29764	0.01370	0.10152	0.00339
S*	99.81	1686	1	3	0.00001	4.58899	0.01373	0.08006	0.00935
T*	99.78	1687	1	3	0.00001	3.81442	0.01370	0.07744	0.01268
U	99.24	1679	1	3	0.00003	1.76550	0.01374	0.08370	0.02932
V	99.85	1684	1	3	0.00000	10.88552	0.01375	0.10595	0.00511
Bt: S7A (3277-02)									
A	97.78	1520	4	5	0.00007	10.00465	0.01573	0.35719	0.01187
B	99.83	1703	3	4	0.00001	64.89007	0.01352	0.23956	0.00107
C	99.94	1694	3	5	0.00000	239.19540	0.01365	0.27917	0.00037
D	99.88	1675	2	4	0.00000	76.07443	0.01387	0.20501	0.00081
E	100.06	1642	3	4	0.00000	-194.60850	0.01433	0.25953	0.00036
F	98.98	1642	3	4	0.00003	12.72182	0.01417	0.24024	0.00682
G	99.69	1659	2	4	0.00001	21.54335	0.01405	0.18289	0.00234
H	99.31	1665	4	5	0.00002	28.51639	0.01393	0.31544	0.00370
I	99.82	1666	8	8	0.00001	236.60930	0.01398	0.56702	0.00094
J	99.54	1666	3	4	0.00002	27.19983	0.01394	0.24892	0.00269
K	99.70	1692	2	3	0.00001	13.04042	0.01363	0.13242	0.00334
L	99.87	1674	1	3	0.00000	17.89342	0.01389	0.12168	0.00251
M	99.81	1681	1	3	0.00001	14.31917	0.01379	0.12749	0.00346
N	99.93	1681	1	3	0.00000	36.83203	0.01380	0.12359	0.00139
O	99.92	1679	1	3	0.00000	30.41677	0.01383	0.11376	0.00154
P	99.43	1673	1	3	0.00002	3.61268	0.01384	0.10706	0.01170
Q	99.33	1685	1	3	0.00002	3.16313	0.01368	0.10923	0.01185
R	99.81	1679	1	3	0.00001	6.87867	0.01381	0.08506	0.00599
Bt: S35C (3074-01)									
A	93.68	1493	6	6	0.00021	3.47847	0.01558	0.52054	0.13469
B*	99.64	1638	5	6	0.00001	6.41285	0.01443	0.48371	0.07429

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Bt: S35C (3074-01)										
C*	64b	0.40	21.429	0.042	17194580	82482	246856.80	171.55	3368.7810	59.1648
D*	64b	0.50	21.429	0.042	6154444	29439	88510.80	52.92	1151.3540	33.4289
E*	64b	0.60	21.429	0.042	2941181	14047	42180.38	32.79	525.0146	14.2604
F*	64b	0.70	21.429	0.042	3041214	14505	43614.49	31.53	574.9908	18.8545
G*	64b	0.75	21.429	0.042	2675375	12751	38431.62	32.79	433.1188	28.4936
H*	64b	0.80	21.429	0.042	1831971	8738	26329.07	23.98	299.3034	17.6834
I*	64b	0.90	21.429	0.042	3747793	17782	53853.43	36.56	690.5025	17.0828
J*	64b	1.00	21.429	0.042	3424544	16232	49361.16	37.82	576.9923	11.4265
K*	64b	1.10	21.429	0.042	3704479	17541	53376.50	37.82	755.3331	28.1248
L*	64b	1.20	21.429	0.042	1843593	8745	26531.57	23.98	391.7782	17.0828
M*	64b	1.30	21.429	0.042	1645641	7796	23609.74	26.49	306.9194	23.8998
N*	64b	1.50	21.429	0.042	5301565	24991	76307.69	45.37	927.1531	22.7098
O*	64b	1.70	21.429	0.042	156131	906	2251.51	8.79	8.8371	13.9578
P*	64b	2.00	21.429	0.042	153251	901	2178.50	7.79	23.4649	12.1202
Q	64b	5.00	21.429	0.042	351430	1735	5027.21	11.90	83.7511	7.0520
Bt: S60A (3071-01)										
A	64a	0.20	21.760	0.038	25378	537	695.05	5.16	23.9181	13.6004
B	64a	0.25	21.760	0.038	19285	481	457.59	3.81	18.5806	12.9529
C	64a	0.30	21.760	0.038	14866	538	462.37	3.69	18.1777	12.6840
D	64a	0.40	21.760	0.038	325347	1281	5004.76	12.64	109.7714	11.7494
E	64a	0.40	21.760	0.038	543701	2040	7840.79	12.64	101.9792	8.7194
F	64a	0.50	21.760	0.038	1271981	4597	18746.08	23.95	206.4131	16.2175
G*	64a	0.60	21.760	0.038	2023636	7261	30149.15	31.50	402.3525	11.4553
H*	64a	1.00	21.760	0.038	21390440	76292	320918.20	196.02	4231.6380	85.9131
I*	64a	0.80	21.760	0.038	233025	998	3564.36	10.77	47.5592	12.7845
J*	64a	1.10	21.760	0.038	4686960	16617	70075.14	45.36	960.9154	24.8659
K	64a	1.20	21.760	0.038	4705500	16655	69783.56	41.58	919.1216	15.4269
L	64a	1.30	21.760	0.038	1402137	4994	20882.42	23.96	273.6858	13.2136
M	64a	1.50	21.760	0.038	3328062	11729	49430.03	35.28	645.4484	17.2966
N	64a	1.70	21.760	0.038	3357243	11811	49976.43	41.58	718.8392	17.2966
O	64a	2.00	21.760	0.038	2625046	9231	39448.88	35.28	561.6092	22.1210
P	64a	2.50	21.760	0.038	4615884	16181	69634.44	45.36	958.9012	19.6956
Q	64a	5.00	21.760	0.038	783673	2807	11468.65	20.19	393.2637	54.6937
Bt: S60A (3071-02)										
A	64a	0.20	21.760	0.038	65274	571	1558.23	6.66	63.8361	17.5358
B	64a	0.40	21.760	0.038	662547	2385	11125.14	16.42	183.3384	8.2246
C	64a	0.50	21.760	0.038	910876	3229	13873.63	17.67	267.8951	21.1038
D	64a	0.60	21.760	0.038	1055166	3723	16066.03	21.45	147.8012	27.1761
E*	64a	0.70	21.760	0.038	1814299	6325	27267.89	28.99	398.1983	16.8213
F*	64a	0.80	21.760	0.038	19977940	69236	299205.60	189.90	4459.9950	79.9314
G*	64a	0.90	21.760	0.038	358588	1346	5356.03	11.26	83.9399	11.1261
H*	64a	1.00	21.760	0.038	438198	1617	6284.31	13.90	130.3787	11.4108
I*	64a	1.10	21.760	0.038	579285	2076	8624.08	16.41	146.4920	18.1648
J*	64a	1.20	21.760	0.038	901329	3175	13432.59	20.18	201.2518	14.5296
K*	64a	1.30	21.760	0.038	868322	3052	12953.96	18.93	177.1071	10.7598
L*	64a	1.50	21.760	0.038	17231670	59449	257017.20	159.27	3839.8200	57.1059
M*	64a	1.70	21.760	0.038	2207551	7629	32738.68	32.77	435.0574	18.3234
N*	64a	2.00	21.760	0.038	1816502	6284	27071.77	30.25	423.4760	24.5352
O*	64a	2.50	21.760	0.038	1240044	4311	18638.73	22.70	227.9771	19.2924
P*	64a	5.00	21.760	0.038	683158	2416	10137.42	16.41	105.2396	16.1618
Q*	64a	5.00	21.760	0.038	1027046	6411	15414.98	89.44	242.3406	9.0096
Bt: S74A (3075-01)										
A	64b	0.20	21.438	0.037	125662	766	2937.86	8.15	81.5355	9.5446
B	64b	0.30	21.438	0.037	129028	761	1658.54	6.41	37.5640	12.5182
C	64b	0.30	21.438	0.037	91630	654	1230.82	5.79	9.1518	10.0965
D*	64b	0.40	21.438	0.037	654619	2830	8869.05	16.42	109.6581	9.7255
E*	64b	0.40	21.438	0.037	1018593	4347	13927.77	20.18	123.9712	11.6709
F*	64b	0.50	21.438	0.037	1966247	8327	27004.84	25.22	286.5512	15.9761
G*	64b	0.50	21.438	0.037	2173287	9202	29998.92	28.99	366.7398	19.5856
H*	64b	0.60	21.438	0.037	3231700	13668	44751.63	36.55	527.3686	23.2483
I*	64b	0.60	21.438	0.037	2133013	9044	29421.43	27.74	400.5776	9.0221
J*	64b	0.70	21.438	0.037	7661723	32412	105803.60	52.92	1359.9450	19.1144
K*	64b	0.70	21.438	0.037	3157941	13385	43714.90	34.03	588.0954	12.8035
L*	64b	0.80	21.438	0.037	32639990	138289	451204.20	263.41	5600.5530	104.3395
M*	64b	0.90	21.438	0.037	4064409	17270	56165.47	37.82	714.2947	17.6086
N*	64b	1.00	21.438	0.037	2965899	12626	40986.50	34.04	530.0625	13.8331
O*	64b	1.10	21.438	0.037	4583745	19509	63249.61	41.59	790.9585	21.1644
P*	64b	1.20	21.438	0.037	2793656	11917	38715.95	34.04	513.5842	10.3518
Q*	64b	1.30	21.438	0.037	1363505	5858	18928.63	25.23	186.6869	19.5824
R*	64b	1.40	21.438	0.037	4712236	20132	65245.64	46.62	785.8979	21.2884
S*	64b	1.50	21.438	0.037	7721242	33004	107042.10	49.14	1338.4060	29.3066
T*	64b	1.70	21.438	0.037	7567583	32389	104823.90	57.96	1286.9190	22.1994
U*	64b	2.00	21.438	0.037	19763230	84846	273069.90	196.03	3310.2530	79.7578
V*	64b	2.50	21.438	0.037	23022080	98962	318513.30	208.28	3966.5480	110.3215
W*	64b	5.00	21.438	0.037	23444040	100926	326108.20	208.28	4130.6220	98.0925
Bt: S89A (3280-01)										
A	68b	0.10	21.285	0.060	22443	507	515.19	4.10	6.8104	5.9719
B	68b	0.20	21.285	0.060	112279	541	1722.88	7.10	31.9118	6.9334
C	68b	0.25	21.285	0.060	543460	628	6903.24	15.14	100.4056	10.6292
D	68b	0.30	21.285	0.060	699464	737	9004.74	16.40	159.9616	11.9520
E	68b	0.35	21.285	0.060	1473035	1048	19099.53	22.69	303.1303	19.1785

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Bt: S35C (3074-01)																
C*	217.0031	97.7631	92.6732	13.7061	9181	370	47.4	1.2	87.4	6.8	394.50	1.70	117.9	1.7	0.87033	28.76
D*	66.8118	22.2244	12.9347	3.3828	9181	370	47.4	1.2	87.4	6.8	394.51	1.70	117.9	1.7	0.31206	10.31
E*	53.0439	23.2407	9.6839	3.1852	5394	380	77.4	1.5	100.7	6.7	392.72	1.80	118.5	1.5	0.14871	4.91
F*	58.9784	23.2470	3.2282	3.2226	5394	380	77.4	1.5	100.7	6.7	392.72	1.80	118.5	1.5	0.15377	5.08
G*	68.1873	24.5653	3.3517	3.0580	5394	380	77.4	1.5	100.7	6.7	392.72	1.80	118.5	1.5	0.13550	4.48
H*	41.6634	22.5984	9.9941	3.2664	5394	380	77.4	1.5	100.7	6.7	392.72	1.80	118.5	1.5	0.09283	3.07
I*	19.7334	22.8740	4.9670	3.3814	5448	310	69.9	1.4	101.1	4.9	400.65	1.70	120.9	1.6	0.18987	6.27
J*	-12.7452	21.5710	0.4930	3.1844	5448	310	69.9	1.4	101.1	4.9	400.65	1.70	120.9	1.6	0.17403	5.75
K*	-10.7115	22.2004	5.1526	3.2150	5448	310	69.9	1.4	101.1	4.9	400.65	1.70	120.9	1.6	0.18819	6.22
L*	-7.8802	23.5079	1.3930	3.2711	5448	310	69.9	1.4	101.1	4.9	400.65	1.70	120.9	1.6	0.09354	3.09
M*	-35.8732	22.5930	0.4932	3.2028	5073	380	55.2	1.3	107.7	7.6	400.13	1.80	120.1	1.8	0.08324	2.75
N*	-5.1384	22.6265	9.7905	3.4192	5073	380	55.2	1.3	107.7	7.6	400.13	1.80	120.1	1.8	0.26903	8.89
O*	-57.5075	21.9571	-3.4898	3.1757	5073	380	55.2	1.3	107.7	7.6	400.13	1.80	120.1	1.8	0.00794	0.26
P*	0.6204	22.0207	0.3700	3.2777	5073	380	55.2	1.3	107.7	7.6	400.13	1.80	120.1	1.8	0.00768	0.25
Q	-71.9916	23.0319	34.1782	3.4199	5136	310	43.3	1.2	86.7	4.2	403.32	1.90	117.6	1.5	0.01772	0.59
Bt: S60A (3071-01)																
A	6.8113	12.0119	40.5763	4.1885	4861	330	50.2	1.1	99.2	9.0	324.20	1.50	157.6	2.0	0.00245	0.09
B	-3.5238	11.5588	19.5969	3.8243	4861	330	50.2	1.1	99.2	9.0	324.20	1.50	157.6	2.0	0.00161	0.06
C	-2.2322	12.0151	7.6113	3.6764	4861	330	50.2	1.1	99.2	9.0	324.20	1.50	157.6	2.0	0.00163	0.06
D	26.9674	12.4872	42.3487	4.1083	4861	330	50.2	1.1	99.2	9.0	324.20	1.50	157.6	2.0	0.01764	0.65
E	16.9273	12.6261	19.7733	3.7470	6004	380	51.4	1.0	120.4	5.9	323.12	1.70	155.2	1.9	0.02764	1.02
F	24.9256	12.6299	27.9638	3.7910	6004	380	51.4	1.0	120.4	5.9	323.12	1.70	155.2	1.9	0.06609	2.44
G*	5.8211	12.1976	37.7614	3.8454	6004	380	51.4	1.0	120.4	5.9	323.12	1.70	155.2	1.9	0.10630	3.92
H*	-32.6053	50.2330	217.5255	16.5854	6004	380	51.4	1.0	120.4	5.9	323.10	1.70	155.2	1.9	1.13144	41.76
I*	-5.6479	14.5843	-3.2863	4.1835	2862	400	53.4	1.2	120.0	6.8	323.14	1.90	160.9	2.1	0.01257	0.46
J*	21.6542	12.8763	45.3488	3.9494	2862	400	53.4	1.2	120.0	6.8	323.14	1.90	160.9	2.1	0.24706	9.12
K	-9.0047	13.2844	37.7602	4.1321	2862	400	53.4	1.2	120.0	6.8	323.14	1.90	160.9	2.1	0.24603	9.08
L	16.3058	13.7144	15.5760	4.0113	2862	400	53.4	1.2	120.0	6.8	323.14	1.90	160.9	2.1	0.07362	2.72
M	13.0731	13.0943	16.3996	3.5584	2222	310	55.8	1.1	100.4	5.6	323.26	1.70	159.6	1.7	0.17427	6.43
N	4.4175	12.2184	12.5734	3.5346	2222	310	55.8	1.1	100.4	5.6	323.26	1.70	159.6	1.7	0.17620	6.50
O	4.2416	14.0195	9.0534	3.6804	2222	310	55.8	1.1	100.4	5.6	323.26	1.70	159.6	1.7	0.13908	5.13
P	-15.3788	13.0975	13.4582	3.7888	2222	310	55.8	1.1	100.4	5.6	323.26	1.70	159.6	1.7	0.24551	9.06
Q	117.6525	14.2533	558.1675	9.0025	2812	390	52.5	1.2	70.0	14.0	325.13	1.60	160.7	2.0	0.04043	1.49
Bt: S60A (3071-02)																
A	13.8593	12.9866	91.9389	4.5818	5065	380	58.7	1.2	112.0	6.3	322.65	1.80	162.2	1.9	0.00549	0.20
B	40.4063	13.4280	17.9176	3.6697	5065	380	58.7	1.2	112.0	6.3	322.65	1.80	162.2	1.9	0.03922	1.43
C	-10.6788	12.9878	-1.9146	3.7272	5065	380	58.7	1.2	112.0	6.3	322.65	1.80	162.2	1.9	0.04891	1.79
D	7.0222	12.9931	-2.5161	3.4785	5065	380	58.7	1.2	112.0	6.3	322.65	1.80	162.2	1.9	0.05664	2.07
E*	-12.3970	12.8246	-6.1254	3.5658	5546	330	57.8	1.1	114.4	7.4	322.62	1.60	161.8	1.8	0.09614	3.51
F*	140.1303	47.6122	2.6866	15.2621	5546	330	57.8	1.1	114.4	7.4	322.60	1.60	161.8	1.8	1.05489	38.52
G*	0.8859	12.3753	2.9096	3.6100	5546	330	57.8	1.1	114.4	7.4	322.62	1.60	161.8	1.8	0.01888	0.69
H*	14.8853	12.3801	45.9918	4.0924	5546	330	57.8	1.1	114.4	7.4	322.62	1.60	161.8	1.8	0.02216	0.81
I*	-30.8457	12.0851	5.2309	3.6902	5045	350	55.4	1.1	114.8	4.4	327.43	1.50	156.4	2.0	0.03041	1.11
J*	-44.5636	12.0851	0.1474	3.6648	5045	350	55.4	1.1	114.8	4.4	327.43	1.50	156.4	2.0	0.04736	1.73
K*	-16.6111	12.0922	-0.7000	3.6602	5045	350	55.4	1.1	114.8	4.4	327.43	1.50	156.4	2.0	0.04567	1.67
L*	-130.2589	53.1549	23.2340	14.7265	5045	350	55.4	1.1	114.8	4.4	327.40	1.50	156.4	2.0	0.90615	33.09
M*	-5.6782	12.5636	7.9715	3.5377	4010	350	57.1	1.1	137.4	12.0	321.92	1.50	155.6	2.0	0.11542	4.21
N*	3.3129	12.5675	-0.4913	3.4181	4010	350	57.1	1.1	137.4	12.0	321.92	1.50	155.6	2.0	0.09545	3.49
O*	-13.9052	12.0987	-0.6756	3.6537	4010	350	57.1	1.1	137.4	12.0	321.92	1.50	155.6	2.0	0.06571	2.40
P*	7.3386	12.1047	0.4545	3.4223	4010	350	57.1	1.1	137.4	12.0	321.92	1.50	155.6	2.0	0.03574	1.31
Q*	7.4843	11.5811	-0.7519	3.0263	5364	310	44.6	1.0	107.8	5.1	319.75	1.70	145.9	1.7	0.05435	1.98
Bt: S74A (3075-01)																
A	191.1370	25.4248	160.6712	5.5631	4107	340	48.4	1.2	105.0	6.7	333.09	1.70	146.7	1.7	0.01036	0.14
B	73.8587	23.7121	15.3075	3.8028	4107	340	48.4	1.2	105.0	6.7	333.09	1.70	146.7	1.7	0.00585	0.08
C	16.8526	23.9414	3.4714	3.7864	4107	340	48.4	1.2	105.0	6.7	333.09	1.70	146.7	1.7	0.00434	0.06
D*	57.1964	23.9076	12.4878	3.7828	4107	340	48.4	1.2	105.0	6.7	333.09	1.70	146.7	1.7	0.03127	0.41
E*	61.1620	23.8556	3.1039	3.8400	4193	350	52.0	1.1	136.3	5.2	330.96	1.70	144.9	2.0	0.04910	0.64
F*	101.0682	24.7695	11.6801	4.0596	4193	350	52.0	1.1	136.3	5.2	330.96	1.70	144.9	2.0	0.09521	1.24
G*	62.2307	23.3120	-1.6073	3.7338	4193	350	52.0	1.1	136.3	5.2	330.96	1.70	144.9	2.0	0.10577	1.38
H*	64.4094	24.5475	6.3806	3.7281	4193	350	52.0	1.1	136.3	5.2	330.96	1.70	144.9	2.0	0.15778	2.06
I*	62.1171	24.2180	15.0451	3.5026	2515	380	52.4	1.2	103.9	7.4	330.53	1.70	137.1	1.7	0.10373	1.35
J*	193.4116	24.8438	43.6896	4.1936	2515	380	52.4	1.2	103.9	7.4	330.53	1.70	137.1	1.7	0.37303	4.87
K*	69.6798	24.6250	19.2932	3.6862	2515	380	52.4	1.2	103.9	7.4	330.53	1.70	137.1	1.7	0.15412	2.01
L*	638.9047	114.1921	62.9738	15.7228	2515	380	52.4	1.2	103.9	7.4	330.50	1.70	137.1	1.7	1.59078	20.76
M*	162.6507	25.1584	5.3519	3.7052	5496	360	68.5	1.5	105.5	6.5	333.69	1.70	144.9	1.8	0.19802	2.58
N*	166.6954	25.8415	10.7412	3.7530	5496	360	68.5	1.5	105.5	6.5	333.69	1.70	144.9	1.8	0.14450	1.89
O*	221.0339	25.9261	20.8329	3.9144	5496	360	68.5	1.5	105.5	6.5	333.69	1.70	144.9	1.8	0.22300	2.91
P*	123.3657	24.9581	13.9467	3.7863	5496	360	68.5	1.5	105.5	6.5	333.69	1.70	144.9	1.8	0.13650	1.78
Q*	69.7475	23.9577	22.1131	3.7738	4092	340	47.4	1.3	134.0	15.0	337.39	1.70	140.9	1.7	0.06674	0.87
R*	203.6480	26.0922	5.4887	3.7888	4092	340	47.4	1.3	134.0	15.0	337.39	1.70	140.9	1.7	0.23003	3.00
S*	343.1793	27.4338	31.1901	4.2437	4092	340	47.4	1.3	134.0	15.0	337.39	1.70	140.9	1.7	0.37739	4.93
T*	88.0541	24.7337	8.3997	3.8188	4092	340	47.4	1.3	134.0	15.0	337.39	1.70	140.9	1.7	0.36957	4.82
U*	174.9124	112.7824	-37.5693	16.0933	3801	360	50.5	1.4	119.8	5.2	332.50	1.70	149.3	1.9	0.96275	12.56
V*	9.6930	108.4941	-10.5726	16.7846	3801	360	50.5	1.4	119.8	5.2	332.50	1.70	149.3	1.9	1.12296	14.66
W*	-30.6739	111.5944	149.8170	18.7378	3801	360	50.5	1.4	119.8	5.2	332.50	1.70	149.3	1.9	1.14974	15.00
Bt: S89A (3280-01)																
A	-13.9023	18.7775	22.5118	1.9085	11448	330	17.6	0.8	40.8	3.4	165.98	1.20	63.6	1.1	0.00182	0.23
B	-20.7092	18.2284	63.2938	2.2269	11448	330	17.6	0.8	40.8	3.4	165.98	1.20	63.6	1.1	0.00607	0.78
C	-18.5675	19.3043	60.1371	2.3316	11448	330	17.6	0.8	40.8	3.4	165.98	1.20	63.6	1.1	0.02434	3.12
D	31.5713	18.5061	13.5567	1.9503	11095	420	19.5	0.8	14.0	10.0	163.25	1.30	61.4	1.0	0.03175	4.07
E	58.4900	19.7405	20.1481	2.1519	11095	420	19.5	0.8	14.0	10.0	163.25	1.30	61.4	1.0	0.06734	8.63

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Bt: S35C (3074-01)															
C*	37.5	5.6	0.0653	0.0009	0.0004	0.0017	0.0008	0.0171	8.E-08	0.0136	0.0002	69.65	0.34	69.54	0.34
D*	14.6	3.8	0.1441	0.0008	0.0003	0.0015	0.0005	0.0135	5.E-08	0.0130	0.0004	69.53	0.34	69.49	0.34
E*	23.0	7.6	0.1528	0.0013	0.0006	0.0025	0.0011	0.0101	1.E-07	0.0124	0.0003	69.73	0.34	69.66	0.34
F*	7.4	7.4	0.5097	0.0014	0.0005	0.0027	0.0010	0.0146	1.E-07	0.0132	0.0004	69.73	0.34	69.70	0.34
G*	8.7	8.0	0.5676	0.0018	0.0006	0.0035	0.0013	0.0033	1.E-07	0.0113	0.0007	69.61	0.34	69.59	0.34
H*	38.0	12.4	0.1163	0.0016	0.0009	0.0031	0.0017	0.0035	2.E-07	0.0114	0.0007	69.58	0.34	69.46	0.34
I*	9.2	6.3	0.1108	0.0004	0.0004	0.0007	0.0008	0.0125	9.E-08	0.0128	0.0003	69.59	0.33	69.56	0.33
J*	1.0	6.5	-0.7212	-0.0003	0.0004	-0.0005	0.0009	0.0059	9.E-08	0.0117	0.0002	69.38	0.33	69.37	0.33
K*	9.7	6.0	-0.0580	-0.0002	0.0004	-0.0004	0.0008	0.0204	8.E-08	0.0142	0.0005	69.40	0.33	69.37	0.33
L*	5.3	12.3	-0.1578	-0.0003	0.0009	-0.0006	0.0017	0.0241	2.E-07	0.0148	0.0006	69.49	0.34	69.47	0.34
M*	2.1	13.6	-2.0294	-0.0015	0.0010	-0.0030	0.0019	0.0136	2.E-07	0.0130	0.0010	69.70	0.34	69.69	0.34
N*	12.8	4.5	-0.0146	-0.0001	0.0003	-0.0001	0.0006	0.0085	6.E-08	0.0122	0.0003	69.48	0.33	69.43	0.33
O*	-155.0	141.1	0.4598	-0.0255	0.0098	-0.0501	0.0191	-0.0384	2.E-06	0.0039	0.0062	69.35	0.48	69.80	0.64
P*	17.0	150.5	0.0468	0.0003	0.0101	0.0006	0.0198	0.0002	2.E-06	0.0108	0.0056	70.35	0.48	70.29	0.66
Q	679.9	68.1	-0.0588	-0.0143	0.0046	-0.0281	0.0090	0.0277	9.E-07	0.0167	0.0014	69.91	0.38	67.87	0.43
Bt: S60A (3071-01)															
A	5837.9	604.2	0.0047	0.0098	0.0173	0.0192	0.0339	0.0754	3.E-06	0.0344	0.0196	36.51	0.82	19.08	1.96
B	4282.7	836.5	-0.0050	-0.0077	0.0253	-0.0151	0.0495	0.1295	5.E-06	0.0406	0.0283	42.14	1.11	29.36	2.72
C	1646.1	795.2	-0.0082	-0.0048	0.0260	-0.0095	0.0509	0.1513	5.E-06	0.0393	0.0274	32.15	1.19	27.24	2.65
D	846.2	82.1	0.0178	0.0054	0.0025	0.0106	0.0049	0.0572	5.E-07	0.0219	0.0023	65.01	0.30	62.48	0.39
E	252.2	47.8	0.0239	0.0022	0.0016	0.0042	0.0032	0.0109	3.E-07	0.0130	0.0011	69.34	0.28	68.59	0.32
F	149.2	20.2	0.0249	0.0013	0.0007	0.0026	0.0013	0.0002	1.E-07	0.0110	0.0009	67.85	0.26	67.40	0.27
G*	125.3	12.8	0.0043	0.0002	0.0004	0.0004	0.0008	0.0143	8.E-08	0.0133	0.0004	67.12	0.25	66.74	0.25
H*	67.8	5.2	-0.0042	-0.0001	0.0002	-0.0002	0.0003	0.0140	3.E-08	0.0132	0.0003	66.65	0.24	66.45	0.24
I*	-92.2	117.4	0.0479	-0.0016	0.0041	-0.0031	0.0080	0.0167	8.E-07	0.0133	0.0036	65.38	0.34	65.65	0.49
J*	64.7	5.6	0.0133	0.0003	0.0002	0.0006	0.0004	0.0171	4.E-08	0.0137	0.0004	66.88	0.24	66.69	0.24
K	54.1	5.9	-0.0067	-0.0001	0.0002	-0.0003	0.0004	0.0140	4.E-08	0.0132	0.0002	67.43	0.24	67.27	0.24
L	74.6	19.2	0.0292	0.0008	0.0007	0.0015	0.0013	0.0134	1.E-07	0.0131	0.0006	67.14	0.25	66.92	0.26
M	33.2	7.2	0.0222	0.0003	0.0003	0.0005	0.0005	0.0136	5.E-08	0.0131	0.0004	67.33	0.24	67.23	0.24
N	25.2	7.1	0.0098	0.0001	0.0002	0.0002	0.0005	0.0216	5.E-08	0.0144	0.0003	67.18	0.24	67.10	0.24
O	23.0	9.3	0.0131	0.0001	0.0004	0.0002	0.0007	0.0207	7.E-08	0.0142	0.0006	66.54	0.24	66.47	0.24
P	19.3	5.4	-0.0319	-0.0002	0.0002	-0.0004	0.0004	0.0180	4.E-08	0.0138	0.0003	66.29	0.24	66.23	0.24
Q	4866.9	79.0	0.0059	0.0103	0.0012	0.0201	0.0024	0.0855	2.E-07	0.0343	0.0048	68.33	0.27	53.80	0.35
Bt: S60A (3071-02)															
A	5900.2	295.1	0.0042	0.0089	0.0083	0.0174	0.0163	0.1135	2.E-06	0.0410	0.0113	41.89	0.41	24.27	0.96
B	161.1	33.0	0.0629	0.0036	0.0012	0.0071	0.0024	0.0325	2.E-07	0.0165	0.0007	59.55	0.23	59.07	0.25
C	-13.8	26.9	0.1556	-0.0008	0.0009	-0.0015	0.0018	0.0512	2.E-07	0.0193	0.0015	65.66	0.25	65.69	0.26
D	-15.7	21.7	-0.0779	0.0004	0.0008	0.0009	0.0016	-0.0087	2.E-07	0.0092	0.0017	65.68	0.25	65.72	0.26
E*	-22.5	13.1	0.0565	-0.0005	0.0005	-0.0009	0.0009	0.0234	9.E-08	0.0146	0.0006	66.54	0.24	66.60	0.25
F*	0.9	5.1	1.4552	0.0005	0.0002	0.0009	0.0003	0.0249	3.E-08	0.0149	0.0003	66.77	0.24	66.76	0.24
G*	54.3	67.4	0.0085	0.0002	0.0023	0.0003	0.0045	0.0289	5.E-07	0.0157	0.0021	66.95	0.29	66.79	0.35
H*	731.9	65.1	0.0090	0.0024	0.0020	0.0046	0.0039	0.0514	4.E-07	0.0207	0.0018	69.73	0.30	67.54	0.36
I*	60.7	42.8	-0.1645	-0.0036	0.0014	-0.0070	0.0027	0.0366	3.E-07	0.0170	0.0021	67.17	0.27	66.99	0.30
J*	1.1	27.3	-8.4375	-0.0033	0.0009	-0.0065	0.0018	0.0254	2.E-07	0.0150	0.0011	67.10	0.26	67.09	0.27
K*	-5.4	28.3	0.6621	-0.0013	0.0009	-0.0025	0.0018	0.0177	2.E-07	0.0137	0.0008	67.03	0.26	67.04	0.27
L*	9.0	5.7	-0.1564	-0.0005	0.0002	-0.0010	0.0004	0.0250	4.E-08	0.0149	0.0002	67.04	0.24	67.02	0.24
M*	24.4	10.8	-0.0199	-0.0002	0.0004	-0.0003	0.0008	0.0151	8.E-08	0.0133	0.0006	67.43	0.24	67.35	0.24
N*	-1.8	12.6	-0.1881	0.0001	0.0005	0.0002	0.0009	0.0293	9.E-08	0.0156	0.0009	67.10	0.24	67.10	0.25
O*	-3.6	19.6	0.5742	-0.0007	0.0006	-0.0015	0.0013	0.0091	1.E-07	0.0122	0.0010	66.53	0.25	66.54	0.25
P*	4.5	33.8	0.4504	0.0007	0.0012	0.0014	0.0023	-0.0019	2.E-07	0.0104	0.0016	67.39	0.26	67.37	0.28
Q*	-4.9	19.6	-0.2777	0.0005	0.0008	0.0010	0.0015	0.0298	2.E-07	0.0157	0.0006	66.63	0.57	66.64	0.57
Bt: S74A (3075-01)															
A	5469.0	190.0	0.0332	0.0651	0.0087	0.1275	0.0170	0.0400	2.E-06	0.0278	0.0032	42.77	0.29	26.45	0.63
B	923.0	229.3	0.1346	0.0445	0.0143	0.0873	0.0280	0.0605	3.E-06	0.0226	0.0075	77.80	0.55	75.04	0.87
C	282.0	307.6	0.1354	0.0137	0.0195	0.0268	0.0381	-0.0225	4.E-06	0.0074	0.0082	74.45	0.64	73.60	1.12
D*	140.8	42.7	0.1278	0.0064	0.0027	0.0126	0.0053	0.0083	5.E-07	0.0124	0.0011	73.81	0.35	73.39	0.37
E*	22.3	27.6	0.5498	0.0044	0.0017	0.0086	0.0034	-0.0109	3.E-07	0.0089	0.0008	73.13	0.33	73.06	0.34
F*	43.3	15.0	0.2414	0.0037	0.0009	0.0073	0.0018	-0.0010	2.E-07	0.0106	0.0006	72.81	0.32	72.68	0.32
G*	-5.4	12.5	-1.0802	0.0021	0.0008	0.0041	0.0015	0.0091	2.E-07	0.0122	0.0007	72.45	0.31	72.46	0.32
H*	14.3	8.3	0.2816	0.0014	0.0005	0.0028	0.0011	0.0063	1.E-07	0.0118	0.0005	72.21	0.31	72.17	0.31
I*	51.1	11.9	0.1152	0.0021	0.0008	0.0041	0.0016	0.0167	2.E-07	0.0136	0.0003	72.50	0.31	72.34	0.32
J*	41.3	4.0	0.1235	0.0018	0.0002	0.0036	0.0005	0.0123	5.E-08	0.0129	0.0002	72.41	0.31	72.29	0.31
K*	44.1	8.4	0.1008	0.0016	0.0006	0.0031	0.0011	0.0158	1.E-07	0.0135	0.0003	72.24	0.31	72.11	0.31
L*	14.0	3.5	0.2831	0.0014	0.0003	0.0028	0.0005	0.0100	5.E-08	0.0124	0.0002	72.34	0.31	72.30	0.31
M*	9.5	6.6	0.8479	0.0029	0.0004	0.0057	0.0009	0.0119	9.E-08	0.0127	0.0003	72.36	0.31	72.33	0.31
N*	26.2	9.2	0.4330	0.0041	0.0006	0.0080	0.0012	0.0129	1.E-07	0.0129	0.0003	72.36	0.31	72.28	0.32
O*	32.9	6.2	0.2960	0.0035	0.0004	0.0068	0.0008	0.0103	8.E-08	0.0125	0.0003	72.47	0.31	72.37	0.31
P*	36.0	9.8	0.2468	0.0032	0.0006	0.0062	0.0013	0.0148	1.E-07	0.0133	0.0003	72.16	0.31	72.05	0.32
Q*	116.8	19.9	0.0880	0.0037	0.0013	0.0072	0.0025	-0.0063	3.E-07	0.0099	0.0010	72.03	0.32	71.68	0.33
R*	8.4	5.8	1.0352	0.0031	0.0004	0.0061	0.0008	0.0079	8.E-08	0.0120	0.0003	72.22	0.31	72.20	0.31
S*	29.1	4.0	0.3070	0.0032	0.0003	0.0063	0.0005	0.0104	5.E-08	0.0125	0.0003	72.13	0.31	72.04	0.31
T*	8.0	3.6	0.2925	0.0008	0.0002	0.0016	0.0005	0.0093	5.E-08	0.0123	0.0002	72.19	0.31	72.17	0.31
U*	-13.8	5.9	-0.1299	0.0006	0.0004	0.0013	0.0008	0.0086	8.E-08	0.0121	0.0003	72.37	0.32	72.41	0.32
V*	-3.3	5.3	-0.0256	0.0000	0.0003	0.0001	0.0007	0.0104	7.E-08	0.0125	0.0003	72.28	0.31	72.29	0.31
W*	45.9	5.8	-0.0057	-0.0001	0.0003	-0.0002	0.0007	0.0111	7.E-08	0.0127	0.0003	71.89	0.31	71.75	0.31
Bt: S89A (3280-01)															
A	4369.6	372.1	-0.0172	-0.0270	0.0364	-0.0529	0.0714	-0.0339	7.E-06	0.0132	0.0116	43.56	1.04	30.51	1.50
B	3673.7	130.1	-0.0091	-0.0120	0.0106	-0.0236	0.0207	0.0053	2.E-06	0.0185	0.0040	65.17	0.41	54.20	0.55
C	871.1	33.8	-0.0086	-0.0027	0.0028	-0.0053	0.0055	0.0131	6.E-07	0.0145	0.0015	78.73	0.20	76.12	0.22
D	150.6	21.7	0.0650	0.0035	0.0021	0.0069	0.0040	0.0402	4.E-07	0.0178	0.0013	77.68	0.16	77.23	0.18
E	105.5	11.3	0.0810	0.0031	0.0010	0.0060	0.0020	0.0295	2.E-07	0.0159	0.0010	77.12	0.11	76.81	0.11

Sample No.[a]	Derived Results				Inverse Isochron Data				
	%^{40}Ar*	Age (Ma)		w/±J	^{36}Ar/^{40}Ar		^{39}Ar/^{40}Ar		^{36}Ar/^{39}Ar
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Bt: S35C (3074-01)									
C*	99.84	1646	5	6	0.00001	14.83443	0.01436	0.48472	0.03201
D*	99.94	1645	5	6	0.00000	26.29234	0.01438	0.48208	0.01805
E*	99.90	1648	5	6	0.00000	33.00502	0.01434	0.48392	0.01428
F*	99.97	1649	5	6	0.00000	101.13940	0.01434	0.48243	0.00466
G*	99.96	1647	5	6	0.00000	91.90331	0.01437	0.48419	0.00511
H*	99.84	1645	5	6	0.00001	32.73785	0.01437	0.48563	0.01431
I*	99.96	1646	5	6	0.00000	68.52411	0.01437	0.47931	0.00685
J*	100.00	1643	5	6	0.00000	656.36690	0.01441	0.48016	0.00071
K*	99.96	1643	5	6	0.00000	62.88833	0.01441	0.47880	0.00745
L*	99.98	1645	5	6	0.00000	238.77870	0.01439	0.48288	0.00195
M*	99.99	1648	5	6	0.00000	653.01950	0.01435	0.48685	0.00071
N*	99.95	1644	5	6	0.00000	35.01445	0.01439	0.47514	0.01336
O*	100.66	1650	10	10	-0.00002	-91.51661	0.01442	0.69928	0.00526
P*	99.93	1658	10	10	0.00000	886.43820	0.01422	0.68834	0.00057
Q	97.10	1620	7	7	0.00010	10.01448	0.01431	0.54753	0.04445
Bt: S60A (3071-01)									
A	52.26	627	54	54	0.00160	10.53828	0.02739	2.24106	0.18935
B	69.66	891	65	65	0.00102	19.67543	0.02373	2.63010	0.12025
C	84.72	840	65	65	0.00051	48.44977	0.03111	3.70505	0.07292
D	96.12	1549	6	7	0.00013	9.71339	0.01538	0.46773	0.03411
E	98.91	1648	5	5	0.00004	18.96131	0.01442	0.40838	0.01818
F	99.34	1629	4	5	0.00002	13.56568	0.01474	0.38332	0.02512
G*	99.44	1618	4	4	0.00002	10.19419	0.01490	0.37375	0.03380
H*	99.70	1614	4	4	0.00001	7.63796	0.01500	0.36187	0.04603
I*	100.42	1601	8	8	-0.00001	-127.29370	0.01530	0.52416	0.00275
J*	99.71	1617	4	4	0.00001	8.72505	0.01495	0.36042	0.03998
K	99.76	1627	4	4	0.00001	10.95746	0.01483	0.35895	0.03186
L	99.67	1621	4	5	0.00001	25.77903	0.01489	0.37421	0.01315
M	99.85	1626	4	4	0.00000	21.73521	0.01485	0.35959	0.01589
N	99.89	1624	4	4	0.00000	28.19609	0.01489	0.36154	0.01214
O	99.90	1614	4	4	0.00000	40.77989	0.01503	0.36285	0.00836
P	99.91	1610	4	4	0.00000	28.23163	0.01509	0.35657	0.01221
Q	78.74	1398	6	7	0.00071	1.65240	0.01464	0.39913	0.19456
Bt: S60A (3071-02)									
A	57.95	765	25	25	0.00141	5.06034	0.02387	0.97309	0.15521
B	99.19	1491	4	5	0.00003	20.51108	0.01679	0.38906	0.01624
C	100.06	1601	4	5	0.00000	-192.66790	0.01523	0.37668	0.00173
D	100.07	1602	4	5	0.00000	-138.39540	0.01523	0.37723	0.00238
E*	100.10	1616	4	4	0.00000	-58.05322	0.01503	0.36450	0.00574
F*	100.00	1619	4	4	0.00000	634.36240	0.01498	0.35234	0.00054
G*	99.76	1619	6	6	0.00001	124.30130	0.01494	0.43037	0.00264
H*	96.87	1631	6	6	0.00010	8.90902	0.01434	0.43017	0.03552
I*	99.73	1622	5	5	0.00001	70.57174	0.01489	0.40572	0.00448
J*	100.00	1624	4	5	0.00000	2463.88200	0.01490	0.38300	0.00013
K*	100.02	1623	4	5	0.00000	-520.84080	0.01492	0.38065	0.00062
L*	99.96	1623	4	4	0.00000	63.85972	0.01492	0.35053	0.00532
M*	99.89	1628	4	4	0.00000	44.46325	0.01483	0.35979	0.00747
N*	100.01	1624	4	4	0.00000	-659.88630	0.01490	0.36356	0.00050
O*	100.02	1615	4	4	0.00000	-539.50360	0.01503	0.36837	0.00061
P*	99.98	1628	4	5	0.00000	755.28460	0.01484	0.38894	0.00043
Q*	100.02	1617	9	9	0.00000	-393.55200	0.01501	0.85224	0.00116
Bt: S74A (3075-01)									
A	61.84	810	15	16	0.00128	3.51711	0.02338	0.67013	0.15788
B	96.46	1730	13	13	0.00012	24.88984	0.01285	0.70533	0.01983
C	98.87	1708	17	17	0.00004	109.20090	0.01343	0.85500	0.00546
D*	99.43	1705	6	6	0.00002	30.34097	0.01355	0.47025	0.01310
E*	99.91	1700	5	5	0.00000	124.19840	0.01367	0.45076	0.00325
F*	99.82	1695	5	5	0.00001	34.84137	0.01373	0.43368	0.01187
G*	100.02	1691	5	5	0.00000	-228.52620	0.01380	0.43433	0.00181
H*	99.94	1687	5	5	0.00000	58.68566	0.01385	0.43076	0.00708
I*	99.79	1689	5	5	0.00001	23.33841	0.01379	0.43436	0.01774
J*	99.83	1689	5	5	0.00001	9.62985	0.01381	0.42600	0.04363
K*	99.82	1686	5	5	0.00001	19.15406	0.01384	0.43096	0.02177
L*	99.94	1689	5	5	0.00000	25.10375	0.01382	0.42770	0.01672
M*	99.96	1689	5	5	0.00000	70.12552	0.01382	0.43022	0.00599
N*	99.89	1688	5	5	0.00000	35.15498	0.01382	0.43374	0.01189
O*	99.86	1690	5	5	0.00000	18.87077	0.01380	0.43067	0.02229
P*	99.85	1685	5	5	0.00000	27.25841	0.01386	0.43556	0.01533
Q*	99.52	1679	5	5	0.00002	17.08403	0.01388	0.44981	0.02402
R*	99.97	1687	5	5	0.00000	69.98040	0.01385	0.43317	0.00602
S*	99.88	1685	5	5	0.00000	13.67165	0.01386	0.42992	0.03109
T*	99.97	1687	5	5	0.00000	45.78090	0.01385	0.43157	0.00927
U*	100.06	1690	5	5	0.00000	-42.69437	0.01382	0.43529	0.00992
V*	100.01	1689	5	5	0.00000	-157.04950	0.01384	0.43482	0.00271
W*	99.81	1680	5	5	0.00001	12.52460	0.01391	0.43523	0.03400
Bt: S89A (3280-01)									
A	70.04	903	35	35	0.00100	8.77248	0.02296	2.39546	0.24287
B	83.17	1384	10	10	0.00056	3.55117	0.01535	0.63421	0.10325
C	96.70	1738	3	4	0.00011	3.87908	0.01270	0.24791	0.01390
D	99.42	1754	3	4	0.00002	14.41418	0.01287	0.21039	0.00366
E	99.59	1748	2	4	0.00001	10.70333	0.01297	0.13849	0.00342

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Bt: S89A (3280-01)										
F	68b	0.40	21.285	0.060	1481471	1019	19314.33	22.69	291.8510	15.9786
G	68b	0.45	21.285	0.060	1171944	890	15266.31	21.43	257.4215	11.4930
H	68b	0.50	21.285	0.060	1245332	941	16131.29	20.19	211.5995	12.0150
I	68b	0.55	21.285	0.060	382856	582	4994.55	12.27	59.6190	6.9347
J	68b	0.60	21.285	0.060	341507	571	4443.78	10.89	43.0903	5.8582
K	68b	0.70	21.285	0.060	1217564	1035	15769.22	22.70	197.4627	11.4234
L	68b	0.80	21.285	0.060	1588301	1307	20711.38	23.95	240.4397	22.8841
M	68b	0.90	21.285	0.060	1908025	1460	25046.77	27.73	322.8312	11.7729
N	68b	1.00	21.285	0.060	1161708	935	15282.81	21.43	202.6869	9.6120
O	68b	1.10	21.285	0.060	835096	745	10950.57	18.92	117.5637	7.0610
P	68b	1.20	21.285	0.060	722213	720	9496.66	16.40	126.9169	10.5465
Q	68b	1.50	21.285	0.060	724713	715	9564.19	15.14	131.5872	9.7656
R	68b	1.70	21.285	0.060	159125	554	2098.67	7.11	28.6514	5.6564
S	68b	2.00	21.285	0.060	226026	564	2959.43	9.11	45.3059	8.3682
T	68b	3.00	21.285	0.060	183762	547	2426.78	8.97	17.8882	5.9975
U	68b	5.00	21.285	0.060	740118	793	9668.02	17.65	115.8013	6.5832
Bt: S89A (3280-02)										
A	68b	0.25	21.285	0.060	113659	538	1710.66	6.27	45.5451	7.8956
B	68b	0.30	21.285	0.060	196543	565	2640.02	9.01	55.3641	6.6013
C	68b	0.35	21.285	0.060	623884	757	8190.84	16.40	89.9949	11.6943
D	68b	0.40	21.285	0.060	5312356	4267	69901.14	52.92	879.3043	18.0945
E*	68b	0.45	21.285	0.060	1838197	1482	24079.51	26.47	316.3481	15.6527
F*	68b	0.50	21.285	0.060	1704664	1325	22345.63	22.70	353.2323	25.5086
G*	68b	0.55	21.285	0.060	1234103	989	16183.00	21.45	201.2266	10.1204
H*	68b	0.60	21.285	0.060	1205735	1006	15845.09	21.45	206.6774	9.5276
I*	68b	0.70	21.285	0.060	1056596	934	13856.46	20.19	181.1480	11.4383
J*	68b	0.80	21.285	0.060	334771	595	4415.44	11.14	55.7795	7.7837
K*	68b	0.90	21.285	0.060	144173	513	1892.01	7.36	38.4452	7.8873
L*	68b	1.00	21.285	0.060	82772	504	1075.95	5.62	2.0393	12.0368
M*	68b	1.20	21.285	0.060	278451	571	3643.41	11.00	61.5072	6.5927
N*	68b	1.50	21.285	0.060	112108	513	1476.45	7.24	23.8929	6.4995
O*	68b	1.70	21.285	0.060	83765	531	1123.80	6.24	28.4122	5.1446
P*	68b	2.00	21.285	0.060	122814	500	1617.11	6.74	45.3311	6.5062
Q*	68b	3.00	21.285	0.060	393288	602	5127.09	12.13	58.6245	17.9120
R	68b	5.00	21.285	0.060	90292	504	1177.27	5.61	20.7836	5.3441
S	68b	7.00	21.285	0.060	816	528	20.91	1.65	8.9882	5.3441
Bt: S92C (3067-01)										
A	64a	0.20	21.908	0.046	92804	557	1799.40	6.39	62.0737	13.2026
B	64a	0.30	21.908	0.046	835496	1526	13060.55	20.19	218.2840	18.6868
C	64a	0.40	21.908	0.046	1886441	3250	27833.07	26.48	386.2141	17.6847
D	64a	0.50	21.908	0.046	2633215	4515	38142.84	31.52	482.7928	21.5632
E*	64a	0.60	21.908	0.046	1685824	2917	24293.95	26.48	324.3922	13.4911
F*	64a	0.70	21.908	0.046	1601304	2786	23157.30	27.74	310.2427	11.9891
G*	64a	0.70	21.908	0.046	991312	1772	14382.49	20.19	169.5163	14.5425
H*	64a	0.80	21.908	0.046	2391740	4104	34481.62	28.99	423.5389	15.7910
I*	64a	0.90	21.908	0.046	2254414	3876	32593.79	28.99	530.6668	20.6602
J*	64a	1.00	21.908	0.046	1210142	2127	17507.71	21.44	224.2635	13.4026
K*	64a	1.10	21.908	0.046	821146	1493	11874.80	20.19	160.5785	9.0596
L*	64a	1.20	21.908	0.046	494620	980	7136.51	13.90	112.9689	13.3516
M*	64a	1.30	21.908	0.046	403104	866	5826.89	12.02	69.8030	10.6587
N	64a	1.50	21.908	0.046	853588	1550	12239.95	17.67	173.3054	8.6816
O	64a	1.70	21.908	0.046	457116	962	6630.83	11.77	103.0995	11.7614
P	64a	2.00	21.908	0.046	1466127	2560	20942.33	23.96	331.3662	25.8364
Q	64a	5.00	21.908	0.046	1997872	3471	28158.61	27.73	331.6180	20.9600
Bt: S105A (3084-01)										
A	64c	0.20	22.236	0.050	379829	1781	8336.38	15.16	164.4935	17.7993
B*	64c	0.40	22.236	0.050	91930480	410872	1328506.00	983.12	17593.3300	625.2886
C*	64c	0.40	22.236	0.050	18872800	84131	270462.70	214.41	3747.9870	122.6432
D*	64c	0.50	22.236	0.050	17607820	78316	251525.30	171.53	3763.2930	147.0985
E*	64c	0.60	22.236	0.050	16773860	74341	238892.70	177.66	2906.1900	98.2188
F*	64c	0.70	22.236	0.050	43370920	191450	621502.00	287.92	8092.2730	140.9937
G*	64c	0.70	22.236	0.050	7322301	32256	104786.80	55.45	1329.5560	16.7343
H*	64c	0.80	22.236	0.050	30051700	132135	430233.30	257.29	5526.4750	86.0121
I*	64c	0.80	22.236	0.050	7453614	32623	106675.00	55.44	1465.4480	29.3992
J*	64c	0.90	22.236	0.050	9616220	41996	137932.00	71.81	1775.1250	29.3992
K*	64c	1.00	22.236	0.050	8827215	38487	126335.20	60.47	1624.4410	21.9997
L*	64c	1.10	22.236	0.050	3885662	16930	55525.26	37.81	727.7644	13.5823
M*	64c	1.30	22.236	0.050	3395956	14743	48473.42	41.60	561.6344	35.8788
N*	64c	1.50	22.236	0.050	910666	3988	12949.83	18.96	156.2858	14.2604
O*	64c	1.70	22.236	0.050	477690	2166	6787.37	20.22	88.8997	12.3063
P*	64c	2.00	22.236	0.050	694388	3060	9850.09	17.71	133.3622	13.4889
Q*	64c	2.50	22.236	0.050	584495	2586	8307.26	15.17	161.0820	31.0817
R*	64c	5.00	22.236	0.050	851274	3720	12086.06	17.68	185.3022	12.5404
Bt: S105A (3084-02)										
A	64c	0.20	22.236	0.050	11299	497	185.72	2.91	37.1737	10.6722
B	64c	0.30	22.236	0.050	30616	478	587.77	5.06	58.1084	10.8431
C	64c	0.35	22.236	0.050	44010	473	618.90	4.75	23.9307	9.8070
D	64c	0.40	22.236	0.050	85894	477	1336.87	5.99	19.3233	10.5113
E	64c	0.45	22.236	0.050	134475	531	1981.43	8.12	27.2792	9.8070
F	64c	0.50	22.236	0.050	312470	565	4541.83	11.13	68.5568	10.6140
G	64c	0.60	22.236	0.050	918640	957	13214.90	17.67	173.0536	12.7591

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Bt: S89A (3280-01)																
F	59.7839	19.5166	12.3869	1.8445	11095	420	19.5	0.8	14.0	10.0	163.25	1.30	61.4	1.0	0.06810	8.72
G	35.2413	19.3121	10.5511	1.8416	11095	420	19.5	0.8	14.0	10.0	163.25	1.30	61.4	1.0	0.05382	6.90
H	-1.2971	17.7800	14.3160	1.8957	12475	350	32.2	1.1	39.5	4.0	166.26	1.20	57.0	1.1	0.05687	7.29
I	-25.7239	17.7345	6.7512	1.8001	12475	350	32.2	1.1	39.5	4.0	166.26	1.20	57.0	1.1	0.01761	2.26
J	-30.6940	16.9897	6.1979	1.8009	12475	350	32.2	1.1	39.5	4.0	166.26	1.20	57.0	1.1	0.01567	2.01
K	-16.2107	17.8652	13.3905	1.9943	12475	350	32.2	1.1	39.5	4.0	166.26	1.20	57.0	1.1	0.05560	7.12
L	17.4068	17.3533	8.3279	1.8980	10306	340	19.5	0.8	45.9	3.2	164.16	1.10	60.7	1.1	0.07302	9.36
M	18.6013	18.0578	3.5656	1.9895	10306	340	19.5	0.8	45.9	3.2	164.16	1.10	60.7	1.1	0.08831	11.31
N	-10.4932	16.3166	0.7624	1.9873	10306	340	19.5	0.8	45.9	3.2	164.16	1.10	60.7	1.1	0.05388	6.90
O	18.0708	17.9454	3.9759	1.8918	10306	340	19.5	0.8	45.9	3.2	164.16	1.10	60.7	1.1	0.03861	4.95
P	46.1226	17.6973	2.8380	1.8605	11635	390	22.4	0.9	40.4	4.7	161.24	1.20	58.2	1.2	0.03348	4.29
Q	20.0355	17.7647	7.8219	1.9534	11635	390	22.4	0.9	40.4	4.7	161.24	1.20	58.2	1.2	0.03372	4.32
R	23.5077	17.9000	2.8026	1.8632	11635	390	22.4	0.9	40.4	4.7	161.24	1.20	58.2	1.2	0.00740	0.95
S	21.5638	17.3062	3.2364	1.8656	11635	390	22.4	0.9	40.4	4.7	161.24	1.20	58.2	1.2	0.01043	1.34
T	-16.1450	18.1431	-1.1723	1.9554	11739	360	18.8	0.7	52.9	2.3	166.78	1.20	61.8	1.2	0.00856	1.10
U	-46.3611	18.7583	1.7699	1.9540	11739	360	18.8	0.7	52.9	2.3	166.78	1.20	61.8	1.2	0.03409	4.37
Bt: S89A (3280-02)																
A	17.0110	19.6782	10.2813	2.1981	10948	340	21.6	1.1	28.1	5.5	148.69	1.00	59.2	1.3	0.00603	0.87
B	-9.4235	18.8057	-0.6568	1.9273	10948	340	21.6	1.1	28.1	5.5	148.69	1.00	59.2	1.3	0.00931	1.34
C	58.6898	18.5561	5.2022	2.0490	9977	360	18.5	0.9	41.1	4.1	147.84	1.10	60.5	1.2	0.02888	4.17
D	57.6216	20.2935	13.4592	2.0504	9977	360	18.5	0.9	41.1	4.1	147.84	1.10	60.5	1.2	0.24645	35.61
E*	47.2291	18.3387	-4.0171	1.9512	9977	360	18.5	0.9	41.1	4.1	147.84	1.10	60.5	1.2	0.08490	12.27
F*	30.3184	19.2102	0.3407	1.8619	9977	360	18.5	0.9	41.1	4.1	147.84	1.10	60.5	1.2	0.07878	11.38
G*	15.9762	18.3267	3.6190	1.8941	11085	380	28.8	1.1	35.6	3.3	148.20	1.10	57.4	1.1	0.05706	8.24
H*	-6.3943	20.2693	6.1813	1.8035	11085	380	28.8	1.1	35.6	3.3	148.20	1.10	57.4	1.1	0.05586	8.07
I*	-19.5634	18.5023	-0.9637	1.8029	11085	380	28.8	1.1	35.6	3.3	148.20	1.10	57.4	1.1	0.04885	7.06
J*	43.4592	19.6472	0.1411	1.8061	11085	380	28.8	1.1	35.6	3.3	148.20	1.10	57.4	1.1	0.01557	2.25
K*	-28.7117	19.6030	-2.0459	1.9002	9738	340	17.3	0.9	36.6	4.4	147.58	1.10	58.5	1.1	0.00667	0.96
L*	22.1773	19.4933	-1.8225	1.8047	9738	340	17.3	0.9	36.6	4.4	147.58	1.10	58.5	1.1	0.00379	0.55
M*	7.1449	18.4124	-0.9642	1.8032	9738	340	17.3	0.9	36.6	4.4	147.58	1.10	58.5	1.1	0.01285	1.86
N*	14.5341	19.2261	0.5056	1.8025	9738	340	17.3	0.9	36.6	4.4	147.58	1.10	58.5	1.1	0.00521	0.75
O*	8.7425	18.1446	-0.6233	1.9538	11001	350	18.2	0.9	28.3	3.2	149.28	1.10	56.6	1.2	0.00396	0.57
P*	-26.1004	18.0836	1.8582	1.6934	11001	350	18.2	0.9	28.3	3.2	149.28	1.10	56.6	1.2	0.00570	0.82
Q*	-4.3084	19.0221	1.9994	1.7782	11001	350	18.2	0.9	28.3	3.2	149.28	1.10	56.6	1.2	0.01808	2.61
R	-14.1539	19.0312	-1.8465	1.8655	11001	350	18.2	0.9	28.3	3.2	149.28	1.10	56.6	1.2	0.00415	0.60
S	-23.9965	19.0661	-2.4935	1.7798	11001	350	18.2	0.9	28.3	3.2	149.28	1.10	56.6	1.2	0.00007	0.01
Bt: S92C (3067-01)																
A	-6.9330	19.6887	1.6132	3.0222	4446	350	43.6	1.1	70.2	11.0	407.29	1.70	122.1	1.8	0.00634	0.56
B	-26.2811	21.0569	18.2811	2.9928	4446	350	43.6	1.1	70.2	11.0	407.29	1.70	122.1	1.8	0.04605	4.08
C	-12.1581	19.6946	7.2984	2.7948	4446	350	43.6	1.1	70.2	11.0	407.29	1.70	122.1	1.8	0.09813	8.70
D	8.1367	19.9557	3.8611	3.1775	6541	370	50.9	1.2	95.5	7.7	403.37	1.90	128.6	1.7	0.13448	11.92
E*	39.9193	19.9621	-1.8004	3.0685	6541	370	50.9	1.2	95.5	7.7	403.37	1.90	128.6	1.7	0.08565	7.59
F*	22.5333	19.9638	-1.7261	2.8931	6541	370	50.9	1.2	95.5	7.7	403.37	1.90	128.6	1.7	0.08164	7.24
G*	35.0482	21.2511	-1.9499	2.9793	6541	370	50.9	1.2	95.5	7.7	403.37	1.90	128.6	1.7	0.05071	4.49
H*	-12.9440	19.9748	4.7827	3.0339	4813	340	49.4	1.1	95.4	4.6	408.20	1.90	122.1	1.8	0.12157	10.77
I*	-58.7294	21.2575	7.2060	3.0420	4813	340	49.4	1.1	95.4	4.6	408.20	1.90	122.1	1.8	0.11491	10.18
J*	-42.7898	21.2627	3.0567	3.0292	4813	340	49.4	1.1	95.4	4.6	408.20	1.90	122.1	1.8	0.06173	5.47
K*	-47.8572	20.6162	-1.6404	2.9292	4813	340	49.4	1.1	95.4	4.6	408.20	1.90	122.1	1.8	0.04187	3.71
L*	-62.5443	19.5216	3.9652	2.9616	4623	350	43.0	1.1	91.6	5.4	409.77	1.80	122.9	1.5	0.02516	2.23
M*	-42.9906	20.1763	1.4421	2.9540	4623	350	43.0	1.1	91.6	5.4	409.77	1.80	122.9	1.5	0.02054	1.82
N	-25.4897	21.5238	-6.6020	3.0252	4623	350	43.0	1.1	91.6	5.4	409.77	1.80	122.9	1.5	0.04315	3.82
O	-42.9191	19.5342	7.4981	2.7927	4623	350	43.0	1.1	91.6	5.4	409.77	1.80	122.9	1.5	0.02338	2.07
P	-26.7905	21.2917	52.3374	2.9873	4740	320	40.1	1.0	95.4	5.8	404.52	1.90	121.0	1.7	0.07384	6.54
Q	21.8140	22.6429	99.8488	3.8694	4740	320	40.1	1.0	95.4	5.8	404.52	1.90	121.0	1.7	0.09928	8.80
Bt: S105A (3084-01)																
A	95.7824	24.5852	94.6175	4.9038	3561	340	46.0	1.1	89.9	7.0	330.81	1.50	145.0	1.8	0.02939	0.22
B*	609.1244	544.9848	381.6290	83.5720	3561	340	46.0	1.1	89.9	7.0	330.80	1.50	145.0	1.8	4.68384	35.15
C*	118.4182	117.1903	43.0758	16.9225	3561	340	46.0	1.1	89.9	7.0	330.80	1.50	145.0	1.8	0.95355	7.16
D*	281.8692	112.9440	43.9114	16.9117	3561	340	46.0	1.1	89.9	7.0	330.80	1.50	145.0	1.8	0.88679	6.66
E*	187.5747	112.0308	21.6012	15.5097	7209	350	103.3	1.6	121.4	7.2	332.00	1.50	145.8	1.9	0.84225	6.32
F*	255.7749	115.6685	25.2326	15.9215	7209	350	103.3	1.6	121.4	7.2	332.00	1.50	145.8	1.9	2.19119	16.45
G*	23.9286	24.7390	18.0869	3.9412	7209	350	103.3	1.6	121.4	7.2	332.01	1.50	145.8	1.9	0.36944	2.77
H*	219.1631	111.5436	38.3293	16.4182	7209	350	103.3	1.6	121.4	7.2	332.00	1.50	145.8	1.9	1.51685	11.38
I*	-4.0730	23.8465	-3.5984	3.7294	5447	350	62.0	1.2	118.4	5.1	336.78	1.60	153.5	1.5	0.37610	2.82
J*	11.5219	25.5983	7.8827	3.9026	5447	350	62.0	1.2	118.4	5.1	336.78	1.60	153.5	1.5	0.48630	3.65
K*	26.4105	24.6123	1.0894	3.7636	5447	350	62.0	1.2	118.4	5.1	336.78	1.60	153.5	1.5	0.44541	3.34
L*	-26.4637	23.8858	2.4850	3.7729	5447	350	62.0	1.2	118.4	5.1	336.78	1.60	153.5	1.5	0.19576	1.47
M*	28.0863	24.7074	10.7124	3.9994	3365	350	55.9	1.6	111.3	6.7	336.95	1.70	141.9	2.1	0.17090	1.28
N*	73.8897	24.9852	4.5178	3.8044	3365	350	55.9	1.6	111.3	6.7	336.95	1.70	141.9	2.1	0.04566	0.34
O*	-36.0286	24.8992	8.6443	4.7386	3365	350	55.9	1.6	111.3	6.7	336.95	1.70	141.9	2.1	0.02393	0.18
P*	-19.9970	24.2838	2.3143	4.0890	3365	350	55.9	1.6	111.3	6.7	336.95	1.70	141.9	2.1	0.03473	0.26
Q*	-1.9907	24.7461	-6.0618	3.9884	4940	380	50.9	1.3	93.8	7.3	334.06	2.10	151.1	2.3	0.02929	0.22
R*	-1.3035	25.3624	-3.9924	3.8650	4940	380	50.9	1.3	93.8	7.3	334.06	2.10	151.1	2.3	0.04261	0.32
Bt: S105A (3084-02)																
A	18.2236	23.9285	4.3857	4.9407	5772	360	43.6	1.2	55.5	7.9	372.93	1.80	121.1	1.8	0.00065	0.04
B	14.0290	24.7308	4.9583	4.8489	5772	360	43.6	1.2	55.5	7.9	372.93	1.80	121.1	1.8	0.00207	0.13
C	28.3760	23.1632	54.3180	5.9863	6241	360	41.2	0.9	87.7	6.1	372.92	1.80	120.7	1.6	0.00218	0.14
D	2.3566	22.4076	12.0555	4.9878	6241	360	41.2	0.9	87.7	6.1	372.92	1.80	120.7	1.6	0.00471	0.29
E	23.2635	23.1728	2.4532	4.7828	6241	360	41.2	0.9	87.7	6.1	372.92	1.80	120.7	1.6	0.00699	0.43
F	86.5130	23.1784	-1.2949	4.6517	6241	360	41.2	0.9	87.7	6.1	372.92	1.80	120.7	1.6	0.01601	1.00
G	15.8946	25.0850	4.7801	4.9109	7119	360	42.3	1.1	79.7	3.7	375.73	1.70	119.7	1.7	0.04659	2.90

