GEOCHRONOLOGY AND PROVENANCE OF FOUR MESOPROTEROZOIC BASINS ACROSS THE SOUTHWEST UNITED STATES: EVIDENCE FROM $^{40}AR/^{39}AR$ DATING OF DETRITAL MUSCOVITES

by

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ABSTRACT

Detrital muscovite $^{40}Ar/^{39}Ar$ dates provide key constraints on depositional ages and provenances for several Mesoproterozoic sedimentary sequences from New Mexico, Arizona and California. The data further refine or strengthen existing regional correlations between similar lithostratigraphic units and provide critical information to better understand the tectonic settings and paleogeography for southern Laurentia for the time period between about 1.3 and 1.1 Ga.

Over 1000 detrital muscovites from the Apache Group and Troy Quartzite, southeast AZ; Unkar Group, Grand Canyon, AZ; Crystal Springs Formation, Death Valley, CA; and Debaca Sequence, NM were analyzed. Most of the sedimentary rocks are dominated by muscovites with apparent ages between about 1.4 and 1.7 Ga and record exhumation of Yavapai and Mazatzal crust. There are no muscovites older than about 1.7 Ga, which demonstrates that regions such as the low-grade rocks from the Wyoming Province did not contribute detritus to the southern Laurentian basins. Other than the Unkar Group, most sequences could have received sediment from fairly proximal sources, however the large region that can contribute 1.4 to 1.7 Ga muscovites precludes precise location source regions. In contrast, the units such as the Dox Formation that contain muscovites with apparent ages between about 1.25 and 1.1 Ga represent a Grenville source terrain.

The 1328±5 Ma Pioneer Shale (Apache Group) and Crystal Springs Formation (Pahrump Group) represent the oldest units studied and might be coeval. If correlative, these units suggest a possible shoreline that extended roughly northwest to southeast at about 1.3 Ga. Also at this time, highlands existed in northern Arizona,

and it is probable that the Grand Canyon basement was the sediment source for the Apache Basin.

At about 1.25 Ga, regional carbonate deposition began across southern Laurentia. The detrital muscovite data support, but do not require, contemporaneous deposition of the Bass Limestone, the Mescal Limestone, the Caster Marble and the Carbonate Member of the Crystal Springs Formation. This regional correlation from west Texas to California supports the hypothesis that a shallow interior seaway flooded southern Laurentia prior to Grenville collision.

In Arizona, mature marine sandstones like the Troy Quartzite and Shinumo Sandstone cap the limestone members and record regression of the seaway, followed by significant fluvial sandstone deposition. This transition period is marked by a striking change in detrital muscovite ages. Most notably, the Dox Formation of the Unkar Group contains a nearly uniform distribution of ~1.15 Ga detrital muscovites and requires development of a Grenville highlands that shed a large apron of sediment into a foreland basin across southern Laurentia. Evidently, large river systems carried detritus from the actively exhuming Grenville highlands to at least northern Arizona (~800 km) within a relatively short (10-50 Ma) time span.

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1. INTRODUCTION

The supercontinent Rodinia was assembled during a long (ca. 2.5 to 1.1 Ga) and punctuated history (e.g. Karlstrom et al., 2003) that culminated with the Grenville orogeny. A key component of this history is recorded within the evolution of Laurentia where Paleoproterozoic juvenile crust was added to the Archean Wyoming nucleus between about 1.8 and 1.6 Ga (Condie, 1982; Whitmeyer and Karlstrom, 2004). A major magmatic event beginning at about 1.45 Ga and persisting for about 100 Ma penetrated the evolving Laurentian crust and was associated with major deformation and metamorphism (Karlstrom et al., 1997; Pedrick et al., 1998; Read et al., 1999; Williams et al., 1999). The final growth of Rodinia occurred during the Grenville orogeny and by about 1.0 Ga the supercontinent was fully constructed. The long periods between orogenic activities are poorly understood, but are generally considered to be times of overall crustal stability (Karlstrom and Bowring, 1990). Essentially no rock record is recorded for the 1.6 to 1.45 Ga and 1.35 to 1.20 Ga history of Laurentia, however for this later period there are very important, but limited intrusive and sedimentary rocks (Howard, 1991; Gherels, 2003; Timmons et al., 2005). These sparse Mesoproterozoic sedimentary rocks have great potential to record a portion of the culmination of the assembly of Rodinia. Sedimentary rocks are a powerful tool for reconstructing past tectonic episodes because they can preserve information about depositional environments, tectonic histories and source dynamics. On a regional scale, sedimentary rocks become a particularly useful tool when inter-basin syndepositional relationships can be established. Chronologic and lithological correlation between basins allows large-scale paleolandscape reconstruction. If the presently isolated Mesoproterozoic deposits can be chronicled in time and space the potential to better understand the evolution of Laurentia may be realized.

Mesoproterozoic sedimentary rocks sporadically cropout, or are persevered in the subsurface, in several locations across the southwest United States (Fig. 1) and record cursory information of the 1.4 to 1.1 Ga Laurentian history. A major limitation for fully utilizing these sedimentary sequences to determine inter-basin correlations is lack of detailed knowledge of their precise depositional ages and provenances. With a few notable exceptions (e.g. Stewart et al., 2001; Timmons et al., 2005) interformational volcanic horizons with datable material that yield absolute depositional ages have not been found within most of the Mesoproterozoic sedimentary sections. Dating detrital minerals provides a less direct means to constrain the age of deposition of sedimentary units and detrital mineral geochronology has experienced a huge growth during the past decade or so (e.g. Copeland and Harrison, 1990; Renne et al., 1990; Rainbird et al., 1997; Lovera et al., 1999; Stewart et al., 2001; Santos et al., 2002). These and many other studies on sediments that span the geological time-scale have demonstrated the potential to reveal age and provenance for the sediments and determine information about the tectonic setting of the source terrain. A driving force behind the boom for the advancement of detrital mineral geochronology is new instrumentation that allows relatively rapid and inexpensive collection of the hundreds of individual dates required to fully characterize provenance and age (Gehrels et al., 2003). The

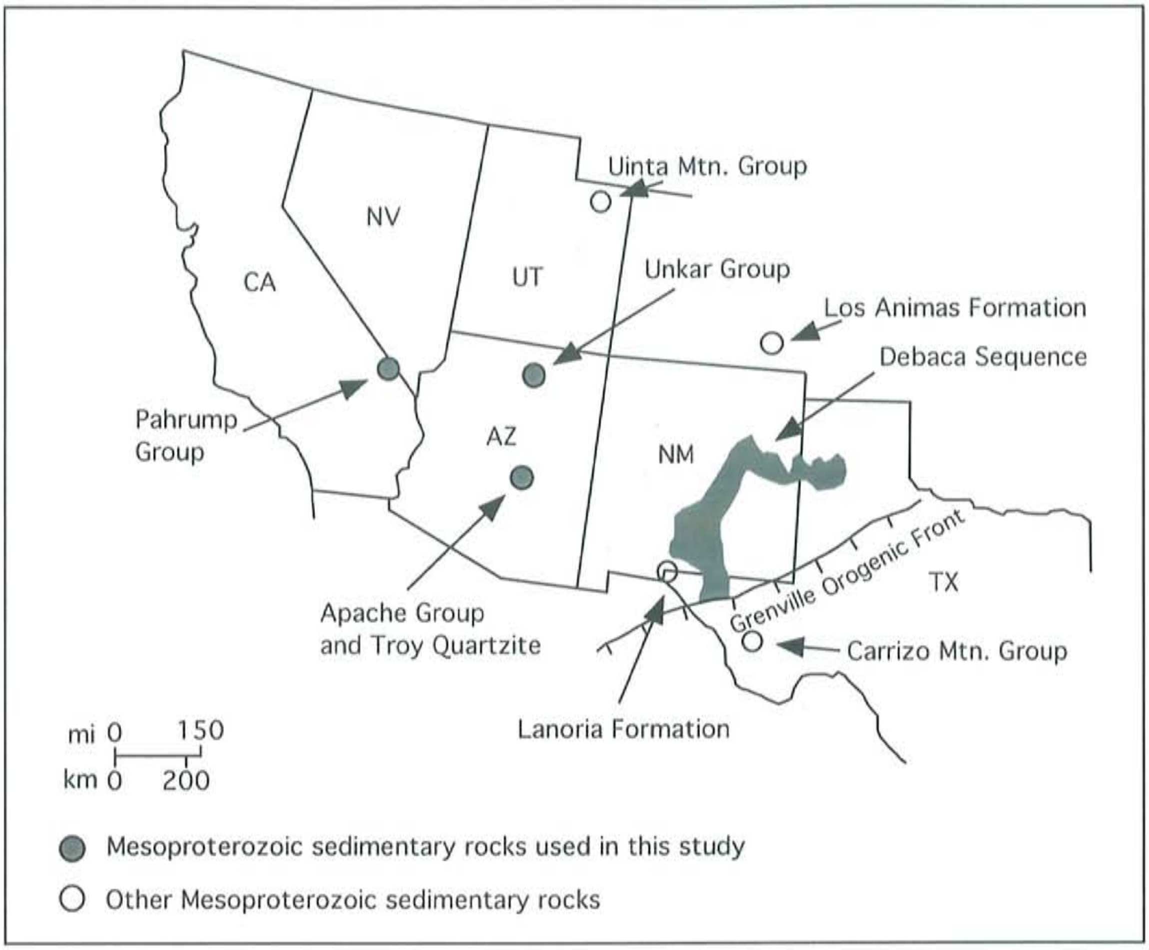


Figure 1. Map of the southwest United States showing the locations of Mesoproterozoic sedimentary rocks. The areas shaded in grey are the sedimentary units used in this study. The Debaca Sequence (NM & TX) is mostly subsurface, the samples used in this study came from an outcrop in the Sacramento Mountains, NM. Modified from Seeley, 1999.

high throughput now available in modern LAICPMS U/Pb and $^{40}Ar/^{39}Ar$ laboratories makes it possible to investigate the zircon and K-bearing mineral phases to extract here-to-fore unavailable detail about the geochronology of sedimentary rocks.

This study primarily utilizes detrital muscovite $^{40}Ar/^{39}Ar$ geochronology to achieve two fundamental goals. First, new data are used to refine the age of the sedimentary sections that further tests some previously proposed inter-basin correlations (e.g. Wrucke and Shride, 1972; Heaman and Grotzinger, 1992; Seeley, 1999; Timmons et al., 2005). Second, provenance age data are coupled with new and published field evidence to build a model for the extent of Mesoproterozoic sedimentary units in space and time and ultimately to decipher the Mesoproterozoic landscape of the southwest margin of Laurentia preceding and during the Grenville Orogeny.

1.1 Area of Study

The four basins examined in this study are the Apache/Troy basin, central and southern Arizona; Unkar basin, Grand Canyon, Arizona; Pahrump basin, Death Valley, California; and the Debaca basin, New Mexico (Fig. 1). The sedimentary sections deposited in these basins have at least two things in common, (1) they unconformably overlie crystalline basement rocks that are either ~1.4 Ga granitoids or are Paleoproterozoic rocks that were residing in the mid-crust (ca. 10 km) at 1.4 Ga, and (2) they are cut by medium to coarse grained 1.1 Ga diabase dikes and sills (Hammond, 1990). These data constrain deposition of the sedimentary rocks to between ~1.4 and 1.1 Ga. Lithology, sedimentary structures and limited radiometric dates from ash layers have been used to correlate the inter-basin stratigraphy (summarized in Fig. 2). This study tests some of these correlations and refines depositional ages for several formations within the widely separated basins.

1.2 Radiometric dating of detrital minerals

Robust methods are of critical importance to this study for obtaining dates that have not been disturbed during transport, deposition or by post-depositional processes. $^{40}Ar/^{39}Ar$ dating of detrital minerals from Phanerozoic sediments has proven to yield accurate provenance data (Renne et al., 1990), source terrain exhumation histories (Copeland and Harrison, 1990; Lovera et al., 1999) and to directly date tectonic events (Renne et al., 1990). In comparison to numerous U/Pb detrital zircon geochronology studies of Precambrian sedimentary rocks (e.g. Rainbird et al., 1997; Stewart et al., 2001; Santos et al., 2002) there are very few $^{40}Ar/^{39}Ar$ studies. This is primarily due the fact that many Precambrian sedimentary sequences have experienced significant post-depositional alteration or heating events that would compromise recovery of the $^{40}Ar/^{39}Ar$ age of the detrital minerals. For instance, the relatively low closure temperature for argon in muscovites (~300-350°C) compared to the high temperature closure of lead in zircon (>800°C) has made zircon the mineral of preference for Precambrian provenance studies. Additionally, zircon is very stable in sedimentary environments and is resistant to mechanical and chemical weathering. A drawback to U/Pb dating is that zircons commonly experience Pb-loss. Muscovite is expected to reliably record accurate source ages because most of the sedimentary rocks chosen for this study are

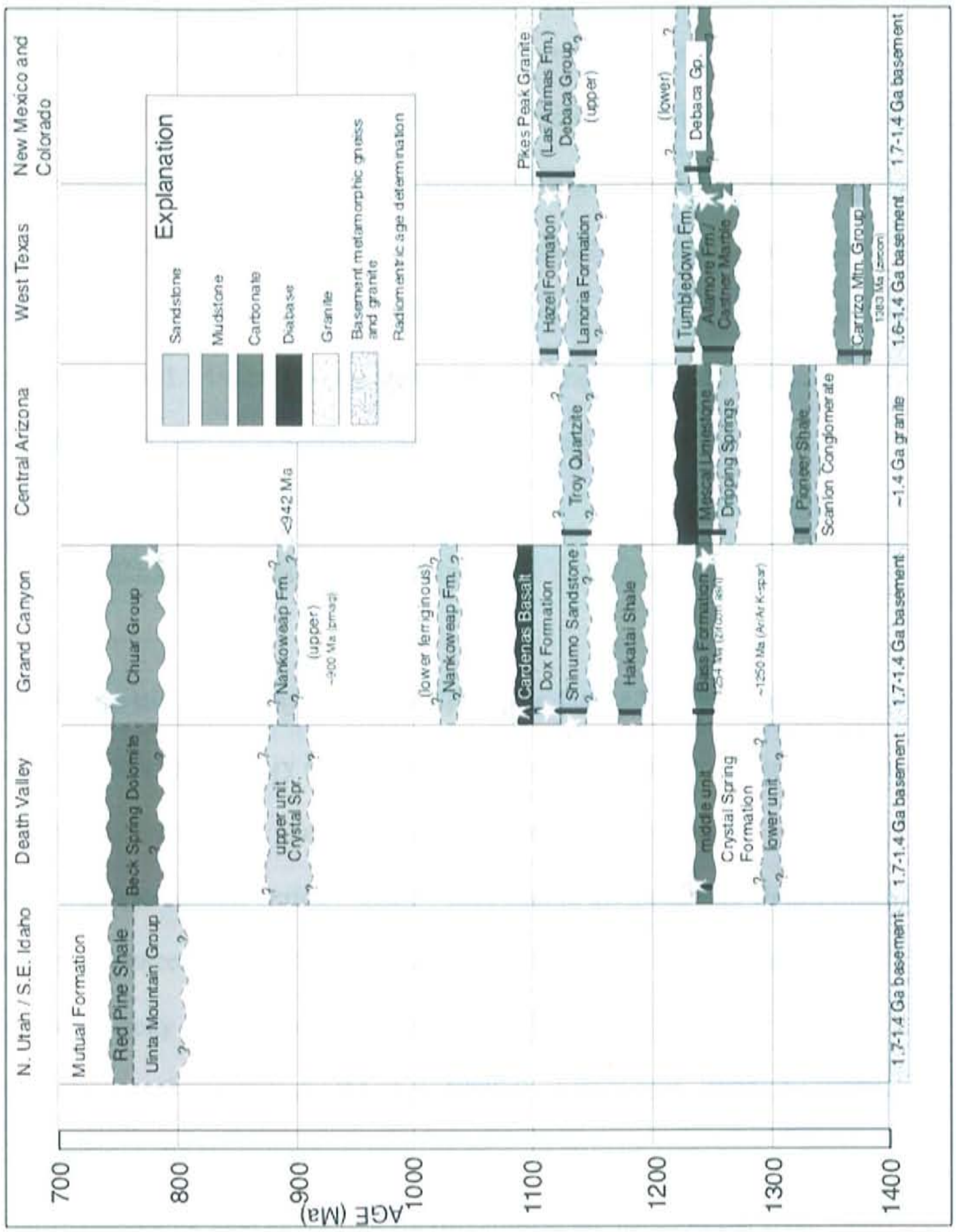


Figure 2. Correlative units of Mesoproterozoic and Neoproterozoic sedimentary rocks across the southwest United States as hypothesized by Timmons et al. (2005). From Timmons et al., 2005.

unmetamorphosed and have experienced minimal alteration. Despite being greater than 1 Ga, the majority of the analyzed sedimentary rocks have not experienced complex or high-temperature post-depositional histories, which further advances the hypothesis that $^{40}Ar/^{39}Ar$ muscovite ages will be reliable. A final important constraint that will help evaluate the quality of the muscovite data is the knowledge of the minimum depositional age provided by the crosscutting diabase dikes. Any apparent ages less then ca. 1.1 Ga can clearly be thought of as suspect and therefore provide a key guide for interpreting post-depositional argon loss.

1.3 Previous Mesoproterozoic reconstructions

Recent studies have synthesized existing age data and geologic information on Mesoproterozoic sedimentary rocks to develop a hypothesis for the tectonic evolution of southeast Laurentia (e.g. Seeley, 1999; Timmons, 2004; Timmons et al., 2005). The late Mesoproterozoic period (~1300 – 1000 Ma) in the southwest United States is primarily influenced by the post 1.4 Ga exhumational history of the region and the Grenville Orogeny which developed as a long lived ~10, 000 km long convergent margin along southern Laurentia (Mosher, 1998; Karlstrom et al., 2003). In southwest Texas, the Grenville Orogen culminated at 1.20-1.12 Ga with late stage tectonic plutonism continuing until about 1.10 Ga (Bickford et al., 2000; Reese et al., 2000). Sedimentary rocks have aided reconstructions of landscape evolution during this time, and two different models have arisen. The model of Seeley (1999) proposes that the bulk of sedimentation in the southwest occurred in a large NW striking rift basin (Fig. 3). The strength of this model lies in the observation that the only

Mesoproterozoic sedimentary rocks exposed today lie along a roughly northwest to southeast trend. This observation may give some insight into the Mesoproterozoic distribution of sediments or it may be a consequence of erosional history. That is, the alignment of the sedimentary rocks along a 'trend' may be a coincidence caused by preferential preservation of some areas. In contrast to the rift hypothesis, the model proposed by Timmons et al. (2005) suggests an intra-cratonal seaway developed by about 1250 Ma that flooded parts of West Texas, most of New Mexico and Arizona and the Death Valley region of California (Fig. 4). This model is principally dependent upon correlation of carbonate members (Bass Formation, Grand Canyon; Mescal Limestone, Arizona; Caster Marble, Texas) that appear to be contemporaneous or at least time transgressive.

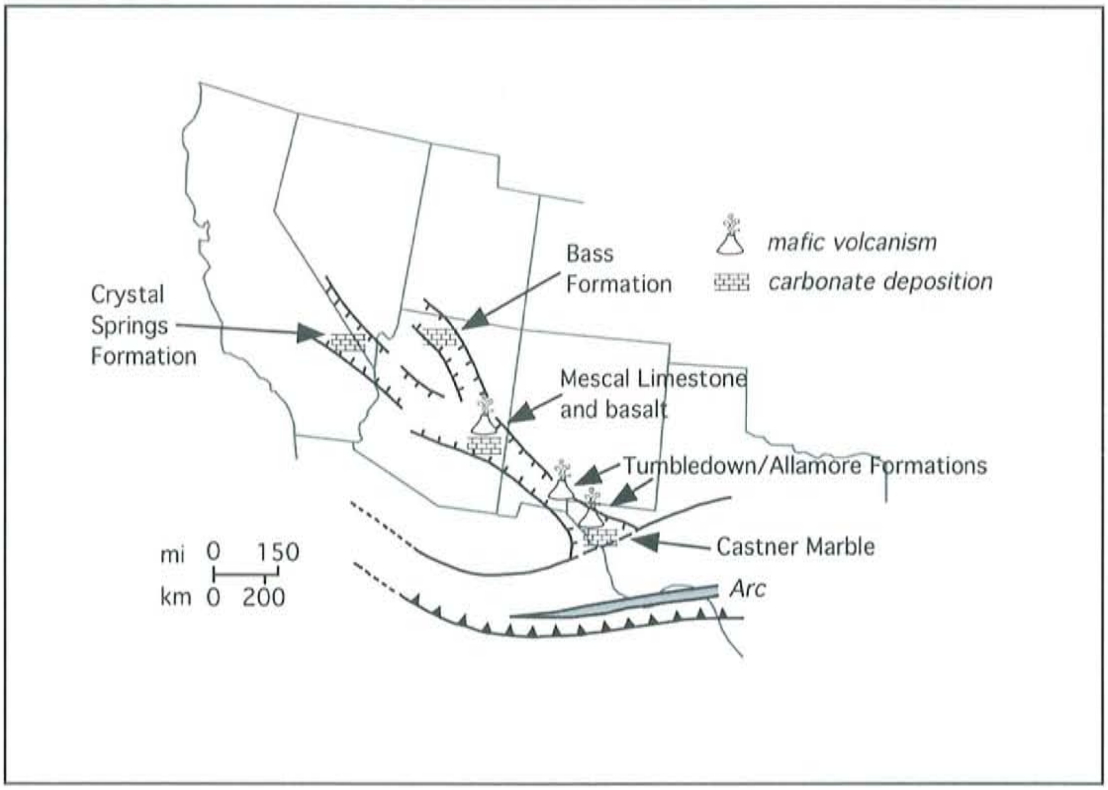


Figure 3. Tectonic setting of southwest Laurentia between ~1300 - 1260 Ma as proposed by Seeley (1999). The rifting event is inferred on the basis of the linear arrangement of preserved syndepositional carbonate rocks, and diabase/basalts.
Modified from Seeley, 1999.

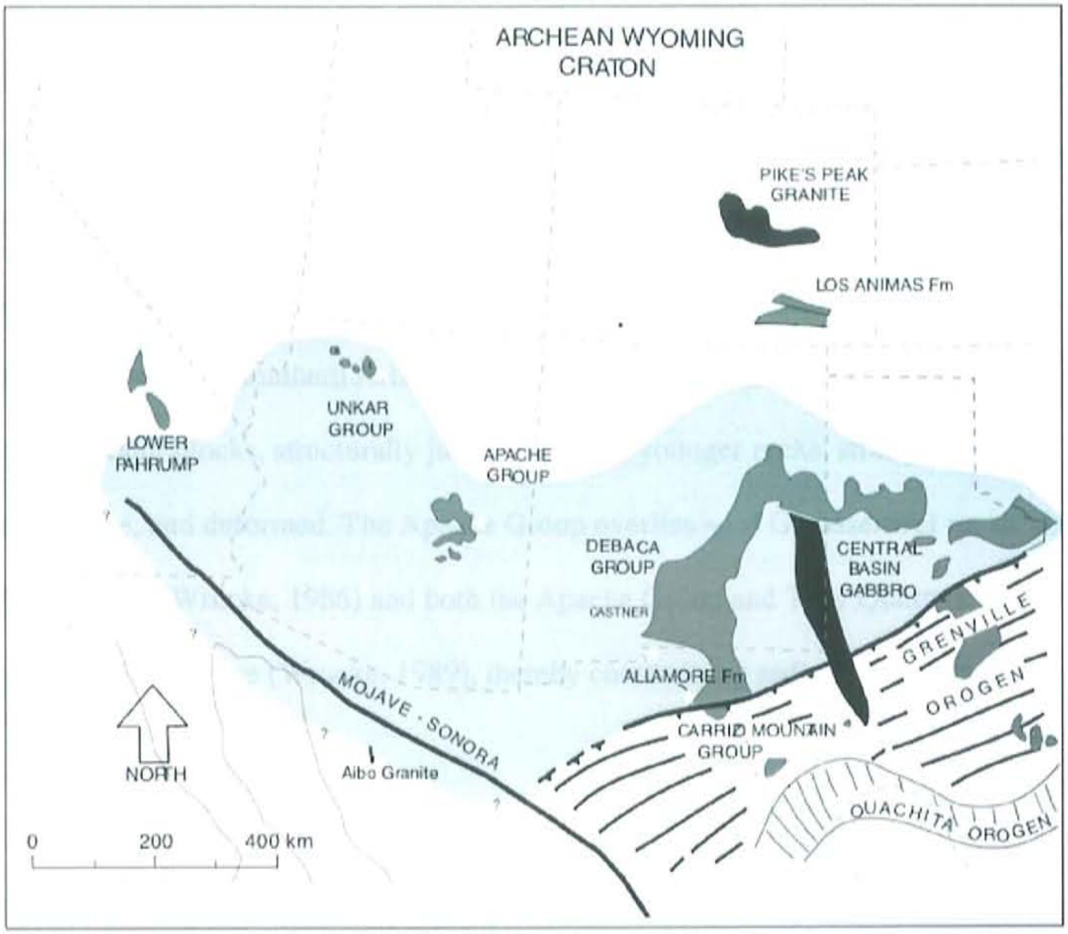


Figure 4. Map of the southwest United States at ca. 1.25 Ga as hypothesized by Timmons et al. (2005). The light grey area represents a shallow cratonal sea. The areas shaded in dark grey are Mesoproterozoic sedimentary rocks. Modified from Timmons et al., 2005.

2. PREVIOUS WORK

2.1 Apache Group and Troy Quartzite, Arizona

2.1.1 Introduction

The Apache Group and Troy Quartzite form a Mesoproterozoic sedimentary succession that is exposed at the surface in parts of central and southern Arizona (Fig. 5). In the Arizona transition zone (i.e., zone separating the Colorado Plateau and the Basin and Range province) the Apache Group and Troy Quartzite cropout as a semi-continuous sedimentary sequence that is broken by relatively few faults. In the Basin and Range zone of southern Arizona, Apache and Troy outcrops are scattered amongst fault blocks, structurally juxtaposed with younger rocks, stratigraphically incomplete, and deformed. The Apache Group overlies ~1.4 Ga basement rocks (Conway and Wrucke, 1986) and both the Apache Group and Troy Quartzite are cut by a ~1.1 Ga diabase (Wrucke, 1989), thereby constraining sedimentation between 1.4 and1.1 Ga.

2.1.2 Stratigraphy and Depositional Environments

The Apache Group is formally divided into the Pioneer Shale, Dripping Springs Quartzite, Mescal Limestone and Unnamed Basalt, and is unconformably overlain by the Troy Quartzite (Wrucke, 1989); (Fig. 6). Apache Group sediments were deposited on the eroded surface of the Tonto Basin Supergroup, Pinal Schist and the Ruin Granite (Conway and Wrucke, 1986). In some areas, for example along the

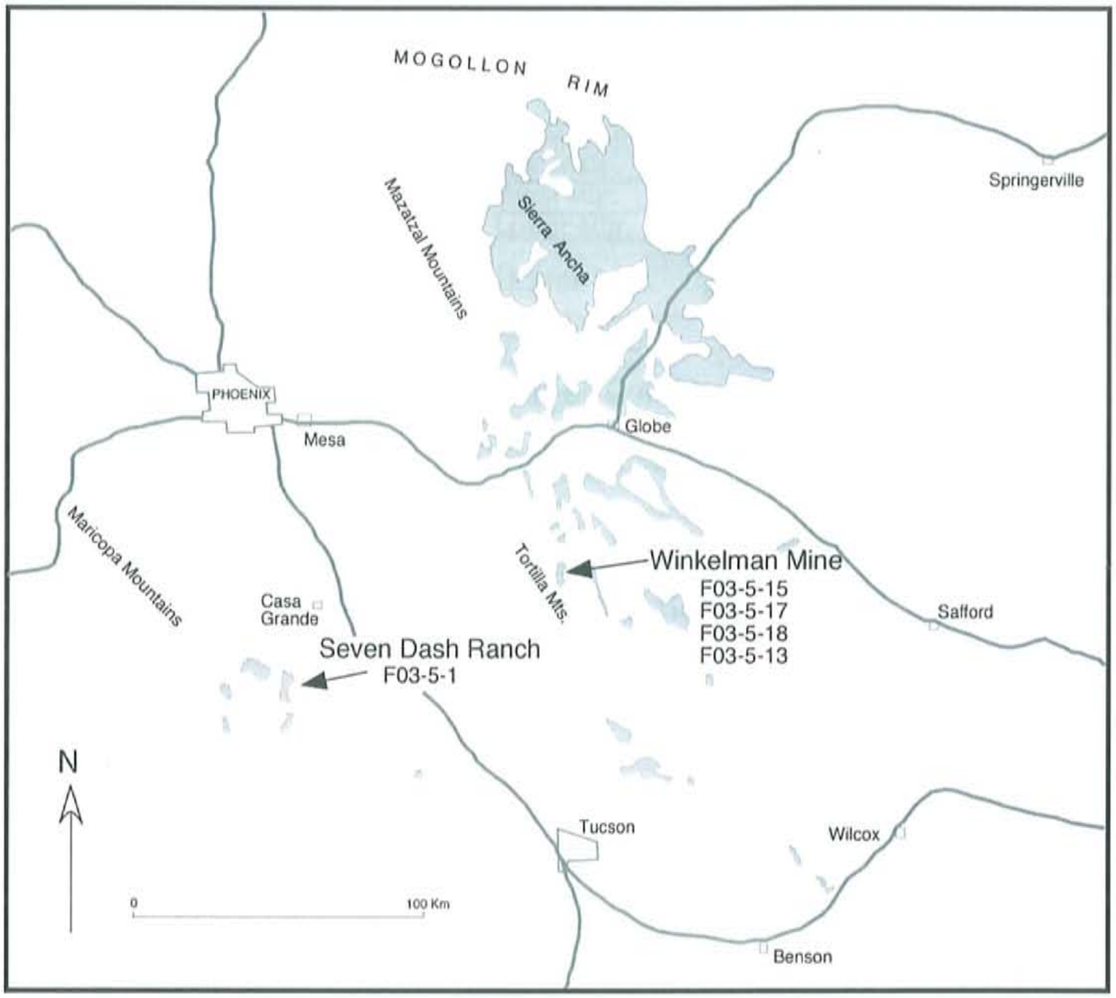


Figure 5. Map of central to southeast Arizona. The areas shaded in grey are known exposures of the Apache Group and/or Troy Quartzite. The samples used for $^{40}Ar/^{39}Ar$ analysis are listed under the location where they were collected. Modified from Condie, 1981.

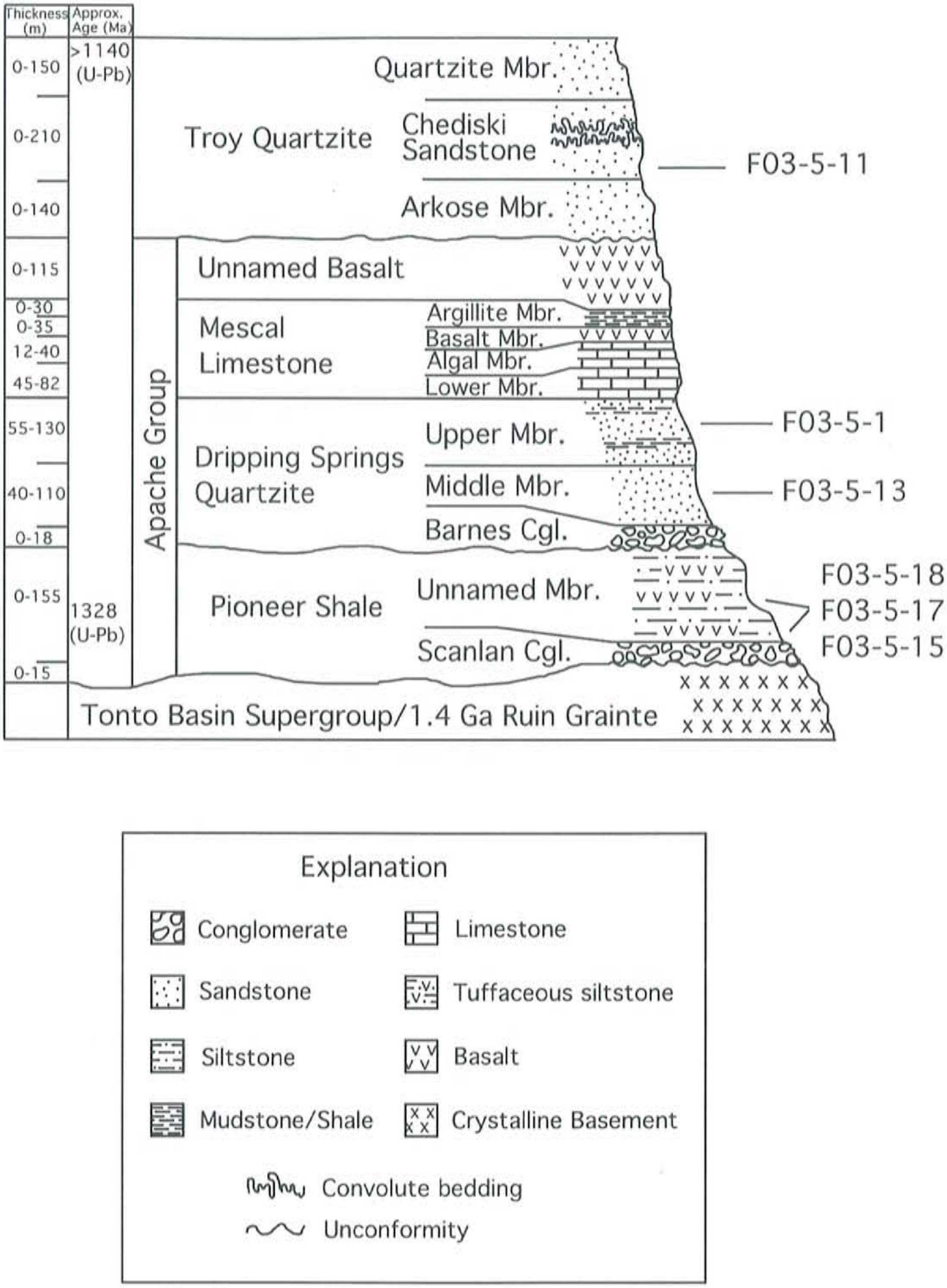


Figure 6. Stratigraphic section of the Apache Group and Troy Quartzite, central and southern Arizona. Mesoproterozoic (~1140 Ma) diabase intrudes all rocks (not shown on diagram). Sample numbers are shown beside the member that they were collected from. After Wrucke, 1989.

Salt River drainage, the Apache sequence is extensively intruded by 1.1 Ga dikes and sills (Davis et al.,).

The Apache basin sediments record clastic deposition, which progressed into carbonate deposition followed by prolonged aerial exposure. According to Middleton and Montgomery (2001), the basin formed by faulting along its northern boundary, which resulted in the southward flow of the coarse clastic sediments of the Scanlan Conglomerate Member of the Pioneer Shale. Fan deposits become increasingly fine when moving up section and graded into braid-plains during Pioneer Shale time, with evidence that these braided rivers were periodically choked by volcanic ash (Gastil, 1954). It is possible that volcanic debris was from vents from within the ~1370 Ma Southern granite-Rhyolite province in central New Mexico (Elizabeth Anthony, pers. comm. *in* Seeley, 1999). There is a disconformity between the Pioneer Shale and the Dripping Springs Quartzite, with the lower member of the Dripping Springs recording renewed coarse clastic input (Barnes Conglomerate Member). This may be related to reactivation of the basin-bounding fault to the north (Middleton and Montgomery, 2001). The Dripping Springs unit records a transition from braided river to shoreline and shelf deposits. Middleton and Montgomery (2001) recognized a major unconformity in the Upper Member, characterized by incised channels. They believe the Upper Member represents storm dominated shoreline and shelf deposits and cite this as evidence of major changes in base level associated with eustacy and differential subsidence. The change from river to shoreline to shelf deposits culminated with the deposition of the marine carbonates of the Mescal Limestone. Extensive karst features in the Mescal Limestone indicate prolonged post-depositional aerial exposure (Skotnicki and Knauth, 2002). The Mescal Limestone is overlain by argillite and basalt flows of unknown age (Shride, 1967).

Following exposure, the Apache Group was folded, faulted and eroded before deposition of the eolian and braided stream sands of the Troy Quartzite (Middleton and Montgomery, 2001). The Troy Quartzite was deposited in two (north and south) geographically discrete basins (Middleton and Montgomery, 2001) and at its thickest is approximately 365 meters (Weiss, 1986; Stewart et al., 2001). The Troy Quartzite has formation status and is divided, from base to top, into the Arkose Member, Chediski Sandstone and Quartzite Member (Weiss, 1986). The Arkose Member is only present in the northern basin, whereas in the southern basin the Chediski Sandstone unconformably overlies the Dripping Springs Quartzite, the Mescal Limestone or the Apache Group Basalts. In places, the unconformity represents up to 1000 ft of eroded section (Burns, 1987). The Chediski Sandstone is characterized by intervals of convoluted bedding which have been interpreted as soft sediment deformation in response to seismic shaking (Burns, 1987). Similar sedimentary features are observed in the Shinumo Quartzite, Grand Canyon, prompting the possibility of a time equivalent correlation between these sedimentary units (Timmons, 2004). The entire sedimentary package (Apache Group and Troy Quartzite) is intruded by a diabase that forms laterally extensive sills, some as thick as 400 m (Conway and Wrucke, 1986).

2.1.3 Geochronology

As mentioned, the Apache and Troy sedimentary rocks unconformably overlie 1.43 Ga Ruin Granite (Conway and Wrucke, 1986) and are cut by a ca. 1.1 Ga diabase. The age of deposition of the Pioneer Shale is estimated by an interlayed tuff that yields a U/Pb zircon age of 1328 ± 5 Ma (Stewart et al., 2001). Twenty-two detrital zircons from the Dripping Springs Quartzite exhibit age populations of 1.26, 1.32, 1.44 and 1.71 Ga (Stewart et al., 2001) and indicate deposition after 1.26 Ga. No direct dates are available for the Mescal Limestone, but other authors (e.g. Seeley, 1999; Timmons et al., 2005) have correlated it to the Bass Formation (1255 Ma; Timmons et al., 2005), Grand Canyon, and the Castner Marble (1260 ± 20 Ma; Pittenger et al., 1994), southwest Texas. Thirteen detrital zircons from the Troy Quartzite yield an age peak at 1.26 Ga (Stewart et al., 2001), and therefore the Troy is also younger than 1.26 Ga. The diabase that intrudes the Apache Group and Troy Quartzite has been dated from different places in five separate studies. Zircon geochronology has yielded apparent ages of 1150 ± 30 Ma (Silver, 1960) and 1120 ± 10 Ma (Silver, 1978), and K-Ar dating has revealed ages of 1140 ± 40 Ma (Damon et al., 1962) and 1140 ± 30 Ma (Banks et al., 1972). Most recently the diabase is proposed to be 1.12-1.11 Ga, based on a U-Pb zircon age from a granophyre associated with diabase emplacement (Wrucke, 1989). The most recent result is the preferred age as it comes from the most advanced analytical techniques.

2.1.4 Provenance

Timmons et al. (2005) suggest a northerly source for the Pioneer Shale and Dripping Springs Quartzite. Their $^{40}Ar/^{39}Ar$ K-feldspar thermochronology study supports the hypothesis that material was eroded from the Grand Canyon area between 1350 – 1250 Ma and coupled with the limited paleocurrent data suggest this region supplied sediment to the Apache basin.

The basal Arkose Member of the Troy Quartzite only exists in the northern Troy basin (Burns, 1987) and has paleocurrent data indicative of fluvial flow towards the northeast at the very base of the section, which changes into eastward paleowind directions higher up in the section (Weiss, 1986). Weiss (1986) studied the lithology of the Arkose Member of the Troy Quartzite and hypothesized that it incorporates constituents from a feldspar-rich terrain, probably the Ruin Granite of central Arizona, as well as a large percentage of volcanic material that resemble the rocks of the Alder Group and the Haigler Group in the Mazatzal Mountains and the Pinal Schist of the Pinal Mountains of central Arizona. There is evidence of recycling of Apache sediments and basalt. The presence of fragile components such as cleavable metapelitic and pelitic material may preclude long distance transport for these constituents.

The Chediski Sandstone exists in both the northern and southern Troy basins, however due to the basin geomorphology, provenance of the northern and the southern Chediski Member are not the same. Burns (1987) took 150 paleocurrent readings (axes of trough cross-beds, planar tabular cross-beds and scour-channel fill deposits) in the northern basin and 201 readings from the southern basin. She found that paleocurrents were predominantly to the south-southeast in the northern basin and southwest in the southern basin.

The Quartzite member of the Troy Quartzite is a thick sea sand deposit that records transport in a generally southward direction (Seeley, 1999).

2.2 Unkar Group, Grand Canyon, Arizona

2.2.1 Introduction

The Grand Canyon Supergroup is a roughly 4 km thick sequence of Precambrian sedimentary and volcanic rocks that is well exposed along expanses of the Colorado River, within the Grand Canyon (Fig. 7). The Supergroup represents approximately 550 million years of deposition and erosion, from about 1255 Ma to 742 Ma (Karlstrom et al., 2000; Timmons et al., 2005). This study focuses on the Unkar Group, the lower most group of the Grand Canyon Supergroup. The Unkar Group represents deposition between about 1255 Ma to 1100 Ma (Timmons et al., 2005). Although numerous authors have studied the Unkar Group over more than a century (e.g. Powell, 1875; Walcott, 1894; Beus et al., 1974; Timmons et al., 2001, and many others), the details of its age remain enigmatic due to a lack of directly datable materials (e.g. ash beds, tuffs etc.). The detrital muscovite geochronology for the Unkar Group that is presented in this thesis is my contribution to a large and multidisciplinary effort to study the tectonic setting, sedimentology and age of the Grand Canyon Supergroup. A parallel study of detrital zircon geochronology for Unkar Group sediments has also been done by our working group and a summary of

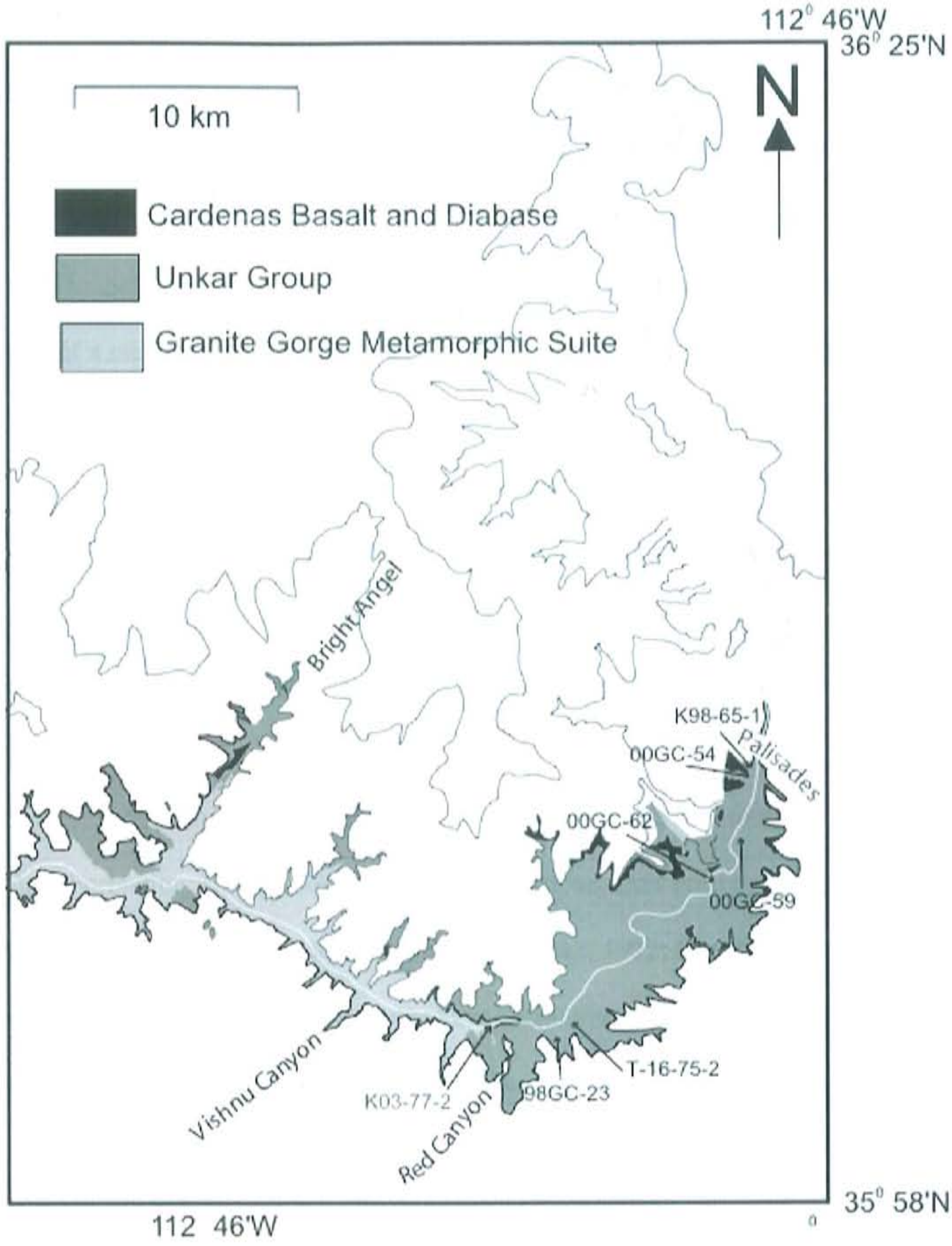


Figure 7. Map of the eastern part of the Grand Canyon showing sample locations. Modified from Timmons et al., 2005.

these results are provided in Appendix 1. It is necessary to note that I personally did not participate in the zircon data collection, but provide the data in this thesis as a means to allow readers to have the full detrital mineral geochronology data at their disposal. These only partially published (Timmons et al., 2005) zircon results are important to the interpretation of my muscovite data and therefore provide further need to include them as an appendix. The zircon data have recently been submitted as part of a manuscript by Bloch et al. (in review) to the Journal of Sedimentology.

2.2.2 Stratigraphy and Depositional Environments

The most extensive exposures of Unkar Group rocks occur in the Eastern Grand Canyon, between Colorado River miles 63 and 79 (Fig. 7). Note that river miles are measured downstream from Lee's Ferry located below Lake Powell along the Colorado River.

The Mesoproterozoic Unkar Group is divided into the Hotauta Conglomerate, Bass Formation, Hakatai Shale, Shinamo Sandstone, Dox Formation and Cardenas Basalt (also known as Cardenas Lavas) (Hendricks, 1972; Elston, 1979; Stevenson and Bues, 1982) (Fig 8). These strata have been interpreted as a succession of fluvial and shallow marine sediments, capped by basaltic volcanism (Timmons et al., 2005).