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ			±1σ		±1σ		±1σ		±1σ		±1σ		±1σ
Bt: S89A (3280-01)															
F	64.1	9.6	0.1347	0.0031	0.0010	0.0061	0.0020	0.0254	2.E-07	0.0151	0.0008	76.70	0.10	76.51	0.11
G	69.1	12.1	0.0932	0.0023	0.0013	0.0045	0.0025	0.0358	3.E-07	0.0169	0.0008	76.77	0.12	76.56	0.13
H	88.8	11.8	-0.0025	-0.0001	0.0011	-0.0002	0.0022	0.0133	2.E-07	0.0131	0.0007	77.20	0.11	76.93	0.12
I	135.2	36.0	-0.1063	-0.0052	0.0036	-0.0101	0.0070	0.0058	7.E-07	0.0119	0.0014	76.65	0.22	76.25	0.25
J	139.5	40.5	-0.1382	-0.0069	0.0038	-0.0135	0.0075	-0.0075	8.E-07	0.0097	0.0013	76.85	0.23	76.43	0.26
K	84.9	12.7	-0.0338	-0.0010	0.0011	-0.0020	0.0022	0.0099	2.E-07	0.0125	0.0007	77.21	0.13	76.95	0.13
L	40.2	9.2	0.0583	0.0008	0.0008	0.0016	0.0016	0.0049	2.E-07	0.0116	0.0011	76.69	0.11	76.56	0.11
M	14.2	7.9	0.1456	0.0007	0.0007	0.0015	0.0014	0.0128	1.E-07	0.0129	0.0005	76.18	0.10	76.13	0.11
N	5.0	13.0	-0.3840	-0.0007	0.0011	-0.0013	0.0021	0.0151	2.E-07	0.0133	0.0006	76.01	0.12	76.00	0.13
O	36.3	17.3	0.1268	0.0017	0.0016	0.0032	0.0032	-0.0002	3.E-07	0.0107	0.0006	76.26	0.15	76.15	0.16
P	29.9	19.6	0.4534	0.0049	0.0019	0.0095	0.0037	0.0155	4.E-07	0.0134	0.0011	76.05	0.15	75.96	0.16
Q	81.8	20.4	0.0715	0.0021	0.0019	0.0041	0.0036	0.0172	4.E-07	0.0138	0.0010	75.77	0.14	75.53	0.15
R	133.5	88.8	0.2340	0.0112	0.0085	0.0220	0.0167	0.0160	2.E-06	0.0137	0.0027	75.82	0.37	75.42	0.45
S	109.4	63.0	0.1859	0.0073	0.0058	0.0143	0.0115	0.0261	1.E-06	0.0153	0.0028	76.38	0.30	76.05	0.36
T	-48.3	80.6	0.3842	-0.0067	0.0075	-0.0130	0.0147	-0.0192	1.E-06	0.0074	0.0025	75.72	0.36	75.86	0.43
U	18.3	20.2	-0.7308	-0.0048	0.0019	-0.0094	0.0038	0.0074	4.E-07	0.0120	0.0007	76.55	0.16	76.50	0.17
Bt: S89A (3280-02)															
A	601.0	128.5	0.0462	0.0099	0.0115	0.0195	0.0225	0.0877	2.E-06	0.0266	0.0046	66.44	0.40	64.65	0.55
B	-24.9	73.0	0.4003	-0.0036	0.0071	-0.0070	0.0140	0.0612	1.E-06	0.0210	0.0025	74.45	0.33	74.52	0.40
C	63.5	25.0	0.3148	0.0072	0.0023	0.0140	0.0044	0.0010	5.E-07	0.0110	0.0014	76.17	0.18	75.98	0.19
D	19.3	2.9	0.1194	0.0008	0.0003	0.0016	0.0006	0.0109	6.E-08	0.0126	0.0003	76.00	0.08	75.94	0.08
E*	-16.7	8.1	-0.3280	0.0020	0.0008	0.0038	0.0015	0.0146	2.E-07	0.0131	0.0007	76.34	0.10	76.39	0.11
F*	1.5	8.3	2.4830	0.0014	0.0009	0.0027	0.0017	0.0303	2.E-07	0.0158	0.0011	76.29	0.10	76.28	0.10
G*	22.4	11.7	0.1232	0.0010	0.0011	0.0019	0.0022	0.0100	2.E-07	0.0124	0.0006	76.26	0.12	76.19	0.12
H*	39.0	11.4	-0.0289	-0.0004	0.0013	-0.0008	0.0025	0.0135	3.E-07	0.0130	0.0006	76.10	0.12	75.98	0.13
I*	-7.0	13.0	0.5664	-0.0014	0.0013	-0.0028	0.0026	0.0142	3.E-07	0.0131	0.0008	76.25	0.13	76.27	0.14
J*	3.2	40.9	8.5962	0.0098	0.0044	0.0193	0.0087	0.0114	9.E-07	0.0126	0.0018	75.82	0.23	75.81	0.26
K*	-108.1	100.4	0.3915	-0.0152	0.0104	-0.0297	0.0203	0.0583	2.E-06	0.0203	0.0042	76.20	0.40	76.52	0.50
L*	-169.4	167.7	-0.3395	0.0206	0.0181	0.0404	0.0355	-0.0503	4.E-06	0.0019	0.0112	76.93	0.62	77.43	0.80
M*	-26.5	49.5	-0.2067	0.0020	0.0051	0.0038	0.0099	0.0370	1.E-06	0.0169	0.0018	76.43	0.28	76.50	0.32
N*	34.3	122.1	0.8019	0.0098	0.0130	0.0193	0.0255	0.0321	3.E-06	0.0162	0.0044	75.93	0.51	75.83	0.63
O*	-55.5	173.9	-0.3913	0.0078	0.0161	0.0152	0.0316	0.0871	3.E-06	0.0253	0.0046	74.54	0.63	74.70	0.82
P*	114.9	104.7	-0.3919	-0.0161	0.0112	-0.0316	0.0219	0.1015	2.E-06	0.0280	0.0040	75.95	0.44	75.60	0.54
Q*	39.0	34.7	-0.0601	-0.0008	0.0037	-0.0016	0.0073	0.0039	7.E-07	0.0114	0.0035	76.71	0.22	76.59	0.24
R	-156.9	158.5	0.2139	-0.0120	0.0162	-0.0236	0.0317	0.0430	3.E-06	0.0177	0.0045	76.70	0.56	77.16	0.74
S	-11923.1	8562.1	0.2685	-1.1474	0.9161	-2.2490	1.7956	2.6184	2.E-04	0.4298	0.2578	39.02	25.43	74.50	36.27
Bt: S92C (3067-01)															
A	89.7	168.0	-0.1199	-0.0039	0.0109	-0.0076	0.0214	0.1401	2.E-06	0.0345	0.0073	51.57	0.36	51.31	0.62
B	140.0	22.9	-0.0401	-0.0020	0.0016	-0.0039	0.0032	0.0341	3.E-07	0.0167	0.0014	63.97	0.15	63.55	0.17
C	26.2	10.0	-0.0465	-0.0004	0.0007	-0.0009	0.0014	0.0185	1.E-07	0.0139	0.0006	67.78	0.13	67.70	0.14
D	10.1	8.3	0.0588	0.0002	0.0005	0.0004	0.0010	0.0115	1.E-07	0.0127	0.0006	69.04	0.13	69.00	0.13
E*	-7.4	12.6	-0.6186	0.0016	0.0008	0.0032	0.0016	0.0158	2.E-07	0.0134	0.0006	69.39	0.14	69.41	0.15
F*	-7.5	12.5	-0.3642	0.0010	0.0009	0.0019	0.0017	0.0161	2.E-07	0.0134	0.0005	69.15	0.15	69.17	0.15
G*	-13.6	20.7	-0.5015	0.0024	0.0015	0.0048	0.0029	0.0066	3.E-07	0.0118	0.0010	68.92	0.16	68.96	0.17
H*	13.9	8.8	-0.0755	-0.0004	0.0006	-0.0007	0.0011	0.0092	1.E-07	0.0123	0.0005	69.36	0.13	69.32	0.14
I*	22.1	9.3	-0.2274	-0.0018	0.0007	-0.0035	0.0013	0.0329	1.E-07	0.0163	0.0006	69.17	0.13	69.10	0.14
J*	17.5	17.3	-0.3906	-0.0024	0.0012	-0.0048	0.0024	0.0123	2.E-07	0.0128	0.0008	69.12	0.15	69.07	0.16
K*	-13.8	24.7	0.8140	-0.0040	0.0017	-0.0079	0.0034	0.0169	3.E-07	0.0135	0.0008	69.15	0.17	69.19	0.19
L*	55.6	41.5	-0.4401	-0.0088	0.0027	-0.0172	0.0054	0.0298	5.E-07	0.0158	0.0019	69.31	0.19	69.14	0.23
M*	24.8	50.7	-0.8317	-0.0074	0.0035	-0.0145	0.0068	0.0073	7.E-07	0.0120	0.0018	69.18	0.21	69.10	0.26
N	-53.9	24.7	0.1077	-0.0021	0.0018	-0.0041	0.0034	0.0211	4.E-07	0.0142	0.0007	69.74	0.16	69.90	0.18
O	113.1	42.1	-0.1597	-0.0065	0.0029	-0.0127	0.0058	0.0275	6.E-07	0.0155	0.0018	68.94	0.19	68.60	0.23
P	249.9	14.3	-0.0143	-0.0013	0.0010	-0.0025	0.0020	0.0276	2.E-07	0.0158	0.0012	70.01	0.15	69.26	0.15
Q	354.6	13.8	0.0061	0.0008	0.0008	0.0015	0.0016	0.0024	2.E-07	0.0118	0.0007	70.95	0.14	69.89	0.15
Bt: S105A (3084-01)															
A	1135.0	58.9	0.0282	0.0115	0.0029	0.0225	0.0058	0.0409	6.E-07	0.0197	0.0021	45.56	0.23	42.17	0.29
B*	28.7	6.3	0.0445	0.0005	0.0004	0.0009	0.0008	0.0148	8.E-08	0.0132	0.0005	69.20	0.31	69.11	0.31
C*	15.9	6.3	0.0767	0.0004	0.0004	0.0009	0.0008	0.0185	9.E-08	0.0139	0.0005	69.78	0.32	69.73	0.32
D*	17.5	6.7	0.1791	0.0011	0.0004	0.0022	0.0009	0.0251	9.E-08	0.0150	0.0006	70.00	0.32	69.95	0.32
E*	9.0	6.5	0.2423	0.0008	0.0005	0.0015	0.0009	0.0086	9.E-08	0.0122	0.0004	70.22	0.32	70.19	0.32
F*	4.1	2.6	0.2828	0.0004	0.0002	0.0008	0.0004	0.0137	4.E-08	0.0130	0.0002	69.78	0.31	69.77	0.31
G*	17.3	3.8	0.0369	0.0002	0.0002	0.0004	0.0005	0.0116	5.E-08	0.0127	0.0002	69.88	0.31	69.82	0.31
H*	8.9	3.8	0.1595	0.0005	0.0003	0.0010	0.0005	0.0126	5.E-08	0.0128	0.0002	69.85	0.31	69.82	0.31
I*	-3.4	3.5	0.0316	0.0000	0.0002	-0.0001	0.0004	0.0181	4.E-08	0.0137	0.0003	69.87	0.31	69.88	0.31
J*	5.7	2.8	0.0408	0.0001	0.0002	0.0002	0.0004	0.0128	4.E-08	0.0129	0.0002	69.72	0.31	69.70	0.31
K*	0.9	3.0	0.6764	0.0002	0.0002	0.0004	0.0004	0.0128	4.E-08	0.0129	0.0002	69.87	0.31	69.87	0.31
L*	4.5	6.8	-0.2971	-0.0005	0.0004	-0.0009	0.0008	0.0142	9.E-08	0.0131	0.0002	69.98	0.31	69.96	0.31
M*	22.1	8.3	0.0731	0.0006	0.0005	0.0011	0.0010	0.0050	1.E-07	0.0116	0.0007	70.06	0.31	69.99	0.31
N*	34.9	29.4	0.4563	0.0057	0.0019	0.0112	0.0038	0.0077	4.E-07	0.0121	0.0011	70.32	0.32	70.22	0.34
O*	127.4	69.8	-0.1163	-0.0053	0.0037	-0.0104	0.0072	0.0128	7.E-07	0.0131	0.0018	70.38	0.38	70.00	0.43
P*	23.5	41.5	-0.2411	-0.0020	0.0025	-0.0040	0.0048	0.0166	5.E-07	0.0135	0.0014	70.50	0.34	70.42	0.36
Q*	-73.0	48.0	0.0092	-0.0002	0.0030	-0.0005	0.0058	0.0524	6.E-07	0.0194	0.0037	70.36	0.34	70.57	0.37
R*	-33.0	32.0	0.0091	-0.0001	0.0021	-0.0002	0.0041	0.0278	4.E-07	0.0153	0.0010	70.43	0.32	70.53	0.34
Bt: S105A (3084-02)															
A	2361.5	2660.5	0.1159	0.0981	0.1288	0.1923	0.2525	1.0972	3.E-05	0.2002	0.0575	60.84	2.84	53.81	8.42
B	843.6	825.0	0.0789	0.0239	0.0421	0.0468	0.0825	0.5134	8.E-06	0.0989	0.0185	52.09	0.93	49.58	2.63
C	8776.6	969.6	0.0146	0.0458	0.0374	0.0899	0.0734	0.0677	8.E-06	0.0387	0.0158	71.11	0.94	44.91	3.01
D	901.8	373.1	0.0055	0.0018	0.0168	0.0035	0.0329	0.0122	3.E-06	0.0145	0.0079	64.25	0.46	61.56	1.20
E	123.8	241.4	0.2646	0.0117	0.0117	0.0230	0.0229	0.0168	2.E-06	0.0138	0.0049	67.87	0.39	67.50	0.82
F	-28.5	102.4	-1.8640	0.0190	0.0051	0.0373	0.0100	0.0264	1.E-06	0.0151	0.0023	68.80	0.21	68.88	0.37
G	36.2	37.2	0.0928	0.0012	0.0019	0.0024	0.0037	0.0138	4.E-07	0.0131	0.0010	69.52	0.12	69.40	0.16

Sample No.[a]	Derived Results				Inverse Isochron Data				
	%^{40}Ar*	Age (Ma)		w/±J	^{36}Ar/^{40}Ar		^{39}Ar/^{40}Ar		^{36}Ar/^{39}Ar
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Bt: S89A (3280-01)									
F	99.75	1743	2	4	0.00001	14.93863	0.01304	0.13613	0.00233
G	99.73	1744	2	4	0.00001	17.51273	0.01303	0.15963	0.00206
H	99.66	1750	2	4	0.00001	13.25123	0.01295	0.14618	0.00295
I	99.47	1740	4	5	0.00002	26.64271	0.01305	0.28885	0.00300
J	99.46	1742	4	5	0.00002	29.01205	0.01301	0.29676	0.00325
K	99.67	1750	2	4	0.00001	14.89705	0.01295	0.16719	0.00290
L	99.84	1744	2	4	0.00001	22.81879	0.01304	0.14194	0.00209
M	99.94	1738	2	4	0.00000	56.11127	0.01313	0.13457	0.00078
N	99.98	1736	2	4	0.00000	263.30210	0.01316	0.16170	0.00015
O	99.86	1738	2	4	0.00000	47.64342	0.01311	0.19443	0.00086
P	99.88	1735	2	4	0.00000	66.01399	0.01315	0.19941	0.00075
Q	99.68	1729	2	4	0.00001	25.01682	0.01320	0.18656	0.00209
R	99.48	1728	7	7	0.00002	66.67707	0.01319	0.48575	0.00374
S	99.57	1737	5	6	0.00001	57.81942	0.01309	0.39631	0.00272
T	100.19	1734	6	7	-0.00001	-167.75650	0.01321	0.47490	0.00111
U	99.93	1743	3	4	0.00000	109.80540	0.01306	0.21174	0.00049
Bt: S89A (3280-02)									
A	97.30	1561	9	9	0.00009	21.41047	0.01505	0.59854	0.01747
B	100.10	1714	6	7	0.00000	-291.20410	0.01343	0.44623	0.00064
C	99.75	1736	3	4	0.00001	39.51696	0.01313	0.23419	0.00159
D	99.92	1735	1	3	0.00000	15.29473	0.01316	0.11038	0.00382
E*	100.07	1742	2	4	0.00000	-48.21521	0.01310	0.13633	0.00099
F*	99.99	1740	1	3	0.00000	620.47630	0.01311	0.12790	0.00008
G*	99.91	1739	2	4	0.00000	52.51563	0.01311	0.15486	0.00079
H*	99.85	1736	2	4	0.00001	29.21754	0.01314	0.15901	0.00150
I*	100.03	1740	2	4	0.00000	-186.33560	0.01311	0.17041	0.00025
J*	99.99	1733	4	5	0.00000	1427.53500	0.01319	0.30858	0.00007
K*	100.42	1744	7	8	-0.00001	-93.01027	0.01312	0.52734	0.00258
L*	100.66	1757	12	12	-0.00002	-98.83187	0.01300	0.80175	0.00467
M*	100.10	1743	5	6	0.00000	-185.41180	0.01309	0.36487	0.00062
N*	99.87	1733	9	10	0.00000	361.00120	0.01317	0.67043	0.00086
O*	100.22	1717	12	12	-0.00001	-309.96230	0.01342	0.84293	0.00154
P*	99.55	1730	8	9	0.00002	91.16624	0.01317	0.58235	0.00312
Q*	99.85	1745	3	5	0.00001	88.93267	0.01304	0.28182	0.00094
R	100.61	1753	11	11	-0.00002	-101.11740	0.01304	0.73455	0.00420
S	191.08	1714	539	539	-0.00305	-96.42969	0.02565	65.18020	0.66610
Bt: S92C (3067-01)									
A	99.48	1359	11	12	0.00002	188.26640	0.01939	0.69782	0.00275
B	99.35	1574	3	4	0.00002	16.38173	0.01563	0.23930	0.00851
C	99.88	1641	2	3	0.00000	38.38297	0.01475	0.19679	0.00393
D	99.96	1661	2	3	0.00000	82.71197	0.01449	0.19034	0.00187
E*	100.03	1668	2	3	0.00000	-168.00690	0.01441	0.20452	0.00087
F*	100.03	1664	2	3	0.00000	-165.62120	0.01446	0.21126	0.00087
G*	100.06	1661	3	3	0.00000	-151.75070	0.01451	0.22727	0.00093
H*	99.94	1666	2	3	0.00000	63.55382	0.01442	0.19110	0.00242
I*	99.90	1663	2	3	0.00000	42.36498	0.01446	0.19358	0.00360
J*	99.92	1662	2	3	0.00000	98.98783	0.01447	0.21422	0.00146
K*	100.06	1664	3	4	0.00000	-179.18400	0.01446	0.24892	0.00074
L*	99.76	1664	4	4	0.00001	74.52167	0.01443	0.27783	0.00190
M*	99.89	1663	4	5	0.00000	203.39490	0.01446	0.29774	0.00076
N	100.23	1675	3	4	-0.00001	-45.80452	0.01434	0.23198	0.00310
O	99.51	1655	4	4	0.00002	37.22355	0.01451	0.27538	0.00433
P	98.93	1666	2	3	0.00004	5.71242	0.01428	0.20875	0.02557
Q	98.51	1675	2	3	0.00005	3.87965	0.01409	0.19971	0.03896
Bt: S105A (3084-01)									
A	92.57	1193	6	6	0.00025	5.20618	0.02195	0.50285	0.08396
B*	99.88	1679	5	6	0.00000	21.95191	0.01445	0.45304	0.02009
C*	99.93	1689	5	6	0.00000	39.47452	0.01433	0.45280	0.01112
D*	99.93	1693	5	6	0.00000	38.77424	0.01429	0.45000	0.01134
E*	99.96	1696	5	6	0.00000	72.21044	0.01424	0.44941	0.00605
F*	99.98	1690	5	5	0.00000	64.01193	0.01433	0.44387	0.00686
G*	99.93	1691	5	5	0.00000	21.85291	0.01431	0.44370	0.02002
H*	99.96	1691	5	5	0.00000	43.11301	0.01432	0.44376	0.01011
I*	100.01	1691	5	5	0.00000	-101.84320	0.01431	0.44078	0.00427
J*	99.98	1689	5	5	0.00000	49.90960	0.01434	0.43983	0.00869
K*	100.00	1691	5	5	0.00000	366.25500	0.01431	0.43864	0.00118
L*	99.98	1693	5	5	0.00000	153.01730	0.01429	0.44101	0.00281
M*	99.91	1693	5	5	0.00000	37.39413	0.01427	0.44255	0.01139
N*	99.85	1697	5	6	0.00000	84.66189	0.01422	0.46180	0.00491
O*	99.46	1693	7	7	0.00002	54.77573	0.01421	0.54256	0.00692
P*	99.90	1700	6	6	0.00000	176.68980	0.01419	0.47596	0.00231
Q*	100.31	1702	6	6	-0.00001	-65.64796	0.01421	0.47863	0.00623
R*	100.14	1702	5	6	0.00000	-96.54837	0.01420	0.46084	0.00429
Bt: S105A (3084-02)									
A	88.45	1420	154	154	0.00039	113.09530	0.01644	4.66827	0.03664
B	95.18	1341	50	50	0.00016	98.13867	0.01920	1.78277	0.01393
C	63.16	1249	60	60	0.00123	11.07546	0.01406	1.32023	0.07886
D	95.81	1556	20	20	0.00014	41.38439	0.01556	0.71377	0.01044
E	99.46	1654	13	13	0.00002	195.60260	0.01474	0.56893	0.00140
F	100.13	1676	6	6	0.00000	-351.33030	0.01454	0.30453	0.00031
G	99.85	1684	3	4	0.00001	103.00130	0.01439	0.16952	0.00062

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Bt: S105A (3084-02)										
H	64c	0.70	22.236	0.050	1005143	1023	14404.17	20.19	195.7506	8.6375
I	64c	0.75	22.236	0.050	989750	1024	14224.77	20.19	201.5036	13.1210
J*	64c	0.80	22.236	0.050	1031496	1040	14711.32	17.67	188.4116	15.5527
K*	64c	0.90	22.236	0.050	1361716	1314	19429.06	23.97	228.9087	15.8289
L*	64c	1.00	22.236	0.050	1577728	1511	22531.99	23.97	264.2319	20.2932
M*	64c	1.10	22.236	0.050	1318779	1299	18833.04	22.71	187.4423	29.0319
N*	64c	1.20	22.236	0.050	2709357	2500	38759.20	31.52	491.2019	19.2924
O*	64c	1.30	22.236	0.050	539464	727	7667.54	16.42	95.4458	12.8949
P*	64c	1.50	22.236	0.050	759136	893	10836.62	16.42	131.8264	11.0095
Q*	64c	1.70	22.236	0.050	760963	877	10817.72	16.42	136.4086	8.0061
R*	64c	2.00	22.236	0.050	1165171	1212	16634.30	21.45	204.4493	11.0095
S*	64c	5.00	22.236	0.050	17133490	16403	244403.40	177.68	3304.7430	67.9163
Bt: S131C (3282-01)										
A	68c	0.30	21.919	0.060	1953360	1387	22314.34	26.47	538.7989	18.6826
B	68c	0.35	21.919	0.060	5899696	4090	80188.36	50.40	1052.0560	13.9196
C	68c	0.40	21.919	0.060	4561677	3410	62957.30	40.32	792.7083	21.0742
D	68c	0.45	21.919	0.060	7454354	5988	102958.70	51.66	1229.5280	28.3801
E	68c	0.50	21.919	0.060	5465305	4462	75261.70	52.93	926.4481	19.3661
F	68c	0.55	21.919	0.060	3276188	2547	45149.50	32.77	557.8579	16.9205
G	68c	0.60	21.919	0.060	3228806	2342	44436.65	37.81	562.7799	10.9504
H	68c	0.70	21.919	0.060	4085224	2792	56232.25	45.37	705.7723	19.3661
I*	68c	0.80	21.919	0.060	5079134	3369	69662.67	49.15	858.4452	31.6998
J*	68c	0.90	21.919	0.060	4049524	2792	55500.60	37.82	677.6749	20.4969
K*	68c	1.00	21.919	0.060	4223627	3037	57860.28	41.59	696.4317	20.4969
L*	68c	1.20	21.919	0.060	6368279	4838	87381.22	50.41	1036.9500	21.7352
M*	68c	1.50	21.919	0.060	9588399	7332	131696.40	59.23	1575.3710	24.2670
N	68c	1.70	21.919	0.060	6563116	4724	90640.79	54.19	1152.0210	15.6527
O	68c	2.00	21.919	0.060	6961992	4796	96508.42	55.45	1182.4090	12.4044
P	68c	3.00	21.919	0.060	3563732	2443	49258.47	36.56	599.1354	18.0945
Q	68c	5.00	21.919	0.060	382375	575	5471.96	13.90	93.8093	10.0691
R	68c	7.00	21.919	0.060	127027	531	2782.01	8.51	36.2044	18.4621
Bt: S145A (3284-01)										
A	68c	0.10	21.843	0.060	21785	534	754.71	4.72	8.0566	6.4654
B	68c	0.20	21.843	0.060	120888	512	1936.15	8.10	48.7677	9.1071
C	68c	0.25	21.843	0.060	93188	516	1509.80	6.85	74.3097	12.5902
D	68c	0.30	21.843	0.060	47396	507	806.07	4.60	8.7616	8.2575
E	68c	0.35	21.843	0.060	30988	543	461.46	3.74	-5.1109	8.4734
F	68c	0.40	21.843	0.060	142059	503	2169.43	8.10	29.3437	6.6216
G	68c	0.45	21.843	0.060	329574	581	4639.85	11.74	70.4702	9.0857
H	68c	0.50	21.843	0.060	810899	744	11296.17	20.17	170.8884	11.3779
I	68c	0.55	21.843	0.060	1004374	836	14306.71	20.17	184.4084	11.8473
J	68c	0.60	21.843	0.060	1583984	1089	22378.08	23.95	302.6645	13.2706
K	68c	0.70	21.843	0.060	2849873	1807	39833.09	35.30	436.3288	27.0862
L	68c	0.80	21.843	0.060	4302779	2783	60067.95	42.85	686.3357	19.7830
M*	68c	0.90	21.843	0.060	4640227	3725	64763.29	44.11	777.7280	15.0519
N*	68c	1.00	21.843	0.060	2818741	2355	39285.43	35.30	499.7747	19.7830
O*	68c	1.10	21.843	0.060	4772895	3486	66392.54	42.84	794.6217	16.6028
P*	68c	1.20	21.843	0.060	2184542	1568	30472.27	27.73	375.0482	16.6028
Q*	68c	1.50	21.843	0.060	6097812	3839	85099.35	56.70	1154.2740	49.1748
R	68c	1.70	21.843	0.060	9377141	5622	131392.80	69.30	1622.8170	30.3418
S	68c	2.00	21.843	0.060	5241868	3228	73132.57	49.15	921.7652	17.0266
T	68c	3.00	21.843	0.060	7743935	4954	108427.90	57.96	1303.8250	24.3755
U	68c	5.00	21.843	0.060	5382444	3727	74928.88	45.37	918.6181	15.8204
Bt: S145A (3284-02)										
A	68c	0.20	21.843	0.060	285381	527	5682.92	12.63	116.1412	17.1413
B	68c	0.25	21.843	0.060	1467749	1104	20893.29	25.21	264.7606	10.7671
C	68c	0.30	21.843	0.060	2466588	1667	34479.39	31.51	445.1533	12.8542
D	68c	0.35	21.843	0.060	4081822	2667	57157.45	39.07	745.8918	24.0590
E	68c	0.40	21.843	0.060	5438731	3725	76074.05	45.37	904.9093	14.2351
F	68c	0.45	21.843	0.060	3395157	2471	47385.55	37.82	581.6375	24.1447
G	68c	0.50	21.843	0.060	1902310	1543	26538.91	27.74	306.0760	15.4624
H	68c	0.55	21.843	0.060	1064944	939	14820.69	18.92	176.9309	8.8632
I	68c	0.60	21.843	0.060	2904366	2079	40452.39	34.03	517.7888	10.4485
J	68c	0.70	21.843	0.060	2422673	1652	33834.41	31.51	428.7631	12.0831
K*	68c	0.80	21.843	0.060	5262719	3321	73726.28	49.15	897.5702	25.5249
L*	68c	0.90	21.843	0.060	4983884	3174	69823.22	49.15	933.9005	45.3583
M*	68c	1.00	21.843	0.060	2743097	1871	38414.65	36.55	474.9250	21.4846
N*	68c	1.20	21.843	0.060	3514910	2496	49349.89	36.55	636.3469	9.0144
O*	68c	1.50	21.843	0.060	7381910	5515	103683.00	52.93	1272.9080	23.9934
P*	68c	1.70	21.843	0.060	244402	575	3460.39	10.38	35.4743	7.6719
Q*	68c	2.00	21.843	0.060	1324166	1086	18535.16	23.96	195.6877	12.5564
R	68c	3.00	21.843	0.060	2183020	1522	30516.77	27.73	380.0332	9.7617
S	68c	5.00	21.843	0.060	1328624	988	18662.29	23.96	232.2572	9.3096
T	68c	7.00	21.843	0.060	536921	630	7486.61	16.40	78.7534	8.3375
Bt: S162A (3089-01)										
A	64d	0.20	23.196	0.053	209311	649	3508.98	9.75	81.0697	10.5494
B*	64d	0.30	23.196	0.053	2755190	4756	41296.01	31.51	424.2691	24.6113
C*	64d	0.40	23.196	0.053	4521039	27507	68120.79	45.36	858.1431	20.7290
D*	64d	0.50	23.196	0.053	8149937	49393	123307.80	61.74	1407.0000	38.0820
E*	64d	0.60	23.196	0.053	2943564	17818	44569.65	36.55	571.8814	17.0828
F*	64d	0.70	23.196	0.053	2286065	13806	34676.69	34.03	457.4019	9.4297

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Bt: S105A (3084-02)																
H	-67.2839	22.6430	17.6372	5.2510	7119	360	42.3	1.1	79.7	3.7	375.73	1.70	119.7	1.7	0.05078	3.16
I	22.1590	23.4481	7.3801	4.8707	7119	360	42.3	1.1	79.7	3.7	375.73	1.70	119.7	1.7	0.05015	3.12
J*	-3.0783	23.4528	12.9915	5.1059	7119	360	42.3	1.1	79.7	3.7	375.73	1.70	119.7	1.7	0.05187	3.23
K*	6.5697	23.9936	2.0777	4.9345	4731	370	41.1	1.2	110.9	12.0	374.90	1.80	123.8	1.7	0.06850	4.26
L*	-23.3067	23.9984	5.1500	4.8631	4731	370	41.1	1.2	110.9	12.0	374.90	1.80	123.8	1.7	0.07944	4.94
M*	-2.4646	23.2222	4.6146	4.9037	4731	370	41.1	1.2	110.9	12.0	374.90	1.80	123.8	1.7	0.06640	4.13
N*	-13.0448	24.0088	-3.0719	4.7870	4731	370	41.1	1.2	110.9	12.0	374.90	1.80	123.8	1.7	0.13665	8.51
O*	-13.6667	24.0192	5.8937	4.8316	5081	360	44.0	1.2	95.2	6.6	374.92	1.80	120.0	1.5	0.02703	1.68
P*	4.5222	24.0246	7.8823	4.8353	5081	360	44.0	1.2	95.2	6.6	374.92	1.80	120.0	1.5	0.03821	2.38
Q*	44.2037	24.0304	9.9325	5.0449	5081	360	44.0	1.2	95.2	6.6	374.92	1.80	120.0	1.5	0.03814	2.37
R*	16.5541	24.0353	-1.0192	4.6958	5081	360	44.0	1.2	95.2	6.6	374.92	1.80	120.0	1.5	0.05865	3.65
S*	1962.4930	96.6067	-16.0155	22.3604	5448	390	41.9	1.0	96.3	8.8	375.80	1.90	125.8	1.7	0.86168	53.63
Bt: S131C (3282-01)																
A	64.6882	18.3959	1339.7920	7.1901	9532	310	18.0	0.8	42.7	6.2	152.83	1.10	61.8	1.0	0.07867	1.96
B	24.8248	19.3152	199.2117	3.1942	9532	310	18.0	0.8	42.7	6.2	152.83	1.10	61.8	1.0	0.28272	7.06
C	-1.2179	19.3932	23.1573	2.0414	9532	310	18.0	0.8	42.7	6.2	152.83	1.10	61.8	1.0	0.22196	5.54
D	5.5334	17.3118	40.1204	2.1549	9532	310	18.0	0.8	42.7	6.2	152.83	1.10	61.8	1.0	0.36300	9.06
E	38.2240	18.6359	18.8037	2.0893	10413	370	21.0	1.0	47.2	4.3	146.40	1.10	56.6	1.1	0.26535	6.62
F	57.8972	17.6281	7.5370	1.8893	10413	370	21.0	1.0	47.2	4.3	146.40	1.10	56.6	1.1	0.15918	3.97
G	80.6326	19.3042	5.9120	1.8866	10413	370	21.0	1.0	47.2	4.3	146.40	1.10	56.6	1.1	0.15667	3.91
H	54.8656	17.4095	14.5914	1.8874	10413	370	21.0	1.0	47.2	4.3	146.40	1.10	56.6	1.1	0.19825	4.95
I*	0.3667	18.8867	8.4677	2.0775	11326	380	42.8	1.2	48.0	3.8	150.35	1.20	60.6	1.1	0.24561	6.13
J*	-6.8470	18.9295	5.8041	1.8838	11326	380	42.8	1.2	48.0	3.8	150.35	1.20	60.6	1.1	0.19568	4.88
K*	1.8344	19.0279	4.7758	1.9792	11326	380	42.8	1.2	48.0	3.8	150.35	1.20	60.6	1.1	0.20399	5.09
L*	3.4249	20.0399	12.1776	1.9819	11326	380	42.8	1.2	48.0	3.8	150.35	1.20	60.6	1.1	0.30807	7.69
M*	81.6333	16.8475	14.4172	2.2324	12878	310	37.3	1.2	44.6	4.1	148.22	0.95	60.8	1.2	0.46431	11.59
N	55.6915	18.5192	4.9795	1.9451	12878	310	37.3	1.2	44.6	4.1	148.22	0.95	60.8	1.2	0.31957	7.98
O	35.0111	16.5006	9.0634	2.1337	12878	310	37.3	1.2	44.6	4.1	148.22	0.95	60.8	1.2	0.34025	8.49
P	44.8015	18.3270	6.3065	2.0384	12878	310	37.3	1.2	44.6	4.1	148.22	0.95	60.8	1.2	0.17367	4.34
Q	53.7240	19.5727	8.9947	2.1011	10948	340	21.6	1.1	28.1	5.5	148.69	1.00	59.2	1.3	0.01929	0.48
R	101.4526	17.7383	33.5005	2.2969	10948	340	21.6	1.1	28.1	5.5	148.69	1.00	59.2	1.3	0.00981	0.24
Bt: S145A (3284-01)																
A	7.0385	17.9255	47.7123	2.4532	11739	360	18.8	0.7	52.9	2.3	166.78	1.20	61.8	1.2	0.00266	0.09
B	59.9704	18.7391	160.6514	2.6127	11739	360	18.8	0.7	52.9	2.3	166.78	1.20	61.8	1.2	0.00683	0.23
C	49.0056	17.4558	83.2070	2.6207	9284	350	16.5	0.8	45.7	4.3	164.11	1.10	58.9	1.1	0.00532	0.18
D	56.9925	17.5950	6.7476	1.8900	9284	350	16.5	0.8	45.7	4.3	164.11	1.10	58.9	1.1	0.00284	0.10
E	28.8655	17.7377	4.6853	1.7072	9284	350	16.5	0.8	45.7	4.3	164.11	1.10	58.9	1.1	0.00163	0.06
F	19.8859	17.1910	20.9410	1.8982	9284	350	16.5	0.8	45.7	4.3	164.11	1.10	58.9	1.1	0.00765	0.26
G	68.9690	18.0655	75.9047	2.3815	11029	340	15.8	0.7	46.4	4.2	163.32	1.10	61.0	1.4	0.01636	0.56
H	31.9056	17.7430	127.4438	2.8840	11029	340	15.8	0.7	46.4	4.2	163.32	1.10	61.0	1.4	0.03983	1.35
I	16.0147	17.5110	8.4031	2.0782	11029	340	15.8	0.7	46.4	4.2	163.32	1.10	61.0	1.4	0.05044	1.72
J	12.7747	18.1697	11.9829	2.1649	11029	340	15.8	0.7	46.4	4.2	163.32	1.10	61.0	1.4	0.07890	2.68
K	35.1102	16.6788	4.8785	1.9452	15783	310	57.2	1.3	65.5	5.9	163.18	1.00	59.3	1.2	0.14044	4.78
L	51.6067	16.6741	9.9780	2.0392	15783	310	57.2	1.3	65.5	5.9	163.18	1.00	59.3	1.2	0.21178	7.20
M*	55.2855	17.7891	5.4834	2.0413	15783	310	57.2	1.3	65.5	5.9	163.18	1.00	59.3	1.2	0.22833	7.76
N*	20.8579	17.8067	0.9236	1.9479	15783	310	57.2	1.3	65.5	5.9	163.18	1.00	59.3	1.2	0.13851	4.71
O*	76.6876	17.3102	8.3787	2.0801	10958	330	18.9	0.8	51.6	2.8	161.83	1.10	60.0	1.1	0.23408	7.96
P*	43.6413	18.0308	-1.4253	1.9787	10958	330	18.9	0.8	51.6	2.8	161.83	1.10	60.0	1.1	0.10743	3.65
Q*	121.8425	17.2164	6.8793	1.9797	10958	330	18.9	0.8	51.6	2.8	161.83	1.10	60.0	1.1	0.30003	10.20
R	107.6326	17.2182	11.4896	1.9804	10958	330	18.9	0.8	51.6	2.8	161.83	1.10	60.0	1.1	0.46324	15.75
S	31.4059	18.1946	8.4259	2.0781	12367	370	18.5	1.1	45.3	4.7	164.32	1.10	59.5	1.1	0.25784	8.77
T	74.7352	18.4014	18.4690	2.0829	12367	370	18.5	1.1	45.3	4.7	164.32	1.10	59.5	1.1	0.38228	13.00
U	51.5219	17.7651	124.7814	2.7555	12367	370	18.5	1.1	45.3	4.7	164.32	1.10	59.5	1.1	0.26417	8.98
Bt: S145A (3284-02)																
A	153.6171	19.4587	109.7449	2.5247	8709	360	17.9	0.9	47.6	5.1	145.84	1.20	58.9	1.2	0.02004	0.74
B	161.1900	18.3186	22.2617	1.9714	9326	340	18.0	0.8	47.6	2.6	143.91	1.00	58.5	1.2	0.07366	2.71
C	127.6713	19.3825	8.8512	1.9643	9326	340	18.0	0.8	47.6	2.6	143.91	1.00	58.5	1.2	0.12156	4.47
D	186.5355	19.6041	7.2608	2.0573	9326	340	18.0	0.8	47.6	2.6	143.91	1.00	58.5	1.2	0.20152	7.41
E	211.2545	19.7349	9.0540	2.0601	9723	340	30.1	1.2	48.9	3.3	144.19	1.10	57.1	1.2	0.26821	9.87
F	126.6817	20.7526	3.5253	1.9662	9723	340	30.1	1.2	48.9	3.3	144.19	1.10	57.1	1.2	0.16706	6.15
G	126.8125	21.0218	6.0017	2.0634	9723	340	30.1	1.2	48.9	3.3	144.19	1.10	57.1	1.2	0.09357	3.44
H	46.5320	19.1119	-3.7041	1.9676	10088	360	20.2	1.0	49.0	4.2	145.00	1.10	62.7	1.2	0.05225	1.92
I	107.4565	20.7421	-2.5248	1.8745	10088	360	20.2	1.0	49.0	4.2	145.00	1.10	62.7	1.2	0.14262	5.25
J	92.5886	20.5581	-1.4160	1.8722	10088	360	20.2	1.0	49.0	4.2	145.00	1.10	62.7	1.2	0.11929	4.39
K*	119.6019	18.7308	1.3926	2.0556	10088	360	20.2	1.0	49.0	4.2	145.00	1.10	62.7	1.2	0.25993	9.56
L*	117.6201	19.9546	7.9094	2.0539	8079	340	19.7	1.0	53.2	1.9	142.11	1.00	58.1	1.2	0.24617	9.06
M*	106.9097	19.1551	7.6508	1.9599	8079	340	19.7	1.0	53.2	1.9	142.11	1.00	58.1	1.2	0.13544	4.98
N*	75.2398	20.2549	4.1448	1.9595	8079	340	19.7	1.0	53.2	1.9	142.11	1.00	58.1	1.2	0.17399	6.40
O*	48.2317	19.5719	5.5153	2.0550	8079	340	19.7	1.0	53.2	1.9	142.11	1.00	58.1	1.2	0.36555	13.45
P*	64.9172	20.2610	-3.7639	2.0941	12573	370	17.2	1.0	44.2	4.2	142.55	1.10	61.9	1.1	0.01220	0.45
Q*	19.3234	20.7843	-2.5941	1.8032	12573	370	17.2	1.0	44.2	4.2	142.55	1.10	61.9	1.1	0.06535	2.40
R	32.4578	20.6067	1.4730	1.8967	12573	370	17.2	1.0	44.2	4.2	142.55	1.10	61.9	1.1	0.10759	3.96
S	42.4346	19.5769	-0.2355	1.8014	12573	370	17.2	1.0	44.2	4.2	142.55	1.10	61.9	1.1	0.06580	2.42
T	-23.4900	18.6231	-3.7519	2.0164	8166	400	18.7	0.8	57.2	5.0	146.10	1.10	61.7	1.3	0.02640	0.97
Bt: S162A (3089-01)																
A	15.1177	20.0178	58.9808	3.4372	4740	320	40.1	1.0	95.4	5.8	404.52	1.90	121.0	1.7	0.01237	0.28
B*	21.5636	20.6572	20.6165	3.1199	4740	320	40.1	1.0	95.4	5.8	404.52	1.90	121.0	1.7	0.14559	3.30
C*	5.3346	21.4064	5.2757	3.3833	6619	360	47.7	1.1	89.1	4.9	403.78	1.70	125.6	1.7	0.24017	5.44
D*	7.0563	21.4003	5.2124	3.4543	6619	360	47.7	1.1	89.1	4.9	403.78	1.70	125.6	1.7	0.43474	9.85
E*	19.1062	22.6813	-3.4453	3.2302	6619	360	47.7	1.1	89.1	4.9	403.78	1.70	125.6	1.7	0.15714	3.56
F*	-36.4100	21.3427	-4.9982	3.2884	6619	360	47.7	1.1	89.1	4.9	403.78	1.70	125.6	1.7	0.12226	2.77

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ			±1σ		±1σ		±1σ		±1σ		±1σ		±1σ
Bt: S105A (3084-02)															
H	122.5	36.5	-0.1064	-0.0047	0.0016	-0.0092	0.0031	0.0158	3.E-07	0.0136	0.0006	69.78	0.12	69.41	0.16
I	51.9	34.2	0.0838	0.0016	0.0016	0.0031	0.0032	0.0200	3.E-07	0.0142	0.0009	69.58	0.12	69.42	0.16
J*	88.3	34.7	-0.0066	-0.0002	0.0016	-0.0004	0.0031	0.0115	3.E-07	0.0128	0.0011	70.12	0.11	69.85	0.15
K*	10.7	25.4	0.0882	0.0003	0.0012	0.0007	0.0024	0.0063	2.E-07	0.0118	0.0008	70.09	0.11	70.05	0.13
L*	22.9	21.6	-0.1263	-0.0010	0.0011	-0.0020	0.0021	0.0058	2.E-07	0.0117	0.0009	70.02	0.10	69.95	0.12
M*	24.5	26.0	-0.0149	-0.0001	0.0012	-0.0003	0.0024	-0.0047	2.E-07	0.0100	0.0015	70.02	0.11	69.95	0.13
N*	-7.9	12.4	0.1185	-0.0003	0.0006	-0.0007	0.0012	0.0118	1.E-07	0.0127	0.0005	69.90	0.09	69.92	0.09
O*	76.9	63.0	-0.0647	-0.0018	0.0031	-0.0035	0.0061	0.0095	6.E-07	0.0124	0.0017	70.36	0.18	70.12	0.26
P*	72.7	44.6	0.0160	0.0004	0.0022	0.0008	0.0043	0.0079	4.E-07	0.0122	0.0010	70.05	0.13	69.83	0.19
Q*	91.8	46.6	0.1242	0.0041	0.0022	0.0080	0.0044	0.0103	4.E-07	0.0126	0.0007	70.34	0.13	70.07	0.19
R*	-6.1	28.2	-0.4531	0.0010	0.0014	0.0020	0.0028	0.0095	3.E-07	0.0123	0.0007	70.05	0.12	70.06	0.14
S*	-6.6	9.2	-3.4188	0.0080	0.0004	0.0157	0.0008	0.0168	8.E-08	0.0135	0.0003	70.10	0.08	70.12	0.09
Bt: S131C (3282-01)															
A	6004.2	33.0	0.0013	0.0029	0.0008	0.0057	0.0016	0.0126	2.E-07	0.0241	0.0008	87.54	0.12	69.61	0.14
B	248.4	4.0	0.0035	0.0003	0.0002	0.0006	0.0005	0.0116	5.E-08	0.0131	0.0002	73.57	0.07	72.83	0.07
C	36.8	3.2	-0.0015	0.0000	0.0003	0.0000	0.0006	0.0108	6.E-08	0.0126	0.0003	72.46	0.07	72.34	0.07
D	39.0	2.1	0.0038	0.0001	0.0002	0.0001	0.0003	0.0069	3.E-08	0.0119	0.0003	72.40	0.07	72.28	0.07
E	25.0	2.8	0.0567	0.0005	0.0002	0.0010	0.0005	0.0093	5.E-08	0.0123	0.0003	72.62	0.08	72.54	0.08
F	16.7	4.2	0.2143	0.0013	0.0004	0.0025	0.0008	0.0096	8.E-08	0.0124	0.0004	72.56	0.08	72.51	0.08
G	13.3	4.3	0.3805	0.0018	0.0004	0.0036	0.0009	0.0115	9.E-08	0.0127	0.0002	72.66	0.08	72.62	0.08
H	26.0	3.4	0.1049	0.0010	0.0003	0.0019	0.0006	0.0107	6.E-08	0.0126	0.0003	72.65	0.08	72.57	0.08
I*	12.2	3.0	0.0012	0.0000	0.0003	0.0000	0.0005	0.0095	5.E-08	0.0123	0.0005	72.91	0.07	72.87	0.07
J*	10.5	3.4	-0.0329	-0.0001	0.0003	-0.0002	0.0007	0.0088	7.E-08	0.0122	0.0004	72.96	0.07	72.93	0.07
K*	8.3	3.4	0.0107	0.0000	0.0003	0.0001	0.0006	0.0078	7.E-08	0.0120	0.0004	73.00	0.07	72.97	0.07
L*	13.9	2.3	0.0078	0.0000	0.0002	0.0001	0.0004	0.0068	5.E-08	0.0119	0.0002	72.88	0.07	72.83	0.07
M*	11.0	1.7	0.1580	0.0006	0.0001	0.0012	0.0003	0.0074	3.E-08	0.0120	0.0002	72.81	0.06	72.77	0.06
N	5.5	2.2	0.3120	0.0006	0.0002	0.0012	0.0004	0.0119	4.E-08	0.0127	0.0002	72.41	0.07	72.39	0.07
O	9.4	2.2	0.1078	0.0004	0.0002	0.0007	0.0003	0.0091	3.E-08	0.0123	0.0001	72.14	0.06	72.11	0.07
P	12.8	4.1	0.1982	0.0009	0.0004	0.0018	0.0007	0.0085	7.E-08	0.0122	0.0004	72.35	0.07	72.31	0.07
Q	164.4	38.4	0.1666	0.0098	0.0036	0.0192	0.0070	0.0364	7.E-07	0.0171	0.0018	69.88	0.21	69.39	0.24
R	1204.2	82.6	0.0845	0.0365	0.0064	0.0715	0.0125	0.0003	1.E-06	0.0130	0.0066	45.66	0.24	42.07	0.34
Bt: S145A (3284-01)															
A	6321.9	327.4	0.0041	0.0093	0.0238	0.0183	0.0466	-0.0708	5.E-06	0.0107	0.0086	28.86	0.73	9.99	1.20
B	8297.5	139.3	0.0104	0.0310	0.0097	0.0607	0.0190	-0.0068	2.E-06	0.0252	0.0047	62.44	0.37	37.66	0.51
C	5511.1	175.4	0.0164	0.0325	0.0116	0.0636	0.0227	0.1668	2.E-06	0.0492	0.0083	61.72	0.44	45.27	0.65
D	837.1	234.5	0.2357	0.0707	0.0218	0.1386	0.0428	-0.0083	4.E-06	0.0109	0.0102	58.80	0.71	56.30	0.99
E	1015.3	370.1	0.1719	0.0626	0.0384	0.1226	0.0753	-0.1405	8.E-06	-0.0111	0.0184	67.15	1.30	64.12	1.70
F	965.3	87.6	0.0265	0.0092	0.0079	0.0180	0.0155	0.0060	2.E-06	0.0135	0.0031	65.48	0.34	62.60	0.42
G	1635.9	51.5	0.0254	0.0149	0.0039	0.0291	0.0076	0.0083	8.E-07	0.0152	0.0020	71.03	0.22	66.15	0.26
H	1128.2	25.6	0.0070	0.0028	0.0016	0.0055	0.0031	0.0136	3.E-07	0.0151	0.0010	71.79	0.14	68.41	0.16
I	58.7	14.5	0.0532	0.0011	0.0012	0.0022	0.0024	0.0123	2.E-07	0.0129	0.0008	70.20	0.11	70.02	0.12
J	53.6	9.7	0.0297	0.0006	0.0008	0.0011	0.0016	0.0162	2.E-07	0.0135	0.0006	70.78	0.09	70.62	0.09
K	12.3	4.9	0.2008	0.0009	0.0004	0.0017	0.0008	0.0014	8.E-08	0.0110	0.0007	71.55	0.08	71.51	0.08
L	16.6	3.4	0.1443	0.0009	0.0003	0.0017	0.0005	0.0041	6.E-08	0.0114	0.0003	71.63	0.07	71.58	0.07
M*	8.5	3.2	0.2813	0.0009	0.0003	0.0017	0.0005	0.0077	6.E-08	0.0120	0.0002	71.65	0.08	71.62	0.08
N*	2.4	5.0	0.6300	0.0005	0.0005	0.0010	0.0009	0.0120	9.E-08	0.0127	0.0005	71.75	0.09	71.74	0.09
O*	12.6	3.1	0.2554	0.0012	0.0003	0.0023	0.0005	0.0074	5.E-08	0.0120	0.0003	71.89	0.07	71.85	0.07
P*	-4.7	6.5	-0.8543	0.0014	0.0006	0.0028	0.0012	0.0096	1.E-07	0.0123	0.0005	71.69	0.08	71.70	0.09
Q*	8.1	2.3	0.4942	0.0014	0.0002	0.0028	0.0004	0.0169	4.E-08	0.0136	0.0006	71.66	0.07	71.63	0.07
R	8.7	1.5	0.2614	0.0008	0.0001	0.0016	0.0003	0.0097	3.E-08	0.0124	0.0002	71.37	0.06	71.34	0.06
S	11.5	2.8	0.1040	0.0004	0.0002	0.0008	0.0005	0.0112	5.E-08	0.0126	0.0002	71.68	0.07	71.64	0.07
T	17.0	1.9	0.1129	0.0007	0.0002	0.0014	0.0003	0.0077	3.E-08	0.0120	0.0002	71.42	0.06	71.37	0.06
U	166.5	3.7	0.0115	0.0007	0.0002	0.0013	0.0005	0.0074	5.E-08	0.0123	0.0002	71.83	0.07	71.33	0.07
Bt: S145A (3284-02)															
A	1931.1	44.6	0.0391	0.0270	0.0034	0.0530	0.0067	0.0362	7.E-07	0.0204	0.0030	50.22	0.15	44.45	0.19
B	106.6	9.4	0.2020	0.0077	0.0009	0.0151	0.0017	0.0105	2.E-07	0.0127	0.0005	70.25	0.10	69.93	0.10
C	25.7	5.7	0.4024	0.0037	0.0006	0.0073	0.0011	0.0128	1.E-07	0.0129	0.0004	71.54	0.08	71.46	0.08
D	12.7	3.6	0.7168	0.0033	0.0003	0.0064	0.0007	0.0138	7.E-08	0.0130	0.0004	71.41	0.07	71.37	0.07
E	11.9	2.7	0.6510	0.0028	0.0003	0.0054	0.0005	0.0070	5.E-08	0.0119	0.0002	71.49	0.06	71.45	0.07
F	7.4	4.2	1.0026	0.0027	0.0004	0.0052	0.0009	0.0093	9.E-08	0.0123	0.0005	71.65	0.08	71.62	0.08
G	22.6	7.8	0.5895	0.0048	0.0008	0.0094	0.0016	0.0047	2.E-07	0.0115	0.0006	71.68	0.09	71.61	0.10
H	-25.0	13.3	-0.3505	0.0031	0.0013	0.0062	0.0025	0.0076	3.E-07	0.0119	0.0006	71.86	0.11	71.93	0.12
I	-6.2	4.6	-1.1874	0.0027	0.0005	0.0052	0.0010	0.0125	1.E-07	0.0128	0.0003	71.80	0.08	71.81	0.08
J	-4.2	5.5	-1.8243	0.0027	0.0006	0.0054	0.0012	0.0117	1.E-07	0.0127	0.0004	71.60	0.08	71.61	0.08
K*	1.9	2.8	2.3962	0.0016	0.0003	0.0032	0.0005	0.0087	5.E-08	0.0122	0.0003	71.38	0.07	71.37	0.07
L*	11.3	2.9	0.4149	0.0017	0.0003	0.0033	0.0006	0.0157	6.E-08	0.0134	0.0006	71.38	0.07	71.34	0.07
M*	19.9	5.1	0.3899	0.0028	0.0005	0.0055	0.0010	0.0096	1.E-07	0.0124	0.0006	71.41	0.08	71.35	0.08
N*	8.4	4.0	0.5065	0.0015	0.0004	0.0030	0.0008	0.0129	8.E-08	0.0129	0.0002	71.22	0.07	71.20	0.07
O*	5.3	2.0	0.2440	0.0005	0.0002	0.0009	0.0004	0.0093	4.E-08	0.0123	0.0002	71.20	0.06	71.18	0.06
P*	-108.8	60.5	-0.4812	0.0188	0.0059	0.0368	0.0115	-0.0014	1.E-06	0.0103	0.0022	70.63	0.27	70.95	0.32
Q*	-14.0	9.7	-0.2078	0.0010	0.0011	0.0020	0.0022	-0.0007	2.E-07	0.0106	0.0007	71.44	0.11	71.48	0.11
R	4.8	6.2	0.6148	0.0011	0.0007	0.0021	0.0013	0.0103	1.E-07	0.0125	0.0003	71.54	0.08	71.52	0.08
S	-1.3	9.7	-5.0267	0.0023	0.0010	0.0045	0.0021	0.0104	2.E-07	0.0124	0.0005	71.19	0.11	71.19	0.11
T	-50.1	26.9	0.1747	-0.0031	0.0025	-0.0061	0.0049	-0.0005	5.E-07	0.0105	0.0011	71.72	0.18	71.86	0.20
Bt: S162A (3089-01)															
A	1680.9	98.1	0.0072	0.0043	0.0057	0.0084	0.0112	0.0548	1.E-06	0.0231	0.0030	59.65	0.25	54.63	0.38
B*	49.9	7.6	0.0292	0.0005	0.0005	0.0010	0.0010	-0.0031	1.E-07	0.0103	0.0006	66.72	0.13	66.57	0.13
C*	7.7	5.0	0.0282	0.0001	0.0003	0.0002	0.0006	0.0112	6.E-08	0.0126	0.0003	66.37	0.41	66.34	0.41
D*	4.2	2.8	0.0378	0.0001	0.0002	0.0001	0.0003	0.0042	3.E-08	0.0114	0.0003	66.09	0.40	66.08	0.40
E*	-7.7	7.3	-0.1547	0.0004	0.0005	0.0008	0.0010	0.0127	1.E-07	0.0128	0.0004	66.04	0.40	66.06	0.40
F*	-14.4	9.5	0.2032	-0.0011	0.0006	-0.0021	0.0012	0.0149	1.E-07	0.0132	0.0003	65.93	0.40	65.97	0.40

Sample No.[a]	Derived Results				Inverse Isochron Data				
	$\%^{40}Ar^*$	Age (Ma)		w/±J	$^{36}Ar/^{40}Ar$		$^{39}Ar/^{40}Ar$		$^{36}Ar/^{39}Ar$
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Bt: S105A (3084-02)									
H	99.48	1684	3	4	0.00002	29.75834	0.01433	0.17320	0.00201
I	99.78	1684	3	4	0.00001	66.16374	0.01437	0.17561	0.00092
J*	99.62	1691	2	3	0.00001	39.32305	0.01426	0.15684	0.00165
K*	99.95	1694	2	3	0.00000	238.31080	0.01427	0.15662	0.00025
L*	99.90	1693	2	3	0.00000	94.41528	0.01428	0.14315	0.00068
M*	99.90	1693	2	3	0.00000	106.16770	0.01428	0.15572	0.00059
N*	100.03	1692	1	3	0.00000	-155.05180	0.01431	0.12301	0.00045
O*	99.67	1695	4	5	0.00001	81.97158	0.01421	0.25306	0.00088
P*	99.69	1691	3	4	0.00001	61.38510	0.01428	0.19187	0.00118
Q*	99.61	1694	3	4	0.00001	50.88192	0.01422	0.19060	0.00137
R*	100.03	1694	2	3	0.00000	-455.70260	0.01428	0.16571	0.00014
S*	100.03	1695	1	3	0.00000	-133.61370	0.01427	0.12022	0.00057
Bt: S131C (3282-01)									
A	79.52	1672	2	4	0.00069	0.54138	0.01142	0.13824	0.06734
B	98.99	1721	1	3	0.00003	1.60543	0.01359	0.09358	0.03199
C	99.85	1714	1	3	0.00001	8.82854	0.01380	0.09845	0.00643
D	99.84	1713	1	3	0.00001	5.37688	0.01381	0.09472	0.01267
E	99.90	1717	1	3	0.00000	11.13793	0.01377	0.10775	0.00555
F	99.93	1716	1	3	0.00000	25.19225	0.01378	0.10636	0.00226
G	99.95	1718	1	3	0.00000	32.16725	0.01376	0.11181	0.00146
H	99.89	1717	1	3	0.00000	12.97480	0.01377	0.10575	0.00341
I*	99.95	1722	1	3	0.00000	24.62744	0.01372	0.09684	0.00185
J*	99.96	1723	1	3	0.00000	32.57857	0.01371	0.09694	0.00151
K*	99.97	1723	1	3	0.00000	41.63563	0.01370	0.10168	0.00122
L*	99.94	1721	1	3	0.00000	16.31521	0.01372	0.09540	0.00371
M*	99.96	1720	1	3	0.00000	15.55983	0.01374	0.08872	0.00424
N	99.98	1715	1	3	0.00000	39.59427	0.01381	0.09358	0.00140
O	99.96	1710	1	3	0.00000	23.67722	0.01386	0.08971	0.00223
P	99.95	1713	1	3	0.00000	32.49134	0.01382	0.10103	0.00143
Q	99.30	1668	4	5	0.00002	23.42519	0.01431	0.29523	0.00327
R	92.13	1179	7	7	0.00026	6.87516	0.02190	0.51804	0.04906
Bt: S145A (3284-01)									
A	34.60	356	39	39	0.00219	5.69688	0.03465	2.53098	0.41720
B	60.33	1083	11	11	0.00133	1.68087	0.01602	0.59531	0.17946
C	73.35	1240	13	13	0.00089	3.19907	0.01620	0.71616	0.13404
D	95.76	1447	18	18	0.00014	28.09723	0.01701	1.21206	0.03356
E	95.49	1580	28	28	0.00015	36.52141	0.01489	1.92961	0.04352
F	95.60	1555	7	8	0.00015	9.07478	0.01527	0.51458	0.02684
G	93.13	1613	4	5	0.00023	3.14350	0.01408	0.30842	0.03210
H	95.31	1649	3	4	0.00016	2.26519	0.01393	0.20074	0.01850
I	99.75	1674	2	4	0.00001	24.76914	0.01425	0.16372	0.00171
J	99.77	1684	1	3	0.00001	18.09767	0.01413	0.12718	0.00205
K	99.95	1697	1	3	0.00000	39.97634	0.01398	0.10898	0.00092
L	99.93	1698	1	3	0.00000	20.49107	0.01396	0.09630	0.00212
M*	99.96	1699	1	3	0.00000	37.48801	0.01396	0.10528	0.00163
N*	99.99	1701	1	3	0.00000	217.29740	0.01394	0.12270	0.00026
O*	99.95	1702	1	3	0.00000	24.95815	0.01391	0.09746	0.00219
P*	100.02	1700	1	3	0.00000	-136.40030	0.01395	0.11590	0.00033
Q*	99.97	1699	1	3	0.00000	29.20147	0.01396	0.09167	0.00148
R	99.96	1695	1	3	0.00000	17.37083	0.01401	0.07985	0.00259
S	99.95	1699	1	3	0.00000	24.79926	0.01395	0.09116	0.00168
T	99.93	1695	1	3	0.00000	11.31445	0.01400	0.08337	0.00434
U	99.31	1695	1	3	0.00002	2.21019	0.01392	0.09199	0.02359
Bt: S145A (3284-02)									
A	88.52	1224	4	5	0.00038	2.30915	0.01991	0.28887	0.05105
B	99.55	1673	2	3	0.00002	8.87856	0.01424	0.14220	0.00448
C	99.89	1696	1	3	0.00000	22.33766	0.01398	0.11367	0.00180
D	99.95	1695	1	3	0.00000	28.69205	0.01400	0.09455	0.00157
E	99.95	1696	1	3	0.00000	22.96926	0.01399	0.09082	0.00225
F	99.97	1699	1	3	0.00000	56.68433	0.01396	0.10802	0.00087
G	99.91	1699	2	3	0.00000	34.62072	0.01395	0.13234	0.00144
H	100.10	1704	2	4	0.00000	-52.86071	0.01392	0.15519	0.00095
I	100.03	1702	1	3	0.00000	-72.68321	0.01393	0.11046	0.00064
J	100.02	1699	1	3	0.00000	-128.16230	0.01397	0.11545	0.00031
K*	99.99	1695	1	3	0.00000	154.76440	0.01401	0.09180	0.00028
L*	99.95	1695	1	3	0.00000	26.25372	0.01401	0.09493	0.00163
M*	99.92	1695	1	3	0.00000	25.77986	0.01400	0.11708	0.00154
N*	99.97	1692	1	3	0.00000	47.87585	0.01404	0.10261	0.00103
O*	99.98	1692	1	3	0.00000	37.66987	0.01405	0.09049	0.00164
P*	100.46	1689	5	6	-0.00002	-55.37794	0.01416	0.38101	0.00262
Q*	100.06	1697	2	3	0.00000	-69.38723	0.01400	0.15307	0.00063
R	99.98	1697	1	3	0.00000	130.92680	0.01398	0.11456	0.00032
S	100.01	1692	2	3	0.00000	-701.85930	0.01405	0.14836	0.00005
T	100.21	1703	3	4	-0.00001	-53.84446	0.01394	0.24851	0.00103
Bt: S162A (3089-01)									
A	91.59	1477	7	7	0.00028	5.83735	0.01677	0.41649	0.03958
B*	99.78	1685	2	3	0.00001	15.13542	0.01499	0.18872	0.01043
C*	99.97	1681	7	7	0.00000	64.51661	0.01507	0.61209	0.00938
D*	99.98	1677	7	7	0.00000	66.55650	0.01513	0.60815	0.00908
E*	100.04	1676	7	7	0.00000	-93.02223	0.01514	0.61088	0.00645
F*	100.07	1675	7	7	0.00000	-65.66552	0.01517	0.61187	0.00908

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Bt: S162A (3089-01)										
G*	64d	0.70	23.196	0.053	1136541	6860	17181.24	22.71	204.4619	14.9746
H*	64d	0.80	23.196	0.053	1818006	10893	27412.06	27.74	352.1246	17.3293
I*	64d	0.90	23.196	0.053	22515220	134016	341029.20	220.56	4224.2910	104.2327
J*	64d	1.00	23.196	0.053	2501322	14865	37805.15	31.52	465.8488	12.1237
K*	64d	1.10	23.196	0.053	2196165	12971	33195.72	31.51	409.8553	10.7950
L*	64d	1.20	23.196	0.053	1498784	8843	22645.05	26.48	275.1839	13.5451
M*	64d	1.30	23.196	0.053	2153114	12640	32691.58	27.74	424.2313	13.5451
N*	64d	1.50	23.196	0.053	7543872	44051	114525.90	56.70	1351.4980	23.2043
O*	64d	1.70	23.196	0.053	7247306	42065	109842.80	57.96	1348.2880	23.6576
P*	64d	2.00	23.196	0.053	4826981	27949	73200.42	49.15	952.5063	15.4269
Q*	64d	5.00	23.196	0.053	8364885	48258	126799.20	63.00	1567.0750	27.2963
Bt: S165B (3285-01)										
A	68c	0.10	21.741	0.060	145421	544	559.07	3.65	83.8140	7.1596
B	68c	0.20	21.741	0.060	342277	555	3796.26	11.00	215.3257	9.8767
C	68c	0.25	21.741	0.060	558422	663	8511.74	16.40	141.8594	12.3056
D	68c	0.30	21.741	0.060	820594	750	11595.31	18.92	150.2182	8.4970
E	68c	0.35	21.741	0.060	4542790	3005	64227.63	44.10	827.3643	21.5700
F	68c	0.40	21.741	0.060	2247528	1677	31343.44	31.51	388.5304	21.5700
G	68c	0.45	21.741	0.060	2638710	2060	36523.79	34.03	486.3428	16.5862
H	68c	0.50	21.741	0.060	2849497	2224	39314.24	35.29	449.5719	18.1174
I	68c	0.55	21.741	0.060	1053373	896	14551.81	21.43	120.0058	19.3442
J	68c	0.60	21.741	0.060	31223020	20309	435751.80	238.96	5407.8890	122.5152
K	68c	0.70	21.741	0.060	1806906	1236	25242.47	30.25	287.3066	14.4703
L	68c	0.80	21.741	0.060	1200050	876	16594.56	21.45	215.0110	8.1523
M	68c	0.90	21.741	0.060	697371	658	9654.30	15.16	127.8988	10.3454
N	68c	1.00	21.741	0.060	168969	518	2347.95	8.39	37.7402	7.8401
O	68c	1.10	21.741	0.060	329195	549	4560.16	11.77	71.6661	6.0396
P	68c	1.20	21.741	0.060	396587	565	5589.14	12.63	72.1949	5.2695
Q	68c	1.50	21.741	0.060	1927822	1280	26706.65	27.73	336.2505	9.2508
R	68c	1.70	21.741	0.060	1379910	938	19096.13	21.44	255.1682	13.0290
S	68c	2.00	21.741	0.060	5104075	2966	70485.02	42.85	866.7285	15.5768
T	68c	3.00	21.741	0.060	25977520	16044	364199.50	238.96	4280.0640	146.9586
U	68c	5.00	21.741	0.060	6469306	4292	94815.99	54.19	1149.3400	31.5955
Bt: S165B (3285-02)										
A	68c	0.30	21.741	0.060	857218	751	11949.56	20.18	132.2544	9.2163
B	68c	0.35	21.741	0.060	1144397	867	16020.46	21.44	203.5933	10.4264
C	68c	0.40	21.741	0.060	2159769	1359	30220.14	31.51	375.1237	14.1081
D	68c	0.45	21.741	0.060	2149982	1327	30197.21	31.51	349.1411	10.4264
E	68c	0.50	21.741	0.060	1943781	1235	27288.69	27.73	329.4401	15.7910
F	68c	0.55	21.741	0.060	1312572	927	18317.38	26.47	228.0652	11.9950
G	68c	0.60	21.741	0.060	2088010	1374	29045.26	26.47	341.3992	14.5914
H	68c	0.65	21.741	0.060	1034399	818	14366.93	21.44	169.3023	12.3446
I	68c	0.70	21.741	0.060	1924186	1379	26704.73	27.73	281.4781	25.5937
J	68c	0.75	21.741	0.060	1555678	1143	21596.57	25.21	253.5317	11.9651
K	68c	0.80	21.741	0.060	1841969	1218	25614.18	26.47	252.0588	28.0113
L	68c	0.90	21.741	0.060	2534404	1570	35302.01	35.29	428.4233	13.2706
M	68c	1.00	21.741	0.060	2759429	1626	38528.01	34.03	477.0147	20.5748
N*	68c	1.20	21.741	0.060	8041927	4486	112607.40	57.96	1340.4580	26.7673
O*	68c	1.50	21.741	0.060	8284475	5033	115929.40	63.01	1437.3760	20.5157
P*	68c	1.70	21.741	0.060	6398773	4174	89593.87	50.41	1112.7200	20.5157
Q	68c	2.00	21.741	0.060	412701	598	5697.54	12.65	88.5095	6.2700
R	68c	3.00	21.741	0.060	2058135	1561	28562.72	28.99	319.3190	12.1671
S	68c	5.00	21.741	0.060	650185	678	9064.46	15.15	119.5149	7.9385
T	68c	7.00	21.741	0.060	310011	553	4329.97	12.64	64.3019	8.7050
Bt: Y48A (3065-01)										
A	64a	0.20	21.413	0.369	1121895	3370	17125.63	20.23	421.7514	20.5157
B	64a	0.40	21.413	0.369	5672781	16615	88067.56	46.64	1039.8450	21.7529
C	64a	0.50	21.413	0.369	4933709	14431	72796.53	42.86	848.7521	18.0502
D*	64a	0.60	21.413	0.369	5366392	15658	78429.21	44.12	840.8214	50.5047
E*	64a	0.70	21.413	0.369	5097678	14824	74239.62	44.13	873.0101	18.2658
F*	64a	0.70	21.413	0.369	3033785	8831	44102.24	35.32	499.6740	13.1204
G*	64a	0.80	21.413	0.369	3609842	10481	52369.19	42.87	544.7029	49.3291
H*	64a	0.90	21.413	0.369	4061436	11761	58830.80	41.61	758.7068	18.2658
I*	64a	1.00	21.413	0.369	3046883	8810	44149.73	31.55	616.3690	16.9462
J*	64a	1.10	21.413	0.369	2269126	6573	32910.19	29.04	429.1660	12.7428
K*	64a	1.20	21.413	0.369	1486689	4327	21487.64	25.27	258.2272	15.7339
L*	64a	1.30	21.413	0.369	1123903	3303	16296.82	20.25	209.3084	10.7598
M*	64a	1.40	21.413	0.369	990226	2882	14349.08	21.45	144.6666	8.3600
N*	64a	1.50	21.413	0.369	938892	2758	13701.92	26.48	163.5493	18.3750
O	64a	2.00	21.413	0.369	1076008	3121	15848.35	21.45	179.2346	10.7786
P	64a	5.00	21.413	0.369	1810937	5188	20333.82	22.71	637.7569	14.7915
Bt: Y48A (3065-02)										
A	64a	0.20	21.413	0.369	119505	530	1855.49	7.50	75.9462	9.9000
B	64a	0.30	21.413	0.369	170682	652	4336.16	10.13	66.3538	9.6149
C	64a	0.40	21.413	0.369	631087	1474	10235.64	16.41	126.5644	8.8018
D	64a	0.50	21.413	0.369	1596924	3517	24239.56	23.96	290.2523	19.9378
E	64a	0.60	21.413	0.369	1813268	3923	26784.37	25.23	293.5001	13.5482
F*	64a	0.70	21.413	0.369	1777105	3818	26144.40	27.75	300.0209	10.8691
G*	64a	0.75	21.413	0.369	1207527	2607	17729.53	22.71	163.9396	22.1210
H*	64a	0.80	21.413	0.369	1223145	2610	17920.51	20.20	203.8450	18.4922
I*	64a	0.90	21.413	0.369	1326178	2795	19400.78	23.97	173.2173	21.9260