According to Timmons (2004) the lower Unkar Group formations (Bass, Hakatai and Shinamo) represent a transition from carbonate deposition in a shallow cratonal sea to clastic deposition in near shore environments. The Bass Formation is a heterogeneous unit that is primarily interbedded limestones and sandstones, and has a

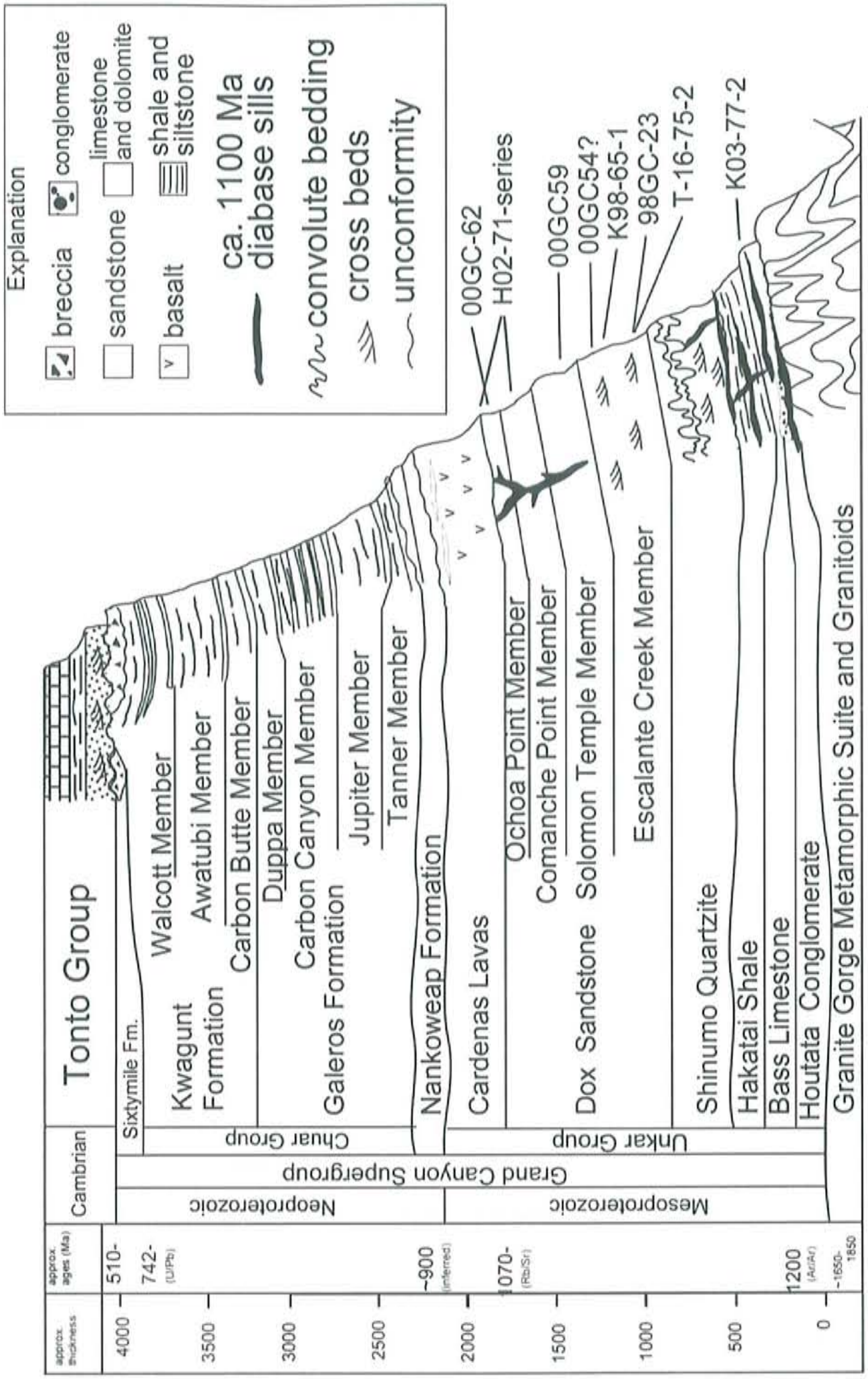


Figure 8. Stratigraphy of the Grand Canyon Supergroup. Samples for this study were taken from the Hotauta Conglomerate and Dox Sandstone. Sample numbers appear beside the sedimentary units that they were taken from, Modified from Timmons et al., 2005.

basal unit known as the Hotauta Conglomerate. The environment of deposition for the Hakatai Shale has been proposed as a marginal marine/tidal flat environment (Timmons, 2004), and the Shinamo Sandstone was likely deposited in a fluvial/deltaic environment (Daneker, 1975)

The Shinamo Sandstone is overlain by the Dox Formation, which represents fluvial deposition within a large river system grading into a fluvial-deltaic sequence (Timmons, 2004). Timmons (2004) measured paleocurrent indicators (ripple foresets, planar tabular foresets, trough axes, parting lineations and imbrications) that record transport from the south. The Dox Formation records first a regression from the marine dominated sandstones of the Shinamo followed by a transgressive sequence (Timmons, 2004). An intercalated contact exists between the Dox Formation and the Cardenas Basalt, with interfingering of the two units (Hendricks, 1972; Stevenson, 1973; Timmons 2004) suggesting contemporaneous deposition (Timmons, 2004).

2.2.3 Geochronology and Provenance

A variety of direct and indirect methods have previously been employed to determine the age of the Unkar Group. Timmons et al. (2005) dated zircons from an ash layer in the lower Bass Formation that gave an age of 1255 ± 2 Ma, indicating that Unkar deposition began during this time. The top of the Unkar Group is marked by the Cardenas Basalts that have been dated by several methods. Rb-Sr whole rock isochron dates of 1070 ± 70 Ma and 1103 ± 66 Ma (Elston and McKee, 1982; Larson et al., 1994, respectively) have been reported, as well as $^{40}Ar/^{39}Ar$ whole rock step heating data that indicates an age >1050 Ma (Timmons et al., 2001). Hornblende and biotite from diabase sills have been reported by Weil et al. (2004) and Timmons et al. (2005). Combined, these studies indicate sill emplacement at 1104 ± 2 Ma, and support a ca. 1100 Ma age for the Cardenas Basalts. Therefore it appears that Unkar deposition occurred between 1255 and 1104 Ma.

Detrital zircons from several Unkar samples have been dated in parallel to the detrital muscovite samples (Appendix 1). The primary conclusions of the zircon studies are that the Hakatai, and Shinamo Formations are perhaps significantly younger than the Bass Formation and that there may not be a large (ca. 100 Ma) hiatus between the Shinumo and Dox. In addition to the relatively young zircons, 1.4 to 1.8 Ga zircons indicate detritus derived from non-Archean basement within the southwest United States.

2.3 Pahrump Group, Death Valley, California

2.3.1 Introduction

The Pahrump Group is a roughly 3 – 4 km thick sequence of marine and non-marine sedimentary and intrusive rocks which cropout along an east-west trending belt between Kingston Peak and the South Panamint Range in Southern Death Valley, California (Roberts, 1976); (Fig. 9). Early studies (e.g. Roberts. 1976) suggested that the Pahrump Group was deposited in a long-lived west to northwest trending aulacogen, approximately 50 km wide and at least 140 km long. The term aulacogen refers to a basin formed by extension that is bounded by normal faults (i.e. a rift basin). Some authors suggested that Pahrump Group sediments are rift basin fill

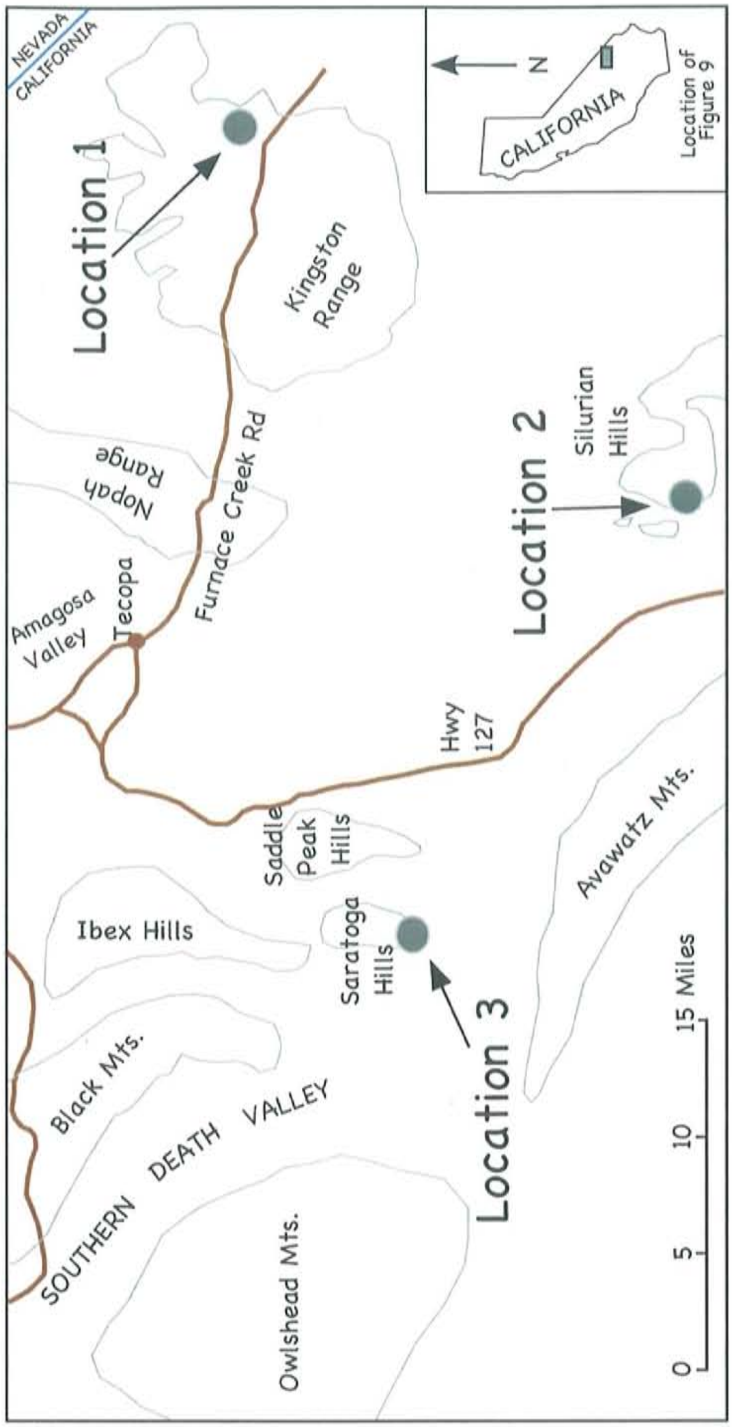


Figure 9. Locations of sampling points in the southern Death Valley ranges. The only sample used in this study was from Location 1 in the Kingston Range because all other localities were too highly metamorphosed to yield meaningful $^{40}Ar/^{39}Ar$ results. Modified from Wright, 1968.

deposited synchronously with the early development of the Cordilleran miogeocline (Wright et al., 1976). Abrupt vertical and lateral facies changes are cited as evidence that the Pahrump Group was deposited during a time of extension, when basins and uplands were formed by block-faulting (Wright and Prave, 1988). Other authors make palenspathic reconstructions that account for Tertiary extension in the region and conclude that the basin was originally more equant and is probably a fault bounded remnant of a cratonic cover sequence (Heaman and Grotzinger, 1992). In order to remove any genetic description for the Death Valley region, the term Amargosa Basin is used herein rather than Amargosa aulacogen.

The detrital muscovite study in the Death Valley region focuses on the Crystal Springs Formation, the lowermost formation in the Pahrump Group. The Crystal Springs Formation is Mesoproterozoic and is hypothesized to be a time correlative unit to the Apache Group in central and southern Arizona (Wrucke and Shride, 1972) and the Unkar Group, Grand Canyon (Heaman and Grotzinger, 1992).

2.3.2 Stratigraphy and Depositional Environments

The Crystal Springs Formation is divided into six members, and the lower four are intruded by a diabase that forms thick sills in places (Fig. 10). Only the lower four Members are considered in this study. The Crystal Springs Formation unconformably overlies World Beater Complex, which was deformed and metamorphosed at about 1.7 Ga and later intruded by 1.4 Ga plutons (Lanphere et al., 1964; Labotka et al., 1980). Based on work by Hewett (1956) the members of the Crystal Springs Formation (in ascending order) include the Arkose, Feldspathic

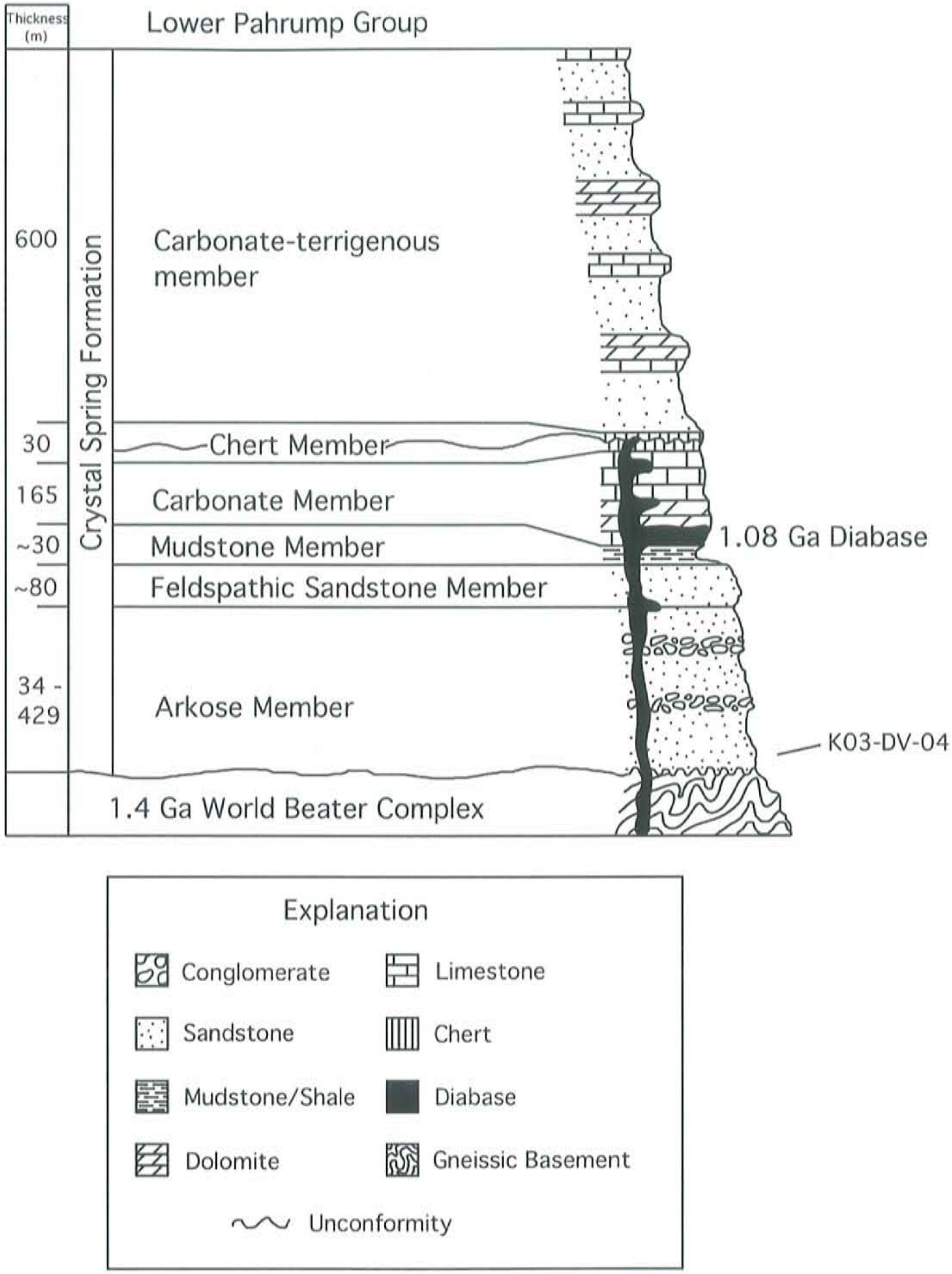


Figure 10. Stratigraphy of the Crystal Springs Formation, Pahrump Goup, Death Valley, California. The sample used in this study is shown beside the the unit from which it was collected. Modified from Roberts, 1976.

Sandstone, Mudstone (commonly grouped as the 'lower unit'), Dolomite, Algal, Chert (middle unit) and Carbonate-terrigenous (upper unit) Members (Fig. 10). There is a disconformity between the Chert Member and the Carbonate-terrigenous Member (Prave, pers. comm. *in* Timmons, 2004). The lower and middle units are intruded by a diabase that forms sills that are particularly thick in the Carbonate Member (up to 450 m; Wright, 1968; Wright et al., 1976).

Roberts (1976) described the Arkose, Feldspathic and Purple Mudstone Members. The Arkose Member is about 300 meters thick and consists of interbedded cyclic conglomerates and arkosic sandstones. The entire member is a generally fining upwards fluvial sequence recording sedimentation in a braided stream to tidal delta environment through times of periodic uplift of the source area. The Feldspathic Sandstone Member is about 28 meters thick and exhibits a variety of sedimentary structures characteristic of a tidal flat environment. Ripples, mudcracks, herringbone cross beds and mud-chip conglomerates are fairly common throughout this fining upwards member. The purple mudstone member is between 9 to 49 meters of massive to thickly bedded purple-red silty to sandy mudstone. There are a few discontinuous limestone and sandstone beds in this member, which has been interpreted as an estuary or tidal mash environment (Roberts, 1976).

The Dolomite and Algal Members have been grouped into the 'Carbonate Member' by the mining community because of the abundance of talc deposits in both members (e.g. Wright, 1968). The Dolomite member is 30-122 meters thick and consists of mostly marine dolomite with some sandy beds (Roberts, 1976). The Algal member is up to 91 meters of marine limestone, and contains the Baicalia and

Conophyton stromatolites (Howell, 1971). This unit has been interpreted as a series of transgressive intertidal sequences (Roberts, 1976). Diabase intrusions form thick sills (up to 450 m) in the Carbonate Members (Wright, 1968; Wright et al., 1976), and extensive contact scarns (talc deposits) have developed as a result of diabase emplacement (Roberts, 1976). Contact scarns show evidence that the limestone beds were wet and unconsolidated at the time of intrusion (Wright, 1968; Hammond, 1986).

The chert member is a dense, dark massive chert that is 30-152 meters thick (Wright, 1968), but is not preserved at all locations. Although the chert member was documented in the first publication of the stratigraphy of the Crystal Springs Formation (Hewett, 1956), it was not found during the field expedition launched to collect samples for this study. Field evidence from the Saratoga Springs area showed that overlying the Algal Member is a diabase sill and a siltstone, with an overlying white quartzarenite. The contact between the siltstone and the quartzarenite is an unconformity; the lower 15-20 cm of the quartzarenite is a basal conglomerate that includes clasts of diabase and hornfelsed sediments. The Saratoga Springs location was the only area where this part of the section was observed, therefore the stratigraphic section that accompanies this text (Fig. 10) illustrates the original interpretation of stratigraphy (i.e. includes the Chert Member), but includes an unconformity within the Chert Member. The unconformity is important because it truncates diabase intrusions. This means that the overlying Carbonate-Terrigenous Member is younger than the age of the diabase, and thus will not be included in this study.

2.3.3 Geochronology

The Crystal Springs Formation is poorly dated, but like the other Precambrian successions discussed above it overlies 1.4 Ga granitoids (Lanphere et al., 1964; Labotka et al., 1980) and is intruded (at least in part) by a 1.1 Ga diabase. The presence of Baicalia and Conophyton stromatolites suggests that the Algal Member is between 1.35 and 1.2 Ga (Raaben, 1969). The lower and middle units are intruded by a 1.08 Ga diabase (two U-Pb baddeleyite ages; 1087 ± 3 Ma and 1069 ± 3 Ma; Heaman and Grotzinger, 1992), which is truncated by the unconformity between the middle and upper units.

2.3.4 Provenance

Roberts (1976) speculates that a northern upland was the source area for Lower and Middle Crystal Springs units. He bases these interpretations on recognition that maximum and mean pebble size in conglomerates in the Arkose Member decreases to the south, thereby indicating a northerly source. Cross strata in sandstones and clast imbrication in conglomerates of the Arkose Member (lower unit) also support southward or westward fluvial transport.

2.4 Debaca Sequence, New Mexico

2.4.1 Introduction

The Debaca sequence is a sedimentary and volcanic package that has extensive subcrop in eastern New Mexico and the Pan Handle region of Texas (Fig.

11). The Debaca sequence, as it is used here, encompasses the Swisher Volcanic terrain of Flawn (1956), and the Debaca terrain of Muehlberger et al. (1967). The sequence is weakly metamorphosed volcaniclastic sandstone, tuffaceous sandstone, rhyolite, quartz rich dolostone, dolomitic quartz, sandstone and arkose (Amarante et al., 2004). Small outcrops of the sequence exist in the Sacramento Mountains, eastern New Mexico. A measured section of the Precambrian Debaca Sequence at Nigger Ed Canyon, Sacramento Mountains, is described by Pray (1961). The section is about 36 meters of shale and quartzite that is intruded by diabase sills and is unconformably overlain by the Phanerozoic Bliss Sandstone.

The Debaca does not crop out anywhere at the surface in its entirety, so a formalized stratigraphy does not exist. Additionally, in many well logs the Debaca is intruded by significant volume of mafic dykes and sills that complicate stratigraphic correlations between wells. Without a formalized stratigraphy it is difficult to estimate the position of Pray's (1961) measured section compared to the larger stratigraphic section presented by Amarante et al. (2004).

2.4.2 Stratigraphy and Depositional Environments

The Debaca sequence, like previously discussed sedimentary packages, overlies metamorphic/igneous basement, includes terrigenous and carbonate deposits, and is intruded by mafic igneous rocks. The sequence lies with unconformity upon basement igneous and metamorphic rocks, including the 1332 Ma Panhandle Igneous Complex (Barnes, 2001). Due to the lack of subaerial exposure a formalized stratigraphy of the Debaca Sequence does not exist, however Amarante et al. (2004)

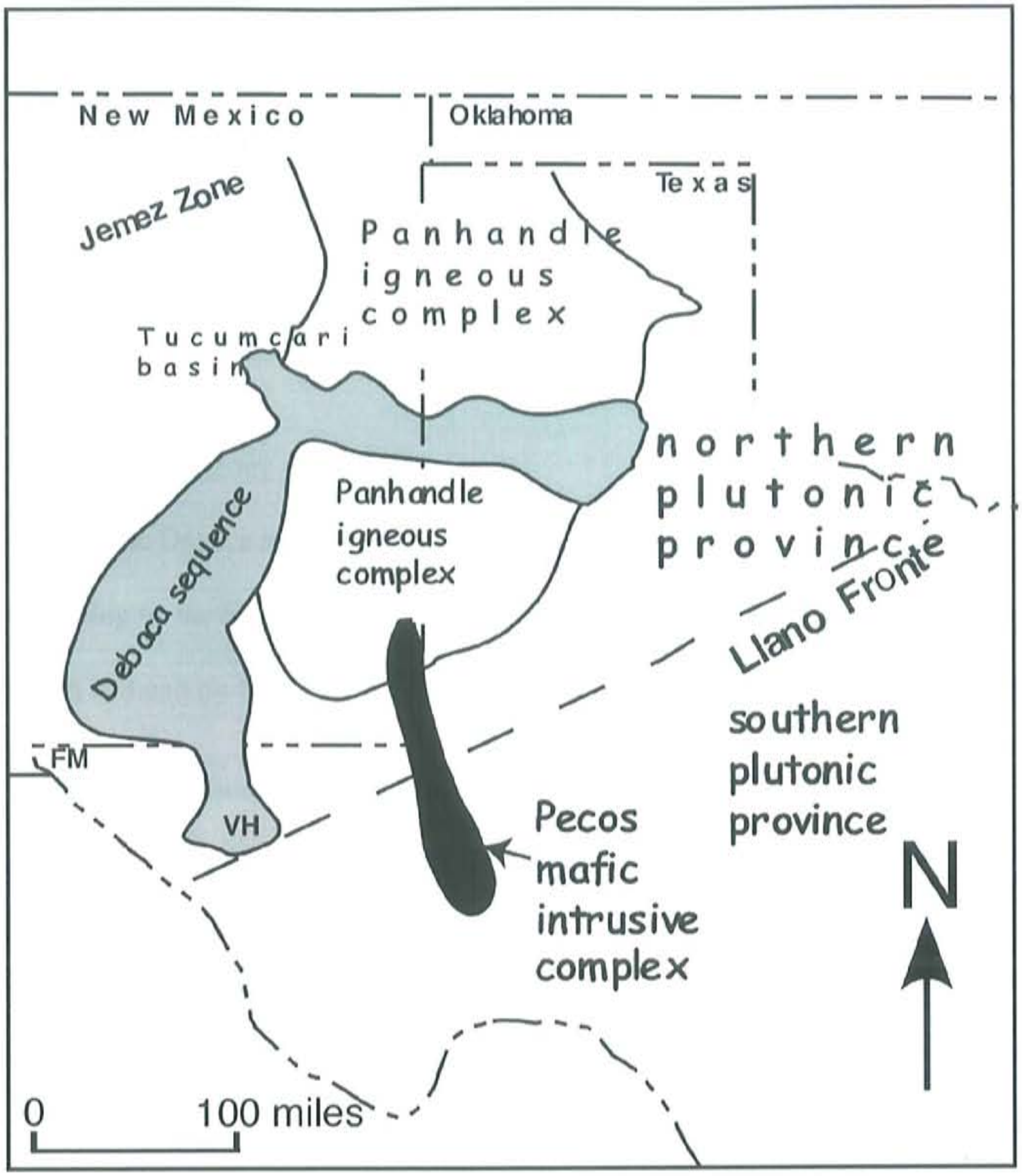


Figure 11. Map of the subsurface extent of the Debacca Sequence. From Amarante et al., 2004.

does present a generalized stratigraphy, deduced from well chips of the unit as it exists in the Tucumcari basin region, New Mexico (Fig. 12). The well logging of Amarante et al. (2004) defines a 550 m thick sedimentary-volcanic sequence. In ascending order they report arkose, dolomitic quartzite, quartz rich dolomite, rhyolite, tuffaceous sandstone and volcaniclastic sandstone. Detailed studies of sedimentary structures and other features that would allow diagnosis of depositional environment are lacking due to limited outcrop of the sequence.

2.4.3 Geochronology and Provenance

The Debaca sequence was deposited between about 1.33 Ga and 1.1 Ga according to Barnes (2001). The sediments overlie the Panhandle Igneous Complex, which is dated by U/Pb SHRIMP on zircons at 1332 ± 18 Ma. Detrital zircons from the basal arkose unit of the sequence have two distinct age populations at 1320 ± 126 Ma and 1692 ± 37 Ma with the youngest crystal being 1308 ± 52 Ma. This indicates that deposition occurred after 1308 Ma, and that this part of the sequence has multiple provenances. The older crystals are likely derived from basement exposures, and the younger crystals could be derived from the local Panhandle Igneous Complex. The sequence is cut by a gabbro that intruded at 1105 ± 3 Ma (Amarante et al., 2004).

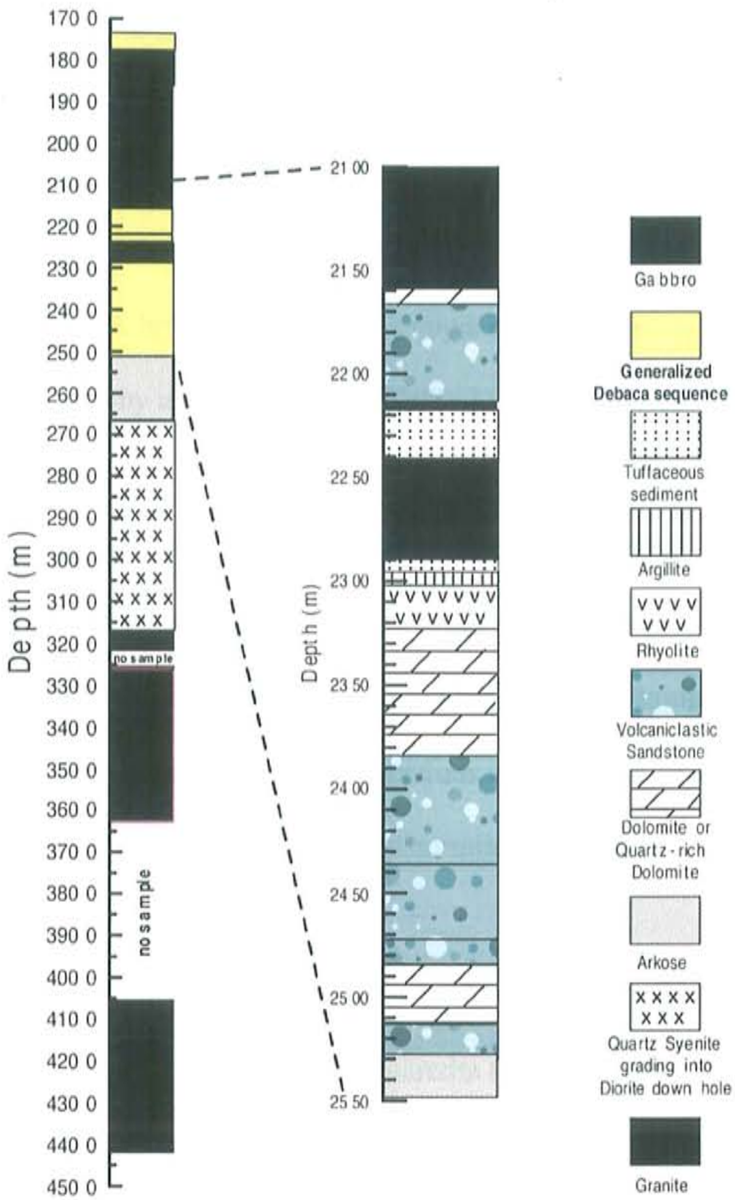


Figure 12. The stratigraphy of the Debacca Sequence in the subsurface of northeast New Mexico deduced by well chips by Amarante et al., 2004. Modified from Amarante et al., 2004.

3. SAMPLE COLLECTION AND METHODOLOGY

Samples were collected from various outcrops of each of the sedimentary sections described above. Detailed descriptions of sample locations can be found in Appendix 2. A brief description of sample collection is presented below, accompanied by a summary table (Table 1).

3.1 Apache Group and Troy Quartzite, Southeast Arizona

Twenty-one samples of the Apache Group and Troy Quartzite were collected from locations in southeast Arizona in May 2003. Six samples from two locations were used in this study (Fig. 5). Locations in the southeast were chosen to complement previous isotopic age determinations in the Sierra Ancha area (Central Arizona) by Stewart et al. (2001).

Three samples of the Pioneer Shale (F03-5-15, F03-5-17 and F03-5-18), two samples of the Dripping Springs Quartzite (F03-5-1 and F03-5-13) and one sample of the Troy Quartzite (F03-5-11) were selected for $^{40}Ar/^{39}Ar$ analysis. These rocks contained the largest and most abundant muscovites

3.2 Grand Canyon Supergroup, Grand Canyon

Muscovite bearing sandstones and siltstones were collected from the Hotauta Conglomerate and Dox Formation. Several different members of the Grand Canyon research group, including this author, Matt Heizler, Karl Karlstrom, Mike Timmons and Laura Crossey, collected samples over several years. The oldest sedimentary rock

Table 1. Summary of the samples used from each stratigraphic unit. For each sample the number of crystals that were step heated (step) and the number fused in one step (fused) is listed. The correction factor is listed if a correction factor was used when calculating the age of the crystal (see section 4.1).

Group	Formation	Member	Sample	Step	Fused	Correction
Apache	Pioneer	Unnamed	F03-5-15	3	55	1.6
			F03-5-17	4	54	1.6
			F03-5-18	13	61	1.6
	Dripping Sp.	Upper	F03-5-1	34	38	3.9
		Upper	F03-5-13	39	0	-
-	Troy	Arkose	F03-5-11	19	94	0.7
Unkar	Bass	Hotauta	K03-77-2	-	13	-
	Dox	Escalante Creek	T-16-75-2	23		
			98GC-23	7	59	0.8
			K98-65-1	12	35	3.9
			00GC-54	13	9	1.3
		Solomon Temple	00GC-59r	10	38	0.5
			00GC-59g	15	18	0.6
			00GC-59gbio.	7	17	6.4
		Comanche Point	H02-71-3		21	
			H02-71-9		19	
			H02-71-16.5		19	
			H02-71-43		16	
		Ochoa Point	H02-71-124		20	
			H02-71-174		22	
			H02-71-181		25	
			H01-71-200.2		25	
			00GC-62	11		0.8
Pahrump	Crystal Sp.	Arkose	K03-DV-04	65	-	-
			K03-DV-04fsp.	23	-	-
	Debaca	Upper	KSC-99-4	-	68	
		Upper	KSC-99-11	40		

sampled from the Grand Canyon Supergroup is from a sandy layer within the Hotauta Conglomerate (K03-77-2). This sample is from Hance Rapids at river mile 77. Several Dox Formation samples were collected with representative samples from each of the Escalante Creek, Solomon Temple, Comanche Point and Ochoa Point members. $^{40}Ar/^{39}Ar$ muscovite analyses were performed on a total of 17 Dox samples. Biotite was also dated from a sample of the Escalante Creek Member.

3.3 Crystal Springs Formation, Death Valley

Three sampling locations were visited in the southern part of Death Valley, however because of post deposition metamorphism only one location provided samples suitable for $^{40}Ar/^{39}Ar$ dating. A sample of the Arkose Member of the Crystal Springs Formation (K03-DV-04/F04-DV-01) from the Kingston Range (Location 1, Fig. 9) yielded muscovite, and K-feldspar. Three samples from the upper Carbonate-Terrigenous Member of the Crystal Springs Formation from the Saratoga Springs area (Location 3, Fig. 9) were attempted for $^{40}Ar/^{39}Ar$ analysis however the muscovites had experienced significant argon loss due to Phanerozoic metamorphism.

3.4 Debaca Sequence, New Mexico

Two samples of the Debaca Sequence from the Sacramento Mountains were provided by Karl Karlstrom and Mike Timmons. These samples are a quartzarenite and a shale taken from the measured section documented by Pray (1961), in Nigger Ed Canyon, Sacramento Mountains, near Alamogordo, NM.

3.5 $^{40}Ar/^{39}Ar$ dating techniques

For each sample the rock was crushed mechanically in a jaw crusher and then ground in a disk grinder. The rock fragments were sieved and washed, and 50 to 100 muscovite or biotite crystals were handpicked from the grain size fraction that contained the most mica (usually the 60-90 sieve fraction), and wrapped in copper foil packages. About 60 K-feldspar crystals were also picked from Death Valley sample K03-DV-04. These copper packages were placed in 6-hole circular aluminum trays with alternating samples of neutron flux monitor Fish Canyon sanidine. The samples were irradiated in four different irradiation batches at either the McMaster nuclear reactor at McMaster University in Hamilton, Ontario or the Ford Reactor at the University of Michigan.

All $^{40}Ar/^{39}Ar$ samples and flux monitors were heated using a CO_2 laser at the New Mexico Geochronology Research Laboratory (NMGRL) at the New Mexico Institute of Mining and Technology. Details of the argon extraction, mass spectrometry, as well as age calculation methods for $^{40}Ar/^{39}Ar$ geochronology are provided in Appendix 3. Also, complete data tables and figures are provided in Appendix 3.

4. RESULTS

4.1 $^{40}Ar/^{39}Ar$ data

Argon data tables, age spectra and age probability diagrams are provided in Appendix 3. Age probability diagrams that summarize results obtained from $^{40}Ar/^{39}Ar$ analysis are presented as Figure 14. Table 1 is a summary of the location and number of crystals analyzed from each sample. Table 2 contains descriptions and photomicrographs of muscovites from each sample analyzed. Unless otherwise specified, all results presented below are obtained from detrital muscovite crystals.

Most of the muscovites are highly radiogenic and indicate only minor post-depositional argon loss. ^{37}Ar signals (determined from irradiation of Ca) are generally very small or not detectable and also indicate limited alteration.

Both single crystal age spectrum and total fusion analyses were conducted. The age spectrum has the potential to evaluate the internal age heterogeneity within individual grains that can occur due to argon loss related to protracted cooling, reheating events and/or alteration. Some studies have shown that incremental heating of muscovite crystals can reveal reasonable diffusion loss profiles in partially disturbed crystals (Lanphere and Dalrymple, 1971; Hanson et al., 1975; Harrison and McDougall, 1981; Wijbrans and McDougall, 1986) and therefore the step-heating method was used for most of the samples in this study. When there is minor argon loss, the age spectrum may allow a better age estimate compared to the total fusion analysis. Step heating experiments of the detrital crystals must obviously be done on single grains in order to decipher the age populations, however the experiments are difficult and time consuming because the argon concentrations are low for the typically small (most between about 150-400 μm in diameter) crystals. The old age (> 1 Ga) for the crystals helps make the step-heating analyses possible, and long irradiations also contribute to higher concentrations of reactor-produced isotopes. Still, only low-resolution age spectra (3-7 heating steps) can be carried out because of signal limitations and therefore any within crystal age heterogeneities will be more homogenized than for typical high resolution age spectra that are performed on bulk samples. The total fusion analyses allow for more grains to be analyzed, but can be less rigorous due to the inability to adequately investigate post depositional argon loss. The two types of analyses were used for most samples to exploit the benefits of both and as will be shown below, total fusion age data were corrected in order to make them more directly comparable to the age spectrum data.

Four different styles of age spectra are recognized and are defined as types 1, 2, 3 and 4 (Fig. 13). Type 1 spectra show the least amount of internal discordance and have consecutive steps with age populations that have MSWD values less than 10 and which also contain 80% or more of the total ^{39}Ar released. These spectra yield the most reliable plateau ages that record a robust measure of when the source terrain cooled below the muscovite closure temperature of about 350°C. Type 2 age spectra are more disturbed and defined plateau segments containing more than 40% of the total gas released and have an MSWD of less than 100. The Type 2 spectra do not show obvious signs of recording post-depositional argon loss and their complex structure are probably related to a complex or protracted source terrain thermal

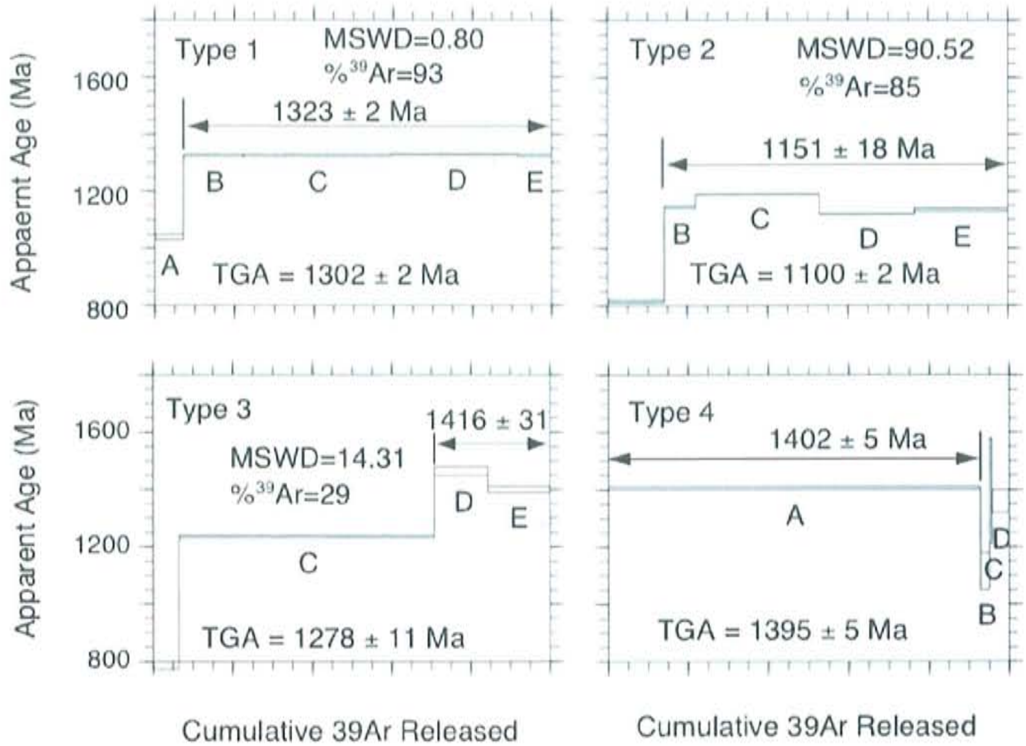


Figure 13. Examples of the different 'types' of age spectra plateaus.
Type 1 has MSWD less than 10 and is more than 80% of the gas.
Type 2 has MSWD less than 100 and is more than 40% of the gas.
Type 3 has MSWD more than 100 and/or is less than 40% of the gas.
Type 4 has a step that is more than 80% of the gas.

history. Type 3 spectra are generally quite complex and have apparent ages that are younger than the possible depositional age based on the ca. 1.1 Ga crosscutting diabases. The older steps in the spectra are geologically acceptable (i.e. greater than 1.1 Ga) however there is not complete confidence that these apparent ages have not been decreased after deposition. Plateau ages assigned to type 3 spectra are from combining two or more consecutive steps that either have an MSWD of above 100 or constitute less than 40% of the gas released. Samples that almost completely degassed in one heating step are defined by Type 4 spectra. These samples are nearly equivalent to total fusion results and give little information about any possible internal age complexity. If a spectrum has a single step containing 80% or more of the total ^{39}Ar, it is classified as type 4 and the plateau may or may not be defined from this single step.

In almost all of the age spectra, initial heating steps yielded younger ages compared to the bulk of the spectrum. Therefore plateau ages are typically older than total gas ages that are determined by combining all steps of individual age spectra. Total gas ages can be considered equivalent to total fusion ages as both represent an age that is derived from all of the sample gas. As mentioned, single-crystal age spectra may afford a more accurate apparent age of a crystal, however they are very time consuming and therefore it was necessary to conduct total fusion analyses to obtain a sufficient number of ages to more completely describe the entire distribution of detrital ages. In some samples that contained only very small crystals, all of the analyses needed to be total fusion analyses. Because plateau ages are nearly always older than total gas ages, plateau ages cannot be directly compared to total fusion ages with out some bias. By comparing the total gas age of step heated crystals to their plateau ages it is possible to determine how much the total fusion ages underestimate the age of the crystal. In each sample, the average percent difference in age between the plateau age and the total gas age in the step-heated crystals was calculated. This percent difference (usually between 0.5 – 5%) was used to correct (i.e. increase) the apparent ages of total fusion results.

The error estimate of the total fusion results also needs adjustment to reflect the uncertainty in the amount that the total fusion age was increased. A fairly conservative approach was used in estimating the error of total fusion data. Because there is no way to know if any given analysis should be adjusted by the average amount, or by the low or higher amounts encompassing the standard deviation of the mean correction, we simply add to the error the number of years represented by the age correction percentage. For example, if the total fusion age was 1200 ± 5 Ma, and the age correction was 5%, the final age would be 1260 Ma and the error would be 1200*5% + 5 Ma (i.e. ±65 Ma). This larger error is thought to more appropriately reflect the uncertainty as compared to the relatively small analytical error. The adjusted total fusion age data can be combined with the plateau ages to construct age probability diagrams for each sample (Fig. 14). These plots are the summation of the normal distribution for each individual analysis (Deino and Potts, 1992) and are similar to histograms, but also incorporate the error of individual analyses rather than simply bin the data based solely on the calculated age. The high precision plateau data standout as sharp peaks superimposed on the broad peaks defined by the low precision corrected total fusion ages.

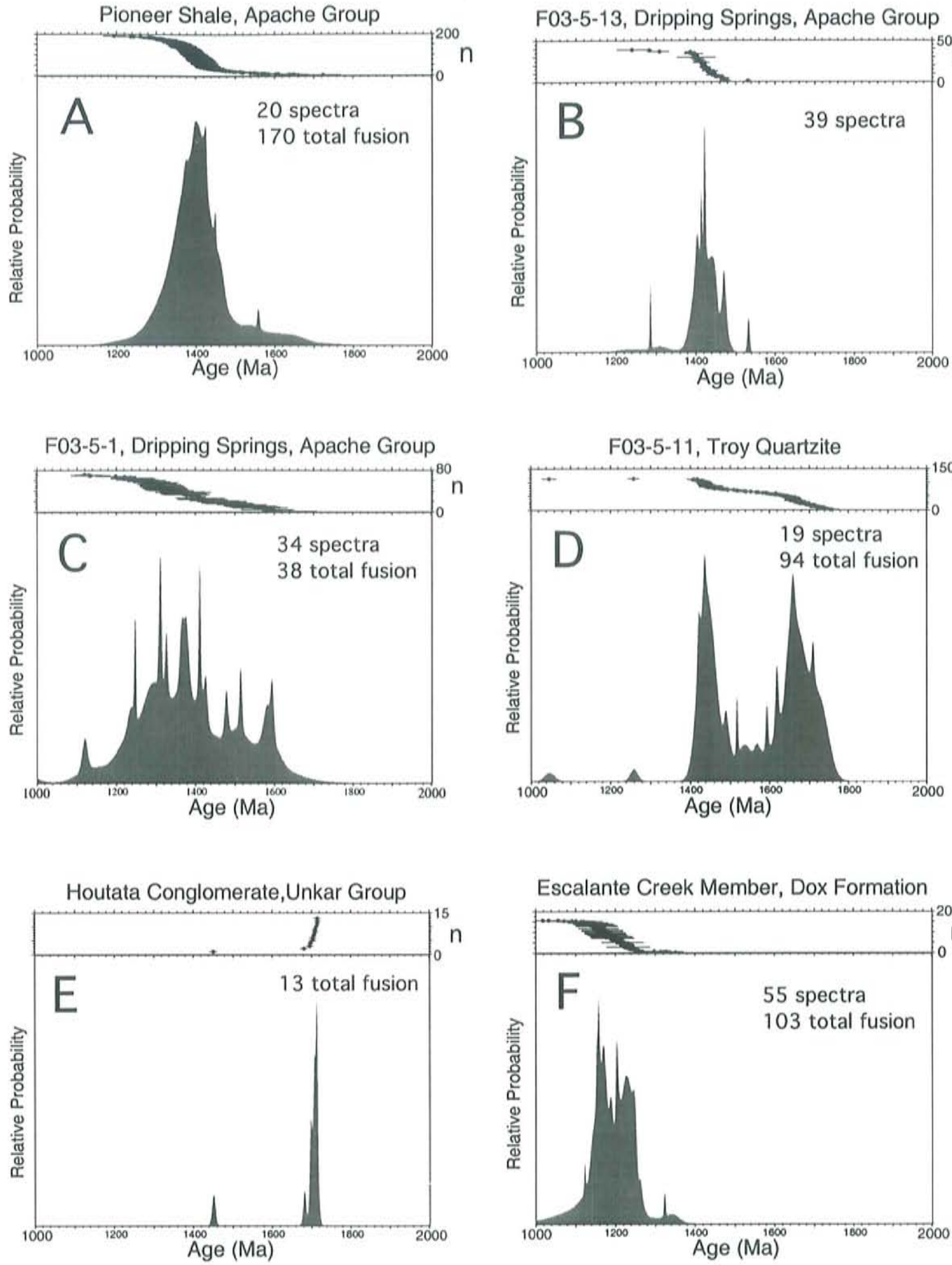


Figure 14. Age probability distribution diagrams of each sample dated in this study. Errors are 1 sigma.

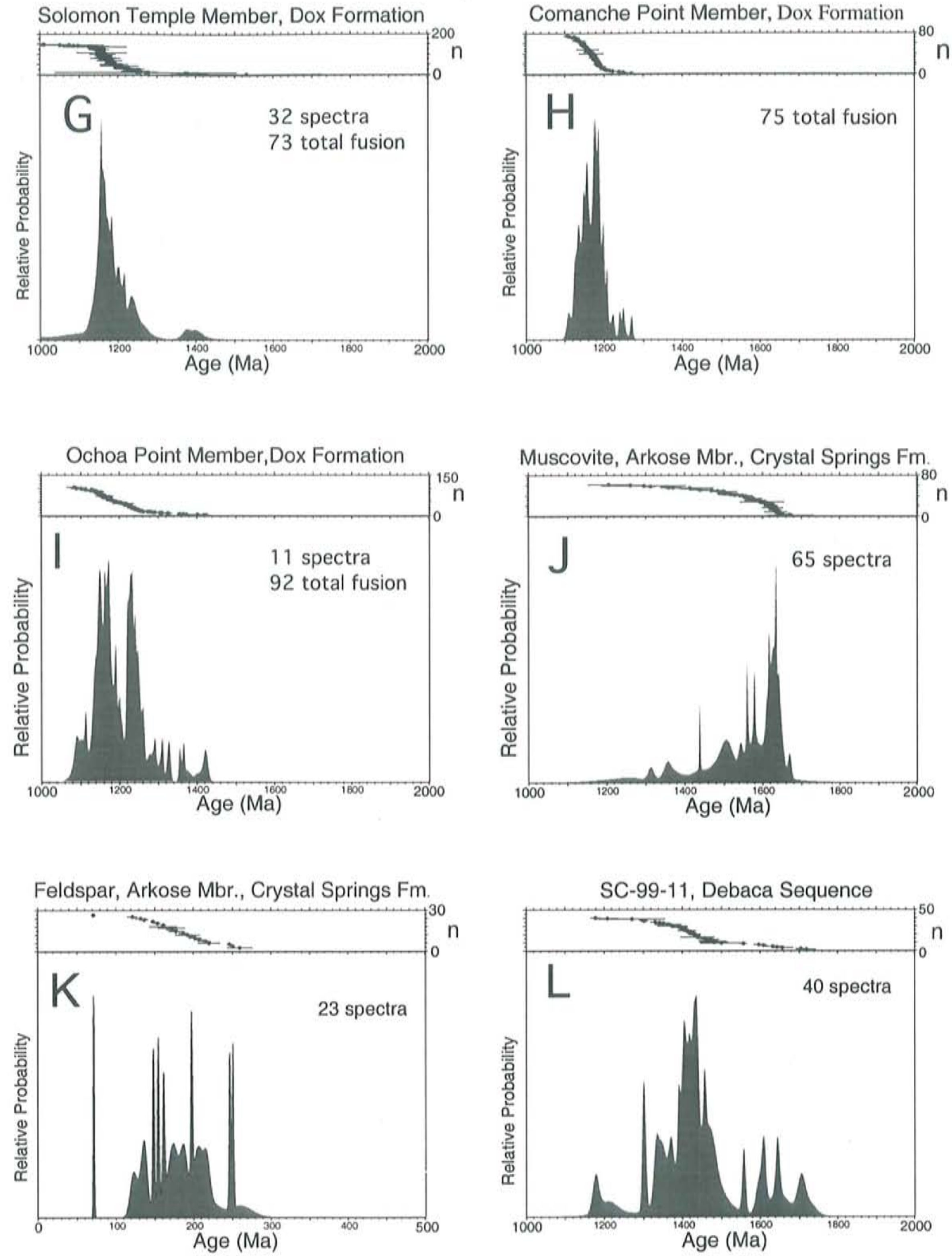


Figure 14 (Continued).

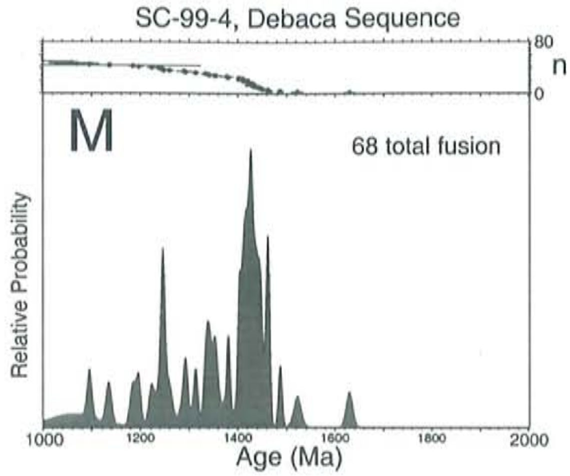


Figure 14 (Continued).

4.2. Apache Group and Troy Quartzite, southeast Arizona

4.2.1 Pioneer Shale

Three samples of the Pioneer Shale were analyzed from the location near the Winkelman mine (Fig. 5). These samples were taken from about 3 to 15 meters above the unconformity with the crystalline basement. Thin sections from these samples reveal little to no observable alteration of the muscovites (Table 2). For sample F03-5-15 3 crystals were step heated and 55 were fused. For F03-5-17 there are 4 step heated crystals and 54 total fusion ages. Thirteen crystals from F03-5-18 were step heated and 61 were fused. The shape of the spectra from all of these samples are similar and therefore all of the step-heating data from all three samples are used to determine the age correction for the total fusion data. The age distributions of each Pioneer sample are very similar, so the data from all three samples are presented on one age probability diagram (Fig 14-A). The step heating data are dominated by type 2 spectra (65%) with the majority of the rest being type 4 (Appendix 3). The average age correction for the total fusion data is 1.6 %. The age results reveal a very prominent population at about 1.4 Ga, with a smaller data set corresponding to an older age between about 1.50 and 1.65 Ga.

4.2.2 Dripping Springs Quartzite

Two samples from the Dripping Springs Quartzite were analyzed, one from the 7-Dash Ranch (F03-5-1) and one from the Winkelman location (F03-5-13) (Fig. 5). Thirty-nine crystals from sample F03-5-13 were step heated. The age spectra types

Table 2. Photomicrographs of samples used in this study.

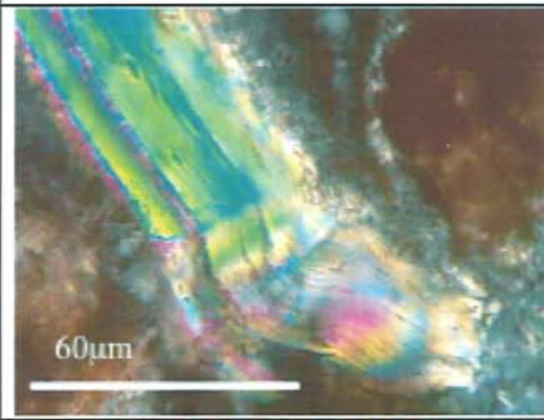
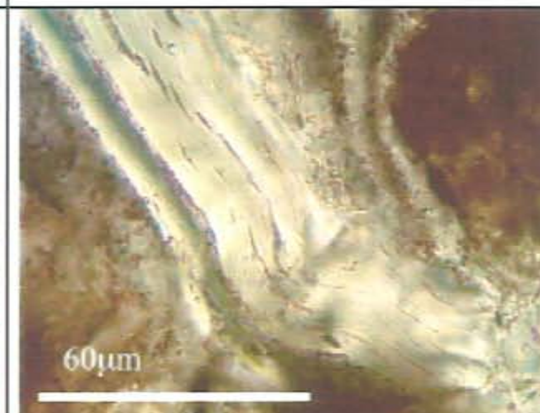
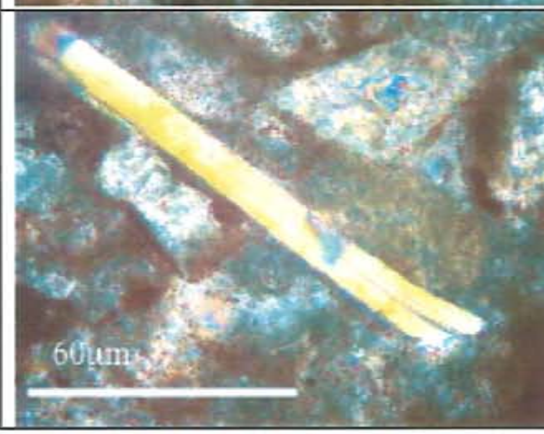
Sample	Evidence of Post-deposition processes	Muscovite Preservation	Crossed Poles	Transmitted Light
F03-5-15	Bending Kinking Opaque blotches	Good		
F03-5-17	Kinking Discoloration to orange/brown	Good		

Table 2 (Continued)

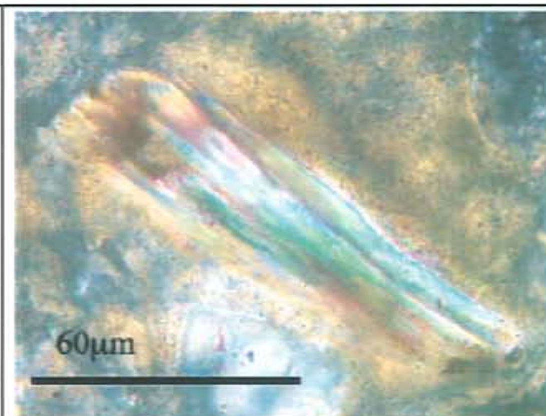
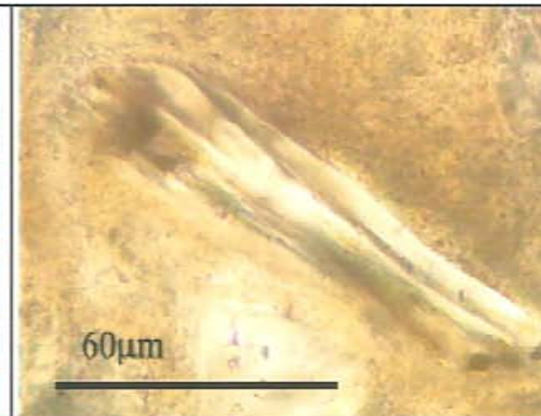
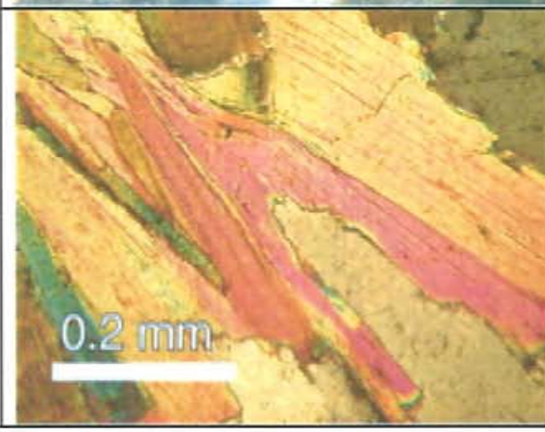
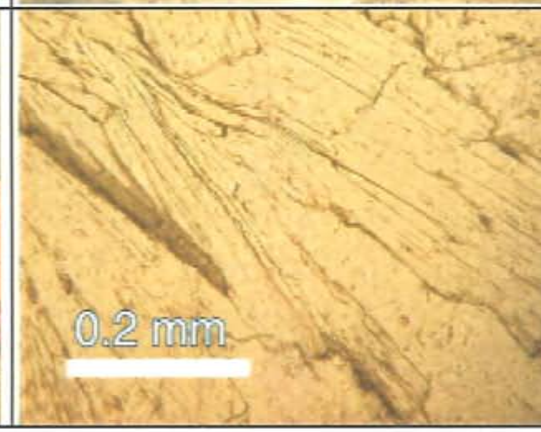
F03-5-18	Discoloration to orange/brown	Good		
F03-5-13	Breaking of crystal edges	Excellent		

Table 2 (continued).

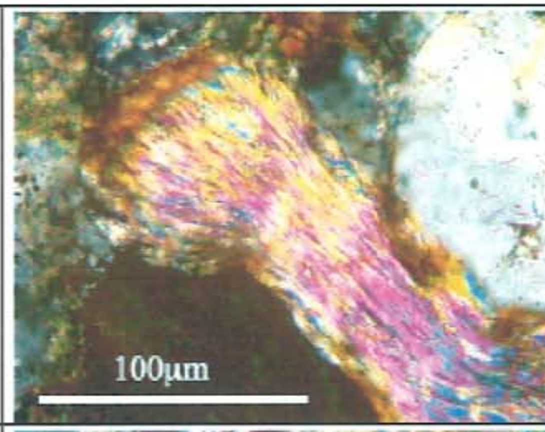
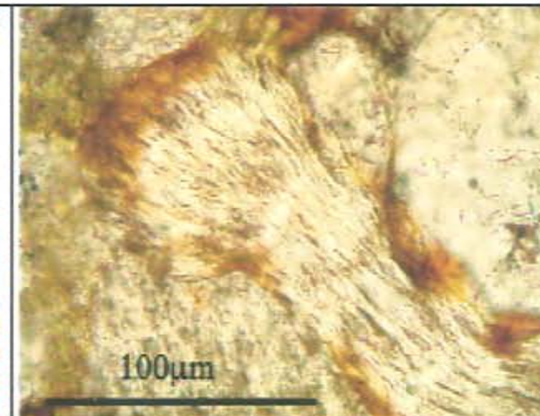
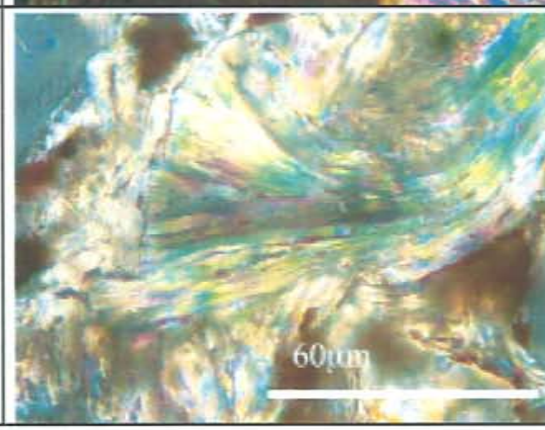
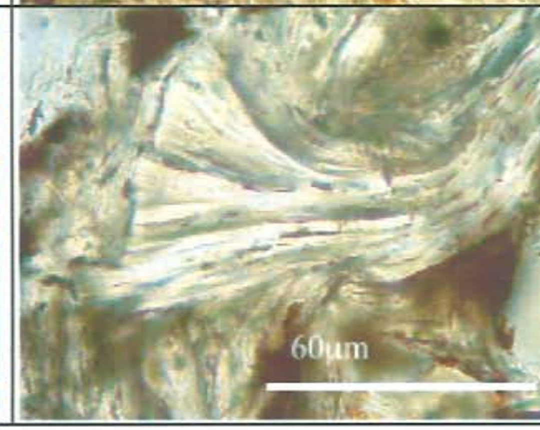
F03-5-1	Bending Fanning at crystal ends Opaque blotches Discoloration at crystal edges	Poor to Fair		
F03-5-11	Bending Breakag of crystal edges Fanning at crystal ends Opaque blotches Discoloration at crystal edges	Poor to Good		

Table 2 (Continued).

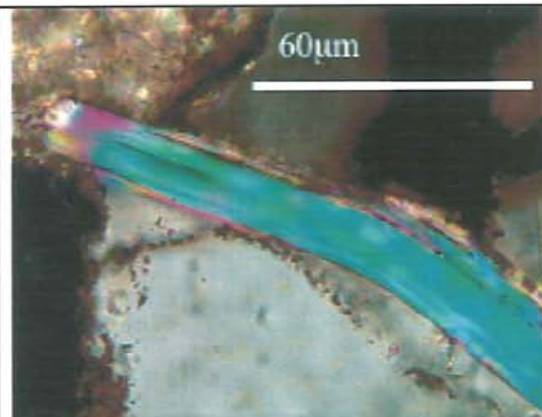
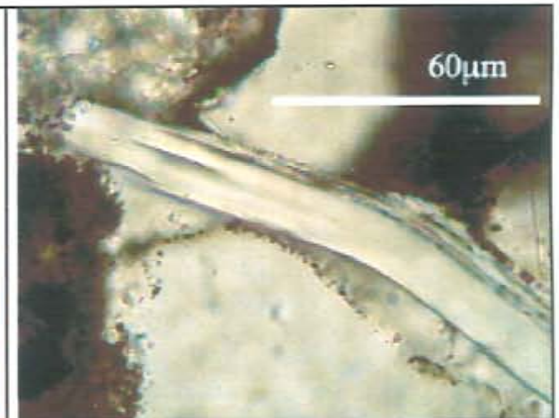
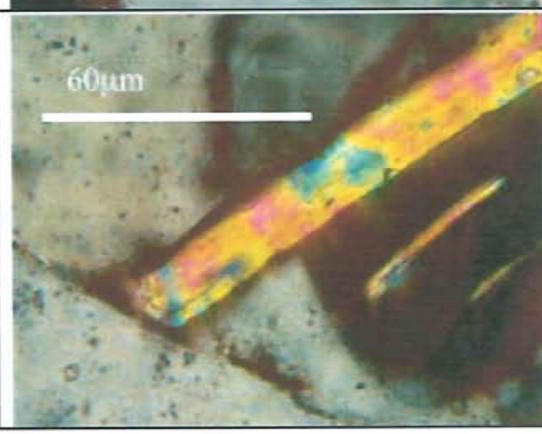
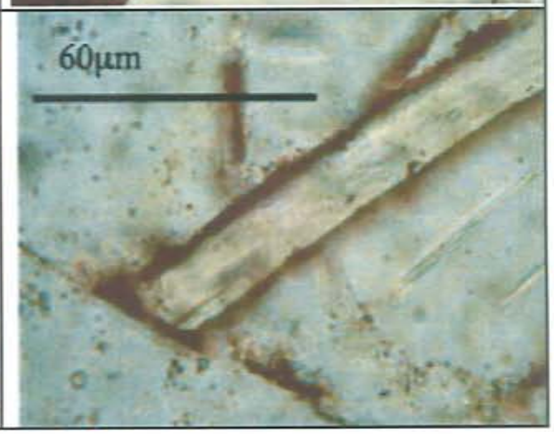
K03-77-2	Bending	Good		
H02-71-3	Bending	Good		

Table 2 (Continued).

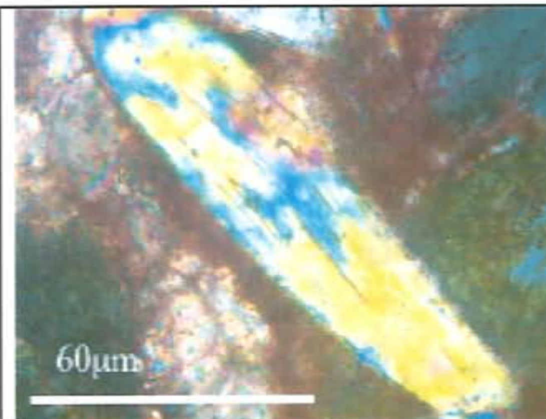
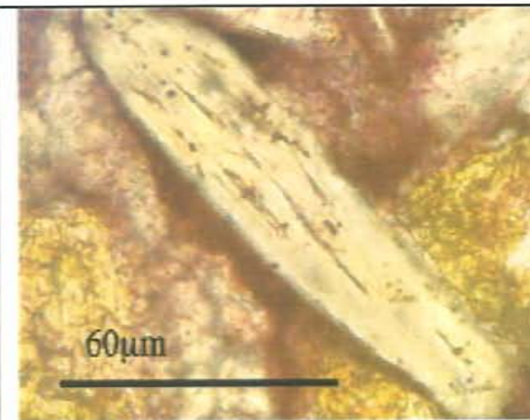
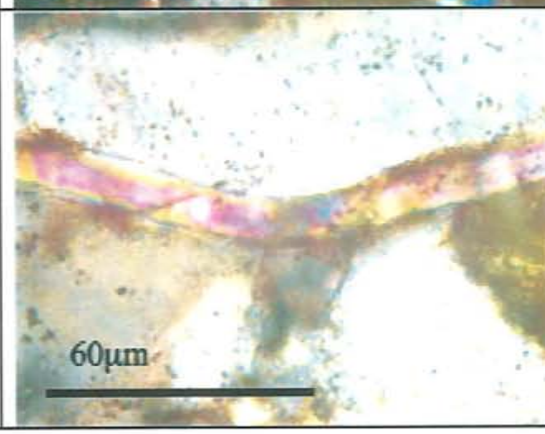
H02-71-9	Bending Some discoloration	Good		
H02-71-16.5	Bending Some discoloration	Fair to Good		

Table 2 (Continued).

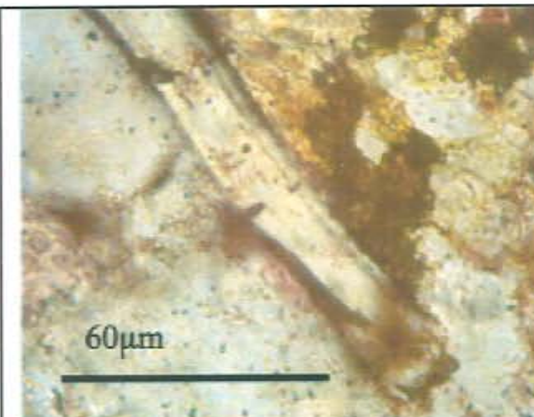
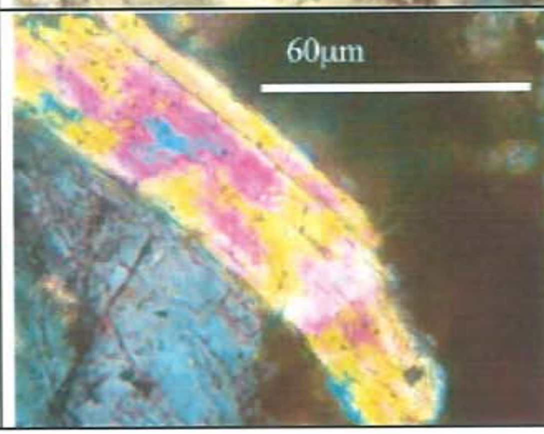
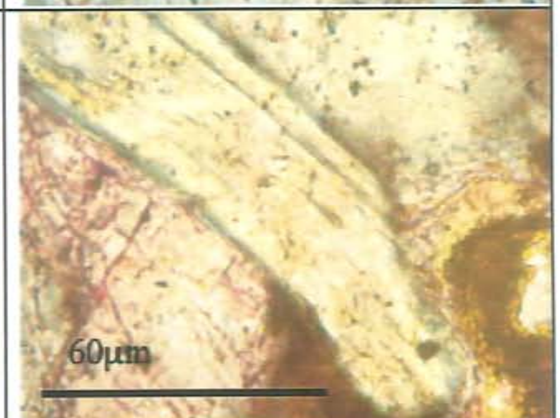
H02-71-43	Bending Kinking Some discoloration to orange/brown	Good		
H02-71-124	Bending Some discoloration	Poor to Good		

Table 2 (Continued).

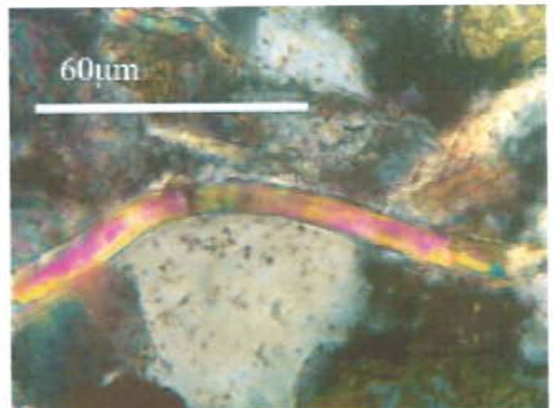
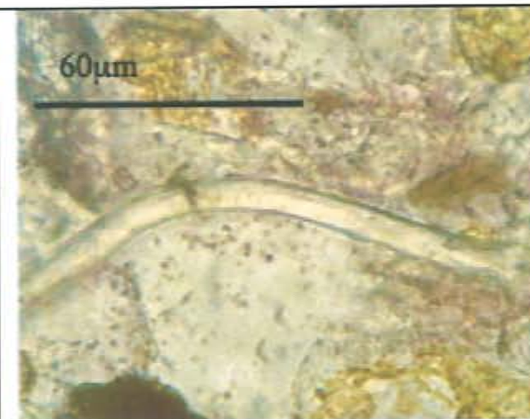
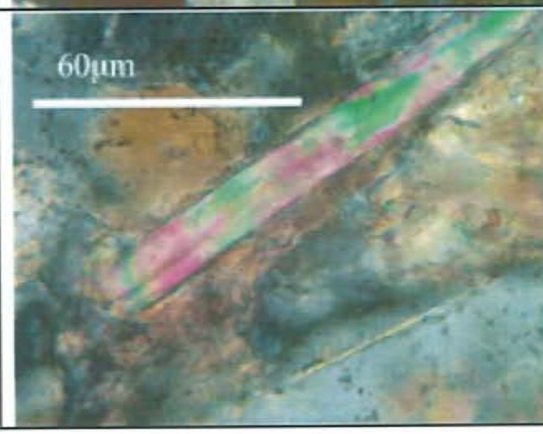
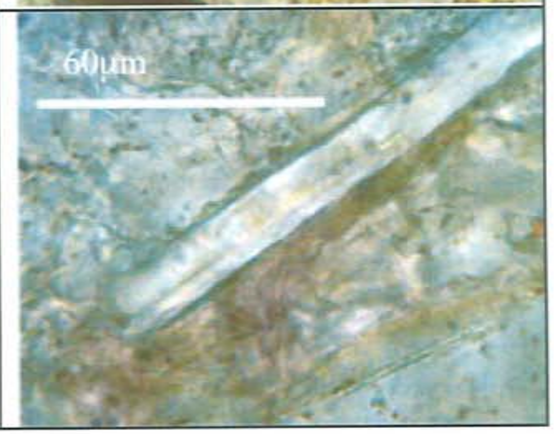
H02-71-174	Bending	Good		
H02-71-181	Bending	Fair to Good		

Table 2 (Continued).

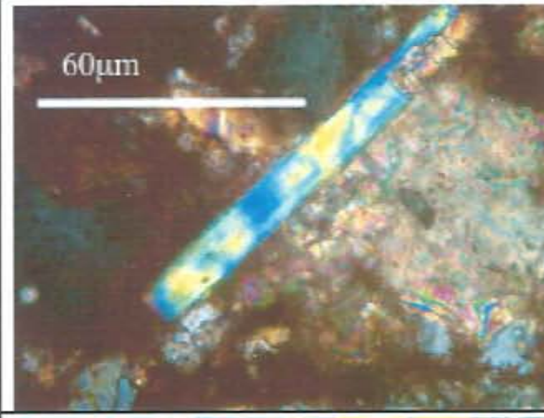
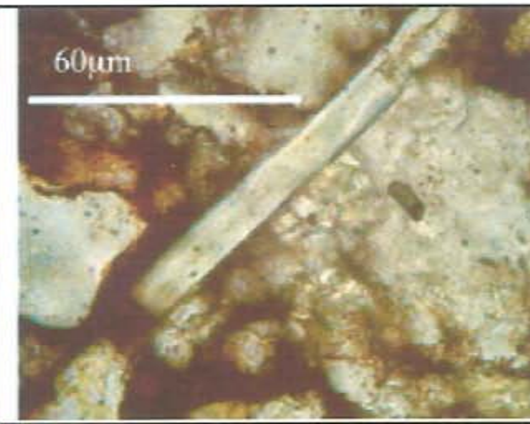
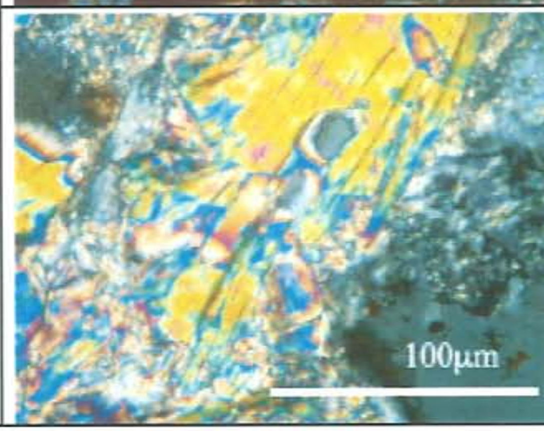
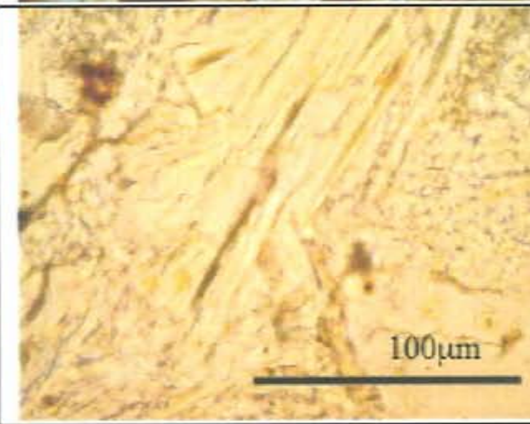
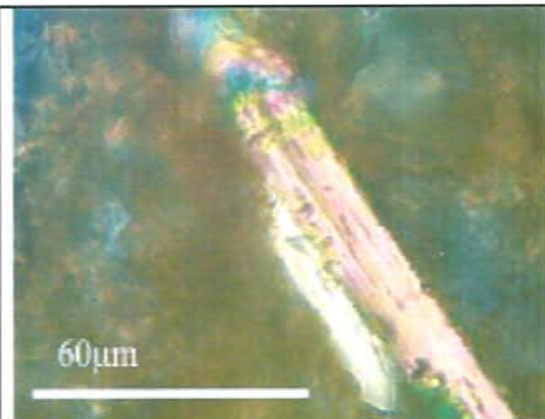
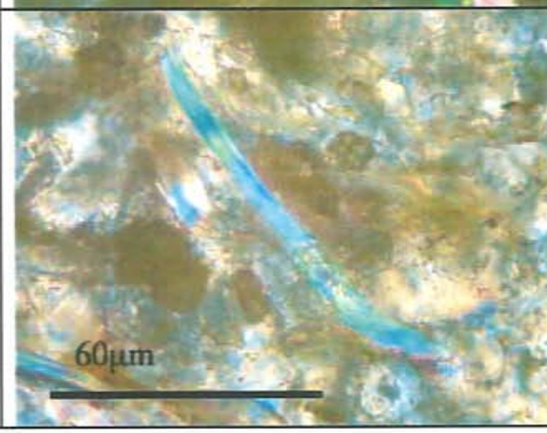
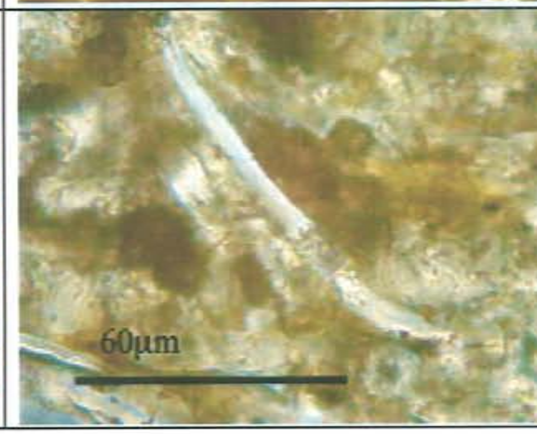
H02-71-200	Breaking at crystal edges	Fair to Good		
K03-DV-04	Breaking at crystal edges Fanning at crystal ends Kinking Implantation of smaller crystals	Poor to Good		

Table 2 (Continued).

KSC-99-4	Discoloration to orange/brown Crystals breaking at edges	Fair to Good		
KSC-99-11	Bending Kinking Some discoloration to orange/brown	Fair to Good		

were fairly uniformly distributed and there were about 15% type 1 and type 2, 23% type 3 and 8% type 4 (Appendix 3). The average difference between the total gas ages and the plateau ages was 1.8%. Most of the plateau ages cluster relatively tightly around a 1420 Ma peak, with a much smaller peak at 1285 Ma (Fig. 14-B). Thirty-four crystals were step heated from sample F03-5-1 with about half being type 1 and type 2 and most of the remaining being type 3 (Appendix 3). This sample revealed fairly complex age spectra with the average total fusion age correction at about 3.9%. Thirty-eight F03-5-1 muscovite crystals were fused. This sample shows a wide distribution of ages between about 1100 Ma and 1600 Ma (Fig. 14-C). Thin-section analysis shows that the matrix of this sample is composed of what appears to be illitic clay. Muscovite grain boundaries look frayed and chipped indicating mechanical weathering (Table 2). It is probable that clay particles from the matrix adhered to the surface of the muscovites and were caught in the voids created by mechanical weathering. The presence of clay is likely the reason for the complex age spectra and wide age variability noted in this sample.

4.2.3 Troy Quartzite

A sample of the Troy Quartzite from the Winkelman location had 19 crystals step heated and 94 crystals totally fused. In thin section the muscovites appear to be pristine, with little to no evidence of alteration. Many of the age spectra are quite flat with about 95% being either type 1or type 2 (Appendix 3). The flat spectra result in a rather small total gas age correction of 0.6%. The age probability diagram for this sample shows major groups at 1.44 Ga and 1.66 Ga (Fig. 14-D). There are also several crystals with ages that lie between 1.4 and 1.6 Ga. Two crystals are significantly younger than the overall population and have apparent ages of 1.04 Ga (F03-5-11-01) and 1.25 Ga (F03-5-11-21).

4.3 Unkar Group, Grand Canyon

4.3.1 Hotauta Conglomerate

The Hotauta Conglomerate sample (K03-77-2) was collected from a sandy layer within the conglomerate. The muscovite from this sample is very fine grained and most crystals are between about 100-150 μm in diameter. Only 13 crystals were analyzed from this sample and all are total fusion analyses as the grains were too small for step-heating. Because there are no age spectra data there is no basis for an age correction for the total fusion results and therefore only the analytical error is reported. Twelve of the 13 apparent ages are ~1700 Ma with a lone grain yielding a date at 1451 Ma (Fig 14-E).

4.3.2 Dox Formation

Each member of the Dox Formation was represented by more than one sample (Table 1). Recall that the Dox is divided into (in ascending order) the Escalante Creek, Solomon Temple, Comanche Point and Ochoa Point Members. Samples from the Escalante Creek Member included T-16-75-2, 98GC-23, K98-65-1 and 00GC-54. Together these samples are represented by 55 step-heated crystals and 103 total fusion results. Most Escalante Creek muscovites have quite flat age spectra with the great majority yielding either type 1 or type 2 spectra. In contrast, K98-65-1 revealed a significant amount (17%) of type 3 spectra that yield some unrealistically young ages. The difference between plateau age and total gas age differed between samples from about 0.8% for 98GC-23 and T-16-75-2 to 1.3% for 00GC-54. The K98-65-1 crystals showed significantly discordant age spectra that resulted in a relatively large difference of 3.9% between total gas and plateau ages. Because the muscovites from the Escalante Creek member are quite similar the age data are combined into one age probability diagram (Fig. 14-F). Of the 158 crystals analyzed, 144 fall between 1100 and 1300 Ma with the bulk of these between 1140 and1240 Ma. The few crystals that are younger than 1100 are from the altered K98-65-1 sample. There is also a small population (6 crystals) that falls between 1300 and 1350 Ma.

Samples 00GC-59r and 00GC-59g are from the Solomon Temple Member and were collected at the same location. In addition to muscovites from these samples, 24 biotites were analyzed from 00GC-59g. Twenty-five muscovites were step heated, as were 7 biotite crystals. The muscovite spectra are overall very flat with 80% of them yielding type 1 spectra with the final 20% being type 2. These flat spectra resulted in only minor differences between total gas and plateau ages such that the total fusion data only required about a 0.5% age increase. The biotite age spectra from sample 00GC-59g were fairly disturbed with about 70% type 2 and 15% each of types 3 and 4 (Appendix 3). These biotite spectra generally show initially young ages that are significantly less than 1.1 Ga and then climb to ages that are similar to the ages given by the flat muscovite spectra. Because the biotite spectra were very disturbed there is a large (6.4%) average discordance between total gas and plateau ages. In addition to the age spectrum analyses, 56 muscovites from the Solomon Temple Member were analyzed by total fusion, as were 17 biotite crystals. The age probability distribution for the Solomon Temple Member (Fig. 14-G) has a narrow age population peak at about 1160 Ma, with a full 1/3 of all analyzed crystals being between 1150 and 1170 Ma. Of the remaining crystals most were between 1170 to 1280 Ma with a smaller peak at about 1400 Ma.

Only total fusion analyses were conducted on Comanche Point samples. A total of 75 crystals were fused from samples H02-71-3, H02-71-9, H02-71-16.5 and H02-71-43. An age correction was not applied to these total fusion results because no age spectra were generated. The majority of the ages form a large population between 1140 Ma and 1200 Ma with a significant peak at about 1190 Ma (Fig. 14-H). There are four crystals that record ages from 1240 Ma to 1280 Ma.

The age data for the Ochoa Point Member come from total fusion analyses from four samples (H02-71-124, H02-71-174, H02-71-181, H02-71-200) with step heating and total fusion results from a fifth sample (00GC-62). One hundred and forty-eight crystals were fused and 11 were step heated. Only the total fusion results from 00GC-62 were subject to an age correction because it was the only sample that had step heating analyses. The majority of the age spectra (91%) from 00GC-62 gave type 1 spectra and the average age increase based on the plateau versus total gas age was 0.8%. The muscovites from the Ochoa Point cluster tightly between 1100 Ma and 1270 Ma, with the majority of the crystals falling between 1140 and 1210 Ma.

The age results for the vast majority of muscovites from the Unkar Group were geologically reasonable, with the bulk falling between about 1150 to 1250 Ma, however one sample (H02-71-124) had a few ages that are younger than the age of the Cardenas Basalts (Fig. 15). This sample had anomalously low radiogenic yields (~95% and less) compared to typical values of greater than 98%. The low radiogenic yields probably correspond to alteration or incorrect correction for atmospheric ^{36}Ar. Either way the results are geologically inaccurate and are removed from the data set. Combined, nine crystals from sample H02-71-124 and one crystal from sample H02-71-181 were rejected from the data set leaving eighty-three crystals in the final age probability diagram for the Ochoa Point Member (Fig. 14-I).

4.4 Crystal Springs Formation, Death Valley, California

Step-heating experiments were carried out on 65 muscovite crystals and 22 K-feldspar crystals from K03-DV-04. This sample is from the Arkose Member of the Crystal Springs Formation and yielded fairly complex muscovite age spectra (15% type 1, 40% type 2, 42% type 3 and 3% type 4).

Most concerning for this sample is that many of the apparent ages in the spectra, as well as some plateau ages are younger than the 1.08 Ga age determined for the cross-cutting diabase dyke. These young ages and the complexity of the spectra strongly suggest post deposition argon loss, but it is not known if all ages from all muscovites have been affected. For instance, there are many ages that are older than 1.08 Ga and thus could be recording an accurate source age signature.

Despite suspected argon loss, the age probability diagram for K03-DV-04 muscovites shows a distinct peak between about 1620 to 1640 Ma (Fig 14-J). There are also some younger ages, the youngest peak being 1310 Ma. There are several low

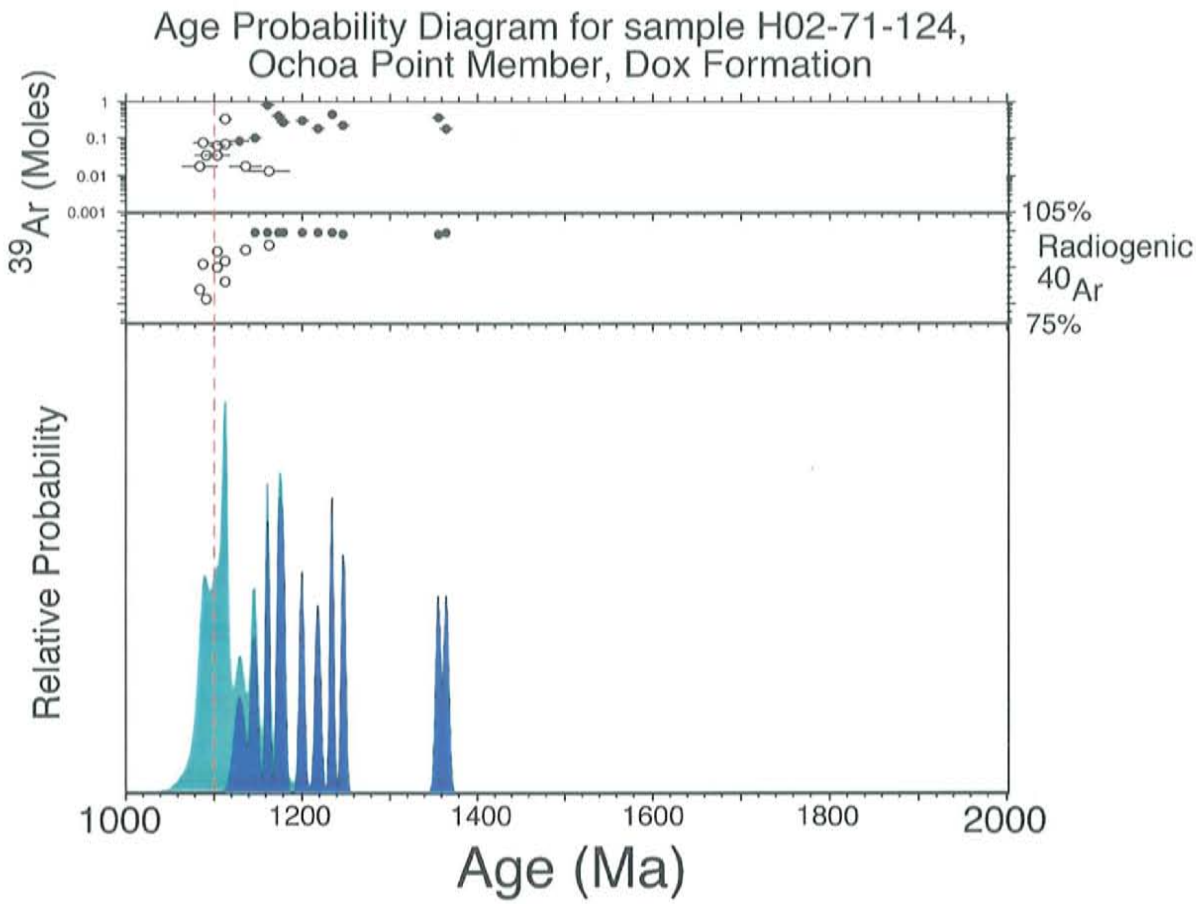


Figure 15. Age probability diagram of sample H02-71-124 highlighting the coincidence of analyses with low radiogenic yield, low 39Ar signals and unreasonably low apparent ages. The dashed red line represents the age of the Cardenas Basalt (minimum possible age of the sediments).

precision dates that are younger than 1300 Ma (Appendix 2; 54343-17, -18, -39, -36. -79, -44, 86, -49 –54). All of these young crystals had highly complex age spectra. In thin section muscovites show signs of alteration (Table 2). Type 3 age spectra with MSWD above 1,000 were excluded from figure 14-J (54343-36, -44. 86. –49 and –56).

K-feldspar from K03-DV-04 display radically different age trends than the muscovites from the same sample. Typically the first step (step A) of a K-feldspar age spectra is old compared to the rest of the steps. Steps B and C, and sometimes D and E, are younger and form an age minima in the spectra. Following the age minimum, the apparent ages rise and a plateau is generally defined by steps F and G. All of the K-feldspars yield ages (~100-250 Ma) are far younger than the possible depositional age of the Crystal Springs Formation. The plateaus are poorly defined due to continuous climbing nature of the spectra and therefore the calculated MSWD values that are very high are not meaningful. The age probability diagram for the K-feldspars illustrates that most of the assigned ages are between 100 to 250 Ma (Fig. 14-K).

4.5 Debaca Sequence, New Mexico

Forty muscovite age spectra were generated from sample SC-99-11. This shale sample is from the Debaca Sequence that crops out in the Sacramento Mountains near Alamogordo, NM. The spectra are quite variable and many are dominated by a single heating step. Of the better resolved spectra many are fairly flat with about 58% of all analyses yielding type 1 spectra. The plateau ages shown on the age probability plot cluster between about 1.40 to 1.44 Ga (Fig. 14-L). There are four smaller peaks between 1560 and 1710 Ma, and a sharp peak, defined by two crystals at about 1300 Ma. The youngest apparent age is 1180 Ma. The thin section shows muscovites that are very small, but still have distinct grain boundaries and little to no apparent alteration (Table 2).

A second sample from the Debaca Sequence, (SC-99-4) was also analyzed. This sample is a quartzarenite that is from the same exposure as the sample discussed above. Sixty-eight crystals were analyzed by total fusion and the results are presented in Figure (14-M). The ages from this sample show significant overlap with SC-99-11 at 1.4 Ga, and there are also a few older crystals up to about 1600 Ma. There are a significant number of crystals that fall around 1200 Ma. Also, there are several apparent ages between 400 and 600 Ma and are clearly not recording provenance ages based on the cross cutting diabase with a presumed 1.1 Ga age.

5. DISSCUSSION

5.1 Probable Source Areas and Present-day Age distributions

It is prudent to discuss the regional isotopic apparent ages found across the southwest United States before analyzing the results of each sample. The southwest United States was assembled in a series of orogenic events between about 1.8 to 1.0 Ga (Hoffmann, 1988)). These events were episodic and can be divided into three basic tectonic periods (Karlstrom et al., 2003). The first involved accretion of continental lithosphere during the Yavapai and Mazatzal orogenies and stabilization of that crust (1.80 – 1.65 Ga). This continental growth was followed by a lull in activity until about 1.45 Ga. The second period ranges from about 1.45 to 1.35 Ga and records pervasive intracratonic tectonism that is characterized by heating of the 1.80 to 1.65 Ga crust at mid crustal levels (~10-20 km) and widespread pluton emplacement. The final period spans from about 1.3 to 1.0 Ga, and during this time the southern margin of Laurentia experienced accretion of arc terrains and culminated with the Grenville orogeny continent-continent collision (Mosher, 1998).

The sedimentary rocks examined in this study were deposited between about 1.35 to 1.1 Ga, therefore the detrital mineral age results record the distribution of rocks exposed during this time. Coupling knowledge of basement thermal histories with the present day distribution of muscovite ages across the region can lead to an overall better understanding of the paleogeographic distribution of highlands and basins. For instance, thermochronology studies in the Rocky Mountains indicate that the present surface was not exhumed until at least 800 Ma (Sanders et al., 2004). Therefore, if the Rocky Mountain region was contributing detritus to the studied basins, the detrital mineral signature could be recording a very different age distribution compared to the present day distribution. In contrast, the basement in the Grand Canyon region was exposed by 1.25 Ga (Timmons et al., 2005) and therefore it is likely that at least part of the present day distribution of muscovite apparent ages were available as sources for the Mesoproterozoic sedimentary rocks.

Muscovite detrital apparent ages ranging between about 1.6 and 1.7 Ga must have come from rocks that were high enough in the crustal column to not be reset during 1.4 Ga heating or were from regions where the intensity of 1.4 Ga tectonism was limited. In contrast, 1.4 Ga crystals probably originated at mid-crustal depths and could be from either reset older rocks or from 1.4 Ga plutons. Because muscovite is not expected to occur as a dominate mineral in volcanic terrains, the presence of 1.4 Ga muscovites in the Mesoproterozoic sediments implies exhumation of basement from mid-crustal levels during or prior to sedimentation.

Detrital muscovites with ages significantly less than about 1.3 Ga would not likely be sourced from Yavapai or Mazatzal crust based on the present day distribution of mica ages. The vast majority of muscovite ages from present day exposures are older than 1.3 Ga in Arizona and the Rocky Mountain region (Shaw et al., 2005; Karlstrom et al., 1997). Therefore, muscovite apparent ages that would be less than 1.3 Ga are still not exposed today, and thus many present day exposures could not have been contributing overall young detritus during the Mesoproterozoic. There are a few locations within the Yavapai /Mazatzal region that could possibly contribute muscovites that are younger than about 1.3 Ga. For instance, in the Tusus and Taos Ranges of New Mexico the presently exposed muscovites cooled below about 350°C at about 1.0 Ga (Karlstrom et al., 1997). Also, the Pikes Peak batholith in Colorado was intruded at about 1090 Ma (Unruh et al., 1995) and therefore if muscovite-bearing rocks were associated with this magmatic activity they could have possibly provided detritus to the very youngest Mesoproterozoic sediments. Another very limited source area for muscovites with ages less than about 1.3 Ga is the Burro Mountains located is southwestern New Mexico. Here, 1.21 Ga magmatism has reset older muscovites (Ramo et al., 2003; McLemore et al., 2000) and thus if this region was exposed during deposition of the units studied, an overall young distribution of micas would be possible. Overall, detrital muscovite with ages less than about 1.3 Ga should be indicative of a Grenville-aged source terrain. At present, Grenville basement is exposed in west Texas, however the distribution of the Grenville terrain in the Precambrian likely extend to the south of Arizona (Karlstrom et al., 1999).

5.2 Apache Group and Troy Quartzite, Arizona

5.2.1 Pioneer Shale

Muscovite data from the three Pioneer Shale samples (F03-5-15, F03-5-17 and F03-5-18) are combined into a single age probability diagram (Fig. 14-A). These samples are from the bottom of the Apache section near the unconformity with the basement (Fig. 6). The Pioneers Shale muscovites have probably undergone minor post-deposition argon loss, as approximately one third of the step heating analyses have age spectra where the first step is younger than 1.1 Ga. The cause of the initial young steps does not seem to be related to reheating and volume diffusion loss of radiogenic argon as this would require post-deposition temperatures approaching 300°C. More likely, the apparent argon loss is related to minor alteration.

The overwhelming age population at ca. 1.4 Ga indicates two possible sources for the muscovites. They may have come from crystalline basement complexes that cooled through muscovite closure at 1.4 Ga or they could have come from exhumed 1.4 Ga plutons that are common throughout the southwest United States (Anderson, 1989; Van Schmus et al., 1993). Regardless, the source terrain was at shallow to mid-crustal levels at 1.4 Ga and thus significant stripping of the basement must have occurred prior to Pioneer Shale deposition.

Aside from the dominant 1.4 Ga age peak, there are several apparent ages that range between 1.7 and 1.5 Ga (Fig. 14-A). In several areas around Arizona there are muscovites ages that fall between 1.4 and 1.7 Ga that presumably record effects of partial argon loss due to 1.4 Ga reheating and/or slow cooling following the Yavapai/Mazatzal Orogenies. Rocks such as the Crazy Basin pluton in central Arizona or parts of the Upper Granite Gorge, Grand Canyon have presently exposed muscovites that yield apparent ages between 1.4 and 1.7 Ga (Hodges et al., 1994; Karlstrom et al., 1997b). Therefore, the ca. 1.5 to 1.6 Ga muscovites recorded in the Pioneer Shale detritus do not necessary record an exotic (relative to the SW Laurentia) source terrain, but more likely reflect a source that underwent relatively slow cooling between 1.7 and 1.4 Ga.