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Bt: S162A (3089-01)																
G*	9.4708	21.9862	10.8581	3.1846	6612	410	47.0	1.3	96.2	5.7	401.53	1.70	116.0	1.6	0.06057	1.37
H*	3.0999	21.3401	10.8819	3.3348	6612	410	47.0	1.3	96.2	5.7	401.53	1.70	116.0	1.6	0.09665	2.19
I*	36.0197	86.4905	34.5260	14.5887	6612	410	47.0	1.3	96.2	5.7	401.50	1.70	116.0	1.6	1.20235	27.24
J*	41.1719	21.3607	8.7008	3.3098	6612	410	47.0	1.3	96.2	5.7	401.53	1.70	116.0	1.6	0.13329	3.02
K*	21.1944	21.3403	2.8287	3.2859	5152	330	45.1	1.1	99.7	5.0	403.06	1.70	119.0	1.6	0.11704	2.65
L*	31.3650	20.1250	2.4654	3.4472	5152	330	45.1	1.1	99.7	5.0	403.06	1.70	119.0	1.6	0.07984	1.81
M*	-0.9480	21.9413	6.4193	3.1500	5152	330	45.1	1.1	99.7	5.0	403.06	1.70	119.0	1.6	0.11526	2.61
N*	43.6984	19.5413	7.3068	3.3900	5152	330	45.1	1.1	99.7	5.0	403.06	1.70	119.0	1.6	0.40378	9.15
O*	-9.3972	21.7114	1.9764	3.3301	4560	360	47.6	1.3	92.8	6.8	406.01	1.80	121.0	1.7	0.38727	8.77
P*	-25.8672	22.3157	8.0046	3.4507	4560	360	47.6	1.3	92.8	6.8	406.01	1.80	121.0	1.7	0.25808	5.85
Q*	12.7629	22.3429	12.9559	3.4828	4560	360	47.6	1.3	92.8	6.8	406.01	1.80	121.0	1.7	0.44705	10.13
Bt: S165B (3285-01)																
A	74.8849	17.2516	463.3794	4.5804	10951	350	18.6	0.9	49.1	2.9	159.69	1.00	62.5	1.2	0.00197	0.04
B	140.6105	17.2945	858.2082	6.0266	10951	350	18.6	0.9	49.1	2.9	159.69	1.00	62.5	1.2	0.01338	0.30
C	67.4112	17.2748	205.2310	3.0296	10951	350	18.6	0.9	49.1	2.9	159.69	1.00	62.5	1.2	0.03001	0.66
D	96.5964	17.9892	29.3549	2.1634	8952	390	18.8	0.9	35.8	2.7	154.19	1.10	60.0	1.4	0.04088	0.90
E	240.6015	19.1784	45.1601	2.2569	8952	390	18.8	0.9	35.8	2.7	154.19	1.10	60.0	1.4	0.22644	5.00
F	119.1776	18.3989	2.6021	2.1583	8952	390	18.8	0.9	35.8	2.7	154.19	1.10	60.0	1.4	0.11051	2.44
G	182.4202	18.7588	6.6890	2.0733	8952	390	18.8	0.9	35.8	2.7	154.19	1.10	60.0	1.4	0.12877	2.84
H	124.9867	19.3324	4.1398	2.0389	11894	310	19.5	0.8	46.8	4.2	157.11	1.20	62.3	1.2	0.13861	3.06
I	42.7544	18.9984	-0.2925	1.8551	11894	310	19.5	0.8	46.8	4.2	157.11	1.20	62.3	1.2	0.05130	1.13
J	629.8054	74.6800	-72.6382	7.5273	11894	310	19.5	0.8	46.8	4.2	157.11	1.20	62.3	1.2	1.53630	33.90
K	107.1227	17.9973	1.7918	1.9473	11894	310	19.5	0.8	46.8	4.2	157.11	1.20	62.3	1.2	0.08900	1.96
L	64.6255	18.7097	0.7150	1.8911	12460	330	38.8	1.1	37.8	4.5	157.27	1.20	62.8	1.1	0.05851	1.29
M	19.4716	18.7148	-0.5277	1.8934	12460	330	38.8	1.1	37.8	4.5	157.27	1.20	62.8	1.1	0.03404	0.75
N	15.7265	19.6541	-3.8836	1.8953	12460	330	38.8	1.1	37.8	4.5	157.27	1.20	62.8	1.1	0.00828	0.18
O	16.1954	18.9586	-3.4980	1.8990	12460	330	38.8	1.1	37.8	4.5	157.27	1.20	62.8	1.1	0.01608	0.35
P	7.0764	19.5788	2.8305	1.8717	12911	300	23.3	0.9	36.5	3.8	159.32	1.30	60.1	1.2	0.01971	0.43
Q	89.0974	18.7114	6.5404	1.8704	12911	300	23.3	0.9	36.5	3.8	159.32	1.30	60.1	1.2	0.09416	2.08
R	61.4602	20.1439	4.0384	2.0497	12911	300	23.3	0.9	36.5	3.8	159.32	1.30	60.1	1.2	0.06733	1.49
S	194.6637	18.5423	15.3520	1.9597	12911	300	23.3	0.9	36.5	3.8	159.32	1.30	60.1	1.2	0.24850	5.48
T	749.2182	77.3398	-73.6021	7.0244	14168	420	51.0	1.4	45.7	2.8	157.25	1.10	63.1	1.3	1.28404	28.33
U	349.4877	19.0827	0.9031	2.2953	14168	420	51.0	1.4	45.7	2.8	157.25	1.10	63.1	1.3	0.33429	7.38
Bt: S165B (3285-02)																
A	14.8722	18.9893	18.0229	1.9995	10438	350	16.7	0.9	39.5	2.7	148.57	0.97	56.8	1.1	0.04213	1.73
B	8.7384	18.8625	23.0393	2.0985	10438	350	16.7	0.9	39.5	2.7	148.57	0.97	56.8	1.1	0.05648	2.32
C	40.1644	17.8570	22.6713	2.0976	10438	350	16.7	0.9	39.5	2.7	148.57	0.97	56.8	1.1	0.10655	4.37
D	44.2231	18.7351	13.5019	1.9000	10438	350	16.7	0.9	39.5	2.7	148.57	0.97	56.8	1.1	0.10646	4.37
E	62.7597	19.3976	15.0365	2.1138	9049	340	19.9	0.9	34.7	4.6	145.69	1.10	55.9	1.3	0.09621	3.95
F	28.0074	18.4568	8.0456	2.0218	9049	340	19.9	0.9	34.7	4.6	145.69	1.10	55.9	1.3	0.06458	2.65
G	59.8334	18.5202	9.5828	2.0239	9049	340	19.9	0.9	34.7	4.6	145.69	1.10	55.9	1.3	0.10240	4.20
H	60.4584	18.5807	7.4325	2.0246	9049	340	19.9	0.9	34.7	4.6	145.69	1.10	55.9	1.3	0.05065	2.08
I	58.1340	19.5724	5.6234	1.9386	9049	340	19.9	0.9	34.7	4.6	145.69	1.10	55.9	1.3	0.09415	3.87
J	10.0913	19.5201	2.6030	1.8994	10255	390	20.6	0.8	45.0	4.2	149.75	1.10	57.7	1.1	0.07614	3.13
K	8.1263	19.4252	3.3401	1.8961	10255	390	20.6	0.8	45.0	4.2	149.75	1.10	57.7	1.1	0.09031	3.71
L	13.1809	19.3802	2.6239	1.7997	10255	390	20.6	0.8	45.0	4.2	149.75	1.10	57.7	1.1	0.12446	5.11
M	-18.7336	17.5379	2.0957	1.8900	10255	390	20.6	0.8	45.0	4.2	149.75	1.10	57.7	1.1	0.13584	5.58
N*	5.6722	18.4866	6.0735	1.9848	10255	390	20.6	0.8	45.0	4.2	149.75	1.10	57.7	1.1	0.39701	16.30
O*	7.5293	20.5430	1.6835	2.1338	11084	360	35.3	1.1	38.5	3.9	147.55	1.10	57.8	1.2	0.40873	16.78
P*	42.6045	20.7419	1.7761	2.0387	11084	360	35.3	1.1	38.5	3.9	147.55	1.10	57.8	1.2	0.31588	12.97
Q	-9.3900	19.0412	0.8643	1.9464	11084	360	35.3	1.1	38.5	3.9	147.55	1.10	57.8	1.2	0.02009	0.82
R	36.7300	19.3814	2.7422	1.8881	12774	340	18.2	1.0	39.1	4.1	146.58	1.10	58.3	1.1	0.10070	4.13
S	14.3455	19.1726	-0.0817	1.7931	12774	340	18.2	1.0	39.1	4.1	146.58	1.10	58.3	1.1	0.03196	1.31
T	-15.8293	19.0320	-1.9489	1.8843	12774	340	18.2	1.0	39.1	4.1	146.58	1.10	58.3	1.1	0.01527	0.63
Bt: Y48A (3065-01)																
A	121.9144	13.2285	1170.3720	17.7512	10930	380	131.6	1.8	111.9	3.9	320.04	1.50	150.0	1.5	0.06038	2.58
B	266.2246	13.2560	72.4197	4.2390	10930	380	131.6	1.8	111.9	3.9	320.04	1.50	150.0	1.5	0.31049	13.24
C	148.8702	12.7544	14.0403	3.8328	10930	380	131.6	1.8	111.9	3.9	320.04	1.50	150.0	1.5	0.25665	10.95
D*	175.2145	12.2883	-0.1602	3.6411	10930	380	131.6	1.8	111.9	3.9	320.04	1.50	150.0	1.5	0.27651	11.79
E*	131.6871	13.3504	15.9019	3.7088	11029	330	137.6	1.9	110.2	4.8	320.11	1.70	139.0	1.8	0.26174	11.16
F*	58.2391	13.3410	11.0697	3.5943	11029	330	137.6	1.9	110.2	4.8	320.11	1.70	139.0	1.8	0.15549	6.63
G*	75.7077	14.2842	11.8957	3.6752	11029	330	137.6	1.9	110.2	4.8	320.11	1.70	139.0	1.8	0.18464	7.87
H*	148.2622	12.9085	12.4258	3.6768	11029	330	137.6	1.9	110.2	4.8	320.11	1.70	139.0	1.8	0.20742	8.85
I*	98.1409	12.5926	11.5384	3.6297	12899	350	172.3	2.0	103.5	4.4	320.46	1.60	140.4	1.7	0.15566	6.64
J*	118.3924	13.5364	6.0404	3.7542	12899	350	172.3	2.0	103.5	4.4	320.46	1.60	140.4	1.7	0.11603	4.95
K*	157.7474	13.0714	1.4300	3.3972	12899	350	172.3	2.0	103.5	4.4	320.46	1.60	140.4	1.7	0.07576	3.23
L*	87.6279	12.5981	6.3363	3.6683	12899	350	172.3	2.0	103.5	4.4	320.46	1.60	140.4	1.7	0.05746	2.45
M*	112.8974	13.0700	3.3654	3.8425	6144	340	78.7	1.3	103.2	5.2	319.15	1.60	136.2	2.0	0.05059	2.16
N*	92.6673	14.5221	11.2798	3.9736	6144	340	78.7	1.3	103.2	5.2	319.15	1.60	136.2	2.0	0.04831	2.06
O	327.0978	13.1129	10.7251	3.6495	6144	340	78.7	1.3	103.2	5.2	319.15	1.60	136.2	2.0	0.05588	2.38
P	688.5309	13.6592	2108.1760	27.9303	6144	340	78.7	1.3	103.2	5.2	319.15	1.60	136.2	2.0	0.07169	3.06
Bt: Y48A (3065-02)																
A	34.4815	23.8231	230.5637	5.2173	4495	320	40.7	1.0	84.9	6.4	386.90	1.90	110.9	1.5	0.00654	0.61
B	58.5343	23.8377	42.0141	3.2683	4495	320	40.7	1.0	84.9	6.4	386.90	1.90	110.9	1.5	0.01529	1.42
C	88.8255	23.8555	43.6062	3.2687	4495	320	40.7	1.0	84.9	6.4	386.90	1.90	110.9	1.5	0.03609	3.36
D	103.7938	24.5674	27.6233	3.0718	4495	320	40.7	1.0	84.9	6.4	386.90	1.90	110.9	1.5	0.08546	7.96
E	99.8051	22.1665	15.1892	3.3252	5604	330	55.0	1.3	93.2	5.6	382.69	1.70	117.7	1.6	0.09443	8.79
F*	121.4966	22.1806	13.8310	3.4865	5604	330	55.0	1.3	93.2	5.6	382.69	1.70	117.7	1.6	0.09218	8.58
G*	68.3853	22.8704	4.7492	3.1668	5604	330	55.0	1.3	93.2	5.6	382.69	1.70	117.7	1.6	0.06251	5.82
H*	98.3292	22.8886	9.0334	2.9422	5604	330	55.0	1.3	93.2	5.6	382.69	1.70	117.7	1.6	0.06318	5.88
I*	97.2163	24.3973	-7.0876	2.9416	6531	340	65.1	1.3	139.5	17.0	387.90	2.00	121.3	1.6	0.06840	6.37

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Bt: S162A (3089-01)															
G*	63.2	18.5	0.0243	0.0006	0.0013	0.0011	0.0025	0.0064	3.E-07	0.0119	0.0009	66.15	0.41	65.96	0.41
H*	39.7	12.2	0.0079	0.0001	0.0008	0.0002	0.0015	0.0123	2.E-07	0.0128	0.0006	66.32	0.40	66.20	0.40
I*	10.1	4.3	0.0291	0.0001	0.0003	0.0002	0.0005	0.0099	5.E-08	0.0124	0.0003	66.02	0.40	65.99	0.40
J*	23.0	8.8	0.1320	0.0011	0.0006	0.0021	0.0011	0.0094	1.E-07	0.0123	0.0003	66.16	0.40	66.09	0.40
K*	8.5	9.9	0.2090	0.0006	0.0006	0.0013	0.0013	0.0097	1.E-07	0.0123	0.0003	66.16	0.40	66.13	0.40
L*	10.9	15.2	0.3549	0.0014	0.0009	0.0027	0.0017	0.0085	2.E-07	0.0122	0.0006	66.19	0.40	66.15	0.40
M*	19.6	9.6	-0.0041	0.0000	0.0007	-0.0001	0.0013	0.0133	1.E-07	0.0130	0.0004	65.86	0.39	65.80	0.39
N*	6.4	3.0	0.1669	0.0004	0.0002	0.0007	0.0003	0.0065	3.E-08	0.0118	0.0002	65.87	0.39	65.85	0.39
O*	1.8	3.0	-0.1327	-0.0001	0.0002	-0.0002	0.0004	0.0093	4.E-08	0.0123	0.0002	65.98	0.38	65.97	0.38
P*	10.9	4.7	-0.0902	-0.0004	0.0003	-0.0007	0.0006	0.0136	6.E-08	0.0130	0.0002	65.94	0.38	65.91	0.38
Q*	10.2	2.8	0.0275	0.0001	0.0002	0.0002	0.0003	0.0097	4.E-08	0.0124	0.0002	65.97	0.38	65.94	0.38
Bt: S165B (3285-01)															
A	82884.2	981.5	0.0045	0.1339	0.0309	0.2625	0.0605	-0.1009	6.E-06	0.1499	0.0128	260.11	1.96	12.66	2.63
B	22606.7	171.7	0.0046	0.0370	0.0046	0.0726	0.0089	0.0202	9.E-07	0.0567	0.0026	90.16	0.30	22.67	0.50
C	2411.2	35.9	0.0092	0.0079	0.0020	0.0155	0.0040	0.0084	4.E-07	0.0167	0.0014	65.61	0.15	58.41	0.17
D	253.2	18.7	0.0918	0.0083	0.0016	0.0163	0.0030	0.0105	3.E-07	0.0130	0.0007	70.77	0.13	70.01	0.14
E	70.3	3.5	0.1486	0.0037	0.0003	0.0073	0.0006	0.0122	6.E-08	0.0129	0.0003	70.73	0.07	70.52	0.07
F	8.3	6.9	1.2779	0.0038	0.0006	0.0075	0.0012	0.0100	1.E-07	0.0124	0.0007	71.71	0.09	71.68	0.09
G	18.3	5.7	0.7609	0.0050	0.0005	0.0098	0.0010	0.0153	1.E-07	0.0133	0.0005	72.25	0.09	72.19	0.09
H	10.5	5.2	0.8423	0.0032	0.0005	0.0062	0.0010	0.0042	1.E-07	0.0114	0.0005	72.48	0.09	72.45	0.09
I	-2.0	12.8	-4.0782	0.0029	0.0013	0.0058	0.0026	-0.0145	3.E-07	0.0082	0.0013	72.39	0.12	72.39	0.13
J	-16.7	1.7	-0.2419	0.0014	0.0002	0.0028	0.0003	0.0103	3.E-08	0.0124	0.0003	71.65	0.06	71.70	0.06
K	7.1	7.7	1.6680	0.0042	0.0007	0.0083	0.0014	0.0040	1.E-07	0.0114	0.0006	71.58	0.10	71.56	0.10
L	4.3	11.4	2.5216	0.0039	0.0011	0.0076	0.0022	0.0133	2.E-07	0.0130	0.0005	72.32	0.11	72.30	0.11
M	-5.5	19.6	-1.0294	0.0020	0.0019	0.0040	0.0038	0.0152	4.E-07	0.0132	0.0011	72.23	0.13	72.25	0.14
N	-165.4	80.7	-0.1130	0.0067	0.0084	0.0131	0.0164	0.0337	2.E-06	0.0161	0.0033	71.96	0.34	72.46	0.42
O	-76.7	41.6	-0.1292	0.0036	0.0042	0.0070	0.0081	0.0306	8.E-07	0.0157	0.0013	72.19	0.22	72.42	0.25
P	50.6	33.5	0.0698	0.0013	0.0035	0.0025	0.0069	0.0126	7.E-07	0.0129	0.0009	70.96	0.19	70.80	0.21
Q	24.5	7.0	0.3801	0.0033	0.0007	0.0065	0.0014	0.0109	1.E-07	0.0126	0.0003	72.19	0.09	72.11	0.09
R	21.2	10.7	0.4246	0.0032	0.0011	0.0063	0.0021	0.0156	2.E-07	0.0134	0.0007	72.26	0.09	72.20	0.10
S	21.8	2.8	0.3538	0.0028	0.0003	0.0054	0.0005	0.0092	5.E-08	0.0123	0.0002	72.41	0.06	72.35	0.06
T	-20.2	1.9	-0.2840	0.0021	0.0002	0.0040	0.0004	0.0065	4.E-08	0.0118	0.0004	71.33	0.06	71.39	0.06
U	1.0	2.4	10.7964	0.0037	0.0002	0.0072	0.0004	0.0084	4.E-08	0.0121	0.0003	68.23	0.06	68.22	0.06
Bt: S165B (3285-02)															
A	150.8	16.7	0.0230	0.0012	0.0016	0.0024	0.0031	0.0005	3.E-07	0.0111	0.0008	71.74	0.14	71.28	0.14
B	143.8	13.1	0.0106	0.0005	0.0012	0.0011	0.0023	0.0103	2.E-07	0.0127	0.0007	71.43	0.11	71.00	0.12
C	75.0	6.9	0.0494	0.0013	0.0006	0.0026	0.0012	0.0093	1.E-07	0.0124	0.0005	71.47	0.09	71.24	0.09
D	44.7	6.3	0.0914	0.0015	0.0006	0.0029	0.0012	0.0046	1.E-07	0.0116	0.0003	71.20	0.09	71.06	0.09
E	55.1	7.8	0.1164	0.0023	0.0007	0.0045	0.0014	0.0075	1.E-07	0.0121	0.0006	71.23	0.09	71.06	0.09
F	43.9	11.0	0.0971	0.0015	0.0010	0.0030	0.0020	0.0099	2.E-07	0.0125	0.0007	71.66	0.12	71.52	0.12
G	33.0	7.0	0.1742	0.0021	0.0006	0.0040	0.0012	0.0059	1.E-07	0.0118	0.0005	71.89	0.08	71.79	0.08
H	51.7	14.1	0.2269	0.0042	0.0013	0.0082	0.0025	0.0059	3.E-07	0.0118	0.0009	72.00	0.12	71.84	0.13
I	21.1	7.3	0.2884	0.0022	0.0007	0.0043	0.0014	-0.0012	1.E-07	0.0105	0.0010	72.05	0.09	71.99	0.09
J	12.1	8.8	0.1082	0.0005	0.0009	0.0009	0.0018	0.0060	2.E-07	0.0117	0.0006	72.03	0.10	71.99	0.10
K	13.0	7.4	0.0679	0.0003	0.0008	0.0006	0.0015	-0.0052	2.E-07	0.0098	0.0011	71.91	0.09	71.87	0.09
L	7.4	5.1	0.1402	0.0004	0.0005	0.0007	0.0011	0.0084	1.E-07	0.0121	0.0004	71.79	0.08	71.77	0.09
M	5.4	4.9	-0.2494	-0.0005	0.0005	-0.0010	0.0009	0.0099	9.E-08	0.0124	0.0005	71.62	0.08	71.60	0.08
N*	5.4	1.8	0.0261	0.0001	0.0002	0.0001	0.0003	0.0071	3.E-08	0.0119	0.0002	71.42	0.05	71.40	0.05
O*	1.5	1.8	0.1248	0.0001	0.0002	0.0001	0.0003	0.0101	4.E-08	0.0124	0.0002	71.46	0.06	71.45	0.06
P*	2.0	2.3	0.6692	0.0005	0.0002	0.0009	0.0005	0.0102	5.E-08	0.0124	0.0002	71.42	0.06	71.41	0.06
Q	15.2	34.2	-0.3031	-0.0016	0.0033	-0.0032	0.0066	0.0285	7.E-07	0.0155	0.0011	72.43	0.19	72.39	0.22
R	9.6	6.6	0.3737	0.0013	0.0007	0.0025	0.0013	0.0027	1.E-07	0.0112	0.0004	72.06	0.09	72.03	0.09
S	-0.9	19.8	-4.8997	0.0016	0.0021	0.0031	0.0041	0.0147	4.E-07	0.0132	0.0009	71.73	0.14	71.73	0.15
T	-45.0	43.5	0.2266	-0.0037	0.0044	-0.0072	0.0086	0.0251	9.E-07	0.0149	0.0020	71.60	0.24	71.73	0.28
Bt: Y48A (3065-01)															
A	6834.0	104.0	0.0029	0.0071	0.0008	0.0140	0.0015	0.0062	2.E-07	0.0246	0.0012	65.51	0.21	45.10	0.37
B	82.2	4.8	0.1026	0.0030	0.0002	0.0059	0.0003	0.0056	3.E-08	0.0118	0.0002	64.41	0.19	64.17	0.19
C	19.3	5.3	0.2958	0.0020	0.0002	0.0040	0.0003	0.0055	4.E-08	0.0117	0.0002	67.77	0.20	67.71	0.20
D*	-0.2	4.6	-30.5055	0.0022	0.0002	0.0044	0.0003	0.0001	3.E-08	0.0107	0.0006	68.42	0.20	68.42	0.20
E*	21.4	5.0	0.2310	0.0018	0.0002	0.0035	0.0004	0.0060	4.E-08	0.0118	0.0002	68.67	0.20	68.60	0.20
F*	25.1	8.2	0.1468	0.0013	0.0003	0.0026	0.0006	0.0035	6.E-08	0.0113	0.0003	68.79	0.21	68.71	0.21
G*	22.7	7.0	0.1776	0.0014	0.0003	0.0028	0.0005	-0.0020	5.E-08	0.0104	0.0009	68.93	0.21	68.86	0.21
H*	21.1	6.3	0.3329	0.0025	0.0002	0.0049	0.0004	0.0128	4.E-08	0.0129	0.0003	69.04	0.21	68.97	0.21
I*	26.1	8.2	0.2373	0.0022	0.0003	0.0044	0.0006	0.0190	6.E-08	0.0140	0.0004	69.01	0.21	68.93	0.21
J*	18.4	11.4	0.5468	0.0036	0.0004	0.0071	0.0008	0.0137	8.E-08	0.0130	0.0004	68.95	0.21	68.89	0.21
K*	6.7	15.8	3.0778	0.0073	0.0006	0.0144	0.0012	0.0077	1.E-07	0.0120	0.0007	69.19	0.22	69.17	0.22
L*	38.9	22.5	0.3858	0.0054	0.0008	0.0105	0.0015	0.0123	2.E-07	0.0128	0.0007	68.96	0.22	68.85	0.23
M*	23.5	26.8	0.9359	0.0079	0.0009	0.0154	0.0018	-0.0039	2.E-07	0.0101	0.0006	69.01	0.23	68.94	0.24
N*	82.3	29.0	0.2292	0.0068	0.0011	0.0133	0.0021	0.0064	2.E-07	0.0119	0.0013	68.52	0.24	68.27	0.26
O	67.7	23.0	0.8509	0.0206	0.0008	0.0405	0.0016	0.0029	2.E-07	0.0113	0.0007	67.89	0.22	67.69	0.23
P	10367.8	137.9	0.0091	0.0339	0.0007	0.0664	0.0013	0.0067	1.E-07	0.0314	0.0007	89.06	0.27	58.11	0.49
Bt: Y48A (3065-02)															
A	12426.0	285.6	0.0042	0.0186	0.0128	0.0364	0.0252	0.0404	3.E-06	0.0409	0.0053	64.41	0.39	27.31	0.89
B	968.9	75.4	0.0389	0.0135	0.0055	0.0265	0.0108	0.0165	1.E-06	0.0153	0.0022	39.36	0.18	36.47	0.28
C	426.0	31.9	0.0568	0.0087	0.0023	0.0170	0.0046	0.0051	5.E-07	0.0124	0.0009	61.66	0.17	60.38	0.20
D	114.0	12.7	0.1048	0.0043	0.0010	0.0084	0.0020	0.0063	2.E-07	0.0120	0.0008	65.88	0.16	65.54	0.16
E	56.7	12.4	0.1833	0.0037	0.0008	0.0073	0.0016	0.0009	2.E-07	0.0110	0.0005	67.70	0.16	67.53	0.16
F*	52.9	13.3	0.2451	0.0046	0.0008	0.0091	0.0017	0.0040	2.E-07	0.0115	0.0004	67.97	0.16	67.81	0.17
G*	26.8	17.9	0.4017	0.0039	0.0013	0.0076	0.0025	-0.0089	3.E-07	0.0092	0.0012	68.11	0.17	68.03	0.18
H*	50.4	16.4	0.3037	0.0055	0.0013	0.0108	0.0025	0.0034	3.E-07	0.0114	0.0010	68.25	0.16	68.10	0.17
I*	-36.5	15.2	-0.3827	0.0050	0.0013	0.0098	0.0025	-0.0101	3.E-07	0.0089	0.0011	68.36	0.17	68.46	0.17

Sample No.[a]	Derived Results				Inverse Isochron Data				
	$\%^{40}Ar^*$	Age (Ma)		w/±J	$^{36}Ar/^{40}Ar$		$^{39}Ar/^{40}Ar$		$^{36}Ar/^{39}Ar$
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Bt: S162A (3089-01)									
G*	99.71	1675	7	7	0.00001	29.35551	0.01512	0.61790	0.02009
H*	99.82	1679	7	7	0.00001	30.69170	0.01508	0.60768	0.01925
I*	99.95	1675	7	7	0.00000	42.43398	0.01515	0.59875	0.01395
J*	99.90	1677	7	7	0.00000	38.15714	0.01511	0.60015	0.01543
K*	99.96	1677	7	7	0.00000	116.93450	0.01512	0.59825	0.00499
L*	99.95	1678	7	7	0.00000	140.75700	0.01511	0.60152	0.00411
M*	99.91	1672	6	7	0.00000	49.20521	0.01518	0.59320	0.01181
N*	99.97	1673	6	7	0.00000	46.66313	0.01518	0.58605	0.01247
O*	99.99	1675	6	7	0.00000	171.74350	0.01516	0.58284	0.00337
P*	99.95	1674	6	7	0.00000	43.28534	0.01517	0.58292	0.01329
Q*	99.95	1674	6	7	0.00000	26.99656	0.01516	0.57907	0.02129
Bt: S165B (3285-01)									
A	4.87	439	81	81	0.00319	1.05690	0.00384	0.75175	0.17592
B	25.14	723	13	13	0.00251	0.72075	0.01109	0.33198	0.10971
C	89.03	1479	3	4	0.00037	1.48119	0.01524	0.22635	0.04202
D	98.93	1669	2	4	0.00004	7.37894	0.01413	0.18702	0.00605
E	99.70	1677	1	3	0.00001	5.00964	0.01414	0.09535	0.00916
F	99.97	1695	1	3	0.00000	84.49822	0.01395	0.12520	0.00053
G	99.93	1703	1	3	0.00000	31.35811	0.01384	0.12154	0.00160
H	99.96	1706	1	3	0.00000	49.76539	0.01380	0.11895	0.00103
I	100.01	1706	2	4	0.00000	-629.63920	0.01382	0.17009	0.00007
J	100.07	1695	1	3	0.00000	-10.30919	0.01396	0.08508	0.00482
K	99.97	1693	2	3	0.00000	110.81940	0.01397	0.13800	0.00031
L	99.98	1704	2	3	0.00000	275.37740	0.01383	0.14844	0.00013
M	100.02	1703	2	4	0.00000	-350.69410	0.01384	0.18322	0.00014
N	100.69	1707	6	7	-0.00002	-48.70462	0.01390	0.47070	0.00410
O	100.32	1706	4	5	-0.00001	-54.12050	0.01385	0.30734	0.00167
P	99.79	1681	3	4	0.00001	66.25337	0.01409	0.26725	0.00115
Q	99.90	1701	1	3	0.00000	28.76845	0.01385	0.12327	0.00124
R	99.91	1703	2	3	0.00000	51.14901	0.01384	0.13127	0.00069
S	99.91	1705	1	3	0.00000	12.83664	0.01381	0.08410	0.00313
T	100.09	1690	1	3	0.00000	-9.50357	0.01402	0.09011	0.00445
U	100.00	1641	1	3	0.00000	298.63180	0.01466	0.08757	0.00017
Bt: S165B (3285-02)									
A	99.37	1689	2	4	0.00002	11.09807	0.01394	0.19021	0.00363
B	99.40	1684	2	4	0.00002	9.11308	0.01400	0.15377	0.00410
C	99.69	1688	1	3	0.00001	9.26319	0.01399	0.12179	0.00351
D	99.81	1685	1	3	0.00001	14.09316	0.01405	0.12123	0.00223
E	99.77	1685	1	3	0.00001	14.08434	0.01404	0.11985	0.00239
F	99.82	1692	2	4	0.00001	25.18163	0.01396	0.16085	0.00123
G	99.86	1696	1	3	0.00000	21.17627	0.01391	0.11242	0.00182
H	99.79	1697	2	4	0.00001	27.31752	0.01389	0.16886	0.00136
I	99.91	1699	1	3	0.00000	34.56740	0.01388	0.12619	0.00118
J	99.95	1700	2	3	0.00000	73.22837	0.01388	0.13793	0.00053
K	99.95	1698	1	3	0.00000	56.70102	0.01391	0.12269	0.00063
L	99.97	1696	1	3	0.00000	69.06449	0.01393	0.11760	0.00047
M	99.98	1694	1	3	0.00000	90.74815	0.01396	0.10617	0.00036
N*	99.98	1690	1	3	0.00000	32.89635	0.01400	0.07591	0.00125
O*	99.99	1691	1	3	0.00000	131.25270	0.01399	0.08152	0.00035
P*	99.99	1691	1	3	0.00000	118.48140	0.01400	0.08615	0.00042
Q	99.94	1706	3	4	0.00000	226.56480	0.01381	0.26505	0.00035
R	99.96	1700	1	3	0.00000	69.21012	0.01388	0.12671	0.00066
S	100.00	1695	2	4	0.00000	-1947.75000	0.01394	0.19699	0.00003
T	100.19	1695	4	5	-0.00001	-96.65481	0.01397	0.34203	0.00096
Bt: Y48A (3065-01)									
A	68.85	1219	7	17	0.00104	1.54628	0.01527	0.32282	0.18081
B	99.62	1560	3	18	0.00001	5.86817	0.01553	0.29766	0.04912
C	99.92	1617	3	19	0.00000	27.40748	0.01476	0.29838	0.01046
D*	100.00	1628	3	19	0.00000	-1738.40800	0.01462	0.29717	0.00016
E*	99.91	1630	3	19	0.00000	23.40147	0.01456	0.29683	0.01218
F*	99.89	1632	3	19	0.00000	32.53476	0.01454	0.30190	0.00863
G*	99.90	1635	3	19	0.00000	30.94374	0.01451	0.30167	0.00903
H*	99.91	1636	3	19	0.00000	29.75075	0.01449	0.29810	0.00946
I*	99.89	1636	3	19	0.00000	31.61040	0.01449	0.29785	0.00888
J*	99.92	1635	3	19	0.00000	62.64877	0.01450	0.30281	0.00442
K*	99.97	1639	3	19	0.00000	246.08830	0.01445	0.31395	0.00110
L*	99.83	1634	4	19	0.00001	58.18039	0.01450	0.31910	0.00465
M*	99.90	1636	4	19	0.00000	115.19460	0.01449	0.32724	0.00225
N*	99.64	1625	4	19	0.00001	35.31978	0.01459	0.35162	0.00695
O	99.70	1616	4	19	0.00001	34.32688	0.01473	0.32012	0.00766
P	65.25	1458	8	19	0.00116	1.35565	0.01123	0.30751	0.19692
Bt: Y48A (3065-02)									
A	42.40	831	22	25	0.00193	2.30613	0.01553	0.60007	0.14214
B	92.65	1041	6	15	0.00025	7.79232	0.02541	0.44799	0.04186
C	97.94	1497	3	18	0.00007	7.50468	0.01622	0.28331	0.02566
D	99.48	1582	3	18	0.00002	11.13731	0.01518	0.24140	0.01804
E	99.75	1614	3	19	0.00001	21.93543	0.01477	0.23599	0.00904
F*	99.77	1618	3	19	0.00001	25.27996	0.01471	0.23964	0.00762
G*	99.88	1621	3	19	0.00000	66.86261	0.01468	0.25104	0.00278
H*	99.78	1623	3	19	0.00001	32.68115	0.01465	0.24133	0.00577
I*	100.16	1628	3	19	-0.00001	-41.39432	0.01463	0.24433	0.00439

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Bt: Y48A (3065-02)										
J*	64a	1.00	21.413	0.369	1361654	2840	19974.99	22.71	151.0616	25.4078
K*	64a	1.10	21.413	0.369	917951	1944	13459.24	18.94	77.7967	21.9260
L*	64a	1.20	21.413	0.369	1040858	2178	15248.14	18.94	113.7746	18.6539
M*	64a	1.30	21.413	0.369	902394	1890	13218.58	16.42	188.4997	11.9197
N*	64a	1.50	21.413	0.369	1415835	2863	20751.73	25.22	295.9297	12.9794
O*	64a	1.70	21.413	0.369	1203379	2444	17672.81	23.97	251.9456	10.7598
P*	64a	2.00	21.413	0.369	932749	1913	13762.30	18.93	194.8820	11.3371
Q	64a	5.00	21.413	0.369	1647540	3246	24303.17	26.48	226.2273	34.7022
R	64a	7.00	21.413	0.369	1196612	2843	17621.73	22.70	302.6141	14.9368
Bt: Y66C (3070-01)										
A	64a	0.20	21.865	0.039	258474	1385	4191.21	11.16	52.7583	7.7566
B*	64a	0.30	21.865	0.039	1535698	7624	20654.92	23.97	268.2980	11.3475
C*	64a	0.40	21.865	0.039	2383297	11811	31966.54	30.26	369.1819	16.2175
D*	64a	0.50	21.865	0.039	2656313	13160	35606.82	29.00	404.1779	18.5852
E*	64a	0.60	21.865	0.039	1564605	7781	20902.30	25.22	276.0147	16.9205
F*	64a	0.70	21.865	0.039	1160951	5793	15584.04	20.19	171.7822	9.1323
G*	64a	0.70	21.865	0.039	483070	2474	6489.94	13.90	71.7165	11.5319
H*	64a	0.80	21.865	0.039	856506	4303	11407.73	17.67	155.8452	9.5795
I*	64a	0.90	21.865	0.039	520941	2644	6979.57	12.65	100.4937	5.8868
J*	64a	1.00	21.865	0.039	1888847	9394	25347.40	22.71	291.0831	7.9156
K*	64a	1.10	21.865	0.039	1516030	7552	20388.29	23.97	271.2185	8.5951
L*	64a	1.20	21.865	0.039	1586428	7908	21372.91	23.97	273.6607	8.4809
M*	64a	1.30	21.865	0.039	1164249	5865	15677.33	22.71	173.0410	11.4569
N*	64a	1.50	21.865	0.039	708370	3617	9645.42	15.17	114.1522	9.7656
O*	64a	1.70	21.865	0.039	343296	1834	4740.60	11.04	70.9486	12.3822
P*	64a	2.00	21.865	0.039	1458106	7342	19798.84	20.20	219.3792	13.4372
Q	64a	5.00	21.865	0.039	321465	1688	4552.87	10.27	60.5379	6.8661
Bt: Y98A (3087-01)										
A	64d	0.20	23.206	0.060	27984	496	864.17	5.55	34.8449	9.9488
B	64d	0.30	23.206	0.060	41266	534	737.31	4.09	9.0385	9.5547
C	64d	0.40	23.206	0.060	229778	1109	3559.73	11.02	43.1407	10.8040
D*	64d	0.50	23.206	0.060	563219	2469	8117.81	15.16	103.3387	10.1131
E*	64d	0.60	23.206	0.060	955105	4116	14332.35	18.93	162.2276	8.8560
F*	64d	0.70	23.206	0.060	1208781	5183	18280.81	21.45	225.3587	11.4528
G*	64d	0.70	23.206	0.060	493938	2167	7449.52	13.91	92.9281	13.2012
H*	64d	0.80	23.206	0.060	756242	3262	11428.59	18.93	134.7595	15.1314
I*	64d	0.90	23.206	0.060	1120205	4795	16904.77	21.45	210.0889	11.6524
J*	64d	1.00	23.206	0.060	2163741	9190	32741.60	32.77	398.9662	20.1384
K*	64d	1.10	23.206	0.060	2166105	9196	32879.28	27.74	399.2180	21.3233
L*	64d	1.20	23.206	0.060	1802942	7659	27264.74	27.74	281.6417	27.3469
M*	64d	1.30	23.206	0.060	2786823	11788	41883.19	31.51	518.0154	17.7993
N*	64d	1.40	23.206	0.060	1602713	6795	24153.05	26.47	264.9872	17.7993
O*	64d	1.50	23.206	0.060	2426957	10263	36449.53	32.76	447.5703	12.7865
P*	64d	1.70	23.206	0.060	4476352	18894	66898.50	47.88	785.0167	18.9631
Q*	64d	2.00	23.206	0.060	15616740	65869	234132.40	177.65	2278.0560	208.2288
R*	64d	2.50	23.206	0.060	1311878	5562	19679.44	21.45	232.7356	9.7086
S*	64d	3.00	23.206	0.060	3348021	14120	50139.76	36.55	559.4818	14.9368
T*	64d	5.00	23.206	0.060	3351814	14135	50367.37	36.55	618.6476	17.2966
Bt: Z1A (3286-01)										
A	68c	0.10	21.563	0.060	9049	492	257.45	3.01	5.4005	5.4097
B	68c	0.20	21.563	0.060	53375	508	1764.52	6.47	32.1509	6.6869
C	68c	0.25	21.563	0.060	94995	522	1524.71	6.73	29.6836	7.1606
D	68c	0.30	21.563	0.060	329400	586	4857.66	12.25	84.2043	7.0434
E	68c	0.35	21.563	0.060	439067	624	6337.68	13.88	94.0107	6.4627
F	68c	0.40	21.563	0.060	1622868	1471	23103.66	26.47	321.6605	6.3476
G	68c	0.45	21.563	0.060	2200439	1831	31278.62	35.29	443.7686	14.0712
H	68c	0.50	21.563	0.060	3273813	2452	46578.63	32.77	610.5909	11.7251
I	68c	0.55	21.563	0.060	3191734	2283	45322.18	35.29	628.9449	17.8003
J	68c	0.60	21.563	0.060	2576374	1808	36560.35	32.77	474.1068	21.5459
K	68c	0.70	21.563	0.060	3494157	2440	49431.32	39.07	628.5673	15.5768
L	68c	0.80	21.563	0.060	5368963	3854	76100.70	45.37	1021.3270	15.5768
M	68c	0.90	21.563	0.060	3976653	3070	56335.74	42.85	753.5707	24.2181
N*	68c	1.00	21.563	0.060	7560369	6190	107769.10	55.45	1378.2100	15.5768
O*	68c	1.10	21.563	0.060	27686800	22510	395354.00	245.09	5139.4320	85.9063
P*	68c	1.20	21.563	0.060	6073180	4501	86753.56	52.92	1123.9990	25.8364
Q*	68c	1.50	21.563	0.060	16439610	11485	234811.70	208.32	3159.5250	92.0154
R	68c	1.70	21.563	0.060	2210800	1538	31368.25	28.99	452.6561	13.4047
S	68c	2.00	21.563	0.060	4246889	2758	60238.02	45.36	836.8057	14.9494
T	68c	3.00	21.563	0.060	7199093	4753	102200.30	59.22	1378.1980	30.2613
U	68c	5.00	21.563	0.060	1181646	1013	17077.40	21.44	245.5003	13.8540
Bt: Z58B (3287-01)										
A	68c	0.20	21.487	0.060	425407	622	6832.94	12.62	102.8478	8.6427
B	68c	0.25	21.487	0.060	687693	687	9602.94	17.66	138.6745	11.2437
C	68c	0.30	21.487	0.060	2174716	1492	30366.58	35.29	412.5744	19.5335
D	68c	0.35	21.487	0.060	3272351	2056	45820.28	36.55	677.6875	46.8449
E	68c	0.40	21.487	0.060	2874655	1902	40105.38	36.55	533.9524	18.2924
F	68c	0.45	21.487	0.060	3368499	2259	47117.18	37.81	606.3360	18.2924
G*	68c	0.50	21.487	0.060	2713373	1941	37786.42	35.29	477.1784	14.6887
H*	68c	0.55	21.487	0.060	1815656	1430	25240.42	28.99	303.5834	13.5085
I*	68c	0.60	21.487	0.060	2542631	1907	35328.50	31.51	472.7850	14.1477
J*	68c	0.70	21.487	0.060	2565499	1808	35555.91	30.25	497.2066	17.8609

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Bt: Y48A (3065-02)																
J*	179.3051	24.4408	5.7534	3.0884	6531	340	65.1	1.3	139.5	17.0	387.90	2.00	121.3	1.6	0.07042	6.56
K*	161.2911	25.1236	1.5424	3.1442	6531	340	65.1	1.3	139.5	17.0	387.90	2.00	121.3	1.6	0.04745	4.42
L*	299.4078	25.1941	-3.7828	3.2897	6531	340	65.1	1.3	139.5	17.0	387.90	2.00	121.3	1.6	0.05376	5.00
M*	248.7016	23.4647	0.2204	3.0453	5514	380	54.6	1.2	73.6	4.4	382.83	1.80	122.4	1.6	0.04660	4.34
N*	348.7695	24.2355	5.0440	3.1501	5514	380	54.6	1.2	73.6	4.4	382.83	1.80	122.4	1.6	0.07316	6.81
O*	283.3950	22.1130	-3.3791	2.8545	5514	380	54.6	1.2	73.6	4.4	382.83	1.80	122.4	1.6	0.06231	5.80
P*	307.0013	24.2224	-2.7425	3.1907	5514	380	54.6	1.2	73.6	4.4	382.83	1.80	122.4	1.6	0.04852	4.52
Q	886.8470	26.4686	76.0479	3.9337	4079	380	45.6	1.1	99.9	7.0	386.43	1.90	120.3	1.6	0.08568	7.98
R	854.0113	26.4438	28.2394	3.5415	3210	350	43.1	1.0	73.7	5.6	384.04	1.80	124.9	1.7	0.06213	5.78
Bt: Y66C (3070-01)																
A	57.7557	21.3867	29.3633	3.3918	3350	350	49.1	1.3	93.2	5.9	399.87	1.90	124.2	1.8	0.01478	1.52
B*	44.8506	21.9960	22.5172	3.4287	3350	350	49.1	1.3	93.2	5.9	399.87	1.90	124.2	1.8	0.07282	7.50
C*	99.4023	21.4214	0.8783	3.2247	3350	350	49.1	1.3	93.2	5.9	399.87	1.90	124.2	1.8	0.11270	11.61
D*	24.1779	23.2696	6.6543	3.1782	3350	350	49.1	1.3	93.2	5.9	399.87	1.90	124.2	1.8	0.12554	12.93
E*	40.0758	22.4894	5.9848	3.1465	4313	430	48.0	1.1	92.0	4.3	404.40	2.00	124.2	1.6	0.07369	7.59
F*	-8.0339	22.4636	6.3424	3.2324	4313	430	48.0	1.1	92.0	4.3	404.40	2.00	124.2	1.6	0.05494	5.66
G*	-8.9958	21.8652	2.1015	3.1241	4313	430	48.0	1.1	92.0	4.3	404.40	2.00	124.2	1.6	0.02288	2.36
H*	-23.7596	23.0828	24.4233	3.2583	4313	430	48.0	1.1	92.0	4.3	404.40	2.00	124.2	1.6	0.04022	4.14
I*	-6.0290	20.7295	6.1660	2.9990	2856	340	44.6	1.2	83.4	3.6	401.54	1.60	121.9	1.5	0.02461	2.54
J*	22.1970	20.7532	10.3782	3.1070	2856	340	44.6	1.2	83.4	3.6	401.54	1.60	121.9	1.5	0.08937	9.21
K*	33.4753	21.4353	5.0772	2.9129	2856	340	44.6	1.2	83.4	3.6	401.54	1.60	121.9	1.5	0.07188	7.41
L*	27.1864	20.7662	11.1782	3.1971	2856	340	44.6	1.2	83.4	3.6	401.54	1.60	121.9	1.5	0.07535	7.76
M*	29.4681	20.5536	-29.5121	3.0338	11281	330	40.5	1.3	95.1	4.7	402.54	1.70	148.3	1.6	0.05527	5.69
N*	11.1069	21.8453	-23.2854	3.2358	11281	330	40.5	1.3	95.1	4.7	402.54	1.70	148.3	1.6	0.03401	3.50
O*	18.8933	20.5572	-28.6151	2.8858	11281	330	40.5	1.3	95.1	4.7	402.54	1.70	148.3	1.6	0.01671	1.72
P*	19.0711	20.5631	-17.4530	3.1883	11281	330	40.5	1.3	95.1	4.7	402.54	1.70	148.3	1.6	0.06980	7.19
Q	18.1143	22.4225	19.8544	3.3769	2360	350	43.3	1.2	87.8	4.8	402.24	2.10	125.5	1.7	0.01605	1.65
Bt: Y98A (3087-01)																
A	4.4514	24.2959	30.4501	3.9242	3163	340	50.2	1.2	102.8	7.6	333.84	1.60	146.4	1.7	0.00305	0.12
B	30.3202	23.7824	10.2527	3.6071	3163	340	50.2	1.2	102.8	7.6	333.84	1.60	146.4	1.7	0.00260	0.11
C	12.2441	23.9607	-1.2250	3.5848	3163	340	50.2	1.2	102.8	7.6	333.84	1.60	146.4	1.7	0.01255	0.51
D*	19.0047	23.9839	74.9617	4.6051	3163	340	50.2	1.2	102.8	7.6	333.84	1.60	146.4	1.7	0.02862	1.16
E*	-3.8240	23.3377	-6.4200	3.5903	5613	300	50.6	1.2	101.0	6.1	333.55	1.70	148.2	1.6	0.05053	2.05
F*	6.8927	23.6990	5.3054	3.6831	5613	300	50.6	1.2	101.0	6.1	333.55	1.70	148.2	1.6	0.06445	2.62
G*	7.9117	23.6885	-8.2832	3.4203	5613	300	50.6	1.2	101.0	6.1	333.55	1.70	148.2	1.6	0.02626	1.07
H*	15.7458	23.7251	1.3969	3.7301	5613	300	50.6	1.2	101.0	6.1	333.55	1.70	148.2	1.6	0.04029	1.64
I*	8.8515	24.2186	-5.2697	3.6300	5182	360	48.6	1.2	98.0	7.0	334.57	1.80	149.8	1.8	0.05960	2.42
J*	-0.1361	24.1470	-2.4512	3.5794	5182	360	48.6	1.2	98.0	7.0	334.57	1.80	149.8	1.8	0.11544	4.69
K*	-1.9722	24.1231	3.7627	3.7761	5182	360	48.6	1.2	98.0	7.0	334.57	1.80	149.8	1.8	0.11592	4.71
L*	48.6647	24.1320	2.1450	3.8405	5182	360	48.6	1.2	98.0	7.0	334.57	1.80	149.8	1.8	0.09613	3.90
M*	12.6279	23.5151	6.1047	3.6817	2911	350	47.5	1.0	101.8	7.0	331.10	1.70	142.5	2.0	0.14767	6.00
N*	-7.1244	23.6990	9.7582	3.8539	2911	350	47.5	1.0	101.8	7.0	331.10	1.70	142.5	2.0	0.08515	3.46
O*	20.6144	23.2511	5.6763	3.7500	2911	350	47.5	1.0	101.8	7.0	331.10	1.70	142.5	2.0	0.12851	5.22
P*	49.1329	23.4408	6.3386	3.8290	2911	350	47.5	1.0	101.8	7.0	331.10	1.70	142.5	2.0	0.23586	9.58
Q*	12.5092	106.3339	42.4585	15.1798	1523	350	50.5	1.3	113.6	5.6	334.10	1.50	141.4	1.5	0.82547	33.53
R*	-20.1588	23.0253	3.9976	3.5655	1523	350	50.5	1.3	113.6	5.6	334.07	1.50	141.4	1.5	0.06938	2.82
S*	27.6508	24.0080	6.7570	3.4344	1523	350	50.5	1.3	113.6	5.6	334.07	1.50	141.4	1.5	0.17677	7.18
T*	39.0525	23.4313	22.7371	3.7215	1523	350	50.5	1.3	113.6	5.6	334.07	1.50	141.4	1.5	0.17758	7.21
Bt: Z1A (3286-01)																
A	-15.6204	18.4049	22.2896	2.1470	12581	350	16.9	0.8	51.4	4.4	162.75	1.10	65.5	1.2	0.00091	0.02
B	138.6785	19.3365	18.8197	1.9569	12581	350	16.9	0.8	51.4	4.4	162.75	1.10	65.5	1.2	0.00622	0.12
C	51.8948	17.5128	9.6941	1.8637	13096	320	17.7	0.9	39.8	2.6	162.46	1.10	64.3	1.2	0.00538	0.11
D	96.5693	17.6115	12.2894	2.1442	13096	320	17.7	0.9	39.8	2.6	162.46	1.10	64.3	1.2	0.01713	0.34
E	107.0995	18.5680	5.6349	1.9557	13096	320	17.7	0.9	39.8	2.6	162.46	1.10	64.3	1.2	0.02234	0.45
F	177.2340	18.8035	8.5474	2.0521	13096	320	17.7	0.9	39.8	2.6	162.46	1.10	64.3	1.2	0.08146	1.63
G	151.4935	18.8137	5.3082	2.0494	12240	360	19.0	0.9	37.5	2.5	161.44	1.10	59.7	1.2	0.11028	2.21
H	121.2551	16.9875	11.3326	2.1448	12240	360	19.0	0.9	37.5	2.5	161.44	1.10	59.7	1.2	0.16422	3.29
I	158.8389	17.7398	5.5077	1.9530	12240	360	19.0	0.9	37.5	2.5	161.44	1.10	59.7	1.2	0.15979	3.20
J	119.2714	17.6562	7.1047	2.0457	12240	360	19.0	0.9	37.5	2.5	161.44	1.10	59.7	1.2	0.12890	2.58
K	162.7336	17.2734	8.9951	1.8923	15995	380	63.7	1.2	47.9	3.8	162.21	1.00	57.1	1.1	0.17428	3.49
L	222.5943	18.3277	11.9189	2.0880	15995	380	63.7	1.2	47.9	3.8	162.21	1.00	57.1	1.1	0.26830	5.38
M	86.6628	17.4736	12.1888	1.9915	15995	380	63.7	1.2	47.9	3.8	162.21	1.00	57.1	1.1	0.19862	3.98
N*	171.6352	18.6652	13.2806	1.9940	15995	380	63.7	1.2	47.9	3.8	162.21	1.00	57.1	1.1	0.37996	7.62
O*	430.9543	73.9908	-49.3659	7.5828	11665	380	17.8	0.9	52.2	5.8	161.23	1.00	61.7	1.2	1.39388	27.94
P*	87.3041	18.3368	7.2158	2.0489	11665	380	17.8	0.9	52.2	5.8	161.23	1.00	61.7	1.2	0.30586	6.13
Q*	162.8464	86.6271	-78.5527	8.1257	11665	380	17.8	0.9	52.2	5.8	161.23	1.00	61.7	1.2	0.82786	16.59
R	29.5990	16.3635	0.4586	1.9520	11665	380	17.8	0.9	52.2	5.8	161.23	1.00	61.7	1.2	0.11059	2.22
S	50.8792	18.6705	3.9062	2.0158	14205	390	17.4	0.9	24.8	8.8	162.60	1.10	59.8	1.3	0.21238	4.26
T	115.7056	18.0239	5.9316	2.2013	14205	390	17.4	0.9	24.8	8.8	162.60	1.10	59.8	1.3	0.36032	7.22
U	256.3123	20.1002	12.4435	2.2048	14205	390	17.4	0.9	24.8	8.8	162.60	1.10	59.8	1.3	0.06021	1.21
Bt: Z58B (3287-01)																
A	-13.3705	20.6176	61.3202	2.5131	10190	340	17.1	0.8	38.4	5.0	157.51	1.20	60.6	1.3	0.02409	0.91
B	-9.6733	18.8312	22.5216	2.1136	10190	340	17.1	0.8	38.4	5.0	157.51	1.20	60.6	1.3	0.03386	1.28
C	-32.7339	20.5315	24.2856	2.3984	10190	340	17.1	0.8	38.4	5.0	157.51	1.20	60.6	1.3	0.10706	4.04
D	-30.5946	19.6734	15.7474	2.0200	10190	340	17.1	0.8	38.4	5.0	157.51	1.20	60.6	1.3	0.16155	6.10
E	17.8200	18.3774	5.5745	2.0487	11550	360	45.1	1.0	40.4	4.9	151.66	1.10	61.6	1.2	0.14140	5.34
F	29.9102	18.5523	6.4094	1.9568	11550	360	45.1	1.0	40.4	4.9	151.66	1.10	61.6	1.2	0.16612	6.28
G*	31.4769	19.6126	4.8335	1.8673	11550	360	45.1	1.0	40.4	4.9	151.66	1.10	61.6	1.2	0.13322	5.03
H*	20.5932	19.8219	0.1764	1.9577	11550	360	45.1	1.0	40.4	4.9	151.66	1.10	61.6	1.2	0.08899	3.36
I*	3.2368	20.6703	7.9026	1.9573	10912	350	24.6	0.9	37.5	2.9	152.91	1.10	55.2	1.2	0.12456	4.71
J*	26.0222	19.5707	10.1014	1.8656	10912	350	24.6	0.9	37.5	2.9	152.91	1.10	55.2	1.2	0.12536	4.74

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Bt: Y48A (3065-02)															
J*	28.8	15.5	0.8695	0.0090	0.0012	0.0176	0.0024	-0.0189	2.E-07	0.0076	0.0013	68.17	0.16	68.08	0.17
K*	11.5	23.4	2.9175	0.0120	0.0019	0.0235	0.0037	-0.0293	4.E-07	0.0058	0.0016	68.20	0.17	68.17	0.19
L*	-24.8	21.6	-2.2083	0.0196	0.0017	0.0385	0.0032	-0.0189	3.E-07	0.0075	0.0012	68.26	0.17	68.33	0.18
M*	1.7	23.0	31.4876	0.0188	0.0018	0.0369	0.0035	0.0211	4.E-07	0.0143	0.0009	68.27	0.17	68.26	0.18
N*	24.3	15.2	1.9291	0.0168	0.0012	0.0329	0.0023	0.0208	2.E-07	0.0143	0.0006	68.23	0.16	68.15	0.17
O*	-19.1	16.2	-2.3399	0.0160	0.0013	0.0314	0.0025	0.0213	3.E-07	0.0143	0.0006	68.09	0.17	68.15	0.17
P*	-19.9	23.2	-3.1231	0.0223	0.0018	0.0437	0.0035	0.0207	4.E-07	0.0142	0.0008	67.78	0.17	67.84	0.18
Q	312.9	16.2	0.3254	0.0365	0.0011	0.0715	0.0021	-0.0117	2.E-07	0.0093	0.0014	67.79	0.15	66.86	0.16
R	160.3	20.1	0.8437	0.0485	0.0015	0.0950	0.0029	0.0366	3.E-07	0.0172	0.0008	67.91	0.18	67.43	0.19
Bt: Y66C (3070-01)															
A	700.6	81.0	0.0549	0.0138	0.0051	0.0270	0.0100	0.0034	1.E-06	0.0126	0.0019	61.67	0.37	59.58	0.44
B*	109.0	16.6	0.0556	0.0022	0.0011	0.0043	0.0021	0.0124	2.E-07	0.0130	0.0005	74.35	0.38	74.02	0.38
C*	2.8	10.1	3.1576	0.0031	0.0007	0.0061	0.0013	0.0050	1.E-07	0.0115	0.0005	74.56	0.38	74.55	0.38
D*	18.7	8.9	0.1014	0.0007	0.0007	0.0013	0.0013	0.0037	1.E-07	0.0114	0.0005	74.60	0.37	74.54	0.38
E*	28.6	15.1	0.1868	0.0019	0.0011	0.0038	0.0021	0.0145	2.E-07	0.0132	0.0008	74.85	0.38	74.77	0.39
F*	40.7	20.7	-0.0353	-0.0005	0.0014	-0.0010	0.0028	0.0015	3.E-07	0.0110	0.0006	74.50	0.38	74.37	0.39
G*	32.4	48.1	-0.1194	-0.0014	0.0034	-0.0027	0.0066	0.0017	7.E-07	0.0111	0.0018	74.43	0.41	74.33	0.44
H*	214.1	28.6	-0.0271	-0.0021	0.0020	-0.0041	0.0040	0.0152	4.E-07	0.0137	0.0008	75.08	0.39	74.44	0.40
I*	88.3	43.0	-0.0273	-0.0009	0.0030	-0.0017	0.0058	0.0209	6.E-07	0.0144	0.0008	74.64	0.40	74.37	0.42
J*	40.9	12.3	0.0597	0.0009	0.0008	0.0017	0.0016	0.0042	2.E-07	0.0115	0.0003	74.52	0.38	74.39	0.38
K*	24.9	14.3	0.1840	0.0016	0.0011	0.0032	0.0021	0.0152	2.E-07	0.0133	0.0004	74.36	0.38	74.28	0.38
L*	52.3	15.0	0.0679	0.0013	0.0010	0.0025	0.0019	0.0119	2.E-07	0.0128	0.0004	74.23	0.38	74.07	0.38
M*	-188.3	19.4	-0.0279	0.0019	0.0013	0.0037	0.0026	0.0041	3.E-07	0.0110	0.0007	74.26	0.39	74.82	0.39
N*	-241.4	33.6	-0.0133	0.0012	0.0023	0.0023	0.0044	0.0094	5.E-07	0.0118	0.0010	73.44	0.39	74.16	0.41
O*	-603.6	60.9	-0.0184	0.0040	0.0043	0.0078	0.0085	0.0320	9.E-07	0.0150	0.0026	72.42	0.42	74.22	0.46
P*	-88.2	16.1	-0.0305	0.0010	0.0010	0.0019	0.0020	0.0032	2.E-07	0.0111	0.0007	73.65	0.38	73.91	0.38
Q	436.1	74.2	0.0255	0.0040	0.0049	0.0078	0.0097	0.0105	1.E-06	0.0133	0.0015	70.61	0.40	69.30	0.46
Bt: Y98A (3087-01)															
A	3523.6	454.7	0.0041	0.0052	0.0281	0.0101	0.0551	0.1363	6.E-06	0.0403	0.0115	32.38	0.61	21.86	1.48
B	1390.6	489.3	0.0825	0.0411	0.0323	0.0806	0.0632	-0.0063	6.E-06	0.0123	0.0130	55.97	0.79	51.82	1.66
C	-34.4	100.7	-0.2789	0.0034	0.0067	0.0067	0.0132	0.0088	1.E-06	0.0121	0.0030	64.55	0.37	64.65	0.48
D*	923.4	56.8	0.0071	0.0023	0.0030	0.0046	0.0058	0.0017	6.E-07	0.0127	0.0012	69.38	0.33	66.62	0.37
E*	-44.8	25.1	0.0166	-0.0003	0.0016	-0.0005	0.0032	0.0042	3.E-07	0.0113	0.0006	66.64	0.30	66.77	0.31
F*	29.0	20.2	0.0362	0.0004	0.0013	0.0007	0.0025	0.0093	3.E-07	0.0123	0.0006	66.12	0.29	66.03	0.30
G*	-111.2	45.9	-0.0266	0.0011	0.0032	0.0021	0.0062	0.0118	6.E-07	0.0125	0.0018	66.30	0.32	66.63	0.34
H*	12.2	32.6	0.3145	0.0014	0.0021	0.0027	0.0041	0.0063	4.E-07	0.0118	0.0013	66.17	0.31	66.13	0.32
I*	-31.2	21.5	-0.0469	0.0005	0.0014	0.0010	0.0028	0.0106	3.E-07	0.0124	0.0007	66.27	0.30	66.36	0.30
J*	-7.5	10.9	0.0015	0.0000	0.0007	0.0000	0.0014	0.0089	1.E-07	0.0122	0.0006	66.09	0.29	66.10	0.29
K*	11.4	11.5	-0.0146	-0.0001	0.0007	-0.0001	0.0014	0.0084	1.E-07	0.0121	0.0006	65.88	0.29	65.84	0.29
L*	7.9	14.1	0.6330	0.0018	0.0009	0.0035	0.0017	-0.0023	2.E-07	0.0103	0.0010	66.13	0.29	66.10	0.29
M*	14.6	8.8	0.0577	0.0003	0.0006	0.0006	0.0011	0.0097	1.E-07	0.0124	0.0004	66.54	0.29	66.49	0.29
N*	40.4	16.0	-0.0204	-0.0003	0.0010	-0.0006	0.0019	0.0012	2.E-07	0.0110	0.0007	66.36	0.29	66.23	0.29
O*	15.6	10.3	0.1013	0.0006	0.0006	0.0011	0.0013	0.0092	1.E-07	0.0123	0.0004	66.58	0.29	66.53	0.29
P*	9.5	5.7	0.2163	0.0007	0.0004	0.0014	0.0007	0.0060	7.E-08	0.0117	0.0003	66.91	0.29	66.88	0.29
Q*	18.1	6.5	0.0082	0.0001	0.0005	0.0001	0.0009	-0.0060	9.E-08	0.0097	0.0009	66.70	0.29	66.64	0.29
R*	20.3	18.1	-0.1407	-0.0010	0.0012	-0.0020	0.0023	0.0065	2.E-07	0.0118	0.0005	66.66	0.29	66.60	0.30
S*	13.5	6.9	0.1142	0.0006	0.0005	0.0011	0.0009	0.0026	1.E-07	0.0112	0.0003	66.77	0.29	66.73	0.29
T*	45.1	7.4	0.0479	0.0008	0.0005	0.0015	0.0009	0.0089	9.E-08	0.0123	0.0003	66.55	0.28	66.41	0.29
Bt: Z1A (3286-01)															
A	8657.9	840.1	-0.0196	-0.0607	0.0715	-0.1189	0.1401	-0.0358	1.E-05	0.0210	0.0210	35.15	1.95	9.29	3.14
B	1066.6	111.0	0.2056	0.0786	0.0110	0.1540	0.0215	0.0327	2.E-06	0.0182	0.0038	30.25	0.31	27.07	0.45
C	635.8	122.3	0.1494	0.0340	0.0115	0.0667	0.0225	0.0449	2.E-06	0.0195	0.0047	62.30	0.44	60.41	0.57
D	253.0	44.2	0.2192	0.0199	0.0036	0.0390	0.0071	0.0365	7.E-07	0.0173	0.0015	67.81	0.21	67.06	0.25
E	88.9	30.9	0.5303	0.0169	0.0029	0.0331	0.0057	0.0235	6.E-07	0.0148	0.0010	69.28	0.18	69.01	0.20
F	37.0	8.9	0.5785	0.0077	0.0008	0.0150	0.0016	0.0187	2.E-07	0.0139	0.0003	70.24	0.10	70.13	0.11
G	17.0	6.6	0.7963	0.0048	0.0006	0.0095	0.0012	0.0205	1.E-07	0.0142	0.0005	70.35	0.10	70.30	0.10
H	24.3	4.6	0.2985	0.0026	0.0004	0.0051	0.0007	0.0140	7.E-08	0.0131	0.0003	70.29	0.07	70.21	0.07
I	12.2	4.3	0.8046	0.0035	0.0004	0.0069	0.0008	0.0187	8.E-08	0.0139	0.0004	70.42	0.07	70.38	0.08
J	19.4	5.6	0.4684	0.0033	0.0005	0.0064	0.0009	0.0132	1.E-07	0.0130	0.0006	70.47	0.08	70.41	0.08
K	18.2	3.8	0.5048	0.0033	0.0003	0.0065	0.0007	0.0118	7.E-08	0.0127	0.0003	70.69	0.07	70.63	0.08
L	15.7	2.7	0.5211	0.0029	0.0002	0.0057	0.0005	0.0160	5.E-08	0.0134	0.0002	70.55	0.07	70.50	0.07
M	21.6	3.5	0.1984	0.0015	0.0003	0.0030	0.0006	0.0156	6.E-08	0.0134	0.0004	70.59	0.08	70.52	0.08
N*	12.3	1.9	0.3606	0.0016	0.0002	0.0031	0.0003	0.0122	3.E-08	0.0128	0.0001	70.15	0.07	70.11	0.07
O*	-12.5	1.9	-0.2436	0.0011	0.0002	0.0021	0.0004	0.0138	4.E-08	0.0130	0.0002	70.03	0.07	70.07	0.07
P*	8.3	2.4	0.3376	0.0010	0.0002	0.0020	0.0004	0.0133	4.E-08	0.0130	0.0003	70.00	0.07	69.98	0.07
Q*	-33.5	3.5	-0.0578	0.0007	0.0004	0.0014	0.0007	0.0167	7.E-08	0.0135	0.0004	70.01	0.08	70.11	0.08
R	1.5	6.2	1.8007	0.0009	0.0005	0.0018	0.0010	0.0221	1.E-07	0.0144	0.0004	70.48	0.08	70.47	0.08
S	6.5	3.4	0.3634	0.0008	0.0003	0.0017	0.0006	0.0189	6.E-08	0.0139	0.0002	70.50	0.07	70.48	0.07
T	5.8	2.2	0.5442	0.0011	0.0002	0.0022	0.0003	0.0165	4.E-08	0.0135	0.0003	70.44	0.06	70.42	0.06
U	72.9	12.9	0.5747	0.0150	0.0012	0.0294	0.0023	0.0210	2.E-07	0.0144	0.0008	69.19	0.11	68.98	0.11
Bt: Z58B (3287-01)															
A	897.4	36.8	-0.0061	-0.0020	0.0030	-0.0038	0.0059	0.0158	6.E-07	0.0151	0.0013	62.26	0.15	59.58	0.18
B	234.5	22.0	-0.0120	-0.0010	0.0020	-0.0020	0.0038	0.0196	4.E-07	0.0144	0.0012	71.61	0.15	70.91	0.16
C	80.0	7.9	-0.0376	-0.0011	0.0007	-0.0021	0.0013	0.0162	1.E-07	0.0136	0.0006	71.62	0.10	71.37	0.10
D	34.4	4.4	-0.0542	-0.0007	0.0004	-0.0013	0.0008	0.0239	9.E-08	0.0148	0.0010	71.42	0.07	71.31	0.07
E	13.9	5.1	0.0892	0.0004	0.0005	0.0009	0.0009	0.0153	9.E-08	0.0133	0.0005	71.68	0.08	71.63	0.08
F	13.6	4.2	0.1302	0.0006	0.0004	0.0012	0.0008	0.0127	8.E-08	0.0129	0.0004	71.49	0.07	71.45	0.08
G*	12.8	4.9	0.1817	0.0008	0.0005	0.0016	0.0010	0.0113	1.E-07	0.0126	0.0004	71.81	0.08	71.77	0.09
H*	0.7	7.8	3.2570	0.0008	0.0008	0.0016	0.0015	0.0079	2.E-07	0.0120	0.0005	71.93	0.10	71.93	0.10
I*	22.4	5.5	0.0114	0.0001	0.0006	0.0002	0.0011	0.0157	1.E-07	0.0134	0.0004	71.97	0.08	71.90	0.09
J*	28.4	5.3	0.0719	0.0007	0.0006	0.0014	0.0011	0.0192	1.E-07	0.0140	0.0005	72.15	0.08	72.07	0.08