Overall, the muscovite age data for the Pioneer Shale are consistent with the 1328 ±5 Ma depositional age suggested by Stewart et al. (2001). Recall that this age constraint is provided by a U/Pb zircon age on a tuff unit that occurs within the

Pioneer Shale exposed to the north in the Sierra Ancha basin. Of the 190 muscovites analyzed there are 11 with apparent ages significantly less than 1328 Ma with the youngest at about 1200 Ma (Fig. 14-A). Each of these 11 ages are derived from total fusion analyses and have either experienced significant post-depositional argon loss or indicate that the Pioneer Shale samples collected in this study are younger than 1328 Ma. Of the 20 age spectra generated for the Pioneer shale muscovites, 1 yields a total gas age less than 1328 Ma. The age spectrum from analysis 54316-81 from sample F03-5-18 shows an initial step comprising about 20% of the total ^{39}Ar released to have unrealistically young apparent age of 1040 Ma (Appendix 3). The spectra then rises to a plateau segment with an age of 1373 Ma and overall yields a total gas age that is about 5% younger at 1306 Ma. This spectrum demonstrates two important points for the interpretation of the youngest apparent ages of the Pioneer Shale muscovites: First, it shows that total gas (and therefore total fusion) ages can be younger than the 1328 Ma zircon age reported by Stewart et al. (2001). Second, it shows that the average age correction for total fusion data of 1.6% deduced from all of the age spectra/total gas age determinations can significantly underestimate the actual age correction required for some total fusion results. Because at least some of the Pioneer Shale muscovites reveal post-deposition argon loss, it is unwise to use the youngest apparent ages to constrain the maximum depositional age for the Pioneer Shale, and therefore the 1328 ± 5 Ma age reported by Stewart et al. (2001) is our best depositional age estimate.

5.2.2 Dripping Springs Quartzite

Two samples of the Dripping Springs Quartzite were analyzed, sample F03-5-13 and F03-5-1. Sample F03-5-13 was collected from the middle member of the Dripping Springs Quartzite at the same location and stratigraphically overlying the Pioneer Shale samples discussed above. In thin section this sample has large (1-2 mm), pristine muscovite crystals. Age spectra are mostly type 2 with the first step being the youngest and the last step the oldest (Appendix 3). Because the spectra are fairly flat there is minor (~1.8%) average discordance between total gas and plateau ages. The muscovites do not appear to have undergone definitive post-deposition argon loss, as there are very few individual age spectrum steps with apparent ages less than 1.1 Ga. However, many steps in the spectra are between 1.2 and 1.4 Ga and may either record post-deposition argon loss (if the Dripping Springs Quartzite is older than 1.2 Ga) or may record cooling in the source terrain. It is important to make this distinction because if the 1.2 to 1.4 Ga ages are related to the source thermal history, then the Dripping Springs could be younger than some of the young and prominent age spectrum steps.

The age probability diagram for sample F03-5-13 shows a fairly uniform population of plateau ages between 1400 to 1450 Ma (Fig. 14-B). There are also three grains between ~1220 and 1310 Ma. Crystal 54313-21 with a plateau age of 1242 Ma has a very disturbed age spectrum and has clearly undergone post-deposition argon loss. Crystal 54313-17 is essentially a one-step spectrum that yields what is equivalent to a total fusion result with an age of 1285 Ma. The final young crystal is 54313-43 with and undulatory age spectrum and a plateau age of 1309 Ma. These later two grains could be source terrain cooling ages and perhaps help place a maximum depositional age of 1.28 Ga on the Dripping Springs. The overall age distribution is dominated by 1.4 Ga muscovites with only one crystal (54313-18) giving an age older than of about 1530 Ma. Like the 1.4 Ga crystals within the Pioneer Shale it is not possible to determine the exact source of the sediment, but the near complete lack of any grains older than 1.4 Ga supports the hypotheses that at the time of deposition the basin was sourcing from an exhumed 1.4 Ga pluton. Stewart et al. (2001) observed 1.44 Ga zircons in a Dripping Springs Quartzite sample located in central Arizona. These zircons also indicate that the source is plutonic, and is possibly the Ruin granite of central Arizona.

The second Dripping Springs sample F03-5-1 has very different age trends compared to F03-5-13. This sample was collected from the upper member of the Dripping Springs Quartzite from the 7 Dash Ranch, 100 km from F03-5-13. In thin section this sample displays a range of altered muscovite from slight to major clay content within the muscovites (Appendix 2). The relatively large difference between total gas and plateau ages in step heated crystals (3.9%) and the high percentage of type 3 age spectra (~half) suggests that the muscovites have suffered post-depositional argon loss. In fact, about two thirds of the age spectra have first steps that are younger than 1.1 Ga and strongly indicate at least some argon loss occurred after deposition. The high clay content observed within the detrital muscovites supports post-depositional alteration and diagenic growth within original muscovite grains further supporting the hypothesis that the argon analyses may not be accurately recording the source terrain cooling ages.

Despite alteration of the muscovites in F03-5-1, there are many grains that are older than 1.45 Ga (Fig. 14-C) and therefore this sample is apparently recording a different source region compared to F03-5-13. The most probable explanation for the variation in muscovite age data is a change in provenance. Montgomery and Middleton (2000) recognized a major unconformity in the upper member of the Dripping Springs Quartzite. This unconformity may be the product of a tectonic event that changed the dynamics of the basin that resulted in a provenance area change.

Determining the minimum possible depositional age for the Dripping Springs Quartzite is critical for evaluating regional correlations of various limestone members. For instance some authors (e.g. Seeley, 1999; Timmons et al., 2005) suggest that the Mescal Limestone, which overlies the Dripping Springs Quartzite, is a time correlative unit to the Bass Formation (1255 ± 2 Ma, Timmons et al., 2005), Grand Canyon and the Castner Marble (1260 ± 20 Ma, Pittenger et al., 1994), southwest Texas. Thus constraining the age of the Dripping Springs can help constrain the age of the Mescal Limestone.

Unfortunately, deciphering the youngest reliable age from the Dripping Springs sample is difficult. For instance, 10 of the 18 crystals from sample F03-5-1 that have relatively well-behaved type 1 or 2 spectra, have first steps that are younger than 1.1 Ga. However, there appears to be two reliable age spectrum plateau ages that indicate an apparent age of 1247 Ma and therefore it is suggested that the Dripping Springs was deposited after 1247 Ma and thus the Mescal Limestone must also be younger than 1247 Ma.

The source of the 1247 Ma muscovites is not locally obvious. Presently exposed crystalline rocks in the region have muscovites older than about 1350 Ma, therefore crystals from the basement that are younger than 1350 Ma have yet to be exposed and therefore not all of the Dripping Springs detritus is locally derived. Either the 1250-1350 Ma grains are derived from basement outside Arizona or from younger volcanic/hydrothermal complexes within Arizona that are no longer preserved, as hypothesized by Stewart et al. (2001). The ages between 1365 and 1411 Ma could be locally derived from Arizona basement. There are three crystals between 1580 and 1600 Ma that are probably from a part of the Yavapai basement that was not heated above ~300°C at 1.4 Ga. The ages observed in sample F03-5-1 are, for the most part, in agreement with the U/Pb ages for the Dripping Springs Quartzite reported by Stewart et al. (2001), which are 1.26, 1.32, 1.44 and 1.71 Ga.

5.2.3 Troy Quartzite

Muscovites from the Troy Quartzite, which overlies the Mescal Limestone, show little evidence of post depositional argon loss. Muscovite crystals appear to be pristine and yield a high percentage of type 1 and 2 age spectra (Appendix 3), with the difference between the total gas age and plateau age being relatively low (0.8%). None of the age spectra have any steps younger than 1.1 Ga. These observations all support the notion that sample F03-5-11 has undergone little, if any, post-depositional argon loss. Total fusion dates are similar to plateau dates, with two grains yielding significantly younger ages of about 1040 and 1250 Ma (Fig. 14-D).

The Troy Quartzite sample has two main age populations at 1440 Ma and 1660 Ma with a continuum of ages between the main peaks (Fig. 14-D). The 1400 to 1660 Ma grains are the expected ages of the Yavapai and Mazatzal terrains and therefore could be derived from a variety of regional source areas. The 1040 Ma total fusion result (F03-5-11-01) is too young given the cross cutting relationship with the 1.1 Ga dyke. This young age is probably the result of argon loss due to alteration. The 1251 Ma crystal may have undergone post-depositional argon loss, or it could be recording an accurate result. Stewart et al. (2001) analyzed 13 detrital zircons from the Troy Quartzite in the northern Troy basin and found that all were ~1.26 Ga. It is possible that the 1251 Ma muscovite crystal is from the same source area as the 1.26 Ga zircons observed by Stewart et al. (2001). Most striking between the muscovites from the Troy sample studied here and the zircons analyzed by Stewart et al. (2001) is that the muscovites are nearly all older than 1.4 Ga, whereas the zircons are all 1.26 Ga. The radically different age populations can be explained by the segregation of the northern Troy deposits and the southern Troy deposits. Recall that after Mescal Limestone deposition and subaerial exposure, the Apache group was faulted and folded. The resulting landscape was two basins (northern and southern) where the Troy Quartzite was deposited on the Apache Group. It is possible the northern and southern basins had very different provenances. Stewart et al., (2001) hypothesized that the northern basin sourced from a supposed 1.26 Ga volcanic field. The muscovite data from the southern basin indicates a dominantly basement source rock. The paleocurrent information provided by Burnes (1987) indicates that the supposed volcanic field was to the east or northeast.

5.2.4 Summary of provenance in southeast Arizona

Muscovites from the Apache Group and Troy Quartzite record a distinct change in provenance through the section. The Pioneer Shale and Middle Member of the Dripping Springs Quartzite are dominated by 1.4 Ga detritus suggesting a source that was already eroded down to mid-crustal levels. The Apache Group overlies 1.4 Ga basement, therefore the most logical explanation for the 1.4 Ga muscovites is from a fairly local exposure. The Upper Member of the Dripping Springs and the Troy Quartzite reveal an older source of muscovites, which means an exposure of higher crustal levels must have become available. The ca. 1.25 Ga crystals probably indicate input from the Grenville terrain, rather than from simply a local volcanic field that has been subsequently eroded away.

5.2 Unkar Group, Grand Canyon

5.2.1 Hotauta Conglomerate

Except for one ca. 1400 Ma date, the Hotauta crystals all yield total fusion apparent ages of about 1700 Ma (Fig 14-E). In light of the muscovite ages within the local Granite Gorge Metamorphic Suite, the 1705 Ma muscovites within the Hotauta Conglomerate are interesting. Directly underlying the Hotauta, the basement muscovites are 1.4 Ga (Karlstrom et al., 1997b) and therefore it does not appear that the detritus is dominated by a local source. Additionally, the Grand Canyon basement is dominated by 1.68 to 1.69 Ga granites and metamorphic rocks (Ilg et al., 1996) and down river from the Hotauta location these rocks presently contain muscovites with 1.5 to 1.6 Ga cooling ages (Karlstrom et al., 1997b). Perhaps muscovites from a higher structural level (and therefore older) within the Grand Canyon basement were contributing to the Hotauta conglomerate, however other additional evidence indicates a potentially more distal source. For instance, Timmons (2004) reported quartzite clasts within the Hotauta Conglomerate that have no recognized local source. It is possible that the quartzite clasts and the ca. 1.7 Ga muscovites are from a Yavapai basement terrain that did not undergo significant erosion between 1.7 and 1.25 Ga. Areas in the Mazatzal Mountains south of Payson, AZ preserve low-grade Yavapai rocks and the Mazatzal quartzite and represent at least one possible source area for the Hotauta Conglomerate. The 1400 Ma crystal is presumably derived from the local basement. This crystal constrains the depositional age of the Hotauta Conglomerate to less than 1.4 Ga. $^{40}Ar/^{39}Ar$ thermochronology on basement K-feldspars below the Hotauta further constrain the depositional age to be less than about 1.3 to 1.25 Ga and a U/Pb zircon age from an overlying ash requires deposition prior to 1255 Ma (Timmons et al., 2005).

5.2.2 Dox Formation

Most Dox Formation samples show very little evidence of post depositional argon loss. With the exception of samples K98-65-1 muscovite and 00GC-59g biotite, the step heating spectra of Dox samples were mostly type 1 and the difference between the total gas age and plateau age averaged 0.9%. K98-65-1 was mostly type 2 spectra and the difference between the total gas age and the plateau age was 3.9%. Many initial steps in the muscovite age spectra yield Phanerozoic apparent ages and clearly demonstrate post-depositional argon loss. This sample is noticeably altered in hand specimen and shows copper mineralization. Also, electron microprobe analysis from K98-65-1 revealed a range of muscovite alteration that is presumably responsible for the poor argon results from this sample. Biotites from sample 00GC-59g are highly chloritized and most have spectra with significant age gradients with initial steps much less than 1.1 Ga (Appendix 3). The average age difference between plateau and total gas ages is 6.4%, but is highly variable from grain to grain. Despite the high degree of post-depositional argon loss from the biotites, their age spectra rise to plateau segments that are in good agreement to muscovites from the same sample. For instance, muscovites from 00GC-59g yield very flat spectra with many giving ages between about 1120 and 1200 Ma. These muscovites show no signs of post-depositional argon loss and indicate that the chlorite alteration of the biotites is the cause for argon loss in the biotites rather than reheating and diffusive loss.

The Dox Formation age data is grouped into the 4 stratigraphic members and represent 16 individual samples (Fig 14-F, 14-G, 14-H and 14-I). The most striking aspect of the Dox Formation muscovites is the dominance of crystals that are younger than 1200 Ma with many crystals yielding ages between 1140 and 1160 Ma. In a preliminary study, Heizler et al. (1999) suggested that the overall young ages (compared to typical 1.4 to 1.7 Ga ages) resulted from alteration or authigenic growth during dyke emplacement or Cardenas Lava extrusion. This study challenges the interpretation of Heizler et al. (1999) and suggests that the muscovites are reliably recording the source cooling history. Because samples were collected far from dyke/sandstone contact metamorphic aureoles it is unlikely the muscovites have been thermally affected during 1.1 Ga igneous activity. Regional burial and heating great enough to cause significant argon loss from the muscovites is not believed to be a viable mechanism to explain the young muscovites as zircon fission track dates from the upper Unkar Group, suggests that the Dox Formation has not been heated above 250°C since 1100 Ma (Naeser, et al. 1989). Thin sections of the Dox Formation sandstones display primary sedimentary textures with clear compaction related kinking of muscovites around other grains (Appendix 2) and also do not show signs of overgrowths or recrystallization. These observations do not support an authigenic origin for the muscovites. Further arguing against the authigenic origin is the biotite data. This mineral is clearly detrital and despite post-depositional argon loss, the age data corroborate an overall young detrital age for the muscovites. Finally, the new detrital zircon data with crystals as young as 1180 Ma (Timmons et al., 2005) from the Escalante Creek Member provide convincing support that the muscovites are faithfully recording provenance ages.

These 1200 to 1140 Ma detrital muscovites, coupled with paleo-current indicators recording northward flow (Timmons et al., 2005), suggest provenance from the Grenville terrain. The Grenville Orogenic Front formed a long-lived ~10 000 km long convergent margin along southern Laurentia during the Mesoproterozoic (Karlstrom et al., 2003). In southwest Texas, the Grenville Orogen culminated at 1.20-1.12 Ga with some plutonism continuing until about 1.10 Ga (Reese et al., 2000). The Grenville terrain may have extended south of Arizona during final assembly of Rodinia (Karlstrom, et al., 1999) however, Meso- and Paleoproterozoic rocks presently extend well into Mexico. Therefore the Grenville detritus in the Unkar Group, whether derived from Texas or other regions within Rodinia, require transport distances of several hundred kilometers without incorporation of older muscovites from Yavapai or Mazatzal crust.

The transport mechanism for Dox Formation sediment was probably large river systems that flooded the landscape with Grenville-aged detritus. This hypothesis is not unprecedented. Rainbird et al. (1997) and Santos et al. (2002) argued that the Grenville orogen on the east coast of the United States provided sediment approximately 3000 km to northwestern Canada at about 900 Ma. A similar, though perhaps shorter, river system probably carried sediment to the Grand Canyon region. The absence 1.4 Ga and older muscovites in the Dox Formation suggests that between about 1200 and 1100 Ma there was little, or perhaps no Yavapai or Mazatzal basement exposed between the Grenville front and northern Arizona. This may indicate that the limited sediments preserved in the Apache and Unkar Groups only represent a small aerial extent of a once very large Grenville-aged sedimentary record.

It is interesting to note that although our Dox Formation muscovites are nearly all less than 1.2 Ga, the zircons reported by Timmons et al. (2005) do have older populations (Fig. 16). Because the muscovite data indicate burial of the older basement, the zircon source ages are difficult to explain. A possible explanation involves sediment recycling. The Shinumo Sandstone that underlies the Dox Formation is very mature and is not muscovite bearing, however it does have zircons that are essentially identical in age to those observed in the Dox Formation (Fig. 16). Thus, it is suggested that the Dox Formation may include a component of recycled Shinumo Sandstone that could provide the older zircons without an older muscovite

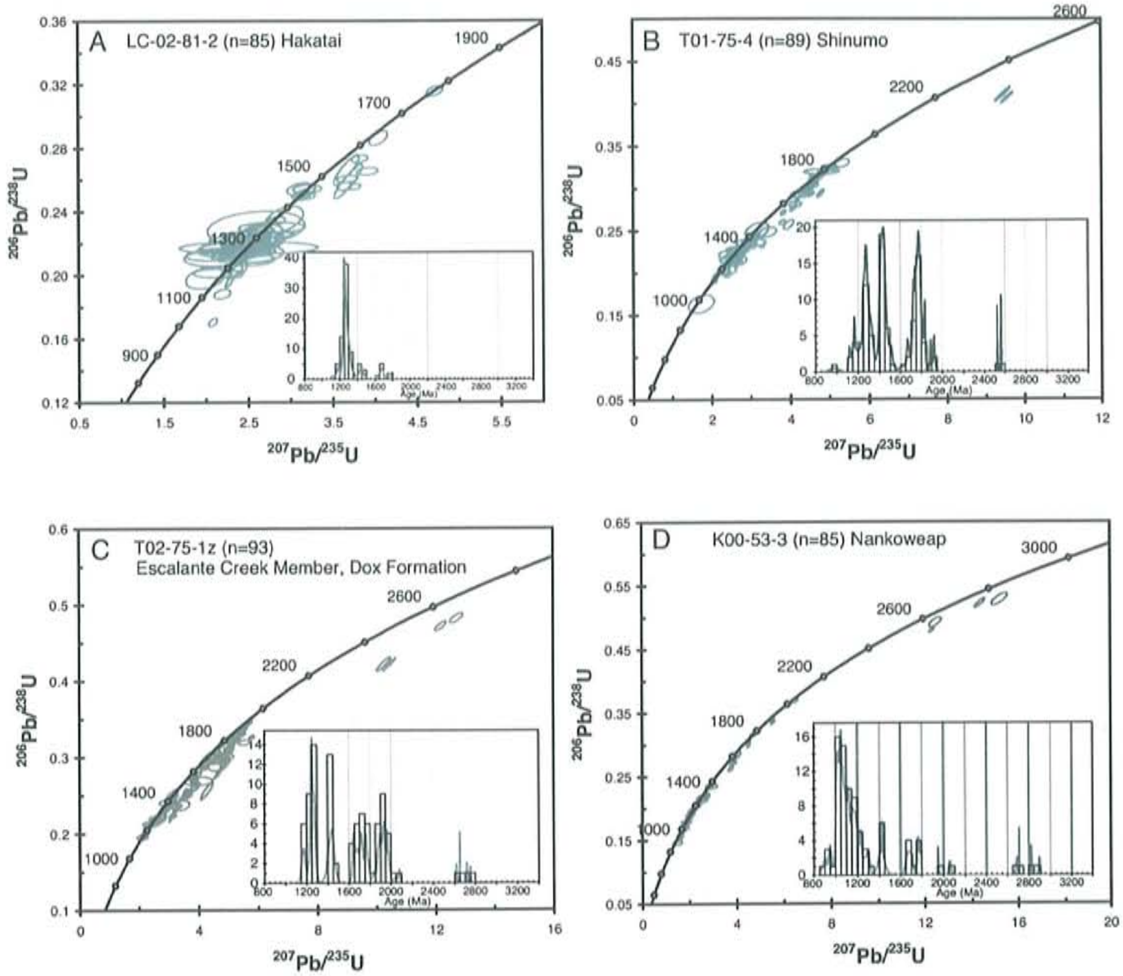


Figure 16. U/Pb analyses of detrital zircons from the Unkar Group and Nankoweap Formation. Note that the Shinumo Formation (B) and the Escalente Creek Member of the Dox Formation (C) have zircon age populations at ca. 1200 Ma, 1700 Ma, 1900 Ma and 2700 Ma. Muscovites from the Dox Formation are all younger than ca. 1400 Ma.
From Timmons, et al., 2005.

component. The dominance of 1150 Ma detrital muscovites observed in all members of the Dox Formation indicates deposition after 1150 Ma. The contemporaneous deposition of the Ochoa Point member and the Cardenas lavas implies that Dox sedimentation persisted until about 1100 Ma and thus constrains the entire depositional history to a maximum of 50 Ma. The short time between exhumation in the source and transport several hundred kilometers to the Grand Canyon region is remarkable, but similar processes are observed in modern orogens. For instance, Copeland and Harrison (1990) argued that muscovites in the Himalaya passed through argon closure, were exhumed, eroded, transported and deposited in the Bengal Fan in less than a few million years. The Dox Formation appears to record a similar situation where the actively exhuming Grenville Orogen was contributing relatively deep crustal detritus to a sedimentary basin in no more than 50 Ma, and perhaps over a much shorter interval.

Grenville-aged detritus appears to have contributed to the Unkar basin as early as Hakatai time. Both shale petrology (Bloch et al., in prep) and detrital zircon geochronology (Timmons et al., 2005) indicate Hakatai deposition after 1187 Ma. It is likely that the entire 1700 m thick Unkar Group represents a Grenville-aged succession beginning with Bass limestone deposition and proceeding through Dox deposition and culminating with extrusion of the Cardenas lavas.

5.3 Crystal Springs Formation, Death Valley

Detrital muscovite from sample K03-DV-04 of the Crystal Springs Formation reveal highly complex age spectra with some steps yielding ages less than the youngest possible depositional age. The fairly severe post-depositional argon loss seems too large to be explained by the minor alteration of the muscovite that is observed in thin section (Appendix 2). The K-feldspars from this sample are very young (ca. 200 Ma) relative to the minimum depositional age and are best explained by post-depositional argon loss due to reheating. The K-feldspars suggest temperatures of ~175-250°C (cf. McDougall and Harrison, 1999) during the Mesozoic and/or Cenozoic and therefore reheating is thought to be the main cause for argon loss from the detrital muscovites.

Despite complications related to argon loss, some detrital muscovites still record ages older than 1600 Ma with a peak near 1640 Ma (Fig. 14-J). These older crystals suggest that a Yavapai/Mazatzal basement was contributing to the Crystal Springs detritus. It is probable that the ~1.64 Ga muscovites are derived from a basement exposure that was not affected by 1.4 Ga heating and are likely derived from a local basement source. As discussed in section 2.3.4, sedimentological evidence observed by Roberts (1976) indicates a northern source for the Arkose Member of the Crystal Springs Formation. Additionally, the immature lithology suggests a proximal source, therefore it is most likely that the muscovites are derived from a local northern upland. Because of the argon loss experienced by the detrital muscovites, it is not possible to know if the younger apparent ages record reliable provenance information. However, unlike the Apache Group or Troy Quartzite, the Crystal Springs Arkose seems to lack 1.4 Ga grains and indicates that the Death Valley region was deriving sediment from dissimilar highlands compared to the Arizona sequences. The overall spread in ages is probably due to both variations of source ages and differing degrees of argon loss related to grain-to-grain argon closure temperature differences.

5.4 Debaca Sequence, New Mexico

The muscovite age spectra from sample SC-99-11 identifies only a few crystals with initial steps younger than 1.1 Ga and therefore post depositional argon loss does not appear to be a significant problem. Although a lot of the age spectra were type 4 (i.e. similar to total fusion ages) they are considered to accurately record the source cooling ages. Like results from the Apache Group/Troy Quartzite there is a large population of ca. 1.4 Ga grains that require exposure of 1.4 Ga mid-crustal rocks by Debaca time. There is also a large number of grains that are significantly older than 1.4 Ga that do not correspond to the present day distribution of muscovite ages at the surface in New Mexico. The older ages indicate that at least part of the source area was not significantly affected during 1.4 Ga reheating, and therefore may represent erosion of Mazatzal structural highs in New Mexico. Alternatively, regions such as Arizona could be contributing sediment to the Debaca sequence. The Paleoproterozoic muscovite ages in the Debaca sequence are consistent with the Debaca being older than 1.1 Ga and the New Mexico basement thermochronology. Based on K-feldspars from high-grade metamorphic rocks and 1.4 Ga plutons in New Mexico, it appears that the most significant exhumation that exposes the present day surface occurred between about 1.0 and 0.8 Ga (i.e. Sanders et al., 2004; in prep). Thus, the Debaca sequence that rests upon the high-level ca. 1.4 Ga Granite/Rhyolite province may partially record removal of the structurally highest Mazatazal rocks within the core of the New Mexico Precambrian metamorphic terrains. The sharp peak at 1300 Ma may be due to volcanic detritus that was being produced in large quantities around 1300 – 1340 Ma. The peak at 1180 Ma may record a real age population. If this age population is significant the part of the Debacca Sequence exposed in the Sacramento Mountains was deposited after 1180 Ma. The 1180 Ma peak is made of just two crystals, one at 1178 ± 8 Ma and another at 1209 ± 23 Ma. It is possible that these two crystals have undergone argon loss. The first step of the heating spectra of the 1178 Ma crystal is younger than the age of the dyke that cuts the sediments (Appendix 2; 54341-64). This indicates that argon loss has probably occurred post-deposition which may compromise the interpretation that the source was delivering 1180 Ma detritus. The plateau age of 1178 Ma may have been effected by this argon loss, thus the peak at 1180 Ma could be an artifact of argon loss rather than the age of the crystals at the time of deposition.

The basal unit of the Debaca Sequence in northeastern New Mexico has detrital zircon populations at 1320 ± 126 Ma and 1692 ± 37 Ma (Barnes, 2001). The muscovites from the Sacramento Mountains section of the Debaca Sequence mirror the two populations observed by Barnes (2001). The concurrence of 1.4 and 1.6 to 1.7 Ga crystals in the same sample implies the typical Yavapai/Mazatzal source for the Debaca Sequence.

The lack of abundant 1.10 to 1.25 Ga muscovites in the samples of the Debaca Sequence from the Sacramento Mountains suggest that sediments are older than the Dox Formation. During Dox time the Debaca basin, which is proximal to the Grenville Front, would almost certainly have been swamped with Grenville detritus.

It is probable that this part of the Debaca is correlative with the Tory Quartzite/Shinamo Sandstone or possibly the Upper Member of the Dripping Springs Formation.

5.5 Regional Correlations

In some cases the time of sediment deposition has been refined or has corroborated previous work, while in others timing for deposition remains poorly constrained. The muscovite detrital ages support the conclusion of Stewart et al. (2001) that the Pioneer Shale was deposited as early as 1328±5 Ma and are probably the oldest rocks investigated in this study. It is possible that the Arkose Member of the Crystal Springs Formation (Death Valley) is as old or older than the Pioneer Formation, but the detrital ages are not conclusive. The only age population detected in the Crystal Springs sample is ~1.6 Ga, which does not help to constrain the depositional age of this unit. The Dripping Springs Quartzite was deposited after 1247 Ma, based on the youngest age peak in the samples analyzed. This means the Mescal Limestone cannot be older than 1247 Ma and thus corroborate earlier correlations. It is probable that the Mescal Limestone does correlate with the Bass Limestone (Grand Canyon) and the Castner Marble (Texas) as hypothesized by Timmons et al. (2005). Deposition of the Debaca Sequence probably began shortly after 1300 Ma. This is based on the 1300 Ma muscovites in sample SC-99-11, the 1308 ± 52 Ma detrital zircon (Barnes, 2001), and the unconformity with the 1320 Ma basement. It is likely that the exposure of the Debaca Sequence at the Sacramento Mountains is coeval with the Upper Member of the Dripping Springs or the Troy

Quartzite. There is no evidence in the muscovite age data to either corroborate or refute the correlation of the Troy Quartzite with the Shinamo Quartzite. If this correlation is correct the Troy Quartzite must be younger than 1180 Ma. The lack of ~1100 – 1200 Ma muscovites in the Troy Quartzite suggests that it is unlikely that there was a huge sheet of Grenville ages sediments covering the landscape at the time of Troy deposition. A more appropriate model is a transition between local and Grenville detritus at Hakatai/Shinumo/Troy time followed by a deluge of Grenville sediment during Dox time. The Dox Formation records deposition between about 1140 Ma and 1110 Ma.

The data presented herein does not refute any of the correlations (Fig. 2) presented by Timmons et al. (2005), and therefore their correlations remains our best model.

5.6 Tectonic Implications

Regional observations of provenance through time and space provide a possible model for the tectonic evolution of the southern margin of Laurentia between ~1350 and 1100 Ma. This model is summarized in Figures 17- 19.

Between about 1350 Ma and 1250 Ma a shoreline existed which passed roughly through Death Valley, the Apache Group and the southern part of the Debaca Sequence (Fig. 17). During this time each basin was sourced by relatively proximal highlands to their north. Basement at the Grand Canyon area was undergoing erosion at this time perhaps making it a possible source area for the sediment that

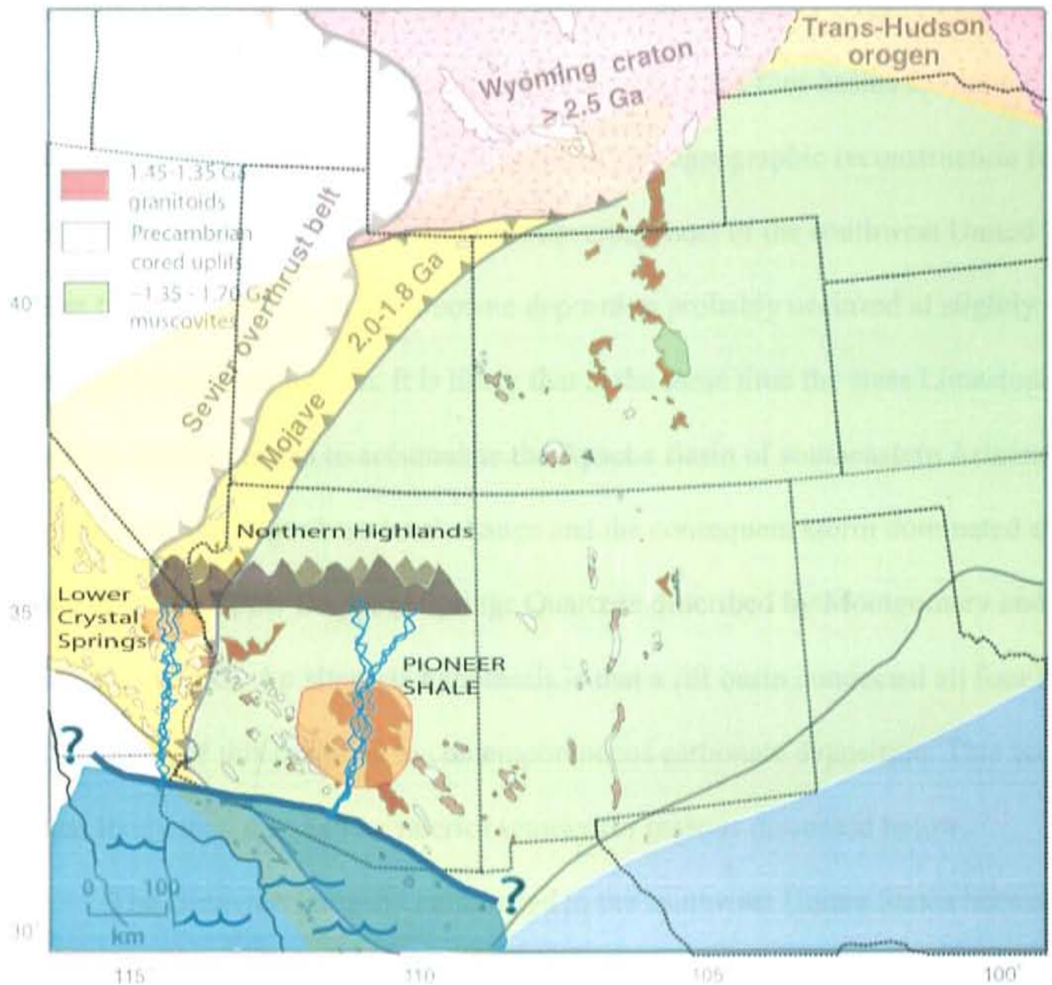


Figure 17. Hypothetical map of what the southwest United States may have looked like between about1340 Ma and 1300 Ma. At this time the Pioneer Shale was being deposited in a braided stream environment that was sourcing from the north (possibly the Grand Canyon area). Deposition of the lower Crystal Springs Formation occurred in a braided stream environment proximal to its source and may have been contemporaneous with the Pioneer Shale. There was volcanism at this time but there is no evidence left today to suggest where the volcanic source was.

accumulated in the Apache basin. Between about 1340 and 1300 Ma there was a period of significant volcanism, which produced a large amount of detritus. Near the end of this time a collision occurred to the southeast that caused a transformation of the landscape.

Between about 1250 Ma and 1200 Ma each of the four basins examined accumulated limestone facies. The most likely paleogeographic reconstruction for this time period is that of a large shallow sea covering most of the southwest United States (Fig. 18). The onset of carbonate deposition probably occurred at slightly different times in each basin. It is likely that at the same time the Bass Limestone of northern Arizona began to accumulate the Apache Basin of southeastern Arizona was experiencing the major base level change and the consequent storm dominated shelf deposits of the Upper Dripping Springs Quartzite described by Montgomery and Middleton (2000). An alternate hypothesis is that a rift basin connected all four basins and flooding of this basin led to contemporaneous carbonate deposition. This scenario is less likely than the shallow interior seaway for reasons discussed below.

The Grenville Orogeny culminated in the southwest United States between 1.2 – 1.12 Ga (Reese et al., 2000). Evidence from detrital zircons from the Unkar Group indicates that Grenville highlands were contributing sediment to the Unkar Basin as early as Hakatai time (<1187 Ma) and by Dox time (1140-1110 Ma) was the main source of sediment to the basin. The Shinumo Quartzite overlies the Hakatai Shale and in most inter-basin interpretations is correlated with the Chediski Sandstone Member of the Troy Quartzite. The youngest detrital muscovites and zircons in the Troy are about 1250 Ma and indicate a Grenville source, however none of the >1200

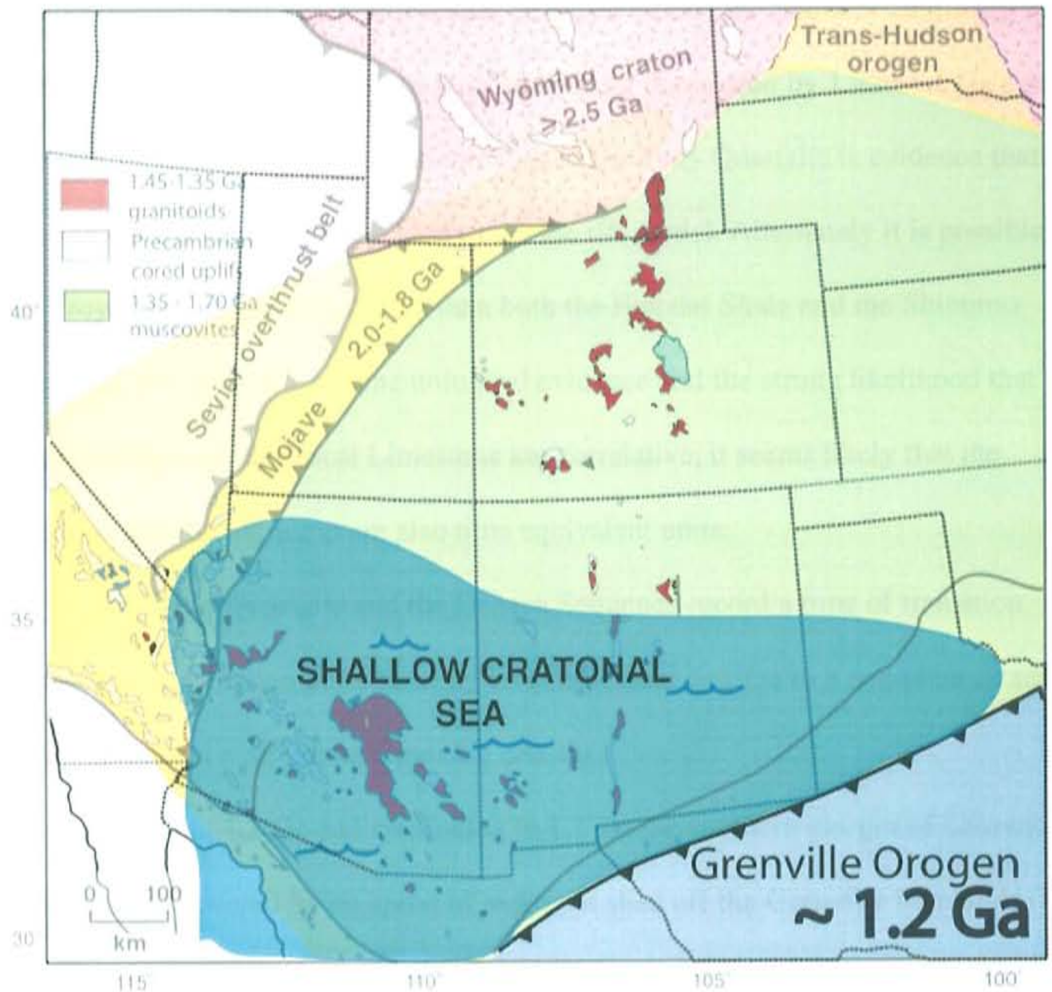


Figure 18. Hypothetical map of what the southwest United States may have looked like between about 1250 Ma and 1200 Ma. The Dripping Spring Formation records a rise in sea level and is capped by the ca. 1250 Ma limestone facies of the Mescal Limestone. Other ca. 1250 Ma limestone units exist in the Unkar Group, Crystal Springs Formation, Debacca Sequence and in southwest Texas. It is probable that the limestone facies were deposited in a shallow cratonal sea that flooded Arizona, New Mexico and parts of California and Texas (depicted above).

Ma detritus that occurs in the Shinumo were found. Therefore, the Shinumo and Chediski may be time correlative, but appear to be sourcing from different provenances. If the Apache/Troy and Unkar basins were connected along a rift valley as suggested by Seeley (1999) it would be expected that the Shinumo and Troy would have similar detrital mineral ages with both being dominated by 1.2 to 1.1 Ga ages. The lack of 1.12 to 1.2 Ga detrital minerals in the Troy Quartzite is evidence that the interior seaway model is more likely than the rift model. Alternately it is possible that the Troy Quartzite is in fact older than both the Hakatai Shale and the Shinumo Quartzite, but given the sedimentological evidence and the strong likelihood that the Bass Limestone and Mescal Limestone are correlative, it seems likely that the Chediski and the Shinumo are also time equivalent units.

The Troy Quartzite and the Debaca Sequence record a time of transition between sedimentation dominated by local basement detritus to a complete swamping of the landscape with young Grenville detritus.

By about 1.2 Ga and continuing to 1.1 Ga the southern margin of Laurentia appears to be covered by an apron of sediment shed off the Grenville highlands (Fig. 19). This is primarily deduced by the remarkable dominance of Grenville-aged muscovites within the Unkar Group with very few grains originating from Yavapai or Mazatzal crust. Therefore, rather than small isolated basins recorded by the present-day distribution of late Mesoproterozoic basins (Unkar, Debaca, Las Animas) the region was probably similar to a large foreland basin that has been dissected by later tectonism and erosion.

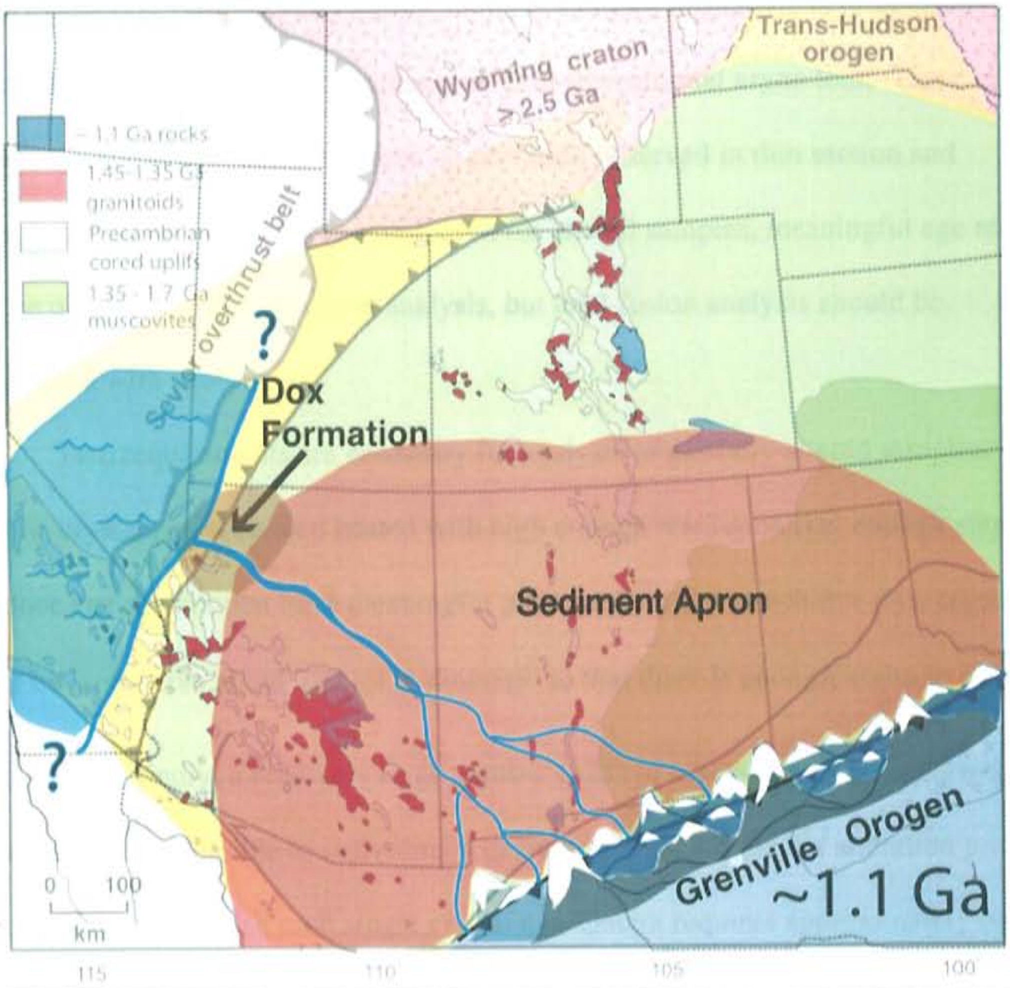


Figure 19. Hypothetical map of what the southwest United States may have looked like between about 1180 Ma and 1100 Ma. By this time the Grenville orogen in southwest Texas was a huge mountain range. Detritus shed off the mountain front and blanketed the landscape in a large sediment apron leaving very few basement exposures. Sediment was probably transported in large rivers. At this time the Dox Formation accumulated in the Unkar basin. There was probably a shoreline to the west of the Grand Canyon area.

5.7 Viability of the $^{40}Ar/^{39}Ar$ technique for Precambrian provenance studies

$^{40}Ar/^{39}Ar$ dating of detrital muscovites provides meaningful age data from most of the Precambrian successions. In many samples muscovite is pristine and age spectrum analysis shows little evidence of post-depositional argon loss. There is a good correlation between the degree of alteration observed in thin section and complexity of age spectra. However, even for altered samples, meaningful age results can be obtained by age spectrum analysis, but total fusion analysis should be interpreted with caution.

Two requirements are necessary for analysis of partially altered samples. Firstly, crystals must be step heated with high enough resolution (i.e. enough steps) to produce age spectra that have meaningful plateaus. In order to achieve this, crystals must be larger than about 250μm in diameter so that there is enough argon to measure precisely. Secondly, a relatively large number (>25) of crystals must be analyzed because it is not possible to individually characterize each grain for alteration prior to argon analysis. Because each single crystal age spectra requires approximately one to two hours to generate, the analytical time commitment is not trivial. However, without at least some spectra for each sample it is difficult to evaluate the integrity of the age results and thus the analytical time commitment is necessary to properly carryout detrital muscovite geochronology of Precambrian sedimentary sequences.

It is recommended that samples be characterized by petrographic and/or microprobe analysis before being subject to $^{40}Ar/^{39}Ar$ analysis. Samples with advanced degrees of alteration should be avoided, and pristine samples may allow only total fusion analyses. In the instances where some altered muscovites require analysis it is recommended that only step heating experiments be performed and only plateau ages that have a low MSWD values that incorporate a large percentage of the total gas released be considered as yielding meaningful source ages.

6. CONCLUSIONS

6.1 Geochronology

1. Apache Group

    - Pioneer Shale muscovites are consistent with an age of deposition of 1.328 ± 5 Ma (Stewart et al., 2001)
    - The Dripping Springs Quartzite is no older than 1250 Ma, thus the overlying Mescal Limestone is also no older than 1250 Ma.
    - The age of deposition of the Troy Quartzite cannot be refined using the muscovite data, however they do not refute the age assignment of Timmons et al. (2005).

2. Unkar Group

    - Deposition of the Hotauta Conglomerate occurred after 1400 Ma.
    - The Dox Formation was deposited between ca. 1140 Ma and 1100 Ma.

3. Crystal Springs Formation

    - The age of deposition of the Crystal Springs Formation cannot be refined using the muscovite data,

4. Debacca Sequence

    - The part of the Debacca sequence exposed in the Sacramento Mountains was deposited after 1300 Ma. Some evidence suggests that the sediment may be younger than 1180 Ma.

6.2 Provenance

1. Apache Group

- The Pioneer Shale was sourced from an area that was at shallow to mid-crustal levels at 1.4 Ga, possibly from northern Arizona. Significant stripping of the basement must have occurred prior to Pioneer Shale deposition (1.4 to 1.328 Ga).
- During deposition of the Dripping Springs Quartzite provenance changed from exclusively 1.4 Ga plutonic detritus to multiple provenances that also included older crustal material (1.7 to 1.6 Ga) and younger (~1.25 Ga) crystals which may have been sourced form the Grenville orogen.
- The Troy Quartzite includes detritus from a 1.4 Ga terrain and ca. 1.7 Ga source. The 1.4 Ga crystals probably come from a plutonic source and the ~1.7 Ga crystals are probably from older basement rocks in the region.

2. Unkar Group

- The muscovites analyzed from the Hotauta conglomerate suggest that the sediments were sourced from a combination of local basement and a constituent of a more distal Yavapai terrain. This more distal source area evidently experienced little erosion between 1.7 Ga and the time of deposition (~1.25 Ga).
- The overwhelming majority of the muscovites in the Dox Formation are derived from a 1.14 Ga to 1.25 Ga source region, most likely the Grenville Orogen.

3. Crystal Springs Formation

- Muscovites from the Crystal Springs Formation are mostly 1.64 Ga. The muscovites are probably derived from local basement.

4. Debacca Sequence

- The Debacca Sequence muscovites record two main age populations. The population at 1.4 Ga requires exposure of 1.4 Ga mid-crustal rocks by Debaca time. There is also a large number of grains that are significantly older than 1.4 Ga that do not correspond to the present day distribution of muscovite ages at the surface in New Mexico. The older ages indicate that at least part of the source area was not significantly affected during 1.4 Ga reheating, and therefore may represent erosion of Mazatzal structural highs in New Mexico or a distal source such as Arizona.

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Appendix 1. Detrital zircon geochronology for samples from the Unkar Group and Nankoweap Formation, Grand Canyon.

All samples were collected along the Colorado River in Eastern Grand Canyon, AZ.

Sample	Member/Fm	Description
LC-02-81-2	Hakatai Fm.	Arkosic sandstone
LC-02-76-7	Hakatai Fm.	Arkosic sandstone
LC-16-76-5	Shinumo	Very coarse sandstone
T01-76-3	Shinumo	Very coarse sandstone
T01-76-2	Shinumo	Med. ss, hematite cement
T01-75-4	Shinumo	Qtz cemented quartzarenite
T01-75-5	Shinumo	Qtz cemented quartzarenite
T02-75-2z	Shinumo/Escalante Ck.	Qtz cemented quartzarenite
T02-75-1z	Escalante Ck., Dox	Arkosic sandstone
T02-73-1z	Solomon Temple, Dox	Fine grained sandstone
K00—53-3	Nankoweap	Coarse arkosic sandstone
J10-60-2a,b,c,d	Carbon Butte, Kwagunt	Fine grained sandstone

U-Pb geochronologic analyses of zircon by laser-ICPMS

U-Pb geochronology of zircons was conducted by laser ablation multicollector inductively coupled plasma mass spectrometry (LA-MC-ICPMS). The analyses involve ablation of zircon with a New Wave DUV193 Excimer laser (operating at a wavelength of 193 nm) using a spot diameter of 35 microns. The ablated material is carried in argon gas into the plasma source of a Micromass Isoprobe, which is equipped with a flight tube of sufficient width that U, Th, and Pb isotopes are measured simultaneously. All measurements are made in static mode, using Faraday detectors for ^{238}U, ^{232}Th, $^{208-206}Pb$, and an ion-counting channel for ^{204}Pb. Ion yields are ~1 mv per ppm. Each analysis consists of one 30-second integration on peaks with the laser off (for backgrounds), 20 one-second integrations with the laser firing, and a 30 second delay to purge the previous sample and prepare for the next analysis. The ablation pit is ~20 microns in depth.

Common Pb correction is made by using the measured ^{204}Pb and assuming an initial Pb composition from Stacey and Kramers (1975) (with uncertainties of 1.0 for $^{206}Pb/^{204}Pb$ and 0.3 for $^{207}Pb/^{204}Pb$). Our measurement of ^{204}Pb is unaffected by the presence of ^{204}Hg because backgrounds are measured on peaks (thereby subtracting any background ^{204}Hg and ^{204}Pb), and because very little Hg is present in the argon gas.

Inter-element fractionation of Pb/U is generally ~15%, whereas fractionation of Pb isotopes is generally <5%. In-run analysis of fragments of a large zircon crystal (generally every fifth measurement) with known age of 564 ± 4 Ma (2-sigma error) (G. Gehrels, unpublished data) is used to correct for this fractionation.

Fractionation also increases with depth into the laser pit by up to 5%. The accepted isotope ratios are accordingly determined by least-squares projection through the measured values back to the initial determination. Analyses that display >10% change in ratio during the 20-second measurement are interpreted to be variable in age (or perhaps compromised by fractures or inclusions), and are excluded from further consideration.

The measured isotopic ratios and ages are reported in table xx. Errors that propagate from the measurement of $^{206}Pb/^{238}U$, $^{206}Pb/^{207}Pb$, and $^{206}Pb/^{204}Pb$, reported at the 1-sigma level. Additional errors that affect all ages include uncertainties from (1) U decay constants, (2) the composition of common Pb (assumed to be ±1.0 for $^{206}Pb/^{204}Pb$ and ±0.3 for $^{207}Pb/^{204}Pb$), and (3) calibration correction. These systematic errors add an additional 1-2% (1-sigma) uncertainty to $^{206}Pb/^{238}U$ and >1.4 Ga $^{206}Pb/^{207}Pb$ ages.

Age interpretations for <1.4 Ga analyses are based largely on $^{206}Pb/^{238}U$ ages. $^{206}Pb/^{207}Pb$ ages for these analyses are less reliable given the low concentration of ^{207}Pb. For grains >1.4 Ga, $^{206}Pb/^{207}Pb$ ages are generally more precise than $^{206}Pb/^{238}U$ ages, and are accordingly used in age interpretations. To reduce the effect of discordance, only analyses that are less than 20% discordant (and less than 10% reverse discordant) are included Table 1 and in age interpretations.

Analyses that yield isotopic data of acceptable discordance, in-run fractionation, and precision are reported in Table 1. These analyses are shown on Pb/U concordia diagrams (error ellipses at 1-sigma level) and plotted on relative age-probability diagrams. The latter diagrams are a sum of the probability distributions of all analyses from a sample. Age peaks on these diagrams are considered robust if defined by several analyses, whereas less significance is attributed to peaks defined by single analyses.

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

U	$^{206}Pb_m$	U/Th	Isotopic ratios $^{207}Pb^*$	± (%)	$^{206}Pb^*$	± (%)	error	Apparent ages (Ma) $^{206}Pb^*$	±(Ma)	$^{207}Pb^*$	±(Ma)	$^{206}Pb^*$	±(Ma)	% disc.		
(ppm)	^{204}Pb		^{235}U		^{238}U		corr.	^{238}U		^{235}U		$^{207}Pb^*$			Ages	
LC-02-81-2																
7	91747	4	2.42122	6.35	0.21375	1.20	0.19	**1249**	**17**	1249	145	1249	61	1.00	1249	17
15	2246	6	2.43154	3.86	0.21632	1.03	0.27	**1262**	**14**	1252	91	1234	36	1.02	1262	14
10	2377	6	2.35183	3.52	0.21416	0.81	0.23	**1251**	**11**	1228	81	1188	34	1.05	1251	11
8	1366	6	2.48933	3.89	0.21510	0.68	0.18	**1256**	**9**	1269	94	1291	37	0.97	1256	9
17	13173	3	2.62434	10.93	0.22553	0.56	0.05	**1311**	**8**	1308	256	1302	106	1.01	1311	8
16	1675	4	2.39726	2.46	0.21224	0.69	0.28	**1241**	**10**	1242	58	1244	23	1.00	1241	10
19	14513	7	2.38540	2.82	0.21260	0.85	0.30	**1243**	**12**	1238	66	1231	26	1.01	1243	12
20	16672	6	2.47893	2.79	0.21383	0.61	0.22	**1249**	**8**	1266	68	1294	26	0.97	1249	8
8	13044	4	2.50358	2.32	0.21433	0.83	0.36	**1252**	**11**	1273	57	1309	21	0.96	1252	11
9	8139	5	2.48392	4.22	0.21674	0.99	0.24	**1265**	**14**	1267	101	1272	40	0.99	1265	14
21	11555	3	2.44668	2.11	0.21424	0.38	0.18	**1251**	**5**	1256	51	1265	20	0.99	1251	5
4	34168	4	2.66807	5.93	0.22741	1.31	0.22	**1321**	**19**	1320	149	1318	56	1.00	1321	19
9	11285	3	2.52433	3.97	0.21743	1.04	0.26	**1268**	**15**	1279	97	1297	37	0.98	1268	15
12	1056	4	2.37845	3.57	0.21310	0.68	0.19	**1245**	**9**	1236	83	1220	34	1.02	1245	9
16	14311	5	3.67744	2.28	0.26049	0.53	0.23	1492	9	1567	82	**1668**	**21**	0.89	1668	21
5	10764	5	2.58607	5.76	0.20947	1.06	0.19	1226	14	1297	141	**1416**	**54**	0.87	1416	54
3	11135	4	2.51909	3.41	0.21609	1.12	0.33	**1261**	**16**	1278	84	1305	31	0.97	1261	16
10	11095	3	2.56122	5.02	0.21894	0.74	0.15	**1276**	**11**	1290	123	1312	48	0.97	1276	11
15	22325	5	2.42311	2.99	0.21385	0.65	0.22	**1249**	**9**	1250	71	1250	29	1.00	1249	9
13	12637	4	3.15703	2.93	0.24964	0.63	0.21	1437	10	1447	90	**1462**	**27**	0.98	1462	27
21	31113	3	3.64257	1.59	0.25579	0.65	0.41	1468	11	1559	57	**1684**	**13**	0.87	1684	13
13	3977	3	2.57043	2.31	0.22370	0.38	0.16	**1301**	**5**	1292	59	1277	22	1.02	1301	5
16	49881	3	2.35488	1.92	0.20850	0.49	0.26	**1221**	**7**	1229	45	1243	18	0.98	1221	7
20	41479	6	3.12659	1.44	0.25042	0.87	0.60	1441	14	1439	45	**1437**	**11**	1.00	1437	11
6	14925	5	2.51230	6.51	0.21607	0.59	0.09	**1261**	**8**	1276	154	1300	63	0.97	1261	8
21	44270	6	4.71778	1.36	0.31567	0.66	0.49	1769	14	1770	63	**1773**	**11**	1.00	1773	11
5	33344	3	2.50422	7.61	0.21367	0.66	0.09	**1248**	**9**	1273	177	1316	74	0.95	1248	9
25	24094	6	2.46556	1.82	0.21570	0.64	0.35	**1259**	**9**	1262	45	1267	17	0.99	1259	9
18	77676	6	3.76153	1.31	0.25543	0.49	0.38	1466	8	1585	49	**1746**	**11**	0.84	1746	11
11	21532	4	2.41053	4.74	0.21542	0.66	0.14	**1258**	**9**	1246	110	1225	46	1.03	1258	9
13	9182	2	2.32655	3.31	0.20041	0.80	0.24	**1178**	**10**	1220	75	1297	31	0.91	1178	10
21	4297	7	2.35177	2.10	0.20242	1.22	0.58	**1188**	**16**	1228	49	1299	17	0.91	1188	16
14	29691	1	2.19446	2.97	0.18811	1.04	0.35	**1111**	**13**	1179	64	1307	27	0.85	1111	13
11	61111	3	2.65655	3.47	0.22775	0.82	0.24	**1323**	**12**	1317	90	1306	33	1.01	1323	12
21	8982	6	3.15897	1.81	0.24994	0.79	0.44	1438	13	1447	56	**1460**	**15**	0.98	1460	15
8	24361	5	3.13114	3.55	0.25402	1.04	0.29	1459	17	1440	107	**1413**	**33**	1.03	1413	33
19	2611	7	2.44129	1.77	0.21415	0.70	0.40	**1251**	**10**	1255	43	1262	16	0.99	1251	10
25	3962	5	4.04954	1.81	0.28601	1.06	0.59	1622	20	1644	72	**1673**	**14**	0.97	1673	14
18	35648	5	2.50528	2.90	0.22079	0.94	0.32	**1286**	**13**	1274	71	1253	27	1.03	1286	13
42	1664	6	2.27612	1.32	0.19551	1.05	0.80	**1151**	**13**	1205	30	1303	8	0.88	1151	13
15	31102	3	2.46467	2.53	0.21728	0.61	0.24	**1268**	**9**	1262	62	1252	24	1.01	1268	9
11	21093	3	2.42316	4.62	0.21233	0.56	0.12	**1241**	**8**	1250	108	1264	45	0.98	1241	8
18	31364	6	2.47894	2.28	0.21478	0.94	0.41	**1254**	**13**	1266	56	1286	20	0.98	1254	13
12	15252	6	2.43374	2.68	0.21577	1.19	0.45	**1260**	**17**	1253	64	1241	23	1.01	1260	17
20	27930	5	2.43982	2.50	0.21373	0.56	0.23	**1249**	**8**	1254	60	1264	24	0.99	1249	8
7	1580	3	2.11359	8.42	0.20131	0.87	0.10	**1182**	**11**	1153	166	1099	84	1.08	1182	11
8	11535	5	2.31301	4.60	0.21417	0.77	0.17	**1251**	**11**	1216	103	1155	45	1.08	1251	11
26	8955	6	3.15325	1.23	0.25062	0.59	0.48	**1442**	**10**	1446	39	1452	10	0.99	1442	10
20	12273	2	3.91380	2.17	0.26518	0.57	0.26	1516	10	1617	83	**1750**	**19**	0.87	1750	19
8	1521	6	2.55330	9.30	0.22137	1.00	0.11	**1289**	**14**	1287	216	1284	90	1.00	1289	14
25	4740	3	3.66536	2.72	0.26601	2.38	0.88	1521	41	1564	96	**1623**	**12**	0.94	1623	12
7	8950	9	2.47669	9.20	0.21510	0.90	0.10	**1256**	**13**	1265	209	1281	89	0.98	1256	13
22	1519	2	2.42724	2.34	0.21219	0.77	0.33	**1241**	**11**	1251	56	1268	22	0.98	1241	11
19	2195	3	2.52284	3.91	0.22131	1.04	0.27	**1289**	**15**	1279	96	1262	37	1.02	1289	15
27	1912	3	2.39407	2.54	0.20375	1.49	0.59	**1195**	**20**	1241	60	1321	20	0.91	1195	20
13	12716	4	2.58006	2.78	0.22473	0.64	0.23	**1307**	**9**	1295	70	1275	26	1.02	1307	9
18	28144	3	2.57481	2.52	0.21536	0.71	0.28	**1257**	**10**	1294	64	1354	23	0.93	1257	10
24	3714	5	3.69009	3.03	0.25883	2.75	0.91	1484	46	1569	108	**1686**	**12**	0.88	1686	12
6	46022	6	2.48163	5.36	0.21472	0.91	0.17	**1254**	**13**	1267	127	1288	51	0.97	1254	13
7	10565	2	2.40597	4.66	0.21585	0.79	0.17	**1260**	**11**	1244	108	1218	45	1.03	1260	11
12	26256	6	2.45853	3.38	0.21334	0.81	0.24	**1247**	**11**	1260	81	1283	32	0.97	1247	11
8	16243	4	2.38166	4.34	0.21698	1.23	0.28	**1266**	**17**	1237	100	1187	41	1.07	1266	17
15	6452	5	2.61186	3.92	0.22038	0.96	0.24	**1284**	**14**	1304	99	1337	37	0.96	1284	14
13	4998	4	2.41931	4.30	0.21626	0.81	0.19	**1262**	**11**	1248	100	1225	41	1.03	1262	11
19	11612	4	2.37854	4.84	0.21860	0.35	0.07	**1275**	**5**	1236	111	1170	48	1.09	1275	5
4	1598	3	2.50678	21.72	0.21717	1.20	0.06	**1267**	**17**	1274	441	1286	211	0.99	1267	17
10	7006	3	3.20498	3.57	0.25412	0.65	0.18	1460	11	1458	110	**1456**	**33**	1.00	1456	33
11	1913	6	2.47724	3.81	0.22005	1.06	0.28	**1282**	**15**	1265	92	1237	36	1.04	1282	15
19	13355	3	2.44852	1.46	0.22175	0.54	0.37	**1291**	**8**	1257	36	1199	13	1.08	1291	8
4	2941	2	2.78344	9.33	0.22990	0.99	0.11	**1334**	**15**	1351	235	1378	89	0.97	1334	15

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

			Isotopic ratios					Apparent ages (Ma)								
U (ppm)	$^{206}Pb_m$ / ^{204}Pb	U/Th	$^{207}Pb^*$ / ^{235}U	± (%)	$^{206}Pb^*$ / ^{238}U	± (%)	error corr.	$^{206}Pb^*$ / ^{238}U	±(Ma)	$^{207}Pb^*$ / ^{235}U	±(Ma)	$^{206}Pb^*$ / $^{207}Pb^*$	±(Ma)	% disc.	Ages	Ages
LC-02-81-2 continued																
6	23420	2	2.92531	5.20	0.23523	2.27	0.44	1362	34	1389	144	**1430**	**45**	0.95	1430	45
3	2598	5	2.59436	14.66	0.22958	3.07	0.21	**1332**	**45**	1299	327	1245	140	1.07	1332	45
20	3425	3	2.48902	2.30	0.21711	1.47	0.64	**1267**	**21**	1269	57	1273	17	1.00	1267	21
12	7184	3	2.65427	3.91	0.22750	0.81	0.21	**1321**	**12**	1316	100	1307	37	1.01	1321	12
6	55176	4	2.52814	5.36	0.22211	0.86	0.16	**1293**	**12**	1280	129	1259	52	1.03	1293	12
14	38855	5	2.83397	2.40	0.23415	0.73	0.31	**1356**	**11**	1365	67	1378	22	0.98	1356	11
5	2939	5	2.44002	10.82	0.22218	0.88	0.08	**1293**	**13**	1255	238	1188	106	1.09	1293	13
12	7528	3	2.58590	2.97	0.22121	0.49	0.17	**1288**	**7**	1297	75	1311	28	0.98	1288	7
4	5296	7	2.58332	8.57	0.21335	1.63	0.19	**1247**	**22**	1296	203	1379	81	0.90	1247	22
13	10234	5	2.40721	3.03	0.21735	0.45	0.15	**1268**	**6**	1245	72	1205	30	1.05	1268	6
5	5868	5	2.55581	9.69	0.22130	2.06	0.21	**1289**	**29**	1288	225	1287	92	1.00	1289	29
16	15926	3	2.52329	2.50	0.21915	0.52	0.21	**1277**	**7**	1279	62	1281	24	1.00	1277	7
10	31837	3	2.28568	6.21	0.21181	1.06	0.17	**1238**	**15**	1208	135	1154	61	1.07	1238	15
14	37422	3	2.56176	4.48	0.22605	0.45	0.10	**1314**	**7**	1290	110	1250	44	1.05	1314	7
17	19416	4	3.82433	1.71	0.27311	0.55	0.32	1557	10	1598	64	**1653**	**15**	0.94	1653	15
LC-02-76-7																
20	1996	2	2.07078	2.68	0.18930	0.78	0.29	**1118**	**10**	1139	55	1181	25	0.95	1118	10
12	54653	5	2.56901	4.25	0.22100	0.80	0.19	**1287**	**11**	1292	105	1300	41	0.99	1287	11
11	2092	1	2.49460	4.99	0.22083	0.96	0.19	**1286**	**14**	1271	119	1244	48	1.03	1286	14
4	50299	3	2.55178	4.63	0.21838	1.32	0.29	**1273**	**19**	1287	113	1310	43	0.97	1273	19
5	8323	4	2.58979	7.50	0.22118	1.29	0.17	**1288**	**18**	1298	180	1314	72	0.98	1288	18
5	6883	9	3.09870	5.54	0.24789	1.17	0.21	1428	19	1432	161	**1440**	**52**	0.99	1440	52
14	10852	5	2.76960	3.01	0.22504	0.86	0.29	1309	13	1347	81	**1410**	**28**	0.93	1410	28
5	3279	3	2.40841	6.11	0.21370	1.58	0.26	**1249**	**22**	1245	139	1239	58	1.01	1249	22
6	35049	4	2.18529	8.82	0.20040	1.00	0.11	**1178**	**13**	1176	179	1174	87	1.00	1178	13
12	10025	5	2.28434	3.75	0.20149	1.36	0.36	**1183**	**18**	1208	83	1251	34	0.95	1183	18
9	26603	4	2.42042	4.17	0.22012	0.99	0.24	**1283**	**14**	1249	98	1191	40	1.08	1283	14
4	7401	4	2.87555	5.05	0.23367	0.94	0.19	1354	14	1376	138	**1410**	**47**	0.96	1410	47
6	98664	7	2.74724	3.16	0.22384	2.08	0.66	1302	30	1341	85	**1404**	**23**	0.93	1404	23
9	8829	2	2.69561	6.02	0.21601	0.65	0.11	1261	9	1327	153	**1436**	**57**	0.88	1436	57
5	4268	6	2.40828	7.72	0.21566	1.31	0.17	**1259**	**18**	1245	173	1221	75	1.03	1259	18
5	3698	5	2.14574	9.53	0.19865	0.99	0.10	**1168**	**13**	1164	189	1156	94	1.01	1168	13
3	7542	4	3.02282	3.73	0.24540	1.98	0.53	1415	31	1413	108	**1411**	**30**	1.00	1411	30
6	15471	3	2.15405	5.78	0.19776	1.52	0.26	**1163**	**19**	1166	119	1172	55	0.99	1163	19
18	4331	7	2.47867	3.98	0.21631	3.21	0.81	**1262**	**45**	1266	96	1272	23	0.99	1262	45
11	32005	3	2.39633	5.32	0.21283	0.83	0.16	**1244**	**11**	1242	122	1237	51	1.01	1244	11
11	116184	5	2.33461	3.61	0.21475	1.08	0.30	**1254**	**15**	1223	82	1168	34	1.07	1254	15
8	95629	3	2.53476	5.06	0.21710	1.68	0.33	**1267**	**24**	1282	123	1308	46	0.97	1267	24
16	6005	4	2.37793	2.66	0.21315	0.81	0.30	**1246**	**11**	1236	62	1219	25	1.02	1246	11
6	2472	8	3.05306	8.75	0.24434	2.94	0.34	1409	46	1421	240	**1439**	**79**	0.98	1439	79
4	15292	4	2.32555	16.39	0.20251	1.36	0.08	**1189**	**18**	1220	328	1276	159	0.93	1189	18
6	15841	3	2.51015	4.65	0.21931	1.06	0.23	**1278**	**15**	1275	112	1269	44	1.01	1278	15
3	5175	4	2.41250	5.00	0.21840	2.46	0.49	**1273**	**35**	1246	116	1200	43	1.06	1273	35
4	2797	4	2.57082	9.04	0.22023	2.30	0.26	**1283**	**33**	1292	212	1308	85	0.98	1283	33
9	59334	2	3.74497	3.22	0.25782	0.89	0.28	1479	15	1581	116	**1720**	**28**	0.86	1720	28
9	32203	5	2.24715	4.99	0.19852	0.85	0.17	**1167**	**11**	1196	108	1248	48	0.94	1167	11
6	12287	4	2.16388	7.75	0.19545	1.34	0.17	**1151**	**17**	1170	157	1204	75	0.96	1151	17
8	1665	1	2.85184	7.23	0.22456	2.02	0.28	1306	29	1369	190	**1470**	**66**	0.89	1470	66
13	6043	3	2.51373	4.23	0.21962	1.06	0.25	**1280**	**15**	1276	103	1269	40	1.01	1280	15
9	4987	2	2.95668	5.83	0.23426	2.68	0.46	1357	40	1397	161	**1458**	**49**	0.93	1458	49
6	3796	3	2.48853	5.86	0.21757	1.05	0.18	**1269**	**15**	1269	138	1268	56	1.00	1269	15
6	13877	4	3.07068	8.13	0.24394	1.07	0.13	1407	17	1425	226	**1453**	**77**	0.97	1453	77
5	2622	2	2.44665	9.63	0.21589	2.59	0.27	**1260**	**36**	1256	215	1250	91	1.01	1260	36
16	33050	7	2.83813	2.25	0.22544	0.86	0.38	1311	13	1366	63	**1453**	**20**	0.90	1453	20
6	1355	5	2.05257	10.42	0.18939	1.61	0.16	**1118**	**20**	1133	197	1162	102	0.96	1118	20
24	80041	4	2.46003	2.25	0.21928	0.85	0.38	**1278**	**12**	1260	55	1230	20	1.04	1278	12
10	4968	3	2.47482	4.70	0.21294	1.09	0.23	**1244**	**15**	1265	112	1299	44	0.96	1244	15
13	6387	2	4.48848	2.15	0.30494	1.06	0.49	1716	21	1729	94	**1745**	**17**	0.98	1745	17
4	2000	1	3.46842	7.76	0.25202	2.51	0.32	1449	41	1520	242	**1621**	**68**	0.89	1621	68
26	44529	1	3.73608	6.95	0.25714	4.99	0.72	1475	82	1579	234	**1721**	**44**	0.86	1721	44
9	3450	4	2.81591	5.19	0.22418	2.00	0.39	1304	29	1360	138	**1449**	**46**	0.90	1449	46
17	11848	6	3.61794	3.51	0.26229	1.86	0.53	1502	32	1554	122	**1625**	**28**	0.92	1625	28
10	21730	5	2.87420	6.25	0.23285	3.43	0.55	1349	51	1375	168	**1415**	**50**	0.95	1415	50
6	43757	4	2.46815	7.12	0.21957	1.69	0.24	**1280**	**24**	1263	164	1234	68	1.04	1280	24
7	3875	3	2.86174	6.35	0.23037	1.98	0.31	1337	29	1372	170	**1428**	**58**	0.94	1428	58
8	10326	3	4.00236	3.42	0.27359	1.73	0.51	1559	31	1635	130	**1733**	**27**	0.90	1733	27
5	3118	1	3.88157	6.74	0.28244	4.33	0.64	1604	78	1610	236	**1618**	**48**	0.99	1618	48
17	4013	2	2.83838	3.96	0.23107	2.89	0.73	1340	43	1366	108	**1406**	**26**	0.95	1406	26
8	9811	3	2.19630	6.00	0.19963	1.16	0.19	**1173**	**15**	1180	126	1192	58	0.98	1173	15
8	6200	2	2.29067	8.29	0.20894	1.77	0.21	**1223**	**24**	1209	177	1185	80	1.03	1223	24

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

			Isotopic ratios					Apparent ages (Ma)								
U (ppm)	$^{206}Pb_m/^{204}Pb$	U/Th	$^{207}Pb^*/^{235}U$	± (%)	$^{206}Pb^*/^{238}U$	± (%)	error corr.	$^{206}Pb^*/^{238}U$	±(Ma)	$^{207}Pb^*/^{235}U$	±(Ma)	$^{206}Pb^*/^{207}Pb^*$	±(Ma)	% disc.	Ages	
LC-02-76-7 continued																
3	5641	4	2.84026	5.35	0.22438	1.70	0.32	1305	25	1366	144	**1463**	**48**	0.89	1463	48
11	18478	4	2.95911	3.77	0.23945	1.01	0.27	1384	16	1397	107	**1418**	**35**	0.98	1418	35
LC-16-76-5																
7	7892	3	3.74998	5.08	0.25438	0.70	0.14	1461	11	1582	177	**1748**	**46**	0.84	1748	46
17	25511	5	3.29065	2.40	0.23168	0.53	0.22	1343	8	1479	77	**1679**	**22**	0.80	1679	22
7	9777	5	4.01614	3.57	0.26521	0.51	0.14	1516	9	1638	136	**1797**	**32**	0.84	1797	32
41	1527	4	10.50117	2.56	0.41521	2.45	0.96	2239	65	2480	242	**2684**	**6**	0.83	2684	6
24	11702	5	4.29819	1.56	0.28057	1.26	0.81	1594	23	1693	66	**1818**	**8**	0.88	1818	8
6	10535	4	4.57242	3.75	0.30842	1.71	0.46	1733	34	1744	161	**1758**	**31**	0.99	1758	31
19	14631	5	3.98546	1.99	0.26604	1.66	0.83	1521	28	1631	78	**1777**	**10**	0.86	1777	10
13	17227	5	12.30683	0.82	0.48974	0.57	0.70	2570	18	2628	98	**2674**	**5**	0.96	2674	5
40	8948	3	10.96954	1.57	0.43158	1.52	0.97	2313	42	2521	161	**2692**	**3**	0.86	2692	3
5	2602	4	2.47091	7.37	0.21794	0.85	0.12	**1271**	**12**	1264	170	1251	72	1.02	1271	12
8	5710	3	4.83598	2.32	0.31295	0.63	0.27	1755	13	1791	108	**1833**	**20**	0.96	1833	20
4	4421	6	4.51393	4.05	0.29855	1.24	0.31	1684	24	1734	170	**1794**	**35**	0.94	1794	35
12	14171	6	4.69531	2.06	0.29720	0.46	0.22	1677	9	1766	94	**1873**	**18**	0.90	1873	18
21	59471	3	13.30052	0.65	0.52105	0.44	0.68	2704	15	2701	84	**2699**	**4**	1.00	2699	4
23	32288	7	4.65986	1.11	0.31160	0.62	0.56	1749	12	1760	51	**1774**	**8**	0.99	1774	8
10	6205	3	2.47645	3.02	0.21478	0.72	0.24	**1254**	**10**	1265	73	1284	29	0.98	1254	10
5	2934	3	2.19994	3.81	0.20081	0.85	0.22	**1180**	**11**	1181	82	1184	37	1.00	1180	11
23	53440	3	18.55900	0.74	0.59530	0.58	0.79	3011	22	3019	131	**3025**	**4**	1.00	3025	4
5	3641	14	3.60834	3.69	0.25014	0.94	0.25	1439	15	1551	127	**1708**	**33**	0.84	1708	33
11	38689	3	4.27996	3.39	0.29050	2.41	0.71	1644	45	1690	138	**1746**	**22**	0.94	1746	22
11	10656	2	4.75791	2.97	0.30620	1.26	0.43	1722	25	1778	134	**1843**	**24**	0.93	1843	24
18	8074	4	2.37063	1.82	0.21080	0.51	0.28	**1233**	**7**	1234	43	1235	17	1.00	1233	7
21	41937	2	13.30033	0.78	0.51641	0.63	0.80	2684	21	2701	100	**2714**	**4**	0.99	2714	4
6	2308	3	2.71969	5.77	0.21687	1.19	0.21	1265	17	1334	148	**1446**	**54**	0.88	1446	54
27	18128	5	2.48711	2.82	0.19889	2.29	0.81	1169	29	1268	69	**1440**	**16**	0.81	1440	16
15	58232	4	11.16898	1.58	0.43011	1.19	0.75	2306	33	2537	165	**2728**	**9**	0.85	2728	9
20	28794	3	2.11813	5.05	0.19202	4.54	0.90	**1132**	**56**	1155	103	1197	22	0.95	1132	56
15	32518	2	2.41246	3.83	0.20933	0.57	0.15	**1225**	**8**	1246	90	1283	37	0.96	1225	8
19	51800	2	13.15233	0.68	0.51115	0.58	0.85	2662	19	2691	87	**2713**	**3**	0.98	2713	3
7	4472	8	3.69527	2.79	0.25324	0.93	0.34	1455	15	1570	100	**1729**	**24**	0.84	1729	24
7	6347	7	3.82916	3.64	0.26046	0.63	0.17	1492	11	1599	132	**1743**	**33**	0.86	1743	33
21	71180	2	13.38952	0.78	0.51240	0.69	0.88	2667	23	2708	101	**2738**	**3**	0.97	2738	3
9	16465	11	3.03224	2.68	0.24211	0.97	0.36	1398	15	1416	79	**1443**	**24**	0.97	1443	24
4	2476	3	3.11283	6.87	0.25098	0.79	0.11	1444	13	1436	197	**1425**	**65**	1.01	1425	65
20	24524	5	4.35465	1.53	0.30061	1.06	0.69	1694	21	1704	66	**1715**	**10**	0.99	1715	10
26	4845	2	10.59721	1.50	0.41077	1.41	0.94	2219	37	2489	150	**2717**	**4**	0.82	2717	4
8	6187	6	3.19276	4.08	0.25806	0.67	0.17	1480	11	1455	124	**1420**	**38**	1.04	1420	38
27	6316	2	14.36308	1.08	0.54074	1.00	0.93	2787	35	2774	146	**2765**	**3**	1.01	2765	3
19	18863	8	4.88152	1.53	0.30505	0.80	0.52	1716	16	1799	73	**1896**	**12**	0.91	1896	12
12	6152	3	4.68248	2.48	0.31601	1.10	0.44	1770	22	1764	111	**1757**	**20**	1.01	1757	20
11	11614	7	3.39203	3.33	0.23670	0.98	0.29	1370	15	1503	109	**1696**	**29**	0.81	1696	29
21	25899	9	4.70712	1.48	0.30443	0.96	0.65	1713	19	1769	69	**1834**	**10**	0.93	1834	10
33	13630	4	4.16132	2.27	0.26375	2.13	0.94	1509	36	1666	92	**1871**	**7**	0.81	1871	7
31	3826	2	12.14863	2.18	0.47097	2.15	0.98	2488	65	2616	239	**2717**	**3**	0.92	2717	3
13	4673	2	10.96435	5.46	0.42747	5.41	0.99	2294	147	2520	477	**2707**	**6**	0.85	2707	6
7	4060	8	3.15154	4.03	0.25116	0.70	0.18	1444	11	1445	121	**1447**	**38**	1.00	1447	38
14	18625	5	16.05588	0.87	0.55917	0.79	0.91	2863	29	2880	133	**2892**	**3**	0.99	2892	3
15	14227	5	12.00610	0.91	0.47599	0.84	0.92	2510	26	2605	105	**2680**	**3**	0.94	2680	3
9	11728	4	3.76537	3.04	0.25558	0.52	0.17	1467	9	1585	110	**1746**	**27**	0.84	1746	27
18	19911	7	3.72757	1.14	0.25602	0.47	0.42	1469	8	1577	42	**1725**	**10**	0.85	1725	10
12	22301	5	3.76985	2.37	0.25751	0.89	0.38	1477	15	1586	87	**1735**	**20**	0.85	1735	20
11	14366	3	13.42030	1.07	0.51719	0.85	0.79	2687	28	2710	137	**2726**	**5**	0.99	2726	5
16	24621	3	2.90212	2.96	0.22972	0.82	0.28	1333	12	1383	84	**1460**	**27**	0.91	1460	27
21	66261	3	12.46794	0.92	0.49630	0.81	0.88	2598	26	2640	110	**2673**	**4**	0.97	2673	4
46	3146	2	11.91887	1.61	0.43865	1.55	0.96	2345	44	2598	178	**2802**	**4**	0.84	2802	4
17	26001	8	4.91209	1.49	0.32171	0.72	0.48	1798	15	1804	72	**1812**	**12**	0.99	1812	12
17	30801	2	10.95554	2.06	0.42893	2.01	0.98	2301	55	2519	207	**2700**	**4**	0.85	2700	4
20	7176	3	2.89057	2.44	0.23011	1.78	0.73	1335	26	1380	69	**1449**	**16**	0.92	1449	16
29	16134	14	4.28687	1.17	0.29268	0.73	0.63	1655	14	1691	50	**1736**	**8**	0.95	1736	8
37	7296	6	3.86141	2.11	0.26115	1.97	0.93	1496	33	1606	79	**1753**	**7**	0.85	1753	7
23	54403	6	20.66761	1.11	0.59028	1.08	0.98	2991	41	3123	209	**3209**	**2**	0.93	3209	2
7	12139	3	13.08611	1.71	0.49850	1.01	0.59	2607	32	2686	205	**2746**	**11**	0.95	2746	11
68	1272	2	11.10394	3.18	0.42955	3.07	0.96	2304	84	2532	307	**2720**	**7**	0.85	2720	7
8	1563	5	3.76120	4.87	0.25325	1.11	0.23	1455	18	1585	171	**1761**	**43**	0.83	1761	43
13	30010	3	3.49296	2.16	0.24544	0.60	0.28	1415	9	1526	74	**1683**	**19**	0.84	1683	19
17	85196	3	13.19495	0.87	0.51636	0.83	0.95	2684	28	2694	111	**2701**	**2**	0.99	2701	2
31	5421	4	11.48752	1.61	0.44571	1.55	0.97	2376	45	2564	172	**2715**	**3**	0.88	2715	3

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

U (ppm)	$^{206}Pb_m$ / ^{204}Pb	U/Th	Isotopic ratios: $^{207}Pb^*$ / ^{235}U	± (%)	$^{206}Pb^*$ / ^{238}U	± (%)	error corr.	Apparent ages (Ma): $^{206}Pb^*$ / ^{238}U	±(Ma)	$^{207}Pb^*$ / ^{235}U	±(Ma)	$^{206}Pb^*$ / $^{207}Pb^*$	±(Ma)	% disc.	Ages	
LC-16-76-5 Continued																
15	23195	4	4.55090	2.33	0.30183	1.06	0.45	1700	21	1740	102	1789	19	0.95	1789	19
16	34607	4	3.01204	2.32	0.24212	1.15	0.50	1398	18	1411	69	1430	19	0.98	1430	19
26	7349	3	12.31163	2.59	0.43666	2.51	0.97	2336	70	2629	281	2862	5	0.82	2862	5
9	15227	6	3.59847	3.27	0.24909	1.19	0.36	1434	19	1549	113	1710	28	0.84	1710	28
13	8825	16	4.86848	1.51	0.30849	1.13	0.75	1733	22	1797	72	1871	9	0.93	1871	9
31	22170	5	4.65746	1.21	0.30560	0.85	0.70	1719	17	1760	56	1808	8	0.95	1808	8
21	20689	4	12.29585	1.02	0.48414	0.88	0.86	2545	27	2627	120	2691	4	0.95	2691	4
25	29675	8	5.18045	0.95	0.33179	0.74	0.78	1847	16	1849	49	1852	5	1.00	1852	5
60	2016	2	11.56176	2.04	0.46119	1.97	0.97	2445	58	2570	215	2670	4	0.92	2670	4
16	13444	3	12.72317	0.77	0.48136	0.61	0.79	2533	19	2659	95	2757	4	0.92	2757	4
13	60855	4	13.00019	1.16	0.49802	0.92	0.80	2605	30	2680	143	2736	6	0.95	2736	6
10	7009	2	2.45390	4.09	0.21216	0.80	0.20	1240	11	1259	97	1290	39	0.96	1240	11
14	65332	1	9.70608	1.10	0.42852	0.86	0.78	2299	24	2407	103	2500	6	0.92	2500	6
19	53347	5	10.61265	0.55	0.46109	0.45	0.82	2444	13	2490	58	2527	3	0.97	2527	3
15	85071	5	4.89971	1.35	0.31933	0.77	0.57	1786	16	1802	65	1820	10	0.98	1820	10
12	56513	3	13.11074	0.88	0.50360	0.62	0.70	2629	20	2688	111	2732	5	0.96	2732	5
T01-76-3																
28	3165	10	2.37683	2.27	0.21109	1.87	0.82	1235	25	1236	53	1237	13	1.00	1235	25
25	2289	3	2.46241	2.06	0.21617	1.48	0.72	1262	21	1261	50	1260	14	1.00	1262	21
32	7024	5	4.35186	3.17	0.29065	3.06	0.97	1645	57	1703	131	1776	7	0.93	1776	7
18	53526	3	13.08142	0.52	0.51763	0.41	0.79	2689	14	2686	67	2683	3	1.00	2683	3
16	6758	4	2.66853	2.57	0.21400	0.88	0.34	1250	12	1320	67	1435	23	0.87	1435	23
9	2929	7	2.42275	5.67	0.21906	0.85	0.15	1277	12	1249	131	1202	55	1.06	1277	12
17	12839	12	4.32489	2.02	0.29724	0.69	0.34	1678	13	1698	85	1724	17	0.97	1724	17
40	19218	8	4.65775	1.45	0.30993	1.25	0.87	1740	25	1760	66	1783	7	0.98	1783	7
3	11722	8	12.72643	2.38	0.47384	1.71	0.72	2500	52	2660	268	2783	14	0.90	2783	14
15	18870	4	12.14038	1.51	0.46556	1.45	0.96	2464	43	2615	171	2735	3	0.90	2735	3
13	51964	8	5.38183	1.51	0.33805	0.56	0.37	1877	12	1882	80	1887	13	0.99	1887	13
17	16867	10	4.48930	2.37	0.28540	1.72	0.73	1619	32	1729	103	1865	15	0.87	1865	15
24	55215	5	3.16353	1.69	0.25116	0.83	0.49	1444	13	1448	53	1454	14	0.99	1454	14
23	30352	9	4.11537	1.87	0.28339	1.16	0.62	1608	21	1657	75	1720	13	0.94	1720	13
16	94359	5	12.46469	1.21	0.49676	1.08	0.89	2600	35	2640	143	2671	5	0.97	2671	5
40	1442	2	11.74354	1.46	0.45372	1.39	0.95	2412	41	2584	161	2722	4	0.89	2722	4
31	2886	9	3.16040	1.61	0.25174	0.98	0.61	1447	16	1448	50	1448	12	1.00	1448	12
40	2434	7	3.64545	2.66	0.24816	2.57	0.97	1429	41	1560	94	1741	6	0.82	1741	6
39	5378	2	11.18417	1.82	0.43645	1.79	0.98	2335	50	2539	188	2706	3	0.86	2706	3
19	15248	5	11.39163	1.84	0.44522	1.74	0.95	2374	50	2556	193	2703	5	0.88	2703	5
34	1669	6	5.30567	2.56	0.32011	2.32	0.91	1790	48	1870	129	1959	10	0.91	1959	10
9	83663	9	5.29006	2.22	0.33150	0.85	0.38	1846	18	1867	113	1891	18	0.98	1891	18
28	33396	13	4.86568	1.14	0.31700	0.91	0.80	1775	19	1796	55	1821	6	0.97	1821	6
26	4329	5	3.36977	1.45	0.23786	1.12	0.77	1376	17	1497	49	1674	9	0.82	1674	9
13	63709	5	2.93789	1.76	0.23441	0.60	0.34	1358	9	1392	51	1444	16	0.94	1444	16
17	72112	4	12.41755	0.74	0.48732	0.57	0.77	2559	18	2637	90	2696	4	0.95	2696	4
9	51573	12	3.63229	3.63	0.25737	1.47	0.41	1476	24	1557	126	1667	31	0.89	1667	31
31	2206	4	3.75400	2.35	0.27209	1.50	0.64	1551	26	1583	86	1625	17	0.95	1625	17
6	2435	4	2.39737	6.58	0.21383	1.05	0.16	1249	15	1242	149	1229	64	1.02	1249	15
12	45115	6	4.46819	1.78	0.29431	1.08	0.61	1663	21	1725	78	1801	13	0.92	1801	13
22	32014	6	3.07352	1.53	0.25017	1.05	0.69	1439	17	1426	47	1406	11	1.02	1406	11
6	8329	4	3.09103	5.05	0.24575	1.10	0.22	1417	17	1431	147	1451	47	0.98	1451	47
26	7481	5	2.57438	3.35	0.20326	2.73	0.81	1193	36	1293	84	1464	18	0.81	1464	18
7	11391	10	3.05914	3.37	0.24804	0.59	0.18	1428	9	1423	100	1414	32	1.01	1414	32
31	9524	6	4.43607	0.94	0.30726	0.57	0.61	1727	11	1719	41	1709	7	1.01	1709	7
28	71421	10	3.16759	0.79	0.25203	0.58	0.73	1449	9	1449	25	1450	5	1.00	1450	5
13	18058	6	4.24126	1.88	0.29855	0.69	0.37	1684	13	1682	78	1679	16	1.00	1679	16
7	34180	12	4.32265	4.78	0.29133	4.03	0.84	1648	75	1698	191	1759	24	0.94	1759	24
35	4295	4	2.78679	4.63	0.22405	4.16	0.90	1303	60	1352	123	1430	19	0.91	1430	19
45	2615	12	4.51862	1.56	0.29417	1.31	0.84	1662	25	1734	69	1822	8	0.91	1822	8
16	20719	19	4.47706	1.45	0.30000	0.91	0.63	1691	18	1727	64	1770	10	0.96	1770	10
18	32203	5	3.18993	1.49	0.25286	0.88	0.59	1453	14	1455	47	1457	11	1.00	1457	11
23	23249	7	4.35920	1.16	0.29450	0.73	0.63	1664	14	1705	50	1755	8	0.95	1755	8
5	3280	4	2.43513	15.40	0.21528	1.62	0.11	1257	22	1253	323	1246	150	1.01	1257	22
3	18698	5	2.55888	12.52	0.21842	1.79	0.14	1274	25	1289	282	1315	120	0.97	1274	25
11	67212	5	3.63098	1.98	0.25468	0.53	0.27	1463	9	1556	70	1686	18	0.87	1686	18
37	6291	6	11.29533	0.99	0.47272	0.95	0.96	2496	29	2548	107	2590	2	0.96	2590	2
8	16154	5	3.82208	2.99	0.26146	1.04	0.35	1497	18	1597	110	1732	26	0.86	1732	26
11	12307	13	4.75655	2.31	0.31753	1.21	0.52	1778	25	1777	106	1777	18	1.00	1777	18
16	155577	7	10.94551	0.98	0.47813	0.67	0.69	2519	21	2519	103	2518	6	1.00	2518	6
28	6338	3	4.40523	1.31	0.29019	0.84	0.64	1643	16	1713	57	1801	9	0.91	1801	9
15	10272	14	4.68644	3.13	0.30063	0.84	0.27	1694	16	1765	139	1849	27	0.92	1849	27
15	22881	9	4.70929	1.40	0.31856	0.69	0.49	1783	14	1769	65	1753	11	1.02	1753	11

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

U (ppm)	$^{206}Pb_m$ / ^{204}Pb	U/Th	$^{207}Pb^*$ / ^{235}U	± (%)	$^{206}Pb^*$ / ^{238}U	± (%)	error corr.	$^{206}Pb^*$ / ^{238}U	±(Ma)	$^{207}Pb^*$ / ^{235}U	±(Ma)	$^{206}Pb^*$ / $^{207}Pb^*$	±(Ma)	% disc.	Ages	
			Isotopic ratios					Apparent ages (Ma)								
T01-76-3 Continued																
53	2087	6	3.45627	1.80	0.24750	1.44	0.80	1426	23	1517	61	**1648**	**10**	0.87	1648	10
6	8811	11	3.18069	5.83	0.25387	3.09	0.53	1458	50	1453	173	**1444**	**47**	1.01	1444	47
7	25321	4	2.94353	4.03	0.23093	0.82	0.20	1339	12	1393	114	**1477**	**37**	0.91	1477	37
32	18494	11	4.65789	1.10	0.30269	0.71	0.64	1705	14	1760	51	**1826**	**8**	0.93	1826	8
4	2841	6	2.21088	15.37	0.20281	1.67	0.11	**1190**	**22**	1185	297	1174	151	1.01	1190	22
6	23750	8	14.00092	1.40	0.53220	0.76	0.54	2751	26	2750	182	**2749**	**10**	1.00	2749	10
29	22330	11	4.24067	1.69	0.29350	1.42	0.84	1659	27	1682	70	**1711**	**8**	0.97	1711	8
24	1812	5	3.59014	3.39	0.25635	2.96	0.87	1471	49	1547	117	**1653**	**15**	0.89	1653	15
26	17276	4	2.67951	1.96	0.22038	1.15	0.59	**1284**	**16**	1323	52	1386	15	0.93	1284	16
40	3251	3	4.22100	1.60	0.27231	1.30	0.81	1553	23	1678	66	**1839**	**8**	0.84	1839	8
16	69959	6	3.02454	2.28	0.24346	0.62	0.27	1405	10	1414	68	**1428**	**21**	0.98	1428	21
18	70025	9	3.39013	1.85	0.26212	0.82	0.44	1501	14	1502	62	**1504**	**16**	1.00	1504	16
16	17086	7	4.32247	1.30	0.29486	0.67	0.52	1666	13	1698	56	**1737**	**10**	0.96	1737	10
11	24257	3	12.87889	0.72	0.50749	0.45	0.63	2646	15	2671	90	**2690**	**5**	0.98	2690	5
13	49713	7	5.22542	1.27	0.33111	0.36	0.28	1844	8	1857	65	**1871**	**11**	0.99	1871	11
5	31285	5	3.37583	9.80	0.24378	1.04	0.11	1406	16	1499	290	**1632**	**91**	0.86	1632	91
26	37748	6	9.32923	1.11	0.41659	0.93	0.84	2245	25	2371	100	**2481**	**5**	0.90	2481	5
23	45294	5	4.73959	1.19	0.30987	0.69	0.58	1740	14	1774	56	**1815**	**9**	0.96	1815	9
22	10521	7	4.37739	0.96	0.30325	0.61	0.63	1707	12	1708	42	**1709**	**7**	1.00	1709	7
7	33501	15	12.34365	1.78	0.50172	1.59	0.89	2621	51	2631	202	**2638**	**7**	0.99	2638	7
21	23374	6	4.70265	1.71	0.30693	0.67	0.39	1726	13	1768	79	**1818**	**14**	0.95	1818	14
31	8819	8	3.91941	1.74	0.25413	1.26	0.73	1460	21	1618	67	**1830**	**11**	0.80	1830	11
T01-76-2																
9	79529	2	5.80471	1.98	0.35357	0.45	0.23	1952	10	1947	110	**1942**	**17**	1.00	1942	17
17	23485	5	3.84583	1.89	0.25939	0.87	0.46	1487	15	1602	71	**1758**	**15**	0.85	1758	15
15	55423	5	6.13382	0.99	0.35985	0.45	0.46	1982	10	1995	60	**2009**	**8**	0.99	2009	8
30	37350	1	3.65290	1.06	0.24590	0.57	0.54	1417	9	1561	39	**1762**	**8**	0.80	1762	8
15	28581	4	10.61303	1.02	0.45766	0.62	0.61	2429	18	2490	104	**2540**	**7**	0.96	2540	7
21	21413	6	4.93192	0.87	0.32112	0.53	0.61	1795	11	1808	43	**1822**	**6**	0.99	1822	6
11	13414	3	12.87381	1.11	0.48303	0.77	0.69	2540	24	2671	136	**2770**	**7**	0.92	2770	7
10	8477	5	3.94676	4.16	0.27122	0.94	0.23	1547	16	1623	155	**1724**	**37**	0.90	1724	37
33	51834	2	15.97403	0.95	0.55423	0.93	0.98	2843	33	2875	144	**2898**	**2**	0.98	2898	2
12	7180	4	5.09445	1.69	0.32668	0.65	0.38	1822	14	1835	84	**1850**	**14**	0.99	1850	14
8	55047	2	4.64951	2.48	0.30741	0.73	0.30	1728	15	1758	111	**1794**	**22**	0.96	1794	22
16	59546	3	5.45777	1.24	0.34073	0.67	0.54	1890	15	1894	67	**1898**	**9**	1.00	1898	9
18	17311	4	3.87941	1.75	0.26165	0.34	0.19	1498	6	1609	67	**1758**	**16**	0.85	1758	16
13	17188	3	4.35348	2.23	0.28830	0.92	0.41	1633	17	1704	94	**1791**	**19**	0.91	1791	19
14	15100	3	10.24533	1.06	0.43136	0.82	0.78	2312	23	2457	104	**2580**	**6**	0.90	2580	6
10	6950	3	4.72829	1.68	0.30216	0.47	0.28	1702	9	1772	78	**1856**	**15**	0.92	1856	15
37	30633	10	5.72158	1.32	0.34418	1.27	0.96	1907	28	1935	74	**1965**	**3**	0.97	1965	3
16	6005	3	3.59942	4.61	0.25329	1.50	0.33	1455	24	1549	156	**1680**	**40**	0.87	1680	40
21	35493	6	5.78536	1.78	0.35081	1.54	0.87	1938	35	1944	100	**1950**	**8**	0.99	1950	8
24	30479	4	3.83697	1.70	0.25415	0.76	0.45	1460	12	1601	64	**1791**	**14**	0.82	1791	14
16	11959	7	5.14509	1.24	0.32197	0.58	0.47	1799	12	1844	63	**1894**	**10**	0.95	1894	10
15	21464	3	4.11598	1.67	0.26839	0.94	0.56	1533	16	1658	67	**1820**	**13**	0.84	1820	13
31	47849	5	5.87456	0.84	0.34275	0.70	0.83	1900	15	1958	49	**2019**	**4**	0.94	2019	4
13	10647	4	4.08897	1.53	0.27607	0.77	0.50	1572	14	1652	62	**1756**	**12**	0.89	1756	12
26	32951	3	4.85431	0.99	0.30023	0.64	0.65	1692	12	1794	48	**1915**	**7**	0.88	1915	7
38	188913	3	9.45334	0.53	0.40368	0.50	0.94	2186	13	2383	50	**2556**	**2**	0.86	2556	2
22	61943	4	7.84237	1.31	0.40954	1.18	0.90	2213	31	2213	100	**2213**	**5**	1.00	2213	5
25	12656	5	4.88528	1.24	0.29990	1.01	0.81	1691	20	1800	60	**1928**	**6**	0.88	1928	6
10	18181	5	4.83757	1.41	0.29841	0.73	0.52	1683	14	1792	67	**1920**	**11**	0.88	1920	11
26	27700	7	4.89911	1.16	0.29473	1.02	0.88	1665	19	1802	56	**1964**	**5**	0.85	1964	5
11	4330	2	4.20265	4.72	0.27103	1.44	0.31	1546	25	1675	184	**1840**	**41**	0.84	1840	41
16	30466	3	5.06449	1.14	0.31438	0.69	0.61	1762	14	1830	57	**1908**	**8**	0.92	1908	8
32	89856	6	12.45921	0.66	0.50467	0.62	0.94	2634	20	2640	80	**2644**	**2**	1.00	2644	2
12	92335	4	11.50180	0.76	0.47379	0.48	0.63	2500	15	2565	85	**2616**	**5**	0.96	2616	5
11	110276	4	5.47658	2.13	0.33057	0.56	0.26	1841	12	1897	112	**1959**	**18**	0.94	1959	18
7	35083	3	4.15391	2.75	0.29404	0.97	0.35	1662	18	1665	110	**1669**	**24**	1.00	1669	24
22	32596	3	3.96450	1.62	0.26699	0.64	0.40	1526	11	1627	63	**1761**	**14**	0.87	1761	14
23	33969	4	2.48575	1.82	0.21149	0.37	0.20	**1237**	**5**	1268	45	1321	17	0.94	1237	5
9	23193	2	11.04800	1.33	0.47143	0.46	0.35	2490	14	2527	139	**2557**	**10**	0.97	2557	10
35	3183	10	5.89079	1.90	0.35321	1.66	0.88	1950	38	1960	108	**1970**	**8**	0.99	1970	8
14	61977	4	4.69662	1.28	0.30589	0.87	0.68	1721	17	1767	59	**1822**	**8**	0.94	1822	8
35	84540	4	5.93762	0.98	0.33406	0.63	0.64	1858	14	1967	58	**2083**	**7**	0.89	2083	7
51	5085	1	4.79820	2.82	0.29294	2.69	0.96	1656	51	1785	129	**1938**	**7**	0.85	1938	7
75	2498	1	4.79195	4.57	0.29026	4.54	0.99	1643	84	1784	201	**1952**	**5**	0.84	1952	5
28	56662	6	4.31092	1.46	0.28796	0.96	0.66	1631	18	1696	62	**1776**	**10**	0.92	1776	10
19	52335	2	10.90418	0.90	0.44903	0.82	0.91	2391	24	2515	95	**2617**	**3**	0.91	2617	3
22	28874	4	14.91267	0.91	0.51329	0.85	0.94	2671	28	2810	129	**2911**	**3**	0.92	2911	3