Sample No.[a]	Derived Results				Inverse Isochron Data				
	$\%^{40}Ar^*$	Age (Ma)		w/±J	$^{36}Ar/^{40}Ar$		$^{39}Ar/^{40}Ar$		$^{36}Ar/^{39}Ar$
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Bt: Y48A (3065-02)									
J*	99.87	1622	3	19	0.00000	54.00722	0.01467	0.23759	0.00339
K*	99.95	1624	3	19	0.00000	207.74510	0.01466	0.25425	0.00085
L*	100.11	1626	3	19	0.00000	-85.35186	0.01465	0.24339	0.00211
M*	100.00	1625	3	19	0.00000	2182.10100	0.01465	0.24349	0.00008
N*	99.90	1624	3	19	0.00000	63.91343	0.01466	0.23597	0.00271
O*	100.09	1623	3	19	0.00000	-82.18120	0.01469	0.24422	0.00206
P*	100.09	1618	3	19	0.00000	-112.35770	0.01476	0.24702	0.00152
Q	98.63	1603	3	18	0.00005	5.19272	0.01475	0.22515	0.03321
R	99.30	1612	3	19	0.00002	12.66257	0.01473	0.27028	0.01650
Bt: Y66C (3070-01)									
A	96.61	1505	8	8	0.00011	11.57059	0.01622	0.59839	0.04147
B*	99.56	1737	6	6	0.00001	15.25097	0.01345	0.50987	0.03170
C*	99.99	1744	6	6	0.00000	381.95910	0.01341	0.50454	0.00127
D*	99.93	1744	6	6	0.00000	47.85094	0.01341	0.50210	0.01022
E*	99.89	1748	6	6	0.00000	52.78374	0.01336	0.51176	0.00916
F*	99.84	1742	6	6	0.00001	50.95846	0.01342	0.51551	0.00948
G*	99.87	1741	7	7	0.00000	148.52040	0.01344	0.55513	0.00318
H*	99.15	1743	6	6	0.00003	13.35115	0.01332	0.52571	0.03596
I*	99.65	1742	6	7	0.00001	48.67403	0.01340	0.53902	0.00982
J*	99.84	1742	6	6	0.00001	29.97341	0.01342	0.50537	0.01633
K*	99.90	1740	6	6	0.00000	57.62044	0.01345	0.51186	0.00842
L*	99.79	1737	6	6	0.00001	28.65226	0.01347	0.51093	0.01697
M*	100.76	1749	6	6	-0.00003	-10.28877	0.01347	0.52417	0.04706
N*	100.98	1739	6	6	-0.00003	-13.90211	0.01362	0.53425	0.03510
O*	102.49	1740	7	7	-0.00008	-10.09544	0.01381	0.58286	0.04852
P*	100.36	1735	6	6	-0.00001	-18.26772	0.01358	0.51381	0.02702
Q	98.16	1664	7	7	0.00006	17.02331	0.01416	0.57143	0.02833
Bt: Y98A (3087-01)									
A	67.52	740	41	41	0.00109	13.01170	0.03088	1.88666	0.12821
B	92.59	1424	31	32	0.00025	35.23566	0.01787	1.40857	0.03379
C	100.16	1653	8	8	-0.00001	-291.58160	0.01549	0.57342	0.00139
D*	96.03	1686	6	7	0.00013	6.15961	0.01441	0.47650	0.06547
E*	100.20	1688	5	6	-0.00001	-55.91884	0.01501	0.45073	0.00737
F*	99.87	1676	5	6	0.00000	69.52670	0.01512	0.44455	0.00595
G*	100.50	1686	6	6	-0.00002	-41.27046	0.01508	0.47683	0.00978
H*	99.95	1678	5	6	0.00000	268.34110	0.01511	0.46213	0.00150
I*	100.14	1682	5	6	0.00000	-68.77794	0.01509	0.44647	0.00597
J*	100.03	1677	5	6	0.00000	-145.45590	0.01513	0.43640	0.00284
K*	99.95	1673	5	6	0.00000	100.59540	0.01518	0.43288	0.00414
L*	99.96	1677	5	6	0.00000	180.01570	0.01512	0.43685	0.00230
M*	99.93	1684	5	5	0.00000	60.48471	0.01503	0.42964	0.00689
N*	99.82	1680	5	6	0.00001	39.49348	0.01507	0.43793	0.01039
O*	99.93	1685	5	6	0.00000	66.26764	0.01502	0.43235	0.00624
P*	99.96	1690	5	5	0.00000	60.67210	0.01495	0.42812	0.00686
Q*	99.92	1686	5	5	0.00000	35.71943	0.01499	0.42857	0.01162
R*	99.91	1686	5	6	0.00000	89.16667	0.01500	0.43778	0.00461
S*	99.94	1688	5	5	0.00000	50.92161	0.01498	0.42801	0.00816
T*	99.80	1682	5	5	0.00001	16.39253	0.01503	0.42794	0.02536
Bt: Z1A (3286-01)									
A	26.44	329	102	102	0.00246	11.06013	0.02845	5.56228	0.48077
B	89.50	829	11	11	0.00035	10.46503	0.03306	1.02015	0.08487
C	96.96	1505	10	10	0.00010	19.26959	0.01605	0.70511	0.02225
D	98.89	1614	4	5	0.00004	17.49950	0.01475	0.30869	0.00587
E	99.62	1644	3	4	0.00001	34.93666	0.01443	0.26113	0.00221
F	99.84	1662	2	3	0.00001	24.20610	0.01424	0.14611	0.00232
G	99.93	1664	2	3	0.00000	39.13946	0.01422	0.14020	0.00126
H	99.90	1663	1	3	0.00000	19.03456	0.01423	0.10276	0.00287
I	99.95	1666	1	3	0.00000	36.00604	0.01420	0.10574	0.00134
J	99.92	1666	1	3	0.00000	29.02186	0.01419	0.11384	0.00149
K	99.92	1670	1	3	0.00000	21.20840	0.01415	0.10547	0.00218
L	99.93	1668	1	3	0.00000	17.69414	0.01417	0.09332	0.00312
M	99.91	1668	1	3	0.00000	16.42660	0.01417	0.10839	0.00335
N*	99.95	1662	1	3	0.00000	15.13874	0.01426	0.09670	0.00458
O*	100.05	1661	1	3	0.00000	-15.24724	0.01428	0.10224	0.00424
P*	99.96	1659	1	3	0.00000	28.70364	0.01429	0.09599	0.00199
Q*	100.14	1662	1	3	0.00000	-10.31548	0.01428	0.11293	0.00419
R	99.99	1667	1	3	0.00000	466.39440	0.01419	0.11568	0.00009
S	99.97	1667	1	3	0.00000	52.49918	0.01418	0.09945	0.00081
T	99.98	1666	1	3	0.00000	37.81053	0.01420	0.08785	0.00131
U	99.69	1644	2	3	0.00001	17.84543	0.01445	0.15203	0.00271
Bt: Z58B (3287-01)									
A	95.70	1487	3	4	0.00014	4.10119	0.01606	0.23557	0.02211
B	99.02	1670	2	4	0.00003	9.38816	0.01396	0.20929	0.00509
C	99.67	1677	2	3	0.00001	9.88230	0.01396	0.13494	0.00353
D	99.86	1676	1	3	0.00000	12.86384	0.01400	0.10153	0.00302
E	99.94	1681	1	3	0.00000	36.97810	0.01395	0.11263	0.00105
F	99.94	1678	1	3	0.00000	30.70616	0.01399	0.10459	0.00140
G*	99.95	1683	1	3	0.00000	38.86688	0.01393	0.11766	0.00112
H*	100.00	1686	2	3	0.00000	1213.51900	0.01390	0.13930	0.00004
I*	99.91	1685	1	3	0.00000	24.85398	0.01390	0.11653	0.00194
J*	99.88	1688	1	3	0.00000	18.54241	0.01386	0.11047	0.00242

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Bt: Z58B (3287-01)										
K*	68c	0.80	21.487	0.060	2141629	1462	29744.66	27.73	380.6123	11.0862
L*	68c	0.90	21.487	0.060	3001538	1921	41649.64	37.81	548.4417	19.1041
M*	68c	1.00	21.487	0.060	3384135	2174	46982.58	36.55	605.4423	18.3469
N	68c	1.20	21.487	0.060	6334036	4147	88319.91	52.93	1201.5060	33.1250
O	68c	1.50	21.487	0.060	4231187	2986	58962.78	44.11	767.2040	17.1413
P	68c	1.70	21.487	0.060	2564129	1993	35555.23	31.52	526.2608	23.2261
Q	68c	2.00	21.487	0.060	2441004	1934	34024.49	32.77	412.7506	12.3446
R	68c	3.00	21.487	0.060	1461316	1171	20525.12	25.22	266.9510	14.5914
S	68c	5.00	21.487	0.060	3470608	2343	49330.44	36.55	591.8593	41.7958
T	68c	7.00	21.487	0.060	404273	605	5590.82	12.26	54.7095	14.5914
U	68c	8.00	21.487	0.060	2209345	1761	26283.89	26.48	596.3156	17.6239
Bt: Z58B (3287-02)										
A	68c	0.20	21.487	0.060	787425	762	10597.61	17.66	169.9946	7.5558
B	68c	0.25	21.487	0.060	1628854	1182	21582.88	25.21	291.2593	11.9249
C	68c	0.30	21.487	0.060	3607162	2535	48866.37	40.32	596.9199	26.9045
D	68c	0.35	21.487	0.060	8615677	6016	118231.50	59.22	1593.2090	17.8449
E	68c	0.40	21.487	0.060	5114752	3438	70208.97	49.15	924.1319	19.0892
F	68c	0.45	21.487	0.060	3857434	2551	52916.41	44.11	721.3317	26.5837
G	68c	0.50	21.487	0.060	2422111	1654	33141.42	32.77	427.5672	11.5483
H	68c	0.55	21.487	0.060	2443449	1822	33300.86	31.52	432.6656	15.4841
I	68c	0.60	21.487	0.060	2369341	1896	32373.56	30.26	424.4075	11.7083
J*	68c	0.70	21.487	0.060	7479715	6208	102677.30	52.93	1348.0990	30.4030
K*	68c	0.80	21.487	0.060	18079510	16458	248846.30	196.08	3540.4460	91.8953
L*	68c	0.90	21.487	0.060	5802368	5434	79822.00	47.89	1073.8090	26.6798
M*	68c	1.00	21.487	0.060	23801850	20709	327779.40	208.33	4319.2460	73.5541
N*	68c	1.20	21.487	0.060	178175	562	2424.05	8.24	39.2886	6.0880
O*	68c	1.50	21.487	0.060	607893	743	8324.12	15.14	128.4275	8.9394
P*	68c	1.70	21.487	0.060	366901	601	5037.42	11.38	73.8439	6.4460
Q*	68c	2.00	21.487	0.060	437882	625	6008.87	13.89	80.8054	8.2106
R*	68c	3.00	21.487	0.060	1231516	1057	16888.44	22.70	219.2281	11.0191
S*	68c	5.00	21.487	0.060	751610	756	10312.27	18.92	138.3221	9.0155
T	68c	7.00	21.487	0.060	326566	552	4172.85	9.87	61.2807	16.7351
Ms: B72A (3064-01)										
A	64a	0.10	21.459	0.479	71145	508	1418.72	6.31	76.8148	12.3818
B	64a	0.20	21.459	0.479	385220	850	7992.97	15.17	163.0332	15.5891
C	64a	0.30	21.459	0.479	5415792	9764	77148.92	56.70	970.8225	24.7677
D	64a	0.40	21.459	0.479	25146700	45163	356098.80	232.81	4202.8640	80.2139
E*	64a	0.50	21.459	0.479	7795674	13925	110946.40	64.26	1241.4240	24.5879
F*	64a	0.50	21.459	0.479	1787332	3237	25482.73	25.23	338.3024	11.7917
G*	64a	0.60	21.459	0.479	1655289	2998	23443.60	26.49	296.6598	13.8188
H*	64a	0.60	21.459	0.479	979807	1830	13852.38	21.46	187.7318	9.0657
I*	64a	0.70	21.459	0.479	1195664	2182	16987.59	20.19	240.6537	25.4191
J*	64a	0.80	21.459	0.479	730362	1402	10369.34	16.42	140.7139	8.2106
K*	64a	0.90	21.459	0.479	402282	877	5698.38	12.65	69.4380	9.0155
L*	64a	1.10	21.459	0.479	272360	687	3850.72	10.15	36.0408	11.6176
M	64a	1.50	21.459	0.479	701711	1356	9778.71	15.18	110.2875	8.5611
N	64a	2.00	21.459	0.479	278593	738	3955.11	11.05	104.7738	17.8388
O	64a	5.00	21.459	0.479	1656765	2958	22093.72	22.72	295.6527	12.0153
Ms: B72A (3064-02)										
A	64a	0.10	21.459	0.479	38657	533	850.33	4.79	12.8780	9.2582
B	64a	0.20	21.459	0.479	281782	600	5248.75	12.02	89.4159	11.1675
C	64a	0.25	21.459	0.479	604127	860	8911.37	13.90	112.1003	12.4166
D	64a	0.30	21.459	0.479	1134671	1354	15805.94	21.45	185.5918	11.8284
E	64a	0.35	21.459	0.479	3477268	3720	48954.00	35.29	546.6415	19.5593
F	64a	0.40	21.459	0.479	7649695	8045	109412.00	57.96	1359.8560	44.3538
G	64a	0.45	21.459	0.479	1939979	2090	27959.24	26.47	309.2231	14.7566
H	64a	0.50	21.459	0.479	1729424	1865	24705.65	26.47	316.9902	13.2331
I	64a	0.55	21.459	0.479	1850278	1950	26333.28	30.26	322.9949	13.0808
J	64a	0.60	21.459	0.479	819253	966	11692.75	17.67	174.5894	16.9554
K	64a	0.65	21.459	0.479	350940	608	4999.87	11.89	129.2710	21.5632
L	64a	0.70	21.459	0.479	197709	534	2810.05	9.26	68.9974	10.0254
M	64a	0.80	21.459	0.479	315618	573	4463.00	10.50	55.6410	9.5843
N	64a	0.90	21.459	0.479	183234	543	2593.64	7.38	39.4271	7.0052
O	64a	1.00	21.459	0.479	152042	484	2113.92	7.38	37.3752	8.8125
P	64a	1.10	21.459	0.479	164425	522	2347.65	7.87	26.6498	8.8125
Q	64a	1.30	21.459	0.479	130895	499	1853.58	7.38	39.1250	9.5130
R	64a	1.50	21.459	0.479	193213	538	2752.82	9.13	74.4104	11.9197
S	64a	2.00	21.459	0.479	78071	489	1140.07	5.26	14.6278	10.3023
T	64a	2.50	21.459	0.479	442803	616	6216.26	12.51	70.6213	8.6327
U	64a	5.00	21.459	0.479	3189	489	30.66	1.88	13.2557	7.9656
V	64a	7.00	21.459	0.479	211584	513	2946.27	8.99	41.9070	7.7885
Ms: B75A (3080-01)										
A	64c	0.10	22.161	0.050	112699	494	898.32	5.16	37.5136	15.2689
B	64c	0.20	22.161	0.050	1522550	1851	22102.31	25.22	284.5119	13.6095
C	64c	0.30	22.161	0.050	37396370	43248	547802.00	294.07	6730.0920	202.0982
D	64c	0.40	22.161	0.050	3069582	3595	44808.57	35.29	515.5984	22.0231
E	64c	0.50	22.161	0.050	3307404	3859	47287.21	39.07	563.6108	12.6952
F	64c	0.50	22.161	0.050	647523	945	9375.77	17.67	102.4198	6.6556
G	64c	0.60	22.161	0.050	463760	739	6671.18	12.65	43.5939	19.5072
H	64c	0.60	22.161	0.050	480287	781	6912.67	13.91	37.4507	18.2168
I	64c	0.70	22.161	0.050	326455	657	4725.25	11.15	11.7702	17.9592

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Bt: Z58B (3287-01)																
K*	5.5179	18.4725	6.5146	1.9536	10912	350	24.6	0.9	37.5	2.9	152.91	1.10	55.2	1.2	0.10487	3.96
L*	10.9190	19.2211	10.0304	1.9537	10912	350	24.6	0.9	37.5	2.9	152.91	1.10	55.2	1.2	0.14684	5.55
M*	-25.9331	18.2077	8.6542	2.0470	10708	340	33.6	1.1	35.7	5.1	153.04	1.10	56.7	1.2	0.16564	6.26
N	20.2963	18.3152	10.8645	2.0484	10708	340	33.6	1.1	35.7	5.1	153.04	1.10	56.7	1.2	0.31138	11.76
O	-6.6073	18.3939	22.0813	2.1490	10708	340	33.6	1.1	35.7	5.1	153.04	1.10	56.7	1.2	0.20788	7.85
P	-20.5487	19.4218	43.5854	2.1614	10708	340	33.6	1.1	35.7	5.1	153.04	1.10	56.7	1.2	0.12536	4.74
Q	4.0837	18.5862	3.9125	1.8978	10487	410	21.1	1.0	42.4	4.6	150.43	1.10	60.6	1.1	0.11996	4.53
R	62.4219	18.5230	30.2090	2.1992	10487	410	21.1	1.0	42.4	4.6	150.43	1.10	60.6	1.1	0.07236	2.73
S	72.4640	19.3331	97.2177	2.5355	10487	410	21.1	1.0	42.4	4.6	150.43	1.10	60.6	1.1	0.17392	6.57
T	23.7412	18.3877	64.9420	2.2118	10487	410	21.1	1.0	42.4	4.6	150.43	1.10	60.6	1.1	0.01971	0.74
U	125.1549	26.3107	1187.4030	7.7594	9993	420	17.2	1.1	0.0	0.0	145.49	2.20	56.1	1.2	0.09267	3.50
Bt: Z58B (3287-02)																
A	34.0980	19.6860	125.0484	2.6522	8166	400	18.7	0.8	57.2	5.0	146.10	1.10	61.7	1.3	0.03736	0.86
B	-1.3892	19.8003	132.7080	2.6683	8166	400	18.7	0.8	57.2	5.0	146.10	1.10	61.7	1.3	0.07609	1.75
C	29.1720	20.1066	80.6912	2.8394	8166	400	18.7	0.8	57.2	5.0	146.10	1.10	61.7	1.3	0.17229	3.96
D	43.7465	20.4963	95.1976	2.7598	10262	340	20.0	0.9	54.2	2.8	146.26	1.00	56.3	1.1	0.41684	9.58
E	14.9288	20.1531	15.2471	2.1926	10262	340	20.0	0.9	54.2	2.8	146.26	1.00	56.3	1.1	0.24753	5.69
F	-18.8627	18.9236	12.9855	2.0907	10262	340	20.0	0.9	54.2	2.8	146.26	1.00	56.3	1.1	0.18656	4.29
G	-41.2837	17.4370	7.7901	1.8948	10262	340	20.0	0.9	54.2	2.8	146.26	1.00	56.3	1.1	0.11684	2.69
H	25.1136	19.5758	2.8870	2.1089	12703	360	28.9	1.1	43.9	3.4	145.12	1.00	60.8	1.3	0.11741	2.70
I	20.4336	19.5757	2.9813	2.1107	12703	360	28.9	1.1	43.9	3.4	145.12	1.00	60.8	1.3	0.11414	2.62
J*	15.3667	18.6657	8.7340	2.3030	12703	360	28.9	1.1	43.9	3.4	145.12	1.00	60.8	1.3	0.36200	8.32
K*	-133.4917	81.5896	-78.2277	7.6106	12703	360	28.9	1.1	43.9	3.4	145.12	1.00	60.8	1.3	0.87734	20.17
L*	61.3736	22.6396	11.7326	2.1207	10088	380	16.7	0.9	43.7	3.6	144.23	1.30	57.6	1.3	0.28142	6.47
M*	156.1054	76.4253	-29.6999	7.6212	10088	380	16.7	0.9	43.7	3.6	144.23	1.30	57.6	1.3	1.15563	26.57
N*	6.6260	21.4490	3.8755	1.9332	10088	380	16.7	0.9	43.7	3.6	144.23	1.30	57.6	1.3	0.00855	0.20
O*	-13.5116	20.4973	4.2981	2.1089	10088	380	16.7	0.9	43.7	3.6	144.23	1.30	57.6	1.3	0.02935	0.67
P*	-20.2814	20.1224	4.1688	1.9899	10784	340	16.8	1.0	47.4	3.5	144.03	1.10	58.4	1.1	0.01776	0.41
Q*	-23.4784	19.2478	1.5735	1.8929	10784	340	16.8	1.0	47.4	3.5	144.03	1.10	58.4	1.1	0.02119	0.49
R*	25.0183	20.3716	2.1841	1.8934	10784	340	16.8	1.0	47.4	3.5	144.03	1.10	58.4	1.1	0.05954	1.37
S*	27.3254	18.7114	4.1685	1.8018	10784	340	16.8	1.0	47.4	3.5	144.03	1.10	58.4	1.1	0.03636	0.84
T	28.4845	20.7464	109.9170	2.5552	10784	340	16.8	1.0	47.4	3.5	144.03	1.10	58.4	1.1	0.01471	0.34
Ms: B72A (3064-01)																
A	-10.9625	20.2412	138.5987	4.2618	3223	360	46.9	1.3	82.1	10.0	408.61	1.70	140.9	1.8	0.00500	0.21
B	-20.3139	17.6500	139.9988	4.1838	3223	360	46.9	1.3	82.1	10.0	408.61	1.70	140.9	1.8	0.02818	1.16
C	42.6750	21.6324	54.6331	4.3392	3223	360	46.9	1.3	82.1	10.0	408.61	1.70	140.9	1.8	0.27200	11.20
D	74.4286	72.5289	12.0129	14.0899	3223	360	46.9	1.3	82.1	10.0	408.60	1.70	140.9	1.8	1.25548	51.67
E*	14.0337	21.1098	18.5676	3.4095	5420	370	61.3	1.4	86.0	5.7	407.99	1.90	134.4	1.6	0.39116	16.10
F*	-27.3915	21.1085	12.0586	3.1990	5420	370	61.3	1.4	86.0	5.7	407.99	1.90	134.4	1.6	0.08984	3.70
G*	-8.0827	21.1132	14.7538	3.0318	5420	370	61.3	1.4	86.0	5.7	407.99	1.90	134.4	1.6	0.08265	3.40
H*	-25.6990	21.1144	13.1367	2.9393	5420	370	61.3	1.4	86.0	5.7	407.99	1.90	134.4	1.6	0.04884	2.01
I*	30.8151	20.0338	-0.9147	3.2574	6751	350	54.2	1.2	97.4	3.5	409.32	1.80	142.3	1.9	0.05989	2.47
J*	-21.7104	20.6897	-2.4972	3.3365	6751	350	54.2	1.2	97.4	3.5	409.32	1.80	142.3	1.9	0.03656	1.50
K*	16.3494	20.6963	-1.7557	3.2522	6751	350	54.2	1.2	97.4	3.5	409.32	1.80	142.3	1.9	0.02009	0.83
L*	-14.7341	20.6961	-10.0409	3.1383	6751	350	54.2	1.2	97.4	3.5	409.32	1.80	142.3	1.9	0.01358	0.56
M	58.4448	23.1469	8.9301	3.3567	8756	420	48.4	1.4	91.7	7.1	405.35	2.20	134.2	2.2	0.03448	1.42
N	12.8668	22.5263	20.4848	3.5548	8756	420	48.4	1.4	91.7	7.1	405.35	2.20	134.2	2.2	0.01394	0.57
O	68.5210	23.7890	260.7173	5.2003	8756	420	48.4	1.4	91.7	7.1	405.35	2.20	134.2	2.2	0.07789	3.21
Ms: B72A (3064-02)																
A	15.1791	24.0369	73.0088	6.4395	5135	390	39.0	1.1	98.3	7.6	374.70	2.00	117.1	1.6	0.00300	0.27
B	3.6437	24.0409	64.3864	6.2709	5135	390	39.0	1.1	98.3	7.6	374.70	2.00	117.1	1.6	0.01851	1.67
C	52.5414	24.7806	22.5170	5.3049	5135	390	39.0	1.1	98.3	7.6	374.70	2.00	117.1	1.6	0.03142	2.84
D	27.4406	25.5384	5.3904	4.8088	5135	390	39.0	1.1	98.3	7.6	374.70	2.00	117.1	1.6	0.05573	5.03
E	-6.9894	24.7946	10.2271	4.7872	6790	350	42.7	1.0	95.5	5.1	377.25	1.70	114.1	1.5	0.17259	15.58
F	-14.1843	23.1727	11.1157	4.7462	6790	350	42.7	1.0	95.5	5.1	377.25	1.70	114.1	1.5	0.38575	34.83
G	-19.8621	23.9824	6.9293	4.6477	6790	350	42.7	1.0	95.5	5.1	377.25	1.70	114.1	1.5	0.09857	8.90
H	5.9801	22.3923	8.2315	4.6706	6790	350	42.7	1.0	95.5	5.1	377.25	1.70	114.1	1.5	0.08710	7.86
I	-54.7544	23.7128	-3.2067	4.5257	5136	340	41.5	1.1	69.3	7.7	379.18	1.80	117.0	1.6	0.09284	8.38
J	-13.7928	23.7177	-0.9769	4.5686	5136	340	41.5	1.1	69.3	7.7	379.18	1.80	117.0	1.6	0.04122	3.72
K	-12.4770	23.7220	0.7514	4.5479	5136	340	41.5	1.1	69.3	7.7	379.18	1.80	117.0	1.6	0.01763	1.59
L	-106.6341	22.9530	-4.0822	4.3870	5136	340	41.5	1.1	69.3	7.7	379.18	1.80	117.0	1.6	0.00991	0.89
M	89.6258	23.2101	1.8278	4.5182	5972	320	41.4	1.0	81.5	5.9	371.20	1.70	112.2	1.7	0.01573	1.42
N	13.4010	21.6510	4.9070	4.5258	5972	320	41.4	1.0	81.5	5.9	371.20	1.70	112.2	1.7	0.00914	0.83
O	13.6068	24.8478	0.0876	4.5316	5972	320	41.4	1.0	81.5	5.9	371.20	1.70	112.2	1.7	0.00745	0.67
P	27.5239	21.6590	2.4154	4.5193	5972	320	41.4	1.0	81.5	5.9	371.20	1.70	112.2	1.7	0.00828	0.75
Q	-8.2298	23.2294	-3.4534	4.5154	6599	310	38.4	1.0	82.0	4.4	371.47	1.70	120.9	1.4	0.00654	0.59
R	24.8979	24.0424	-6.0552	4.4012	6599	310	38.4	1.0	82.0	4.4	371.47	1.70	120.9	1.4	0.00971	0.88
S	2.6428	22.4467	-6.0921	4.5701	6599	310	38.4	1.0	82.0	4.4	371.47	1.70	120.9	1.4	0.00402	0.36
T	-16.8766	24.0509	-7.4172	4.4789	6599	310	38.4	1.0	82.0	4.4	371.47	1.70	120.9	1.4	0.02192	1.98
U	-20.8501	22.4594	3.9766	4.5445	4904	350	37.7	0.9	75.8	5.6	375.60	1.70	113.3	1.8	0.00011	0.01
V	-6.5106	23.2560	6.1268	4.6399	4904	350	37.7	0.9	75.8	5.6	375.60	1.70	113.3	1.8	0.01039	0.94
Ms: B75A (3080-01)																
A	-38.2101	19.3757	278.1473	5.0059	3980	340	44.1	1.1	123.1	12.0	412.97	1.70	128.5	1.6	0.00317	0.12
B	36.7047	20.0499	124.2585	3.7476	3980	340	44.1	1.1	123.1	12.0	412.97	1.70	128.5	1.6	0.07792	2.95
C	288.8917	79.9820	65.8791	12.0327	3375	430	48.1	1.1	104.8	5.2	408.00	1.80	132.3	1.9	1.93135	73.19
D	69.8332	20.4689	-0.5040	3.2919	3375	430	48.1	1.1	104.8	5.2	407.97	1.80	132.3	1.9	0.15798	5.99
E	12.5234	19.8153	2.7536	3.2158	3375	430	48.1	1.1	104.8	5.2	407.97	1.80	132.3	1.9	0.16672	6.32
F	43.2086	21.1330	-10.6089	3.1703	3375	430	48.1	1.1	104.8	5.2	407.97	1.80	132.3	1.9	0.03306	1.25
G	-8.4091	20.0588	-5.7779	3.0313	4648	370	51.6	1.2	131.8	17.0	410.71	1.70	135.4	1.9	0.02352	0.89
H	19.5965	20.0648	-10.0808	3.0970	4648	370	51.6	1.2	131.8	17.0	410.71	1.70	135.4	1.9	0.02437	0.92
I	19.0109	22.8380	-6.1224	3.2797	4648	370	51.6	1.2	131.8	17.0	410.71	1.70	135.4	1.9	0.01666	0.63

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Bt: Z58B (3287-01)															
K*	21.9	6.6	0.0236	0.0002	0.0006	0.0004	0.0012	0.0122	1.E-07	0.0128	0.0004	72.00	0.08	71.93	0.09
L*	24.1	4.7	0.0304	0.0003	0.0005	0.0005	0.0009	0.0144	9.E-08	0.0132	0.0005	72.07	0.08	71.99	0.08
M*	18.4	4.4	-0.0836	-0.0006	0.0004	-0.0011	0.0008	0.0128	8.E-08	0.0129	0.0004	72.03	0.07	71.97	0.07
N	12.3	2.3	0.0521	0.0002	0.0002	0.0005	0.0004	0.0171	4.E-08	0.0136	0.0004	71.72	0.06	71.68	0.06
O	37.5	3.6	-0.0083	-0.0001	0.0003	-0.0002	0.0006	0.0133	6.E-08	0.0130	0.0003	71.76	0.07	71.65	0.07
P	122.6	6.1	-0.0132	-0.0006	0.0005	-0.0011	0.0011	0.0230	1.E-07	0.0148	0.0007	72.12	0.09	71.75	0.09
Q	11.5	5.6	0.0291	0.0001	0.0005	0.0002	0.0011	0.0084	1.E-07	0.0121	0.0004	71.74	0.09	71.71	0.09
R	147.2	10.7	0.0577	0.0030	0.0009	0.0060	0.0018	0.0120	2.E-07	0.0130	0.0007	71.20	0.10	70.75	0.11
S	197.1	5.1	0.0208	0.0015	0.0004	0.0029	0.0008	0.0055	8.E-08	0.0120	0.0008	70.35	0.07	69.76	0.07
T	1161.6	39.6	0.0102	0.0042	0.0033	0.0083	0.0064	-0.0184	7.E-07	0.0098	0.0026	72.31	0.19	68.84	0.22
U	4517.6	29.9	0.0029	0.0048	0.0010	0.0093	0.0020	0.0206	2.E-07	0.0227	0.0007	84.06	0.11	70.57	0.13
Bt: Z58B (3287-02)															
A	1180.0	25.1	0.0076	0.0032	0.0019	0.0063	0.0036	0.0185	4.E-07	0.0160	0.0007	74.30	0.14	70.78	0.16
B	614.9	12.4	-0.0003	-0.0001	0.0009	-0.0001	0.0018	0.0097	2.E-07	0.0135	0.0006	75.47	0.10	73.63	0.11
C	165.1	5.8	0.0101	0.0006	0.0004	0.0012	0.0008	0.0071	8.E-08	0.0122	0.0006	73.82	0.08	73.32	0.08
D	80.5	2.3	0.0128	0.0004	0.0002	0.0007	0.0003	0.0156	3.E-08	0.0135	0.0002	72.87	0.06	72.63	0.06
E	21.7	3.1	0.0273	0.0002	0.0003	0.0004	0.0006	0.0144	6.E-08	0.0132	0.0003	72.85	0.07	72.78	0.07
F	24.5	4.0	-0.0405	-0.0004	0.0004	-0.0007	0.0007	0.0171	7.E-08	0.0136	0.0005	72.90	0.08	72.82	0.08
G	23.5	5.7	-0.1479	-0.0012	0.0005	-0.0024	0.0010	0.0128	1.E-07	0.0129	0.0003	73.08	0.09	73.01	0.09
H	8.7	6.3	0.2427	0.0008	0.0006	0.0015	0.0012	0.0135	1.E-07	0.0130	0.0005	73.37	0.09	73.35	0.09
I	9.2	6.5	0.1912	0.0006	0.0006	0.0012	0.0012	0.0142	1.E-07	0.0131	0.0004	73.19	0.09	73.16	0.09
J*	8.5	2.2	0.0491	0.0001	0.0002	0.0003	0.0004	0.0143	4.E-08	0.0131	0.0003	72.85	0.07	72.82	0.07
K*	-31.4	3.1	0.0476	-0.0005	0.0003	-0.0011	0.0006	0.0213	7.E-08	0.0142	0.0004	72.65	0.09	72.74	0.09
L*	14.7	2.7	0.1459	0.0008	0.0003	0.0015	0.0006	0.0162	6.E-08	0.0135	0.0003	72.69	0.08	72.64	0.08
M*	-9.1	2.3	-0.1466	0.0005	0.0002	0.0009	0.0005	0.0148	5.E-08	0.0132	0.0002	72.62	0.08	72.64	0.08
N*	159.9	79.8	0.0477	0.0027	0.0088	0.0054	0.0173	0.0309	2.E-06	0.0162	0.0025	73.50	0.34	73.02	0.41
O*	51.6	25.3	-0.0877	-0.0016	0.0025	-0.0032	0.0048	0.0275	5.E-07	0.0154	0.0011	73.03	0.16	72.87	0.18
P*	82.8	39.5	-0.1357	-0.0040	0.0040	-0.0079	0.0078	0.0226	8.E-07	0.0147	0.0013	72.84	0.20	72.58	0.23
Q*	26.2	31.5	-0.4163	-0.0039	0.0032	-0.0077	0.0063	0.0160	6.E-07	0.0134	0.0014	72.87	0.20	72.79	0.22
R*	12.9	11.2	0.3196	0.0015	0.0012	0.0029	0.0024	0.0134	2.E-07	0.0130	0.0007	72.92	0.12	72.88	0.12
S*	40.4	17.5	0.1829	0.0026	0.0018	0.0052	0.0036	0.0156	4.E-07	0.0134	0.0009	72.89	0.15	72.76	0.16
T	2634.1	61.6	0.0072	0.0068	0.0050	0.0134	0.0097	-0.0058	1.E-06	0.0147	0.0040	78.26	0.23	70.39	0.28
Ms: B72A (3064-01)															
A	9769.3	303.5	-0.0022	-0.0077	0.0143	-0.0151	0.0280	0.1484	3.E-06	0.0541	0.0087	50.15	0.42	20.98	0.97
B	1751.5	52.5	-0.0040	-0.0025	0.0022	-0.0050	0.0043	0.0379	4.E-07	0.0204	0.0020	48.19	0.14	42.96	0.21
C	70.8	5.6	0.0218	0.0006	0.0003	0.0011	0.0005	0.0104	6.E-08	0.0126	0.0003	70.20	0.14	69.98	0.14
D	3.4	4.0	0.1729	0.0002	0.0002	0.0004	0.0004	0.0065	4.E-08	0.0118	0.0002	70.62	0.13	70.60	0.14
E*	16.7	3.1	0.0211	0.0001	0.0002	0.0002	0.0004	0.0027	4.E-08	0.0112	0.0002	70.27	0.13	70.21	0.13
F*	47.3	12.6	-0.0634	-0.0011	0.0008	-0.0021	0.0016	0.0147	2.E-07	0.0133	0.0005	70.14	0.14	69.99	0.15
G*	62.9	12.9	-0.0153	-0.0003	0.0009	-0.0007	0.0018	0.0109	2.E-07	0.0127	0.0006	70.61	0.15	70.42	0.16
H*	94.8	21.2	-0.0546	-0.0019	0.0015	-0.0036	0.0030	0.0159	3.E-07	0.0136	0.0007	70.73	0.17	70.45	0.18
I*	-5.4	19.2	-0.9399	0.0018	0.0012	0.0036	0.0023	0.0206	2.E-07	0.0142	0.0015	70.38	0.15	70.40	0.16
J*	-24.1	32.2	0.2426	-0.0021	0.0020	-0.0041	0.0039	0.0173	4.E-07	0.0136	0.0008	70.43	0.18	70.50	0.20
K*	-30.8	57.1	-0.2598	0.0029	0.0036	0.0056	0.0071	0.0092	7.E-07	0.0122	0.0016	70.60	0.22	70.69	0.28
L*	-260.8	81.5	0.0409	-0.0038	0.0054	-0.0075	0.0105	-0.0050	1.E-06	0.0094	0.0030	70.73	0.26	71.50	0.36
M	91.3	34.3	0.1826	0.0060	0.0024	0.0117	0.0046	0.0024	5.E-07	0.0113	0.0009	71.76	0.18	71.48	0.21
N	517.9	89.9	0.0175	0.0033	0.0057	0.0064	0.0112	0.0879	1.E-06	0.0265	0.0045	70.44	0.27	68.89	0.38
O	1180.1	23.6	0.0073	0.0031	0.0011	0.0061	0.0021	0.0027	2.E-07	0.0134	0.0005	74.99	0.15	71.46	0.17
Ms: B72A (3064-02)															
A	8585.9	758.8	0.0058	0.0179	0.0283	0.0350	0.0554	-0.0696	6.E-06	0.0151	0.0109	45.46	0.68	19.82	2.35
B	1226.7	119.5	0.0016	0.0007	0.0046	0.0014	0.0090	0.0239	9.E-07	0.0170	0.0021	53.69	0.17	50.02	0.39
C	252.7	59.5	0.0651	0.0059	0.0028	0.0116	0.0055	0.0083	6.E-07	0.0126	0.0014	67.79	0.14	67.04	0.23
D	34.1	30.4	0.1420	0.0017	0.0016	0.0034	0.0032	0.0058	3.E-07	0.0117	0.0007	71.79	0.13	71.68	0.16
E	20.9	9.8	-0.0191	-0.0001	0.0005	-0.0003	0.0010	0.0025	1.E-07	0.0112	0.0004	71.03	0.09	70.97	0.10
F	10.2	4.3	-0.0356	-0.0001	0.0002	-0.0003	0.0004	0.0101	4.E-08	0.0124	0.0004	69.92	0.08	69.88	0.08
G	24.8	16.6	-0.0800	-0.0007	0.0009	-0.0014	0.0017	0.0019	2.E-07	0.0111	0.0005	69.39	0.10	69.31	0.11
H	33.3	18.9	0.0203	0.0002	0.0009	0.0005	0.0018	0.0123	2.E-07	0.0128	0.0005	70.00	0.11	69.90	0.12
I	-12.2	17.2	0.4764	-0.0021	0.0009	-0.0041	0.0018	0.0094	2.E-07	0.0123	0.0005	70.26	0.11	70.30	0.12
J	-8.4	39.1	0.3939	-0.0012	0.0020	-0.0023	0.0040	0.0252	4.E-07	0.0149	0.0015	70.07	0.13	70.09	0.18
K	15.0	91.0	-0.4633	-0.0025	0.0047	-0.0049	0.0093	0.0897	1.E-06	0.0259	0.0043	70.19	0.21	70.14	0.34
L	-145.3	156.1	0.7288	-0.0379	0.0082	-0.0744	0.0160	0.0838	2.E-06	0.0246	0.0036	70.36	0.30	70.78	0.55
M	41.0	101.2	1.3681	0.0201	0.0052	0.0394	0.0102	0.0100	1.E-06	0.0125	0.0021	70.72	0.21	70.60	0.37
N	189.2	174.5	0.0762	0.0052	0.0083	0.0101	0.0164	0.0246	2.E-06	0.0152	0.0027	70.65	0.29	70.08	0.60
O	4.1	214.4	4.3330	0.0064	0.0118	0.0126	0.0230	0.0414	2.E-06	0.0177	0.0042	71.92	0.34	71.91	0.72
P	102.9	192.5	0.3179	0.0117	0.0092	0.0230	0.0181	0.0027	2.E-06	0.0114	0.0038	70.04	0.32	69.73	0.66
Q	-186.3	243.6	0.0665	-0.0044	0.0125	-0.0087	0.0246	0.0638	3.E-06	0.0211	0.0051	70.62	0.39	71.17	0.83
R	-220.0	159.9	-0.1147	0.0090	0.0087	0.0177	0.0171	0.0993	2.E-06	0.0270	0.0043	70.19	0.30	70.84	0.57
S	-534.4	400.9	-0.0121	0.0023	0.0197	0.0045	0.0386	0.0186	4.E-06	0.0128	0.0090	68.48	0.53	70.07	1.31
T	-119.3	72.1	0.0635	-0.0027	0.0039	-0.0053	0.0076	0.0053	8.E-07	0.0114	0.0014	71.23	0.17	71.59	0.28
U	12970.0	14843.5	-0.1463	-0.6800	0.7337	-1.3329	1.4381	2.3554	1.E-04	0.4323	0.2612	104.00	17.18	65.22	47.19
V	208.0	157.5	-0.0296	-0.0022	0.0079	-0.0043	0.0155	0.0186	2.E-06	0.0142	0.0026	71.81	0.28	71.19	0.55
Ms: B75A (3080-01)															
A	30963.0	584.9	-0.0038	-0.0425	0.0216	-0.0834	0.0423	-0.1619	4.E-06	0.0418	0.0170	125.45	0.91	33.00	1.76
B	562.2	17.0	0.0082	0.0017	0.0009	0.0033	0.0018	0.0066	2.E-07	0.0129	0.0006	68.89	0.11	67.21	0.12
C	12.0	2.2	0.1223	0.0005	0.0001	0.0010	0.0003	0.0093	3.E-08	0.0123	0.0004	68.27	0.09	68.23	0.09
D	-1.1	7.4	-3.8658	0.0016	0.0005	0.0031	0.0009	0.0048	9.E-08	0.0115	0.0005	68.50	0.10	68.50	0.10
E	5.8	6.8	0.1269	0.0003	0.0004	0.0005	0.0008	0.0072	8.E-08	0.0119	0.0003	69.94	0.10	69.92	0.10
F	-113.2	33.8	-0.1136	0.0046	0.0023	0.0090	0.0044	0.0026	5.E-07	0.0109	0.0007	69.06	0.16	69.40	0.19
G	-86.6	45.4	0.0406	-0.0013	0.0030	-0.0025	0.0059	-0.0237	6.E-07	0.0065	0.0029	69.52	0.17	69.77	0.22
H	-145.8	44.8	-0.0542	0.0028	0.0029	0.0056	0.0057	-0.0297	6.E-07	0.0054	0.0026	69.48	0.18	69.91	0.22
I	-129.6	69.4	-0.0866	0.0040	0.0048	0.0079	0.0095	-0.0472	1.E-06	0.0025	0.0038	69.09	0.21	69.47	0.30

Sample No.[a]	Derived Results				Inverse Isochron Data				
	$\%^{40}Ar^*$	Age (Ma)		w/±J	$^{36}Ar/^{40}Ar$		$^{39}Ar/^{40}Ar$		$^{36}Ar/^{39}Ar$
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Bt: Z58B (3287-01)									
K*	99.91	1686	1	3	0.00000	30.07526	0.01389	0.11555	0.00134
L*	99.90	1687	1	3	0.00000	19.53972	0.01388	0.11106	0.00189
M*	99.92	1686	1	3	0.00000	23.71189	0.01388	0.10090	0.00173
N	99.95	1682	1	3	0.00000	18.98887	0.01394	0.08876	0.00254
O	99.84	1681	1	3	0.00001	9.74867	0.01394	0.10285	0.00497
P	99.49	1683	1	3	0.00002	4.96352	0.01387	0.11790	0.01033
Q	99.95	1682	1	3	0.00000	48.68804	0.01394	0.12472	0.00103
R	99.38	1668	2	3	0.00002	7.28770	0.01405	0.14668	0.00600
S	99.16	1652	1	3	0.00003	2.61004	0.01421	0.10024	0.01742
T	95.20	1638	3	5	0.00016	3.40931	0.01383	0.26556	0.02477
U	83.95	1665	2	4	0.00054	0.65838	0.01190	0.12846	0.07509
Bt: Z58B (3287-02)									
A	95.26	1668	2	4	0.00016	2.12362	0.01346	0.19269	0.02290
B	97.57	1711	2	3	0.00008	2.01223	0.01325	0.13752	0.01904
C	99.33	1707	1	3	0.00002	3.52079	0.01355	0.10839	0.01294
D	99.67	1696	1	3	0.00001	2.90305	0.01372	0.08594	0.01955
E	99.91	1699	1	3	0.00000	14.43139	0.01373	0.09705	0.00323
F	99.90	1699	1	3	0.00000	16.14939	0.01372	0.10640	0.00255
G	99.90	1702	1	3	0.00000	24.35222	0.01368	0.12018	0.00159
H	99.97	1707	1	3	0.00000	73.78580	0.01363	0.12050	0.00063
I	99.96	1704	1	3	0.00000	71.46679	0.01366	0.12305	0.00073
J*	99.97	1699	1	3	0.00000	26.59844	0.01373	0.09771	0.00265
K*	100.13	1698	1	3	0.00000	-9.70283	0.01376	0.12040	0.00709
L*	99.94	1696	1	3	0.00000	18.19940	0.01376	0.11123	0.00433
M*	100.04	1696	1	3	0.00000	-25.42525	0.01377	0.10775	0.00276
N*	99.35	1702	6	7	0.00002	49.95854	0.01361	0.46380	0.00430
O*	99.79	1700	3	4	0.00001	49.15183	0.01369	0.21919	0.00139
P*	99.66	1696	4	5	0.00001	47.73502	0.01373	0.27899	0.00201
Q*	99.89	1699	3	5	0.00000	120.15870	0.01372	0.27176	0.00062
R*	99.95	1700	2	4	0.00000	87.41135	0.01371	0.15948	0.00053
S*	99.84	1698	2	4	0.00001	43.38638	0.01372	0.20926	0.00111
T	89.95	1662	4	5	0.00034	2.33109	0.01278	0.29080	0.04216
Ms: B72A (3064-01)									
A	41.84	671	26	29	0.00195	3.15700	0.01994	0.84127	0.19204
B	89.15	1179	4	20	0.00036	2.99688	0.02075	0.29103	0.05580
C	99.70	1654	2	24	0.00001	7.95101	0.01425	0.19470	0.02100
D	99.99	1664	2	24	0.00000	118.38350	0.01416	0.19114	0.00143
E*	99.93	1658	2	24	0.00000	18.37986	0.01423	0.18779	0.00925
F*	99.80	1655	2	24	0.00001	26.54590	0.01426	0.20642	0.00599
G*	99.73	1661	2	24	0.00001	20.56168	0.01416	0.21350	0.00747
H*	99.60	1661	3	24	0.00001	22.37906	0.01414	0.24266	0.00642
I*	100.02	1661	3	24	0.00000	-347.69090	0.01421	0.21782	0.00044
J*	100.10	1662	3	24	0.00000	-133.56430	0.01420	0.24885	0.00111
K*	100.13	1665	4	25	0.00000	-184.55460	0.01417	0.31121	0.00083
L*	101.10	1678	5	25	-0.00004	-31.27263	0.01414	0.36487	0.00558
M	99.62	1677	3	25	0.00001	37.66374	0.01394	0.24791	0.00400
N	97.81	1637	6	25	0.00007	17.37042	0.01420	0.38493	0.01049
O	95.30	1677	3	25	0.00016	2.00284	0.01334	0.20602	0.07724
Ms: B72A (3064-02)									
A	43.61	639	64	65	0.00189	8.92784	0.02200	1.48907	0.14293
B	93.18	1316	7	22	0.00023	9.74314	0.01863	0.31269	0.01488
C	98.89	1608	4	24	0.00004	23.57973	0.01475	0.21120	0.00407
D	99.86	1680	2	25	0.00000	89.40497	0.01393	0.18070	0.00088
E	99.91	1669	1	24	0.00000	46.82568	0.01408	0.12901	0.00190
F	99.96	1653	1	24	0.00000	42.86426	0.01430	0.11776	0.00219
G	99.89	1644	2	24	0.00000	67.04319	0.01441	0.14344	0.00121
H	99.86	1653	2	24	0.00000	56.84227	0.01429	0.15202	0.00135
I	100.05	1659	2	24	0.00000	-141.35340	0.01423	0.15590	0.00050
J	100.04	1656	3	24	0.00000	-463.64580	0.01427	0.19170	0.00016
K	99.94	1657	5	25	0.00000	617.84830	0.01425	0.29435	0.00017
L	100.61	1667	9	26	-0.00002	-107.99930	0.01421	0.42615	0.00159
M	99.83	1664	6	25	0.00001	250.89730	0.01414	0.29734	0.00044
N	99.20	1656	9	26	0.00003	92.35803	0.01416	0.41067	0.00231
O	99.98	1684	11	27	0.00000	5653.58900	0.01390	0.47247	0.00004
P	99.56	1650	10	26	0.00001	187.73120	0.01428	0.46188	0.00116
Q	100.79	1673	13	27	-0.00003	-130.65850	0.01416	0.55131	0.00202
R	100.94	1668	9	26	-0.00003	-72.46859	0.01425	0.43300	0.00247
S	102.33	1656	20	32	-0.00008	-75.00304	0.01460	0.77815	0.00673
T	100.50	1679	4	25	-0.00002	-60.41547	0.01404	0.24462	0.00131
U	62.74	1579	761	762	0.00125	115.22910	0.00962	16.51512	0.12351
V	99.14	1673	8	26	0.00003	75.74173	0.01393	0.38978	0.00199
Ms: B75A (3080-01)									
A	26.31	990	41	41	0.00247	1.85243	0.00797	0.72261	0.14383
B	97.56	1645	2	3	0.00008	3.01896	0.01452	0.16673	0.02936
C	99.95	1662	1	3	0.00000	18.34311	0.01465	0.12750	0.00572
D	100.01	1666	2	3	0.00000	-619.08120	0.01460	0.14114	0.00016
E	99.98	1688	2	3	0.00000	117.49790	0.01430	0.14297	0.00081
F	100.49	1680	3	4	-0.00002	-29.84868	0.01448	0.23841	0.00300
G	100.37	1686	3	4	-0.00001	-52.54240	0.01439	0.24776	0.00195
H	100.63	1688	4	4	-0.00002	-30.73078	0.01439	0.25876	0.00333
I	100.56	1681	5	5	-0.00002	-53.60106	0.01448	0.31014	0.00244

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Ms: B75A (3080-01)										
J	64c	0.70	22.161	0.050	193559	571	2770.14	8.90	-12.5507	17.8032
K	64c	0.80	22.161	0.050	203835	589	2872.58	8.64	52.9723	5.8603
L	64c	0.90	22.161	0.050	384240	701	5565.40	12.52	48.6922	16.6749
M	64c	1.00	22.161	0.050	2444801	2839	35366.30	28.99	445.8205	10.5670
N	64c	1.10	22.161	0.050	255772	632	3744.55	9.51	52.9849	7.0610
O	64c	1.20	22.161	0.050	147649	552	2160.54	7.89	41.2272	8.0161
P	64c	1.30	22.161	0.050	87319	529	1233.70	6.77	17.6616	11.0427
Q	64c	1.50	22.161	0.050	32600	527	469.87	4.18	16.2517	6.6013
R	64c	1.70	22.161	0.050	76182	540	1074.75	6.27	19.2352	7.1410
S	64c	2.00	22.161	0.050	28530	449	397.78	3.82	7.3517	7.1420
T	64c	2.50	22.161	0.050	28804	463	436.16	3.82	-6.1935	7.9156
U	64c	5.00	22.161	0.050	125352	504	1785.08	7.51	19.9653	11.0512
Ms: B75A (3080-02)										
A	64c	0.10	22.161	0.050	28033	500	804.82	4.79	24.7867	8.7459
B	64c	0.15	22.161	0.050	306094	766	4649.85	10.64	65.0572	9.7240
C	64c	0.20	22.161	0.050	1015023	2050	14147.61	18.93	152.7988	9.0320
D	64c	0.25	22.161	0.050	620772	1321	8847.30	15.16	110.4386	10.0757
E	64c	0.28	22.161	0.050	8950989	17622	130833.20	59.22	1546.9080	28.2751
F*	64c	0.30	22.161	0.050	8061707	15971	119017.70	60.48	1432.2280	31.9832
G*	64c	0.35	22.161	0.050	4293212	8571	63061.94	45.37	761.6399	16.1458
H*	64c	0.40	22.161	0.050	1881437	3848	27665.22	26.48	381.0277	33.1405
I*	64c	0.45	22.161	0.050	1627279	3369	23954.63	26.48	273.6607	12.6952
J*	64c	0.50	22.161	0.050	948285	2017	13884.86	20.19	176.6288	12.9253
K*	64c	0.55	22.161	0.050	524895	1217	7760.76	15.17	84.8714	10.3404
L	64c	0.60	22.161	0.050	438582	1048	6369.91	12.15	79.9242	8.7840
M	64c	0.65	22.161	0.050	286187	770	4137.76	10.65	26.4861	17.9680
N	64c	0.70	22.161	0.050	238988	719	3461.96	9.02	49.5230	7.8706
O	64c	0.75	22.161	0.050	136819	585	1975.62	7.40	40.0817	5.9273
P	64c	0.90	22.161	0.050	580300	1376	8424.87	13.90	64.0124	14.2828
Q	64c	1.10	22.161	0.050	168842	626	2438.42	7.64	49.0321	22.9280
R	64c	1.30	22.161	0.050	445406	1117	6438.80	13.90	77.6708	9.8335
S	64c	2.00	22.161	0.050	150155	638	2183.74	8.14	2.6436	10.3057
T	64c	5.00	22.161	0.050	560981	1387	8136.74	13.89	91.5937	10.1241
U	64c	7.00	22.161	0.050	210377	691	3111.30	8.50	42.5616	8.5193
Ms: H45A (3276-01)										
A	68b	0.10	21.253	0.060	1784	521	60.07	1.95	-0.3147	6.4231
B	68b	0.20	21.253	0.060	62633	523	988.76	5.36	19.5373	5.0658
C	68b	0.25	21.253	0.060	64569	509	878.62	4.73	14.7789	5.3975
D	68b	0.30	21.253	0.060	48998	495	720.51	4.85	-28.8024	14.1081
E	68b	0.35	21.253	0.060	166809	545	2307.48	8.85	-8.1951	7.9027
F	68b	0.40	21.253	0.060	247051	550	3311.39	10.49	51.0840	7.6666
G	68b	0.45	21.253	0.060	45600910	42640	612936.50	612.71	7585.4810	134.7146
H*	68b	0.50	21.253	0.060	110386500	139137	1474168.00	1460.09	17426.8900	565.7153
I	68b	0.55	21.253	0.060	2014572	1525	26906.71	26.48	341.9153	12.1012
J	68b	0.60	21.253	0.060	1656915	1364	22033.95	25.22	254.5262	12.3398
K	68b	0.70	21.253	0.060	1143312	1090	15187.37	20.19	200.0811	6.8775
L	68b	0.80	21.253	0.060	440480	644	5830.69	12.26	67.7385	11.5832
M	68b	0.90	21.253	0.060	546421	678	7223.62	15.15	86.8856	9.6969
N	68b	1.00	21.253	0.060	350933	574	4645.99	10.75	40.3838	9.1633
O	68b	1.10	21.253	0.060	887934	864	11740.97	17.66	150.8350	11.0188
P	68b	1.20	21.253	0.060	240917	591	3184.76	9.48	32.1132	8.3125
Q	68b	1.50	21.253	0.060	3865207	2760	51003.55	40.32	615.1480	14.5914
R	68b	1.70	21.253	0.060	1296329	1079	17077.16	26.47	190.1991	10.8431
S	68b	2.00	21.253	0.060	1477751	1150	19451.99	21.43	219.5806	12.4615
T	68b	3.00	21.253	0.060	1009589	854	13306.31	20.17	169.3652	12.3891
U	68b	5.00	21.253	0.060	396614	594	5223.93	11.87	61.5954	6.9757
Ms: H45A (3276-02)										
A	68b	0.10	21.253	0.060	617	540	16.67	1.43	-28.1100	7.0109
B	68b	0.20	21.253	0.060	10203	494	230.01	3.01	-11.5562	7.3937
C	68b	0.25	21.253	0.060	16082	577	280.33	3.13	-17.5357	8.3138
D	68b	0.30	21.253	0.060	28758	514	455.11	3.74	-23.8803	7.4631
E	68b	0.35	21.253	0.060	52573	500	792.60	4.35	-12.5004	7.5340
F	68b	0.40	21.253	0.060	64434	501	810.97	5.72	1.8883	6.2104
G	68b	0.40	21.253	0.060	57134	494	738.88	5.22	-8.1447	7.3336
H	68b	0.45	21.253	0.060	110100	527	1423.17	6.97	31.9369	8.1523
I	68b	0.45	21.253	0.060	35853	458	457.89	4.01	8.4091	5.0114
J	68b	0.50	21.253	0.060	109205	495	1488.39	6.62	28.4122	7.6197
K	68b	0.55	21.253	0.060	127217	496	1710.90	6.87	19.0715	5.8841
L	68b	0.60	21.253	0.060	227817	535	3088.34	9.87	50.2657	8.8378
M	68b	0.65	21.253	0.060	6479333	4277	86375.74	51.66	1061.4970	25.4772
N	68b	0.70	21.253	0.060	-257	524	34.31	1.62	9.6428	6.0512
O	68b	0.90	21.253	0.060	-281	452	8.44	1.51	-2.7946	6.0512
P	68b	0.75	21.253	0.060	-1704	429	12.50	1.38	0.3777	7.1729
Q	68b	1.00	21.253	0.060	127944	437	1736.92	7.36	46.7032	12.6247
R*	68b	1.50	21.253	0.060	186323600	512560	2511689.00	3873.73	30927.2200	595.5391
S*	68b	1.00	21.253	0.060	1129626	1029	15145.24	18.91	159.1056	11.8575
T*	68b	1.20	21.253	0.060	846004	814	11319.16	17.66	121.2773	19.6543
U	68b	1.50	21.253	0.060	1109584	926	14777.24	20.17	150.0923	13.3083
V	68b	1.70	21.253	0.060	646442	642	8617.51	15.15	116.4685	9.9488
W	68b	2.00	21.253	0.060	4038901	2639	53682.19	37.81	627.6735	19.1927
X	68b	3.00	21.253	0.060	16092320	11145	213185.10	196.07	2556.6760	128.6004

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Ms: B75A (3080-01)																
J	-7.1513	19.4031	-9.4788	3.0973	4648	370	51.6	1.2	131.8	17.0	410.71	1.70	135.4	1.9	0.00977	0.37
K	38.8822	19.8326	20.5197	3.1800	4996	400	43.5	1.1	87.8	3.2	401.93	1.80	129.2	1.6	0.01013	0.38
L	51.5147	19.2015	3.8360	2.9407	4996	400	43.5	1.1	87.8	3.2	401.93	1.80	129.2	1.6	0.01962	0.74
M	81.8308	21.8330	1.0574	3.0190	4996	400	43.5	1.1	87.8	3.2	401.93	1.80	129.2	1.6	0.12469	4.73
N	30.4811	20.4901	2.9140	2.8497	4996	400	43.5	1.1	87.8	3.2	401.93	1.80	129.2	1.6	0.01320	0.50
O	22.4052	20.2924	0.0615	3.0212	4356	390	45.2	1.1	88.0	4.8	406.92	1.90	131.0	1.6	0.00762	0.29
P	17.3544	20.9318	4.7831	2.6996	4356	390	45.2	1.1	88.0	4.8	406.92	1.90	131.0	1.6	0.00435	0.16
Q	-5.2240	19.6734	-6.6891	2.9078	4356	390	45.2	1.1	88.0	4.8	406.92	1.90	131.0	1.6	0.00166	0.06
R	1.6854	21.5875	3.5906	3.1227	4356	390	45.2	1.1	88.0	4.8	406.92	1.90	131.0	1.6	0.00379	0.14
S	11.8020	19.2276	8.7062	3.1456	4034	320	42.3	1.1	91.0	3.6	407.81	1.80	127.9	1.8	0.00140	0.05
T	41.7353	19.8706	-0.9223	2.8633	4034	320	42.3	1.1	91.0	3.6	407.81	1.80	127.9	1.8	0.00154	0.06
U	-18.8050	20.5178	12.1866	3.0718	4034	320	42.3	1.1	91.0	3.6	407.81	1.80	127.9	1.8	0.00629	0.24
Ms: B75A (3080-02)																
A	92.2040	22.8529	7.5850	3.2386	6397	350	41.6	1.1	97.5	5.8	378.82	1.80	120.9	1.8	0.00284	0.2
B	118.1565	22.8731	46.0628	3.4421	6397	350	41.6	1.1	97.5	5.8	378.82	1.80	120.9	1.8	0.01639	1.0
C	33.3924	24.2682	12.8057	3.0357	6397	350	41.6	1.1	97.5	5.8	378.82	1.80	120.9	1.8	0.04988	3.1
D	44.9280	23.5798	0.7475	2.9548	2402	350	43.3	1.1	85.1	5.7	382.29	1.80	122.4	1.6	0.03119	1.9
E	43.8715	22.8800	14.9514	3.2863	2402	350	43.3	1.1	85.1	5.7	382.29	1.80	122.4	1.6	0.46127	28.4
F*	74.1023	23.6091	7.4391	3.2527	2402	350	43.3	1.1	85.1	5.7	382.29	1.80	122.4	1.6	0.41961	25.8
G*	15.0172	23.5864	8.4198	3.0926	2402	350	43.3	1.1	85.1	5.7	382.29	1.80	122.4	1.6	0.22233	13.7
H*	-23.6492	21.7006	-5.5767	3.0825	5748	380	49.6	1.2	94.6	5.2	387.39	1.70	126.0	1.8	0.09754	6.0
I*	-6.0104	23.1425	2.5126	3.2910	5748	380	49.6	1.2	94.6	5.2	387.39	1.70	126.0	1.8	0.08446	5.2
J*	-52.2621	23.1260	-4.3758	3.1790	5748	380	49.6	1.2	94.6	5.2	387.39	1.70	126.0	1.8	0.04895	3.0
K*	-46.8415	22.4138	-0.5638	3.2054	5748	380	49.6	1.2	94.6	5.2	387.39	1.70	126.0	1.8	0.02736	1.7
L	24.6428	24.3655	-5.7000	3.0625	3439	360	41.3	1.2	87.2	3.5	381.31	1.80	123.3	1.6	0.02246	1.4
M	39.7855	22.2614	3.7265	3.0427	3439	360	41.3	1.2	87.2	3.5	381.31	1.80	123.3	1.6	0.01459	0.9
N	-64.9311	20.9011	3.4937	3.1289	3439	360	41.3	1.2	87.2	3.5	381.31	1.80	123.3	1.6	0.01221	0.8
O	32.0351	23.6680	-2.0963	3.1029	3439	360	41.3	1.2	87.2	3.5	381.31	1.80	123.3	1.6	0.00697	0.4
P	16.3153	23.1901	-2.2558	3.2558	4256	380	42.3	1.1	92.3	3.5	380.38	1.70	124.0	1.7	0.02970	1.8
Q	35.1627	23.9491	-2.9301	3.0987	4256	380	42.3	1.1	92.3	3.5	380.38	1.70	124.0	1.7	0.00860	0.5
R	45.0794	21.7971	3.2857	3.1462	4256	380	42.3	1.1	92.3	3.5	380.38	1.70	124.0	1.7	0.02270	1.4
S	16.4222	22.4929	-1.1034	3.2857	4256	380	42.3	1.1	92.3	3.5	380.38	1.70	124.0	1.7	0.00770	0.5
T	-31.9820	23.7072	19.2499	3.5231	3210	350	43.1	1	73.7	5.6	384.04	1.80	124.9	1.7	0.02869	1.8
U	2.0418	23.7344	5.8855	3.3628	3210	350	43.1	1	73.7	5.6	384.04	1.80	124.9	1.7	0.01097	0.7
Ms: H45A (3276-01)																
A	0.3269	19.5540	4.9630	1.9455	12076	340	18.9	0.8	48.9	2.5	161.98	1.20	60.4	1.2	0.00021	0.00
B	27.4398	19.1058	28.9007	2.0498	12076	340	18.9	0.8	48.9	2.5	161.98	1.20	60.4	1.2	0.00349	0.04
C	-12.1855	19.3523	5.0474	1.9502	12076	340	18.9	0.8	48.9	2.5	161.98	1.20	60.4	1.2	0.00310	0.04
D	-27.8543	20.6859	-1.5974	1.8889	11952	320	15.8	0.8	54.7	2.7	163.59	1.30	62.0	1.1	0.00254	0.03
E	24.3943	19.0570	8.7904	1.8911	11952	320	15.8	0.8	54.7	2.7	163.59	1.30	62.0	1.1	0.00814	0.10
F	-17.9851	19.4221	12.9388	1.9855	11952	320	15.8	0.8	54.7	2.7	163.59	1.30	62.0	1.1	0.01167	0.14
G	4.7752	79.3002	95.5069	10.3483	11952	320	15.8	0.8	54.7	2.7	163.59	1.30	62.0	1.1	2.16099	26.67
H*	1300.3250	378.0160	-461.0197	38.7974	11020	390	20.5	1.1	53.4	3.9	159.22	1.10	63.1	1.3	5.19739	64.14
I	51.9718	18.9553	1.5260	2.1913	11020	390	20.5	1.1	53.4	3.9	159.22	1.10	63.1	1.3	0.09486	1.17
J	51.1421	18.2995	-3.4941	2.0994	11020	390	20.5	1.1	53.4	3.9	159.22	1.10	63.1	1.3	0.07768	0.96
K	29.9235	18.4863	-0.0932	2.1031	11020	390	20.5	1.1	53.4	3.9	159.22	1.10	63.1	1.3	0.05355	0.66
L	15.0424	18.2125	4.1725	1.9524	10166	300	17.4	0.9	47.2	5.0	158.92	1.20	59.8	1.2	0.02056	0.25
M	33.2682	19.5114	1.4577	1.9489	10166	300	17.4	0.9	47.2	5.0	158.92	1.20	59.8	1.2	0.02547	0.31
N	41.5019	18.5164	3.3257	1.9481	10166	300	17.4	0.9	47.2	5.0	158.92	1.20	59.8	1.2	0.01638	0.20
O	49.4059	18.3630	2.7088	1.9470	10166	300	17.4	0.9	47.2	5.0	158.92	1.20	59.8	1.2	0.04139	0.51
P	-5.4893	18.1892	-2.2679	2.0099	8842	370	17.3	0.8	44.1	4.6	162.57	1.20	63.3	1.3	0.01123	0.14
Q	-32.4959	18.1692	-2.4330	1.9239	8842	370	17.3	0.8	44.1	4.6	162.57	1.20	63.3	1.3	0.17982	2.22
R	-19.9801	19.0581	0.3979	1.8426	8842	370	17.3	0.8	44.1	4.6	162.57	1.20	63.3	1.3	0.06021	0.74
S	15.0396	18.4209	-1.3468	2.0147	8842	370	17.3	0.8	44.1	4.6	162.57	1.20	63.3	1.3	0.06858	0.85
T	-20.7683	17.8454	-1.8648	1.8641	12581	350	16.9	0.8	51.4	4.4	162.75	1.10	65.5	1.2	0.04691	0.58
U	-31.3341	17.6686	-2.2287	1.8622	12581	350	16.9	0.8	51.4	4.4	162.75	1.10	65.5	1.2	0.01842	0.23
Ms: H45A (3276-02)																
A	24.1264	19.3029	-0.6773	1.9233	10375	380	17.0	0.8	63.3	6.2	157.81	1.20	60.3	1.3	0.00006	0.00
B	36.6367	19.9814	12.2691	2.0127	10375	380	17.0	0.8	63.3	6.2	157.81	1.20	60.3	1.3	0.00081	0.01
C	21.4460	19.0279	8.9387	2.1000	10375	380	17.0	0.8	63.3	6.2	157.81	1.20	60.3	1.3	0.00099	0.01
D	58.9770	18.9694	9.8803	1.9239	10375	380	17.0	0.8	63.3	6.2	157.81	1.20	60.3	1.3	0.00160	0.02
E	-8.8243	19.2560	9.0454	1.9229	7763	360	14.8	0.7	49.2	4.5	159.64	1.30	56.3	1.3	0.00279	0.03
F	7.9308	19.1902	17.4316	2.1029	7763	360	14.8	0.7	49.2	4.5	159.64	1.30	56.3	1.3	0.00286	0.03
G	30.6064	19.9366	4.2398	1.9238	7763	360	14.8	0.7	49.2	4.5	159.64	1.30	56.3	1.3	0.00261	0.03
H	-6.8139	19.0266	15.3693	2.1063	7763	360	14.8	0.7	49.2	4.5	159.64	1.30	56.3	1.3	0.00502	0.05
I	8.0429	19.1237	-4.4494	2.0112	10863	300	16.6	0.9	38.0	3.9	159.47	1.20	61.3	1.3	0.00161	0.02
J	11.1707	19.1086	1.5384	1.9260	10863	300	16.6	0.9	38.0	3.9	159.47	1.20	61.3	1.3	0.00525	0.05
K	22.1182	17.4732	2.0990	1.8418	10863	300	16.6	0.9	38.0	3.9	159.47	1.20	61.3	1.3	0.00603	0.06
L	-11.2826	18.2488	8.7278	1.9265	10863	300	16.6	0.9	38.0	3.9	159.47	1.20	61.3	1.3	0.01089	0.10
M	49.2639	18.3180	49.9572	2.4973	10863	300	16.6	0.9	38.0	3.9	159.47	1.20	61.3	1.3	0.30453	2.93
N	-20.8900	18.6242	-3.7169	1.9238	12931	280	15.9	0.8	38.7	4.4	160.25	1.10	63.6	1.3	0.00012	0.00
O	4.4685	17.0158	-0.6783	1.9263	12931	280	15.9	0.8	38.7	4.4	160.25	1.10	63.6	1.3	0.00003	0.00
P	-4.2451	17.0663	-4.6691	1.9269	12931	280	15.9	0.8	38.7	4.4	160.25	1.10	63.6	1.3	0.00004	0.00
Q	3.3514	18.8130	-4.1801	2.0164	12931	280	15.9	0.8	38.7	4.4	160.25	1.10	63.6	1.3	0.00612	0.06
R*	1695.4530	324.8503	-38.5511	36.5161	9268	330	17.2	0.8	68.0	8.7	158.47	1.00	59.5	1.2	8.85531	85.19
S*	40.6214	16.4732	6.0755	2.0488	9268	330	17.2	0.8	68.0	8.7	158.47	1.00	59.5	1.2	0.05340	0.51
T*	-6.1582	16.4103	5.6659	1.9545	9268	330	17.2	0.8	68.0	8.7	158.47	1.00	59.5	1.2	0.03991	0.38
U	50.3009	18.2418	6.3122	2.1421	9268	330	17.2	0.8	68.0	8.7	158.47	1.00	59.5	1.2	0.05210	0.50
V	24.5615	17.7980	-6.8778	1.8616	11857	310	18.4	1.0	26.7	7.6	158.02	1.20	66.1	1.2	0.03038	0.29
W	13.2413	18.7382	-4.6838	2.0463	11857	310	18.4	1.0	26.7	7.6	158.02	1.20	66.1	1.2	0.18926	1.82
X	-1.6390	81.2631	-94.0595	8.1147	10568	310	18.2	1.0	38.6	3.0	160.13	1.10	62.5	1.1	0.75161	7.23

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Ms: B75A (3080-01)															
J	-342.2	111.8	0.0210	-0.0026	0.0070	-0.0051	0.0137	-0.0865	1.E-06	-0.0045	0.0064	69.87	0.30	70.89	0.45
K	714.3	110.7	0.0529	0.0135	0.0069	0.0265	0.0135	0.0379	1.E-06	0.0184	0.0020	70.96	0.30	68.83	0.44
L	68.9	52.8	0.3747	0.0093	0.0035	0.0181	0.0068	-0.0123	7.E-07	0.0087	0.0030	69.04	0.20	68.83	0.25
M	3.0	8.5	2.1592	0.0023	0.0006	0.0045	0.0012	0.0113	1.E-07	0.0126	0.0003	69.13	0.10	69.12	0.10
N	77.8	76.1	0.2918	0.0081	0.0055	0.0160	0.0107	0.0196	1.E-06	0.0141	0.0019	68.31	0.24	68.07	0.33
O	2.9	139.8	10.1679	0.0104	0.0094	0.0203	0.0184	0.0497	2.E-06	0.0191	0.0037	68.34	0.36	68.33	0.55
P	387.7	218.8	0.1012	0.0141	0.0170	0.0276	0.0333	0.0171	3.E-06	0.0143	0.0090	70.78	0.58	69.62	0.87
Q	-1423.6	619.0	0.0218	-0.0111	0.0419	-0.0218	0.0821	0.1576	8.E-06	0.0346	0.0141	69.38	1.28	73.63	2.26
R	334.1	290.6	0.0131	0.0016	0.0201	0.0031	0.0394	0.0389	4.E-06	0.0179	0.0066	70.88	0.65	69.88	1.08
S	2188.7	791.1	0.0378	0.0297	0.0483	0.0582	0.0947	0.0217	1.E-05	0.0185	0.0180	71.72	1.32	65.19	2.69
T	-211.5	656.5	-1.2625	0.0957	0.0456	0.1876	0.0893	-0.1453	9.E-06	-0.0142	0.0181	66.04	1.21	66.68	2.30
U	682.7	172.1	-0.0431	-0.0105	0.0115	-0.0206	0.0225	-0.0048	2.E-06	0.0112	0.0062	70.22	0.41	68.18	0.65
Ms: B75A (3080-02)															
A	942.5	402.4	0.3	0.1146	0.0284	0.2245	0.0557	0.1087	6.E-06	0.0308	0.0109	34.83	0.65	32.0286	1.3659
B	990.6	74.1	0.1	0.0254	0.0049	0.0498	0.0096	0.0084	1.E-06	0.0140	0.0021	65.83	0.22	62.8715	0.3110
C	90.5	21.5	0.1	0.0024	0.0017	0.0046	0.0034	-0.0004	3.E-07	0.0108	0.0006	71.75	0.17	71.4722	0.1851
D	8.5	33.4	1.7	0.0051	0.0027	0.0100	0.0052	0.0105	5.E-07	0.0125	0.0011	70.17	0.19	70.1377	0.2160
E	11.4	2.5	0.1	0.0003	0.0002	0.0007	0.0003	0.0065	4.E-08	0.0118	0.0002	68.42	0.14	68.3783	0.1384
F*	6.3	2.7	0.3	0.0006	0.0002	0.0012	0.0004	0.0078	4.E-08	0.0120	0.0003	67.74	0.14	67.7139	0.1388
G*	13.4	4.9	0.0	0.0002	0.0004	0.0005	0.0007	0.0080	7.E-08	0.0121	0.0003	68.08	0.14	68.0366	0.1452
H*	-20.2	11.1	0.1	-0.0009	0.0008	-0.0017	0.0015	0.0184	2.E-07	0.0138	0.0012	68.01	0.15	68.0646	0.1572
I*	10.5	13.7	- 0.1	-0.0003	0.0010	-0.0005	0.0019	0.0042	2.E-07	0.0114	0.0005	67.93	0.16	67.8974	0.1646
J*	-31.5	22.9	0.3	-0.0038	0.0017	-0.0074	0.0033	0.0123	3.E-07	0.0127	0.0009	68.30	0.18	68.3871	0.1889
K*	-7.3	41.3	2.3	-0.0060	0.0029	-0.0118	0.0057	0.0015	6.E-07	0.0109	0.0013	67.63	0.21	67.6525	0.2394
L	-89.5	48.1	- 0.1	0.0039	0.0038	0.0076	0.0075	0.0120	8.E-07	0.0125	0.0014	68.85	0.21	69.1169	0.2551
M	90.1	73.5	0.3	0.0096	0.0054	0.0188	0.0105	-0.0265	1.E-06	0.0064	0.0043	69.16	0.26	68.8937	0.3380
N	100.9	90.4	- 0.5	-0.0188	0.0060	-0.0368	0.0118	0.0202	1.E-06	0.0143	0.0023	69.03	0.27	68.7261	0.3848
O	-106.1	157.1	- 0.4	0.0162	0.0120	0.0318	0.0235	0.0580	2.E-06	0.0203	0.0030	69.25	0.39	69.5703	0.6129
P	-26.8	38.7	- 0.2	0.0019	0.0028	0.0038	0.0054	-0.0181	6.E-07	0.0076	0.0017	68.88	0.20	68.9564	0.2301
Q	-120.2	127.1	- 0.3	0.0144	0.0098	0.0283	0.0193	0.0571	2.E-06	0.0201	0.0094	69.24	0.34	69.6007	0.5073
R	51.0	48.9	0.4	0.0070	0.0034	0.0137	0.0066	0.0075	7.E-07	0.0121	0.0015	69.18	0.23	69.0209	0.2713
S	-50.5	150.5	- 0.4	0.0075	0.0103	0.0147	0.0202	-0.0557	2.E-06	0.0012	0.0047	68.76	0.39	68.9087	0.5943
T	236.6	43.3	0.0	-0.0039	0.0029	-0.0077	0.0057	0.0007	6.E-07	0.0113	0.0012	68.94	0.21	68.2343	0.2436
U	189.2	108.1	0.0	0.0007	0.0076	0.0013	0.0150	0.0156	2.E-06	0.0137	0.0027	67.62	0.29	67.0494	0.4324
Ms: H45A (3276-01)															
A	8262.1	3249.9	0.0018	0.0054	0.3255	0.0107	0.6380	-0.1869	7.E-05	-0.0052	0.1069	29.69	8.72	5.02	12.99
B	2922.9	207.9	0.0265	0.0278	0.0193	0.0544	0.0379	0.0211	4.E-06	0.0198	0.0051	63.34	0.63	54.62	0.87
C	574.5	222.0	-0.0674	-0.0139	0.0220	-0.0272	0.0432	0.0299	4.E-06	0.0168	0.0061	73.49	0.70	71.77	0.96
D	-221.7	262.2	0.4865	-0.0387	0.0287	-0.0758	0.0563	-0.2980	6.E-06	-0.0400	0.0196	68.00	0.83	68.65	1.14
E	381.0	82.0	0.0774	0.0106	0.0083	0.0207	0.0162	-0.0888	2.E-06	-0.0036	0.0034	72.29	0.36	71.15	0.44
F	390.7	60.0	-0.0388	-0.0054	0.0059	-0.0106	0.0115	0.0237	1.E-06	0.0154	0.0023	74.61	0.29	73.44	0.34
G	15.6	1.7	0.0014	0.0000	0.0001	0.0000	0.0003	0.0098	3.E-08	0.0124	0.0002	74.40	0.10	74.35	0.10
H*	-31.3	2.6	-0.0787	0.0009	0.0003	0.0017	0.0005	0.0070	5.E-08	0.0118	0.0004	74.88	0.12	74.97	0.12
I	5.7	8.1	0.9502	0.0019	0.0007	0.0038	0.0014	0.0118	1.E-07	0.0127	0.0004	74.87	0.09	74.85	0.10
J	-15.9	9.5	-0.4084	0.0023	0.0008	0.0045	0.0016	0.0052	2.E-07	0.0116	0.0006	75.20	0.11	75.24	0.11
K	-0.6	13.9	-8.9614	0.0020	0.0012	0.0039	0.0024	0.0147	2.E-07	0.0132	0.0005	75.28	0.12	75.28	0.13
L	71.6	33.5	0.1006	0.0026	0.0031	0.0051	0.0061	0.0046	6.E-07	0.0116	0.0020	75.55	0.19	75.33	0.22
M	20.2	27.0	0.6367	0.0046	0.0027	0.0090	0.0053	0.0077	5.E-07	0.0120	0.0013	75.64	0.18	75.58	0.20
N	71.6	41.9	0.3482	0.0089	0.0040	0.0175	0.0078	-0.0127	8.E-07	0.0087	0.0020	75.53	0.21	75.32	0.25
O	23.1	16.6	0.5089	0.0042	0.0016	0.0082	0.0031	0.0125	3.E-07	0.0128	0.0009	75.63	0.14	75.56	0.14
P	-71.2	63.1	0.0675	-0.0017	0.0057	-0.0034	0.0112	-0.0029	1.E-06	0.0101	0.0026	75.65	0.29	75.86	0.35
Q	-4.8	3.8	0.3726	-0.0006	0.0004	-0.0012	0.0007	0.0081	7.E-08	0.0121	0.0003	75.78	0.08	75.79	0.08
R	2.3	10.8	-1.4008	-0.0012	0.0011	-0.0023	0.0022	0.0026	2.E-07	0.0111	0.0006	75.91	0.13	75.90	0.14
S	-6.9	10.4	-0.3116	0.0008	0.0009	0.0015	0.0019	0.0036	2.E-07	0.0113	0.0006	75.97	0.10	75.99	0.11
T	-14.0	14.0	0.3107	-0.0016	0.0013	-0.0031	0.0026	0.0122	3.E-07	0.0127	0.0009	75.87	0.13	75.91	0.14
U	-42.7	35.7	0.3923	-0.0060	0.0034	-0.0118	0.0066	0.0069	7.E-07	0.0118	0.0013	75.92	0.21	76.05	0.23
Ms: H45A (3276-02)															
A	-4062.8	11541.3	-0.9938	1.4471	1.1645	2.8364	2.2823	-10.0168	2.E-04	-1.6861	0.4447	37.04	32.57	49.19	47.53
B	5334.2	877.9	0.0833	0.1593	0.0869	0.3122	0.1703	-0.4210	2.E-05	-0.0502	0.0322	44.36	2.22	28.44	3.40
C	3188.7	750.0	0.0669	0.0765	0.0679	0.1499	0.1331	-0.4701	1.E-05	-0.0626	0.0297	57.37	2.15	47.85	3.09
D	2171.0	423.1	0.1665	0.1296	0.0417	0.2540	0.0817	-0.3989	8.E-06	-0.0525	0.0164	63.19	1.24	56.71	1.76
E	1141.2	242.7	-0.0272	-0.0111	0.0243	-0.0218	0.0476	-0.1697	5.E-06	-0.0158	0.0095	66.33	0.73	62.92	1.02
F	2149.5	259.7	0.0127	0.0098	0.0237	0.0192	0.0464	-0.0737	5.E-06	0.0023	0.0077	79.45	0.83	73.03	1.12
G	573.8	260.4	0.2014	0.0414	0.0270	0.0812	0.0529	-0.1352	5.E-06	-0.0110	0.0099	77.33	0.86	75.61	1.16
H	1079.9	148.1	-0.0124	-0.0048	0.0134	-0.0094	0.0262	0.0576	3.E-06	0.0224	0.0057	77.36	0.53	74.13	0.68
I	-971.7	439.3	-0.0504	0.0176	0.0418	0.0344	0.0819	0.0563	8.E-06	0.0184	0.0109	78.30	1.21	81.20	1.80
J	103.4	129.4	0.2026	0.0075	0.0128	0.0147	0.0252	0.0486	3.E-06	0.0191	0.0051	73.37	0.47	73.06	0.60
K	122.7	107.7	0.2940	0.0129	0.0102	0.0253	0.0200	0.0013	2.E-06	0.0111	0.0034	74.36	0.42	73.99	0.53
L	282.6	62.4	-0.0361	-0.0037	0.0059	-0.0072	0.0116	0.0299	1.E-06	0.0163	0.0029	73.77	0.29	72.92	0.34
M	57.8	2.9	0.0275	0.0006	0.0002	0.0011	0.0004	0.0088	4.E-08	0.0123	0.0003	75.01	0.07	74.84	0.07
N	-10831.7	5629.7	0.1568	-0.6088	0.5435	-1.1932	1.0653	1.7240	1.E-04	0.2810	0.1768	-7.49	15.28	24.81	22.68
O	-8039.5	22876.7	-0.1838	0.5296	2.0190	1.0380	3.9572	-1.9378	4.E-04	-0.3312	0.7197	-33.25	53.87	-9.23	86.73
P	-37348.0	15955.8	0.0254	-0.3396	1.3656	-0.6655	2.6767	0.5331	3.E-04	0.0302	0.5738	-136.28	37.47	-24.79	57.45
Q	-240.7	116.1	-0.0224	0.0019	0.0108	0.0038	0.0212	0.0987	2.E-06	0.0269	0.0073	73.66	0.40	74.38	0.53
R*	-1.5	1.5	-1.2270	0.0007	0.0001	0.0013	0.0003	0.0096	3.E-08	0.0123	0.0002	74.18	0.23	74.18	0.23
S*	40.1	13.5	0.1865	0.0027	0.0011	0.0053	0.0021	-0.0016	2.E-07	0.0105	0.0008	74.59	0.12	74.46	0.12
T*	50.1	17.3	-0.0303	-0.0005	0.0014	-0.0011	0.0028	-0.0005	3.E-07	0.0107	0.0017	74.74	0.14	74.59	0.15
U	42.7	14.5	0.2223	0.0034	0.0012	0.0067	0.0024	-0.0037	2.E-07	0.0102	0.0009	75.09	0.12	74.96	0.13
V	-79.8	21.6	-0.0996	0.0029	0.0021	0.0056	0.0040	0.0176	4.E-07	0.0135	0.0012	75.01	0.15	75.25	0.16
W	-8.7	3.8	-0.0789	0.0002	0.0003	0.0005	0.0007	0.0060	7.E-08	0.0117	0.0004	75.24	0.07	75.26	0.07
X	-44.1	3.8	0.0005	0.0000	0.0004	0.0000	0.0007	0.0082	8.E-08	0.0120	0.0006	75.49	0.09	75.61	0.09

Sample No.[a]	Derived Results				Inverse Isochron Data				
	$\%^{40}Ar^*$	Age (Ma)		w/±J	$^{36}Ar/^{40}Ar$		$^{39}Ar/^{40}Ar$		$^{36}Ar/^{39}Ar$
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Ms: B75A (3080-01)									
J	101.46	1704	7	7	-0.00005	-32.71730	0.01431	0.43603	0.00609
K	97.00	1671	7	7	0.00010	15.51230	0.01409	0.41696	0.01290
L	99.70	1671	4	5	0.00001	76.89979	0.01448	0.28965	0.00149
M	99.99	1676	2	3	0.00000	296.23180	0.01447	0.14216	0.00032
N	99.66	1659	5	6	0.00001	98.18065	0.01464	0.35436	0.00175
O	99.99	1663	9	9	0.00000	5913.94300	0.01463	0.52278	0.00005
P	98.37	1684	14	14	0.00005	56.51244	0.01413	0.81723	0.00795
Q	106.13	1746	34	34	-0.00021	-43.49360	0.01441	1.84508	0.03257
R	98.59	1688	17	17	0.00005	87.02668	0.01411	0.91762	0.00628
S	90.89	1613	44	44	0.00031	36.18196	0.01394	1.84320	0.03715
T	100.97	1637	37	37	-0.00003	-307.40710	0.01514	1.82976	0.00459
U	97.10	1661	10	11	0.00010	25.19929	0.01424	0.58219	0.01103
Ms: B75A (3080-02)									
A	92.0	968	32	32	0.00027	42.90208	0.02871	1.87925	0.03941
B	95.5	1574	5	6	0.00015	7.48275	0.01519	0.33917	0.02470
C	99.6	1713	3	4	0.00001	23.72465	0.01394	0.24224	0.00710
D	100.0	1692	3	4	0.00000	404.11980	0.01425	0.27315	0.00041
E	100.0	1664	2	3	0.00000	22.05161	0.01462	0.20202	0.00870
F*	100.0	1653	2	3	0.00000	44.07684	0.01476	0.20453	0.00435
G*	99.9	1659	2	3	0.00000	36.84218	0.01469	0.21221	0.00510
H*	100.1	1659	3	4	0.00000	-55.13663	0.01471	0.22582	0.00336
I*	100.0	1656	3	4	0.00000	131.10940	0.01472	0.23471	0.00139
J*	100.1	1664	3	4	0.00000	-72.78002	0.01464	0.25769	0.00241
K*	100.0	1653	4	5	0.00000	-581.51970	0.01479	0.30326	0.00031
L	100.4	1676	4	5	-0.00001	-53.63683	0.01452	0.30580	0.00348
M	99.6	1672	5	6	0.00001	81.79838	0.01446	0.37228	0.00238
N	99.6	1670	6	7	0.00001	89.17372	0.01449	0.39811	0.00255
O	100.5	1683	10	10	-0.00002	-147.06920	0.01444	0.56879	0.00219
P	100.1	1673	4	4	0.00000	-144.45190	0.01452	0.28895	0.00135
Q	100.5	1683	8	8	-0.00002	-105.20180	0.01444	0.48533	0.00269
R	99.8	1674	4	5	0.00001	96.18573	0.01446	0.33094	0.00198
S	100.2	1672	9	10	-0.00001	-297.90030	0.01454	0.56528	0.00107
T	99.0	1662	4	5	0.00003	18.29614	0.01451	0.30045	0.01112
U	99.2	1643	7	7	0.00003	57.16565	0.01479	0.42714	0.00442
Ms: H45A (3276-01)									
A	16.91	183	450	450	0.00278	48.88059	0.03368	29.38134	0.59377
B	86.23	1390	15	16	0.00046	7.14421	0.01579	0.99559	0.09810
C	97.67	1671	15	15	0.00008	38.63065	0.01361	0.95492	0.01685
D	100.96	1623	18	18	-0.00003	-119.57320	0.01471	1.21371	0.00703
E	98.43	1662	7	7	0.00005	21.51074	0.01383	0.50412	0.00986
F	98.44	1696	5	6	0.00005	15.34598	0.01340	0.38717	0.00835
G	99.94	1710	2	3	0.00000	10.86745	0.01344	0.13688	0.00588
H*	100.12	1719	2	4	0.00000	-8.40183	0.01336	0.16031	0.01180
I	99.98	1717	1	3	0.00000	146.39620	0.01336	0.12416	0.00032
J	100.06	1723	2	4	0.00000	-59.75227	0.01330	0.14099	0.00080
K	100.00	1724	2	4	0.00000	-1882.89100	0.01328	0.16361	0.00003
L	99.72	1724	3	4	0.00001	46.85506	0.01324	0.25601	0.00178
M	99.92	1728	3	4	0.00000	134.79170	0.01322	0.24369	0.00047
N	99.72	1724	4	5	0.00001	58.73887	0.01324	0.28328	0.00161
O	99.91	1728	2	4	0.00000	72.42686	0.01322	0.17917	0.00073
P	100.28	1732	5	6	-0.00001	-88.70865	0.01322	0.38565	0.00176
Q	100.02	1731	1	3	0.00000	-78.75896	0.01320	0.10653	0.00061
R	99.99	1733	2	4	0.00000	458.95820	0.01317	0.17594	0.00009
S	100.03	1734	2	4	0.00000	-148.79040	0.01316	0.13488	0.00030
T	100.06	1733	2	4	0.00000	-99.88364	0.01318	0.17361	0.00041
U	100.17	1735	3	5	-0.00001	-83.82784	0.01317	0.27212	0.00098
Ms: H45A (3276-02)									
A	132.71	1291	891	891	-0.00110	-297.51910	0.02698	87.93699	0.29276
B	64.11	853	81	81	0.00120	17.11237	0.02254	5.01438	0.27305
C	83.40	1266	59	59	0.00056	23.76640	0.01743	3.75561	0.14403
D	89.75	1427	31	31	0.00034	19.57137	0.01583	1.96654	0.08289
E	94.86	1532	17	17	0.00017	21.26087	0.01508	1.09780	0.03875
F	91.92	1690	17	17	0.00027	12.08878	0.01259	1.04941	0.04763
G	97.79	1729	17	17	0.00007	45.42810	0.01293	1.11629	0.01474
H	95.83	1707	10	11	0.00014	13.71547	0.01293	0.68491	0.02441
I	103.71	1809	25	25	-0.00012	-45.18681	0.01277	1.55009	0.02334
J	99.58	1691	9	10	0.00001	125.73120	0.01363	0.63493	0.00258
K	99.51	1705	8	8	0.00002	88.01269	0.01345	0.55978	0.00309
L	98.86	1689	5	6	0.00004	22.07803	0.01356	0.39656	0.00630
M	99.77	1717	1	3	0.00001	5.00445	0.01333	0.08908	0.00978
N	-331.39	764	569	569	0.01445	210.39250	-0.13356	-203.96930	0.96895
O	27.76	-394	4137	4137	0.00242	326.28660	-0.03006	-162.00550	0.49043
P	18.20	-1350	4656	4656	0.00274	48.34923	-0.00734	-27.49156	0.47681
Q	100.98	1710	8	8	-0.00003	-48.14033	0.01358	0.54387	0.00445
R*	100.01	1708	3	5	0.00000	-90.99810	0.01348	0.31539	0.00264
S*	99.84	1712	2	4	0.00001	33.78077	0.01341	0.15458	0.00159
T*	99.80	1714	2	4	0.00001	34.48593	0.01338	0.18329	0.00147
U	99.83	1719	2	4	0.00001	33.99967	0.01332	0.15999	0.00128
V	100.32	1723	2	4	-0.00001	-27.01466	0.01333	0.20193	0.00181
W	100.03	1723	1	3	0.00000	-43.51876	0.01329	0.09607	0.00102
X	100.17	1729	1	3	-0.00001	-8.62077	0.01325	0.11513	0.00483

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Ms: H45A (3276-02)										
Y	68b	5.00	21.253	0.060	1538192	1219	20401.37	23.96	258.4790	8.8334
Ms: F122A (3086-01)										
A	64c	0.10	22.254	0.050	10520	519	259.33	3.18	-1.4603	8.6197
B	64c	0.20	22.254	0.050	33740	547	893.22	5.26	1.9260	8.1326
C	64c	0.30	22.254	0.050	171542	691	2832.95	9.75	39.0242	12.0538
D	64c	0.40	22.254	0.050	736109	2041	10329.42	16.41	114.5299	10.3911
E*	64c	0.50	22.254	0.050	6441029	17103	91441.59	46.62	1060.5910	26.6535
F*	64c	0.55	22.254	0.050	1556762	4174	22039.67	22.70	262.7339	16.7145
G*	64c	0.60	22.254	0.050	1460327	3895	20694.63	23.96	261.8275	11.7083
H*	64c	0.65	22.254	0.050	1279796	3417	18222.85	22.70	222.3752	11.5879
I*	64c	0.70	22.254	0.050	3062791	8054	43456.06	34.03	487.4506	13.1210
J*	64c	0.80	22.254	0.050	5887679	15398	83989.22	46.63	947.3072	20.4786
K*	64c	0.90	22.254	0.050	4104576	10720	58357.65	41.59	674.1375	26.6935
L*	64c	1.00	22.254	0.050	1018445	2705	14558.68	22.71	194.6806	9.4413
M*	64c	1.10	22.254	0.050	1370793	3599	19536.26	22.71	215.3383	15.7062
N*	64c	1.20	22.254	0.050	530540	1482	7612.63	13.91	126.7155	19.3661
O*	64c	1.30	22.254	0.050	693678	1875	9919.38	16.42	100.6070	11.7659
P*	64c	1.50	22.254	0.050	751095	2020	10640.47	17.68	113.6109	9.6921
Q*	64c	1.70	22.254	0.050	580304	1571	8230.89	13.90	95.3702	13.1578
R	64c	2.00	22.254	0.050	287950	910	4026.23	10.14	49.5104	11.7127
S	64c	5.00	22.254	0.050	3442911	8823	48497.51	35.29	556.6745	17.8388
Ms: F122B (3073-01)										
A	64a	0.10	21.715	0.056	5378	459	209.82	2.71	-27.4429	19.2924
B	64a	0.20	21.715	0.056	59876	518	1223.51	5.88	-24.0440	12.6581
C	64a	0.30	21.715	0.056	285831	625	3979.93	10.88	-15.5845	15.5053
D	64a	0.40	21.715	0.056	3946636	5296	54048.65	40.32	593.6720	18.3234
E	64a	0.50	21.715	0.056	4215572	5606	58046.36	42.84	699.7550	16.9205
F*	64a	0.60	21.715	0.056	89168740	118106	1247278.00	864.04	14943.4600	256.0906
G	64a	0.60	21.715	0.056	2681366	3572	37096.81	34.03	500.1020	30.5168
H	64a	0.70	21.715	0.056	2275786	3021	31679.50	27.74	379.2527	16.9205
I	64a	0.80	21.715	0.056	2604715	3423	36121.00	32.78	388.0269	11.3645
J	64a	0.90	21.715	0.056	1794978	2387	24922.57	23.98	267.8196	13.7375
K	64a	1.00	21.715	0.056	1042690	1467	14412.83	18.95	173.6705	9.1411
L	64a	1.10	21.715	0.056	566006	903	7805.08	15.18	83.0839	11.3645
M	64a	1.20	21.715	0.056	470492	784	6445.60	13.90	63.6221	10.2322
N	64a	1.30	21.715	0.056	355424	683	4887.79	10.26	54.9361	9.2282
O	64a	1.50	21.715	0.056	281589	648	3845.20	10.51	39.7921	13.3686
P	64a	5.00	21.715	0.056	6124676	7707	84391.36	49.14	1069.1510	55.5718
Ms: F122B (3073-02)										
A	64a	0.10	21.715	0.056	25689	513	443.33	3.82	5.5012	9.9346
B	64a	0.20	21.715	0.056	391127	924	4335.58	11.02	148.4306	27.3469
C	64a	0.25	21.715	0.056	339206	830	4577.30	11.52	84.1791	9.9346
D	64a	0.30	21.715	0.056	5647935	10716	76276.98	46.62	994.5517	23.9642
E	64a	0.35	21.715	0.056	79223960	150092	1107964.00	923.68	13547.0700	357.3705
F	64a	0.40	21.715	0.056	112499400	211946	1591673.00	1042.86	19411.6100	262.1253
G	64a	0.45	21.715	0.056	29877480	56034	418076.90	232.82	5020.1730	159.3672
H	64a	0.50	21.715	0.056	6886588	12854	96145.46	56.70	1140.5910	20.6827
I	64a	0.55	21.715	0.056	1472225	2791	20554.32	22.71	280.1689	30.5757
J	64a	0.58	21.715	0.056	941569	1833	13111.86	20.19	127.2568	10.6594
K	64a	0.60	21.715	0.056	1025787	1977	13972.68	18.93	201.8057	9.4363
L	64a	0.65	21.715	0.056	1617868	3057	22513.59	23.98	245.7772	11.3727
M	64a	0.70	21.715	0.056	2028338	3805	28197.39	26.49	373.7012	42.0788
N	64a	0.75	21.715	0.056	1117990	2144	15582.98	22.72	171.9081	12.0959
O	64a	0.80	21.715	0.056	1806834	3402	22978.08	23.98	355.9011	13.8179
P	64a	0.90	21.715	0.056	3496448	6525	48345.53	35.29	572.2717	21.7529
Q	64a	1.10	21.715	0.056	257810	692	211.97	3.02	159.3196	12.2204
R	64a	1.20	21.715	0.056	33699	508	475.84	4.45	-2.6688	5.6980
S	64a	1.30	21.715	0.056	36577	504	488.37	3.94	1.4603	9.5795
T	64a	1.50	21.715	0.056	76920	515	946.91	4.91	9.6302	11.2987
U	64a	1.70	21.715	0.056	96607	539	1326.16	5.77	22.2312	7.5192
V	64a	2.00	21.715	0.056	169983	614	2311.25	8.01	-3.8143	19.3661
W	64a	5.00	21.715	0.056	8520287	16277	117962.20	56.70	1358.2200	16.1814
X	64a	7.00	21.715	0.056	5989697	13832	82358.61	49.14	958.9767	17.2966
Ms: S89A (3281-01)										
A	68b	0.10	21.285	0.060	32573	535	2218.47	7.47	33.8378	10.1379
B	68b	0.20	21.285	0.060	547663	616	7023.55	15.14	73.1390	10.9532
C	68b	0.25	21.285	0.060	745208	689	9636.72	16.40	85.9792	9.2211
D	68b	0.30	21.285	0.060	7228276	4037	96270.85	59.22	1163.6400	18.0721
E	68b	0.35	21.285	0.060	2235777	1289	29685.42	27.73	352.9428	15.2803
F*	68b	0.40	21.285	0.060	553535	625	7327.17	13.88	80.5788	7.1763
G*	68b	0.45	21.285	0.060	256151	540	3409.87	11.37	29.5703	6.5832
H*	68b	0.50	21.285	0.060	1239278	891	16441.41	22.69	194.4414	10.8216
I*	68b	0.55	21.285	0.060	567910	627	7552.87	15.14	95.8234	8.8824
J*	68b	0.60	21.285	0.060	866268	696	11503.88	18.91	164.1158	8.5469
K*	68b	0.70	21.285	0.060	890766	707	11798.31	18.91	140.4873	10.9532
L*	68b	5.00	21.285	0.060	995002	696	13159.51	17.65	151.3259	7.6006
Ms: S92C (3068-01)										
A*	64a	0.10	21.908	0.046	4324593	15778	59821.63	34.03	801.5202	18.3194
B*	64a	0.20	21.908	0.046	2847334	10382	40337.72	32.77	500.6559	17.1118
C*	64a	0.30	21.908	0.046	20858210	75898	296578.60	189.90	3615.3810	53.4970
D*	64a	0.40	21.908	0.046	3979683	14480	56074.48	40.32	656.5011	13.5451

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Ms: H45A (3276-02)																
Y	44.6232	19.0510	2.6661	1.8997	10568	310	18.2	1.0	38.6	3.0	160.13	1.10	62.5	1.1	0.07193	0.69
Ms: F122A (3086-01)																
A	31.8485	22.8857	12.6013	3.1677	2221	380	40.0	1.0	95.5	5.3	396.62	1.70	119.5	1.6	0.00091	0.05
B	-3.5096	22.8532	8.5449	3.1451	2221	380	40.0	1.0	95.5	5.3	396.62	1.70	119.5	1.6	0.00315	0.19
C	-5.4006	21.5355	12.6017	3.1627	2221	380	40.0	1.0	95.5	5.3	396.62	1.70	119.5	1.6	0.00999	0.60
D	-14.5850	22.1741	0.6412	3.1029	2221	380	40.0	1.0	95.5	5.3	396.62	1.70	119.5	1.6	0.03642	2.17
E*	-32.3362	21.5130	3.3664	2.9562	5593	360	40.5	1.1	88.9	3.4	397.64	1.70	116.7	1.5	0.32239	19.23
F*	44.8668	22.8939	12.4791	3.2682	5593	360	40.5	1.1	88.9	3.4	397.64	1.70	116.7	1.5	0.07770	4.63
G*	9.1016	22.1959	-0.1110	2.7652	5593	360	40.5	1.1	88.9	3.4	397.64	1.70	116.7	1.5	0.07296	4.35
H*	-21.9030	21.5174	2.7376	2.8611	5593	360	40.5	1.1	88.9	3.4	397.64	1.70	116.7	1.5	0.06425	3.83
I*	-17.2235	20.2712	1.6771	3.1341	5207	330	50.3	1.2	101.4	3.7	397.30	1.70	117.0	1.7	0.15321	9.14
J*	-12.2667	22.1717	2.1704	2.9652	5207	330	50.3	1.2	101.4	3.7	397.30	1.70	117.0	1.7	0.29612	17.66
K*	-7.6685	20.8900	-0.4933	2.9514	5207	330	50.3	1.2	101.4	3.7	397.30	1.70	117.0	1.7	0.20575	12.27
L*	-4.6924	20.8917	3.6134	3.2264	5207	330	50.3	1.2	101.4	3.7	397.30	1.70	117.0	1.7	0.05133	3.06
M*	-44.8695	22.5899	1.1100	2.9015	4465	360	42.4	1.2	97.5	4.3	398.51	1.80	117.6	1.6	0.06888	4.11
N*	-17.9700	21.9722	3.3916	3.0832	4465	360	42.4	1.2	97.5	4.3	398.51	1.80	117.6	1.6	0.02684	1.60
O*	-60.6065	21.9371	-0.0987	2.9787	4465	360	42.4	1.2	97.5	4.3	398.51	1.80	117.6	1.6	0.03497	2.09
P*	-10.4800	21.9795	2.1830	2.9024	4465	360	42.4	1.2	97.5	4.3	398.51	1.80	117.6	1.6	0.03751	2.24
Q*	2.3500	22.6061	0.1603	3.0702	3069	360	42.0	1.1	93.5	7.1	394.90	1.80	118.7	1.6	0.02902	1.73
R	-1.8081	21.9623	-2.0598	2.8857	3069	360	42.0	1.1	93.5	7.1	394.90	1.80	118.7	1.6	0.01420	0.85
S	8.3193	23.2733	1.5294	3.0740	3069	360	42.0	1.1	93.5	7.1	394.90	1.80	118.7	1.6	0.17098	10.20
Ms: F122B (3073-01)																
A	10.4230	18.5016	1.1299	2.9908	4725	360	43.0	1	132.2	12.0	406.86	1.80	137.0	1.7	0.00074	0.0
B	14.2610	20.3809	1.9283	3.3165	4725	360	43.0	1	132.2	12.0	406.86	1.80	137.0	1.7	0.00431	0.1
C	53.3000	19.7471	5.8955	3.2471	4725	360	43.0	1	132.2	12.0	406.86	1.80	137.0	1.7	0.01403	0.2
D	37.7916	20.3868	2.2354	3.0628	4725	360	43.0	1	132.2	12.0	406.86	1.80	137.0	1.7	0.19056	3.3
E	39.9742	21.4542	14.5923	3.2820	5314	330	48.1	1.1	95.4	4.3	406.03	1.90	137.5	1.7	0.20465	3.6
F*	752.1487	345.1862	-47.6452	71.4051	5314	330	48.1	1.1	95.4	4.3	406.00	1.90	137.5	1.7	4.39745	77.2
G	43.5784	21.4578	-1.8302	3.1963	5314	330	48.1	1.1	95.4	4.3	406.03	1.90	137.5	1.7	0.13079	2.3
H	75.2320	20.8212	0.8599	3.2912	5314	330	48.1	1.1	95.4	4.3	406.03	1.90	137.5	1.7	0.11169	2.0
I	16.7052	21.3356	-2.7025	3.0752	5782	390	56.0	1.4	98.0	5.5	408.81	1.70	140.3	1.9	0.12735	2.2
J	7.6021	19.9846	-4.6190	3.3816	5782	390	56.0	1.4	98.0	5.5	408.81	1.70	140.3	1.9	0.08787	1.5
K	50.5500	19.9926	7.8868	3.3501	5782	390	56.0	1.4	98.0	5.5	408.81	1.70	140.3	1.9	0.05081	0.9
L	25.1538	18.0628	4.9508	3.5017	5782	390	56.0	1.4	98.0	5.5	408.81	1.70	140.3	1.9	0.02752	0.5
M	-0.1672	18.6869	4.2507	3.2482	4058	350	45.9	1.1	96.4	4.5	408.34	1.70	136.5	1.8	0.02272	0.4
N	58.8614	19.9984	8.4402	3.3481	4058	350	45.9	1.1	96.4	4.5	408.34	1.70	136.5	1.8	0.01723	0.3
O	25.7562	19.9946	7.8629	3.8935	4058	350	45.9	1.1	96.4	4.5	408.34	1.70	136.5	1.8	0.01356	0.2
P	24.0875	19.3377	96.1998	4.0153	4058	350	45.9	1.1	96.4	4.5	408.34	1.70	136.5	1.8	0.29753	5.2
Ms: F122B (3073-02)																
A	-10.9640	23.8720	7.4691	2.9609	4079	380	45.6	1.1	99.9	7.0	386.43	1.90	120.3	1.6	0.00156	0.0
B	-28.2810	23.1799	310.7089	5.9053	4079	380	45.6	1.1	99.9	7.0	386.43	1.90	120.3	1.6	0.01529	0.1
C	-5.0993	23.8837	-0.1102	3.1744	4079	380	45.6	1.1	99.9	7.0	386.43	1.90	120.3	1.6	0.01614	0.1
D	-14.0527	22.5170	526.3407	7.8553	4128	330	40.5	0.98	92.6	7.8	383.38	1.90	116.7	1.6	0.26893	2.1
E	-480.4350	415.9521	463.7068	59.6042	4128	330	40.5	1	92.5	7.8	383.40	1.90	116.7	1.6	3.90628	30.0
F	-11.3873	416.3526	261.2592	60.6342	4128	330	40.5	1	92.5	7.8	383.40	1.90	116.7	1.6	5.61167	43.1
G	199.0717	91.3360	153.6030	13.5981	4128	330	40.5	1	92.5	7.8	383.40	1.90	116.7	1.6	1.47399	11.3
H	51.9344	24.3094	5.4378	2.8510	3893	330	60.6	1.2	92.4	4.7	382.86	2.10	121.2	1.6	0.33897	2.6
I	67.3642	23.6834	3.3926	3.0899	3893	330	60.6	1.2	92.4	4.7	382.86	2.10	121.2	1.6	0.07247	0.6
J	66.4140	23.0724	4.4460	2.8436	3893	330	60.6	1.2	92.4	4.7	382.86	2.10	121.2	1.6	0.04623	0.4
K	63.2455	23.6921	69.2268	3.5931	3893	330	60.6	1.2	92.4	4.7	382.86	2.10	121.2	1.6	0.04926	0.4
L	12.9242	23.7755	0.0122	3.0023	3921	390	50.2	1.4	106.0	6.7	382.76	2.00	118.6	1.8	0.07937	0.6
M	26.0463	23.7873	3.1480	2.9381	3921	390	50.2	1.4	106.0	6.7	382.76	2.00	118.6	1.8	0.09941	0.8
N	45.5418	24.4772	2.6581	3.0952	3921	390	50.2	1.4	106.0	6.7	382.76	2.00	118.6	1.8	0.05494	0.4
O	-0.8686	23.1307	562.3113	8.0918	3921	390	50.2	1.4	106.0	6.7	382.76	2.00	118.6	1.8	0.08101	0.6
P	17.1848	23.4839	-3.8834	2.8479	5429	360	42.3	1.2	87.3	3.9	385.38	1.80	124.1	1.5	0.17045	1.3
Q	-34.2866	23.4708	861.0217	11.0150	5429	360	42.3	1.2	87.3	3.9	385.38	1.80	124.1	1.5	0.00075	0.0
R	-19.4168	24.2081	-6.7504	2.8382	5429	360	42.3	1.2	87.3	3.9	385.38	1.80	124.1	1.5	0.00168	0.0
S	-31.8901	24.2135	-0.2940	3.0389	4999	380	46.0	1.1	91.7	4.3	385.30	1.80	119.5	1.7	0.00172	0.0
T	-30.0599	24.2208	23.9407	3.1579	4999	380	46.0	1.1	91.7	4.3	385.30	1.80	119.5	1.7	0.00334	0.0
U	53.9445	24.2675	10.7087	3.0138	4999	380	46.0	1.1	91.7	4.3	385.30	1.80	119.5	1.7	0.00468	0.0
V	12.0867	23.5299	10.1085	3.2648	4999	380	46.0	1.1	91.7	4.3	385.30	1.80	119.5	1.7	0.00815	0.1
W	115.0145	24.2869	12.2534	3.1757	6397	350	41.6	1.1	97.5	5.8	378.82	1.80	120.9	1.8	0.41589	3.2
X	-18.6717	24.4584	24.4007	3.5016	3210	350	43.1	1	73.7	5.6	384.04	1.80	124.9	1.7	0.29037	2.2
Ms: S89A (3281-01)																
A	8.8903	18.7211	13.2099	1.9020	10415	350	16.4	0.8	51.8	4.0	163.44	1.30	60.5	1.1	0.00782	1.03
B	84.1931	18.6216	8.6383	1.8992	10415	350	16.4	0.8	51.8	4.0	163.44	1.30	60.5	1.1	0.02476	3.25
C	40.4911	19.1549	1.5086	1.7118	10415	350	16.4	0.8	51.8	4.0	163.44	1.30	60.5	1.1	0.03398	4.46
D	140.6524	18.3657	1.7916	1.9933	10415	350	16.4	0.8	51.8	4.0	163.44	1.30	60.5	1.1	0.33942	44.56
E	20.5690	17.0469	-1.4264	1.9582	11116	340	20.5	0.8	44.3	2.3	166.71	1.10	63.1	1.2	0.10466	13.74
F*	-0.7499	16.2237	-6.6020	1.9580	11116	340	20.5	0.8	44.3	2.3	166.71	1.10	63.1	1.2	0.02583	3.39
G*	-34.3910	16.2266	-1.2262	1.8714	11116	340	20.5	0.8	44.3	2.3	166.71	1.10	63.1	1.2	0.01202	1.58
H*	6.4284	17.9569	-4.9876	1.9629	11116	340	20.5	0.8	44.3	2.3	166.71	1.10	63.1	1.2	0.05797	7.61
I*	32.5178	18.4582	-3.4773	1.8083	11558	360	16.2	0.8	35.5	4.0	163.47	1.20	60.5	1.1	0.02663	3.50
J*	20.6227	16.8240	-0.9899	1.9003	11558	360	16.2	0.8	35.5	4.0	163.47	1.20	60.5	1.1	0.04056	5.33
K*	11.6100	18.3976	-0.4595	1.8986	11558	360	16.2	0.8	35.5	4.0	163.47	1.20	60.5	1.1	0.04160	5.46
L*	-19.8130	17.7901	-5.5939	1.8028	11448	330	17.6	0.8	40.8	3.4	165.98	1.20	63.6	1.1	0.04640	6.09
Ms: S92C (3068-01)																
A*	101.5370	12.2885	270.2927	6.6797	4765	330	52.4	1.1	110.5	5.0	324.12	1.50	155.5	1.5	0.21091	8.17
B*	11.9077	11.3794	7.6628	3.6899	4765	330	52.4	1.1	110.5	5.0	324.12	1.50	155.5	1.5	0.14222	5.51
C*	122.3399	46.5633	15.9503	15.8636	4765	330	52.4	1.1	110.5	5.0	324.10	1.50	155.5	1.5	1.04563	40.49
D*	15.1564	11.8355	0.0486	3.5523	4765	330	52.4	1.1	110.5	5.0	324.12	1.50	155.5	1.5	0.19770	7.66

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Ms: H45A (3276-02)															
Y	13.1	9.3	0.4670	0.0022	0.0009	0.0043	0.0018	0.0115	2.E-07	0.0127	0.0004	75.40	0.11	75.35	0.11
Ms: F122A (3086-01)															
A	4859.1	1222.9	0.0705	0.1228	0.0883	0.2407	0.1730	-0.1511	2.E-05	-0.0056	0.0332	40.57	2.06	26.07	4.17
B	956.6	352.2	-0.0115	-0.0039	0.0256	-0.0077	0.0501	-0.0614	5.E-06	0.0022	0.0091	37.77	0.65	34.91	1.23
C	444.8	111.7	-0.0120	-0.0019	0.0076	-0.0037	0.0149	0.0133	2.E-06	0.0138	0.0043	60.55	0.32	59.22	0.46
D	6.2	30.0	-0.6346	-0.0014	0.0021	-0.0028	0.0042	0.0022	4.E-07	0.0111	0.0010	71.26	0.23	71.24	0.24
E*	3.7	3.2	-0.2680	-0.0004	0.0002	-0.0007	0.0005	0.0053	5.E-08	0.0116	0.0003	70.44	0.19	70.42	0.19
F*	56.6	14.8	0.1003	0.0020	0.0010	0.0040	0.0020	0.0066	2.E-07	0.0119	0.0008	70.63	0.20	70.46	0.21
G*	-0.5	13.4	-2.2881	0.0004	0.0011	0.0009	0.0021	0.0116	2.E-07	0.0127	0.0006	70.57	0.21	70.56	0.21
H*	15.0	15.7	-0.2232	-0.0012	0.0012	-0.0024	0.0023	0.0087	2.E-07	0.0122	0.0006	70.23	0.21	70.18	0.21
I*	3.9	7.2	-0.2865	-0.0004	0.0005	-0.0008	0.0009	0.0030	9.E-08	0.0112	0.0003	70.48	0.19	70.47	0.19
J*	2.6	3.5	-0.1577	-0.0001	0.0003	-0.0003	0.0005	0.0034	5.E-08	0.0113	0.0002	70.10	0.19	70.09	0.19
K*	-0.8	5.1	0.4337	-0.0001	0.0004	-0.0003	0.0007	0.0051	7.E-08	0.0116	0.0005	70.33	0.19	70.33	0.19
L*	24.8	22.2	-0.0362	-0.0003	0.0014	-0.0006	0.0028	0.0156	3.E-07	0.0134	0.0006	69.95	0.22	69.88	0.23
M*	5.7	14.9	-1.1279	-0.0023	0.0012	-0.0045	0.0023	0.0018	2.E-07	0.0110	0.0008	70.17	0.20	70.15	0.21
N*	44.6	40.5	-0.1478	-0.0024	0.0029	-0.0046	0.0057	0.0348	6.E-07	0.0166	0.0025	69.69	0.23	69.56	0.26
O*	-1.0	30.0	17.1380	-0.0061	0.0022	-0.0120	0.0043	-0.0033	4.E-07	0.0101	0.0012	69.93	0.22	69.93	0.24
P*	20.5	27.3	-0.1339	-0.0010	0.0021	-0.0019	0.0040	-0.0004	4.E-07	0.0107	0.0009	70.59	0.22	70.52	0.24
Q*	2.0	37.3	0.4089	0.0003	0.0027	0.0006	0.0054	0.0052	6.E-07	0.0116	0.0016	70.50	0.22	70.49	0.25
R	-51.2	71.7	0.0245	-0.0004	0.0055	-0.0009	0.0107	0.0100	1.E-06	0.0123	0.0029	71.52	0.29	71.67	0.36
S	3.2	6.3	0.1518	0.0002	0.0005	0.0003	0.0009	0.0046	1.E-07	0.0115	0.0004	70.99	0.19	70.98	0.19
Ms: F122B (3073-01)															
A	538.5	1425.4	0.3	0.0497	0.0882	0.0974	0.1728	-0.8451	2.E-05	-0.1308	0.0920	25.63	2.21	24.0182	4.7946
B	157.6	271.1	0.2	0.0117	0.0167	0.0228	0.0326	-0.1818	3.E-06	-0.0197	0.0103	48.94	0.48	48.4636	0.9426
C	148.1	81.6	0.3	0.0134	0.0050	0.0262	0.0097	-0.0883	1.E-06	-0.0039	0.0039	71.82	0.25	71.3736	0.3494
D	4.1	5.7	0.5	0.0007	0.0004	0.0014	0.0007	0.0016	8.E-08	0.0110	0.0003	73.02	0.11	73.0048	0.1134
E	25.1	5.7	0.1	0.0007	0.0004	0.0013	0.0007	0.0078	7.E-08	0.0121	0.0003	72.62	0.11	72.5464	0.1117
F*	-3.8	5.7	- 0.4	0.0006	0.0003	0.0012	0.0005	0.0076	6.E-08	0.0120	0.0002	71.49	0.11	71.4992	0.1083
G	-4.9	8.6	- 0.7	0.0012	0.0006	0.0023	0.0011	0.0165	1.E-07	0.0135	0.0008	72.28	0.12	72.2923	0.1197
H	2.7	10.4	2.4	0.0024	0.0007	0.0047	0.0013	0.0075	1.E-07	0.0120	0.0005	71.84	0.11	71.8271	0.1184
I	-7.5	8.5	- 0.2	0.0005	0.0006	0.0009	0.0012	0.0003	1.E-07	0.0107	0.0003	72.11	0.12	72.1302	0.1180
J	-18.5	13.6	0.0	0.0003	0.0008	0.0006	0.0016	0.0005	2.E-07	0.0107	0.0006	72.02	0.12	72.0746	0.1250
K	54.7	23.2	0.2	0.0035	0.0014	0.0069	0.0027	0.0074	3.E-07	0.0120	0.0006	72.34	0.14	72.1787	0.1555
L	63.4	44.9	0.1	0.0032	0.0023	0.0063	0.0045	-0.0010	5.E-07	0.0106	0.0015	72.52	0.18	72.3257	0.2261
M	66.0	50.4	0.0	0.0000	0.0029	-0.0001	0.0057	-0.0057	6.E-07	0.0099	0.0016	72.99	0.20	72.7943	0.2492
N	172.7	68.5	0.2	0.0120	0.0041	0.0236	0.0080	0.0013	8.E-07	0.0112	0.0019	72.72	0.21	72.1998	0.2904
O	204.5	101.3	0.1	0.0067	0.0052	0.0131	0.0102	-0.0044	1.E-06	0.0103	0.0035	73.23	0.26	72.6186	0.3991
P	114.0	4.8	0.0	0.0003	0.0002	0.0006	0.0004	0.0104	5.E-08	0.0127	0.0007	72.57	0.10	72.2315	0.1016
Ms: F122B (3073-02)															
A	1684.8	668.0	0.0	-0.0247	0.0538	-0.0485	0.1055	-0.0087	1.E-05	0.0124	0.0224	57.94	1.26	52.9084	2.3501
B	7166.5	137.4	0.0	-0.0065	0.0053	-0.0128	0.0105	0.0595	1.E-06	0.0342	0.0063	90.21	0.31	68.8141	0.4913
C	-2.4	69.4	1.3	-0.0011	0.0052	-0.0022	0.0102	0.0456	1.E-06	0.0184	0.0022	74.11	0.26	74.1107	0.3324
D	690.0	10.3	0.0	-0.0002	0.0003	-0.0004	0.0006	0.0062	6.E-08	0.0130	0.0003	74.05	0.15	71.9820	0.1504
E	41.9	5.4	0.0	-0.0004	0.0004	-0.0008	0.0007	0.0086	8.E-08	0.0122	0.0003	71.50	0.15	71.3762	0.1489
F	16.4	3.8	0.0	0.0000	0.0003	0.0000	0.0005	0.0087	5.E-08	0.0122	0.0002	70.68	0.14	70.6281	0.1415
G	36.7	3.3	0.0	0.0005	0.0002	0.0009	0.0004	0.0073	4.E-08	0.0120	0.0004	71.46	0.14	71.3516	0.1402
H	5.7	3.0	0.3	0.0005	0.0003	0.0011	0.0005	0.0068	5.E-08	0.0119	0.0002	71.63	0.14	71.6070	0.1405
I	16.5	15.0	0.6	0.0033	0.0012	0.0064	0.0023	0.0172	2.E-07	0.0136	0.0015	71.63	0.16	71.5744	0.1634
J	33.9	21.7	0.4	0.0051	0.0018	0.0099	0.0034	-0.0063	4.E-07	0.0097	0.0008	71.81	0.18	71.7068	0.1896
K	495.4	25.7	0.0	0.0045	0.0017	0.0089	0.0033	0.0167	3.E-07	0.0144	0.0007	73.41	0.17	71.9324	0.1882
L	0.1	13.3	29.4	0.0006	0.0011	0.0011	0.0021	0.0013	2.E-07	0.0109	0.0005	71.86	0.16	71.8588	0.1609
M	11.2	10.4	0.2	0.0009	0.0008	0.0018	0.0017	0.0150	2.E-07	0.0133	0.0015	71.93	0.15	71.8975	0.1541
N	17.1	19.9	0.5	0.0029	0.0016	0.0057	0.0031	0.0018	3.E-07	0.0110	0.0008	71.74	0.17	71.6908	0.1827
O	2447.2	35.3	0.0	0.0000	0.0010	-0.0001	0.0020	0.0010	2.E-07	0.0155	0.0006	78.63	0.17	71.3237	0.1963
P	-8.0	5.9	- 0.1	0.0004	0.0005	0.0007	0.0010	0.0068	1.E-07	0.0118	0.0005	72.32	0.14	72.3432	0.1460
Q	406195.3	7778.5	0.0	-0.1618	0.1107	-0.3170	0.2171	-0.1469	2.E-05	0.7516	0.0586	1216.25	17.64	3.4900	15.8531
R	-1418.7	596.6	0.1	-0.0408	0.0509	-0.0800	0.0997	-0.0809	1.E-05	-0.0056	0.0120	70.82	1.26	75.0478	2.1912
S	-60.2	622.2	3.0	-0.0653	0.0496	-0.1280	0.0972	-0.0451	1.E-05	0.0030	0.0196	74.90	1.19	75.0636	2.2092
T	2528.3	333.8	0.0	-0.0317	0.0256	-0.0622	0.0501	-0.0314	5.E-06	0.0102	0.0119	81.23	0.69	73.6770	1.1971
U	807.5	227.3	0.1	0.0407	0.0183	0.0797	0.0359	0.0269	4.E-06	0.0168	0.0057	72.85	0.52	70.4392	0.8484
V	437.4	141.3	0.0	0.0052	0.0102	0.0102	0.0200	-0.0781	2.E-06	-0.0017	0.0084	73.55	0.37	72.2370	0.5578
W	10.4	2.7	0.3	0.0010	0.0002	0.0019	0.0004	0.0047	4.E-08	0.0115	0.0001	72.23	0.14	72.1951	0.1425
X	29.6	4.3	0.0	-0.0002	0.0003	-0.0004	0.0006	0.0053	6.E-08	0.0116	0.0002	72.73	0.17	72.6356	0.1739
Ms: S89A (3281-01)															
A	595.5	85.8	0.0188	0.0040	0.0084	0.0079	0.0165	0.0203	2.E-06	0.0153	0.0046	14.68	0.25	12.90	0.35
B	123.0	27.0	0.2719	0.0120	0.0027	0.0235	0.0052	-0.0031	5.E-07	0.0104	0.0016	77.98	0.19	77.61	0.21
C	15.7	17.8	0.7489	0.0042	0.0020	0.0082	0.0039	-0.0107	4.E-07	0.0089	0.0010	77.33	0.15	77.28	0.16
D	1.9	2.1	2.1904	0.0015	0.0002	0.0029	0.0004	0.0082	4.E-08	0.0121	0.0002	75.08	0.06	75.07	0.06
E	-4.8	6.6	-0.4023	0.0007	0.0006	0.0014	0.0011	0.0071	1.E-07	0.0119	0.0005	75.32	0.08	75.33	0.09
F*	-90.1	26.7	0.0032	-0.0001	0.0022	-0.0002	0.0043	0.0028	4.E-07	0.0110	0.0010	75.55	0.17	75.81	0.19
G*	-36.0	54.9	0.7825	-0.0101	0.0048	-0.0198	0.0093	-0.0116	1.E-06	0.0087	0.0019	75.12	0.30	75.22	0.34
H*	-30.3	11.9	-0.0360	0.0004	0.0011	0.0008	0.0021	0.0070	2.E-07	0.0118	0.0007	75.38	0.12	75.46	0.12
I*	-46.0	23.9	-0.2609	0.0043	0.0024	0.0084	0.0048	0.0123	5.E-07	0.0127	0.0012	75.19	0.17	75.33	0.19
J*	-8.6	16.5	-0.5812	0.0018	0.0015	0.0035	0.0029	0.0212	3.E-07	0.0143	0.0007	75.30	0.14	75.33	0.15
K*	-3.9	16.1	-0.7049	0.0010	0.0016	0.0019	0.0031	0.0072	3.E-07	0.0119	0.0009	75.50	0.14	75.51	0.14
L*	-42.5	13.7	0.0988	-0.0015	0.0014	-0.0030	0.0026	0.0052	3.E-07	0.0115	0.0006	75.61	0.11	75.73	0.12
Ms: S92C (3068-01)															
A*	451.8	11.2	0.0105	0.0017	0.0002	0.0033	0.0004	0.0110	4.E-08	0.0134	0.0003	72.29	0.27	70.94	0.27
B*	19.0	9.2	0.0434	0.0003	0.0003	0.0006	0.0006	0.0099	6.E-08	0.0124	0.0004	70.59	0.26	70.53	0.27
C*	5.4	5.4	0.2140	0.0004	0.0002	0.0008	0.0003	0.0088	3.E-08	0.0122	0.0002	70.33	0.26	70.31	0.26
D*	0.1	6.3	8.7011	0.0003	0.0002	0.0005	0.0004	0.0060	4.E-08	0.0117	0.0002	70.97	0.26	70.97	0.26