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

U	$^{206}Pb_m$	U/Th	Isotopic ratios					Apparent ages (Ma)								
			$^{207}Pb^*/^{235}U$	± (%)	$^{206}Pb^*/^{238}U$	± (%)	error	$^{206}Pb^*/^{238}U$	±(Ma)	$^{207}Pb^*/^{235}U$	±(Ma)	$^{206}Pb^*/^{207}Pb^*$	±(Ma)	% disc.		
(ppm)	^{204}Pb						corr.								Ages	
T01-76-2 Continued																
28	96417	2	12.94491	0.89	0.45749	0.83	0.93	2429	24	2676	111	**2868**	**3**	0.85	2868	3
13	8414	3	3.59620	1.97	0.25006	0.92	0.47	1439	15	1549	70	**1702**	**16**	0.85	1702	16
24	31515	5	4.70618	1.18	0.29340	0.84	0.71	1659	16	1768	55	**1901**	**7**	0.87	1901	7
29	12334	5	4.44925	1.73	0.29978	0.98	0.57	1690	19	1722	75	**1760**	**13**	0.96	1760	13
19	149354	3	5.37745	1.38	0.32750	0.65	0.47	1826	14	1881	73	**1943**	**11**	0.94	1943	11
28	12092	2	5.10258	2.19	0.31931	2.01	0.92	1786	41	1837	108	**1894**	**8**	0.94	1894	8
17	17765	4	4.43468	1.31	0.28768	0.41	0.31	1630	8	1719	57	**1829**	**11**	0.89	1829	11
33	4360	6	4.18178	2.28	0.27674	2.20	0.96	1575	39	1671	93	**1793**	**6**	0.88	1793	6
22	12803	3	4.49760	1.45	0.28135	0.92	0.63	1598	17	1731	64	**1895**	**10**	0.84	1895	10
41	22659	5	12.86725	3.07	0.44957	3.06	1.00	2393	88	2670	338	**2887**	**2**	0.83	2887	2
28	108078	5	14.23962	0.81	0.50115	0.78	0.96	2619	25	2766	111	**2875**	**2**	0.91	2875	2
21	37329	4	3.98542	2.20	0.27255	1.96	0.89	1554	34	1631	85	**1733**	**9**	0.90	1733	9
17	53257	4	12.71858	0.72	0.47109	0.49	0.68	2488	15	2659	89	**2792**	**4**	0.89	2792	4
39	68506	6	3.47674	1.12	0.24528	0.66	0.59	1414	10	1522	39	**1675**	**8**	0.84	1675	8
30	4333	6	15.51225	1.71	0.47430	1.36	0.79	2502	41	2847	239	**3101**	**8**	0.81	3101	8
18	16091	8	4.95010	2.93	0.30496	2.33	0.80	1716	46	1811	138	**1922**	**16**	0.89	1922	16
24	39446	3	10.53087	1.05	0.44261	1.00	0.95	2362	29	2483	107	**2583**	**3**	0.91	2583	3
49	12237	10	9.70959	2.50	0.41785	2.48	0.99	2251	67	2408	221	**2543**	**3**	0.89	2543	3
38	13819	5	4.85978	1.38	0.28834	1.16	0.84	1633	22	1795	66	**1989**	**7**	0.82	1989	7
16	35353	3	5.19819	1.01	0.31833	0.60	0.59	1782	12	1852	52	**1933**	**7**	0.92	1933	7
23	71652	2	4.18609	1.44	0.27584	0.77	0.53	1570	14	1671	60	**1801**	**11**	0.87	1801	11
32	23406	7	5.43916	1.44	0.30604	1.09	0.76	1721	22	1891	76	**2083**	**8**	0.83	2083	8
47	5400	7	5.07668	1.23	0.31065	1.11	0.90	1744	22	1832	62	**1934**	**5**	0.90	1934	5
15	6731	5	4.01116	1.96	0.26379	0.76	0.39	1509	13	1637	77	**1804**	**16**	0.84	1804	16
17	96181	3	4.70880	1.68	0.28772	0.62	0.37	1630	12	1769	77	**1937**	**14**	0.84	1937	14
25	9323	3	2.03436	2.25	0.18415	0.90	0.40	**1090**	**11**	1127	46	1200	20	0.91	1090	11
32	24892	5	5.33374	0.61	0.31988	0.37	0.61	1789	8	1874	32	**1970**	**4**	0.91	1970	4
22	22659	7	4.78510	1.14	0.29708	0.92	0.81	1677	18	1782	54	**1908**	**6**	0.88	1908	6
13	10036	2	3.52417	2.26	0.24962	0.63	0.28	1437	10	1533	78	**1668**	**20**	0.86	1668	20
23	26600	5	4.98710	0.91	0.31347	0.60	0.66	1758	12	1817	45	**1886**	**6**	0.93	1886	6
96	3677	5	3.55754	1.38	0.25031	0.94	0.68	1440	15	1540	49	**1680**	**9**	0.86	1680	9
16	61062	5	4.39944	1.25	0.28399	0.95	0.76	1611	17	1712	54	**1838**	**7**	0.88	1838	7
31	31426	4	3.40507	1.24	0.24197	0.76	0.61	1397	12	1506	42	**1662**	**9**	0.84	1662	9
T01-75-4																
24	83177	1	5.14597	0.99	0.32312	0.69	0.70	1805	14	1844	51	**1888**	**6**	0.96	1888	6
4	11312	4	2.65482	7.58	0.22699	1.24	0.16	**1319**	**18**	1316	186	1312	73	1.01	1319	18
40	93064	3	4.17678	0.68	0.28651	0.49	0.72	1624	9	1670	28	**1727**	**4**	0.94	1727	4
23	112801	5	2.99084	1.73	0.23847	0.71	0.41	1379	11	1405	51	**1446**	**15**	0.95	1446	15
35	8153	6	2.40457	2.06	0.20891	1.48	0.72	**1223**	**20**	1244	49	1280	14	0.96	1223	20
16	5997	2	4.50227	1.63	0.30402	0.71	0.44	1711	14	1731	72	**1756**	**13**	0.97	1756	13
10	6338	4	4.97654	2.44	0.32515	0.47	0.19	1815	10	1815	116	**1816**	**22**	1.00	1816	22
18	2261	9	2.91557	3.66	0.23537	2.45	0.67	1363	37	1386	103	**1422**	**26**	0.96	1422	26
16	9010	3	3.07756	1.57	0.23720	0.91	0.58	1372	14	1427	48	**1510**	**12**	0.91	1510	12
15	2584	8	2.76444	3.01	0.21391	1.47	0.49	**1250**	**20**	1346	81	1503	25	0.83	1250	20
35	67718	4	2.96870	1.16	0.24183	0.44	0.38	1396	7	1400	35	**1405**	**10**	0.99	1405	10
17	2950	0	2.37097	2.51	0.20274	1.61	0.64	**1190**	**21**	1234	59	1311	19	0.91	1190	21
23	7149	1	2.56938	2.23	0.21841	1.66	0.74	**1273**	**23**	1292	57	1323	14	0.96	1273	23
8	34047	5	2.34943	3.57	0.21603	1.55	0.43	**1261**	**22**	1227	82	1169	32	1.08	1261	22
16	91761	3	3.03955	1.50	0.24608	0.71	0.47	1418	11	1418	45	**1417**	**13**	1.00	1417	13
10	114476	4	4.58332	1.92	0.30349	0.72	0.38	1709	14	1746	86	**1792**	**16**	0.95	1792	16
16	8040	6	2.93432	3.34	0.23803	1.00	0.30	1376	15	1391	95	**1413**	**30**	0.97	1413	30
28	8494	0	2.60151	1.31	0.20912	0.45	0.34	1224	6	1301	34	**1430**	**12**	0.86	1430	12
26	73820	2	9.56048	1.10	0.40666	1.08	0.98	2200	28	2393	102	**2563**	**2**	0.86	2563	2
22	24978	4	2.83569	1.44	0.22970	0.72	0.50	1333	11	1365	41	**1416**	**12**	0.94	1416	12
36	5280	2	2.71886	3.23	0.21538	3.04	0.94	1257	42	1334	85	**1458**	**10**	0.86	1458	10
4	1861	20	1.72850	12.48	0.16313	4.30	0.35	**974**	**45**	1019	198	1117	117	0.87	974	45
22	3675	2	4.32064	4.52	0.29360	1.03	0.23	1660	20	1697	181	**1744**	**40**	0.95	1744	40
24	21858	3	4.76679	1.38	0.31443	0.87	0.63	1763	18	1779	65	**1799**	**10**	0.98	1799	10
13	104576	7	2.94446	2.68	0.23251	0.68	0.26	1348	10	1393	77	**1464**	**25**	0.92	1464	25
12	22708	4	2.53889	2.30	0.22008	0.81	0.35	**1282**	**12**	1283	58	1285	21	1.00	1282	12
22	8317	2	3.00097	1.61	0.24238	0.61	0.38	1399	10	1408	48	**1421**	**14**	0.98	1421	14
14	12874	3	2.64377	1.94	0.21889	0.85	0.44	**1276**	**12**	1313	51	1374	17	0.93	1276	12
30	60529	6	4.36598	1.15	0.30064	0.92	0.80	1695	18	1706	50	**1720**	**6**	0.99	1720	6
79	6340	1	9.44514	1.46	0.41083	1.43	0.98	2219	38	2382	131	**2525**	**2**	0.88	2525	2
41	15793	2	4.77418	1.29	0.29399	1.11	0.86	1661	21	1780	61	**1923**	**6**	0.86	1923	6
8	9520	5	3.43382	4.19	0.24821	1.57	0.38	1429	25	1512	136	**1630**	**36**	0.88	1630	36
34	58385	2	3.82100	1.19	0.27113	0.77	0.65	1547	13	1597	45	**1665**	**8**	0.93	1665	8
52	16110	1	4.36699	1.05	0.29781	0.96	0.91	1680	19	1706	46	**1738**	**4**	0.97	1738	4
14	82079	4	4.20318	1.44	0.28091	0.66	0.46	1596	12	1675	60	**1775**	**12**	0.90	1775	12
17	5697	3	4.79665	1.86	0.31973	1.56	0.84	1788	32	1784	87	**1780**	**9**	1.00	1780	9

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

U	$^{206}Pb_m$	U/Th	$^{207}Pb^*$	± (%)	$^{206}Pb^*$	± (%)	error	$^{206}Pb^*$	±(Ma)	$^{207}Pb^*$	±(Ma)	$^{206}Pb^*$	±(Ma)	% disc.		
			Isotopic ratios					Apparent ages (Ma)								
(ppm)	^{204}Pb		^{235}U		^{238}U		corr.	^{238}U		^{235}U		$^{207}Pb^*$			Ages	
T01-75-4 Continued																
17	2604	4	2.94172	3.38	0.23662	0.79	0.23	1369	12	1393	96	**1429**	**31**	0.96	1429	31
25	1710	3	2.66345	3.90	0.22646	1.84	0.47	**1316**	**27**	1318	100	1322	33	1.00	1316	27
39	10672	4	2.95844	1.29	0.23680	0.89	0.69	1370	14	1397	38	**1438**	**9**	0.95	1438	9
29	7597	5	4.07264	1.53	0.28158	0.74	0.48	1599	14	1649	62	**1713**	**12**	0.93	1713	12
14	2219	1	2.57780	3.66	0.22406	1.29	0.35	**1303**	**19**	1294	92	1280	33	1.02	1303	19
19	146486	7	2.48237	1.69	0.21782	0.85	0.50	**1270**	**12**	1267	42	1261	14	1.01	1270	12
20	44299	4	3.80440	1.41	0.25990	0.65	0.46	1489	11	1594	53	**1735**	**11**	0.86	1735	11
48	21752	2	2.60426	1.27	0.22685	1.00	0.78	**1318**	**15**	1302	33	1275	8	1.03	1318	15
12	13732	4	4.71238	1.85	0.31437	0.77	0.42	1762	16	1769	85	**1778**	**15**	0.99	1778	15
8	8169	6	2.88493	5.70	0.23085	0.79	0.14	1339	12	1378	155	**1439**	**54**	0.93	1439	54
13	2709	6	3.01832	2.96	0.23566	1.04	0.35	1364	16	1412	87	**1486**	**26**	0.92	1486	26
7	77211	1	2.44939	7.02	0.21633	1.07	0.15	**1262**	**15**	1257	161	1248	68	1.01	1262	15
11	2966	3	4.61654	1.86	0.31017	0.76	0.41	1742	15	1752	84	**1765**	**15**	0.99	1765	15
26	2899	1	2.55499	1.55	0.21733	1.16	0.75	**1268**	**16**	1288	39	1322	10	0.96	1268	16
15	178108	4	2.92698	2.21	0.23439	1.08	0.49	1357	16	1389	64	**1438**	**18**	0.94	1438	18
17	79835	5	3.10130	1.13	0.24694	0.63	0.56	1423	10	1433	35	**1448**	**9**	0.98	1448	9
27	22818	1	2.49217	1.70	0.21396	1.35	0.80	**1250**	**19**	1270	42	1304	10	0.96	1250	19
7	15349	3	2.37597	6.82	0.20257	1.88	0.28	**1189**	**25**	1235	153	1317	64	0.90	1189	25
21	10723	4	4.43181	1.63	0.29782	0.89	0.55	1681	17	1718	71	**1765**	**12**	0.95	1765	12
31	15118	4	2.44918	0.98	0.21364	0.45	0.46	**1248**	**6**	1257	24	1273	8	0.98	1248	6
13	13067	5	2.11362	1.81	0.19813	0.41	0.23	**1165**	**5**	1153	38	1131	18	1.03	1165	5
34	4430	5	2.45444	1.60	0.21883	1.02	0.64	**1276**	**14**	1259	39	1230	12	1.04	1276	14
10	18319	4	2.79260	3.47	0.22609	1.13	0.33	1314	17	1354	94	**1417**	**31**	0.93	1417	31
15	10015	1	4.51427	2.03	0.30258	0.55	0.27	1704	11	1734	89	**1769**	**18**	0.96	1769	18
16	6227	2	2.84666	2.46	0.23074	0.93	0.38	1338	14	1368	69	**1414**	**22**	0.95	1414	22
29	7166	2	2.47987	4.39	0.21538	3.37	0.77	**1257**	**47**	1266	105	1281	27	0.98	1257	47
13	12166	4	4.43974	1.72	0.29854	0.80	0.47	1684	15	1720	75	**1764**	**14**	0.95	1764	14
6	105314	3	2.50216	8.68	0.22212	1.53	0.18	**1293**	**22**	1273	200	1238	84	1.04	1293	22
4	13204	4	3.00461	8.41	0.23585	1.23	0.15	1365	19	1409	229	**1476**	**79**	0.93	1476	79
39	49809	2	3.28890	1.27	0.23142	0.56	0.44	1342	8	1478	41	**1680**	**11**	0.80	1680	11
16	4495	6	2.55364	3.02	0.22121	0.95	0.31	**1288**	**14**	1288	76	1286	28	1.00	1288	14
16	17382	5	2.05632	2.42	0.18910	0.61	0.25	**1117**	**7**	1134	49	1169	23	0.96	1117	7
29	74903	5	4.74587	1.16	0.31427	0.82	0.71	1762	17	1775	54	**1792**	**7**	0.98	1792	7
9	4184	6	2.64336	3.39	0.21192	1.31	0.39	1239	18	1313	87	**1435**	**30**	0.86	1435	30
12	83539	5	2.99211	2.73	0.23915	0.88	0.32	1382	14	1406	80	**1441**	**25**	0.96	1441	25
12	3519	7	3.15796	6.31	0.24985	2.56	0.41	1438	41	1447	185	**1461**	**55**	0.98	1461	55
13	16191	4	3.03263	3.20	0.24512	0.54	0.17	1413	9	1416	94	**1420**	**30**	1.00	1420	30
9	27026	2	4.64043	2.20	0.31406	0.57	0.26	1761	12	1757	99	**1752**	**19**	1.01	1752	19
33	2761	5	4.33530	1.67	0.29318	0.62	0.37	1657	12	1700	71	**1753**	**14**	0.95	1753	14
21	46130	1	2.68616	2.02	0.22866	1.14	0.57	**1328**	**17**	1325	54	1320	16	1.01	1328	17
17	62157	2	4.64878	1.41	0.30986	0.82	0.58	1740	16	1758	65	**1780**	**10**	0.98	1780	10
30	12376	3	4.81113	6.29	0.31975	0.62	0.10	1789	13	1787	269	**1785**	**57**	1.00	1785	57
28	42313	3	4.08581	1.33	0.27714	1.07	0.80	1577	19	1652	54	**1748**	**7**	0.90	1748	7
7	5105	4	5.33850	2.24	0.32971	0.95	0.43	1837	20	1875	115	**1918**	**18**	0.96	1918	18
17	9090	1	3.95961	2.15	0.25705	1.44	0.67	1475	24	1626	83	**1828**	**15**	0.81	1828	15
13	51320	2	2.08070	2.59	0.19373	1.15	0.44	**1142**	**14**	1143	53	1144	23	1.00	1142	14
12	35277	4	2.89175	1.79	0.22978	0.50	0.28	1333	8	1380	51	**1452**	**16**	0.92	1452	16
15	29693	4	2.47941	2.73	0.21917	0.94	0.35	**1278**	**13**	1266	67	1247	25	1.02	1278	13
33	18029	4	2.41451	2.36	0.19768	1.27	0.54	**1163**	**16**	1247	56	1395	19	0.83	1163	16
32	73713	3	4.92751	0.76	0.31822	0.60	0.79	1781	12	1807	37	**1837**	**4**	0.97	1837	4
23	46127	1	2.76393	2.24	0.22240	0.93	0.42	1295	13	1346	61	**1428**	**19**	0.91	1428	19
27	22641	2	4.50838	0.93	0.29261	0.68	0.73	1655	13	1733	42	**1828**	**6**	0.91	1828	6
13	50424	3	4.67459	1.25	0.31208	0.64	0.51	1751	13	1763	58	**1777**	**10**	0.99	1777	10
T01-75-5																
19	33644	7	3.05907	2.20	0.24381	1.10	0.50	1407	17	1423	66	**1447**	**18**	0.97	1447	18
13	59970	3	10.14091	2.07	0.43249	1.13	0.55	2317	32	2448	193	**2558**	**14**	0.91	2558	14
72	18745	8	1.79938	0.90	0.17575	0.65	0.73	**1044**	**7**	1045	16	1048	6	1.00	1044	7
67	44329	8	4.35387	0.63	0.30026	0.49	0.77	1693	9	1704	28	**1717**	**4**	0.99	1717	4
8	6095	7	6.68860	2.03	0.38231	1.19	0.59	2087	29	2071	129	**2055**	**15**	1.02	2055	15
21	12363	8	4.69108	1.25	0.31202	1.02	0.82	1751	21	1766	58	**1783**	**7**	0.98	1783	7
63	3656	6	4.34728	1.83	0.28362	1.76	0.97	1610	32	1702	78	**1819**	**4**	0.89	1819	4
5	1628	5	2.50209	8.80	0.21580	1.84	0.21	**1260**	**26**	1273	202	1295	84	0.97	1260	26
12	5489	8	1.70644	4.59	0.17448	0.60	0.13	**1037**	**7**	1011	77	955	46	1.09	1037	7
9	2855	7	2.04006	2.81	0.19323	1.10	0.39	**1139**	**14**	1129	57	1110	26	1.03	1139	14
36	38182	7	2.48227	2.13	0.21446	1.45	0.68	**1253**	**20**	1267	52	1291	15	0.97	1253	20
11	12390	7	3.70891	2.45	0.25981	0.75	0.31	1489	13	1573	88	**1688**	**22**	0.88	1688	22
12	6228	5	3.06962	2.96	0.24689	0.80	0.27	1422	13	1425	88	**1429**	**27**	1.00	1429	27
62	25198	5	4.47502	0.97	0.30385	0.89	0.91	1710	17	1726	43	**1746**	**4**	0.98	1746	4
11	5565	4	3.28373	2.03	0.25873	0.52	0.26	1483	9	1477	66	**1468**	**19**	1.01	1468	19
25	14393	4	4.05344	1.34	0.27208	0.76	0.57	1551	13	1645	54	**1767**	**10**	0.88	1767	10

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

U	$^{206}Pb_m$	U/Th	$^{207}Pb^*$	± (%)	$^{206}Pb^*$	± (%)	error	$^{206}Pb^*$	±(Ma)	$^{207}Pb^*$	±(Ma)	$^{206}Pb^*$	±(Ma)	% disc.		
			Isotopic ratios					Apparent ages (Ma)								
(ppm)	^{204}Pb		^{235}U		^{238}U		corr.	^{238}U		^{235}U		$^{207}Pb^*$			Ages	
T01-75-5 Continued																
57	1142	12	3.59208	1.15	0.24280	0.92	0.80	1401	14	1548	41	**1754**	**6**	0.80	1754	6
21	14399	4	4.07004	1.16	0.28254	0.76	0.65	1604	14	1648	47	**1705**	**8**	0.94	1705	8
31	5744	7	21.42324	0.67	0.63122	0.63	0.94	3154	25	3158	136	**3160**	**2**	1.00	3160	2
40	16418	7	4.17767	1.20	0.28162	1.06	0.89	1600	19	1670	50	**1759**	**5**	0.91	1759	5
20	30043	4	3.96974	1.97	0.26879	0.69	0.35	1535	12	1628	77	**1751**	**17**	0.88	1751	17
24	58013	8	4.75114	1.49	0.30934	0.89	0.60	1738	18	1776	70	**1822**	**11**	0.95	1822	11
203	7385	9	4.30844	3.12	0.29722	3.11	1.00	1678	59	1695	128	**1717**	**2**	0.98	1717	2
20	6307	3	3.94498	3.51	0.28052	1.68	0.48	1594	30	1623	132	**1661**	**29**	0.96	1661	29
40	194138	8	2.43540	0.86	0.21248	0.73	0.85	**1242**	**10**	1253	21	1272	4	0.98	1242	10
91	115254	4	1.77604	0.75	0.16992	0.49	0.65	**1012**	**5**	1037	13	1090	6	0.93	1012	5
16	8645	6	2.29236	3.19	0.20113	1.33	0.42	**1181**	**17**	1210	72	1261	28	0.94	1181	17
5	1955	5	2.37378	7.04	0.21313	1.00	0.14	**1246**	**14**	1235	157	1216	69	1.02	1246	14
14	12329	10	2.93202	3.06	0.23453	0.75	0.25	1358	11	1390	87	**1440**	**28**	0.94	1440	28
37	39596	5	2.07274	1.64	0.18976	0.62	0.38	**1120**	**8**	1140	34	1178	15	0.95	1120	8
17	21287	12	4.68549	1.30	0.31254	0.80	0.62	1753	16	1765	60	**1778**	**9**	0.99	1778	9
93	9423	10	1.93166	1.70	0.18352	1.42	0.84	**1086**	**17**	1092	33	1104	9	0.98	1086	17
18	3430	16	4.04175	1.76	0.28591	1.26	0.72	1621	23	1643	70	**1670**	**11**	0.97	1670	11
115	4214	10	3.00684	2.10	0.24006	0.79	0.38	1387	12	1409	62	**1443**	**19**	0.96	1443	19
36	5997	23	4.27352	1.29	0.29682	0.90	0.70	1676	17	1688	55	**1704**	**9**	0.98	1704	9
19	93468	9	2.14109	3.77	0.19485	1.07	0.28	**1148**	**13**	1162	79	1189	36	0.96	1148	13
65	31696	7	4.46569	0.61	0.29872	0.46	0.75	1685	9	1725	27	**1773**	**4**	0.95	1773	4
35	15153	5	4.01532	1.18	0.27643	0.57	0.49	1573	10	1637	47	**1720**	**10**	0.91	1720	10
20	5002	6	3.98961	2.01	0.28749	0.83	0.41	1629	15	1632	78	**1636**	**17**	1.00	1636	17
8	7060	18	3.53268	3.45	0.25019	1.69	0.49	1439	27	1535	117	**1668**	**28**	0.86	1668	28
34	33180	6	2.46608	1.41	0.21268	0.66	0.47	**1243**	**9**	1262	35	1295	12	0.96	1243	9
19	8979	6	2.17606	3.26	0.20146	0.75	0.23	**1183**	**10**	1173	70	1155	32	1.02	1183	10
21	12540	5	2.94607	1.22	0.24000	0.58	0.48	1387	9	1394	36	**1405**	**10**	0.99	1405	10
8	4256	11	2.99129	3.78	0.24195	1.17	0.31	1397	18	1405	109	**1418**	**34**	0.98	1418	34
44	5603	3	4.98099	1.21	0.31757	0.95	0.79	1778	19	1816	59	**1860**	**7**	0.96	1860	7
138	56990	4	4.24135	0.67	0.29309	0.62	0.93	1657	12	1682	28	**1714**	**2**	0.97	1714	2
18	12798	7	3.79714	2.78	0.26477	1.97	0.71	1514	34	1592	102	**1697**	**18**	0.89	1697	18
16	36378	5	4.21766	2.06	0.28852	0.55	0.27	1634	10	1678	85	**1732**	**18**	0.94	1732	18
15	11767	3	2.08216	2.95	0.19064	0.94	0.32	**1125**	**12**	1143	61	1177	28	0.96	1125	12
13	7878	4	4.04538	1.54	0.28909	0.78	0.51	1637	15	1643	61	**1652**	**12**	0.99	1652	12
25	10203	15	1.74591	1.99	0.17202	0.42	0.21	**1023**	**5**	1026	35	1031	20	0.99	1023	5
19	16325	2	3.48833	2.34	0.24744	0.96	0.41	1425	15	1525	80	**1665**	**20**	0.86	1665	20
23	18531	15	5.77082	1.87	0.34723	0.91	0.49	1921	20	1942	104	**1964**	**15**	0.98	1964	15
26	3843	11	3.93168	1.62	0.26693	1.07	0.66	1525	18	1620	63	**1746**	**11**	0.87	1746	11
36	16176	6	4.05463	1.64	0.26581	1.06	0.65	1520	18	1645	66	**1810**	**11**	0.84	1810	11
20	14647	6	4.14431	1.67	0.28431	1.11	0.66	1613	20	1663	68	**1727**	**11**	0.93	1727	11
29	59955	4	4.48151	1.12	0.30420	0.87	0.78	1712	17	1728	50	**1746**	**6**	0.98	1746	6
25	11687	8	2.53933	2.20	0.21229	0.74	0.34	**1241**	**10**	1283	55	1355	20	0.92	1241	10
40	138210	5	2.05120	1.32	0.18695	1.04	0.79	**1105**	**13**	1133	27	1186	8	0.93	1105	13
27	58330	21	2.16847	3.58	0.19826	3.31	0.93	**1166**	**42**	1171	76	1180	13	0.99	1166	42
30	22366	2	2.51308	1.12	0.21642	0.81	0.72	**1263**	**11**	1276	28	1298	8	0.97	1263	11
29	2603	18	1.86864	5.21	0.18649	1.39	0.27	**1102**	**17**	1070	94	1005	51	1.10	1102	17
25	64174	3	3.11489	1.60	0.24831	0.85	0.53	1430	14	1436	49	**1446**	**13**	0.99	1446	13
38	30947	6	2.21214	1.48	0.20000	0.47	0.32	**1175**	**6**	1185	33	1202	14	0.98	1175	6
55	38520	6	2.81015	0.95	0.22412	0.86	0.91	1304	12	1358	27	**1445**	**4**	0.90	1445	4
20	15177	5	4.39896	1.11	0.29392	0.57	0.51	1661	11	1712	49	**1775**	**9**	0.94	1775	9
32	47706	10	2.10482	2.20	0.19487	0.66	0.30	**1148**	**8**	1150	46	1155	21	0.99	1148	8
6	743	7	9.03856	3.50	0.38906	1.85	0.53	2119	46	2342	279	**2543**	**25**	0.83	2543	25
14	8479	8	3.09825	2.52	0.24918	1.89	0.75	1434	30	1432	76	**1429**	**16**	1.00	1429	16
15	16422	5	4.40841	2.39	0.30146	0.66	0.28	1699	13	1714	102	**1733**	**21**	0.98	1733	21
68	54825	3	1.76765	0.85	0.17062	0.44	0.52	**1016**	**5**	1034	15	1072	7	0.95	1016	5
15	1961	3	3.20039	3.05	0.25633	2.14	0.70	1471	35	1457	95	**1437**	**21**	1.02	1437	21
26	22698	7	3.19380	1.58	0.25404	0.64	0.41	1459	11	1456	50	**1450**	**14**	1.01	1450	14
17	7618	8	2.10058	2.53	0.19308	0.73	0.29	**1138**	**9**	1149	53	1170	24	0.97	1138	9
17	9822	9	1.82680	3.56	0.17754	0.89	0.25	**1054**	**10**	1055	64	1059	35	1.00	1054	10
31	35323	5	4.27380	1.24	0.29249	0.85	0.68	1654	16	1688	53	**1731**	**8**	0.96	1731	8
T02-75-2Z:																
9	11144	2	2.06436	4.80	0.19185	1.12	0.23	**1131**	**14**	1137	96	1148	46	0.99	1131	14
8	3541	3	2.17401	5.06	0.19781	0.63	0.12	**1164**	**8**	1173	106	1190	50	0.98	1164	8
22	2151	0	2.15344	1.97	0.20006	1.06	0.54	**1176**	**14**	1166	42	1149	16	1.02	1176	14
5	3842	1	5.14069	3.54	0.32081	1.19	0.34	1794	25	1843	170	**1899**	**30**	0.94	1899	30
28	3475	0	4.53993	2.02	0.29731	1.71	0.84	1678	33	1738	89	**1812**	**10**	0.93	1812	10
12	22223	3	3.58917	2.59	0.25820	0.46	0.18	1481	8	1547	90	**1639**	**24**	0.90	1639	24
9	32178	3	3.11840	2.80	0.24839	1.17	0.42	1430	19	1437	85	**1448**	**24**	0.99	1448	24
13	8580	2	2.22264	2.62	0.20178	1.23	0.47	**1185**	**16**	1188	58	1194	23	0.99	1185	16
14	1829	0	4.45715	3.07	0.29753	0.97	0.32	1679	19	1723	130	**1777**	**27**	0.94	1777	27

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

U (ppm)	$^{206}Pb_m$ / ^{204}Pb	U/Th	Isotopic ratios $^{207}Pb^*$ / ^{235}U	± (%)	$^{206}Pb^*$ / ^{238}U	± (%)	error corr.	Apparent ages (Ma) $^{206}Pb^*$ / ^{238}U	±(Ma)	$^{207}Pb^*$ / ^{235}U	±(Ma)	$^{206}Pb^*$ / $^{207}Pb^*$	±(Ma)	% disc.	Ages	
T02-75-2Z Continued																
51	63434	2	2.98394	2.08	0.23776	1.97	0.95	1375	30	1404	61	**1447**	**6**	0.95	1447	6
17	23690	3	3.03128	2.04	0.23866	0.88	0.43	1380	14	1416	61	**1470**	**17**	0.94	1470	17
18	59911	5	2.89901	1.77	0.23476	0.65	0.37	1359	10	1382	51	**1416**	**16**	0.96	1416	16
46	19211	1	3.66687	1.01	0.25580	0.87	0.87	1468	14	1564	37	**1696**	**5**	0.87	1696	5
9	10657	9	2.58199	5.93	0.20475	1.26	0.21	1201	17	1296	145	**1456**	**55**	0.82	1456	55
26	133064	3	3.03233	1.21	0.24259	0.57	0.47	1400	9	1416	37	**1439**	**10**	0.97	1439	10
41	68392	1	5.35586	1.50	0.32833	1.45	0.97	1830	31	1878	78	**1931**	**3**	0.95	1931	3
24	29687	3	2.57603	1.60	0.21527	0.97	0.61	1257	13	1294	41	**1356**	**12**	0.93	1356	12
27	47494	1	2.38134	1.55	0.21238	0.84	0.54	**1242**	**12**	1237	37	1229	13	1.01	1242	12
18	26937	1	5.16972	1.11	0.32002	0.66	0.59	1790	14	1848	57	**1913**	**8**	0.94	1913	8
8	7823	3	4.64412	5.48	0.30369	1.25	0.23	1710	24	1757	230	**1814**	**48**	0.94	1814	48
35	71881	1	5.27559	0.95	0.32383	0.73	0.77	1808	15	1865	50	**1929**	**5**	0.94	1929	5
12	2021	4	5.30113	1.46	0.31988	0.95	0.65	1789	20	1869	76	**1959**	**10**	0.91	1959	10
17	19503	4	4.12759	1.18	0.28290	0.69	0.59	1606	13	1660	48	**1729**	**9**	0.93	1729	9
30	51476	2	5.35771	1.62	0.33271	1.53	0.94	1852	33	1878	85	**1908**	**5**	0.97	1908	5
10	9463	3	4.03579	2.37	0.27206	0.61	0.26	1551	11	1641	93	**1759**	**21**	0.88	1759	21
13	143495	2	5.47720	1.27	0.33737	0.44	0.35	1874	10	1897	68	**1922**	**11**	0.97	1922	11
12	43479	2	4.93257	2.47	0.31329	1.81	0.73	1757	37	1808	117	**1867**	**15**	0.94	1867	15
14	48782	5	3.88302	2.18	0.26753	0.42	0.19	1528	7	1610	83	**1719**	**20**	0.89	1719	20
27	27503	1	3.62059	1.87	0.25511	1.49	0.80	1465	25	1554	66	**1678**	**10**	0.87	1678	10
26	4318	3	2.74348	1.45	0.22273	0.65	0.45	1296	9	1340	40	**1411**	**12**	0.92	1411	12
14	79247	1	3.02114	2.45	0.24360	0.74	0.30	1405	12	1413	73	**1424**	**22**	0.99	1424	22
16	52643	2	5.22499	1.69	0.32776	0.90	0.53	1828	19	1857	86	**1890**	**13**	0.97	1890	13
16	52632	4	2.47684	2.11	0.21774	0.64	0.30	**1270**	**9**	1265	52	1257	20	1.01	1270	9
17	10133	4	2.44386	2.91	0.21120	1.38	0.47	**1235**	**19**	1256	70	1291	25	0.96	1235	19
15	15049	0	2.45226	2.73	0.21307	1.46	0.54	**1245**	**20**	1258	66	1280	22	0.97	1245	20
11	7399	4	2.38785	3.19	0.20790	0.66	0.21	**1218**	**9**	1239	75	1276	30	0.95	1218	9
14	11430	2	3.72172	2.19	0.26196	1.65	0.75	1500	28	1576	80	**1680**	**13**	0.89	1680	13
17	88418	4	3.08431	1.81	0.24649	0.94	0.52	1420	15	1429	55	**1441**	**15**	0.99	1441	15
31	19111	2	4.37869	1.63	0.28270	1.51	0.92	1605	27	1708	70	**1838**	**6**	0.87	1838	6
17	44709	3	2.39757	2.62	0.21147	0.57	0.22	**1237**	**8**	1242	62	1251	25	0.99	1237	8
4	3100	8	2.32798	17.39	0.20852	4.38	0.25	**1221**	**59**	1221	345	1221	165	1.00	1221	59
17	23146	2	3.09048	1.26	0.24510	0.49	0.39	1413	8	1430	39	**1456**	**11**	0.97	1456	11
13	3885	3	5.15197	3.69	0.32117	1.24	0.34	1795	26	1845	177	**1901**	**31**	0.94	1901	31
31	13672	0	10.21502	1.10	0.43303	1.04	0.95	2319	29	2454	108	**2568**	**3**	0.90	2568	3
18	4518	1	2.86863	2.86	0.23063	1.60	0.56	1338	24	1374	80	**1430**	**23**	0.94	1430	23
40	45402	1	2.40529	1.43	0.21037	1.16	0.81	**1231**	**16**	1244	34	1267	8	0.97	1231	16
5	3540	2	2.35183	8.03	0.21115	1.33	0.17	**1235**	**18**	1228	176	1216	78	1.02	1235	18
11	12482	4	5.03774	2.04	0.32458	0.88	0.43	1812	18	1826	99	**1841**	**17**	0.98	1841	17
16	7658	0	3.69171	2.99	0.24783	1.48	0.49	1427	24	1570	106	**1767**	**24**	0.81	1767	24
22	15249	1	3.11102	2.54	0.24820	2.20	0.86	1429	35	1435	77	**1445**	**12**	0.99	1445	12
37	26644	7	2.88613	1.20	0.23265	0.89	0.74	1348	13	1378	35	**1425**	**8**	0.95	1425	8
30	5264	0	3.36198	1.83	0.23635	1.73	0.95	1368	26	1496	61	**1682**	**5**	0.81	1682	5
10	24403	4	2.47950	3.50	0.21546	0.90	0.26	**1258**	**13**	1266	84	1280	33	0.98	1258	13
10	40004	5	2.86976	5.12	0.22958	2.66	0.52	1332	39	1374	139	**1439**	**42**	0.93	1439	42
5	29994	3	3.45021	12.68	0.24797	1.49	0.12	1428	24	1516	369	**1641**	**117**	0.87	1641	117
12	59660	2	5.22763	1.85	0.32391	0.31	0.17	1809	6	1857	94	**1912**	**16**	0.95	1912	16
10	18509	3	4.86801	1.95	0.31504	0.63	0.32	1766	13	1797	92	**1833**	**17**	0.96	1833	17
24	13444	2	3.53832	1.46	0.25578	0.78	0.53	1468	13	1536	51	**1630**	**12**	0.90	1630	12
21	132186	2	4.02627	1.22	0.27912	0.45	0.37	1587	8	1640	49	**1708**	**10**	0.93	1708	10
17	58297	3	2.44734	2.39	0.21583	0.38	0.16	**1260**	**5**	1257	58	1251	23	1.01	1260	5
11	13351	1	3.62168	3.45	0.25421	2.02	0.58	1460	33	1554	120	**1685**	**26**	0.87	1685	26
13	7025	3	2.13850	4.61	0.19952	0.71	0.15	**1173**	**9**	1161	96	1140	45	1.03	1173	9
12	18515	4	2.42299	3.06	0.21196	0.64	0.21	**1239**	**9**	1249	73	1267	29	0.98	1239	9
4	3206	5	3.82657	8.54	0.27284	1.49	0.18	1555	26	1598	287	**1656**	**78**	0.94	1656	78
12	29490	1	2.83333	2.69	0.22742	0.86	0.32	1321	13	1364	75	**1433**	**24**	0.92	1433	24
19	6398	2	2.79756	1.88	0.22535	0.89	0.47	1310	13	1355	52	**1426**	**16**	0.92	1426	16
17	4276	2	4.08510	1.28	0.29127	0.99	0.78	1648	19	1651	52	**1656**	**7**	1.00	1656	7
6	7948	7	2.76053	7.19	0.22358	1.45	0.20	1301	21	1345	184	**1416**	**67**	0.92	1416	67
16	26597	4	4.20301	2.23	0.28496	0.78	0.35	1616	14	1675	91	**1748**	**19**	0.92	1748	19
20	80594	1	2.41589	1.79	0.21041	1.04	0.58	**1231**	**14**	1247	43	1276	14	0.97	1231	14
15	122023	1	2.12840	4.89	0.19300	2.43	0.50	**1138**	**30**	1158	101	1197	42	0.95	1138	30
5	4891	2	4.07506	6.69	0.27316	0.77	0.12	1557	14	1649	245	**1769**	**61**	0.88	1769	61
16	8295	3	2.41171	2.26	0.20960	1.11	0.49	**1227**	**15**	1246	54	1280	19	0.96	1227	15
30	18394	0	2.47850	1.93	0.22034	1.68	0.87	**1284**	**24**	1266	48	1236	9	1.04	1284	24
33	45494	1	5.29375	0.99	0.32675	0.80	0.81	1823	17	1868	52	**1919**	**5**	0.95	1919	5
16	17059	3	3.60419	1.93	0.25226	0.92	0.48	1450	15	1551	68	**1690**	**16**	0.86	1690	16
22	8228	0	2.46600	3.25	0.21105	1.55	0.48	**1234**	**21**	1262	78	1310	28	0.94	1234	21
7	6536	1	2.34633	7.99	0.21711	1.09	0.14	**1267**	**15**	1226	175	1157	79	1.10	1267	15
14	78832	2	5.42460	1.16	0.33631	0.54	0.47	1869	12	1889	62	**1911**	**9**	0.98	1911	9