Sample No.[a]	Derived Results				Inverse Isochron Data				
	%^{40}Ar*	Age (Ma)		w/±J	^{36}Ar/^{40}Ar		^{39}Ar/^{40}Ar		^{36}Ar/^{39}Ar
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Ms: H45A (3276-02)									
Y	99.95	1725	2	4	0.00000	71.88336	0.01326	0.14167	0.00062
Ms: F122A (3086-01)									
A	64.26	825	106	106	0.00120	25.63304	0.02465	5.08519	0.18682
B	92.44	1037	28	28	0.00025	36.83041	0.02648	1.72469	0.04137
C	97.81	1517	8	8	0.00007	25.10210	0.01652	0.52983	0.01220
D	99.97	1714	4	5	0.00000	481.57530	0.01403	0.31954	0.00050
E*	99.98	1701	3	4	0.00000	88.08865	0.01420	0.27040	0.00296
F*	99.76	1702	3	4	0.00001	26.23052	0.01416	0.28726	0.00954
G*	100.00	1703	3	4	0.00000	-2246.95900	0.01417	0.29081	0.00011
H*	99.94	1697	3	4	0.00000	104.52610	0.01424	0.29463	0.00231
I*	99.98	1702	3	4	0.00000	186.93020	0.01419	0.27438	0.00135
J*	99.99	1696	3	4	0.00000	137.12710	0.01427	0.26736	0.00187
K*	100.00	1700	3	4	0.00000	-586.87820	0.01422	0.27074	0.00043
L*	99.89	1692	4	4	0.00000	89.48701	0.01430	0.30806	0.00256
M*	99.98	1697	3	4	0.00000	258.83620	0.01425	0.28715	0.00093
N*	99.81	1687	4	5	0.00001	91.06278	0.01435	0.33384	0.00257
O*	100.00	1693	4	4	0.00000	-3702.63800	0.01430	0.31702	0.00006
P*	99.91	1702	4	4	0.00000	132.77250	0.01417	0.31611	0.00172
Q*	99.99	1702	4	5	0.00000	1943.70100	0.01418	0.31908	0.00012
R	100.21	1720	6	6	-0.00001	-140.02900	0.01398	0.40420	0.00177
S	99.99	1710	3	4	0.00000	202.48290	0.01409	0.26641	0.00122
Ms: F122B (3073-01)									
A	93.7	757	123	123	0.00021	263.92910	0.03901	8.62513	0.03195
B	99.0	1297	18	18	0.00003	171.59580	0.02044	0.98955	0.00441
C	99.4	1689	5	6	0.00002	55.09260	0.01392	0.35013	0.00248
D	100.0	1714	2	3	0.00000	137.87800	0.01370	0.15354	0.00085
E	99.9	1707	2	3	0.00000	22.53666	0.01377	0.15209	0.00516
F*	100.0	1691	2	3	0.00000	-148.08540	0.01399	0.14948	0.00079
G	100.0	1703	2	3	0.00000	-171.29930	0.01384	0.16174	0.00064
H	100.0	1696	2	3	0.00000	396.67670	0.01392	0.15903	0.00028
I	100.0	1700	2	3	0.00000	-113.58010	0.01387	0.15973	0.00095
J	100.1	1699	2	3	0.00000	-73.17459	0.01389	0.16414	0.00147
K	99.8	1701	2	4	0.00001	42.57824	0.01382	0.19255	0.00241
L	99.7	1703	3	4	0.00001	70.82951	0.01379	0.25161	0.00143
M	99.7	1710	4	5	0.00001	76.39347	0.01370	0.27256	0.00133
N	99.3	1701	4	5	0.00002	39.74955	0.01375	0.28464	0.00326
O	99.2	1708	6	7	0.00003	49.56149	0.01366	0.35745	0.00299
P	99.5	1702	2	3	0.00002	4.17780	0.01378	0.13866	0.02734
Ms: F122B (3073-02)									
A	91.3	1380	43	43	0.00029	39.67780	0.01726	2.17487	0.04623
B	76.3	1649	8	8	0.00079	1.91533	0.01109	0.34693	0.08399
C	100.0	1730	5	6	0.00000	-2705.58300	0.01349	0.35093	0.00006
D	97.2	1698	2	4	0.00009	1.50457	0.01351	0.19935	0.12004
E	99.8	1689	2	4	0.00001	12.86297	0.01399	0.20699	0.01348
F	99.9	1677	2	4	0.00000	23.26045	0.01415	0.19947	0.00765
G	99.8	1688	2	4	0.00001	8.86565	0.01399	0.19565	0.02028
H	100.0	1692	2	4	0.00000	52.83508	0.01396	0.19575	0.00337
I	99.9	1692	3	4	0.00000	91.98647	0.01396	0.21941	0.00178
J	99.9	1694	3	4	0.00000	64.18009	0.01393	0.24828	0.00238
K	98.0	1697	3	4	0.00007	5.19620	0.01362	0.23564	0.03035
L	100.0	1696	2	4	0.00000	40264.35000	0.01392	0.21689	0.00000
M	100.0	1697	2	4	0.00000	94.07246	0.01390	0.20979	0.00178
N	99.9	1694	3	4	0.00000	117.05840	0.01394	0.24094	0.00130
O	90.7	1688	3	4	0.00031	1.45135	0.01272	0.21527	0.11347
P	100.0	1704	2	4	0.00000	-72.99645	0.01383	0.20041	0.00238
Q	0.3	132	577	577	0.00334	1.30718	0.00082	1.44988	0.03800
R	106.0	1744	33	33	-0.00020	-42.11762	0.01412	1.77265	0.03038
S	100.2	1745	33	33	-0.00001	-1069.15400	0.01335	1.59532	0.00111
T	90.7	1724	18	18	0.00031	13.20273	0.01231	0.84678	0.04007
U	96.7	1674	13	13	0.00011	28.19413	0.01373	0.70778	0.01560
V	98.2	1702	9	9	0.00006	32.28817	0.01360	0.50055	0.00807
W	100.0	1701	2	4	0.00000	26.03563	0.01385	0.19700	0.00712
X	99.9	1708	3	4	0.00000	14.36042	0.01375	0.23852	0.01557
Ms: S89A (3281-01)									
A	87.89	438	11	11	0.00041	14.49725	0.06812	1.67772	0.11107
B	99.53	1759	3	4	0.00002	22.04499	0.01283	0.24315	0.00236
C	99.94	1755	2	4	0.00000	113.98150	0.01293	0.19366	0.00039
D	99.99	1722	1	3	0.00000	116.12500	0.01332	0.08309	0.00032
E	100.02	1726	1	3	0.00000	-135.83710	0.01328	0.10976	0.00022
F*	100.36	1733	3	4	-0.00001	-29.65671	0.01324	0.22060	0.00195
G*	100.14	1725	5	6	0.00000	-154.05890	0.01331	0.39447	0.00073
H*	100.12	1728	2	4	0.00000	-39.30196	0.01327	0.15564	0.00085
I*	100.18	1726	3	4	-0.00001	-51.80639	0.01330	0.22880	0.00103
J*	100.03	1726	2	4	0.00000	-188.76960	0.01328	0.18298	0.00019
K*	100.02	1729	2	4	0.00000	-406.92760	0.01325	0.17890	0.00009
L*	100.17	1732	2	4	-0.00001	-32.24360	0.01323	0.15133	0.00100
Ms: S92C (3068-01)									
A*	98.13	1692	4	5	0.00006	2.49860	0.01383	0.36926	0.14428
B*	99.92	1685	4	5	0.00000	48.25899	0.01417	0.37358	0.00738
C*	99.98	1682	4	5	0.00000	100.19860	0.01422	0.36948	0.00358
D*	100.00	1692	4	5	0.00000	10559.68000	0.01409	0.37091	0.00003

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Ms: S92C (3068-01)										
E*	64a	0.50	21.908	0.046	2829429	10306	39754.94	34.03	486.6827	18.3194
F*	64a	0.60	21.908	0.046	2415724	8806	33974.71	31.51	386.2267	15.9121
G*	64a	0.60	21.908	0.046	2462117	8974	34697.20	28.99	475.9825	44.3424
H*	64a	0.70	21.908	0.046	2328014	8477	32589.55	30.26	445.5687	24.5879
I*	64a	0.80	21.908	0.046	1488159	5444	20860.06	22.70	248.3327	15.3830
J*	64a	0.90	21.908	0.046	1223966	4493	17168.93	22.70	228.5688	13.9282
K*	64a	1.00	21.908	0.046	1742685	6367	24451.81	26.48	226.6805	26.0532
L*	64a	1.10	21.908	0.046	1224230	4491	17164.65	21.45	202.4855	13.8179
M	64a	1.20	21.908	0.046	1047994	3858	14644.12	20.18	172.1976	11.5583
N	64a	1.30	21.908	0.046	1120114	4116	15744.21	21.44	234.1958	13.5039
O	64a	1.50	21.908	0.046	1100339	4049	15367.86	20.18	192.7042	13.6202
P	64a	5.00	21.908	0.046	938423	3461	13208.85	18.93	167.4644	9.2740
Ms: S92C (3068-02)										
A	64a	0.10	21.908	0.046	77420	624	678.95	4.36	4.7962	11.0663
B	64a	0.20	21.908	0.046	244417	1126	3173.78	8.91	19.1596	11.0663
C	64a	0.30	21.908	0.046	1024952	4207	14941.97	20.20	200.4336	13.3026
D	64a	0.40	21.908	0.046	75520380	306424	1067014.00	804.39	12576.4400	744.3569
E	64a	0.40	21.908	0.046	16634820	67353	235028.20	183.78	2966.8000	80.0407
F	64a	0.50	21.908	0.046	32188480	130145	461347.90	275.67	5547.9030	110.5262
G*	64a	0.70	21.908	0.046	102124300	412828	1454444.00	1012.94	17947.6300	476.4563
H*	64a	0.70	21.908	0.046	2984902	12073	42125.17	32.78	495.5324	19.5666
I*	64a	0.80	21.908	0.046	5600367	22618	78843.77	47.91	980.6415	25.9532
J	64a	0.90	21.908	0.046	6148711	24813	86060.05	51.69	1041.0660	11.4552
K	64a	1.00	21.908	0.046	2322516	9401	31473.39	29.05	347.5172	10.5274
L	64a	1.10	21.908	0.046	1577024	6406	21042.93	21.52	270.7779	15.2131
M	64a	1.20	21.908	0.046	1200211	4873	16452.89	21.44	165.3621	17.1617
N	64a	1.30	21.908	0.046	1138796	4622	15825.47	22.70	141.2426	20.9001
O	64a	1.40	21.908	0.046	987869	4015	13797.22	18.93	112.5786	17.6641
P	64a	1.50	21.908	0.046	4188843	16839	58580.87	39.06	642.0118	20.9001
Q	64a	1.70	21.908	0.046	678086	2790	9530.09	16.42	97.7872	10.9622
R	64a	2.00	21.908	0.046	697016	2865	9802.92	15.16	120.8870	14.4253
S	64a	2.50	21.908	0.046	3591944	14428	50182.29	41.59	590.3361	17.3826
T	64a	5.00	21.908	0.046	4165773	16719	58427.31	34.03	793.1363	35.0600
Ms: S92C (3068-03)										
A	64a	0.10	21.908	0.046	6414	510	74.00	2.11	24.0188	8.6145
B	64a	0.20	21.908	0.046	455301	656	5765.64	12.26	122.7250	12.7510
C	64a	0.25	21.908	0.046	1171412	1146	16986.49	20.18	205.9095	14.8996
D	64a	0.30	21.908	0.046	1322737	1255	19033.94	21.44	236.8268	12.7074
E	64a	0.35	21.908	0.046	4954934	4294	70584.53	42.84	868.0628	27.0019
F*	64a	0.40	21.908	0.046	34074580	29230	491534.70	269.58	5386.2780	251.0689
G*	64a	0.45	21.908	0.046	2650523	2309	38158.96	35.30	444.6372	14.4538
H*	64a	0.50	21.908	0.046	3143086	2702	45343.06	34.04	576.8035	21.7847
I*	64a	0.55	21.908	0.046	3973103	3377	57361.44	35.30	691.4844	18.3495
J*	64a	0.60	21.908	0.046	3560644	3033	51450.77	36.55	634.3328	22.9536
K*	64a	0.65	21.908	0.046	2577519	2223	37200.75	28.99	455.2619	17.2645
L*	64a	0.70	21.908	0.046	2599119	2232	37529.31	28.99	463.4444	20.8790
M*	64a	0.75	21.908	0.046	1670594	1483	24107.49	25.22	275.8762	13.7375
N	64a	0.80	21.908	0.046	1658409	1479	24037.58	26.48	226.2777	22.0959
O	64a	0.90	21.908	0.046	3958481	3305	56979.79	41.59	675.6859	19.2228
P	64a	1.00	21.908	0.046	29314960	24178	422035.60	275.71	4971.8070	128.6158
Q	64a	1.10	21.908	0.046	5234976	4343	75100.60	42.85	861.3658	17.9878
R	64a	1.20	21.908	0.046	2756439	2328	39227.48	32.78	453.2477	21.7011
S	64a	1.30	21.908	0.046	2006534	1743	28433.60	30.26	327.3127	17.9219
T	64a	1.50	21.908	0.046	1696181	1498	24091.65	25.23	249.2516	19.9298
U	64a	1.70	21.908	0.046	1393628	1285	19848.59	21.46	192.5783	15.2282
V	64a	2.00	21.908	0.046	962385	963	13605.70	20.20	168.5596	18.9934
W	64a	5.00	21.908	0.046	3378013	2856	47634.37	37.81	612.3156	18.1721
X	64a	7.00	21.908	0.046	716066	794	9568.39	15.17	147.3858	13.6062
Ms: S131C (3283-01)										
A	68c	0.20	21.919	0.060	487794	639	7230.23	13.89	131.4739	15.2015
B	68c	0.25	21.919	0.060	473597	608	6449.73	13.89	77.1547	9.3455
C*	68c	0.30	21.919	0.060	26856300	17810	375501.90	226.71	4099.0320	214.2824
D*	68c	0.35	21.919	0.060	1813013	1343	25367.20	25.21	317.6573	13.9513
E*	68c	0.40	21.919	0.060	1212598	900	16884.99	22.70	202.0449	12.8271
F*	68c	0.45	21.919	0.060	3643035	2244	50955.87	37.81	625.5209	23.0636
G	68c	0.50	21.919	0.060	5104867	3062	71603.18	46.63	846.4484	23.0636
H	68c	0.55	21.919	0.060	4886843	2931	68792.23	41.59	807.9277	21.8281
I	68c	0.60	21.919	0.060	2058815	1386	28749.10	28.99	336.0743	19.4115
J	68c	0.70	21.919	0.060	1109751	920	15426.20	22.70	202.9261	10.8011
K	68c	0.80	21.919	0.060	517707	638	7202.34	15.14	97.1704	10.2322
L	68c	0.90	21.919	0.060	425403	586	5903.77	12.63	91.5811	8.6841
M	68c	1.00	21.919	0.060	327153	589	4572.03	11.49	47.3956	15.5063
N	68c	1.20	21.919	0.060	287506	601	3968.57	10.36	71.0241	7.4229
O	68c	1.50	21.919	0.060	1585254	1413	21959.55	27.73	275.9014	9.1316
P	68c	1.70	21.919	0.060	2501	519	44.97	1.94	11.7450	6.2361
Q	68c	2.00	21.919	0.060	215676	591	3012.54	9.86	37.6647	7.5669
R	68c	3.00	21.919	0.060	12882	526	267.62	3.14	2.2407	5.1738
S	68c	5.00	21.919	0.060	49966	521	861.87	4.86	19.1093	6.0871
T	68c	7.00	21.919	0.060	502307	620	6840.33	15.14	91.7825	8.6423
Ms: S131C (3283-02)										
A	68c	0.10	21.919	0.060	15975	500	641.16	4.22	41.2776	10.1204

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Ms: S92C (3068-01)																
E*	23.7805	12.2970	26.1979	4.0730	4765	330	52.4	1.1	110.5	5.0	324.12	1.50	155.5	1.5	0.14016	5.43
F*	23.0907	11.8415	-5.2742	3.5126	4765	330	52.4	1.1	110.5	5.0	324.12	1.50	155.5	1.5	0.11978	4.64
G*	11.1713	12.2997	7.7422	3.6107	4765	330	52.4	1.1	110.5	5.0	324.12	1.50	155.5	1.5	0.12233	4.74
H*	-4.0534	12.1377	16.0960	3.6972	2077	350	76.0	1.3	110.1	5.7	327.33	1.60	151.4	1.8	0.11490	4.45
I*	12.5123	12.5891	-3.5872	3.4978	3766	360	67.4	1.2	103.3	6.7	323.40	1.60	155.4	1.9	0.07355	2.85
J*	23.4652	11.2860	2.0918	3.6801	3766	360	67.4	1.2	103.3	6.7	323.40	1.60	155.4	1.9	0.06053	2.34
K*	41.7240	13.0569	-11.1291	3.5131	3766	360	67.4	1.2	103.3	6.7	323.40	1.60	155.4	1.9	0.08621	3.34
L*	13.0413	11.7120	-2.8586	3.7194	3766	360	67.4	1.2	103.3	6.7	323.40	1.60	155.4	1.9	0.06052	2.34
M	-12.2346	12.5987	-3.5772	3.5986	2395	320	64.9	1.1	109.8	5.2	324.93	1.60	153.3	1.7	0.05163	2.00
N	20.4143	12.1583	6.9484	3.6007	2395	320	64.9	1.1	109.8	5.2	324.93	1.60	153.3	1.7	0.05551	2.15
O	-0.4641	11.2964	22.6247	3.8712	2395	320	64.9	1.1	109.8	5.2	324.93	1.60	153.3	1.7	0.05418	2.10
P	-8.1225	12.1582	2.0084	3.7196	2395	320	64.9	1.1	109.8	5.2	324.93	1.60	153.3	1.7	0.04657	1.80
Ms: S92C (3068-02)																
A	37.0463	17.7445	15.0230	3.7990	4864	360	64.4	1.3	109.0	4.3	429.42	2.00	154.9	1.8	0.00239	0.01
B	34.6869	17.7475	14.3253	3.9619	4864	360	64.4	1.3	109.0	4.3	429.42	2.00	154.9	1.8	0.01119	0.05
C	69.5226	16.7499	6.7390	3.9161	4864	360	64.4	1.3	109.0	4.3	429.42	2.00	154.9	1.8	0.05268	0.22
D	307.1718	406.5291	-5.5977	81.1797	4864	360	64.4	1.3	109.0	4.3	429.20	2.00	154.9	1.8	3.76191	15.96
E	70.7569	71.4820	-18.7189	14.6413	2859	340	74.2	1.4	105.3	8.5	432.40	1.90	151.2	1.8	0.82863	3.52
F	378.2173	71.5646	89.1105	18.1714	2859	340	74.2	1.4	105.3	8.5	432.40	1.90	151.2	1.8	1.62655	6.90
G*	440.3254	312.9572	-31.2282	77.8897	2859	340	74.2	1.4	105.3	8.5	432.40	1.90	151.2	1.8	5.12785	21.76
H*	29.0493	17.9661	11.2601	3.7409	2859	340	74.2	1.4	105.3	8.5	432.41	1.90	151.2	1.8	0.14852	0.63
I*	27.5720	17.4420	9.8524	3.9974	9480	310	121.4	2.1	103.0	6.3	431.84	1.90	148.1	2.2	0.27797	1.18
J	70.4679	16.4233	7.0623	3.8225	9480	310	121.4	2.1	103.0	6.3	431.84	1.90	148.1	2.2	0.30342	1.29
K	48.3883	17.4526	2.8772	3.7219	9480	310	121.4	2.1	103.0	6.3	431.84	1.90	148.1	2.2	0.11096	0.47
L	35.3154	15.9256	12.3058	3.7761	9480	310	121.4	2.1	103.0	6.3	431.84	1.90	148.1	2.2	0.07419	0.31
M	13.3586	15.7319	17.7983	3.6421	3465	370	53.5	1.1	148.2	13.0	430.27	1.70	139.8	1.7	0.05801	0.25
N	-20.2114	15.7282	9.9141	3.5100	3465	370	53.5	1.1	148.2	13.0	430.27	1.70	139.8	1.7	0.05579	0.24
O	3.3918	15.7360	5.7666	3.4017	3465	370	53.5	1.1	148.2	13.0	430.27	1.70	139.8	1.7	0.04864	0.21
P	-10.5167	17.3635	13.7749	3.7034	3465	370	53.5	1.1	148.2	13.0	430.27	1.70	139.8	1.7	0.20654	0.88
Q	25.8608	17.3010	-0.7846	3.3721	6600	330	52.9	1.2	106.5	8.6	428.14	2.00	147.8	1.6	0.03360	0.14
R	-10.1155	16.7976	0.9216	3.5520	6600	330	52.9	1.2	106.5	8.6	428.14	2.00	147.8	1.6	0.03456	0.15
S	1.0185	17.3031	-4.6330	3.3476	6600	330	52.9	1.2	106.5	8.6	428.14	2.00	147.8	1.6	0.17692	0.75
T	46.5223	17.3149	35.8430	3.9371	6600	330	52.9	1.2	106.5	8.6	428.14	2.00	147.8	1.6	0.20599	0.87
Ms: S92C (3068-03)																
A	-14.8554	24.8942	7.4889	4.7212	4904	350	37.7	0.9	75.8	5.6	375.60	1.70	113.3	1.8	0.00026	0.0
B	-37.4516	21.6980	119.3579	7.3047	4904	350	37.7	0.9	75.8	5.6	375.60	1.70	113.3	1.8	0.02033	0.3
C	51.0080	22.4808	77.2625	6.4957	4242	340	38.4	0.9	78.9	5.5	370.53	1.70	117.5	1.6	0.05989	1.0
D	32.5867	21.7105	41.1137	5.5867	4242	340	38.4	0.9	78.9	5.5	370.53	1.70	117.5	1.6	0.06711	1.1
E	93.0949	22.4898	136.4219	7.8972	4242	340	38.4	0.9	78.9	5.5	370.53	1.70	117.5	1.6	0.24886	4.3
F*	342.8520	90.4602	143.1524	24.5072	4242	340	38.4	0.9	78.9	5.5	370.50	1.70	117.5	1.6	1.73298	29.7
G*	38.8299	23.2959	5.2837	4.6212	6403	290	48.0	1.2	65.3	8.3	372.49	1.70	117.7	1.5	0.13453	2.3
H*	-36.1876	25.7768	-1.7735	4.4703	6403	290	48.0	1.2	65.3	8.3	372.49	1.70	117.7	1.5	0.15986	2.7
I*	20.5955	23.3047	4.7080	4.7217	6403	290	48.0	1.2	65.3	8.3	372.49	1.70	117.7	1.5	0.20224	3.5
J*	33.0411	22.5151	5.1570	4.7310	6403	290	48.0	1.2	65.3	8.3	372.49	1.70	117.7	1.5	0.18140	3.1
K*	47.7456	23.8465	19.2002	4.9550	4387	350	46.4	1.0	87.3	5.5	373.34	1.80	115.0	1.5	0.13116	2.2
L*	20.2042	23.0743	12.9817	4.7121	4387	350	46.4	1.0	87.3	5.5	373.34	1.80	115.0	1.5	0.13231	2.3
M*	30.8229	23.0790	4.0314	4.5771	4387	350	46.4	1.0	87.3	5.5	373.34	1.80	115.0	1.5	0.08499	1.5
N	36.7501	26.2917	15.2500	4.8729	4387	350	46.4	1.0	87.3	5.5	373.34	1.80	115.0	1.5	0.08475	1.5
O	101.3089	23.8702	21.8467	5.0474	4533	340	45.2	1.3	96.9	3.6	368.10	1.80	113.1	1.9	0.20089	3.4
P	417.7849	95.7223	88.8226	23.0224	4533	340	45.2	1.3	96.9	3.6	368.10	1.80	113.1	1.9	1.48795	25.5
Q	114.5320	23.1027	15.4799	4.9722	4533	340	45.2	1.3	96.9	3.6	368.10	1.80	113.1	1.9	0.26478	4.5
R	85.7378	23.1070	7.5956	4.8125	4533	340	45.2	1.3	96.9	3.6	368.10	1.80	113.1	1.9	0.13830	2.4
S	32.8166	23.3660	-2.9428	4.8034	4501	380	43.0	1.3	106.5	13.0	376.51	1.70	122.9	1.6	0.10025	1.7
T	-26.0747	23.3701	-6.4335	4.5582	4501	380	43.0	1.3	106.5	13.0	376.51	1.70	122.9	1.6	0.08494	1.5
U	-14.9321	24.1887	-3.5281	4.5703	4501	380	43.0	1.3	106.5	13.0	376.51	1.70	122.9	1.6	0.06998	1.2
V	37.3379	22.5835	-0.6233	4.6363	4501	380	43.0	1.3	106.5	13.0	376.51	1.70	122.9	1.6	0.04797	0.8
W	3.0701	23.9185	4.0876	4.8191	5772	360	43.6	1.2	55.5	7.9	372.93	1.80	121.1	1.8	0.16794	2.9
X	-1.2283	21.6472	-1.3333	4.8178	5772	360	43.6	1.2	55.5	7.9	372.93	1.80	121.1	1.8	0.03373	0.6
Ms: S131C (3283-01)																
A	69.1270	18.3379	36.6188	2.1614	11180	360	15.6	0.9	42.0	1.7	150.99	0.94	60.3	1.2	0.02549	1.00
B	-7.8471	17.2055	8.3190	1.9576	11180	360	15.6	0.9	42.0	1.7	150.99	0.94	60.3	1.2	0.02274	0.89
C*	155.6967	76.0995	121.4504	9.3201	11180	360	15.6	0.9	42.0	1.7	150.99	0.94	60.3	1.2	1.32389	52.04
D*	14.4286	17.1754	2.6094	2.0466	11180	360	15.6	0.9	42.0	1.7	150.99	0.94	60.3	1.2	0.08944	3.52
E*	-16.9270	18.2475	7.3486	1.9538	10248	360	19.0	1.0	37.3	4.3	152.46	1.10	56.9	1.2	0.05953	2.34
F*	0.3605	18.4356	21.6025	2.0526	10248	360	19.0	1.0	37.3	4.3	152.46	1.10	56.9	1.2	0.17965	7.06
G	25.8560	19.5643	15.9487	2.1480	10248	360	19.0	1.0	37.3	4.3	152.46	1.10	56.9	1.2	0.25245	9.92
H	-13.4810	19.7619	8.2815	2.0519	10248	360	19.0	1.0	37.3	4.3	152.46	1.10	56.9	1.2	0.24254	9.53
I	-9.0383	19.5160	1.4585	1.9342	10204	340	19.1	0.9	33.7	4.5	151.04	1.20	59.1	1.3	0.10136	3.98
J	32.1671	20.1665	1.8816	2.0202	10204	340	19.1	0.9	33.7	4.5	151.04	1.20	59.1	1.3	0.05439	2.14
K	-9.9966	19.9028	0.9876	2.2019	10204	340	19.1	0.9	33.7	4.5	151.04	1.20	59.1	1.3	0.02539	1.00
L	19.3854	18.9171	5.1133	2.0186	10204	340	19.1	0.9	33.7	4.5	151.04	1.20	59.1	1.3	0.02081	0.82
M	79.5427	18.1436	3.6659	1.8003	10481	360	17.6	0.8	26.1	3.5	148.08	1.10	59.6	1.1	0.01612	0.63
N	52.9329	19.0038	2.4551	1.8927	10481	360	17.6	0.8	26.1	3.5	148.08	1.10	59.6	1.1	0.01399	0.55
O	46.1826	18.1443	6.7883	1.9896	10481	360	17.6	0.8	26.1	3.5	148.08	1.10	59.6	1.1	0.07742	3.04
P	21.2811	19.1061	-3.0529	1.7972	10481	360	17.6	0.8	26.1	3.5	148.08	1.10	59.6	1.1	0.00016	0.01
Q	27.5986	19.5263	3.6135	1.8002	11762	370	17.3	0.8	40.5	4.2	148.93	1.20	56.8	1.1	0.01062	0.42
R	0.8393	19.3862	3.1787	1.8011	11762	370	17.3	0.8	40.5	4.2	148.93	1.20	56.8	1.1	0.00094	0.04
S	8.9858	19.3822	14.1428	1.9006	11762	370	17.3	0.8	40.5	4.2	148.93	1.20	56.8	1.1	0.00304	0.12
T	51.8387	20.4140	125.1002	2.5810	11762	370	17.3	0.8	40.5	4.2	148.93	1.20	56.8	1.1	0.02412	0.95
Ms: S131C (3283-02)																
A	27.5090	19.8615	14.7685	2.0229	10601	340	17.5	0.7	34.1	8.3	146.47	1.00	59.3	1.3	0.00226	0.21

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Ms: S92C (3068-01)															
E*	65.9	10.3	0.0253	0.0006	0.0003	0.0012	0.0006	0.0084	6.E-08	0.0122	0.0005	71.17	0.27	70.97	0.27
F*	-15.5	10.3	-0.1221	0.0007	0.0003	0.0013	0.0007	0.0041	7.E-08	0.0114	0.0005	71.10	0.27	71.15	0.27
G*	22.3	10.4	0.0403	0.0003	0.0004	0.0006	0.0007	0.0176	7.E-08	0.0137	0.0013	70.96	0.27	70.89	0.27
H*	49.4	11.3	-0.0070	-0.0001	0.0004	-0.0002	0.0007	0.0171	7.E-08	0.0137	0.0008	71.43	0.27	71.28	0.27
I*	-17.2	16.8	-0.0973	0.0006	0.0006	0.0012	0.0012	0.0073	1.E-07	0.0119	0.0007	71.34	0.27	71.39	0.28
J*	12.2	21.4	0.3130	0.0014	0.0007	0.0027	0.0013	0.0154	1.E-07	0.0133	0.0008	71.29	0.28	71.25	0.29
K*	-45.5	14.4	-0.1046	0.0017	0.0005	0.0033	0.0010	-0.0080	1.E-07	0.0093	0.0011	71.27	0.27	71.40	0.28
L*	-16.7	21.7	-0.1273	0.0008	0.0007	0.0015	0.0013	0.0067	1.E-07	0.0118	0.0008	71.32	0.28	71.37	0.28
M	-24.4	24.6	0.0954	-0.0008	0.0009	-0.0016	0.0017	0.0066	2.E-07	0.0118	0.0008	71.56	0.28	71.63	0.29
N	44.1	22.9	0.0820	0.0013	0.0008	0.0025	0.0015	0.0243	2.E-07	0.0149	0.0009	71.14	0.28	71.01	0.29
O	147.2	25.2	-0.0006	0.0000	0.0007	-0.0001	0.0014	0.0093	1.E-07	0.0125	0.0009	71.60	0.28	71.16	0.29
P	15.2	28.2	-0.1128	-0.0006	0.0009	-0.0012	0.0018	0.0116	2.E-07	0.0127	0.0007	71.05	0.28	71.00	0.29
Ms: S92C (3068-02)															
A	2212.7	559.7	0.0688	0.0546	0.0261	0.1069	0.0512	-0.0463	5.E-06	0.0071	0.0163	114.03	1.17	107.43	2.03
B	451.4	124.8	0.0676	0.0109	0.0056	0.0214	0.0110	-0.0327	1.E-06	0.0060	0.0035	77.01	0.42	75.66	0.56
C	45.1	26.2	0.2878	0.0047	0.0011	0.0091	0.0022	0.0156	2.E-07	0.0134	0.0009	68.60	0.30	68.46	0.31
D	-0.5	7.6	-1.5310	0.0003	0.0004	0.0006	0.0007	0.0064	8.E-08	0.0118	0.0007	70.78	0.29	70.78	0.29
E	-8.0	6.2	-0.1055	0.0003	0.0003	0.0006	0.0006	0.0115	6.E-08	0.0126	0.0003	70.78	0.29	70.80	0.29
F	19.3	3.9	0.1184	0.0008	0.0002	0.0016	0.0003	0.0076	3.E-08	0.0120	0.0002	69.77	0.29	69.71	0.29
G*	-2.2	5.4	-0.3934	0.0003	0.0002	0.0006	0.0004	0.0097	4.E-08	0.0123	0.0003	70.22	0.29	70.22	0.29
H*	26.7	8.9	0.0720	0.0007	0.0004	0.0014	0.0008	0.0060	9.E-08	0.0118	0.0005	70.86	0.29	70.78	0.29
I*	12.5	5.1	0.0781	0.0003	0.0002	0.0007	0.0004	0.0102	4.E-08	0.0124	0.0003	71.03	0.29	70.99	0.29
J	8.2	4.4	0.2784	0.0008	0.0002	0.0016	0.0004	0.0082	4.E-08	0.0121	0.0001	71.45	0.29	71.42	0.29
K	9.1	11.8	0.4692	0.0015	0.0006	0.0030	0.0011	0.0019	1.E-07	0.0110	0.0003	73.79	0.31	73.76	0.31
L	58.5	18.0	0.0801	0.0017	0.0008	0.0033	0.0015	0.0122	2.E-07	0.0129	0.0007	74.94	0.31	74.77	0.32
M	108.2	22.1	0.0209	0.0008	0.0010	0.0016	0.0019	-0.0051	2.E-07	0.0101	0.0010	72.95	0.31	72.62	0.32
N	62.7	22.2	-0.0569	-0.0013	0.0010	-0.0025	0.0019	-0.0112	2.E-07	0.0089	0.0013	71.96	0.31	71.77	0.32
O	41.8	24.7	0.0164	0.0002	0.0011	0.0005	0.0022	-0.0155	2.E-07	0.0082	0.0013	71.60	0.31	71.47	0.32
P	23.5	6.3	-0.0213	-0.0002	0.0003	-0.0004	0.0006	0.0013	6.E-08	0.0110	0.0004	71.51	0.29	71.43	0.29
Q	-8.2	35.4	-0.9196	0.0027	0.0018	0.0053	0.0036	-0.0025	4.E-07	0.0103	0.0012	71.15	0.32	71.17	0.33
R	9.4	36.2	-0.3062	-0.0010	0.0017	-0.0020	0.0034	0.0096	3.E-07	0.0123	0.0015	71.10	0.31	71.07	0.33
S	-9.2	6.7	-0.0061	0.0000	0.0003	0.0000	0.0007	0.0064	7.E-08	0.0118	0.0003	71.58	0.29	71.60	0.29
T	61.4	6.7	0.0362	0.0008	0.0003	0.0016	0.0006	0.0164	6.E-08	0.0136	0.0006	71.30	0.29	71.11	0.29
Ms: S92C (3068-03)															
A	10120.4	6386.7	- 0.1	-0.2008	0.3365	-0.3935	0.6595	1.7483	7.E-05	0.3246	0.1168	86.68	7.32	56.4552	20.3180
B	2070.2	126.8	0.0	-0.0065	0.0038	-0.0127	0.0074	0.0396	8.E-07	0.0213	0.0022	78.97	0.20	72.7840	0.4242
C	454.9	38.2	0.0	0.0030	0.0013	0.0059	0.0026	0.0033	3.E-07	0.0121	0.0009	68.96	0.11	67.6009	0.1551
D	216.0	29.4	0.0	0.0017	0.0011	0.0034	0.0022	0.0079	2.E-07	0.0124	0.0007	69.49	0.10	68.8460	0.1343
E	193.3	11.2	0.0	0.0013	0.0003	0.0026	0.0006	0.0073	6.E-08	0.0123	0.0004	70.20	0.07	69.6188	0.0813
F*	29.1	5.0	0.1	0.0007	0.0002	0.0014	0.0004	0.0012	4.E-08	0.0110	0.0005	69.32	0.07	69.2330	0.0722
G*	13.9	12.1	0.2	0.0010	0.0006	0.0020	0.0012	0.0055	1.E-07	0.0117	0.0004	69.46	0.09	69.4159	0.0954
H*	-3.9	9.9	0.6	-0.0008	0.0006	-0.0016	0.0011	0.0120	1.E-07	0.0127	0.0005	69.32	0.08	69.3266	0.0845
I*	8.2	8.2	0.1	0.0004	0.0004	0.0007	0.0008	0.0079	8.E-08	0.0121	0.0003	69.26	0.07	69.2370	0.0768
J*	10.0	9.2	0.2	0.0006	0.0004	0.0013	0.0009	0.0095	9.E-08	0.0123	0.0004	69.20	0.08	69.1722	0.0816
K*	51.6	13.3	0.1	0.0013	0.0006	0.0025	0.0013	0.0085	1.E-07	0.0122	0.0005	69.29	0.08	69.1299	0.0898
L*	34.6	12.6	0.0	0.0005	0.0006	0.0011	0.0012	0.0094	1.E-07	0.0123	0.0006	69.26	0.08	69.1496	0.0883
M*	16.7	19.0	0.2	0.0013	0.0010	0.0025	0.0019	0.0042	2.E-07	0.0114	0.0006	69.30	0.10	69.2450	0.1107
N	63.4	20.3	0.1	0.0015	0.0011	0.0030	0.0021	-0.0083	2.E-07	0.0094	0.0009	68.99	0.10	68.8000	0.1149
O	38.3	8.9	0.1	0.0018	0.0004	0.0035	0.0008	0.0064	8.E-08	0.0119	0.0003	69.47	0.08	69.3545	0.0815
P	21.1	5.5	0.1	0.0010	0.0002	0.0019	0.0004	0.0062	5.E-08	0.0118	0.0003	69.46	0.07	69.3953	0.0749
Q	20.6	6.6	0.2	0.0015	0.0003	0.0030	0.0006	0.0043	6.E-08	0.0115	0.0002	69.71	0.07	69.6419	0.0729
R	19.4	12.3	0.3	0.0022	0.0006	0.0043	0.0012	0.0049	1.E-07	0.0116	0.0006	70.27	0.08	70.2076	0.0912
S	-10.4	16.9	- 0.3	0.0012	0.0008	0.0023	0.0016	0.0049	2.E-07	0.0115	0.0006	70.57	0.10	70.5972	0.1093
T	-26.7	18.9	0.1	-0.0011	0.0010	-0.0021	0.0019	-0.0018	2.E-07	0.0103	0.0008	70.41	0.10	70.4819	0.1119
U	-17.8	23.0	0.1	-0.0008	0.0012	-0.0015	0.0024	-0.0057	2.E-07	0.0097	0.0008	70.21	0.10	70.2628	0.1212
V	-4.6	34.1	- 1.7	0.0027	0.0017	0.0054	0.0033	0.0101	3.E-07	0.0124	0.0014	70.73	0.13	70.7452	0.1625
W	8.6	10.1	0.0	0.0001	0.0005	0.0001	0.0010	0.0127	1.E-07	0.0129	0.0004	70.92	0.08	70.8870	0.0876
X	-13.9	50.4	0.0	-0.0001	0.0023	-0.0003	0.0044	0.0280	5.E-07	0.0154	0.0014	74.84	0.14	74.8755	0.2087
Ms: S131C (3283-01)															
A	506.5	29.9	0.0527	0.0096	0.0025	0.0187	0.0050	0.0387	5.E-07	0.0182	0.0021	67.47	0.16	65.95	0.18
B	129.0	30.4	-0.0263	-0.0012	0.0027	-0.0024	0.0052	0.0060	5.E-07	0.0120	0.0014	73.43	0.18	73.04	0.20
C*	32.3	2.5	0.0358	0.0004	0.0002	0.0008	0.0004	0.0009	4.E-08	0.0109	0.0006	71.52	0.06	71.42	0.06
D*	10.3	8.1	0.1543	0.0006	0.0007	0.0011	0.0013	0.0107	1.E-07	0.0125	0.0006	71.47	0.09	71.44	0.09
E*	43.5	11.6	-0.0643	-0.0010	0.0011	-0.0020	0.0021	0.0070	2.E-07	0.0120	0.0008	71.82	0.11	71.68	0.12
F*	42.4	4.0	0.0005	0.0000	0.0004	0.0000	0.0007	0.0089	7.E-08	0.0123	0.0005	71.49	0.07	71.36	0.07
G	22.3	3.0	0.0452	0.0004	0.0003	0.0007	0.0005	0.0064	5.E-08	0.0118	0.0003	71.29	0.06	71.22	0.06
H	12.0	3.0	-0.0454	-0.0002	0.0003	-0.0004	0.0006	0.0061	6.E-08	0.0117	0.0003	71.04	0.06	71.00	0.06
I	5.1	6.7	-0.1729	-0.0003	0.0007	-0.0006	0.0013	0.0058	1.E-07	0.0117	0.0007	71.61	0.09	71.60	0.09
J	12.2	13.1	0.4770	0.0021	0.0013	0.0041	0.0026	0.0144	3.E-07	0.0132	0.0007	71.94	0.12	71.90	0.13
K	13.7	30.6	-0.2824	-0.0014	0.0028	-0.0027	0.0054	0.0164	6.E-07	0.0135	0.0014	71.88	0.18	71.84	0.20
L	86.6	34.2	0.1058	0.0033	0.0032	0.0064	0.0063	0.0276	6.E-07	0.0155	0.0015	72.06	0.18	71.80	0.21
M	80.2	39.4	0.6054	0.0174	0.0040	0.0341	0.0078	-0.0029	8.E-07	0.0104	0.0034	71.56	0.22	71.32	0.25
N	61.9	47.7	0.6015	0.0133	0.0048	0.0261	0.0094	0.0420	1.E-06	0.0179	0.0019	72.45	0.24	72.26	0.28
O	30.9	9.1	0.1898	0.0021	0.0008	0.0041	0.0016	0.0107	2.E-07	0.0126	0.0004	72.19	0.11	72.09	0.11
P	-6788.9	4007.3	-0.1945	0.4732	0.4254	0.9275	0.8337	1.5614	9.E-05	0.2612	0.1391	55.61	11.79	75.96	16.93
Q	120.0	59.8	0.2131	0.0092	0.0065	0.0180	0.0127	0.0094	1.E-06	0.0125	0.0025	71.59	0.31	71.23	0.35
R	1187.8	673.2	0.0074	0.0031	0.0724	0.0061	0.1420	-0.0271	1.E-05	0.0084	0.0193	48.14	2.05	44.59	2.86
S	1640.9	220.7	0.0177	0.0104	0.0225	0.0204	0.0441	0.0497	5.E-06	0.0222	0.0071	57.97	0.69	53.07	0.94
T	1828.9	38.0	0.0116	0.0076	0.0030	0.0149	0.0058	-0.0043	6.E-07	0.0134	0.0013	73.43	0.19	67.97	0.21
Ms: S131C (3283-02)															
A	2303.4	315.9	0.0520	0.0429	0.0310	0.0841	0.0607	0.2926	6.E-06	0.0644	0.0158	24.92	0.80	18.04	1.23

Sample No.[a]	Derived Results				Inverse Isochron Data				
	%^{40}Ar*	Age (Ma)		w/±J	^{36}Ar/^{40}Ar		^{39}Ar/^{40}Ar		^{36}Ar/^{39}Ar
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Ms: S92C (3068-01)									
E*	99.72	1692	4	5	0.00001	15.56224	0.01405	0.37417	0.02279
F*	100.07	1695	4	5	0.00000	-66.46542	0.01406	0.37615	0.00532
G*	99.91	1691	4	5	0.00000	46.77703	0.01409	0.37395	0.00760
H*	99.79	1697	4	5	0.00001	22.99711	0.01400	0.37579	0.01534
I*	100.07	1699	4	5	0.00000	-97.28358	0.01402	0.38167	0.00360
J*	99.95	1697	4	5	0.00000	177.21110	0.01403	0.39021	0.00195
K*	100.19	1699	4	5	-0.00001	-31.55433	0.01403	0.38108	0.01110
L*	100.07	1698	4	5	0.00000	-129.78400	0.01402	0.38752	0.00268
M	100.10	1702	4	5	0.00000	-100.61130	0.01397	0.39311	0.00343
N	99.82	1693	4	5	0.00001	51.95771	0.01406	0.39189	0.00663
O	99.39	1695	4	5	0.00002	17.11849	0.01397	0.39076	0.02025
P	99.94	1693	5	5	0.00000	185.45630	0.01408	0.39570	0.00185
Ms: S92C (3068-02)									
A	94.21	2183	24	24	0.00019	25.31762	0.00877	1.02985	0.02489
B	98.25	1763	8	9	0.00006	27.67353	0.01299	0.53968	0.01422
C	99.80	1653	5	5	0.00001	58.35248	0.01458	0.43216	0.00668
D	100.00	1689	5	5	0.00000	-1370.79400	0.01413	0.41271	0.00029
E	100.03	1690	5	5	0.00000	-77.74939	0.01413	0.41239	0.00511
F	99.92	1673	4	5	0.00000	20.44909	0.01433	0.40873	0.01956
G*	100.01	1681	4	5	0.00000	-244.61200	0.01424	0.41021	0.00163
H*	99.89	1689	5	5	0.00000	33.27620	0.01411	0.41190	0.01194
I*	99.95	1693	4	5	0.00000	40.72376	0.01408	0.40843	0.00981
J	99.97	1699	4	5	0.00000	54.46927	0.01400	0.40801	0.00733
K	99.96	1735	5	5	0.00000	130.06980	0.01355	0.41520	0.00303
L	99.77	1750	5	5	0.00001	30.73658	0.01334	0.41891	0.01282
M	99.56	1718	5	5	0.00001	20.46914	0.01371	0.42641	0.01889
N	99.74	1705	5	5	0.00001	35.36588	0.01390	0.43047	0.01082
O	99.83	1700	5	5	0.00001	58.92760	0.01397	0.42901	0.00654
P	99.90	1699	4	5	0.00000	26.88874	0.01399	0.40751	0.01475
Q	100.03	1695	5	6	0.00000	-426.31910	0.01406	0.44611	0.00089
R	99.96	1694	5	6	0.00000	385.61130	0.01406	0.43919	0.00100
S	100.04	1702	5	5	0.00000	-72.08195	0.01397	0.41016	0.00546
T	99.74	1694	4	5	0.00001	11.00636	0.01403	0.40556	0.03609
Ms: S92C (3068-03)									
A	65.1	1452	359	359	0.00117	63.55568	0.01154	8.44279	0.11775
B	92.2	1720	6	7	0.00026	6.12195	0.01266	0.25678	0.01320
C	98.0	1639	2	3	0.00007	8.41006	0.01450	0.15390	0.00740
D	99.1	1659	2	3	0.00003	13.59447	0.01439	0.14727	0.00450
E	99.2	1671	1	3	0.00003	5.79176	0.01425	0.10581	0.01226
F*	99.9	1665	1	3	0.00000	17.13517	0.01443	0.10182	0.00422
G*	99.9	1668	1	3	0.00000	87.79159	0.01440	0.12706	0.00068
H*	100.0	1667	1	3	0.00000	-250.26760	0.01443	0.11413	0.00026
I*	100.0	1665	1	3	0.00000	100.82770	0.01444	0.10494	0.00068
J*	100.0	1664	1	3	0.00000	92.27704	0.01445	0.11093	0.00071
K*	99.8	1663	1	3	0.00001	25.84437	0.01443	0.11625	0.00248
L*	99.9	1664	1	3	0.00000	36.35698	0.01444	0.11552	0.00176
M*	99.9	1665	2	3	0.00000	113.90560	0.01443	0.13718	0.00050
N	99.7	1658	2	3	0.00001	31.95915	0.01450	0.14172	0.00176
O	99.8	1667	1	3	0.00001	23.15145	0.01440	0.11091	0.00272
P	99.9	1668	1	3	0.00000	25.98706	0.01440	0.10522	0.00249
Q	99.9	1672	1	3	0.00000	32.21682	0.01435	0.10070	0.00212
R	99.9	1680	1	3	0.00000	63.62971	0.01423	0.11881	0.00094
S	100.0	1686	2	3	0.00000	-162.40280	0.01417	0.13738	0.00034
T	100.1	1685	2	3	0.00000	-70.95440	0.01420	0.13700	0.00080
U	100.1	1681	2	3	0.00000	-129.87760	0.01424	0.14207	0.00046
V	100.0	1689	3	3	0.00000	-725.10760	0.01414	0.17902	0.00008
W	100.0	1691	1	3	0.00000	118.66220	0.01410	0.11597	0.00052
X	100.1	1752	3	4	0.00000	-358.41610	0.01336	0.19342	0.00018
Ms: S131C (3283-01)									
A	97.76	1613	3	4	0.00008	5.90956	0.01482	0.23247	0.01249
B	99.48	1724	3	4	0.00002	23.53242	0.01362	0.25072	0.00280
C*	99.87	1700	1	3	0.00000	7.67865	0.01398	0.08969	0.00639
D*	99.96	1700	1	3	0.00000	78.94586	0.01399	0.12398	0.00056
E*	99.82	1704	2	4	0.00001	26.59201	0.01393	0.15354	0.00135
F*	99.82	1699	1	3	0.00001	9.51167	0.01399	0.09644	0.00414
G	99.91	1697	1	3	0.00000	13.49345	0.01403	0.08853	0.00301
H	99.95	1693	1	3	0.00000	24.82658	0.01408	0.08516	0.00170
I	99.98	1702	1	3	0.00000	133.11030	0.01396	0.12126	0.00028
J	99.95	1707	2	4	0.00000	108.49490	0.01390	0.16887	0.00038
K	99.94	1706	3	4	0.00000	223.59120	0.01391	0.24371	0.00028
L	99.64	1705	3	4	0.00001	39.58077	0.01388	0.25447	0.00189
M	99.67	1698	4	5	0.00001	49.40235	0.01398	0.30915	0.00212
N	99.75	1713	4	5	0.00001	77.81445	0.01380	0.33446	0.00168
O	99.87	1710	2	3	0.00000	29.41465	0.01385	0.15456	0.00175
P	136.56	1768	251	251	-0.00122	-62.25675	0.01798	21.19738	0.32643
Q	99.50	1697	5	6	0.00002	49.94707	0.01397	0.42704	0.00352
R	92.63	1230	57	57	0.00025	56.80971	0.02078	4.25053	0.06914
S	91.55	1392	17	17	0.00028	13.48402	0.01725	1.18464	0.06796
T	92.56	1646	3	4	0.00025	2.06714	0.01362	0.25345	0.02908
Ms: S131C (3283-02)									
A	72.43	601	35	35	0.00092	14.06560	0.04014	3.19637	0.21761

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Ms: S131C (3283-02)										
B	68c	0.20	21.919	0.060	102658	557	1643.32	7.09	37.9039	11.7439
C	68c	0.25	21.919	0.060	191112	518	2506.53	8.60	53.4758	9.1716
D	68c	0.25	21.919	0.060	124014	547	1611.37	6.97	35.3232	8.7108
E	68c	0.30	21.919	0.060	2395821	2130	32997.28	31.51	428.7380	16.6805
F	68c	0.30	21.919	0.060	3791995	3084	53077.61	39.07	551.7273	31.6113
G*	68c	0.35	21.919	0.060	7576242	5705	106389.60	56.70	1219.9230	23.3338
H*	68c	0.37	21.919	0.060	1153387	975	16203.96	21.43	194.2274	14.4641
I*	68c	0.40	21.919	0.060	2793917	2022	39225.19	36.55	462.0974	21.0487
J	68c	0.45	21.919	0.060	1234037	1020	17181.50	20.18	202.6365	10.5652
K	68c	0.50	21.919	0.060	581003	700	8005.01	15.15	109.8721	9.7516
L	68c	0.55	21.919	0.060	194936	711	2682.86	13.89	14.3257	11.1526
M	68c	0.65	21.919	0.060	233073	549	3195.64	10.12	60.1980	12.3398
N	68c	0.90	21.919	0.060	198154	547	2727.28	8.86	28.6891	7.8113
O	68c	1.50	21.919	0.060	108456	535	1452.27	6.86	27.0274	9.0096
P	68c	7.00	21.919	0.060	1242601	1086	17129.92	25.21	216.7104	13.2331
Ms: Z58B (3288-01)										
A	68c	0.20	21.487	0.060	407876	583	5029.43	11.38	111.5842	10.6450
B*	68c	0.25	21.487	0.060	763767	743	10381.22	17.66	112.9563	18.1648
C*	68c	0.30	21.487	0.060	1504594	1138	20781.39	25.22	257.2957	10.6450
D*	68c	0.35	21.487	0.060	7550088	5294	105275.50	57.96	1308.1050	21.8480
E*	68c	0.40	21.487	0.060	37274900	29373	521403.10	263.47	6479.2670	110.2397
F	68c	0.45	21.487	0.060	9546922	7423	134418.00	89.46	1644.7210	27.8566
G	68c	0.50	21.487	0.060	9900883	6477	139399.60	98.28	1742.2810	25.3550
H	68c	0.55	21.487	0.060	4093832	2565	57696.59	42.85	697.1870	17.8774
I	68c	0.60	21.487	0.060	5892277	3687	82617.02	52.93	1009.6830	14.6533
J	68c	0.70	21.487	0.060	2991943	2031	41844.94	35.30	515.9634	19.1533
K	68c	0.80	21.487	0.060	2291561	1696	31973.92	30.26	408.9615	14.6533
L	68c	0.90	21.487	0.060	941881	900	13067.69	20.19	168.9624	10.6442
M	68c	1.00	21.487	0.060	665733	763	9227.51	16.40	101.4882	8.6918
N	68c	1.20	21.487	0.060	450619	670	6240.43	13.89	127.9240	20.2507
O	68c	1.50	21.487	0.060	337452	592	4699.01	11.12	64.5159	5.8061
P	68c	1.70	21.487	0.060	2842267	1853	39494.10	34.03	419.0952	31.5412
Q	68c	2.00	21.487	0.060	314859	519	4347.53	12.25	-36.9975	14.2781
R	68c	3.00	21.487	0.060	3341288	2046	46292.53	36.55	507.1138	21.4579
S	68c	5.00	21.487	0.060	957599	792	13253.03	21.44	111.7100	11.3153
T	68c	7.00	21.487	0.060	64628	538	893.33	5.11	-34.2532	10.1340
U	68c	8.00	21.487	0.060	584129	648	8060.15	15.14	80.4529	12.8271
Ms: Z58B (3288-02)										
A	68c	0.20	21.487	0.060	111796	550	1504.58	6.48	18.4043	6.8775
B	68c	0.25	21.487	0.060	1023354	848	13743.81	20.18	171.9710	11.2706
C*	68c	0.30	21.487	0.060	6209578	4139	84776.74	47.88	1068.2820	14.3860
D*	68c	0.35	21.487	0.060	159359700	254313	2208797.00	8939.71	27736.6600	476.3926
E*	68c	0.35	21.487	0.060	5177616	3293	72089.41	45.36	864.1730	24.1585
F*	68c	0.40	21.487	0.060	3026977	1902	42092.25	39.07	505.7794	14.2586
G*	68c	0.45	21.487	0.060	5258164	3187	73338.12	50.40	877.6427	22.9129
H*	68c	0.50	21.487	0.060	2831916	1909	39405.27	37.81	481.9116	17.9120
I*	68c	0.55	21.487	0.060	1511035	1177	20992.00	23.96	271.7976	8.4354
J	68c	0.60	21.487	0.060	1074365	967	14891.88	20.19	196.4052	14.2123
K	68c	0.70	21.487	0.060	1033596	988	14266.20	20.19	171.0898	8.0872
L	68c	0.80	21.487	0.060	1502895	1368	20750.78	23.95	260.7323	12.1012
M	68c	0.90	21.487	0.060	27469940	20878	378660.80	251.22	4632.3950	85.7990
N	68c	1.10	21.487	0.060	3243	534	36.41	1.81	2.3163	5.5171
O	68c	1.50	21.487	0.060	6186	514	83.90	2.40	-2.6310	5.0914
P	68c	2.00	21.487	0.060	7058	513	72.71	2.22	-19.3611	8.0212
Q	68c	3.00	21.487	0.060	26945	535	334.76	3.77	5.7403	4.7454
R	68c	5.00	21.487	0.060	185474	549	2505.15	8.62	19.4618	5.0605
S	68c	7.00	21.487	0.060	638691	767	8707.62	17.66	88.8116	6.1620
Phl: F1A (3273-01)										
A	68b	0.10	21.225	0.060	27056	570	411.25	3.14	9.8945	5.8719
B	68b	0.20	21.225	0.060	113683	549	1527.85	6.86	23.0117	5.2204
C	68b	0.25	21.225	0.060	132646	558	1694.31	6.86	13.8473	6.7741
D	68b	0.30	21.225	0.060	202828	583	2649.53	8.61	37.1737	5.6518
E	68b	0.35	21.225	0.060	791714	790	10365.73	16.40	124.8524	12.0702
F	68b	0.40	21.225	0.060	1010507	886	13560.76	20.18	152.4211	10.6292
G	68b	0.45	21.225	0.060	2098316	1485	28716.50	31.51	355.1332	10.0349
H	68b	0.50	21.225	0.060	2413943	1660	33236.92	31.51	397.5437	10.1534
I	68b	0.55	21.225	0.060	2687113	1890	36963.09	32.77	481.7858	19.8436
J	68b	0.60	21.225	0.060	2025562	1542	28136.18	31.51	329.0499	12.7567
K	68b	0.70	21.225	0.060	39434210	30129	551899.30	263.47	6824.4960	85.9271
L*	68b	0.80	21.225	0.060	116979900	101195	1646152.00	983.33	20109.8100	625.2791
M*	68b	0.90	21.225	0.060	45788140	38706	645618.00	300.23	7228.4360	306.1397
N*	68b	1.00	21.225	0.060	29812030	23114	420414.20	245.09	5123.0250	122.5223
O	68b	1.10	21.225	0.060	275347	541	3902.91	10.63	38.0927	8.0975
P	68b	1.20	21.225	0.060	2188791	1545	30887.65	26.48	379.4667	11.1055
Q	68b	1.50	21.225	0.060	102533	545	1580.99	6.77	6.9866	7.1729
R	68b	1.70	21.225	0.060	105171	511	1634.99	6.89	5.6648	6.7822
S	68b	2.00	21.225	0.060	98930	545	1387.95	6.77	1.9260	5.7985
T	68b	3.00	21.225	0.060	159281	532	2239.51	8.26	29.6584	8.3100
U	68b	5.00	21.225	0.060	230327	573	3001.66	9.12	50.4798	8.0907
Phl: F30A (3077-01)										
A	64b	0.20	21.485	0.047	63233	596	1084.06	5.63	65.2586	7.3122

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Ms: S131C (3283-02)																
B	43.0055	18.8962	3.8299	1.9276	10601	340	17.5	0.7	34.1	8.3	146.47	1.00	59.3	1.3	0.00579	0.54
C	40.2824	19.0340	0.5744	2.0122	10601	340	17.5	0.7	34.1	8.3	146.47	1.00	59.3	1.3	0.00884	0.82
D	12.6019	19.3149	-2.0765	2.0118	10601	340	17.5	0.7	34.1	8.3	146.47	1.00	59.3	1.3	0.00568	0.53
E	121.0730	21.3713	22.3347	2.0937	9730	360	16.2	0.8	62.6	9.3	144.70	1.10	61.1	1.1	0.11634	10.76
F	81.2897	20.9308	1.7048	2.0873	9730	360	16.2	0.8	62.6	9.3	144.70	1.10	61.1	1.1	0.18713	17.31
G*	294.6846	20.9809	5.9031	2.0886	9730	360	16.2	0.8	62.6	9.3	144.70	1.10	61.1	1.1	0.37509	34.69
H*	133.4985	20.4217	1.9994	1.8002	9730	360	16.2	0.8	62.6	9.3	144.70	1.10	61.1	1.1	0.05713	5.28
I*	55.3830	20.0963	2.5879	1.9915	9730	360	16.2	0.8	62.6	9.3	144.70	1.10	61.1	1.1	0.13829	12.79
J	-48.6789	19.7407	-0.4942	2.0520	9846	360	18.1	0.9	46.6	3.9	147.88	1.10	62.2	1.2	0.06058	5.60
K	2.7739	20.6837	2.1891	1.9629	9846	360	18.1	0.9	46.6	3.9	147.88	1.10	62.2	1.2	0.02822	2.61
L	-40.3407	21.6366	-1.4950	2.7620	9846	360	18.1	0.9	46.6	3.9	147.88	1.10	62.2	1.2	0.00946	0.87
M	-27.8556	18.6981	0.0942	1.9692	9846	360	18.1	0.9	46.6	3.9	147.88	1.10	62.2	1.2	0.01127	1.04
N	26.7131	18.5098	-0.2945	1.8786	8709	360	17.9	0.9	47.6	5.1	145.84	1.20	58.9	1.2	0.00962	0.89
O	-16.6333	20.2472	-4.0644	1.9639	8709	360	17.9	0.9	47.6	5.1	145.84	1.20	58.9	1.2	0.00512	0.47
P	-11.8454	21.2029	9.6729	2.2554	8709	360	17.9	0.9	47.6	5.1	145.84	1.20	58.9	1.2	0.06039	5.59
Ms: Z58B (3288-01)																
A	50.3029	19.5310	247.6496	3.2494	10345	370	16.0	0.9	37.4	4.4	151.39	1.10	57.7	1.3	0.01773	0.39
B*	25.9748	18.8527	63.6554	2.4186	10345	370	16.0	0.9	37.4	4.4	151.39	1.10	57.7	1.3	0.03660	0.80
C*	40.6745	19.1784	63.8562	2.4246	10345	370	16.0	0.9	37.4	4.4	151.39	1.10	57.7	1.3	0.07327	1.60
D*	95.1715	20.5023	123.0517	2.7792	10345	370	16.0	0.9	37.4	4.4	151.39	1.10	57.7	1.3	0.37116	8.12
E*	270.0445	84.6546	332.2272	9.5595	12716	340	18.6	0.9	38.1	3.0	149.41	1.20	59.8	1.2	1.83828	40.22
F	109.8537	20.6570	65.4168	2.5740	12716	340	18.6	0.9	38.1	3.0	149.41	1.20	59.8	1.2	0.47391	10.37
G	103.7589	20.3365	62.6736	2.5665	12716	340	18.6	0.9	38.1	3.0	149.41	1.20	59.8	1.2	0.49147	10.75
H	33.4304	19.1476	19.8052	2.1461	12716	340	18.6	0.9	38.1	3.0	149.41	1.20	59.8	1.2	0.20342	4.45
I	13.9677	20.6307	19.7560	2.2973	10600	340	22.5	1.2	34.0	7.5	153.37	1.20	61.0	1.3	0.29128	6.37
J	-17.6677	18.8208	6.4484	2.0167	10600	340	22.5	1.2	34.0	7.5	153.37	1.20	61.0	1.3	0.14753	3.23
K	5.3717	19.7252	1.8373	1.9295	10600	340	22.5	1.2	34.0	7.5	153.37	1.20	61.0	1.3	0.11273	2.47
L	-5.9682	19.8030	-4.0136	2.1054	10600	340	22.5	1.2	34.0	7.5	153.37	1.20	61.0	1.3	0.04607	1.01
M	-17.9019	19.7603	-0.3278	1.7421	10129	410	17.3	0.9	43.1	2.1	153.36	1.20	58.9	1.0	0.03253	0.71
N	-26.9715	20.4831	1.2062	1.8365	10129	410	17.3	0.9	43.1	2.1	153.36	1.20	58.9	1.0	0.02200	0.48
O	-22.0779	19.4842	-1.0778	1.6448	10129	410	17.3	0.9	43.1	2.1	153.36	1.20	58.9	1.0	0.01657	0.36
P	-2.0287	19.4265	1.8281	1.7382	10129	410	17.3	0.9	43.1	2.1	153.36	1.20	58.9	1.0	0.13924	3.05
Q	31.2646	19.3715	1.1139	1.7063	9416	340	17.9	0.9	74.8	7.4	147.82	1.20	57.1	1.1	0.01533	0.34
R	79.9492	19.4608	2.7682	1.8913	9416	340	17.9	0.9	74.8	7.4	147.82	1.20	57.1	1.1	0.16321	3.57
S	21.4783	18.6377	1.2555	1.8923	9416	340	17.9	0.9	74.8	7.4	147.82	1.20	57.1	1.1	0.04673	1.02
T	31.0234	19.6332	-2.0070	1.8931	9416	340	17.9	0.9	74.8	7.4	147.82	1.20	57.1	1.1	0.00315	0.07
U	-21.5915	18.8136	-1.0560	1.9891	11431	320	20.9	0.8	47.1	4.3	150.97	1.10	55.7	1.1	0.02842	0.62
Ms: Z58B (3288-02)																
A	-5.7221	19.1724	-2.5345	1.8557	8739	330	17.8	0.9	38.1	3.9	144.78	1.10	57.9	1.2	0.00530	0.05
B	59.2568	20.3668	16.9594	2.0466	8739	330	17.8	0.9	38.1	3.9	144.78	1.10	57.9	1.2	0.04846	0.46
C*	140.9059	20.7823	173.3013	3.0589	8739	330	17.8	0.9	38.1	3.9	144.78	1.10	57.9	1.2	0.29889	2.83
D*	1700.3390	436.9704	-114.9448	39.0867	9824	320	18.9	0.8	42.8	3.4	147.30	1.20	60.9	1.3	7.78743	73.70
E*	100.8623	20.2523	24.0327	2.2964	9824	320	18.9	0.8	42.8	3.4	147.30	1.20	60.9	1.3	0.25416	2.41
F*	123.7222	20.9666	15.1076	2.1042	9824	320	18.9	0.8	42.8	3.4	147.30	1.20	60.9	1.3	0.14840	1.40
G*	160.1978	21.8093	12.9235	2.1015	9824	320	18.9	0.8	42.8	3.4	147.30	1.20	60.9	1.3	0.25856	2.45
H*	126.6928	18.6378	0.4324	2.0373	11418	340	19.9	1.1	40.3	3.2	145.92	0.99	65.1	1.2	0.13893	1.31
I*	33.6509	19.5366	-3.6932	2.0363	11418	340	19.9	1.1	40.3	3.2	145.92	0.99	65.1	1.2	0.07401	0.70
J	34.0300	19.6916	-4.5350	1.9438	11418	340	19.9	1.1	40.3	3.2	145.92	0.99	65.1	1.2	0.05250	0.50
K	17.6669	18.9568	-2.0455	1.9452	11418	340	19.9	1.1	40.3	3.2	145.92	0.99	65.1	1.2	0.05030	0.48
L	-15.2922	19.7438	-1.5678	2.0085	10355	380	17.9	0.8	38.2	3.9	148.35	0.96	59.5	1.3	0.07316	0.69
M	-9.9631	77.0917	-65.1814	7.5446	10355	380	17.9	0.8	38.2	3.9	148.35	0.96	59.5	1.3	1.33502	12.63
N	-37.3934	19.3346	0.9486	2.0097	10355	380	17.9	0.8	38.2	3.9	148.35	0.96	59.5	1.3	0.00013	0.00
O	-42.3823	18.2980	3.9249	1.9244	10355	380	17.9	0.8	38.2	3.9	148.35	0.96	59.5	1.3	0.00030	0.00
P	-22.9694	20.0847	2.7440	1.7080	8134	360	16.5	0.9	43.5	2.7	146.28	1.10	56.5	1.1	0.00026	0.00
Q	10.2347	20.2540	3.1089	1.9900	8134	360	16.5	0.9	43.5	2.7	146.28	1.10	56.5	1.1	0.00118	0.01
R	12.2298	21.3779	5.1877	1.8057	8134	360	16.5	0.9	43.5	2.7	146.28	1.10	56.5	1.1	0.00883	0.08
S	-8.4222	18.6866	4.4268	1.9024	8134	360	16.5	0.9	43.5	2.7	146.28	1.10	56.5	1.1	0.03070	0.29
Phl: F1A (3273-01)																
A	186.3761	18.0324	29.6553	1.9877	10918	420	16.8	0.9	42.6	2.8	160.94	1.10	58.5	1.1	0.00145	0.01
B	545.9731	20.1845	20.7133	2.0807	10918	420	16.8	0.9	42.6	2.8	160.94	1.10	58.5	1.1	0.00539	0.04
C	119.6346	18.0985	12.3767	1.8888	10918	420	16.8	0.9	42.6	2.8	160.94	1.10	58.5	1.1	0.00597	0.05
D	126.7815	18.2571	5.7319	1.8876	10918	420	16.8	0.9	42.6	2.8	160.94	1.10	58.5	1.1	0.00934	0.08
E	353.6869	20.7496	59.1041	2.5076	10821	350	19.7	0.9	43.9	3.4	158.61	1.20	59.1	1.3	0.03655	0.30
F	337.1758	20.5730	18.7010	2.1918	10821	350	19.7	0.9	43.9	3.4	158.61	1.20	59.1	1.3	0.04781	0.39
G	714.1806	20.8901	9.2531	2.0936	10821	350	19.7	0.9	43.9	3.4	158.61	1.20	59.1	1.3	0.10124	0.83
H	694.8835	20.8142	11.2668	2.1830	10821	350	19.7	0.9	43.9	3.4	158.61	1.20	59.1	1.3	0.11718	0.96
I	579.0525	19.4556	11.6624	1.8778	10830	350	18.0	0.9	49.1	6.1	158.91	1.10	58.1	1.1	0.13032	1.07
J	287.3136	19.2431	8.4121	1.9706	10830	350	18.0	0.9	49.1	6.1	158.91	1.10	58.1	1.1	0.09920	0.81
K	1223.8680	75.6444	93.4795	9.1591	10830	350	18.0	0.9	49.1	6.1	158.91	1.10	58.1	1.1	1.94580	15.92
L*	997.8994	362.6045	-309.8631	35.8325	10830	350	18.0	0.9	49.1	6.1	158.91	1.10	58.1	1.1	5.80374	47.49
M*	92.7557	80.2037	-58.5295	7.5121	10958	310	19.4	1.0	45.5	4.4	160.23	1.10	61.4	1.4	2.27622	18.63
N*	30.5619	69.0298	-78.3300	7.5008	10958	310	19.4	1.0	45.5	4.4	160.23	1.10	61.4	1.4	1.48223	12.13
O	-17.1733	18.0172	7.9169	2.0690	10958	310	19.4	1.0	45.5	4.4	160.23	1.10	61.4	1.4	0.01376	0.11
P	8.9814	17.8950	5.1715	2.0681	10958	310	19.4	1.0	45.5	4.4	160.23	1.10	61.4	1.4	0.10890	0.89
Q	11.3439	18.2581	2.0537	2.0024	11389	370	17.9	1.1	51.1	4.4	157.01	1.20	61.5	1.3	0.00557	0.05
R	3.4825	19.0743	2.1821	2.0041	11389	370	17.9	1.1	51.1	4.4	157.01	1.20	61.5	1.3	0.00576	0.05
S	35.0577	18.2669	-2.0667	2.0047	11389	370	17.9	1.1	51.1	4.4	157.01	1.20	61.5	1.3	0.00489	0.04
T	9.2159	19.1464	38.4667	2.2077	11389	370	17.9	1.1	51.1	4.4	157.01	1.20	61.5	1.3	0.00790	0.06
U	39.2798	16.4143	107.4906	2.5931	10951	350	18.6	0.9	49.1	2.9	159.69	1.00	62.5	1.2	0.01058	0.09
Phl: F30A (3077-01)																
A	218.1074	23.4173	148.8213	4.9766	4646	320	39.6	1.0	100.0	3.5	406.56	1.90	128.2	2.0	0.00382	0.04