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

U (ppm)	$^{206}Pb_m$ / ^{204}Pb	U/Th	Isotopic ratios: $^{207}Pb^*$ / ^{235}U	± (%)	$^{206}Pb^*$ / ^{238}U	± (%)	error corr.	Apparent ages (Ma): $^{206}Pb^*$ / ^{238}U	±(Ma)	$^{207}Pb^*$ / ^{235}U	±(Ma)	$^{206}Pb^*$ / $^{207}Pb^*$	±(Ma)	% disc.	Ages	
T02-75-2Z Continued																
18	81752	3	12.69043	1.33	0.49990	1.24	0.94	2613	40	2657	158	**2690**	**4**	0.97	2690	4
19	26990	1	2.05954	4.80	0.17656	2.61	0.54	**1048**	**30**	1136	96	1306	39	0.80	1048	30
15	38465	4	3.06898	2.37	0.24357	1.67	0.70	1405	26	1425	71	**1455**	**16**	0.97	1455	16
14	18676	6	3.55065	1.76	0.25275	0.60	0.34	1453	10	1539	62	**1659**	**15**	0.88	1659	15
7	7966	2	5.06966	2.65	0.32620	0.89	0.34	1820	19	1831	128	**1844**	**23**	0.99	1844	23
24	23434	1	2.48829	2.66	0.21797	2.00	0.75	**1271**	**28**	1269	65	1264	17	1.01	1271	28
31	13617	2	2.55334	3.93	0.20526	3.83	0.97	1204	51	1287	97	**1430**	**9**	0.84	1430	9
28	35447	4	2.32147	1.85	0.20787	0.61	0.33	**1218**	**8**	1219	43	1221	17	1.00	1218	8
13	73290	5	2.76122	2.43	0.22310	0.94	0.39	1298	14	1345	66	**1421**	**21**	0.91	1421	21
28	41753	2	3.60460	1.61	0.25129	1.20	0.74	1445	19	1551	57	**1697**	**10**	0.85	1697	10
14	69789	4	2.33049	3.32	0.19900	1.33	0.40	**1170**	**17**	1222	76	1314	29	0.89	1170	17
34	29914	1	1.93442	3.17	0.17619	2.24	0.71	**1046**	**25**	1093	60	1188	22	0.88	1046	25
16	26604	5	2.91259	1.98	0.23237	0.81	0.41	1347	12	1385	57	**1445**	**17**	0.93	1445	17
46	72779	3	2.96217	1.53	0.23757	1.13	0.74	1374	17	1398	45	**1435**	**10**	0.96	1435	10
7	8966	3	2.85082	4.70	0.23027	0.77	0.16	1336	11	1369	128	**1421**	**44**	0.94	1421	44
7	2784	3	2.76624	6.54	0.22188	3.25	0.50	1292	46	1347	169	**1434**	**54**	0.90	1434	54
T02-75-1Z																
6	48416	4	3.13013	3.68	0.25052	1.07	0.29	1441	17	1440	111	**1439**	**34**	1.00	1439	34
14	21319	2	12.72133	1.16	0.48241	0.89	0.77	2538	28	2659	140	**2753**	**6**	0.92	2753	6
9	3714	1	2.42548	3.38	0.21657	2.03	0.60	**1264**	**28**	1250	80	1227	26	1.03	1264	28
14	2939	4	2.39904	2.50	0.21432	0.38	0.15	**1252**	**5**	1242	59	1226	24	1.02	1252	5
13	2513	1	2.46248	3.30	0.21840	1.01	0.30	**1273**	**14**	1261	79	1240	31	1.03	1273	14
22	6639	8	2.81303	3.37	0.22561	3.00	0.89	1312	44	1359	92	**1435**	**15**	0.91	1435	15
25	71701	1	2.55085	2.12	0.21952	1.31	0.62	**1279**	**19**	1287	54	1299	16	0.98	1279	19
17	14966	6	3.60366	2.65	0.25242	1.03	0.39	1451	17	1550	93	**1689**	**23**	0.86	1689	23
13	42678	5	2.46878	3.15	0.21474	0.56	0.18	**1254**	**8**	1263	76	1278	30	0.98	1254	8
11	11340	3	3.12944	1.70	0.24972	0.74	0.44	1437	12	1440	53	**1444**	**15**	1.00	1444	15
29	10274	5	2.17376	2.13	0.19755	0.85	0.40	**1162**	**11**	1173	46	1192	19	0.97	1162	11
17	45762	3	4.63307	0.98	0.31247	0.63	0.64	1753	13	1755	45	**1758**	**7**	1.00	1758	7
26	12518	6	2.47174	1.75	0.21397	0.62	0.36	**1250**	**9**	1264	43	1287	16	0.97	1250	9
23	22120	3	5.14915	1.63	0.32549	1.44	0.88	1817	30	1844	82	**1876**	**7**	0.97	1876	7
27	19012	2	2.48840	1.48	0.21518	0.68	0.46	**1256**	**9**	1269	37	1290	13	0.97	1256	9
31	34577	4	2.25162	1.35	0.20173	0.95	0.71	**1185**	**12**	1197	30	1220	9	0.97	1185	12
18	9336	5	2.17236	2.69	0.20018	0.63	0.23	**1176**	**8**	1172	58	1165	26	1.01	1176	8
9	7513	3	2.44333	2.86	0.21343	1.04	0.36	**1247**	**14**	1256	69	1270	26	0.98	1247	14
47	2365	1	2.43969	2.46	0.21366	2.25	0.92	**1248**	**31**	1254	59	1265	10	0.99	1248	31
11	7115	2	2.15233	4.16	0.19789	1.21	0.29	**1164**	**15**	1166	87	1169	39	1.00	1164	15
15	12147	3	5.32673	3.09	0.32629	2.96	0.96	1820	62	1873	155	**1932**	**8**	0.94	1932	8
21	31633	4	4.67254	1.09	0.29476	0.53	0.48	1665	10	1762	51	**1879**	**9**	0.89	1879	9
13	8862	5	2.34932	3.26	0.20935	1.03	0.32	**1225**	**14**	1227	75	1231	30	1.00	1225	14
14	4877	4	2.42685	3.16	0.21555	1.00	0.32	**1258**	**14**	1251	75	1237	29	1.02	1258	14
19	17816	5	2.45340	2.36	0.21384	0.54	0.23	**1249**	**7**	1258	57	1274	22	0.98	1249	7
30	31745	8	2.54277	1.14	0.21884	0.40	0.35	**1276**	**6**	1284	29	1299	10	0.98	1276	6
17	8777	8	2.87957	2.12	0.23093	0.97	0.46	1339	14	1377	60	**1435**	**18**	0.93	1435	18
22	25517	3	3.81375	1.91	0.25877	1.09	0.57	1484	18	1596	71	**1747**	**14**	0.85	1747	14
27	26290	3	2.51908	1.90	0.21782	0.42	0.22	**1270**	**6**	1278	47	1290	18	0.98	1270	6
16	25823	5	3.90994	2.38	0.26270	1.37	0.58	1504	23	1616	90	**1765**	**18**	0.85	1765	18
18	17787	3	2.46052	2.12	0.21257	0.70	0.33	**1243**	**10**	1261	52	1291	19	0.96	1243	10
21	94305	8	3.62467	1.44	0.25044	0.61	0.43	1441	10	1555	52	**1714**	**12**	0.84	1714	12
16	16480	2	5.14987	1.68	0.32044	0.94	0.56	1792	19	1844	85	**1904**	**13**	0.94	1904	13
18	1283	3	3.82191	1.72	0.27107	0.91	0.53	1546	16	1597	65	**1665**	**13**	0.93	1665	13
21	48310	3	5.74377	0.79	0.34550	0.62	0.79	1913	14	1938	45	**1965**	**4**	0.97	1965	4
17	8427	5	2.44813	2.44	0.21333	0.46	0.19	**1247**	**6**	1257	59	1275	23	0.98	1247	6
21	5238	1	4.67269	2.00	0.28008	1.88	0.94	1592	34	1762	91	**1971**	**6**	0.81	1971	6
23	42741	1	3.34718	1.61	0.23638	0.77	0.48	1368	12	1492	53	**1673**	**13**	0.82	1673	13
6	10368	2	4.77294	5.60	0.30010	1.41	0.25	1692	27	1780	240	**1885**	**49**	0.90	1885	49
14	10900	3	4.98709	2.70	0.30677	2.07	0.77	1725	41	1817	128	**1925**	**16**	0.90	1925	16
25	136818	3	3.54253	1.70	0.25438	1.44	0.85	1461	24	1537	59	**1643**	**8**	0.89	1643	8
21	25843	5	2.70689	2.05	0.21622	0.64	0.31	1262	9	1330	55	**1442**	**19**	0.87	1442	19
57	8826	3	10.45533	1.43	0.42147	1.41	0.99	2267	38	2476	142	**2652**	**2**	0.85	2652	2
7	6095	9	4.30684	3.83	0.29590	2.54	0.66	1671	48	1695	155	**1724**	**26**	0.97	1724	26
18	28747	3	5.37094	1.25	0.32790	0.98	0.79	1828	21	1880	66	**1938**	**7**	0.94	1938	7
18	23818	4	2.62812	1.64	0.21356	0.77	0.47	1248	11	1309	43	**1410**	**14**	0.89	1410	14
36	14564	2	3.98448	1.82	0.27599	1.40	0.77	1571	25	1631	71	**1709**	**11**	0.92	1709	11
25	12525	3	2.46087	2.27	0.21284	0.83	0.37	**1244**	**11**	1261	55	1289	21	0.96	1244	11
27	64991	2	5.58141	1.01	0.33860	0.70	0.69	1880	15	1913	56	**1950**	**7**	0.96	1950	7
10	1284	4	2.50728	4.69	0.21550	0.82	0.18	**1258**	**11**	1274	113	1301	45	0.97	1258	11
14	19962	4	3.62427	2.77	0.25018	0.83	0.30	1439	13	1555	97	**1715**	**24**	0.84	1715	24
6	1586	2	4.00134	7.84	0.26917	1.32	0.17	1537	23	1635	277	**1763**	**71**	0.87	1763	71
10	9100	3	2.89299	3.53	0.23374	1.34	0.38	1354	20	1380	99	**1421**	**31**	0.95	1421	31

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

U (ppm)	$^{206}Pb_m$ / ^{204}Pb	U/Th	Isotopic ratios: $^{207}Pb^*$ / ^{235}U	± (%)	$^{206}Pb^*$ / ^{238}U	± (%)	error corr.	Apparent ages (Ma): $^{206}Pb^*$ / ^{238}U	±(Ma)	$^{207}Pb^*$ / ^{235}U	±(Ma)	$^{206}Pb^*$ / $^{207}Pb^*$	±(Ma)	% disc.	Ages	
T02-75-1Z Continued																
14	45231	5	4.58699	1.78	0.29562	1.01	0.57	1670	19	1747	80	**1841**	**13**	0.91	1841	13
5	17187	14	2.38041	7.35	0.21280	1.20	0.16	**1244**	**17**	1237	164	1225	71	1.02	1244	17
4	2766	1	2.95844	6.43	0.24064	1.03	0.16	1390	16	1397	177	**1408**	**61**	0.99	1408	61
30	14835	2	4.17486	1.18	0.28675	0.86	0.73	1625	16	1669	49	**1725**	**7**	0.94	1725	7
12	1952	1	2.24415	3.06	0.20223	1.88	0.62	**1187**	**25**	1195	67	1209	24	0.98	1187	25
23	97662	4	3.43144	1.55	0.24626	0.85	0.55	1419	14	1512	53	**1644**	**12**	0.86	1644	12
9	12004	3	4.98996	1.77	0.31153	0.60	0.34	1748	12	1818	86	**1898**	**15**	0.92	1898	15
9	4757	7	2.50656	4.34	0.21974	0.57	0.13	**1281**	**8**	1274	105	1263	42	1.01	1281	8
10	18700	3	5.37809	2.40	0.33027	0.98	0.41	1840	21	1881	123	**1928**	**20**	0.95	1928	20
10	30629	5	3.09516	3.00	0.24490	0.84	0.28	1412	13	1432	90	**1460**	**27**	0.97	1460	27
24	6631	1	3.85184	1.30	0.27037	0.93	0.72	1543	16	1604	50	**1685**	**8**	0.92	1685	8
15	16998	2	3.12722	2.45	0.22362	0.89	0.36	1301	13	1439	75	**1650**	**21**	0.80	1650	21
14	5529	2	4.85552	1.71	0.28873	1.14	0.67	1635	21	1795	81	**1985**	**11**	0.82	1985	11
11	20086	3	3.13111	3.37	0.25006	2.32	0.69	1439	37	1440	102	**1443**	**23**	1.00	1443	23
7	13988	4	2.74095	4.08	0.22019	1.83	0.45	1283	26	1340	108	**1431**	**35**	0.90	1431	35
22	84386	3	3.03274	1.50	0.24060	0.44	0.29	1390	7	1416	45	**1455**	**14**	0.95	1455	14
9	9222	4	2.47579	3.47	0.22060	0.79	0.23	**1285**	**11**	1265	84	1231	33	1.04	1285	11
8	48104	6	2.41806	4.97	0.21328	0.78	0.16	**1246**	**11**	1248	115	1251	48	1.00	1246	11
31	23140	2	4.28602	1.37	0.28840	1.04	0.76	1634	19	1691	58	**1762**	**8**	0.93	1762	8
34	3685	2	3.16252	3.60	0.22748	3.48	0.97	1321	51	1448	109	**1639**	**8**	0.81	1639	8
8	4626	0	2.10556	5.67	0.19556	1.19	0.21	**1151**	**15**	1151	115	1149	55	1.00	1151	15
10	15091	7	2.82889	3.35	0.23015	0.81	0.24	1335	12	1363	92	**1407**	**31**	0.95	1407	31
27	45288	3	5.23097	1.15	0.32141	0.47	0.41	1797	10	1858	59	**1927**	**9**	0.93	1927	9
5	5458	2	4.69548	5.21	0.29295	2.31	0.44	1656	44	1766	222	**1899**	**42**	0.87	1899	42
18	23145	4	5.23600	1.25	0.32565	0.62	0.50	1817	13	1859	65	**1905**	**10**	0.95	1905	10
6	10545	7	3.39775	5.75	0.23711	1.88	0.33	1372	29	1504	181	**1695**	**50**	0.81	1695	50
11	11424	5	4.58396	2.06	0.30750	0.92	0.45	1728	18	1746	92	**1768**	**17**	0.98	1768	17
29	58477	3	5.00727	0.73	0.31394	0.53	0.72	1760	11	1821	37	**1891**	**5**	0.93	1891	5
34	4012	1	10.25257	1.58	0.42198	1.47	0.93	2269	40	2458	152	**2618**	**5**	0.87	2618	5
22	30163	6	5.78626	1.06	0.32617	0.63	0.59	1820	13	1944	61	**2080**	**8**	0.88	2080	8
35	51168	3	2.67208	1.76	0.21812	0.77	0.44	1272	11	1321	47	**1401**	**15**	0.91	1401	15
16	26108	3	2.43222	2.89	0.21704	0.61	0.21	**1266**	**9**	1252	69	1228	28	1.03	1266	9
10	22267	2	5.25652	1.69	0.32206	0.66	0.39	1800	14	1862	87	**1932**	**14**	0.93	1932	14
6	7107	2	4.84523	3.00	0.29500	1.02	0.34	1666	19	1793	138	**1943**	**25**	0.86	1943	25
20	28324	7	3.29158	1.65	0.23557	0.75	0.45	1364	11	1479	54	**1649**	**14**	0.83	1649	14
28	54796	3	4.31412	1.17	0.29842	0.84	0.72	1683	16	1696	50	**1712**	**7**	0.98	1712	7
13	13526	6	2.94035	2.88	0.23574	0.99	0.34	1365	15	1392	83	**1435**	**26**	0.95	1435	26
10	6376	6	5.54592	2.24	0.31951	0.70	0.31	1787	14	1908	119	**2041**	**19**	0.88	2041	19
21	59333	1	12.18615	1.05	0.47202	0.86	0.82	2492	26	2619	122	**2718**	**5**	0.92	2718	5
15	1227	3	4.76654	1.49	0.31740	0.86	0.58	1777	18	1779	70	**1781**	**11**	1.00	1781	11
T02-73-1Z																
37	1659	6	2.15091	2.25	0.19887	1.59	0.71	**1169**	**20**	1165	48	1158	16	1.01	1169	20
7	4742	4	1.91095	7.16	0.17352	1.11	0.16	**1032**	**12**	1085	130	1194	70	0.86	1032	12
18	6422	2	2.06396	2.83	0.18865	0.96	0.34	**1114**	**12**	1137	58	1181	26	0.94	1114	12
5	29320	2	4.46908	3.17	0.30120	1.23	0.39	1697	24	1725	135	**1759**	**27**	0.96	1759	27
3	6846	6	2.06934	17.74	0.18964	1.60	0.09	**1119**	**20**	1139	318	1176	175	0.95	1119	20
22	23951	4	2.42229	1.58	0.21242	0.39	0.25	**1242**	**5**	1249	38	1262	15	0.98	1242	5
14	12076	3	2.22287	3.37	0.20340	0.99	0.29	**1194**	**13**	1188	73	1179	32	1.01	1194	13
14	82443	2	2.55216	2.93	0.20724	0.53	0.18	1214	7	1287	73	**1411**	**28**	0.86	1411	28
33	20621	2	2.21888	1.43	0.19945	1.10	0.77	**1172**	**14**	1187	32	1214	9	0.97	1172	14
4	21684	1	2.43884	8.74	0.21468	1.35	0.16	**1254**	**19**	1254	196	1255	84	1.00	1254	19
39	1057	2	2.18273	2.65	0.20369	1.40	0.53	**1195**	**18**	1176	57	1140	22	1.05	1195	18
10	1336	12	4.17914	4.43	0.27934	2.47	0.56	1588	44	1670	173	**1775**	**34**	0.89	1775	34
10	26402	5	2.50535	4.98	0.21682	0.61	0.12	**1265**	**9**	1274	119	1288	48	0.98	1265	9
23	13796	4	2.39285	1.25	0.21160	0.71	0.57	**1237**	**10**	1241	30	1246	10	0.99	1237	10
36	1733	2	4.72738	0.91	0.31753	0.54	0.60	1778	11	1772	43	**1766**	**7**	1.01	1766	7
12	3114	6	3.47087	1.90	0.23990	0.66	0.35	1386	10	1521	65	**1713**	**16**	0.81	1713	16
14	14481	4	4.17027	3.28	0.28500	0.88	0.27	1617	16	1668	130	**1734**	**29**	0.93	1734	29
7	13200	4	3.08599	3.70	0.24700	0.83	0.22	1423	13	1429	110	**1439**	**34**	0.99	1439	34
29	43383	4	2.57669	1.64	0.20338	0.80	0.49	1193	11	1294	42	**1465**	**14**	0.81	1465	14
19	23090	5	3.06242	1.55	0.24385	0.58	0.37	1407	9	1423	47	**1448**	**14**	0.97	1448	14
10	23134	4	3.05006	2.56	0.24149	0.54	0.21	1394	8	1420	76	**1459**	**24**	0.96	1459	24
11	27603	4	2.98637	2.80	0.24288	0.74	0.27	1402	12	1404	81	**1408**	**26**	1.00	1408	26
30	63706	4	2.52375	1.54	0.21600	0.64	0.42	**1261**	**9**	1279	39	1310	14	0.96	1261	9
17	35933	5	4.48874	0.95	0.29670	0.67	0.70	1675	13	1729	43	**1795**	**6**	0.93	1795	6
57	1338	1	2.43188	1.60	0.21279	1.02	0.64	**1244**	**14**	1252	39	1267	12	0.98	1244	14
31	16658	2	2.04662	1.70	0.18085	0.96	0.56	**1072**	**11**	1131	35	1247	14	0.86	1072	11
19	49014	5	3.06032	2.00	0.24498	0.66	0.33	1413	10	1423	60	**1438**	**18**	0.98	1438	18
21	27719	6	2.70739	1.12	0.22898	0.56	0.50	**1329**	**8**	1331	30	1333	9	1.00	1329	8
19	176086	5	2.47887	1.74	0.21379	0.60	0.35	**1249**	**8**	1266	43	1295	16	0.96	1249	8

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

U (ppm)	$^{206}Pb_m$ / ^{204}Pb	U/Th	Isotopic ratios $^{207}Pb^*$ / ^{235}U	± (%)	$^{206}Pb^*$ / ^{238}U	± (%)	error corr.	Apparent ages (Ma) $^{206}Pb^*$ / ^{238}U	±(Ma)	$^{207}Pb^*$ / ^{235}U	±(Ma)	$^{206}Pb^*$ / $^{207}Pb^*$	±(Ma)	% disc.	Ages	
T02-73-1Z Continued																
34	41024	4	2.96028	0.97	0.23551	0.48	0.50	1363	7	1398	29	**1450**	**8**	0.94	1450	8
13	1704	3	2.15987	4.86	0.19725	1.34	0.28	**1161**	**17**	1168	101	1183	46	0.98	1161	17
16	10948	1	3.71428	2.04	0.25741	0.79	0.39	1477	13	1574	74	**1708**	**17**	0.86	1708	17
36	8133	1	3.51778	1.35	0.24205	0.81	0.60	1397	13	1531	47	**1721**	**10**	0.81	1721	10
41	4567	6	4.20979	1.99	0.28360	1.28	0.64	1610	23	1676	82	**1760**	**14**	0.91	1760	14
44	4340	3	3.50762	2.22	0.24041	1.85	0.83	1389	29	1529	76	**1729**	**11**	0.80	1729	11
26	7320	3	2.66296	1.39	0.22811	0.50	0.36	**1325**	**7**	1318	37	1308	13	1.01	1325	7
21	55665	5	2.15134	2.23	0.19182	1.44	0.65	**1131**	**18**	1166	48	1230	17	0.92	1131	18
12	15584	4	2.92486	2.83	0.23102	1.03	0.36	1340	15	1388	81	**1464**	**25**	0.92	1464	25
10	44275	4	2.56365	4.48	0.21976	0.98	0.22	**1281**	**14**	1290	111	1307	42	0.98	1281	14
23	4082	2	4.49561	2.09	0.30916	0.61	0.29	1737	12	1730	91	**1722**	**18**	1.01	1722	18
15	79830	7	3.07168	1.53	0.24897	0.73	0.48	1433	12	1426	47	**1414**	**13**	1.01	1414	13
7	17662	3	2.18000	6.91	0.19800	0.90	0.13	**1165**	**12**	1175	143	1193	68	0.98	1165	12
25	48334	4	3.96904	1.25	0.27362	0.63	0.50	1559	11	1628	49	**1718**	**10**	0.91	1718	10
31	30606	2	2.28938	1.29	0.19672	0.61	0.47	**1158**	**8**	1209	30	1302	11	0.89	1158	8
9	4577	10	4.67503	1.58	0.31475	0.90	0.57	1764	18	1763	72	**1761**	**12**	1.00	1761	12
7	33149	7	4.62596	2.11	0.30478	1.04	0.49	1715	20	1754	95	**1801**	**17**	0.95	1801	17
11	5906	3	2.53431	3.47	0.20575	1.06	0.31	1206	14	1282	86	**1411**	**32**	0.85	1411	32
67	5152	6	2.14959	0.84	0.18422	0.42	0.50	**1090**	**5**	1165	18	1307	7	0.83	1090	5
11	881	1	1.99892	4.92	0.19366	1.74	0.35	**1141**	**22**	1115	95	1065	46	1.07	1141	22
19	3266	4	2.01983	4.50	0.18681	1.28	0.28	**1104**	**15**	1122	88	1157	43	0.95	1104	15
8	7727	6	1.79219	5.32	0.17771	1.30	0.24	**1055**	**15**	1043	93	1018	52	1.04	1055	15
14	1953	8	4.43638	2.09	0.30300	1.66	0.79	1706	32	1719	90	**1735**	**12**	0.98	1735	12
11	1335	21	3.66019	4.69	0.25750	2.45	0.52	1477	41	1563	161	**1680**	**37**	0.88	1680	37
5	1586	2	1.97874	8.38	0.18007	2.43	0.29	**1067**	**28**	1108	156	1189	79	0.90	1067	28
7	9847	5	2.53072	7.70	0.20350	1.60	0.21	**1194**	**21**	1281	181	1430	72	0.84	1194	21
9	3452	2	2.60360	3.88	0.20888	1.08	0.28	**1223**	**15**	1302	98	1434	36	0.85	1223	15
15	13580	7	3.17925	1.67	0.25593	1.00	0.60	1469	17	1452	53	**1428**	**13**	1.03	1428	13
19	14990	1	2.45928	2.69	0.21132	0.50	0.19	**1236**	**7**	1260	65	1302	26	0.95	1236	7
7	49109	3	2.23222	5.48	0.19117	0.95	0.17	**1128**	**12**	1191	117	1308	52	0.86	1128	12
73	9229	8	2.24398	1.38	0.19321	1.14	0.82	**1139**	**14**	1195	31	1298	8	0.88	1139	14
20	5658	2	4.82743	1.94	0.31892	1.33	0.69	1784	27	1790	91	**1796**	**13**	0.99	1796	13
6	11173	5	2.83824	8.13	0.23388	0.95	0.12	**1355**	**14**	1366	211	1383	78	0.98	1355	14
34	28283	6	2.57829	0.93	0.21752	0.40	0.43	**1269**	**6**	1295	24	1337	8	0.95	1269	6
40	2630	3	2.62359	0.88	0.21399	0.65	0.74	1250	9	1307	23	**1402**	**6**	0.89	1402	6
25	2016	3	2.07078	3.48	0.18656	1.90	0.55	**1103**	**23**	1139	71	1209	29	0.91	1103	23
12	3563	3	4.90368	2.22	0.31499	1.59	0.72	1765	32	1803	105	**1847**	**14**	0.96	1847	14
21	3953	6	2.46119	3.24	0.21526	1.42	0.44	**1257**	**20**	1261	78	1267	28	0.99	1257	20
48	2354	4	2.11631	1.76	0.19208	0.78	0.44	**1133**	**10**	1154	37	1195	16	0.95	1133	10
72	1705	6	2.04516	1.24	0.18449	0.61	0.49	**1092**	**7**	1131	25	1207	11	0.90	1092	7
25	19382	3	2.40870	2.04	0.21241	0.63	0.31	**1242**	**9**	1245	49	1251	19	0.99	1242	9
23	3627	2	2.68822	1.80	0.22610	0.81	0.45	**1314**	**12**	1325	48	1343	16	0.98	1314	12
21	10183	3	5.87531	1.12	0.35613	0.79	0.70	1964	18	1958	65	**1951**	**7**	1.01	1951	7
12	136852	5	3.62702	1.91	0.26077	0.52	0.27	1494	9	1556	68	**1640**	**17**	0.91	1640	17
30	1024	1	3.32990	4.41	0 24035	3.79	0.86	1389	59	1488	139	**1633**	**21**	0.85	1633	21
K00-53-3																
24	4410	11	1.58437	1.66	0.15801	0.90	0.54	**946**	**9**	964	26	1006	14	0.94	946	9
22	28531	9	1.92026	1.35	0.17665	0.82	0.61	**1049**	**9**	1088	26	1168	11	0.90	1049	9
30	1553	34	2.12963	2.36	0.19652	0.91	0.39	**1157**	**12**	1159	50	1162	22	1.00	1157	12
11	806	26	1.85207	4.14	0.17267	2.42	0.59	**1027**	**27**	1064	75	1142	33	0.90	1027	27
9	11495	5	3.97799	2.67	0.28183	0.62	0.23	1601	11	1630	103	**1668**	**24**	0.96	1668	24
10	21028	9	6.47046	1.29	0.36920	0.66	0.51	2026	16	2042	81	**2058**	**10**	0.98	2058	10
12	11937	14	2.15810	1.83	0.19677	0.74	0.41	**1158**	**9**	1168	39	1186	16	0.98	1158	9
29	23458	22	2.15797	2.01	0.19689	1.46	0.73	**1159**	**19**	1168	43	1184	14	0.98	1159	19
15	11669	17	2.95029	2.36	0.23859	1.24	0.53	1379	19	1395	68	**1419**	**19**	0.97	1419	19
9	91620	18	2.38325	2.99	0.21014	0.88	0.29	**1230**	**12**	1238	70	1252	28	0.98	1230	12
23	12588	7	1.85061	2.69	0.18118	0.67	0.25	**1073**	**8**	1064	49	1044	26	1.03	1073	8
6	60447	10	2.93142	5.90	0.23513	1.14	0.19	1361	17	1390	162	**1434**	**55**	0.95	1434	55
64	13281	13	1.99360	1.12	0.18328	0.66	0.59	**1085**	**8**	1113	22	1169	9	0.93	1085	8
6	15986	12	1.78597	7.13	0.17014	1.57	0.22	**1013**	**17**	1040	122	1098	70	0.92	1013	17
17	4281	24	1.91983	4.35	0.18346	2.94	0.68	**1086**	**35**	1088	81	1092	32	0.99	1086	35
49	3205	14	2.79671	0.87	0.22214	0.70	0.81	**1293**	**10**	1355	24	1453	5	0.89	1293	10
8	11633	9	1.92282	3.37	0.18221	0.82	0.24	**1079**	**10**	1089	64	1109	33	0.97	1079	10
16	10060	13	2.69008	1.47	0.21795	0.97	0.66	**1271**	**14**	1326	39	1415	11	0.90	1271	14
13	4990	18	2.21739	3.85	0.20268	1.59	0.41	**1190**	**21**	1187	83	1181	35	1.01	1190	21
12	2999	13	1.77883	4.96	0.17878	0.74	0.15	**1060**	**9**	1038	86	991	50	1.07	1060	9
10	5399	16	2.14652	3.03	0.19585	1.25	0.41	**1153**	**16**	1164	64	1184	27	0.97	1153	16
7	7229	4	12.46534	1.41	0.49198	1.02	0.72	2579	32	2640	164	**2687**	**8**	0.96	2687	8
18	4421	20	1.84959	2.67	0.17812	1.37	0.51	**1057**	**16**	1063	49	1077	23	0.98	1057	16
50	6979	25	1.88378	1.06	0.17975	0.63	0.60	**1066**	**7**	1075	20	1095	8	0.97	1066	7

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

			Isotopic ratios					Apparent ages (Ma)								
U (ppm)	$^{206}Pb_m$ / ^{204}Pb	U/Th	$^{207}Pb^*$ / ^{235}U	± (%)	$^{206}Pb^*$ / ^{238}U	± (%)	error corr.	$^{206}Pb^*$ / ^{238}U	±(Ma)	$^{207}Pb^*$ / ^{235}U	±(Ma)	$^{206}Pb^*$ / $^{207}Pb^*$	±(Ma)	% disc.	Ages	
K00-53-3 Continued																
17	9272	38	2.61727	2.15	0.21343	1.18	0.55	1247	16	1306	56	**1403**	**17**	0.89	1403	17
19	2310	17	1.84989	3.25	0.17762	0.65	0.20	**1054**	**7**	1063	59	1083	32	0.97	1054	7
29	138712	17	1.75763	2.70	0.17031	0.95	0.35	**1014**	**10**	1030	47	1064	25	0.95	1014	10
46	19016	9	2.92561	0.84	0.23573	0.70	0.83	1365	11	1389	25	**1426**	**4**	0.96	1426	4
32	46298	9	2.14663	1.56	0.19459	1.25	0.80	**1146**	**16**	1164	34	1197	9	0.96	1146	16
13	2590	5	3.83759	2.10	0.27306	0.92	0.44	1556	16	1601	79	**1660**	**18**	0.94	1660	18
9	2349	23	1.75797	5.68	0.16883	2.12	0.37	**1006**	**23**	1030	97	1082	53	0.93	1006	23
16	7564	11	3.93004	1.31	0.27209	0.69	0.53	1551	12	1620	51	**1710**	**10**	0.91	1710	10
35	1260	4	4.04818	2.43	0.28645	0.83	0.34	1624	15	1644	95	**1670**	**21**	0.97	1670	21
57	24666	20	1.81720	0.93	0.17338	0.72	0.78	**1031**	**8**	1052	17	1095	6	0.94	1031	8
25	2307	64	1.98810	2.79	0.18804	1.88	0.67	**1111**	**23**	1112	55	1113	21	1.00	1111	23
37	3597	27	1.67788	2.06	0.15582	1.37	0.66	**934**	**14**	1000	35	1149	15	0.81	934	14
11	7124	8	4.69070	1.67	0.31574	0.68	0.41	1769	14	1766	77	**1762**	**14**	1.00	1762	14
16	3442	25	1.88592	2.82	0.17097	1.37	0.49	**1018**	**15**	1076	53	1197	24	0.85	1018	15
31	4359	18	2.24140	1.40	0.20110	0.81	0.58	**1181**	**11**	1194	32	1217	11	0.97	1181	11
31	11029	11	4.52259	1.05	0.29996	0.88	0.84	1691	17	1735	47	**1789**	**5**	0.95	1789	5
18	7994	15	4.74093	1.39	0.31683	0.84	0.60	1774	17	1775	65	**1775**	**10**	1.00	1775	10
22	2515	26	1.79896	3.62	0.17199	2.17	0.60	**1023**	**24**	1045	64	1091	29	0.94	1023	24
13	3040	24	2.45264	5.14	0.21408	2.61	0.51	**1251**	**36**	1258	121	1271	43	0.98	1251	36
74	6419	18	2.45231	0.88	0.20468	0.64	0.73	**1200**	**8**	1258	22	1358	6	0.88	1200	8
45	30412	12	2.08602	1.03	0.19166	0.80	0.78	**1130**	**10**	1144	22	1171	6	0.97	1130	10
16	21448	12	3.75546	1.80	0.26282	1.01	0.56	1504	17	1583	67	**1690**	**14**	0.89	1690	14
27	19523	12	2.22064	1.92	0.20085	0.97	0.51	**1180**	**13**	1188	42	1202	16	0.98	1180	13
23	8375	6	1.97716	1.81	0.18426	0.55	0.30	**1090**	**7**	1108	36	1142	17	0.95	1090	7
36	29948	13	2.06553	1.51	0.18928	0.84	0.56	**1118**	**10**	1138	31	1176	12	0.95	1118	10
5	1542	8	1.50297	8.33	0.14630	1.42	0.17	**880**	**13**	932	120	1055	83	0.83	880	13
47	4540	17	1.94707	1.39	0.17787	0.83	0.60	**1055**	**10**	1097	27	1182	11	0.89	1055	10
19	17818	14	12.31735	0.66	0.47974	0.58	0.88	2526	18	2629	80	**2709**	**3**	0.93	2709	3
27	17207	10	2.71732	2.45	0.21635	1.67	0.68	1263	23	1333	66	**1449**	**17**	0.87	1449	17
53	5649	32	2.03473	1.42	0.18680	1.15	0.81	**1104**	**14**	1127	29	1172	8	0.94	1104	14
23	6650	16	1.67056	2.21	0.16013	1.05	0.47	**958**	**11**	997	37	1086	20	0.88	958	11
34	10526	16	1.80434	1.31	0.17224	0.51	0.39	**1024**	**6**	1047	24	1095	12	0.94	1024	6
71	4062	25	2.19091	1.41	0.20097	0.74	0.52	**1181**	**10**	1178	31	1174	12	1.01	1181	10
9	7948	9	2.69601	3.46	0.21970	1.36	0.39	1280	19	1327	91	**1404**	**30**	0.91	1404	30
20	6517	9	1.70776	2.03	0.16881	0.69	0.34	**1006**	**8**	1011	35	1024	19	0.98	1006	8
42	2420	12	1.81192	2.08	0.17064	0.75	0.36	**1016**	**8**	1050	38	1122	19	0.91	1016	8
20	3852	9	1.85760	2.77	0.17040	0.76	0.28	**1014**	**8**	1066	51	1174	26	0.86	1014	8
13	18197	15	15.21016	1.55	0.52810	1.21	0.78	2734	41	2829	215	**2897**	**8**	0.94	2897	8
23	34651	7	4.50705	1.08	0.30371	0.86	0.80	1710	17	1732	48	**1760**	**6**	0.97	1760	6
27	34459	9	1.83446	1.57	0.17426	1.14	0.73	**1036**	**13**	1058	29	1104	11	0.94	1036	13
14	4758	12	1.96087	3.99	0.17973	1.38	0.35	**1066**	**16**	1102	77	1175	37	0.91	1066	16
46	16771	19	1.79796	1.68	0.17504	0.85	0.51	**1040**	**10**	1045	30	1055	15	0.99	1040	10
12	2337	10	1.84157	2.79	0.17717	0.85	0.30	**1052**	**10**	1060	51	1079	27	0.97	1052	10
16	5206	5	2.04381	2.47	0.18637	0.84	0.34	**1102**	**10**	1130	50	1185	23	0.93	1102	10
13	4549	11	2.26837	2.73	0.20573	0.90	0.33	**1206**	**12**	1203	61	1196	25	1.01	1206	12
11	8935	28	2.39376	3.03	0.21021	0.48	0.16	**1230**	**7**	1241	71	1260	29	0.98	1230	7
35	14672	10	2.65857	1.10	0.22464	0.72	0.65	**1306**	**10**	1317	29	1334	8	0.98	1306	10
13	10292	10	2.41604	4.37	0.21276	1.38	0.32	**1244**	**19**	1247	102	1254	41	0.99	1244	19
9	4141	14	1.85246	5.54	0.17913	1.11	0.20	**1062**	**13**	1064	99	1069	55	0.99	1062	13
10	4855	7	1.94965	4.67	0.18484	1.49	0.32	**1093**	**18**	1098	89	1108	44	0.99	1093	18
9	4248	14	1.98455	4.71	0.18794	0.72	0.15	**1110**	**9**	1110	91	1110	47	1.00	1110	9
46	1328	23	1.55234	1.62	0.15029	1.01	0.62	**903**	**10**	951	25	1066	13	0.85	903	10
9	6147	9	2.02479	5.48	0.18971	1.03	0.19	**1120**	**13**	1124	107	1132	54	0.99	1120	13
38	2250	8	2.16600	1.17	0.18979	0.65	0.56	**1120**	**8**	1170	25	1264	10	0.89	1120	8
5	2537	26	2.02783	6.42	0.19080	4.08	0.64	**1126**	**50**	1125	124	1123	49	1.00	1126	50
8	3772	11	2.11928	3.65	0.19693	1.80	0.49	**1159**	**23**	1155	76	1148	31	1.01	1159	23
17	5724	18	1.76141	3.06	0.17249	0.90	0.29	**1026**	**10**	1031	53	1043	30	0.98	1026	10
22	27999	8	14.34762	1.08	0.52206	0.96	0.89	2708	32	2773	147	**2821**	**4**	0.96	2821	4
61	6416	36	1.89413	0.96	0.17549	0.55	0.57	**1042**	**6**	1079	18	1154	8	0.90	1042	6
24	30700	14	5.54387	1.05	0.33617	0.86	0.82	1868	19	1907	58	**1950**	**5**	0.96	1950	5
60	42013	24	1.93149	1.07	0.17727	0.85	0.79	**1052**	**10**	1092	21	1173	6	0.90	1052	10
J10-60-2abcd																
20	13468	4	2.36119	1.90	0.21176	0.75	0.40	**1238**	**10**	1231	45	1218	17	1.02	1238	10
26	15729	3	2.77867	1.99	0.22448	1.28	0.64	1306	19	1350	55	**1421**	**15**	0.92	1421	15
7	20719	2	11.82514	1.47	0.46735	1.07	0.73	2472	32	2591	163	**2685**	**8**	0.92	2685	8
41	10548	8	3.09742	2.16	0.22337	1.50	0.70	1300	22	1432	66	**1635**	**14**	0.80	1635	14
10	11024	2	2.45598	4.64	0.21729	0.83	0.18	**1268**	**12**	1259	110	1245	45	1.02	1268	12
9	62523	6	3.96249	2.96	0.27418	1.62	0.55	1562	29	1627	113	**1711**	**23**	0.91	1711	23
14	63236	6	10.34237	1.31	0.44019	1.23	0.94	2352	35	2466	129	**2562**	**4**	0.92	2562	4
33	990	8	3.83882	3.60	0.26231	1.27	0.35	1502	21	1601	131	**1734**	**31**	0.87	1734	31

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

U	$^{206}Pb_m$	U/Th	Isotopic ratios					Apparent ages (Ma)								
			$^{207}Pb^*$	± (%)	$^{206}Pb^*$	± (%)	error	$^{206}Pb^*$	±(Ma)	$^{207}Pb^*$	±(Ma)	$^{206}Pb^*$	±(Ma)	% disc.		
(ppm)	^{204}Pb		^{235}U		^{238}U		corr.	^{238}U		^{235}U		$^{207}Pb^*$			Ages	
J10-60-2abcd Continued																
9	1951	5	3.76822	5.77	0.26394	1.62	0.28	1510	28	1586	200	**1689**	**51**	0.89	1689	51
27	2430	4	2.22650	2.10	0.20178	1.33	0.63	**1185**	**17**	1189	47	1198	16	0.99	1185	17
31	6190	2	3.93091	1.75	0.26585	1.60	0.91	1520	27	1620	68	**1753**	**7**	0.87	1753	7
23	19103	4	3.04487	1.41	0.24321	0.53	0.37	1403	8	1419	43	**1442**	**12**	0.97	1442	12
13	24484	5	14.75258	1.10	0.53632	0.94	0.85	2768	32	2799	153	**2822**	**5**	0.98	2822	5
23	7345	4	2.13599	1.92	0.19706	0.88	0.46	**1160**	**11**	1161	41	1162	17	1.00	1160	11
15	51820	3	3.55946	3.40	0.25566	0.87	0.26	1468	14	1541	116	**1642**	**30**	0.89	1642	30
23	1023	7	2.26508	1.92	0.19186	1.18	0.62	**1132**	**15**	1202	43	1330	15	0.85	1132	15
27	43198	6	4.48163	1.07	0.29818	0.46	0.43	1682	9	1728	48	**1783**	**9**	0.94	1783	9
20	11826	3	4.43061	1.69	0.30315	1.24	0.74	1707	24	1718	73	**1732**	**11**	0.99	1732	11
28	10141	4	3.32315	1.16	0.23957	0.77	0.66	1385	12	1487	38	**1635**	**8**	0.85	1635	8
17	22818	3	3.48222	2.24	0.24967	0.93	0.42	1437	15	1523	76	**1645**	**19**	0.87	1645	19
12	3064	6	2.47859	3.33	0.21606	1.84	0.55	**1261**	**26**	1266	81	1274	27	0.99	1261	26
28	5188	2	2.56610	1.73	0.20609	0.85	0.49	1208	11	1291	44	**1432**	**14**	0.84	1432	14
29	2499	6	2.14377	2.32	0.19716	0.65	0.28	**1160**	**8**	1163	49	1169	22	0.99	1160	8
18	3472	3	2.15781	2.96	0.19744	2.22	0.75	**1162**	**28**	1168	63	1179	19	0.99	1162	28
15	53453	5	3.69761	3.25	0.25344	1.73	0.53	1456	28	1571	115	**1729**	**25**	0.84	1729	25
11	5626	4	1.47822	4.20	0.15110	1.88	0.45	**907**	**18**	922	61	956	38	0.95	907	18
14	58797	6	3.11592	1.94	0.24803	0.74	0.38	1428	12	1437	60	**1449**	**17**	0.99	1449	17
37	8455	4	2.32848	1.95	0.20317	1.55	0.79	**1192**	**20**	1221	45	1272	12	0.94	1192	20
33	3348	2	2.08918	2.68	0.18507	2.16	0.81	**1095**	**26**	1145	55	1242	16	0.88	1095	26
34	9188	4	2.87487	1.32	0.23381	0.98	0.74	1354	15	1375	38	**1408**	**8**	0.96	1408	8
15	7852	7	2.81582	3.53	0.22823	2.25	0.64	1325	33	1360	96	**1414**	**26**	0.94	1414	26
23	78576	4	4.70023	1.38	0.31595	0.77	0.56	1770	16	1767	64	**1764**	**10**	1.00	1764	10
32	1291	5	2.03702	1.85	0.19001	1.38	0.74	**1121**	**17**	1128	38	1141	12	0.98	1121	17
25	4824	2	4.34699	3.52	0.28934	3.17	0.90	1638	59	1702	145	**1782**	**14**	0.92	1782	14
31	9463	4	4.32609	3.73	0.29600	3.49	0.93	1671	66	1698	152	**1732**	**12**	0.97	1732	12
9	1421	4	1.92680	12.13	0.17912	3.73	0.31	**1062**	**43**	1090	213	1147	115	0.93	1062	43
44	8621	4	3.41344	1.94	0.24160	1.76	0.91	1395	27	1508	65	**1669**	**7**	0.84	1669	7
7	3788	6	3.89559	3.61	0.26461	0.88	0.24	1513	15	1613	134	**1745**	**32**	0.87	1745	32
12	3588	4	3.15581	1.66	0.25302	0.62	0.38	1454	10	1446	52	**1435**	**15**	1.01	1435	15
41	5461	3	1.86899	2.11	0.16720	0.89	0.42	**997**	**10**	1070	39	1223	19	0.81	997	10
22	11151	4	3.89676	2.04	0.26873	1.77	0.87	1534	31	1613	78	**1717**	**9**	0.89	1717	9
24	32718	6	5.10474	1.03	0.32887	0.71	0.68	1833	15	1837	52	**1841**	**7**	1.00	1841	7
25	18529	4	2.46110	1.79	0.21637	1.15	0.64	**1263**	**16**	1261	44	1257	13	1.00	1263	16
12	9858	5	2.73045	2.91	0.22228	1.32	0.46	1294	19	1337	78	**1406**	**25**	0.92	1406	25
30	12953	4	3.33358	1.32	0.24249	1.01	0.76	1400	16	1489	44	**1619**	**8**	0.86	1619	8
36	4258	2	4.20565	1.52	0.28083	1.32	0.87	1596	24	1675	63	**1776**	**7**	0.90	1776	7
26	4814	4	2.92341	2.43	0.23705	1.79	0.74	1371	27	1388	70	**1414**	**16**	0.97	1414	16
30	16636	4	2.81475	1.69	0.22432	1.55	0.92	1305	22	1360	47	**1447**	**6**	0.90	1447	6
25	41283	3	4.63502	1.31	0.30987	0.60	0.46	1740	12	1756	60	**1774**	**11**	0.98	1774	11
16	47083	5	4.73954	1.60	0.31758	0.98	0.61	1778	20	1774	74	**1770**	**12**	1.00	1770	12
11	39777	3	4.80141	2.61	0.31960	1.27	0.49	1788	26	1785	120	**1782**	**21**	1.00	1782	21
11	86957	8	3.32672	2.14	0.24279	0.64	0.30	1401	10	1487	70	**1612**	**19**	0.87	1612	19
33	5435	4	2.04674	2.82	0.18671	2.50	0.89	**1104**	**30**	1131	57	1185	13	0.93	1104	30
14	1542	9	3.04367	4.49	0.24573	0.81	0.18	1416	13	1419	130	**1422**	**42**	1.00	1422	42
16	12710	3	3.12697	2.19	0.24966	1.16	0.53	1437	19	1439	67	**1443**	**18**	1.00	1443	18
23	39074	7	2.31623	2.96	0.19570	0.84	0.28	**1152**	**11**	1217	67	1335	27	0.86	1152	11
38	33159	7	2.31877	1.30	0.20344	0.63	0.48	**1194**	**8**	1218	30	1261	11	0.95	1194	8
18	2999	3	1.85384	3.48	0.17602	1.18	0.34	**1045**	**13**	1065	64	1105	33	0.95	1045	13
14	23316	3	2.34635	2.85	0.20297	0.59	0.21	**1191**	**8**	1227	66	1289	27	0.92	1191	8
9	12784	4	2.45773	4.33	0.21412	1.16	0.27	**1251**	**16**	1260	103	1275	41	0.98	1251	16
21	9836	2	4.60917	2.26	0.31041	2.11	0.94	1743	42	1751	101	**1761**	**7**	0.99	1761	7
29	15471	4	2.44302	1.81	0.21533	1.05	0.58	**1257**	**15**	1255	44	1252	14	1.00	1257	15
26	20126	3	3.58570	1.06	0.25361	0.38	0.36	1457	6	1546	38	**1671**	**9**	0.87	1671	9
28	39652	9	2.86689	2.38	0.22772	1.77	0.74	1323	26	1373	67	**1453**	**15**	0.91	1453	15
22	21964	4	3.19428	2.71	0.25188	2.00	0.74	1448	32	1456	84	**1467**	**17**	0.99	1467	17
6	12984	1	4.26065	5.51	0.28593	1.30	0.24	1621	24	1686	214	**1767**	**49**	0.92	1767	49
14	53834	3	3.78517	2.49	0.25673	0.96	0.39	1473	16	1590	92	**1748**	**21**	0.84	1748	21
20	37963	4	3.00344	1.38	0.24257	0.83	0.60	1400	13	1409	41	**1421**	**11**	0.99	1421	11
28	16127	3	12.52471	1.95	0.51040	1.91	0.98	2658	63	2645	222	**2634**	**3**	1.01	2634	3
17	18655	2	5.23991	1.67	0.33095	0.87	0.52	1843	19	1859	85	**1877**	**13**	0.98	1877	13
14	36890	2	5.75850	1.32	0.34934	0.52	0.40	1931	12	1940	74	**1950**	**11**	0.99	1950	11
17	98631	4	3.63535	1.92	0.26136	0.71	0.37	1497	12	1557	69	**1640**	**17**	0.91	1640	17
14	42291	3	5.04911	2.59	0.32780	2.34	0.90	1828	49	1828	125	**1827**	**10**	1.00	1827	10
10	57560	6	2.57641	3.88	0.21978	0.93	0.24	**1281**	**13**	1294	97	1316	37	0.97	1281	13
17	3245	5	1.97766	3.02	0.18662	0.97	0.32	**1103**	**12**	1108	59	1117	28	0.99	1103	12
20	48534	3	2.41271	1.59	0.21196	0.75	0.47	**1239**	**10**	1246	38	1259	14	0.98	1239	10
8	71932	2	3.51327	3.00	0.25603	0.84	0.28	1470	14	1530	102	**1615**	**27**	0.91	1615	27
39	6453	2	4.07289	1.32	0.28580	1.19	0.90	1621	22	1649	53	**1685**	**5**	0.96	1685	5

U-Pb geochronologic analyses by Laser-Ablation Multicollector ICP Mass Spectrometery

			Isotopic ratios					Apparent ages (Ma)								
U (ppm)	$^{206}Pb_m$ / ^{204}Pb	U/Th	$^{207}Pb^*$ / ^{235}U	± (%)	$^{206}Pb^*$ / ^{238}U	± (%)	error corr.	$^{206}Pb^*$ / ^{238}U	±(Ma)	$^{207}Pb^*$ / ^{235}U	±(Ma)	$^{206}Pb^*$ / $^{207}Pb^*$	±(Ma)	% disc.	Ages	
J10-60-2abcd Continued																
15	4343	3	3.28828	2.45	0.23648	1.58	0.64	1368	24	1478	79	**1640**	**17**	0.83	1640	17
11	3416	6	3.36137	3.06	0.24397	0.75	0.25	1407	12	1495	99	**1623**	**28**	0.87	1623	28
17	24718	5	2.20420	3.45	0.19475	0.78	0.23	**1147**	**10**	1182	74	1248	33	0.92	1147	10

Notes:

206Pb/204Pb is measured ratio.
All errors are at the 1-sigma level.
Ages in bold are interpreted to be the best estimates of crystallization age ($^{206}Pb/^{238}U$ ages for <1.4 Ga, $^{206}Pb/^{207}Pb$ ages for >1.4 Ga)
U concentration and U/Th have uncertainties of ~25%.
Decay constants: 235U=9.8485x10-10. 238U=1.55125x10-10, 238U/235U=137.88.
Isotope ratios are corrected for Pb/U fractionation by comparison with standard zircon with an age of 564 ± 4 Ma (2-sigma)
Initial Pb composition interpreted from Stacey and Kramers (1975), with uncertainties of 1.0 for 206Pb/204Pb and 0.3 for 207Pb/204Pb.