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Ms: S131C (3283-02)															
B	233.1	117.3	0.3133	0.0262	0.0115	0.0513	0.0225	0.0707	2.E-06	0.0231	0.0071	62.47	0.43	61.78	0.56
C	22.9	80.3	1.9567	0.0161	0.0076	0.0315	0.0149	0.0628	2.E-06	0.0213	0.0037	76.25	0.33	76.18	0.41
D	-128.9	124.9	-0.1693	0.0078	0.0120	0.0153	0.0235	0.0680	2.E-06	0.0219	0.0054	76.96	0.48	77.35	0.60
E	67.7	6.4	0.1512	0.0037	0.0006	0.0072	0.0013	0.0128	1.E-07	0.0130	0.0005	72.61	0.09	72.40	0.10
F	3.2	3.9	1.3304	0.0015	0.0004	0.0030	0.0008	-0.0018	8.E-08	0.0104	0.0006	71.44	0.08	71.43	0.08
G*	5.6	2.0	1.3928	0.0028	0.0002	0.0054	0.0004	0.0045	4.E-08	0.0115	0.0002	71.21	0.07	71.19	0.07
H*	12.3	11.1	1.8628	0.0082	0.0013	0.0161	0.0025	0.0075	3.E-07	0.0120	0.0009	71.18	0.11	71.14	0.12
I*	6.6	5.1	0.5971	0.0014	0.0005	0.0028	0.0010	0.0063	1.E-07	0.0118	0.0005	71.23	0.08	71.21	0.09
J	-2.9	11.9	2.7480	-0.0028	0.0011	-0.0056	0.0023	0.0065	2.E-07	0.0118	0.0006	71.82	0.10	71.83	0.11
K	27.4	24.5	0.0354	0.0003	0.0026	0.0007	0.0051	0.0176	5.E-07	0.0137	0.0012	72.58	0.16	72.50	0.18
L	-55.7	103.0	0.7529	-0.0150	0.0081	-0.0295	0.0158	-0.0312	2.E-06	0.0053	0.0042	72.66	0.46	72.82	0.55
M	3.0	61.6	-8.2513	-0.0087	0.0059	-0.0171	0.0115	0.0482	1.E-06	0.0188	0.0039	72.93	0.29	72.92	0.34
N	-10.8	68.9	-2.5308	0.0098	0.0068	0.0192	0.0133	-0.0009	1.E-06	0.0105	0.0029	72.66	0.31	72.69	0.37
O	-279.9	135.2	0.1142	-0.0115	0.0139	-0.0224	0.0273	0.0500	3.E-06	0.0186	0.0062	74.68	0.51	75.51	0.65
P	56.5	13.2	-0.0342	-0.0007	0.0012	-0.0014	0.0024	0.0109	2.E-07	0.0127	0.0008	72.54	0.12	72.37	0.13
Ms: Z58B (3288-01)															
A	4924.0	65.6	0.0057	0.0100	0.0039	0.0196	0.0076	0.0131	8.E-07	0.0222	0.0021	81.10	0.22	66.40	0.27
B*	613.2	23.3	0.0114	0.0025	0.0018	0.0049	0.0036	-0.0058	4.E-07	0.0109	0.0017	73.57	0.14	71.74	0.16
C*	307.3	11.7	0.0178	0.0020	0.0009	0.0038	0.0018	0.0065	2.E-07	0.0124	0.0005	72.40	0.10	71.48	0.11
D*	116.9	2.6	0.0216	0.0009	0.0002	0.0018	0.0004	0.0089	4.E-08	0.0124	0.0002	71.72	0.06	71.37	0.06
E*	63.7	1.8	0.0227	0.0005	0.0002	0.0010	0.0003	0.0095	3.E-08	0.0124	0.0002	71.49	0.07	71.30	0.07
F	48.7	1.9	0.0469	0.0008	0.0002	0.0016	0.0003	0.0086	3.E-08	0.0122	0.0002	71.02	0.07	70.88	0.07
G	45.0	1.8	0.0462	0.0007	0.0001	0.0015	0.0003	0.0102	3.E-08	0.0125	0.0002	71.03	0.07	70.89	0.07
H	34.3	3.7	0.0471	0.0006	0.0003	0.0011	0.0007	0.0078	7.E-08	0.0121	0.0003	70.95	0.07	70.85	0.07
I	23.9	2.8	0.0197	0.0002	0.0002	0.0003	0.0005	0.0088	5.E-08	0.0122	0.0002	71.32	0.06	71.25	0.06
J	15.4	4.8	-0.0764	-0.0004	0.0004	-0.0008	0.0009	0.0095	9.E-08	0.0123	0.0005	71.50	0.08	71.45	0.08
K	5.8	6.0	0.0816	0.0002	0.0006	0.0003	0.0012	0.0123	1.E-07	0.0128	0.0005	71.67	0.09	71.65	0.09
L	-30.7	16.1	0.0415	-0.0005	0.0015	-0.0009	0.0030	0.0136	3.E-07	0.0129	0.0008	72.08	0.13	72.17	0.14
M	-3.6	18.9	1.5237	-0.0019	0.0021	-0.0038	0.0042	0.0018	4.E-07	0.0110	0.0009	72.15	0.15	72.15	0.16
N	19.3	29.4	-0.6238	-0.0043	0.0033	-0.0085	0.0064	0.0579	7.E-07	0.0205	0.0032	72.21	0.19	72.15	0.21
O	-22.9	35.0	0.5715	-0.0047	0.0041	-0.0092	0.0081	0.0182	8.E-07	0.0137	0.0012	71.81	0.21	71.88	0.24
P	4.6	4.4	-0.0310	-0.0001	0.0005	-0.0001	0.0010	-0.0006	1.E-07	0.0106	0.0008	71.97	0.08	71.95	0.08
Q	25.6	39.3	0.7831	0.0072	0.0045	0.0141	0.0087	-0.1142	9.E-07	-0.0085	0.0033	72.42	0.24	72.34	0.26
R	6.0	4.1	0.8058	0.0017	0.0004	0.0034	0.0008	0.0014	8.E-08	0.0110	0.0005	72.18	0.07	72.16	0.07
S	9.5	14.3	0.4773	0.0016	0.0014	0.0032	0.0028	-0.0136	3.E-07	0.0084	0.0009	72.26	0.13	72.22	0.14
T	-224.7	211.9	-0.4313	0.0347	0.0220	0.0681	0.0431	-0.2883	4.E-06	-0.0383	0.0113	72.34	0.73	73.01	0.97
U	-13.1	24.7	0.5705	-0.0027	0.0023	-0.0053	0.0046	-0.0041	5.E-07	0.0100	0.0016	72.47	0.16	72.51	0.17
Ms: Z58B (3288-02)															
A	-168.5	123.3	0.0630	-0.0038	0.0127	-0.0075	0.0250	0.0110	3.E-06	0.0122	0.0046	74.30	0.49	74.80	0.61
B	123.4	14.9	0.0975	0.0043	0.0015	0.0085	0.0029	0.0094	3.E-07	0.0125	0.0008	74.46	0.13	74.09	0.13
C*	204.4	3.6	0.0227	0.0017	0.0002	0.0033	0.0005	0.0090	5.E-08	0.0126	0.0002	73.25	0.06	72.63	0.06
D*	-5.2	1.8	-0.4127	0.0008	0.0002	0.0015	0.0004	0.0111	4.E-08	0.0126	0.0002	72.15	0.31	72.16	0.31
E*	33.3	3.2	0.1171	0.0014	0.0003	0.0027	0.0006	0.0073	6.E-08	0.0120	0.0003	71.82	0.06	71.72	0.06
F*	35.9	5.0	0.2285	0.0029	0.0005	0.0058	0.0010	0.0074	1.E-07	0.0120	0.0003	71.91	0.08	71.80	0.08
G*	17.6	2.9	0.3458	0.0022	0.0003	0.0043	0.0006	0.0073	6.E-08	0.0120	0.0003	71.70	0.07	71.64	0.07
H*	1.1	5.2	8.1747	0.0032	0.0005	0.0063	0.0009	0.0091	9.E-08	0.0122	0.0005	71.87	0.08	71.86	0.09
I*	-17.6	9.7	-0.2542	0.0016	0.0009	0.0031	0.0018	0.0135	2.E-07	0.0129	0.0004	71.98	0.10	72.03	0.10
J	-30.5	13.1	-0.2094	0.0023	0.0013	0.0045	0.0026	0.0151	3.E-07	0.0132	0.0010	72.14	0.12	72.23	0.12
K	-14.3	13.6	-0.2410	0.0012	0.0013	0.0024	0.0026	0.0078	3.E-07	0.0120	0.0006	72.45	0.12	72.49	0.13
L	-7.6	9.7	0.2721	-0.0007	0.0010	-0.0014	0.0019	0.0111	2.E-07	0.0126	0.0006	72.43	0.11	72.45	0.11
M	-17.2	2.0	0.0043	0.0000	0.0002	-0.0001	0.0004	0.0093	4.E-08	0.0122	0.0002	72.54	0.07	72.59	0.07
N	2605.2	5521.0	-1.0998	-1.0270	0.5335	-2.0129	1.0456	0.2845	1.E-04	0.0636	0.1516	89.05	15.33	81.13	22.42
O	4678.2	2297.7	-0.3013	-0.5052	0.2186	-0.9901	0.4284	-0.3018	4.E-05	-0.0314	0.0607	73.73	6.48	59.70	9.34
P	3774.0	2351.9	-0.2335	-0.3159	0.2764	-0.6192	0.5418	-1.6848	6.E-05	-0.2663	0.1106	97.07	7.65	85.73	10.29
Q	928.7	594.5	0.0918	0.0306	0.0605	0.0599	0.1186	0.0279	1.E-05	0.0171	0.0142	80.49	1.84	77.72	2.54
R	207.1	72.1	0.0658	0.0049	0.0085	0.0096	0.0167	-0.0197	2.E-06	0.0078	0.0020	74.04	0.34	73.42	0.40
S	50.8	21.9	-0.0531	-0.0010	0.0021	-0.0019	0.0042	-0.0035	4.E-07	0.0102	0.0007	73.35	0.17	73.19	0.18
Phl: F1A (3273-01)															
A	7211.1	486.5	0.1753	0.4532	0.0440	0.8883	0.0862	-0.0013	9.E-06	0.0241	0.0143	65.79	1.47	44.31	2.03
B	1355.7	136.3	0.7354	0.3573	0.0133	0.7004	0.0261	0.0108	3.E-06	0.0151	0.0034	74.41	0.49	70.40	0.63
C	730.5	111.5	0.2697	0.0706	0.0107	0.1384	0.0209	-0.0231	2.E-06	0.0082	0.0040	78.29	0.46	76.11	0.56
D	216.3	71.3	0.6171	0.0479	0.0069	0.0938	0.0135	0.0173	1.E-06	0.0140	0.0021	76.55	0.33	75.91	0.39
E	570.2	24.2	0.1670	0.0341	0.0020	0.0669	0.0039	0.0016	4.E-07	0.0120	0.0012	76.38	0.14	74.68	0.16
F	137.9	16.2	0.5030	0.0249	0.0015	0.0487	0.0030	0.0017	3.E-07	0.0112	0.0008	74.52	0.13	74.11	0.14
G	32.2	7.3	2.1534	0.0249	0.0007	0.0487	0.0014	0.0095	1.E-07	0.0124	0.0003	73.07	0.10	72.97	0.10
H	33.9	6.6	1.7207	0.0209	0.0006	0.0410	0.0012	0.0071	1.E-07	0.0120	0.0003	72.63	0.09	72.53	0.09
I	31.6	5.1	1.3853	0.0157	0.0005	0.0307	0.0010	0.0135	1.E-07	0.0130	0.0005	72.70	0.08	72.60	0.08
J	29.9	7.0	0.9529	0.0102	0.0007	0.0200	0.0013	0.0056	1.E-07	0.0117	0.0005	71.99	0.10	71.90	0.10
K	16.9	1.7	0.3653	0.0022	0.0001	0.0043	0.0003	0.0097	3.E-08	0.0124	0.0002	71.45	0.06	71.40	0.06
L*	-18.8	2.2	-0.0899	0.0006	0.0002	0.0012	0.0004	0.0092	4.E-08	0.0122	0.0004	71.06	0.07	71.12	0.08
M*	-9.1	1.2	-0.0442	0.0001	0.0001	0.0003	0.0002	0.0030	2.E-08	0.0112	0.0005	70.92	0.07	70.95	0.07
N*	-18.6	1.8	-0.0109	0.0001	0.0002	0.0001	0.0003	0.0090	3.E-08	0.0122	0.0003	70.91	0.07	70.96	0.07
O	202.9	53.0	-0.0605	-0.0044	0.0046	-0.0086	0.0090	-0.0078	9.E-07	0.0098	0.0021	70.55	0.24	69.94	0.28
P	16.7	6.7	0.0485	0.0003	0.0006	0.0006	0.0011	0.0092	1.E-07	0.0123	0.0004	70.86	0.08	70.81	0.08
Q	129.9	126.7	0.1541	0.0072	0.0115	0.0141	0.0226	-0.0387	2.E-06	0.0044	0.0045	64.85	0.44	64.46	0.58
R	133.5	122.6	0.0445	0.0021	0.0117	0.0042	0.0229	-0.0444	2.E-06	0.0035	0.0041	64.33	0.41	63.92	0.55
S	-148.9	144.4	-0.4733	0.0253	0.0132	0.0495	0.0258	-0.0536	3.E-06	0.0014	0.0042	71.28	0.52	71.72	0.68
T	1717.6	98.8	0.0067	0.0041	0.0085	0.0081	0.0168	-0.0041	2.E-06	0.0132	0.0037	71.12	0.35	65.99	0.45
U	3581.0	87.1	0.0102	0.0131	0.0055	0.0256	0.0107	-0.0038	1.E-06	0.0168	0.0027	76.73	0.30	66.04	0.38
Phl: F30A (3077-01)															
A	13728.2	464.6	0.0409	0.2012	0.0216	0.3943	0.0424	0.1401	4.E-06	0.0602	0.0068	58.33	0.63	17.36	1.48

Sample No.[a]	Derived Results				Inverse Isochron Data				
	$\%^{40}Ar^*$	Age (Ma)		w/±J	$^{36}Ar/^{40}Ar$		$^{39}Ar/^{40}Ar$		$^{36}Ar/^{39}Ar$
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Ms: S131C (3283-02)									
B	98.89	1545	9	10	0.00004	50.56737	0.01601	0.69321	0.00839
C	99.91	1772	6	7	0.00000	362.20460	0.01312	0.43726	0.00046
D	100.50	1789	9	9	-0.00002	-96.48399	0.01299	0.61746	0.00326
E	99.72	1715	1	3	0.00001	9.39782	0.01377	0.13047	0.00645
F	99.99	1700	1	3	0.00000	123.75310	0.01400	0.10969	0.00049
G*	99.98	1696	1	3	0.00000	36.02448	0.01404	0.09225	0.00171
H*	99.95	1695	2	4	0.00000	92.02494	0.01405	0.15699	0.00049
I*	99.97	1696	1	3	0.00000	77.77970	0.01404	0.11799	0.00057
J	100.01	1706	2	3	0.00000	-422.21370	0.01392	0.14360	0.00011
K	99.89	1716	3	4	0.00000	89.98266	0.01378	0.22429	0.00072
L	100.23	1721	8	9	-0.00001	-186.66690	0.01376	0.63333	0.00113
M	99.99	1723	5	6	0.00000	2082.55300	0.01371	0.39476	0.00007
N	100.05	1719	6	6	0.00000	-622.44610	0.01376	0.42655	0.00029
O	101.12	1762	10	10	-0.00004	-48.33906	0.01339	0.68309	0.00738
P	99.77	1714	2	4	0.00001	23.33146	0.01379	0.17117	0.00191
Ms: Z58B (3288-01)									
A	81.87	1599	4	5	0.00061	1.32002	0.01233	0.26762	0.05787
B*	97.51	1683	2	4	0.00008	3.80126	0.01359	0.19600	0.01271
C*	98.73	1679	2	3	0.00004	3.79897	0.01381	0.14299	0.01054
D*	99.51	1677	1	3	0.00002	2.26109	0.01394	0.08915	0.02439
E*	99.73	1676	1	3	0.00001	2.88133	0.01399	0.09362	0.02302
F	99.80	1670	1	3	0.00001	3.94094	0.01408	0.10235	0.01499
G	99.81	1670	1	3	0.00001	4.10208	0.01408	0.09618	0.01085
H	99.86	1669	1	3	0.00000	10.85353	0.01409	0.09717	0.00372
I	99.90	1675	1	3	0.00000	11.65173	0.01402	0.08956	0.00375
J	99.94	1678	1	3	0.00000	31.34321	0.01399	0.10828	0.00136
K	99.98	1681	1	3	0.00000	106.18650	0.01395	0.12014	0.00043
L	100.13	1689	2	4	0.00000	-52.37225	0.01387	0.18167	0.00096
M	100.01	1689	2	4	0.00000	-538.40520	0.01386	0.21146	0.00012
N	99.92	1689	3	4	0.00000	153.46570	0.01385	0.26768	0.00054
O	100.10	1685	4	5	0.00000	-152.92360	0.01393	0.29469	0.00068
P	99.98	1686	1	3	0.00000	95.00521	0.01390	0.10804	0.00041
Q	99.89	1692	4	5	0.00000	151.20010	0.01381	0.32648	0.00055
R	99.98	1689	1	3	0.00000	68.96167	0.01386	0.09991	0.00054
S	99.96	1690	2	4	0.00000	150.43830	0.01384	0.18165	0.00025
T	100.93	1702	15	15	-0.00003	-94.49759	0.01382	1.00983	0.00726
U	100.05	1694	3	4	0.00000	-189.74070	0.01380	0.21818	0.00030
Ms: Z58B (3288-02)									
A	100.68	1729	9	10	-0.00002	-73.24840	0.01346	0.65421	0.00506
B	99.51	1718	2	4	0.00002	12.08475	0.01343	0.16857	0.00337
C*	99.17	1696	1	3	0.00003	1.76719	0.01365	0.08738	0.02878
D*	100.02	1689	5	6	0.00000	-33.52794	0.01386	0.43508	0.00175
E*	99.86	1682	1	3	0.00000	9.57747	0.01392	0.08947	0.00472
F*	99.85	1684	1	3	0.00000	13.97460	0.01391	0.11208	0.00252
G*	99.93	1681	1	3	0.00000	16.35138	0.01395	0.09164	0.00245
H*	100.00	1685	1	3	0.00000	536.19660	0.01392	0.11728	0.00007
I*	100.07	1687	2	3	0.00000	-54.80040	0.01389	0.13822	0.00080
J	100.13	1690	2	4	0.00000	-42.67568	0.01386	0.16273	0.00117
K	100.06	1694	2	4	0.00000	-94.62672	0.01380	0.17077	0.00057
L	100.03	1693	2	3	0.00000	-127.55950	0.01381	0.14702	0.00044
M	100.07	1696	1	3	0.00000	-11.54638	0.01379	0.10089	0.00496
N	91.17	1821	317	317	0.00030	210.32630	0.01124	17.21112	0.07498
O	80.99	1489	159	159	0.00064	49.57225	0.01357	8.78476	0.15846
P	88.34	1884	140	140	0.00039	62.39450	0.01030	7.88562	0.10744
Q	96.56	1772	37	37	0.00012	64.11078	0.01242	2.28336	0.02695
R	99.17	1708	6	7	0.00003	34.81768	0.01351	0.45380	0.00554
S	99.79	1705	3	4	0.00001	42.93940	0.01363	0.23574	0.00142
Phl: F1A (3273-01)									
A	67.33	1196	40	40	0.00109	7.03726	0.01520	2.24059	0.28138
B	94.60	1649	10	10	0.00018	10.13203	0.01344	0.65943	0.03493
C	97.22	1735	8	9	0.00009	15.30669	0.01277	0.58376	0.01981
D	99.16	1732	6	7	0.00003	33.15083	0.01306	0.43386	0.00575
E	97.77	1713	2	4	0.00007	4.25132	0.01309	0.18706	0.01251
F	99.45	1705	2	4	0.00002	11.78136	0.01342	0.17272	0.00378
G	99.87	1688	1	3	0.00000	23.15723	0.01369	0.13058	0.00166
H	99.86	1681	1	3	0.00000	19.73568	0.01377	0.11713	0.00205
I	99.87	1682	1	3	0.00000	16.36109	0.01376	0.11317	0.00267
J	99.88	1672	2	3	0.00000	23.67325	0.01389	0.13543	0.00181
K	99.93	1664	1	3	0.00000	9.86084	0.01400	0.09010	0.00657
L*	100.08	1660	1	3	0.00000	-11.52869	0.01407	0.10513	0.00618
M*	100.04	1657	1	3	0.00000	-12.81102	0.01410	0.09648	0.00578
N*	100.08	1658	1	3	0.00000	-9.55445	0.01410	0.09701	0.00649
O	99.14	1642	4	5	0.00003	26.11559	0.01418	0.33578	0.00440
P	99.93	1655	1	3	0.00000	40.11348	0.01411	0.11106	0.00112
Q	99.40	1555	9	10	0.00002	97.52537	0.01542	0.68273	0.00425
R	99.38	1547	9	9	0.00002	91.75032	0.01555	0.64328	0.00400
S	100.63	1669	10	11	-0.00002	-96.71149	0.01403	0.73595	0.00427
T	92.79	1580	7	8	0.00024	5.74950	0.01406	0.49770	0.03899
U	86.07	1581	6	7	0.00047	2.42553	0.01303	0.39264	0.06499
Phl: F30A (3077-01)									
A	29.76	572	42	42	0.00235	3.47607	0.01714	1.07690	0.23767

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Phl: F30A (3077-01)										
B	64b	0.30	21.485	0.047	623923	3368	13187.58	16.41	260.7952	9.5987
C*	64b	0.40	21.485	0.047	2215273	11761	30503.21	31.51	410.4595	10.5428
D*	64b	0.50	21.485	0.047	4816205	25462	68028.34	46.62	890.7221	25.4191
E*	64b	0.60	21.485	0.047	16362970	86217	232564.60	165.42	3102.0990	74.2849
F*	64b	0.70	21.485	0.047	40942370	214953	582143.70	281.82	7968.6060	190.1055
G*	64b	0.70	21.485	0.047	19759150	103596	280902.20	183.80	3768.8030	116.8400
H*	64b	0.80	21.485	0.047	35198440	183986	499358.80	281.82	6531.7340	159.5558
I*	64b	0.80	21.485	0.047	20521120	106859	289253.30	196.05	3911.4490	104.2438
J*	64b	0.90	21.485	0.047	30155590	156626	425598.80	208.31	5594.4310	134.8167
K*	64b	0.90	21.485	0.047	3937295	20422	55003.99	40.33	679.5883	38.2235
L*	64b	1.00	21.485	0.047	3349145	17345	47233.91	34.04	625.7097	23.4148
M*	64b	1.10	21.485	0.047	5432178	28001	76443.48	46.63	1112.8200	35.3049
N*	64b	1.20	21.485	0.047	2566277	15008	36144.62	105.83	490.6229	16.7736
O*	64b	1.40	21.485	0.047	1858009	9573	26200.23	30.26	395.7814	22.8870
P	64b	1.70	21.485	0.047	1595864	8215	22565.38	23.97	286.5135	22.0045
Q	64b	2.00	21.485	0.047	652583	3400	9436.41	16.42	100.4308	8.7193
R	64b	5.00	21.485	0.047	363407	1940	5589.41	12.65	82.3537	10.2830
Phl: S53A (3081-01)										
A	64c	0.20	22.187	0.050	213049	1208	4158.17	11.14	173.0662	10.2361
B	64c	0.30	22.187	0.050	343152	1829	7802.39	17.67	66.9203	22.1724
C	64c	0.40	22.187	0.050	952358	4838	14666.34	18.93	220.5122	11.9503
D*	64c	0.50	22.187	0.050	1524166	7694	22457.35	25.22	285.4435	11.9503
E*	64c	0.50	22.187	0.050	643261	3284	9658.00	17.67	134.8099	14.2586
F*	64c	0.60	22.187	0.050	2388663	11989	35986.74	30.25	507.0508	14.2586
G*	64c	0.60	22.187	0.050	1660925	8342	25085.19	28.99	353.4715	13.0395
H*	64c	0.70	22.187	0.050	3019771	15108	45698.86	36.55	645.3477	12.9181
I*	64c	0.70	22.187	0.050	3824659	19088	57843.27	41.59	768.7398	13.0032
J*	64c	0.80	22.187	0.050	7150088	35616	108202.50	54.18	1448.0760	16.4850
K*	64c	0.80	22.187	0.050	3901659	19435	59331.91	39.07	707.3711	23.6009
L*	64c	0.90	22.187	0.050	7693717	38256	116116.00	57.96	1506.9900	26.0276
M*	64c	0.90	22.187	0.050	3244974	16131	49081.60	39.07	726.0020	23.5187
N*	64c	1.00	22.187	0.050	24194690	120092	363354.80	226.68	5040.3760	73.7356
O*	64c	1.10	22.187	0.050	6375892	31621	95925.79	47.89	1328.4860	21.1038
P*	64c	1.20	22.187	0.050	9609874	47620	145079.50	57.96	2094.8720	70.7764
Q*	64c	1.40	22.187	0.050	3145320	15594	47307.77	35.30	673.6214	9.7086
R*	64c	1.70	22.187	0.050	3439266	17040	52195.83	41.59	700.5607	19.6956
S*	64c	2.00	22.187	0.050	6750527	33410	102531.50	52.93	1300.5270	60.6836
T*	64c	5.00	22.187	0.050	4908543	24295	74282.30	44.11	996.1379	22.1210
Phl: S59A (3279-01)										
A	68b	0.10	21.270	0.060	2637	494	108.07	2.36	11.7702	4.9223
B	68b	0.20	21.270	0.060	34963	551	4380.40	11.74	82.6936	8.4859
C	68b	0.25	21.270	0.060	86675	580	2602.62	8.48	69.8408	10.2278
D	68b	0.30	21.270	0.060	158340	593	2346.54	9.10	49.8126	8.8801
E	68b	0.35	21.270	0.060	7102412	4593	93596.62	52.92	1147.6150	18.4326
F	68b	0.40	21.270	0.060	1764737	1280	22498.32	23.96	265.3649	11.2896
G	68b	0.45	21.270	0.060	2658362	1926	34472.61	31.52	428.9268	19.2228
H	68b	0.50	21.270	0.060	3224636	2440	41994.02	31.52	445.9212	17.9878
I	68b	0.55	21.270	0.060	3818701	3108	50146.63	37.81	604.8506	12.2483
J	68b	0.60	21.270	0.060	3100086	2578	40366.46	34.03	519.2616	9.4672
K	68b	0.70	21.270	0.060	8872512	6673	117862.40	63.00	1388.2940	28.0265
L*	68b	0.80	21.270	0.060	172784200	177707	2323660.00	2979.80	29756.8100	416.8551
M	68b	0.90	21.270	0.060	435984	591	5812.18	13.89	56.0564	14.4996
N	68b	1.00	21.270	0.060	188498	576	2495.70	8.89	28.9535	7.1929
O	68b	1.10	21.270	0.060	93643	538	1238.51	7.02	25.5672	6.4532
P	68b	1.20	21.270	0.060	86449	525	1158.08	6.15	13.2557	7.0853
Q	68b	1.50	21.270	0.060	39400	542	492.80	4.30	10.5366	6.3505
R	68b	1.70	21.270	0.060	56186	522	727.47	4.49	2.8702	6.5006
S	68b	2.00	21.270	0.060	12883	506	184.18	3.02	-5.4130	6.1909
T	68b	3.00	21.270	0.060	15169	478	184.80	2.78	10.2344	8.6427
U	68b	5.00	21.270	0.060	522448	621	6888.70	15.14	74.9895	8.9534
Phl: S59A (3279-02)										
A	68b	0.30	21.270	0.060	134965	516	6695.81	13.88	133.9665	6.6216
B	68b	0.35	21.270	0.060	138909	494	2040.10	7.36	45.4192	6.7178
C	68b	0.40	21.270	0.060	203379	555	2352.81	8.23	13.4948	8.0436
D	68b	0.45	21.270	0.060	149760	503	1955.40	6.98	15.9244	5.8921
E	68b	0.50	21.270	0.060	647280	684	7937.79	15.14	94.3002	8.3429
F	68b	0.55	21.270	0.060	949850	848	12079.84	20.17	149.8405	9.0218
G	68b	0.60	21.270	0.060	1423729	1205	18204.10	22.69	200.0433	10.8817
H	68b	0.65	21.270	0.060	2498313	2089	32116.80	30.25	415.8474	11.8306
I	68b	0.70	21.270	0.060	8399513	6993	111061.50	57.96	1333.5090	22.8983
J	68b	0.70	21.270	0.060	1942277	1624	25284.32	27.73	294.0791	9.5276
K	68b	0.75	21.270	0.060	4667493	3532	60039.08	39.07	741.2214	16.6944
L	68b	0.75	21.270	0.060	3506678	2451	45966.89	36.55	547.5605	14.3076
M	68b	0.80	21.270	0.060	5466425	3611	72224.62	45.37	865.2934	16.7563
N*	68b	0.85	21.270	0.060	9625852	6106	128268.10	61.74	1600.0820	22.9434
O*	68b	0.90	21.270	0.060	24958600	15619	333145.90	226.71	4024.5250	110.2577
P*	68b	0.95	21.270	0.060	86858360	55076	1161620.00	864.16	14328.6300	446.6264
Q*	68b	1.00	21.270	0.060	16543020	10665	221483.70	171.57	2269.1790	324.5017
R*	68b	1.10	21.270	0.060	163028	539	2171.53	8.64	22.6341	6.7523
S*	68b	1.30	21.270	0.060	236204	559	3143.70	9.26	41.1139	7.9906
T*	68b	1.50	21.270	0.060	153665	525	2033.58	7.64	48.4278	8.5325

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Phl: F30A (3077-01)																
B	15016.9200	57.3219	167.5286	5.1960	4646	320	39.6	1.0	100.0	3.5	406.56	1.90	128.2	2.0	0.04649	0.49
C*	1348.7450	26.2580	10.9870	3.6617	4646	320	39.6	1.0	100.0	3.5	406.56	1.90	128.2	2.0	0.10754	1.13
D*	921.7157	23.3447	6.0160	3.3974	4646	320	39.6	1.0	100.0	3.5	406.56	1.90	128.2	2.0	0.23984	2.52
E*	1145.2660	83.6884	-70.0686	13.3625	5942	400	47.0	1.6	86.8	11.0	405.00	2.70	131.9	2.0	0.81994	8.61
F*	861.8107	90.7263	-4.1176	14.7482	5942	400	47.0	1.6	86.8	11.0	405.00	2.70	131.9	2.0	2.05243	21.55
G*	129.8170	86.3379	-65.2068	13.3700	5942	400	47.0	1.6	86.8	11.0	405.00	2.70	131.9	2.0	0.99036	10.40
H*	88.5241	82.5953	1.2107	14.2902	5942	400	47.0	1.6	86.8	11.0	405.00	2.70	131.9	2.0	1.76056	18.49
I*	248.7796	93.0021	21.6668	14.8563	4590	360	45.6	1.3	90.8	5.9	405.80	2.00	121.1	1.5	1.01980	10.71
J*	153.5062	85.3222	31.3462	13.4744	4590	360	45.6	1.3	90.8	5.9	405.80	2.00	121.1	1.5	1.50051	15.76
K*	31.3084	20.7137	135.8469	4.4005	4590	360	45.6	1.3	90.8	5.9	405.83	2.00	121.1	1.5	0.19392	2.04
L*	-19.2559	23.0159	10.8476	3.4201	4590	360	45.6	1.3	90.8	5.9	405.83	2.00	121.1	1.5	0.16653	1.75
M*	-27.5032	21.9269	25.0355	3.4874	3732	310	45.7	1.2	71.1	16.0	402.82	1.90	119.2	1.5	0.26951	2.83
N*	33.8412	20.7699	16.4981	2.5728	3732	310	45.7	1.2	71.1	16.0	402.82	1.90	119.2	1.5	0.12743	1.34
O*	36.7090	22.5941	29.0709	3.5083	3732	310	45.7	1.2	71.1	16.0	402.82	1.90	119.2	1.5	0.09237	0.97
P	-6.1624	23.2064	23.2863	3.2139	3732	310	45.7	1.2	71.1	16.0	402.82	1.90	119.2	1.5	0.07956	0.84
Q	-68.0640	20.8485	13.3992	3.4498	5625	340	52.2	1.2	109.0	5.3	405.29	1.80	124.2	1.7	0.03327	0.35
R	37.8571	20.3197	114.6494	4.4564	5625	340	52.2	1.2	109.0	5.3	405.29	1.80	124.2	1.7	0.01971	0.21
Phl: S53A (3081-01)																
A	1119.2860	23.3783	361.0443	6.9808	4231	360	46.4	1.1	100.8	5.8	401.70	1.90	124.6	1.5	0.01466	0.29
B	239.3131	24.0109	18.1384	3.3705	4231	360	46.4	1.1	100.8	5.8	401.70	1.90	124.6	1.5	0.02751	0.54
C	214.3078	23.3407	14.8713	3.2629	4231	360	46.4	1.1	100.8	5.8	401.70	1.90	124.6	1.5	0.05171	1.02
D*	230.5135	22.7114	10.3018	3.1489	4231	360	46.4	1.1	100.8	5.8	401.70	1.90	124.6	1.5	0.07918	1.56
E*	46.7953	22.4432	-8.4873	3.2108	5096	340	49.1	1.1	100.6	3.4	405.25	1.70	130.4	1.6	0.03405	0.67
F*	196.6926	22.5430	-0.2109	3.1729	5096	340	49.1	1.1	100.6	3.4	405.25	1.70	130.4	1.6	0.12688	2.50
G*	83.4394	21.1496	-0.4838	3.0105	5096	340	49.1	1.1	100.6	3.4	405.25	1.70	130.4	1.6	0.08844	1.75
H*	162.5539	21.2055	-0.7690	3.3371	5096	340	49.1	1.1	100.6	3.4	405.25	1.70	130.4	1.6	0.16112	3.18
I*	132.3984	22.8968	3.0627	3.4575	5791	340	47.4	1.3	106.2	6.6	404.37	1.80	125.2	1.7	0.20393	4.03
J*	209.8148	22.2952	8.1206	3.1500	5791	340	47.4	1.3	106.2	6.6	404.37	1.80	125.2	1.7	0.38148	7.53
K*	140.7104	20.9879	15.9538	3.5259	5791	340	47.4	1.3	106.2	6.6	404.37	1.80	125.2	1.7	0.20918	4.13
L*	153.9689	21.6212	12.6919	3.2544	5791	340	47.4	1.3	106.2	6.6	404.37	1.80	125.2	1.7	0.40938	8.08
M*	22.1263	20.4792	8.6986	3.3842	4398	390	50.1	1.2	93.6	6.3	405.43	1.70	123.6	1.7	0.17304	3.42
N*	88.9799	92.3253	-5.1216	14.0351	4398	390	50.1	1.2	93.6	6.3	405.40	1.70	123.6	1.7	1.28106	25.29
O*	51.0633	21.7955	10.6410	3.3085	4398	390	50.1	1.2	93.6	6.3	405.43	1.70	123.6	1.7	0.33820	6.68
P*	69.9830	23.1612	6.2301	3.2001	4398	390	50.1	1.2	93.6	6.3	405.43	1.70	123.6	1.7	0.51150	10.10
Q*	-31.6457	21.5236	4.2720	3.0189	3871	330	47.7	1.3	90.6	5.6	406.37	1.80	125.8	1.5	0.16679	3.29
R*	61.2956	21.5873	3.7390	3.2711	3871	330	47.7	1.3	90.6	5.6	406.37	1.80	125.8	1.5	0.18402	3.63
S*	30.3472	22.2122	2.0054	3.0871	3871	330	47.7	1.3	90.6	5.6	406.37	1.80	125.8	1.5	0.36149	7.14
T*	3.7504	20.9283	22.5267	3.5561	3871	330	47.7	1.3	90.6	5.6	406.37	1.80	125.8	1.5	0.26189	5.17
Phl: S59A (3279-01)																
A	8.5472	20.1035	-1.5506	1.8072	10568	310	18.2	1.0	38.6	3.0	160.13	1.10	62.5	1.1	0.00038	0.00
B	973.5997	25.4330	18.8574	2.0076	10280	420	20.2	0.8	37.4	5.4	159.79	1.20	63.2	1.1	0.01544	0.16
C	2638.5070	32.7028	6.9145	1.9983	10280	420	20.2	0.8	37.4	5.4	159.79	1.20	63.2	1.1	0.00918	0.09
D	372.1783	20.0487	6.5868	1.8072	10280	420	20.2	0.8	37.4	5.4	159.79	1.20	63.2	1.1	0.00827	0.09
E	735.8257	22.2146	21.2122	2.1988	10280	420	20.2	0.8	37.4	5.4	159.79	1.20	63.2	1.1	0.32999	3.40
F	86.5496	20.1044	1.5184	1.9564	10934	320	20.9	1.1	45.6	3.6	159.90	1.00	60.6	1.2	0.07932	0.82
G	107.1693	18.5903	2.3782	1.9579	10934	320	20.9	1.1	45.6	3.6	159.90	1.00	60.6	1.2	0.12154	1.25
H	110.9576	19.6978	3.8743	2.0536	10934	320	20.9	1.1	45.6	3.6	159.90	1.00	60.6	1.2	0.14806	1.53
I	115.2023	19.2435	1.8846	2.0552	10934	320	20.9	1.1	45.6	3.6	159.90	1.00	60.6	1.2	0.17680	1.82
J	79.3594	21.4182	108.8743	2.4676	11733	340	21.5	1.0	38.2	4.3	158.81	1.30	60.3	1.3	0.14232	1.47
K	166.3359	19.0558	16.2596	2.1166	11733	340	21.5	1.0	38.2	4.3	158.81	1.30	60.3	1.3	0.41554	4.28
L*	1232.5580	373.6704	-397.8673	36.3549	11733	340	21.5	1.0	38.2	4.3	158.81	1.30	60.3	1.3	8.19239	84.40
M	-10.2515	18.8105	5.1990	2.1070	11733	340	21.5	1.0	38.2	4.3	158.81	1.30	60.3	1.3	0.02049	0.21
N	22.7057	17.4600	0.8319	2.0144	11242	390	20.5	1.1	36.8	3.7	158.92	1.10	62.7	1.3	0.00880	0.09
O	-5.1648	17.4065	-1.7678	1.9266	11242	390	20.5	1.1	36.8	3.7	158.92	1.10	62.7	1.3	0.00437	0.04
P	22.5431	17.5098	-0.7136	2.0145	11242	390	20.5	1.1	36.8	3.7	158.92	1.10	62.7	1.3	0.00408	0.04
Q	2.2406	17.6150	-1.6480	1.9286	11242	390	20.5	1.1	36.8	3.7	158.92	1.10	62.7	1.3	0.00174	0.02
R	-8.8399	18.8906	0.9904	2.0410	11063	350	17.9	0.9	44.3	5.0	158.28	1.20	60.8	1.2	0.00256	0.03
S	20.9363	17.9503	-2.3169	1.9449	11063	350	17.9	0.9	44.3	5.0	158.28	1.20	60.8	1.2	0.00065	0.01
T	23.9725	17.7910	-1.0936	1.9432	11063	350	17.9	0.9	44.3	5.0	158.28	1.20	60.8	1.2	0.00065	0.01
U	-4.5954	18.4467	-2.4528	1.7664	11063	350	17.9	0.9	44.3	5.0	158.28	1.20	60.8	1.2	0.02429	0.25
Phl: S59A (3279-02)																
A	2692.7900	26.9859	79.3006	2.3230	11431	320	20.9	0.8	47.1	4.3	150.97	1.10	55.7	1.1	0.02361	0.30
B	248.1080	18.9593	6.9883	1.7088	11431	320	20.9	0.8	47.1	4.3	150.97	1.10	55.7	1.1	0.00719	0.09
C	115.6310	18.8830	8.6388	2.0845	11431	320	20.9	0.8	47.1	4.3	150.97	1.10	55.7	1.1	0.00830	0.10
D	89.9387	17.9885	1.5351	1.8878	11431	320	20.9	0.8	47.1	4.3	150.97	1.10	55.7	1.1	0.00689	0.09
E	259.0564	20.5098	12.2144	2.0420	10826	320	17.4	0.8	47.2	3.8	147.26	1.00	55.4	1.2	0.02799	0.35
F	141.3323	18.5641	12.4213	1.9492	10826	320	17.4	0.8	47.2	3.8	147.26	1.00	55.4	1.2	0.04259	0.53
G	93.7574	19.5876	5.9571	2.0404	10826	320	17.4	0.8	47.2	3.8	147.26	1.00	55.4	1.2	0.06418	0.80
H	151.1784	17.9192	6.1073	1.8585	10826	320	17.4	0.8	47.2	3.8	147.26	1.00	55.4	1.2	0.11323	1.42
I	184.6154	18.6569	6.7712	2.0822	9030	370	20.1	0.9	38.6	3.3	149.34	1.10	57.2	1.1	0.39156	4.91
J	32.6439	18.3618	6.4795	1.7954	9030	370	20.1	0.9	38.6	3.3	149.34	1.10	57.2	1.1	0.08914	1.12
K	128.7647	20.2003	170.3677	2.8730	9030	370	20.1	0.9	38.6	3.3	149.34	1.10	57.2	1.1	0.21168	2.65
L	47.5179	18.5362	-0.7488	1.8287	10186	380	23.4	1.0	36.1	3.6	150.21	1.00	58.5	1.0	0.16206	2.03
M	90.6849	18.5537	5.4291	1.8303	10186	380	23.4	1.0	36.1	3.6	150.21	1.00	58.5	1.0	0.25464	3.19
N*	64.2062	19.4901	7.1381	2.0296	10186	380	23.4	1.0	36.1	3.6	150.21	1.00	58.5	1.0	0.45223	5.67
O*	194.6485	70.8972	-64.7700	8.0614	10186	380	23.4	1.0	36.1	3.6	150.21	1.00	58.5	1.0	1.17455	14.72
P*	1206.9330	370.7434	-504.7090	33.4197	10899	370	20.8	1.1	37.4	4.2	148.62	1.20	61.8	1.3	4.09545	51.33
Q*	254.0598	77.7045	-82.4984	7.0001	10899	370	20.8	1.1	37.4	4.2	148.62	1.20	61.8	1.3	0.78087	9.79
R*	34.5856	19.9622	-0.2459	2.0142	10899	370	20.8	1.1	37.4	4.2	148.62	1.20	61.8	1.3	0.00766	0.10
S*	19.9536	20.0597	4.0397	2.0174	10899	370	20.8	1.1	37.4	4.2	148.62	1.20	61.8	1.3	0.01108	0.14
T*	40.5127	19.3706	3.2790	1.9322	10899	370	20.8	1.1	37.4	4.2	148.62	1.20	61.8	1.3	0.00717	0.09

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Phl: F30A (3077-01)															
B	1270.4	39.4	2.5009	1.1387	0.0046	2.2319	0.0090	0.0398	9.E-07	0.0198	0.0007	47.31	0.26	43.64	0.29
C*	36.0	12.0	3.4250	0.0442	0.0009	0.0867	0.0017	0.0159	2.E-07	0.0135	0.0003	72.62	0.39	72.52	0.39
D*	8.8	5.0	4.2746	0.0135	0.0003	0.0266	0.0007	0.0141	7.E-08	0.0131	0.0004	70.80	0.38	70.77	0.38
E*	-30.1	5.8	-0.4560	0.0049	0.0004	0.0097	0.0007	0.0160	7.E-08	0.0133	0.0003	70.36	0.37	70.45	0.37
F*	-0.7	2.5	-5.8395	0.0015	0.0002	0.0029	0.0003	0.0177	3.E-08	0.0137	0.0003	70.33	0.37	70.33	0.37
G*	-23.2	4.8	-0.0555	0.0005	0.0003	0.0009	0.0006	0.0164	6.E-08	0.0134	0.0004	70.34	0.37	70.41	0.37
H*	0.2	2.9	2.0399	0.0002	0.0002	0.0003	0.0003	0.0141	3.E-08	0.0131	0.0003	70.49	0.37	70.48	0.37
I*	7.5	5.1	0.3203	0.0009	0.0003	0.0017	0.0006	0.0167	6.E-08	0.0135	0.0004	70.95	0.37	70.92	0.37
J*	7.4	3.2	0.1366	0.0004	0.0002	0.0007	0.0004	0.0144	4.E-08	0.0131	0.0003	70.85	0.37	70.83	0.37
K*	247.0	8.0	0.0064	0.0006	0.0004	0.0011	0.0007	0.0071	8.E-08	0.0124	0.0007	71.58	0.37	70.84	0.38
L*	23.0	7.2	-0.0495	-0.0004	0.0005	-0.0008	0.0010	0.0148	1.E-07	0.0132	0.0005	70.91	0.37	70.83	0.37
M*	32.8	4.6	-0.0307	-0.0004	0.0003	-0.0007	0.0006	0.0225	6.E-08	0.0146	0.0005	71.06	0.37	70.96	0.37
N*	45.6	7.1	0.0572	0.0009	0.0006	0.0018	0.0011	0.0165	1.E-07	0.0136	0.0005	71.00	0.46	70.86	0.46
O*	111.0	13.4	0.0352	0.0014	0.0009	0.0027	0.0017	0.0249	2.E-07	0.0151	0.0009	70.92	0.37	70.58	0.38
P	103.2	14.2	-0.0074	-0.0003	0.0010	-0.0005	0.0020	0.0107	2.E-07	0.0127	0.0010	70.72	0.37	70.41	0.37
Q	142.0	36.6	-0.1417	-0.0072	0.0022	-0.0141	0.0043	-0.0019	4.E-07	0.0106	0.0009	69.16	0.38	68.73	0.40
R	2051.2	79.9	0.0092	0.0068	0.0036	0.0133	0.0071	0.0010	7.E-07	0.0147	0.0018	65.02	0.38	58.89	0.44
Phl: S53A (3081-01)															
A	8682.8	169.5	0.0865	0.2692	0.0057	0.5276	0.0111	0.0863	1.E-06	0.0416	0.0025	51.24	0.32	25.34	0.58
B	232.5	43.2	0.3681	0.0307	0.0031	0.0601	0.0060	-0.0152	6.E-07	0.0086	0.0028	43.98	0.25	43.29	0.29
C	101.4	22.3	0.4021	0.0146	0.0016	0.0286	0.0031	0.0246	3.E-07	0.0150	0.0008	64.93	0.34	64.63	0.35
D*	45.9	14.0	0.6243	0.0103	0.0010	0.0201	0.0020	0.0114	2.E-07	0.0127	0.0005	67.87	0.35	67.73	0.35
E*	-87.9	33.3	-0.1538	0.0048	0.0023	0.0095	0.0046	0.0203	5.E-07	0.0140	0.0015	66.60	0.36	66.86	0.37
F*	-0.6	8.8	-26.0192	0.0055	0.0006	0.0107	0.0012	0.0201	1.E-07	0.0141	0.0004	66.38	0.34	66.38	0.34
G*	-1.9	12.0	-4.8119	0.0033	0.0008	0.0065	0.0017	0.0201	2.E-07	0.0141	0.0005	66.21	0.34	66.21	0.34
H*	-1.7	7.3	-5.8977	0.0036	0.0005	0.0070	0.0009	0.0203	9.E-08	0.0141	0.0003	66.08	0.33	66.08	0.34
I*	5.3	6.0	1.2061	0.0023	0.0004	0.0045	0.0008	0.0153	8.E-08	0.0133	0.0002	66.12	0.33	66.10	0.33
J*	7.5	2.9	0.7209	0.0019	0.0002	0.0038	0.0004	0.0158	4.E-08	0.0134	0.0002	66.08	0.33	66.06	0.33
K*	26.9	5.9	0.2461	0.0024	0.0004	0.0046	0.0007	0.0069	7.E-08	0.0119	0.0004	65.76	0.33	65.68	0.33
L*	10.9	2.8	0.3385	0.0013	0.0002	0.0026	0.0004	0.0134	4.E-08	0.0130	0.0002	66.26	0.33	66.22	0.33
M*	17.7	6.9	0.0710	0.0005	0.0004	0.0009	0.0008	0.0241	8.E-08	0.0148	0.0005	66.11	0.33	66.06	0.33
N*	-1.4	3.9	-0.4847	0.0002	0.0003	0.0005	0.0005	0.0188	5.E-08	0.0139	0.0002	66.59	0.33	66.59	0.33
O*	11.1	3.5	0.1339	0.0005	0.0002	0.0010	0.0004	0.0186	5.E-08	0.0138	0.0002	66.47	0.33	66.43	0.33
P*	4.3	2.2	0.3134	0.0005	0.0002	0.0009	0.0003	0.0221	3.E-08	0.0144	0.0005	66.24	0.33	66.22	0.33
Q*	9.0	6.4	-0.2067	-0.0007	0.0005	-0.0013	0.0009	0.0209	9.E-08	0.0142	0.0002	66.49	0.33	66.46	0.33
R*	7.2	6.3	0.4574	0.0012	0.0004	0.0023	0.0008	0.0161	8.E-08	0.0134	0.0004	65.89	0.33	65.87	0.33
S*	2.0	3.0	0.4222	0.0003	0.0002	0.0006	0.0004	0.0117	4.E-08	0.0127	0.0006	65.84	0.33	65.83	0.33
T*	30.3	4.8	0.0046	0.0001	0.0003	0.0001	0.0006	0.0157	6.E-08	0.0134	0.0003	66.08	0.33	65.99	0.33
Phl: S59A (3279-01)															
A	-1434.8	1672.5	-0.1538	0.0791	0.1860	0.1550	0.3646	0.5985	4.E-05	0.1089	0.0456	24.40	4.60	28.69	6.80
B	430.5	45.9	1.4405	0.2223	0.0058	0.4356	0.0114	0.0437	1.E-06	0.0189	0.0019	7.98	0.13	6.71	0.19
C	265.7	76.8	10.6464	1.0138	0.0130	1.9870	0.0255	0.0929	3.E-06	0.0268	0.0039	33.30	0.25	32.61	0.34
D	280.7	77.0	1.5765	0.1586	0.0086	0.3109	0.0168	0.0593	2.E-06	0.0212	0.0038	67.48	0.36	66.66	0.43
E	22.7	2.4	0.9678	0.0079	0.0002	0.0154	0.0005	0.0090	5.E-08	0.0123	0.0002	75.88	0.07	75.81	0.07
F	6.8	8.7	1.5903	0.0038	0.0009	0.0075	0.0018	0.0064	2.E-07	0.0118	0.0005	78.44	0.10	78.42	0.10
G	6.9	5.7	1.2573	0.0031	0.0005	0.0061	0.0011	0.0103	1.E-07	0.0124	0.0006	77.12	0.09	77.09	0.09
H	9.2	4.9	0.7990	0.0026	0.0005	0.0052	0.0009	-0.0006	9.E-08	0.0106	0.0004	76.79	0.08	76.76	0.08
I	3.8	4.1	1.7055	0.0023	0.0004	0.0045	0.0008	0.0080	8.E-08	0.0121	0.0002	76.15	0.08	76.14	0.09
J	269.7	6.1	0.0203	0.0020	0.0005	0.0039	0.0010	0.0098	1.E-07	0.0129	0.0002	76.80	0.09	75.99	0.09
K	13.8	1.8	0.2854	0.0014	0.0002	0.0028	0.0003	0.0062	3.E-08	0.0118	0.0002	75.28	0.07	75.23	0.07
L*	-17.1	1.6	-0.0864	0.0005	0.0002	0.0010	0.0003	0.0127	3.E-08	0.0128	0.0002	74.36	0.12	74.41	0.12
M	89.5	36.3	-0.0550	-0.0018	0.0032	-0.0035	0.0063	-0.0073	6.E-07	0.0096	0.0025	75.01	0.21	74.74	0.23
N	33.3	80.7	0.7615	0.0091	0.0070	0.0178	0.0137	0.0050	1.E-06	0.0116	0.0029	75.53	0.35	75.43	0.43
O	-142.7	155.6	0.0815	-0.0042	0.0141	-0.0082	0.0275	0.0606	3.E-06	0.0206	0.0052	75.61	0.61	76.03	0.77
P	-61.6	174.0	-0.8814	0.0195	0.0151	0.0382	0.0296	0.0051	3.E-06	0.0114	0.0061	74.65	0.60	74.83	0.80
Q	-334.4	391.4	-0.0379	0.0045	0.0357	0.0089	0.0701	0.0671	7.E-06	0.0214	0.0129	79.95	1.30	80.95	1.75
R	136.1	280.6	-0.2490	-0.0122	0.0260	-0.0238	0.0509	-0.0416	5.E-06	0.0039	0.0089	77.24	0.86	76.82	1.20
S	-1258.0	1056.2	-0.2521	0.1137	0.0975	0.2228	0.1911	-0.2237	2.E-05	-0.0294	0.0336	69.95	2.98	73.71	4.35
T	-591.8	1051.6	-0.6116	0.1297	0.0963	0.2543	0.1887	0.2716	2.E-05	0.0554	0.0468	82.09	2.87	83.87	4.26
U	-35.6	25.6	0.0523	-0.0007	0.0027	-0.0013	0.0052	0.0015	5.E-07	0.0109	0.0013	75.84	0.19	75.94	0.20
Phl: S59A (3279-02)															
A	1184.3	34.8	0.9474	0.4022	0.0041	0.7882	0.0081	0.0420	8.E-07	0.0200	0.0010	20.16	0.09	16.66	0.13
B	342.6	83.8	0.9905	0.1216	0.0093	0.2384	0.0182	0.0648	2.E-06	0.0223	0.0033	68.09	0.34	67.08	0.42
C	367.2	88.6	0.3734	0.0491	0.0080	0.0963	0.0157	-0.0335	2.E-06	0.0057	0.0034	86.44	0.38	85.35	0.46
D	78.5	96.5	1.6346	0.0460	0.0092	0.0902	0.0180	-0.0160	2.E-06	0.0081	0.0030	76.59	0.38	76.36	0.47
E	153.9	25.7	0.5917	0.0326	0.0026	0.0640	0.0051	0.0053	5.E-07	0.0119	0.0011	81.54	0.18	81.09	0.19
F	102.8	16.1	0.3175	0.0117	0.0015	0.0229	0.0030	0.0090	3.E-07	0.0124	0.0007	78.63	0.15	78.32	0.16
G	32.7	11.2	0.4391	0.0052	0.0011	0.0101	0.0021	0.0013	2.E-07	0.0110	0.0006	78.21	0.12	78.11	0.12
H	19.0	5.8	0.6906	0.0047	0.0006	0.0092	0.0011	0.0131	1.E-07	0.0129	0.0004	77.79	0.10	77.73	0.10
I	6.1	1.9	0.7607	0.0017	0.0002	0.0033	0.0003	0.0077	3.E-08	0.0120	0.0002	75.63	0.07	75.61	0.07
J	25.6	7.1	0.1406	0.0013	0.0007	0.0025	0.0014	0.0052	1.E-07	0.0116	0.0004	76.82	0.11	76.74	0.11
K	283.8	4.8	0.0211	0.0021	0.0003	0.0042	0.0007	0.0066	7.E-08	0.0123	0.0003	77.74	0.08	76.89	0.08
L	-1.6	4.0	-1.7706	0.0010	0.0004	0.0020	0.0008	0.0072	8.E-08	0.0119	0.0003	76.29	0.08	76.29	0.08
M	7.5	2.5	0.4660	0.0013	0.0003	0.0025	0.0005	0.0075	5.E-08	0.0120	0.0002	75.69	0.07	75.66	0.07
N*	5.6	1.6	0.2510	0.0005	0.0002	0.0010	0.0003	0.0105	3.E-08	0.0125	0.0002	75.04	0.06	75.03	0.06
O*	-19.4	2.4	-0.0838	0.0006	0.0002	0.0011	0.0004	0.0084	4.E-08	0.0121	0.0003	74.92	0.07	74.97	0.07
P*	-43.5	2.9	-0.0667	0.0010	0.0003	0.0020	0.0006	0.0102	6.E-08	0.0123	0.0004	74.77	0.07	74.90	0.07
Q*	-37.3	3.2	-0.0859	0.0011	0.0004	0.0022	0.0007	-0.0023	7.E-08	0.0102	0.0015	74.69	0.08	74.80	0.08
R*	-11.3	92.8	-3.9246	0.0159	0.0092	0.0312	0.0180	-0.0015	2.E-06	0.0104	0.0031	75.08	0.39	75.11	0.48
S*	128.5	64.2	0.1378	0.0063	0.0064	0.0124	0.0125	0.0127	1.E-06	0.0131	0.0025	75.14	0.28	74.75	0.34
T*	161.2	95.0	0.3447	0.0199	0.0095	0.0390	0.0187	0.0760	2.E-06	0.0238	0.0042	75.56	0.38	75.08	0.48

Sample No.[a]	Derived Results				Inverse Isochron Data				
	$\%^{40}Ar^*$	Age (Ma)		w/±J	$^{36}Ar/^{40}Ar$		$^{39}Ar/^{40}Ar$		$^{36}Ar/^{39}Ar$
		±1σ		±1σ	±1σ		±1σ		Err. Corr.
Phl: F30A (3077-01)									
B	92.18	1193	6	6	0.00026	3.22714	0.02112	0.55403	0.16301
C*	99.86	1694	6	6	0.00000	34.57675	0.01377	0.54090	0.01507
D*	99.96	1668	6	6	0.00000	59.38728	0.01413	0.53312	0.00883
E*	100.13	1663	6	6	0.00000	-18.95304	0.01421	0.53170	0.02755
F*	100.00	1661	6	6	0.00000	-309.75570	0.01422	0.52726	0.00169
G*	100.10	1662	6	6	0.00000	-20.44402	0.01422	0.52838	0.02545
H*	100.00	1663	6	6	0.00000	1569.50700	0.01419	0.52577	0.00033
I*	99.97	1670	6	6	0.00000	69.39790	0.01410	0.52514	0.00744
J*	99.97	1669	6	6	0.00000	43.38211	0.01411	0.52172	0.01192
K*	98.97	1669	6	6	0.00003	3.28130	0.01397	0.52387	0.15653
L*	99.90	1669	6	6	0.00000	31.59858	0.01410	0.52290	0.01623
M*	99.86	1671	6	6	0.00000	13.97328	0.01407	0.51908	0.03664
N*	99.81	1669	7	8	0.00001	15.63722	0.01409	0.65404	0.03345
O*	99.53	1665	6	6	0.00002	12.09434	0.01410	0.52802	0.04157
P	99.56	1662	6	6	0.00001	13.81659	0.01414	0.52566	0.03649
Q	99.39	1636	6	7	0.00002	25.71469	0.01446	0.54936	0.01922
R	90.58	1475	8	8	0.00032	3.92396	0.01538	0.57982	0.12524
Phl: S53A (3081-01)									
A	49.45	805	15	15	0.00169	2.01666	0.01952	0.62705	0.25416
B	98.43	1214	6	6	0.00005	18.65474	0.02274	0.57923	0.02630
C	99.54	1605	6	6	0.00002	22.05759	0.01540	0.52416	0.02232
D*	99.80	1655	6	6	0.00001	30.79484	0.01473	0.51717	0.01600
E*	100.39	1641	6	7	-0.00001	-37.74384	0.01501	0.54237	0.01273
F*	100.00	1633	5	6	0.00000	-1078.73800	0.01507	0.50892	0.00046
G*	100.01	1631	6	6	0.00000	-571.44210	0.01510	0.51541	0.00086
H*	100.01	1628	5	6	0.00000	-392.29010	0.01513	0.50669	0.00126
I*	99.98	1629	5	6	0.00000	115.60150	0.01512	0.50424	0.00427
J*	99.97	1628	5	6	0.00000	39.40468	0.01513	0.50065	0.01258
K*	99.88	1622	5	6	0.00000	22.18415	0.01521	0.50249	0.02226
L*	99.95	1631	5	6	0.00000	25.85894	0.01509	0.49976	0.01913
M*	99.92	1628	5	6	0.00000	39.14674	0.01513	0.50346	0.01254
N*	100.01	1637	5	6	0.00000	-259.22150	0.01502	0.50028	0.00190
O*	99.95	1634	5	6	0.00000	31.34511	0.01505	0.49847	0.01574
P*	99.98	1631	5	6	0.00000	52.59768	0.01510	0.49716	0.00939
Q*	99.96	1635	5	6	0.00000	71.17105	0.01504	0.50139	0.00689
R*	99.97	1625	5	6	0.00000	88.67659	0.01518	0.50185	0.00552
S*	99.99	1624	5	6	0.00000	158.34470	0.01519	0.49763	0.00311
T*	99.86	1627	5	6	0.00000	15.82741	0.01513	0.49852	0.03105
Phl: S59A (3279-01)									
A	117.62	860	162	162	-0.00059	-117.65080	0.04099	18.85778	0.15815
B	84.13	241	6	6	0.00053	10.92172	0.12532	1.59859	0.14226
C	97.88	951	8	8	0.00007	32.41091	0.03001	0.74421	0.01856
D	98.78	1593	7	7	0.00004	27.90767	0.01482	0.53933	0.00932
E	99.91	1733	1	3	0.00000	10.48731	0.01318	0.08590	0.00464
F	99.97	1770	2	4	0.00000	131.52440	0.01275	0.12888	0.00031
G	99.97	1751	1	3	0.00000	83.96097	0.01297	0.11664	0.00054
H	99.96	1746	1	3	0.00000	53.41896	0.01302	0.10658	0.00101
I	99.99	1737	1	3	0.00000	112.07280	0.01313	0.11094	0.00053
J	98.95	1735	1	3	0.00004	2.26896	0.01302	0.11842	0.02574
K	99.95	1724	1	3	0.00000	13.08313	0.01328	0.09227	0.00469
L*	100.07	1712	2	4	0.00000	-9.09967	0.01345	0.16439	0.00707
M	99.64	1717	3	5	0.00001	40.49084	0.01333	0.27488	0.00165
N	99.87	1727	6	7	0.00000	244.18810	0.01324	0.46928	0.00082
O	100.56	1736	11	12	-0.00002	-108.86560	0.01323	0.80724	0.00376
P	100.25	1718	12	12	-0.00001	-279.75680	0.01340	0.80672	0.00164
Q	101.25	1806	25	25	-0.00004	-116.89040	0.01251	1.62956	0.00994
R	99.47	1747	17	18	0.00002	205.29000	0.01295	1.11626	0.00377
S	105.38	1701	65	65	-0.00018	-83.89689	0.01430	4.25620	0.04319
T	102.17	1847	59	59	-0.00007	-176.28310	0.01218	3.49369	0.01614
U	100.14	1734	3	4	0.00000	-72.04251	0.01319	0.24992	0.00079
Phl: S59A (3279-02)									
A	82.62	547	4	4	0.00058	2.98267	0.04961	0.43520	0.11277
B	98.51	1599	7	7	0.00005	24.72309	0.01469	0.50655	0.01011
C	98.74	1867	6	7	0.00004	24.21194	0.01157	0.44382	0.00694
D	99.70	1740	7	8	0.00001	124.90490	0.01306	0.49019	0.00184
E	99.44	1808	3	4	0.00002	16.82135	0.01226	0.21805	0.00305
F	99.61	1769	2	4	0.00001	15.75010	0.01272	0.18936	0.00267
G	99.88	1766	2	4	0.00000	34.41188	0.01279	0.15066	0.00138
H	99.93	1760	1	3	0.00000	30.74452	0.01286	0.12595	0.00181
I	99.98	1729	1	3	0.00000	31.17594	0.01322	0.09826	0.00226
J	99.90	1746	2	4	0.00000	27.77687	0.01302	0.13792	0.00183
K	98.91	1748	1	3	0.00004	1.68869	0.01286	0.09981	0.03398
L	100.01	1739	1	3	0.00000	-235.15690	0.01311	0.10588	0.00020
M	99.97	1730	1	3	0.00000	34.03368	0.01321	0.09116	0.00141
N*	99.98	1721	1	3	0.00000	28.76252	0.01333	0.07963	0.00176
O*	100.08	1720	1	3	0.00000	-12.41141	0.01335	0.09245	0.00341
P*	100.17	1719	1	3	-0.00001	-6.61056	0.01337	0.09775	0.00622
Q*	100.15	1718	1	3	0.00000	-8.48175	0.01339	0.10079	0.00486
R*	100.05	1722	7	8	0.00000	-788.78460	0.01332	0.51706	0.00027
S*	99.49	1717	5	6	0.00002	50.03443	0.01331	0.37782	0.00296
T*	99.37	1722	7	8	0.00002	59.26868	0.01323	0.50802	0.00388

Sample No.[a]	Irrad.[b]	Watts	J[c]		Relative Isotopic Abundances[d]					
					^{40}Ar		^{39}Ar		^{38}Ar	
			(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
Phl: S59A (3279-02)										
U	68b	1.70	21.270	0.060	58182	536	638.58	4.79	20.6325	6.5571
V	68b	2.00	21.270	0.060	37206	465	405.00	3.90	9.9827	6.2486
W	68b	3.00	21.270	0.060	84397	519	937.49	5.62	10.9394	5.6577
X	68b	5.00	21.270	0.060	178491	544	1831.00	7.37	47.6222	10.0234
Y	68b	7.00	21.270	0.060	223616	514	3781.11	11.88	51.1344	6.5568
Z	68b	8.00	21.270	0.060	459136	615	5798.56	12.63	176.1378	11.7694

Sample No.[a]	Relative Isotopic Abundances[d]				Background Relative Isotopic Abundances										Derived Results	
	^{37}Ar		^{36}Ar		^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd		^{39}Ar Mol	^{39}Ar %
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	(X 10^{-14})	of total
Phl: S59A (3279-02)																
U	-0.9675	19.4625	12.5082	2.1155	10899	370	20.8	1.1	37.4	4.2	148.62	1.20	61.8	1.3	0.00225	0.03
V	-10.4161	19.6503	7.2019	2.0209	10307	320	17.7	0.9	42.0	3.7	150.59	1.10	61.1	1.3	0.00143	0.02
W	2.0606	20.4040	41.4588	2.2158	10307	320	17.7	0.9	42.0	3.7	150.59	1.10	61.1	1.3	0.00331	0.04
X	34.6943	18.4855	79.7186	2.6173	10307	320	17.7	0.9	42.0	3.7	150.59	1.10	61.1	1.3	0.00646	0.08
Y	80.0052	20.2612	43.3400	2.2101	10307	320	17.7	0.9	42.0	3.7	150.59	1.10	61.1	1.3	0.01333	0.17
Z	82.9491	19.3661	508.1086	4.5180	10438	350	16.7	0.9	39.5	2.7	148.57	0.97	56.8	1.1	0.02044	0.26

Sample No.[a]	Derived Results														
	$^{36}Ar/^{39}Ar$		$\%(^{36}Ar)_{Ca}$	$^{37}Ar/^{39}Ar$		Ca/K		Cl/K		$^{38}Ar/^{39}Ar$		$^{40}Ar/^{39}Ar$		$^{40}Ar^*/^{39}Ar$	
	(X 10^{-5})	±1σ		±1σ		±1σ		±1σ		±1σ		±1σ		±1σ	
Phl: S59A (3279-02)															
U	1958.8	331.6	-0.0022	-0.0015	0.0305	-0.0030	0.0597	0.1063	6.E-06	0.0323	0.0103	91.11	1.08	85.26	1.45
V	1778.2	499.3	-0.0404	-0.0257	0.0485	-0.0504	0.0951	0.0628	1.E-05	0.0246	0.0154	91.87	1.45	86.55	2.06
W	4422.3	237.8	0.0014	0.0022	0.0218	0.0043	0.0427	-0.0437	4.E-06	0.0117	0.0060	90.02	0.77	76.82	1.01
X	4353.8	144.0	0.0121	0.0189	0.0101	0.0371	0.0198	0.0421	2.E-06	0.0260	0.0055	97.48	0.49	84.48	0.62
Y	1146.2	58.6	0.0515	0.0212	0.0054	0.0415	0.0105	0.0039	1.E-06	0.0135	0.0017	59.14	0.23	55.72	0.28
Z	8762.7	80.2	0.0046	0.0143	0.0033	0.0280	0.0065	0.0187	7.E-07	0.0304	0.0020	79.18	0.20	53.02	0.28

Sample No.[a]	Derived Results				Inverse Isochron Data				
	%^{40}Ar*	Age (Ma)		w/±J	^{36}Ar/^{40}Ar		^{39}Ar/^{40}Ar		^{36}Ar/^{39}Ar
			±1σ	±1σ		±1σ		±1σ	Err. Corr.
Phl: S59A (3279-02)									
U	93.58	1866	20	20	0.00021	16.94262	0.01098	1.18833	0.04219
V	94.22	1884	28	28	0.00019	28.08411	0.01089	1.57658	0.03525
W	85.33	1747	15	15	0.00049	5.38014	0.01111	0.85946	0.08195
X	86.67	1856	9	9	0.00045	3.29808	0.01026	0.50495	0.05587
Y	94.22	1410	5	6	0.00019	5.10760	0.01691	0.38920	0.02653
Z	66.96	1362	5	6	0.00111	0.89930	0.01263	0.25566	0.07800

Notes:

[a] Sample numbers are given in the format w: x (y-z), where w=mineral, x=sample number, y=lab analysis number (assigned at the Noble Gas Lab. at the Geological Survey of Canada, Ottawa, Ontario, Canada), z=aliquot number; Letters are used to name each heating step; *Denotes steps used in the plateau or pseudoplateau age calculations.

[b] Refers to irradiation sample can number at the research nuclear reactor at McMaster University, Hamilton, Ontario, Canada. Nuclear Reactor (Cd-shielded). Irradiation duration 320 h in medium-flux position 8D.

[c] Nominal J, reference to PP20 Hornblende flux monitor at 1074 ± 5 Ma (1σ, Jourdan et al., 2006).

[d] Relative isotopic abundances corrected for baseline, blank, and detector intercalibration. ^{39}Ar and ^{37}Ar are decay-corrected values. Relative abundances are not corrected for nuclear interference reactions. Negative values represent weak or non-existent signals that are near or below the limit of detection. Decay constants and isotopic abundances after Steiger and Jäger (1977).

Atmospheric argon ^{40}Ar/^{36}Ar = 298.56 (Lee et al., 2006).

Nucleogenic interference correction factors (±2σ):

(^{39}Ar/^{37}Ar)Ca = 0.0007 ± 0.00005

(^{36}Ar/^{37}Ar)Ca = 0.00028 ± 0.00016

(^{38}Ar/^{37}Ar)Ca = 0.00003 ± 0.00003

(^{40}Ar/^{39}Ar)K = 0.003 ± 0.005

(^{38}Ar/^{39}Ar)K = 0.011 ± 0.01

^{40}Ar* = radiogenic argon

Appendix 3: Analytical data and ages for $^{40}Ar/^{39}Ar$ UV laser analyses of three muscovite samples from Hall Peninsula, Baffin Island.

Sample No.[a]	J[b]		Relative Isotopic Abundances[c]							
			^{40}Ar		^{39}Ar		^{38}Ar		^{37}Ar	
	(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
F122B										
A	21.715	0.056	1411840	7326	20048.79	23.97	220.1345	15.6792	-173.6135	221.5972
B	21.715	0.056	1313834	6770	18709.81	22.71	232.7230	14.4703	-154.7849	228.2200
C	21.715	0.056	1342014	6860	19027.66	22.71	230.8095	12.7940	-468.5281	219.9115
D	21.715	0.056	1123256	5715	16144.06	20.19	219.2533	13.2706	-264.5867	213.1564
E	21.715	0.056	1250187	6305	17722.47	22.71	232.5971	15.6792	59.6091	220.3830
F	21.715	0.056	1221368	6099	17242.76	22.71	216.8615	16.6915	89.9323	219.7024
G	21.715	0.056	1288398	6393	17524.68	23.97	261.0470	15.5614	-237.3733	218.6042
H	21.715	0.056	1196825	5913	16857.21	21.45	256.3012	11.7127	-300.1087	225.3347
I	21.715	0.056	1149141	5657	16519.44	20.19	209.5854	8.9281	-153.7112	218.3111
J	21.715	0.056	1186800	5822	16887.09	23.97	239.6718	11.5135	162.0732	212.0202
K	21.715	0.056	1212933	5928	17158.42	21.45	231.2123	15.5614	-470.5214	217.2119
L	21.715	0.056	1246770	6064	17363.31	22.71	244.1407	20.7905	-349.2170	213.3556
M	21.715	0.056	1152392	5607	16367.27	21.45	186.3596	17.4323	58.5498	207.2620
N	21.715	0.056	602404	2984	8540.17	15.15	109.6204	13.0248	-215.3755	199.8301
O	21.715	0.056	1167763	5665	16569.38	21.45	182.8726	12.2938	-135.9137	206.7535
P	21.715	0.056	1171646	5687	16580.98	20.19	193.0315	19.6543	-200.7279	206.6589
Q	21.715	0.056	1171372	5696	16509.75	18.93	202.4351	14.1850	129.6331	221.8430
R	21.715	0.056	1124113	5476	15937.97	20.19	190.5138	16.3535	-415.0226	220.6999
S	21.715	0.056	1095464	5373	15735.28	20.19	169.8310	16.5253	-429.6363	221.5074
T	21.715	0.056	1122976	5523	16227.38	20.19	188.0717	13.1625	-545.6586	228.9782
U	21.715	0.056	788403	3938	11236.84	16.42	131.8390	13.8179	-249.8275	201.5424
V	21.715	0.056	1023923	5090	14435.14	20.19	189.6201	12.2009	-436.9231	208.0543
W	21.715	0.056	1070877	5344	15317.58	20.19	163.7634	13.2710	-42.8552	209.4198
X	21.715	0.056	1077581	5403	15261.72	20.19	150.3189	15.3830	-65.8493	216.6644
S92C										
A	21.908	0.046	1882194	4820	27215.74	29.01	351.3567	26.3281	357.8525	277.2307
B	21.908	0.046	1823008	4642	26358.62	26.49	335.4952	16.9554	-216.3640	267.4548
C	21.908	0.046	1848808	4678	26583.56	25.23	298.7621	13.9075	499.9916	265.5870
D	21.908	0.046	1829115	4608	26345.89	31.53	308.7195	11.7972	402.4065	276.2163
E	21.908	0.046	1853341	4647	26662.87	26.49	314.3466	20.3923	524.7565	282.8216
F	21.908	0.046	1836180	4578	26431.25	27.75	298.5481	14.4359	429.2758	269.7220
G	21.908	0.046	1851839	4568	26533.30	27.75	287.8353	11.9856	316.2496	276.9049
H	21.908	0.046	1835069	4517	26507.33	23.97	333.3426	12.6645	-47.4082	262.9604
I	21.908	0.046	1759270	4314	25407.25	26.49	310.8344	16.0423	285.7348	276.4680
J	21.908	0.046	1824960	4462	26125.80	26.49	309.5126	9.6989	-118.1079	274.1718
K	21.908	0.046	1781816	4340	25719.82	25.23	228.2541	31.9311	408.6457	271.1057
L	21.908	0.046	1686590	4106	24365.81	25.23	291.1964	17.2329	-8.8406	268.7778
M	21.908	0.046	1377290	3359	20229.00	25.23	248.0180	13.2674	-169.2600	274.5139
N	21.908	0.046	1310421	3204	18807.91	21.45	227.8890	15.0913	-99.6207	275.1076
O	21.908	0.046	1446050	3518	20733.34	22.71	245.0723	12.5984	24.3670	282.4567
P	21.908	0.046	1577984	3832	22623.96	22.71	245.2988	11.8310	-28.8128	270.0196
Q	21.908	0.046	1626937	3953	23455.36	25.23	301.5315	16.2541	155.2283	277.4680
R	21.908	0.046	1600418	3893	22917.99	25.23	270.8157	16.2541	89.8594	277.4939
S	21.908	0.046	1571195	3838	22578.38	25.23	245.0471	12.9869	-320.9640	271.5154
T	21.908	0.046	1186370	2936	17404.16	25.23	205.4815	12.5052	134.4564	274.7283
U	21.908	0.046	1573846	3896	22667.53	23.97	270.7150	10.8962	-247.1022	274.5089
V	21.908	0.046	1449321	3608	20940.81	22.71	227.1463	10.8962	5.5683	276.7442
W	21.908	0.046	1605457	4001	23359.85	21.45	283.0265	17.1883	178.3033	272.6874
X	21.908	0.046	1250321	3157	18191.05	18.93	253.3177	22.9176	-694.6636	268.2259
B75A										
A	22.161	0.050	665776	1725	9908.50	15.15	143.8358	16.4757	-582.2801	221.4560
B	22.161	0.050	992321	2488	14630.74	18.93	144.8932	35.5985	-287.4200	229.0496
C	22.161	0.050	995008	2486	14637.55	17.67	195.4989	17.6976	-181.2893	221.2427
D	22.161	0.050	887205	2210	13129.20	17.67	195.6877	16.1527	-608.0453	219.6312
E	22.161	0.050	1078210	2625	15808.56	22.71	150.9735	8.4248	244.4178	224.2026
F	22.161	0.050	1041280	2526	15276.23	18.93	150.4951	12.3045	355.6419	224.1303

Sample No.[a]	Rel. Isot. Abun.[c]		Derived Results											
	^{36}Ar		^{39}Ar %	%(^{36}Ar)	Ca/K		Cl/K		$^{40}Ar^{*}/^{39}$Ar		%$^{40}Ar^{*}$	Age (Ma)		w/±*J*
	cps	±1σ	total	Ca	±1σ		±1σ		±1σ				±1σ	±1σ
F122B														
A	11.7139	2.6449	5.1	-0.4	-0.0170	0.0217	0.0010	2.E-06	70.2417	0.3770	99.8	1671	6	6
B	12.5756	2.6450	4.8	-0.3	-0.0162	0.0239	0.0096	2.E-06	70.0172	0.3741	99.7	1668	6	6
C	18.7715	2.9670	4.9	-0.7	-0.0483	0.0227	0.0074	2.E-06	70.2290	0.3731	99.6	1671	6	6
D	20.0007	2.5504	4.1	-0.4	-0.0321	0.0259	0.0157	3.E-06	69.2024	0.3675	99.5	1655	6	6
E	21.2173	2.8609	4.5	0.1	0.0066	0.0244	0.0130	2.E-06	70.1828	0.3701	99.5	1670	6	6
F	23.8609	2.9860	4.4	0.1	0.0102	0.0250	0.0096	3.E-06	70.4184	0.3693	99.4	1674	6	6
G	225.7567	3.6712	4.5	0.0	-0.0265	0.0244	0.0105	3.E-06	69.6684	0.3822	94.8	1662	6	7
H	80.3451	3.3584	4.3	-0.1	-0.0349	0.0262	0.0214	3.E-06	69.5700	0.3666	98.0	1661	6	6
I	9.1384	2.8698	4.2	-0.5	-0.0182	0.0259	0.0112	3.E-06	69.3938	0.3566	99.8	1658	6	6
J	18.0345	2.7789	4.3	0.3	0.0188	0.0246	0.0195	3.E-06	69.9584	0.3621	99.5	1667	6	6
K	3.8349	3.0714	4.4	-3.4	-0.0537	0.0248	0.0162	3.E-06	70.6173	0.3606	99.9	1677	6	6
L	80.8938	3.0474	4.5	-0.1	-0.0394	0.0241	0.0147	2.E-06	70.4086	0.3650	98.1	1674	6	6
M	6.0839	2.7554	4.2	0.3	0.0070	0.0248	0.0037	3.E-06	70.2949	0.3583	99.8	1672	6	6
N	5.9028	2.6515	2.2	-1.0	-0.0494	0.0459	0.0119	5.E-06	70.3253	0.3825	99.7	1673	6	7
O	1.9987	2.6483	4.2	-1.9	-0.0161	0.0245	0.0019	3.E-06	70.4371	0.3571	99.9	1674	6	6
P	3.6723	2.6506	4.3	-1.5	-0.0237	0.0244	0.0053	2.E-06	70.5915	0.3568	99.9	1677	6	6
Q	6.6935	2.6543	4.2	0.5	0.0154	0.0263	0.0088	3.E-06	70.8275	0.3577	99.8	1680	6	6
R	-0.1308	2.7531	4.1	88.5	-0.0510	0.0271	0.0074	3.E-06	70.5267	0.3588	100.0	1676	6	6
S	32.4909	2.9026	4.0	-0.4	-0.0535	0.0276	-0.0018	3.E-06	68.9953	0.3570	99.1	1652	6	6
T	3.5865	2.7754	4.2	-4.2	-0.0659	0.0277	0.0050	3.E-06	69.1293	0.3548	99.9	1654	6	6
U	15.8689	3.0945	2.9	-0.4	-0.0436	0.0352	0.0045	4.E-06	69.7349	0.3742	99.4	1663	6	6
V	44.0065	3.1237	3.7	-0.3	-0.0593	0.0282	0.0110	3.E-06	70.0158	0.3716	98.7	1668	6	6
W	0.8123	3.0839	3.9	-1.5	-0.0055	0.0268	-0.0001	3.E-06	69.8924	0.3659	100.0	1666	6	6
X	-8.5181	3.1844	3.9	0.2	-0.0085	0.0278	-0.0044	3.E-06	70.7698	0.3714	100.2	1679	6	6
S92C														
A	21.6678	3.3194	0.4	0.5	0.0258	0.0200	0.0122	2.E-06	68.9196	0.1952	99.7	1660	3	4
B	10.9856	3.1781	0.4	-0.5	-0.0161	0.0199	0.0116	2.E-06	69.0335	0.1927	99.8	1662	3	4
C	19.0832	3.1129	0.4	0.7	0.0369	0.0196	0.0024	2.E-06	69.3322	0.1911	99.7	1667	3	4
D	4.1467	3.0523	0.4	2.7	0.0299	0.0205	0.0059	2.E-06	69.3791	0.1967	99.9	1667	3	4
E	16.4713	3.0984	0.4	0.9	0.0386	0.0208	0.0058	2.E-06	69.3254	0.1906	99.7	1667	3	4
F	-1.8318	3.0273	0.4	-6.5	0.0318	0.0200	0.0036	2.E-06	69.4899	0.1910	100.0	1669	3	4
G	15.2209	2.9352	0.4	0.6	0.0234	0.0205	0.0002	2.E-06	69.6203	0.1899	99.8	1671	3	4
H	4.3325	3.0862	0.4	-0.3	-0.0035	0.0194	0.0109	2.E-06	69.1770	0.1848	99.9	1664	3	4
I	12.5674	3.0181	0.4	0.6	0.0220	0.0213	0.0085	2.E-06	69.0938	0.1878	99.8	1663	3	4
J	14.7814	3.1239	0.4	-0.2	-0.0089	0.0206	0.0062	2.E-06	69.6804	0.1882	99.8	1672	3	4
K	16.5119	3.0329	0.4	0.7	0.0311	0.0207	-0.0115	2.E-06	69.0851	0.1853	99.7	1663	3	4
L	1.0215	3.0736	0.4	-0.2	-0.0007	0.0216	0.0074	2.E-06	69.2042	0.1870	100.0	1665	3	4
M	7.9380	3.0253	0.3	-0.6	-0.0164	0.0266	0.0088	3.E-06	67.9639	0.1917	99.8	1645	3	4
N	13.2710	3.1382	0.3	-0.2	-0.0104	0.0287	0.0076	3.E-06	69.4598	0.1944	99.7	1669	3	4
O	3.3018	3.1976	0.3	0.2	0.0023	0.0267	0.0065	3.E-06	69.6950	0.1917	99.9	1672	3	4
P	1.8608	3.0980	0.3	-0.4	-0.0025	0.0234	0.0008	2.E-06	69.7207	0.1878	100.0	1673	3	4
Q	11.3232	3.1344	0.4	0.4	0.0130	0.0232	0.0122	2.E-06	69.2171	0.1886	99.8	1665	3	4
R	-1.7039	3.1837	0.3	-1.5	0.0077	0.0237	0.0067	2.E-06	69.8523	0.1911	100.0	1675	3	4
S	0.3671	2.8890	0.3	-24.4	-0.0279	0.0236	0.0009	2.E-06	69.5788	0.1908	100.0	1671	3	4
T	5.3234	3.1049	0.3	0.7	0.0151	0.0309	0.0062	3.E-06	68.0727	0.2026	99.9	1647	3	4
U	21.1443	3.1751	0.3	-0.3	-0.0214	0.0237	0.0063	2.E-06	69.1490	0.1914	99.6	1664	3	4
V	16.4897	3.3599	0.3	0.0	0.0005	0.0259	0.0000	3.E-06	68.9723	0.1939	99.7	1661	3	4
W	4.2641	3.1149	0.3	1.2	0.0150	0.0229	0.0082	2.E-06	68.6709	0.1868	99.9	1656	3	4
X	14.0797	3.0604	0.3	-1.4	-0.0748	0.0289	0.0183	3.E-06	68.4942	0.1943	99.7	1653	3	4
B75A														
A	7.8848	3.2029	4.1	-2.1	-0.1152	0.0438	0.0217	4.E-06	66.9448	0.2239	99.6	1641	4	4
B	0.6333	2.9849	6.1	-12.7	-0.0385	0.0307	-0.0048	3.E-06	67.8058	0.2009	100.0	1655	3	4
C	18.2468	3.1448	6.1	-0.3	-0.0243	0.0296	0.0144	3.E-06	67.6000	0.1991	99.5	1652	3	4
D	16.2935	3.1323	5.5	-1.0	-0.0908	0.0328	0.0235	3.E-06	67.1960	0.2040	99.4	1645	3	4
E	0.8655	2.9713	6.6	7.9	0.0303	0.0278	-0.0069	3.E-06	68.1867	0.2008	100.0	1661	3	4
F	9.1706	2.9102	6.4	1.1	0.0456	0.0288	-0.0057	3.E-06	67.9841	0.1941	99.7	1658	3	4

Sample No.[a]	Background Relative Isotopic Abundances									
	^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd	
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
F122B										
A	11428	370	22.0	0.7	102.3	4.2	241.33	1.50	108.3	1.5
B	11428	370	22.0	0.7	102.3	4.2	241.33	1.50	108.3	1.5
C	11428	370	22.0	0.7	102.3	4.2	241.33	1.50	108.3	1.5
D	11428	370	22.0	0.7	102.3	4.2	241.33	1.50	108.3	1.5
E	11428	370	22.0	0.7	102.3	4.2	241.33	1.50	108.3	1.5
F	14660	300	23.4	0.9	98.4	7.1	241.10	1.50	119.3	1.7
G	14660	300	23.4	0.9	98.4	7.1	241.10	1.50	119.3	1.7
H	14660	300	23.4	0.9	98.4	7.1	241.10	1.50	119.3	1.7
I	14660	300	23.4	0.9	98.4	7.1	241.10	1.50	119.3	1.7
J	14660	300	23.4	0.9	98.4	7.1	241.10	1.50	119.3	1.7
K	14660	300	23.4	0.9	98.4	7.1	241.10	1.50	119.3	1.7
L	14783	350	22.8	0.8	124.7	8.7	241.19	1.40	120.5	1.5
M	14783	350	22.8	0.8	124.7	8.7	241.19	1.40	120.5	1.5
N	14783	350	22.8	0.8	124.7	8.7	241.19	1.40	120.5	1.5
O	14783	350	22.8	0.8	124.7	8.7	241.19	1.40	120.5	1.5
P	14783	350	22.8	0.8	124.7	8.7	241.19	1.40	120.5	1.5
Q	14783	350	22.8	0.8	124.7	8.7	241.19	1.40	120.5	1.5
R	14783	350	22.8	0.8	124.7	8.7	241.19	1.40	120.5	1.5
S	16309	360	23.8	0.9	139.7	6.7	243.14	1.40	122.5	1.7
T	16309	360	23.8	0.9	139.7	6.7	243.14	1.40	122.5	1.7
U	16309	360	23.8	0.9	139.7	6.7	243.14	1.40	122.5	1.7
V	16309	360	23.8	0.9	139.7	6.7	243.14	1.40	122.5	1.7
W	16309	360	23.8	0.9	139.7	6.7	243.14	1.40	122.5	1.7
X	16309	360	23.8	0.9	139.7	6.7	243.14	1.40	122.5	1.7
S92C										
A	18319	360	23.8	0.8	123.3	7.7	225.72	1.40	116.8	1.6
B	18319	360	23.8	0.8	123.3	7.7	225.72	1.40	116.8	1.6
C	18319	360	23.8	0.8	123.3	7.7	225.72	1.40	116.8	1.6
D	18319	360	23.8	0.8	123.3	7.7	225.72	1.40	116.8	1.6
E	18319	360	23.8	0.8	123.3	7.7	225.72	1.40	116.8	1.6
F	18319	360	23.8	0.8	123.3	7.7	225.72	1.40	116.8	1.6
G	14324	350	23.2	0.9	119.5	5.4	229.37	1.40	115.1	1.5
H	14324	350	23.2	0.9	119.5	5.4	229.37	1.40	115.1	1.5
I	14324	350	23.2	0.9	119.5	5.4	229.37	1.40	115.1	1.5
J	14324	350	23.2	0.9	119.5	5.4	229.37	1.40	115.1	1.5
K	14324	350	23.2	0.9	119.5	5.4	229.37	1.40	115.1	1.5
L	14324	350	23.2	0.9	119.5	5.4	229.37	1.40	115.1	1.5
M	11720	390	22.4	0.9	107.9	6.0	229.87	1.40	117.6	1.7
N	11720	390	22.4	0.9	107.9	6.0	229.87	1.40	117.6	1.7
O	11720	390	22.4	0.9	107.9	6.0	229.87	1.40	117.6	1.7
P	11720	390	22.4	0.9	107.9	6.0	229.87	1.40	117.6	1.7
Q	11720	390	22.4	0.9	107.9	6.0	229.87	1.40	117.6	1.7
R	11720	390	22.4	0.9	107.9	6.0	229.87	1.40	117.6	1.7
S	14447	390	24.9	0.9	117.0	8.2	232.50	1.20	115.9	1.5
T	14447	390	24.9	0.9	117.0	8.2	232.50	1.20	115.9	1.5
U	14447	390	24.9	0.9	117.0	8.2	232.50	1.20	115.9	1.5
V	14447	390	24.9	0.9	117.0	8.2	232.50	1.20	115.9	1.5
W	14447	390	24.9	0.9	117.0	8.2	232.50	1.20	115.9	1.5
X	14447	390	24.9	0.9	117.0	8.2	232.50	1.20	115.9	1.5
B75A										
A	13009	340	21.1	0.9	115.2	14.0	228.40	1.40	109.8	1.7
B	13009	340	21.1	0.9	115.2	14.0	228.40	1.40	109.8	1.7
C	13009	340	21.1	0.9	115.2	14.0	228.40	1.40	109.8	1.7
D	13009	340	21.1	0.9	115.2	14.0	228.40	1.40	109.8	1.7
E	13035	370	24.6	0.8	157.6	4.8	224.23	1.50	112.4	1.5
F	13035	370	24.6	0.8	157.6	4.8	224.23	1.50	112.4	1.5

Sample No.[a]	J[b]		Relative Isotopic Abundances[c]							
			^{40}Ar		^{39}Ar		^{38}Ar		^{37}Ar	
	(X 10^{-3})	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
B75A										
G	22.161	0.050	884872	2160	13070.38	18.93	134.0923	8.8433	429.9856	224.0012
H	22.161	0.050	720982	1782	10717.39	17.67	117.0979	14.6557	513.3849	223.9904
I	22.161	0.050	723960	1784	10810.95	17.67	95.6723	10.9295	87.6788	215.6556
J	22.161	0.050	918879	2222	13554.30	17.67	149.1859	12.7696	319.4449	223.3091
K	22.161	0.050	1041421	2511	15250.33	20.19	187.9836	15.3968	-32.6603	221.8502
L	22.161	0.050	992296	2405	14583.47	18.93	174.6776	15.2062	30.4269	230.2472
M	22.161	0.050	986290	2403	13726.98	18.93	187.5556	12.6853	331.5278	231.0973
N	22.161	0.050	962962	2357	14053.16	17.67	107.8832	31.8243	84.6263	222.6471
O	22.161	0.050	906522	2245	13388.06	18.93	154.8255	14.2819	-92.5829	230.6992
P	22.161	0.050	822493	2071	12195.43	16.41	128.0751	15.3968	337.8000	208.5547
Q	22.161	0.050	818783	2074	12103.14	17.67	128.7422	14.1923	-71.2197	231.5154
R	22.161	0.050	894042	2271	13295.90	21.45	162.5549	14.4627	13.5743	224.0604

Sample No.[a]	Rel. Isot. Abun.[c]		Derived Results											
	^{36}Ar		^{39}Ar %	%(^{36}Ar)	Ca/K		Cl/K		^{40}Ar*/^{39}Ar		%^{40}Ar*	Age (Ma)		w/±*J*
	cps	±1σ	total	Ca	±1σ		±1σ		±1σ				±1σ	±1σ
B75A														
G	2.6088	2.8804	5.4	4.6	0.0645	0.0336	-0.0028	3.E-06	67.6421	0.2031	99.9	1652	3	4
H	1.8724	2.8762	4.5	7.6	0.0939	0.0410	0.0012	4.E-06	67.2232	0.2154	99.9	1646	3	4
I	2.3628	2.9716	4.5	1.0	0.0159	0.0391	-0.0112	4.E-06	66.8980	0.2144	99.9	1640	3	4
J	0.5551	2.8700	5.6	16.1	0.0462	0.0323	0.0018	3.E-06	67.7803	0.1967	100.0	1655	3	4
K	1.6392	2.9513	6.4	-0.6	-0.0042	0.0285	0.0095	3.E-06	68.2533	0.1966	100.0	1662	3	4
L	3.8200	3.0581	6.1	0.2	0.0041	0.0309	0.0073	3.E-06	67.9618	0.1973	99.9	1657	3	4
M	179.3260	4.2477	5.7	0.1	0.0473	0.0330	0.0030	3.E-06	67.9504	0.2191	94.6	1657	3	4
N	20.4761	3.0361	5.9	0.1	0.0118	0.0311	-0.0196	3.E-06	68.0851	0.1991	99.4	1659	3	4
O	24.0342	3.0555	5.6	-0.1	-0.0136	0.0338	0.0031	3.E-06	67.1714	0.2044	99.2	1645	3	4
P	14.7052	2.8360	5.1	0.6	0.0543	0.0335	-0.0025	3.E-06	67.0832	0.2045	99.5	1643	3	4
Q	3.2115	2.7879	5.0	-0.6	-0.0115	0.0375	-0.0007	4.E-06	67.5675	0.2094	99.9	1651	3	4
R	11.1811	3.0114	5.5	0.0	0.0020	0.0330	0.0081	3.E-06	66.9882	0.2131	99.6	1642	3	4

Sample No.[a]	Background Relative Isotopic Abundances									
	^{40}Ar Bkgd		^{39}Ar Bkgd		^{38}Ar Bkgd		^{37}Ar Bkgd		^{36}Ar Bkgd	
	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ	cps	±1σ
B75A										
G	13035	370	24.6	0.8	157.6	4.8	224.23	1.50	112.4	1.5
H	13035	370	24.6	0.8	157.6	4.8	224.23	1.50	112.4	1.5
I	13035	370	24.6	0.8	157.6	4.8	224.23	1.50	112.4	1.5
J	13035	370	24.6	0.8	157.6	4.8	224.23	1.50	112.4	1.5
K	13149	380	22.0	0.9	136.5	10.0	225.18	1.30	108.7	1.5
L	13149	380	22.0	0.9	136.5	10.0	225.18	1.30	108.7	1.5
M	13149	380	22.0	0.9	136.5	10.0	225.18	1.30	108.7	1.5
N	13149	380	22.0	0.9	136.5	10.0	225.18	1.30	108.7	1.5
O	13149	380	22.0	0.9	136.5	10.0	225.18	1.30	108.7	1.5
P	13149	380	22.0	0.9	136.5	10.0	225.18	1.30	108.7	1.5
Q	13149	380	22.0	0.9	136.5	10.0	225.18	1.30	108.7	1.5
R	13149	380	22.0	0.9	136.5	10.0	225.18	1.30	108.7	1.5

Notes:

[a] Letters are used to name each UV laser spot analysis, corresponding to spot locations in Fig. 10 in the manuscript.

[b] Nominal J, reference to PP20 Hornblende flux monitor at 1074 ± 5 Ma (1σ, Jourdan et al., 2006).

[c] Relative isotopic abundances corrected for baseline, blank, and detector intercalibration. ^{39}Ar and ^{37}Ar are decay-corrected values. Relative abundances are not corrected for nuclear interference reactions. Negative values represent weak or non-existent signals that are near or below the limit of detection.

For each UV laser spot, the laser was rastered over a 50 X 50 µm area at 85% power, 10 µm beam diameter, 10 µm raster spacing and 20 Hz repetition rate, penetrating to an approximate depth of 10 µm.

Decay constants and isotopic abundances after Steiger and Jäger (1977).

Atmospheric argon ^{40}Ar/^{36}Ar = 298.56 (Lee et al., 2006)

Nucleogenic interference correction factors (±2σ):

(^{39}Ar/^{37}Ar)Ca = 0.0007 ± 0.00005

(^{36}Ar/^{37}Ar)Ca = 0.00028 ± 0.00016

(^{38}Ar/^{37}Ar)Ca = 0.00003 ± 0.00003

(^{40}Ar/^{39}Ar)K = 0.003 ± 0.005

(^{38}Ar/^{39}Ar)K = 0.011 ± 0.01

^{40}Ar* = radiogenic argon

CHAPTER 5

Conclusions

5.1. Tectonothermal evolution of Hall Peninsula

The results of geological mapping, petrology and isotopic dating conducted in this study have provided a clearer resolution of the tectono-metamorphic evolution of the northeastern Trans-Hudson Orogen (THO). The dominant regional deformation event on Hall Peninsula was east-directed crustal shortening (D_1). Early S_1 foliation developed at ca. 1860 Ma and is defined by inclusion trails of prograde-to-peak metamorphic minerals in garnet porphyroblasts. Regionally penetrative S_1 foliation and related D_1 fabrics formed during ca. 1860–1820 Ma and are defined by peak metamorphic assemblages. Concurrent with D_1, the thermal peak of metamorphism attained mid-amphibolite-facies conditions (~720–740ºC, ~6.25–7.25 kbar) on the eastern peninsula, transitioning to granulite-facies conditions (~810–890ºC, ~6.10–7.35 kbar) in the west. Grossular-enriched garnet cores suggest higher pressure conditions during the prograde evolution, consistent with a clockwise P–T history. Monazite dated *in situ* and depth profiling analyses of zircon rims resolve the age of high-grade metamorphism between ca. 1860–1820 Ma, which is interpreted to record: prograde (near-peak) metamorphism at ca. 1860 Ma; the thermal peak of metamorphism between ca. 1860–1820 Ma; and early (near-peak) cooling at ca. 1820 Ma. Based on zoning textures and trace element compositions of monazite and zircon, the ca. 1860–1820 Ma monazite domains and zircon rims likely grew through a combination of metamorphic growth reactions and coupled dissolution-reprecipitation. The second regional deformation event (D_2) is considered a subsequent phase of the east-directed shortening in D_1, and is characterized by east-vergent basement-involved folds and thrusts that have juxtaposed higher-grade rocks over lower-grade rocks. As D_2 is interpreted as syn- to post-thermal peak, ca. 1860 Ma monazite provides a maximum age constraint, and D_2 is likely recorded by ca. 1820 Ma monazite.

The third regional deformation event (D_3) on Hall Peninsula occurred post-thermal peak, forming map-scale, thick-skinned folds with E-striking axial planes. F_3-folded micaceous pelite contains decimetre-scale F_3 crenulations that are typically S-vergent, suggesting that D_3 represents S-vergent crustal shortening. Post-S_1, post-thermal peak biotite throughout the peninsula and muscovite in the mid-amphibolite-facies zone are interpreted to have grown mainly through retrograde reversal of dehydration reactions. Muscovite grew as a syn- to post-D_3 phase.

The new data and mapping presented here and by the Canada-Nunavut Geoscience Office Hall Peninsula Integrated Geoscience Project (e.g., Machado et al., 2013; Steenkamp and St-Onge, 2014; Rayner, 2014, 2015; From et al., 2014) indicate strong similarities between the litho- and tectono-stratigraphy of Hall Peninsula and the Meta Incognita microcontinent (MIM) on southern Baffin Island. There is no apparent evidence for a crustal suture separating the two areas. The NNW–SSE-trending linear feature that appears to divide the peninsula on the magnetic susceptibility map (Fig. 1 in Chapter 1) was identified as the basement–cover contact between Archean basement in the east and Paleoproterozoic supracrustal rocks and intrusions on the western peninsula. The new data presented in this thesis demonstrate that regional amphibolite- to granulite-facies metamorphism and east–northeast-vergent crustal thickening on Hall Peninsula at ca. 1860–1820 Ma overlap temporally with granulite-facies metamorphism and southwest-vergent crustal thickening at ca. 1849–1835 Ma (St-Onge et al. 2007) on the MIM. As both areas experienced very similar depositional, magmatic and tectono-metamorphic events between ca. 2100 and 1800 Ma, Hall Peninsula can be considered to represent the eastern portion of the MIM. Additional discussion of the cratonic affinity of Archean basement on Hall Peninsula and possible tectonic plate configurations is provided further below.

The well-studied accretionary and collisional history of southern Baffin Island, although not entirely agreed upon (e.g., St-Onge et al., 2007; Corrigan et al., 2009; Berman et al., 2013), enables a discussion of tectonic events that potentially caused crustal thickening and metamorphism on Hall Peninsula (Fig. 1). On the MIM further south, regional metamorphism and deformation at ca. 1849–1835 Ma have been attributed to: (1) the Andean-type, northward-dipping subduction of oceanic crust and the eventual accretion of the Narsajuaq arc (intra-oceanic arc terrane) at ca. 1845 Ma; and (2) heat advection from the ca. 1865–1848 Ma Cumberland Batholith (St-Onge et al., 2007). The Narsajuaq arc in this model is considered to be an intra-oceanic arc terrane that formed outboard of the MIM southern margin, and was built on ca. 2.0 Ga oceanic crust (Watts Group) and topped by the sedimentary Parent and Spartan Groups (St-Onge et al., 1992, 2006). This package of rocks is referred to as the Parent-Spartan-Watts collage in other studies (e.g., Corrigan et al., 2009; Berman et al., 2013), which also propose the accretion of this arc collage with the southern margin of the MIM at ca. 1844 Ma, resulting in metamorphism and deformation. Continental arc magmatism formed ca. 1836–1821 Ma intrusions (Narsajuaq arc, younger suite) that were emplaced into the upper-plate Sugluk block and MIM (St-Onge et al., 2007; Corrigan et al., 2009; Berman et al., 2013). In an alternative model proposed by Corrigan et al. (2009), the Archean crystalline Sugluk block collided with the southern margin of the MIM between ca. 1865 and 1850 Ma, possibly causing or contributing to metamorphism and crustal thickening of the MIM. However, Nd isotopic studies of the Cumberland Batholith suggest that the Sugluk block had collided with the MIM prior to the onset of Cumberland Batholith magmatism, and possibly as early as ca. 1.9 Ga (Whalen et al., 2010; Wodicka et al., 2010).

Although the details of the tectonic models described above are not all in agreement, when taken together, the models all support the following: (i) the formation of an intra-oceanic arc

terrane (Narsajuaq arc or Parent-Spartan-Watts collage) outboard of the southern margin of the MIM (± the Sugluk block); (ii) north–northeastward subduction of oceanic crust (on the leading edge of the intra-oceanic arc terrane) beneath the southern margin of the MIM (± Sugluk block) in an Andean-type margin setting, beginning before ca. 1840 Ma and possibly as early as ca. 1870 Ma; and (iii) the eventual accretion of the intra-oceanic arc terrane to the MIM (± Sugluk block) at ca. 1844 Ma. In all proposed models, granulite-facies metamorphism and crustal thickening on the MIM are attributed to north–northeastward subduction and accretion of an arc terrane, with added heat advection from Cumberland Batholith magmatism (Fig. 1). This interpretation is supported by northeast-dipping seismic discontinuities in the upper mantle beneath the southern MIM, which are inferred to represent the underthrust intra-oceanic arc terrane (Narsajuaq arc or Parent-Spartan-Watts collage) and Sugluk block (Snyder, 2010).

Therefore, the north–northeastward subduction and ca. 1844 Ma accretion of the arc terrane was probably also responsible for east–northeast-directed crustal shortening ($D_{1,2}$) and concurrent high-grade metamorphism on Hall Peninsula during ca. 1860–1820 Ma. Heat advection from the CB may have contributed to granulite-facies metamorphism on western Hall Peninsula, as has been proposed on the MIM (St-Onge et al., 2007). The eastward decrease in peak metamorphic grade probably reflects the lower degree of heating and crustal thickening with increasing distance from the Andean-type margin and the Cumberland Batholith. Furthermore, the supracrustal sequences that are now preserved on the eastern peninsula, including mostly pelite, calc-silicate and amphibolite, form packages up to ~10 km thick that are deposited on and structurally interleaved with Archean basement. This implies that the eastern supracrustal sequences were thinner than those on the western peninsula, where west-dipping supracrustal strata are continually exposed over ~50 km, along with subordinate Paleoproterozoic intrusions, but with no exposed

Archean basement. Thicker supracrustal deposits on the western peninsula may have also contributed to a greater degree of crustal thickening than farther east. The contrasting east–northeastward and south–southwestward vergence of syn-metamorphic structures on Hall Peninsula and the southern MIM, respectively, may be analogous to other doubly verging orogens. For instance, thrusts in the Andes can have oceanic transport directions on the coastal side of the orogen, and continental vergence on the inland flank of the orogen (e.g., Ruiz et al., 2004).

As discussed in Chapters 2 and 3, regionally extensive ca. 1800–1750 Ma monazite domains and zircon rims on Hall Peninsula formed post-thermal peak with no coeval fabric development, probably through a combination of retrograde reactions and fluid-assisted coupled dissolution-reprecipitation. The U–Pb and $^{40}Ar/^{39}Ar$ data presented here and in other studies (Scott, 1999; Rayner, 2014, 2015) suggest that Hall Peninsula underwent slow cooling at 1–2°C/Myr following peak metamorphism and was at amphibolite-facies conditions (≥ 600°C) at ca. 1800 Ma. Sufficient fluids were available after the thermal peak to enable limited retrograde biotite growth in granulite- and upper-amphibolite-facies zones, and retrograde muscovite and biotite growth in the eastern mid-amphibolite-facies zone, but there were insufficient fluids available for significant retrogression to lower temperature assemblages (e.g., chlorite). Therefore, the ca. 1800 Ma and younger zircon and monazite are interpreted to have formed during slow cooling after peak metamorphism, resulting from: (i) retrograde reactions related to melt crystallization and/or garnet resorption; and (ii) coupled dissolution-reprecipitation, which was enabled by prolonged amphibolite-facies temperatures (during slow cooling) accompanied by the minimum amount of fluids necessary to facilitate the process.

It is likely that monazite and zircon began to recrystallize at ca. 1800 Ma in response to the docking of the lower-plate Superior craton with the upper-plate Churchill domain (ca. 1820–1795

Ma; Wodicka and Scott, 1997; St-Onge et al., 2007). This terminal collision of the THO caused amphibolite-facies metamorphism and local re-orientation of pre-existing structures on the southern MIM, and produced ca. 1820–1813 Ma monazite and zircon ages (Wodicka and Scott, 1997; St-Onge et al., 2007). As Hall Peninsula is farther away from terminal collisional zone, the amphibolite-facies overprint and deformation associated with the docking of the Superior craton may not be as evident as on the MIM. Furthermore, any such amphibolite-facies overprint would probably be indistinguishable from the retrograde amphibolite-facies assemblages on Hall Peninsula, especially since there is no fabric linked to the terminal collision. Nonetheless, it is unlikely that Hall Peninsula would have been immune to the effects of the terminal collision, and the docking of the Superior craton may have provided additional strain that catalyzed dissolution-reprecipitation processes, without producing a distinct fabric.

Since F_3 folds on Hall Peninsula deformed T_2 thrusts, the post-thermal peak D_3 event is considered to have occurred after ca. 1820 Ma, but the minimum age limit of D_3 is poorly constrained. Evidence of leucosome (Qz+Pl) along F_3 axial planes (Skipton and St-Onge, 2014) near sample F122B implies that D_3 occurred at temperatures above the solidus (~650°C; Chapter 2). Thus, D_3 probably occurred prior to ca. 1742–1730 Ma, the U–Pb age of titanite on the eastern peninsula (Scott, 1999), based on a closure temperatures of ~550–650°C for Pb in titanite (Cherniak, 1993; Hawkins and Bowring, 1999). The ca. 1691 Ma $^{40}Ar/^{39}Ar$ step-heating age of muscovite in sample F122B, in which ~85% of muscovite is retrograde and syn- to post-D_3, provides a younger age limit for D_3. The E–W strike of F_3 axial planes, and their typical S-vergence, suggests that D_3 represents south-directed compression. Therefore, a logical explanation for D_3 on Hall Peninsula is the approximately north–south-directed docking of the Superior craton

during the THO terminal collision. Dating an intrusion that cross-cuts an F_3 fold would constraining the age of D_3 and enable a more confident interpretation of late-orogenic tectonism.

The formation of post-1800 Ma monazite and zircon domains during slow cooling of Hall Peninsula was accompanied by the emplacement of regionally-occurring, post-kinematic granitic dykes, which have been tentatively dated by Bigio and Lentz (2015) at ca. 1800 Ma. Elsewhere in the internal zone of the THO on southern Baffin Island and northern Quebec, similar dykes were emplaced during ca. 1795–1758 Ma (St-Onge et al., 2006, 2007). Farther north in the Repulse Bay area of Melville Peninsula (Rae craton, northeastern THO), post-kinematic ≤1800 Ma granitic pegmatite-aplite dykes are attributed to crustal melts that formed during exhumation (Laflamme et al., 2014). Late-stage granitic pegmatites on Hall Peninsula could possibly have resulted from exhumation of pelitic lithologies at depth along near-isothermal decompressional P–T paths that intersected dehydration reactions (e.g., Bickford et al., 1990; McFarlane, 2015).

Apparent $^{40}Ar/^{39}Ar$ step-heating ages of biotite (ca. 1788–1622), muscovite (ca. 1729–1657 Ma) and phlogopite (ca. 1720–1630 Ma) are somewhat variable, but most apparent ages are between ca. 1700–1670 Ma. Incorporation of excess Ar is likely, particularly in biotite samples with step-heating ages that are similar to or older than U–Pb titanite and monazite/zircon ages. The preferred cooling evolution is therefore interpreted from UV laser transects and step-heating ages of three muscovite samples, together with similar step-heating ages in other samples. Corresponding numerical diffusion models suggest that Hall Peninsula cooled at slow rates of ~1–2ºC/Myr following peak metamorphism and rates of ~1.5–2.5ºC/Myr after ca. 1736 Ma. Therefore, the study area remained hotter than ~420ºC (the nominal closure temperature of Ar in muscovite) for ~150–200 Myr after the thermal peak of metamorphism.

5.2. Implications for tectonic plate configuration

The new U–Pb and $^{40}Ar/^{39}Ar$ ages presented here show that Hall Peninsula shares a similar tectonothermal history with the rest of the MIM, as well as with the Aasiaat domain of West Greenland and parts of the Torngat Orogen in northern Labrador. These areas all record peak metamorphism and maximum crustal thickening between ca. 1870 Ma and 1830 Ma, followed by late- to post-orogenic tectonothermal activity (ca. 1800–1750 Ma) and apparent slow cooling through the closure temperatures of Ar (refer to Fig. 3 in Chapter 4 and references therein).

As discussed above, strikingly similar lithostratigraphic, magmatic and tectono-metamorphic evolutions suggest that Hall Peninsula represents the northeastern portion of the MIM. However, it is uncertain whether Hall Peninsula and the southern MIM on Baffin Island are underlain by equivalent Archean cratonic basement, or whether their underlying basement instead represents two distinct cratonic blocks that have been sutured. Paleoproterozoic (ca. 1870–1850 Ma) intrusions hosted by strata on western Hall Peninsula probably represent the eastern continuation of the ca. 1865–1848 Ma Cumberland Batholith (Scott, 1999; Rayner, 2014, 2015), although no geochemical comparison has yet been done. Thus, if a pre-1865 Ma suture zone existed between Hall Peninsula and MIM basement blocks, it likely would have been intruded and effectively erased by the Cumberland Batholith. Stratigraphic relationships of Paleoproterozoic supracrustal successions may shed light on the cratonic configuration and basement continuity between the MIM and Hall Peninsula. The Lake Harbour Group was deposited on the MIM during ca. 1934–1880 Ma as a stratigraphically north-facing continental margin and foredeep sequence (Scott et al., 2002). On Hall Peninsula, supracrustal sequences with maximum depositional ages of ca. 2126–1906 Ma (Scott, 1999; Rayner, 2014, 2015) show a gradational change from west to east, from successions of dominantly pelite and psammite to heterogeneous sequences with greater

proportions of mafic units, calc-silicate, ironstone and basal quartzite. Steenkamp and St-Onge (2014) suggest that Hall Peninsula supracrustal rocks record a proximal shallow-marine to more distal continental-shelf and slope-rise setting, with mafic material from a possible local rifting environment. Samples of mafic sills/flows from supracrustal sequences throughout the peninsula have intermediate geochemistry between volcanic-arc basalts and within-plate basalts, suggesting derivation from subduction-modified mantle beneath Hall Peninsula basement (MacKay and Ansdell, 2014). Regional stratigraphic reconstructions and correlations of the supracrustal successions are beyond the scope of this thesis, but would likely help to elucidate the Paleoproterozoic configuration of Hall Peninsula and the MIM. Geochemical and isotopic (e.g., Nd) investigations of Paleoproterozoic intrusions on Hall Peninsula would provide new insights into magmatic source material, potentially including assimilation of Archean basement. This information could be used to evaluate the basement underlying Hall Peninsula and the MIM, particularly when compared with existing Nd isotopic data from the Cumberland Batholith (e.g., Whalen et al., 2010).

The new data presented in this thesis support previous proposals that the basement and cover units of Hall Peninsula may also be correlative with those of the Aasiaat domain (Scott, 1999; St-Onge et al., 2009). Contrasting structural deformation in the two areas could be due to competing principal stress directions during temporally overlapping accretionary events between ca. 1860 and 1840 Ma: Hall Peninsula experienced east-directed compression due to the accretion of an intra-oceanic arc to the MIM, whereas the Aasiaat domain underwent northwest-vergent compression due to the accretion of the North Atlantic craton (St-Onge et al., 2009 and references therein).

Aeromagnetic data indicates that the Paleoproterozoic Tasiuyak paragneiss and the Archean–Paleoproterozoic Core Zone of northern Labrador extend northward to Baffin Island

(Bourlon et al., 2002). These geophysical trends suggest that the Archean basement and Paleoproterozoic cover rocks of the Core Zone may connect with those of the MIM (Corrigan et al., 2009), and, potentially, Hall Peninsula. The geophysical data imply that the Tasiuyak paragneiss may be continuous with the Paleoproterozoic supracrustal sequences of Hall Peninsula, as has been proposed by previous studies on the basis of detrital zircon ages (Scott, 1999; Scott et al., 2002).

The available evidence suggests that Hall Peninsula basement is most likely to share cratonic affinity with Archean basements of the MIM, Aasiaat domain and/or the Core Zone. Resolving the regional tectonic evolution of the northeastern THO is beyond the scope of this study, but the new petrological, geochronological and thermochronological data presented here are an important piece of the puzzle. Isotopic, geochemical and geochronological fingerprinting of Hall Peninsula basement is the focus of an ongoing PhD study at the University of Manitoba (e.g., From et al., 2014). Comparisons with neighboring Archean cratonic blocks are required to determine the cratonic affinity and parentage of Hall Peninsula. Additionally, regional lithostratigraphic correlations of Paleoproterozoic supracrustal sequences on the MIM, Hall Peninsula, Aasiaat domain, Core Zone and Torngat Orogen should help to elucidate the tectonic configuration of these terranes. Finally, considering the competing stress directions resulting from contemporaneous accretionary events, a synthesis of the regional structural data may contribute to resolving the tectonic evolution.

5.3. Trans-Hudson Orogen: large and hot, but with no collapse?

As discussed in Chapter 1, large, hot orogens (LHOs) are characterized by high heat content and thickened orogenic crust that becomes thermally weakened and flows laterally under

gravitational or tectonic forcing (e.g., Grenville and Himalayan orogens; Beaumont et al., 2006; Jamieson et al., 2011). The results of this thesis show that the Hall Peninsula portion of the THO underwent significant crustal thickening during orogenesis, reaching a crustal thickness of at least ~58–74 km, and experienced granulite-facies conditions that extend further southwest on the MIM. As a whole, the THO experienced widespread amphibolite- to granulite-facies metamorphism and the emplacement of voluminous batholiths (Cumberland, Wathaman–Chipewyan). This suggests that the THO reached high temperatures on the orogen-scale that are comparable to those of LHOs. The overall crustal thickness attained by the THO during orogenesis is estimated at ~52–58 km (Corrigan et al., 2009), somewhat thinner than the ~60–70 km crustal thickness that is typical of LHOs. Nonetheless, the ~58–74 km estimated orogenic crustal thickness of Hall Peninsula, as well as pressure estimates of 8–9 kbar elsewhere in the Quebec–Baffin segment (e.g., St-Onge et al., 2007), indicate that portions of the THO reached LHO-scale crustal thicknesses.

It is important to note the significant uncertainties involved in estimates of orogenic crustal thicknesses. For instance, the range of pressure estimates during the thermal peak on Hall Peninsula (~6.1–7.35 kbar) correspond to a ~14 km range in estimated crustal thicknesses. Metamorphic pressures estimated from phase diagram models have typical 1σ uncertainties of ±0.5 kbar, and conventional geobarometry can have significantly higher uncertainties depending on the degree of equilibration. On Hall Peninsula, grossular-enriched garnet cores hint at greater pressures during prograde metamorphism, but quantifying such pressure conditions is difficult or impossible due to homogenization of garnet and probable melt loss during the thermal peak. Therefore, maximum pressure estimates and crustal thicknesses are uncertain in areas that have reached mid-amphibolite-facies conditions or higher. Such conditions were attained by most of the THO, meaning that the predominant crustal thickness of the THO of ~52–58 km estimated by

Corrigan et al. (2009) is probably a minimum. Therefore, it is possible that the predominant crustal thickness attained by the THO was greater than 58 km, and comparable to the ~70 km crust of LHOs.

A key feature of a LHO is post-orogenic extension or gravitational collapse, whereby the LHO becomes so thickened and thermally weakened that it is gravitationally unstable, and undergoes extension and rapid exhumation with the cessation of compression (e.g., Leech, 2001; Rivers, 2008, 2012). However, the $^{40}Ar/^{39}Ar$ data presented in this thesis indicate that Hall Peninsula cooled slowly and records no apparent evidence of extensional structures. This is in accordance with the THO overall (refer to Fig. 3 in Chapter 4, and references therein), suggesting that the orogen did not collapse. This implies that overall crustal thicknesses and thermal weakening may have been insufficient for orogen-wide gravitational instability during the terminal phase of the THO, and that it may not meet the classic definition of a LHO. High temperatures may not have been extensive enough to result in orogen-scale thermal weakening. Perhaps the THO mostly reached crustal thicknesses of just ~52–58 km, as estimated by Corrigan et al. (2009), with only localized occurrences of thicker crust, such as on Hall Peninsula.

It is worth considering, however, several factors that leave room for an alternate interpretation in which the THO may have attained crustal thicknesses and temperatures comparable to LHOs, but did not undergo orogenic collapse. Thermal weakening of LHOs is typically manifested by significant anataxis and the development of ductile subhorizontal mid-crustal flow ("channel flow"; Grujic et al., 2002; Beaumont et al., 2006). Despite widespread high-grade metamorphism, channel flow has not been identified on Hall Peninsula or elsewhere in the THO (e.g., St-Onge et al., 2006), which may have been a contributing factor to the apparent gravitational stability of the orogen. The absence of evidence for channel flow and widespread

melt weakening may be attributed to lower melt volumes relative to the Himalayan Orogen (St-Onge et al., 2006). Furthermore, the lithological architecture of the THO may have resulted in greater rheological competence relative to typical LHOs. For instance, the voluminous Cumberland Batholith crystallized during ca. 1865–1848 Ma, mostly preceding crustal thickening and peak metamorphism on the MIM and Hall Peninsula. Even if not fully crystallized, the batholith may have been more competent that the surrounding supracrustal rocks, impeding the development of a laterally continuous mid-crustal channel. Additionally, following the thermal peak, crystallized batholiths (Cumberland, Wathaman–Chipewyan) would have formed extensive portions of relatively strong crust. Granulite-facies strata, such as those on the MIM and Hall Peninsula, may have been relatively strong during the late- to post-orogenic stage since they are quite dry and contain ~20–50 vol% crystallized granitic leucosome. Even if the THO attained temperatures and crustal thicknesses comparable to LHOs, it may have remained gravitationally stable during its terminal phase due to the interplay between the development of its lithological and rheological architecture and the timing of accretionary/collisional events.

It is possible that extensional structures and localized rapid cooling rates, such as those in the Grenville Orogen (e.g., Rivers, 2012), do exist in the THO but have not been encountered or recognized due to the THO's polydeformational history and vast extent in relatively inaccessible areas. In particular, despite the best efforts of this research, there is a marked scarcity of $^{40}Ar/^{39}Ar$ and other low-temperature ages in the northeastern THO. Additional $^{40}Ar/^{39}Ar$ may help to confirm whether the THO underwent orogen-wide slow cooling, or whether rapid exhumation may have occurred, perhaps along extensional faults.

The tectonic evolution of the THO may be further resolved through additional mapping, petrology and geochronological/thermochronological studies of poorly understood areas, as has

been completed on Hall Peninsula for this thesis. Significant insights may be gained by applying recent developments in numerical models, including modeling P–T histories using up-to-date phase equilibria and new P–T estimation methods. As demonstrated in Chapter 4, modeling isotopic diffusion in mineral grains to interpret $^{40}Ar/^{39}Ar$ ages and quantify cooling rates is crucial for investigating exhumational processes. The available evidence suggests that the THO did not undergo orogen-wide extension (collapse), despite achieving temperatures and crustal thicknesses that are comparable to LHOs. Numerical geodynamic models of crustal-scale orogenic processes in the THO could be the key to investigating this apparent paradox, and may yield additional important implications for the tectonothermal evolution of continental collisional orogens in general.

References

Beaumont, C., Nguyen, M.H., Jamieson, R.A., Ellis, S., 2006. Crustal flow modes in large hot orogens, in: Law, R.D., Searle, M.P., Godin, L. (Eds) *Channel flow, Ductile Extrusion and Exhumation in Continental Collision Zones*. Geological Society, London, Special Publications 268, 91–145.

Berman, R.G., Sanborn-Barrie, M., Rayner, N., Whalen, J., 2013. The tectonometamorphic evolution of Southampton Island, Nunavut: Insight from petrologic modeling and in situ SHRIMP geochronology of multiple episodes of monazite growth. Precambrian Research 232, 140–166.

Bickford, M.E., Collerson, K.D., Lewry, J.F., Van Schmus, W.R., Chiarenzelli, J.R., 1990. Proterozoic collisional tectonism in the Trans-Hudson orogen, Saskatchewan. Geology 18, 14–18.

Bigio, A., Lentz, D., 2015. Preliminary lithogeochemistry and geochronology of pegmatites of the Hall Peninsula, Baffin Island, Nunavut: implications for REE mineralization potential, in: Summary of Activities 2015, Canada-Nunavut Geoscience Office, 11–20.

Bourlon, E., Mareschal, J.C., Roest, W.R., Telmat, H., 2002. Geophysical correlations in the Ungava Bay area. Canadian Journal of Earth Sciences 39, 625–637.

Cherniak, D.J., 1993. Pb diffusion in titanite and preliminary results on the effects of radiation damage on Pb transport. Chemical Geology 110, 177–194.

Corrigan, D., Pehrsson, S., Wodicka, N., de Kemp, E., 2009. The Palaeoproterozoic Trans-Hudson Orogen: a prototype of modern accretionary processes. Geological Society, London, Special Publication 327, 457–479.

From, R.E., St-Onge, M.R., Camacho, A.L., 2014. Preliminary characterization of the Archean orthogneiss complex of Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 53–62.

Grujic, D., Hollister, L., Parrish, R., 2002. Himalayan metamorphic sequence as an orogenic channel: insight from Bhutan. Earth and Planetary Science Letters 198, 177–191.

Hawkins, D.P., Bowring, S.A., 1999. U-Pb monazite, xenotime and titanite geochronological constraints on the prograde to post-peak metamorphic thermal history of Paleoproterozoic migmatites from the Grand Canyon, Arizona. Contributions to Mineralogy and Petrology 134, 150–169.

Laflamme, C., Lentz, D., Corrigan, D., McFarlane, C., 2014. Petrology, geochemistry and geochronology of the granitic pegmatite-aplite dykes and sills of the Repulse Bay block, Melville Peninsula, Nunavut. Abstract Volume (Geological Association of Canada) GAC-MAC/AGC-AMC Joint Annual Meeting 37, p. 146.

Leech, M.L., 2001. Arrested orogenic development: eclogitization, delamination, and tectonic collapse. Earth and Planetary Science Letters 185, 149–159.

Machado, G., Bilodeau, C., Takpanie, R., St-Onge, M.R., Rayner, N.M., Skipton, D.R., From, R.E., MacKay, C.B., Creason C.G., Braden, Z.M., 2013. Hall Peninsula regional bedrock mapping, Baffin Island, Nunavut: summary of fieldwork, in: Summary of Activities 2012, Canada-Nunavut Geoscience Office, 13–22.

MacKay, C.B., Ansdell, K.M., 2014. Geochemical study of mafic and ultramafic rocks from southern Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada Nunavut Geoscience Office, 85–92.

McFarlane, C.R.M., 2015. A geochronological framework for sedimentation and Mesoproterozoic tectono-magmatic activity in lower Belt-Purcell rocks exposed west of Kimberley, British Columbia. Canadian Journal of Earth Sciences 52, 444–465.

Rayner, N.M., 2014. New U-Pb geochronological results from Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 39–52.

Rayner, N.M., 2015. New (2013-2014) U-Pb geochronological results from northern Hall Peninsula, southern Baffin Island, Nunavut, in: Summary of Activities 2014, Canada-Nunavut Geoscience Office, 31-44.

Rivers, T., 2008. Assembly and preservation of lower, mid, and upper orogenic crust in the Grenville Province – Implications for the evolution of large hot long-duration orogens. Precambrian Research 167, 237–259.

Rivers, T., 2012. Upper-crustal orogenic lid and mid-crustal core complexes: signature of a collapsed orogenic plateau in the hinterland of the Grenville Province. Canadian Journal of Earth Sciences 49, 1–42.

Ruiz, G.M.H., Seward, D., Winkler, W., 2004. Detrital thermochronology – A new perspective on hinterland tectonics, an example from the Andean Amazon Basin, Equador. Basin Research 16(3), 413–430.

Scott, D.J., 1999. U-Pb geochronology of the eastern Hall Peninsula, southern Baffin Island, Canada: a northern link between the Archean of West Greenland and the Paleoproterozoic Torngat Orogen of northern Labrador. Precambrian Research 93, 5–26.

Scott, D.J., Stern, R.A., St-Onge, M.R., McMullen, S.M., 2002. U–Pb geochronology of detrital zircons in metasedimentary rocks from southern Baffin Island: implications for the Paleoproterozoic tectonic evolution of Northeastern Laurentia. Canadian Journal of Earth Sciences 39, 611–623.

Skipton, D.R., St-Onge, M.R., 2014. Paleoproterozoic deformation and metamorphism in metasedimentary rocks west of Okalik Bay: a field template for the evolution of eastern Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 63–72.

Snyder, D.B., 2010. Mantle lithosphere structure beneath southeast Baffin Island, Nunavut, from teleseismic studies. Geological Survey of Canada Current Research 2010-8, 6 pp.

St-Onge, M.R., Searle, M.P., Wodicka, N., 2006. Trans-Hudson Orogen of North America and Himalaya–Karakorum–Tibetan Orogen of Asia: structural and thermal characteristics of the lower and upper plates. Tectonics 25, 1–22.

St-Onge, M.R., Lucas, S.B., Parrish, R.R., 1992. Terrane accretion in the internal zone of the Ungava orogen, northern Quebec: Part 1. Tectonostratigraphic assemblages and their tectonic implications. Canadian Journal of Earth Sciences 29, 746–764.

St-Onge, M.R., Wodicka, N., Ijewliw, O., 2007. Polymetamorphic evolution of the Trans-Hudson Orogen, Baffin Island, Canada: integration of petrological, structural and geochronological data. Journal of Petrology 48, 271–302.

St-Onge, M.R., Van Gool, J.A.M., Garde, A.A., Scott, D.J., 2009. Correlation of Archaean and Palaeoproterozoic units between northeastern Canada and western Greenland: constraining the pre-collisional upper plate accretionary history of the Trans-Hudson Orogen. Geological Society of London Special Publication 318, 193–235.

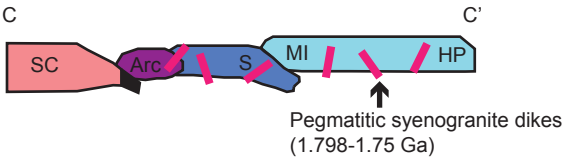
Steenkamp, H.M., St-Onge, M.R., 2014. Overview of the 2013 regional bedrock mapping program on northern Hall Peninsula, Baffin Island, Nunavut, in: Summary of Activities 2013, Canada-Nunavut Geoscience Office, 27–38.

Whalen, J.B., Wodicka, N., Taylor, B.E., Jackson, G.D., 2010. Cumberland Batholith, Trans-Hudson Orogen, Canada: Petrogenesis and implications for Paleoproterozoic crustal and orogenic processes. Lithos 117, 99-118.

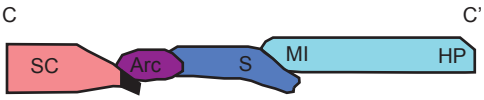
Wodicka, N., Scott, D.J., 1997. A preliminary report on the U–Pb geochronology of the Meta Incognita Peninsula, southern Baffin Island, Northwest Territories. Geological Survey of Canada Paper 1997-C, 167–178.

Wodicka, N., Whalen, J., St-Onge, M.R., Corrigan, D., 2010. Meta Incognita microcontinent revisited: insights from U–Pb geochronology and Nd isotopes. Geological Association of Canada – Mineralogical Association of Canada Abstract Volume 35.

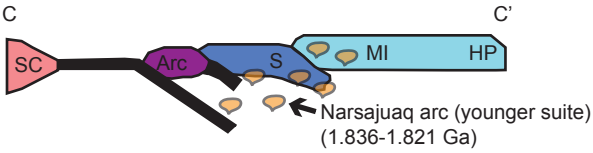
<1.80 Ga: Post-collisional uplift and cooling; emplacement of pegmatitic dikes



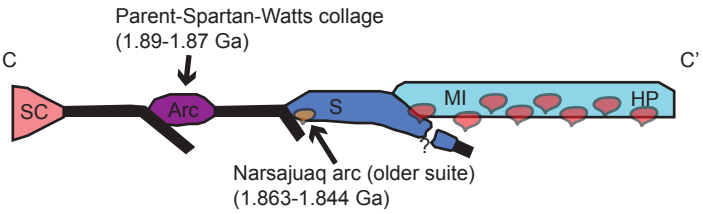
1.82-1.80 Ga: Continued convergence; collision of SC



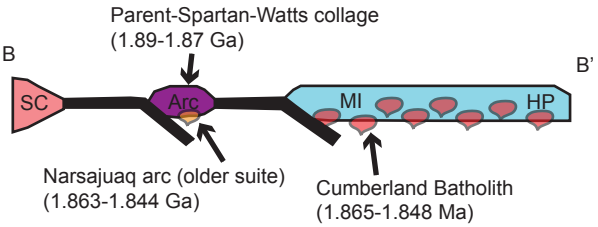
1.84-1.82 Ga: Accretion of intra-oceanic arc to MI; emplacement of Narsajuaq arc (younger suite)



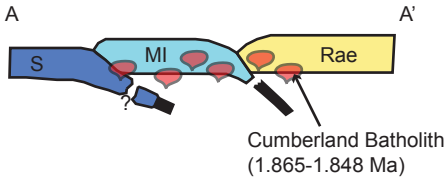
1.87-1.84 Ga: Intra-oceanic arc; emplacement of CB



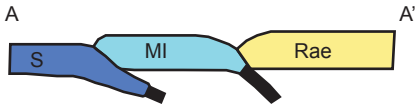
1.87-1.84 Ga: Intra-oceanic arc; emplacement of CB



1.87 Ga: Accretion of MI to Rae; slab break-off; CB magmatism begins



1.89 Ga: Subduction of MI under Rae; Sugluk block already accreted to MI



Hall Peninsula

< 1.80 Ga
Slow cooling and uplift

ca. 1.80 Ga
Post-thermal peak, post-D_1 Mnz & Zrc
S-directed compression (D_3) ?

ca. 1.82 Ga
Early cooling
Waning stages of D_1
Post-thermal peak D_2

ca. 1.85-1.83 Ga
Thermal peak
E-directed crustal shortening (D_{1+2})
Thick-skinned thrusting (D_2)

ca. 1.86 Ga
Prograde metamorphism, early D_1
Thin-skinned, E-directed folding

Mnz & Zrc U-Pb ages

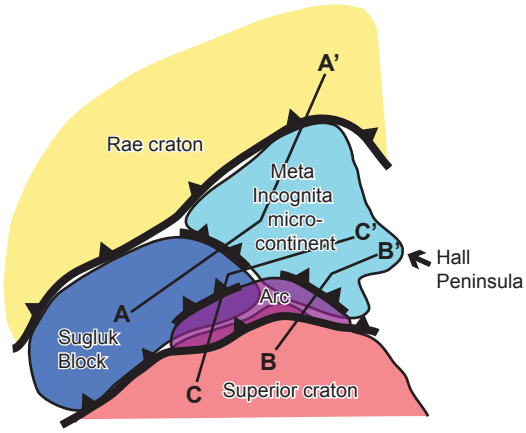


Fig. 1 (previous page): Schematic cross-sections illustrating the tectonic history of southern Baffin Island (modified after St-Onge et al., 2007; Corrigan et al., 2009; Berman et al., 2013) and the interpreted corresponding tectono-metamorphic events on Hall Peninsula. The inset map (bottom right) shows the locations of the cross-sections and the approximate present-day configuration of cratonic blocks, including the lower plate Superior craton and the upper plate Rae craton, Meta Incognita microcontinent and Sugluk block. Note the difference in Narsajuaq arc nomenclature/location between cross-section B-B' (St-Onge et al., 2007) and C-C' (Berman et al., 2013). Note that the accretion of the Sugluk block to the Meta Incognita microcontinent is proposed at 1.9 Ga in some studies (Wodicka et al., 2010; Berman et al., 2013), but at 1.865-1.85 Ga in Corrigan et al. (2009). All known models agree with the accretion of an intra-oceanic arc terrane (Narsajuaq arc and/or Parent-Spartan-Watts collage) to the Meta Incognita microcontinent at ca. 1.84 Ga. Abbreviations: S, Sugluk Block; MI, Meta Incognita microcontinent; Rae, Rae craton; CB, Cumberland Batholith; HP, Hall Peninsula; SC, Superior Craton.