Appendix II: Field Methods and Sample Characterization

Apache Group, Arizona

Twenty-one samples of the Apache Group and Troy Quartzite were collected from five different locations in southeast Arizona in May 2003. These locations were chosen to complement previous U/Pb zircon age determinations in the Sierra Ancha area (Central Arizona) by Stewart et al. (2001).

A full stratigraphic section of the Apache Group is exposed along the access road to Seven Dash Ranch (Fig A-1). At this location four samples of the Dripping Springs Quartzite were taken. These rocks were fine to medium grained, white to purple quartzarenite to subarkose with quartz cement.

A road cut in the Johnny Lyons Hills (Fig A-1) exposes a striking unconformity between the Johnny Lyons Granodiorite and the Barnes Conglomerate Member of the Dripping Springs Quartzite. The Pioneer Shale is absent in this area. A sample of the Barnes Conglomerate was taken (F03-5-6), as well as a sample of the Middle Member of the Dripping Springs Quartzite (F03-5-5).

Four samples of an unnamed member of the Pioneer Shale were taken at the Trails End Ranch, near Aravapai Canyon. Samples F03-5-7 and F03-5-8 are fissile quartzarenites, and samples F03-5-9 and F03-5-10 are siltstones.

An impressive exposure of the entire Apache-Troy section exists near a mine access road near Winkelman, AZ. In this area the strata are almost vertical and the entire section from the unconformity with the underlying crystalline basement to the Troy Quartzite extend for about 500m along a primitive road. Samples F03-5-14, -15, -16, -17 and F03-5-18 are from an unnamed member of the Pioneer Shale, taken at approximately 5 meter intervals above the unconformity with the underlying Ruin Granite (the Scanlan Conglomerate does not exist in this area). Samples F03-5-12 and F03-5-13 are from the Dripping Springs Quartzite. Sample F03-5-11 was taken from the Troy Quartzite above the slightly angular unconformity with the Mescal Limestone (the unnamed basalt does not exist in this area).

Two samples of the Dripping Springs Quartzite (F03-5-20 and F03-5-21) were collected from the Veklo Hills, Papago Indian Reservation. Both of these rocks are medium grained quartzarenites with quartz cements.

Grand Canyon Supergroup, Arizona

Muscovite bearing sandstones and siltstones were collected from the Hotauta Conglomerate, Bass Formation and Dox Formation by several geologists over many years. The oldest rock in this study is from a sandy layer within the Hotauta Conglomerate (K03-77-2) taken at river mile 77.

Samples were collected from the Escalante Creek, Solomon Temple, Comanche Point and Ochoa Point Members of the Dox Formation. Sample 98GC-23 is from an outcrop of the Escalante Creek Member at Shinumo Creek, immediately above the contact with the Shinumo Quartzite. Samples T-16-75-2, K98-65-1 and 00GC-54 are also from the Escalante Creek Member, were sampled at river mile 75, the Palisades Creek area and within Carbon Canyon, respectively. The Solomon Temple Member was sampled in Espejo Canyon (00GC-59). The upper 245 meters of the Dox Formation (Comanche Point and Ochoa Point Members) was measured using a 1.5m Jackob staff at river mile 71, and 8 sandstones were collected in stratigraphic context. Samples H02-71-3, H02- 71-9, H02-71-16.5 and H02-71-43 are from the Comanche Point Member, and samples H02-71-124, H02-71-174, H02-71-181, H02-71-200.2 are from the Ochoa Point Member.

Pahrump Group, Death Valley, California

Samples of the Crystal Springs Formation, and basement lithologies, were collected from three different locations in southern Death Valley in March 2004. This data set is complemented by sample K03-DV-04, which is a sample of the Arkose member of the Crystal Springs Formation, collected by Matt Heizler from an out crop near the Blackwater mine in January, 2003.

The outcrop near Blackwater mine was revisited for further sampling. Here the Arkose Member was re-sampled, along with a cross-cutting dike and the underlying basement. The sample taken of the Arkose Member of the Crystal Springs Formation is a medium grained feldspathic arenite with sub-angular grains (F04-DV-01). This sample was taken from a thin layer of muscovite-rich cross-bedded sandstone within a much larger section of medium to coarse grained feldspathic sandstone with conglomerate interbeds.

The Silurian Hills area offers a large, almost vertical section of the Crystal Springs Formation. Several samples were taken at this location, however these samples have been metamorphosed too extensively to provide meaningful detrital muscovite $^{40}Ar/^{39}Ar$ ages.

The Saratoga Springs area is an extensive expanse of uninterrupted Crystal Springs section. Several samples were taken at this location from below and above the middle-upper Crystal Springs unconformity. Only the samples from above the middle-upper Crystal Springs unconformity were used for $^{40}Ar/^{39}Ar$ dating. Unfortunately these samples were also too metamorphosed to yield meaningful detrital muscovite ages and the age analyses are not included in this thesis.

Debaca Sequence, New Mexico

Two samples of the Debaca sequence were provided by Karl Karlstrom and Mike Timmons. The samples were collected from Nigger Ed Canyon in the Sacramento Mountains, just south of Alamogordo, NM.

Appendix III: $^{40}Ar/^{39}Ar$ methods and results

$^{40}Ar/^{39}Ar$ Methods

Extraction Line and Mass Spectrometer details

All $^{40}Ar/^{39}Ar$ samples and flux monitors were analyzed at the New Mexico Geochronology Research Laboratory (NMGRL) at the New Mexico Institute of Mining and Technology. Samples of unknown age were either heated incrementally using a defocused Synrad 50 W CO_2 laser beam in steps of increasing power for 30 seconds per step, or totally fused in one increment using a focused laser beam at 1.8 watts. Fish Canyon Tuff sanidine (FC-2) flux monitors were also fused in one step. The laser sample chamber consists of a doubly pumped unit with a ZnS window. Gas evolved from samples was passed through a cold finger at -140°C, reacted with 2 SAES GP-50 getters, one operated at 450°C and the second at 20°C, and exposed to a tungsten filament that is at about 2000°C. Following cleaning, the gas was expanded into a MAP 215-50 mass spectrometer operated in static mode. Isotopes were measured with a Johnston electron multiplier operated at about 2.1 kV. A resolution of about 600 at mass 40 was typically achieved. NMGRL uses a Nier type source with source sensitivity of about 8×10^{-4} Amps/Torr. Mass discrimination was determined using air that was scrubbed with a Ti-sublimation pump.

Following introduction into the mass spectrometer, peak intensities of each argon isotope were measured in at least 5 cycles, however for some samples 8 to 15 cycles of peak intensity data were collected, depending on the argon signal size. Final isotopic intensities were calculated by linearly regressing the peak height vs. time trend to time zero. Each isotopic measurement was corrected for mass spectrometer baseline and background and extraction line blank. Blanks plus backgrounds were typically 4e-16, 4e-18, 1e-18, 2e-18 and 2e-18 moles for masses 40, 39, 38, 37 and 36 respectively.

More in depth details of the set-up at the New Mexico Geochronology Research Laboratory are available from the New Mexico Bureau of Geology and Mineral Resources open file report OF-AR-1 at http://geoinfo.nmt.edu/publications/openfile/argon/home.html

Irradiations, Flux Monitors and Age Calculations

Irradiation was performed in three different packages at the McMaster reactor in Hamilton, Ontario, for approximately 75-150 Megawatt hours each. The neutron flux monitor Fish Canyon sanidine (28.27 Ma; Kwon et al., 2002) was used to measure fluence gradients within each package. Unknowns and flux monitors were arranged in six hole circular Aluminum disks, with unknowns at 0, 120 and 240 degrees and flux monitors at 60, 180 and 300 degrees. Six Fish Canyon sanidine crystals were fused from each flux monitor position, and the average J factor for each position was calculated. Flux gradient across the disk was determined by fitting a sine curve to the average result from each flux monitor position, J factors for unknowns were determined by their position in the disk and the J-curve. Interfering nuclear reactions were monitored with K-glass and CaF_2 for K and Ca, respectively.

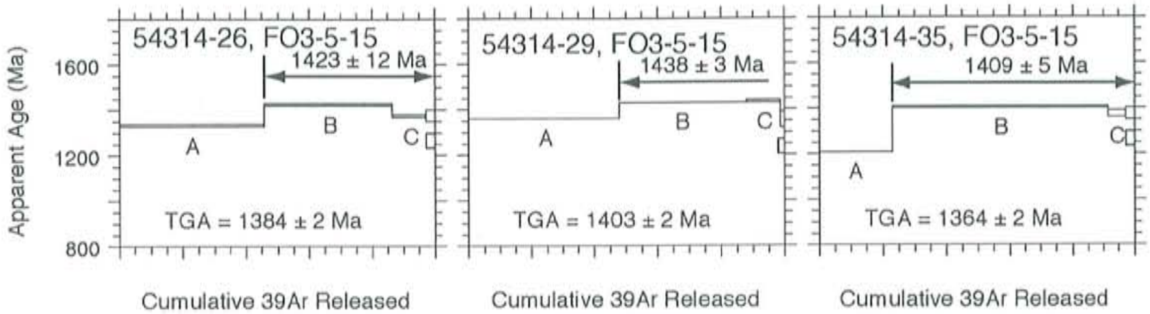
Fish Canyon Sanidine is assigned an age of 28.27 Ma, and the total decay constant for ^{40}K is 5.476e-10/a (Kwon et al., 2002). These values are chosen based on recent work that attempts to resolve the often observed discordance between U/Pb dates compared to $^{40}Ar/^{39}Ar$ dates that are determined with a younger age for Fish Canyon sanidine and the decay constant recommended by Steiger and Jager (1977). This work suggests that the Fish Canyon sanidine age and ^{40}K decay rate recommended by Steiger and Jager (1977), yield results which are 'too young', when compared to the more robust U-Pb system (Kwon et al., 2002, Min et al., 2003). Although there is currently no new universally accepted decay constant for ^{40}K, it is likely that in the future a new decay constant, based on the U-Pb system, will be recommended. Although the decay constant and flux monitor age used herein may not be the exact figures recommended in the future, they are a more accurate reflection our present knowledge and so are used for this study.

Data Tables, Age Spectra and Probability Diagrams

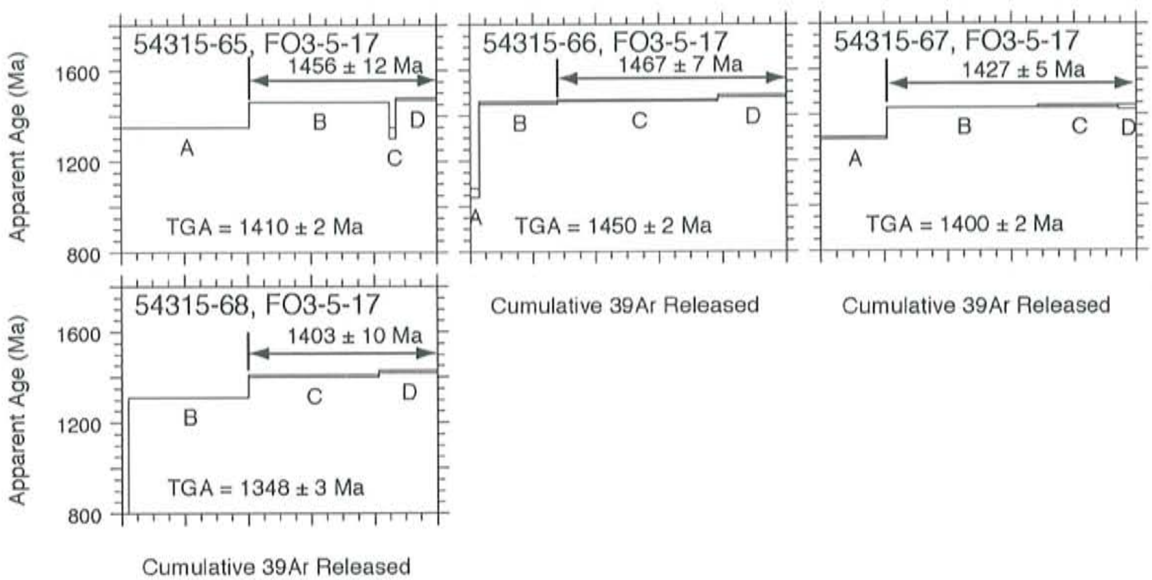
The number of crystals analyzed from each sample was quite variable and depended upon ease of separation and crystal size. Age spectrum analyses are preferred as they provide some information about age heterogeneity within the mica grains. The low-resolution age spectra are still a very homogenized view of the true argon distribution within the grains, but by choosing the oldest steps provides a more accurate measure of the source age. For each sample analyzed an attempt was made to step heat as many crystals as time and analytical precision allowed (many crystals were too small to successfully step-heat). No strict guidelines were followed when determining what steps could be combined for calculating plateau ages, however they generally involved consecutive steps and incorporated the oldest apparent ages. The plateau age was calculated by weighing each step in the plateau by the inverse of the variance and the error is calculated by the method of Taylor (1982). Age spectra and data tables for step-heated crystals follow below.

Most samples have between 5 and 20 step-heated crystals and at least the same number of total fusion crystals. For most crystals the plateau age was significantly older than the total gas age (TGA). The total gas age combines 100% of the gas released from the crystal and is the age the crystal would have yielded if it were fused in one step. If there is a significant difference between plateau ages and total gas ages it is assumed a similar difference occurs between plateau ages and total fusion ages and therefore total fusion ages require adjustment for comparison to plateau ages. In each sample the average percent difference in age between the plateau age and the total gas age in the step heated crystals was calculated. As a whole for all samples, the average difference was 1.9 ± 1.7 % with a range from 0.5 to 6.3 % difference. For each sample with age spectra the percent difference was used to correct (i.e. increase) the apparent ages of the totally fused crystals. This difference was also added to the error of the total fusion ages. This increase in the assigned error is an attempt to realistically record our lack of knowledge about the discordance between any given plateau age and total fusion age. Apparent ages for each sample are plotted on age probability diagrams. These plots are similar to histograms, but incorporate the uncertainty and represent the summation of the normal distribution of each analysis (Deino and Potts, 1992). Age probability diagrams for each individual sample are presented in this appendix.

Single crystal muscovite age spectra for sample F03-5-15 (L# 54314)
Pioneer Shale Formation, Apache Group

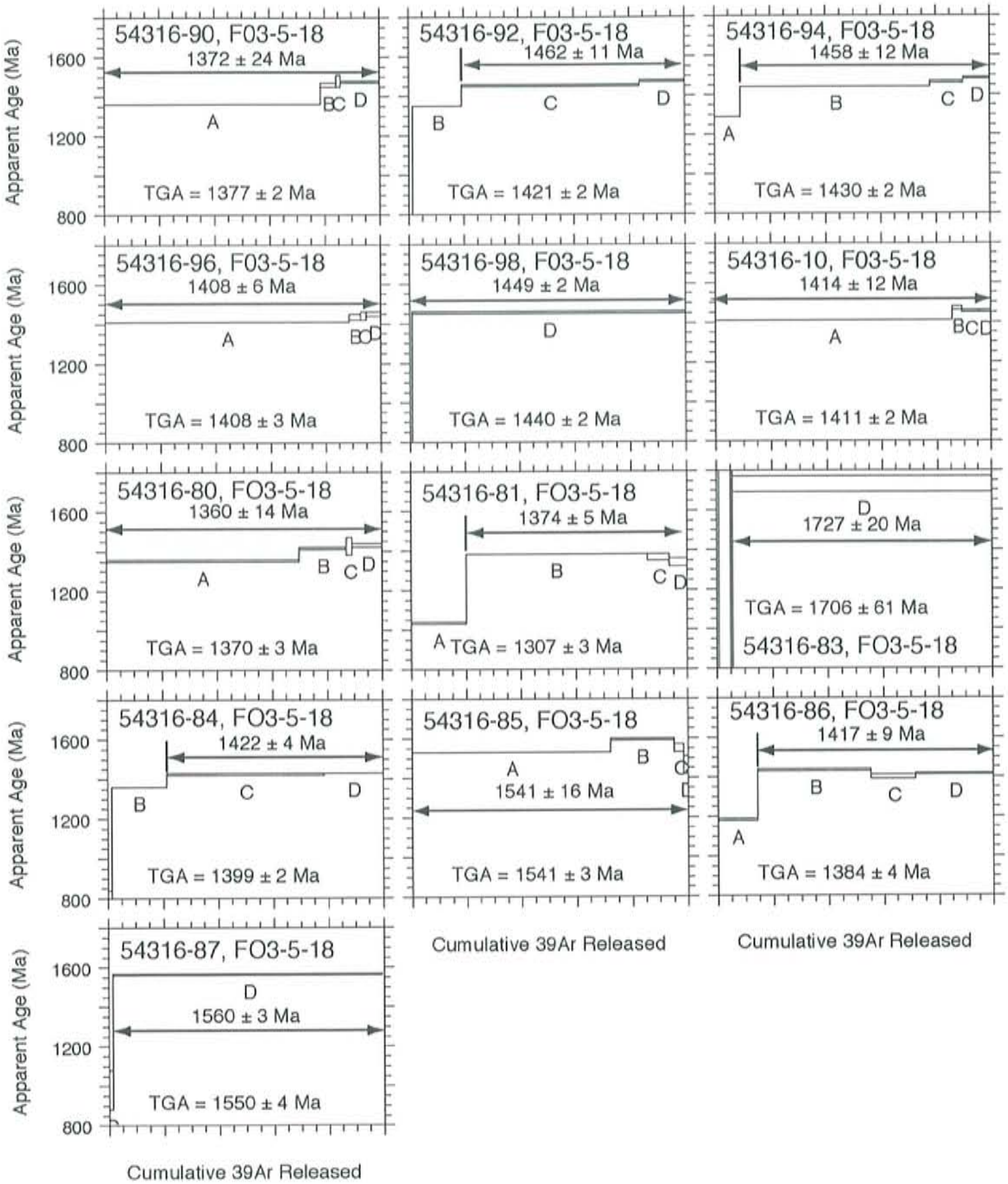


Single crystal muscovite age spectra for sample F03-5-17 (L# 54315)
Pioneer Shale Formation, Apache Group

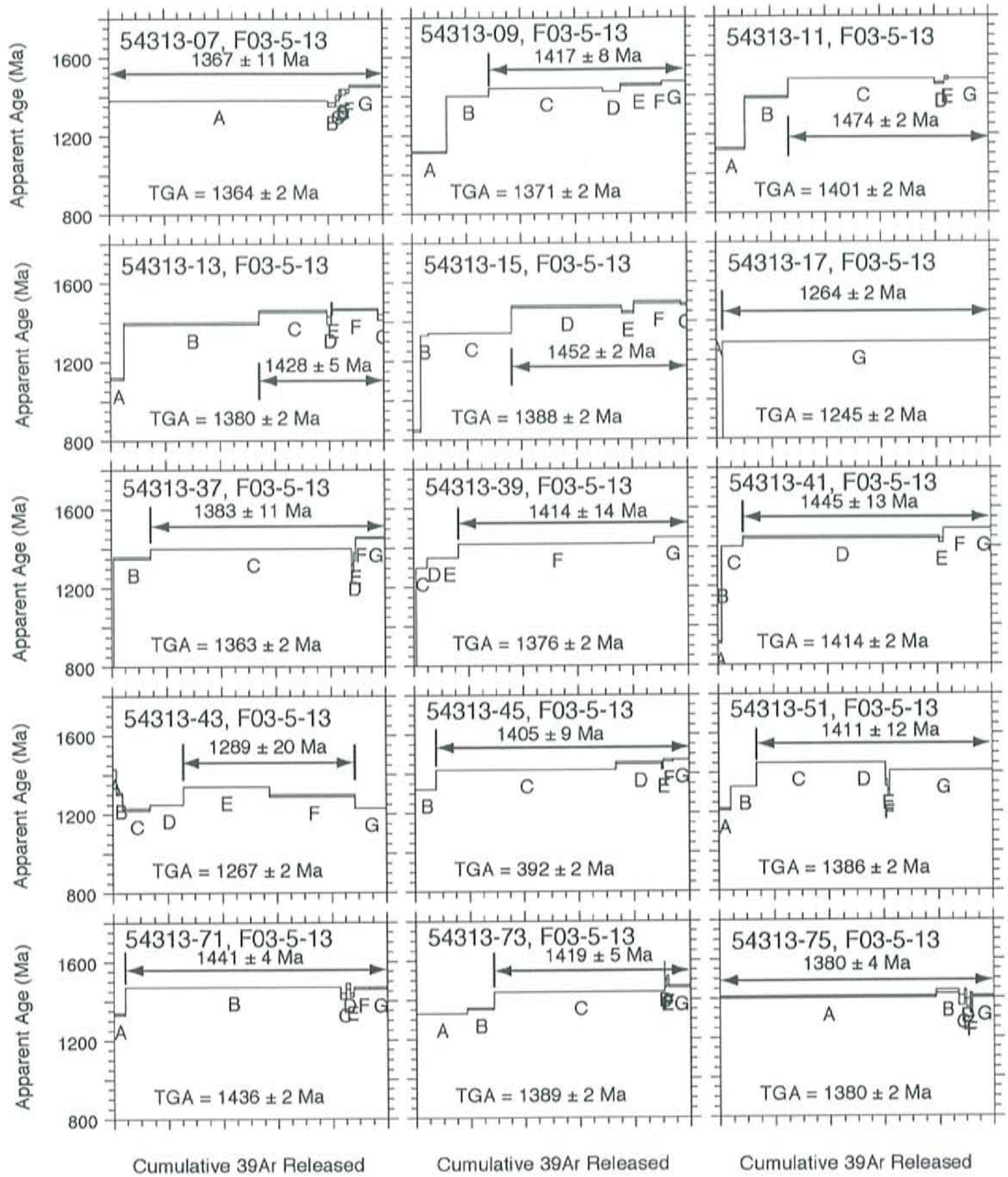


Single crystal muscovite age spectra for sample F03-5-18 (L# 54316)

Pioneer Shale Formation, Apache Group

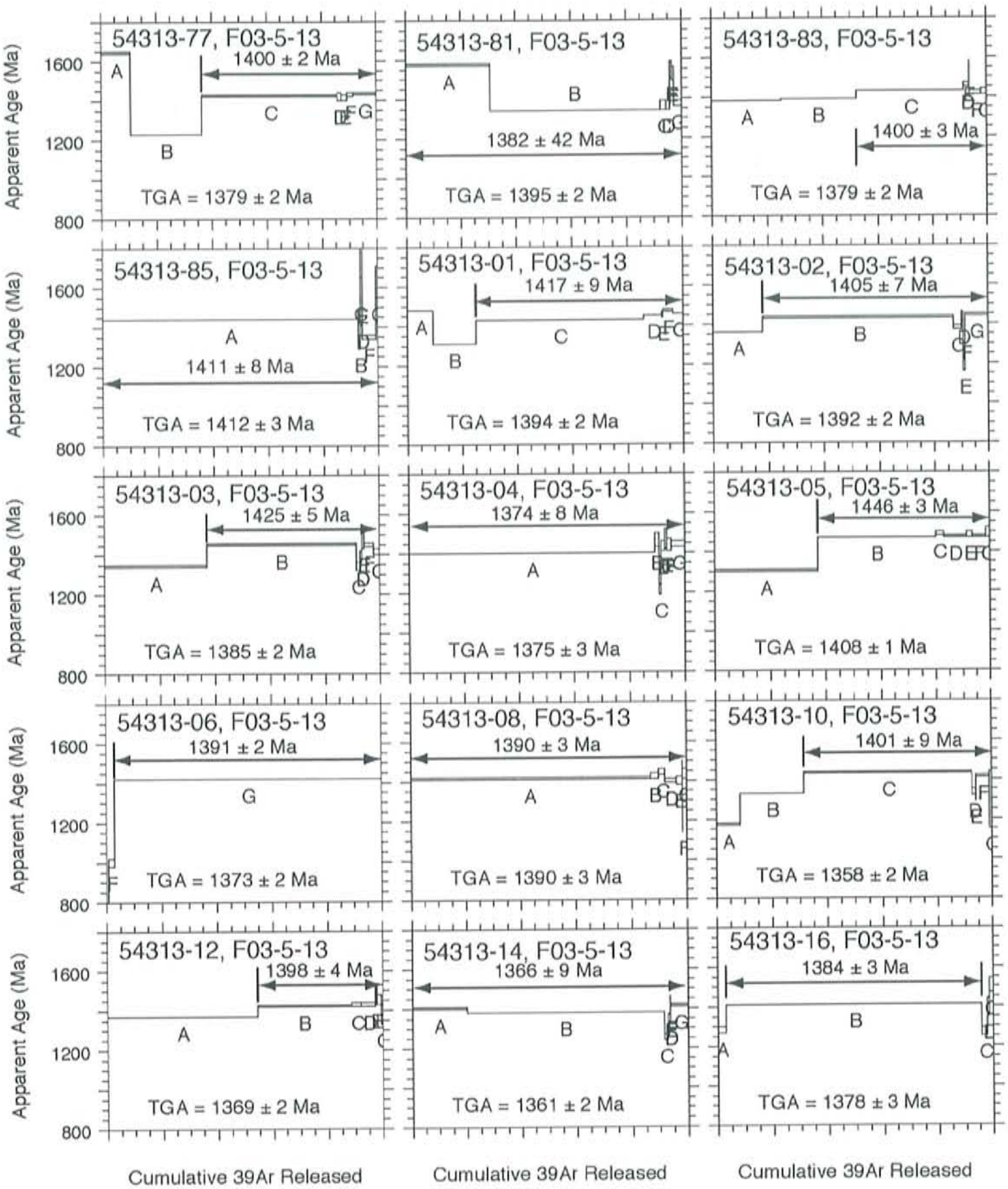


Single crysal muscovite age spectra for sample F03-5-13 (L# 54313)
Middle Member, Dripping Springs Quartzite, Apache Group



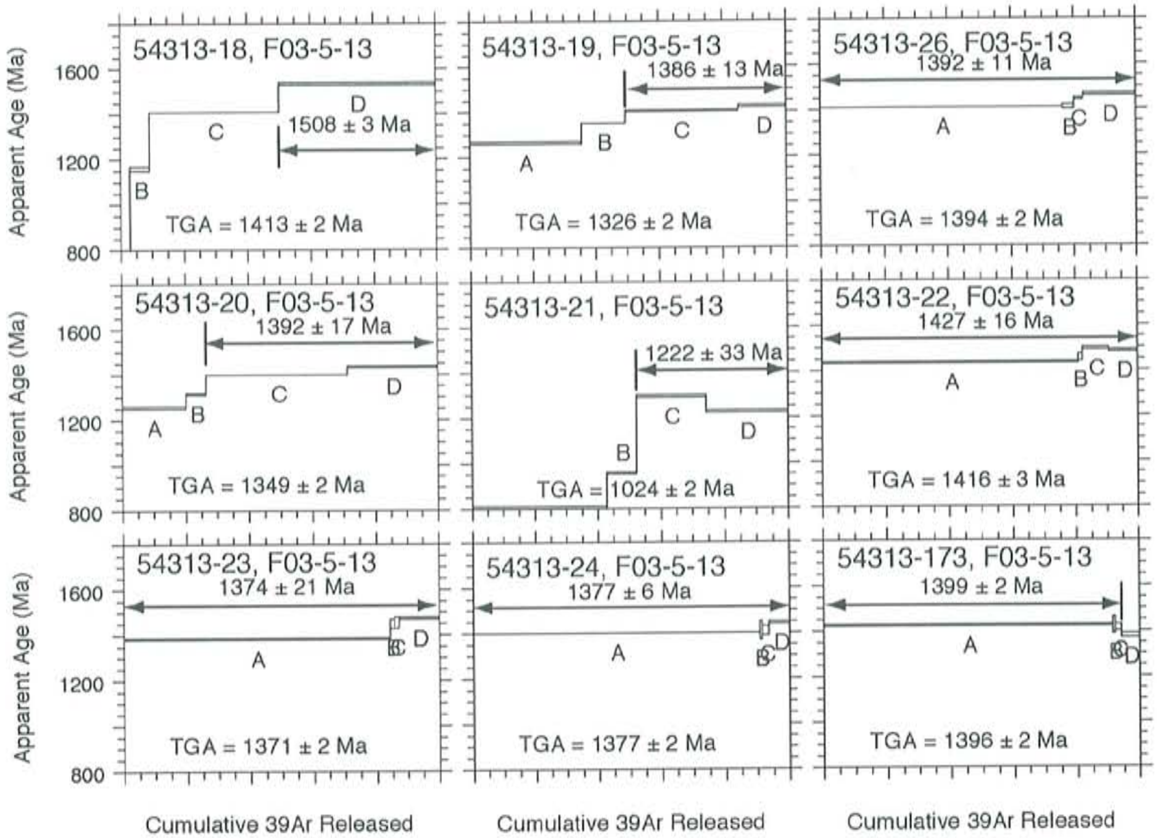
Single crysal muscovite age spectra for sample F03-5-13 (L# 54313)

Middle Member, Dripping Springs Quartzite, Apache Group



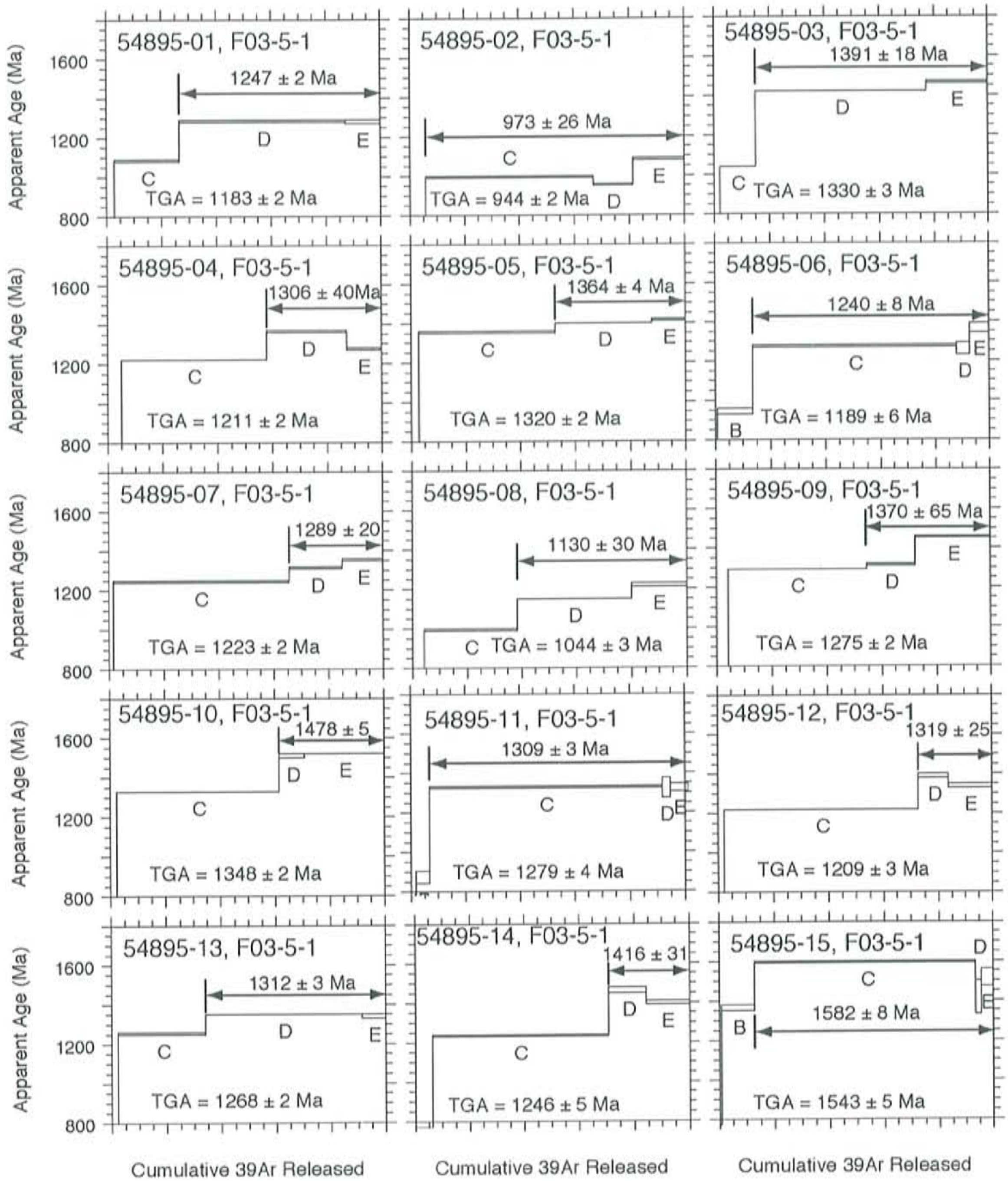
Single crysal muscovite age spectra for sample F03-5-13 (L# 54313)

Middle Member, Dripping Springs Quartzite, Apache Group

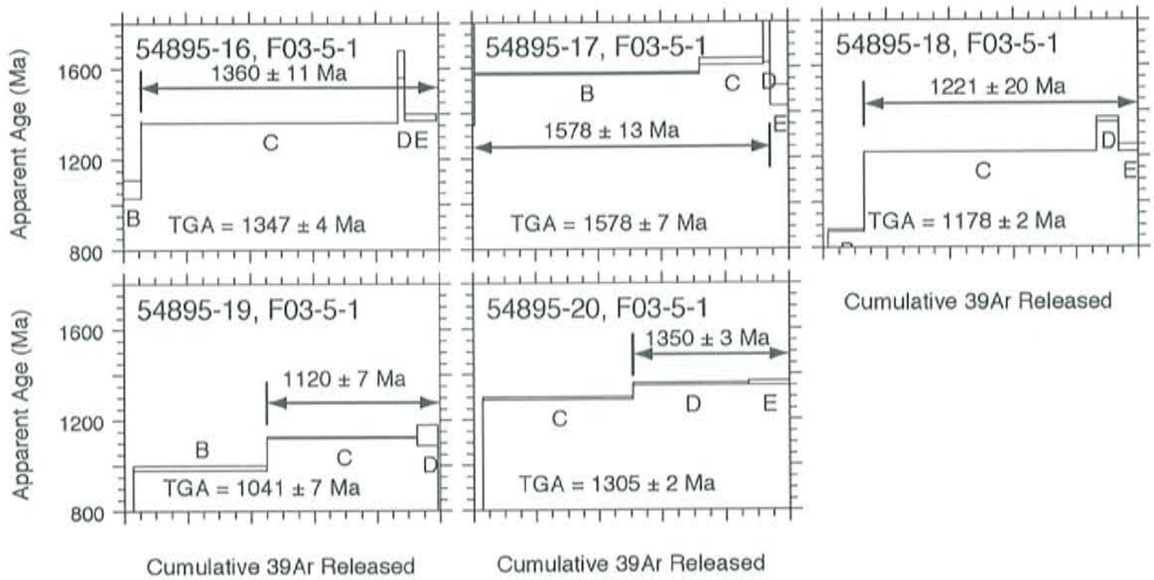


Single crystal muscovite age spectra for sample F03-5-1 (L# 54895)

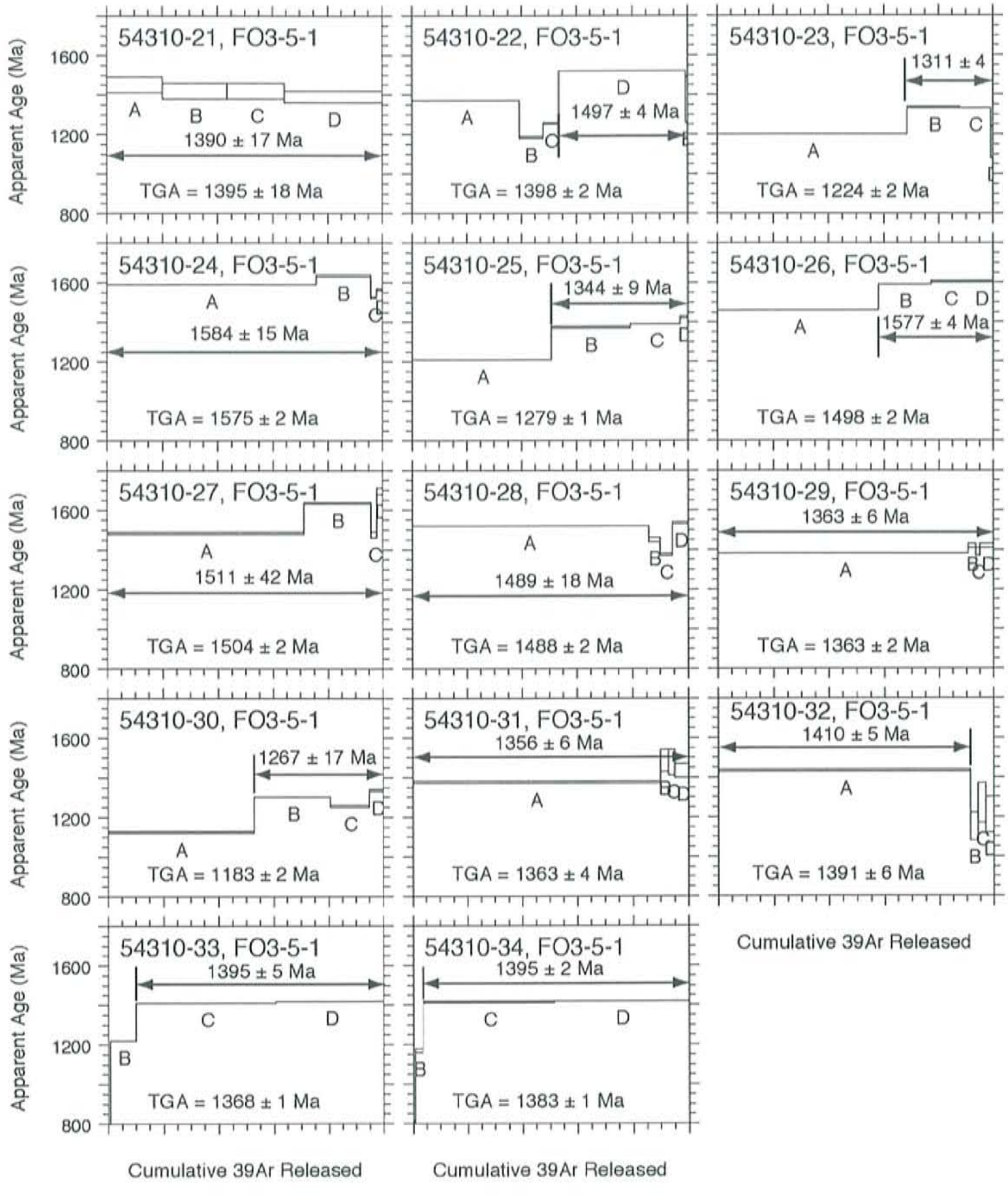
Dripping Springs Quartzite, Apache Group



Single crystal muscovite age spectra for sample F03-5-1 (L# 54895)
Dripping Springs Quartzite, Apache Group

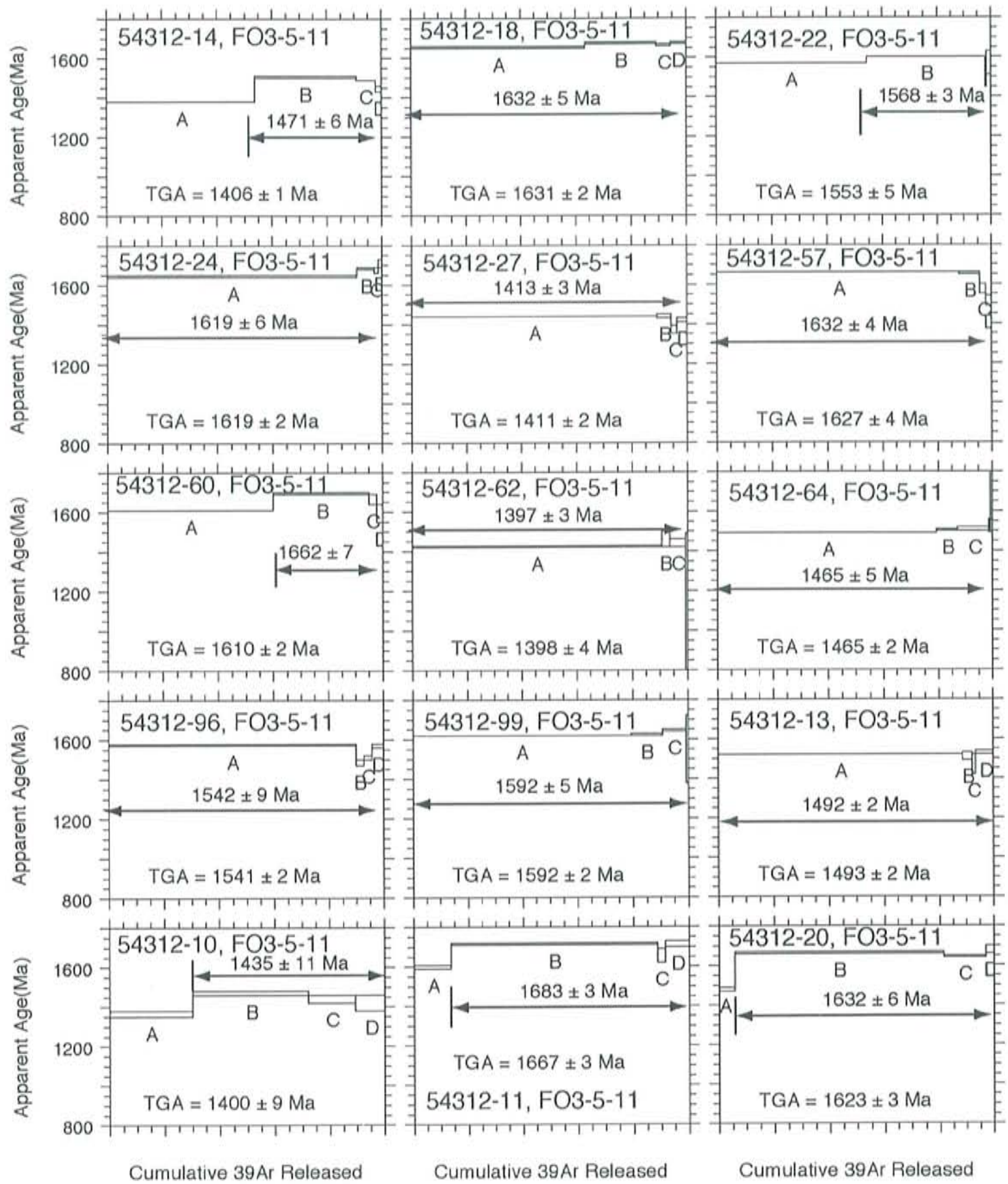


Single crystal muscovite age spectra for sample F03-5-1 (L# 54310)
Dripping Springs Formation, Apache Group

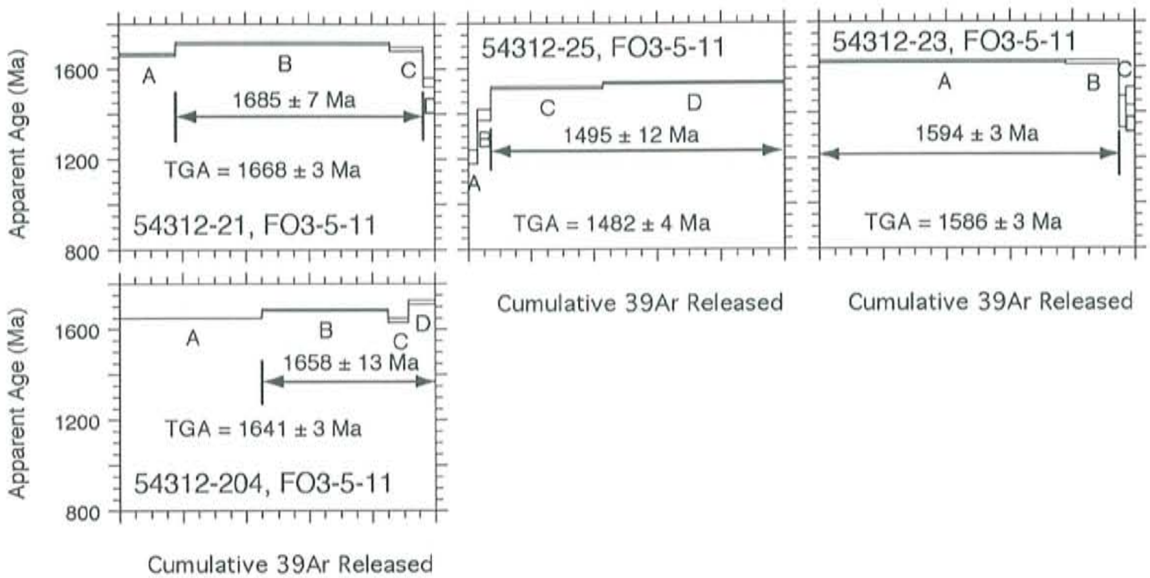


Single crystal muscovite age spectra for sample F03-5-11 (L# 54312)

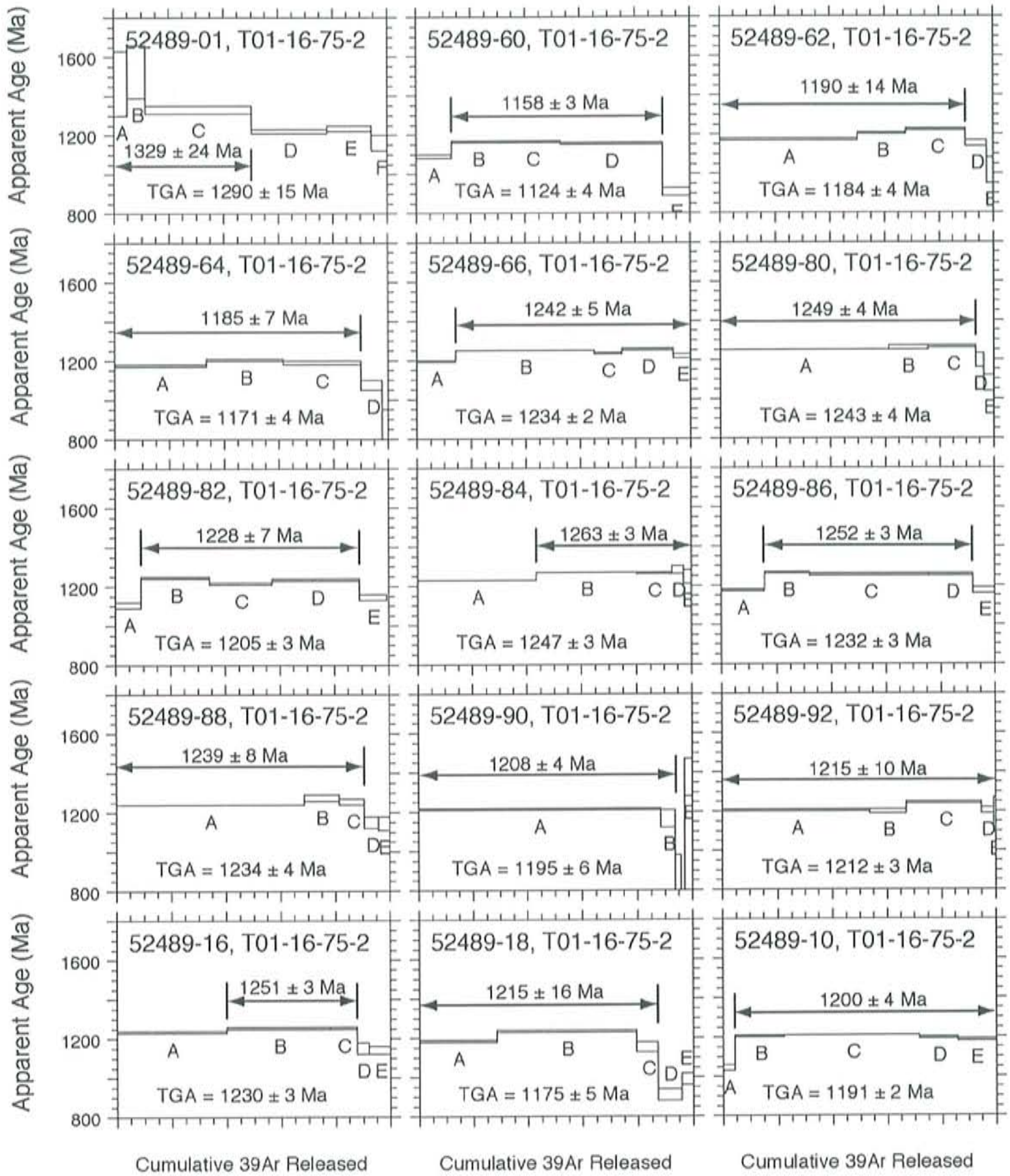
Chediski Sandstone, Troy Quartzite



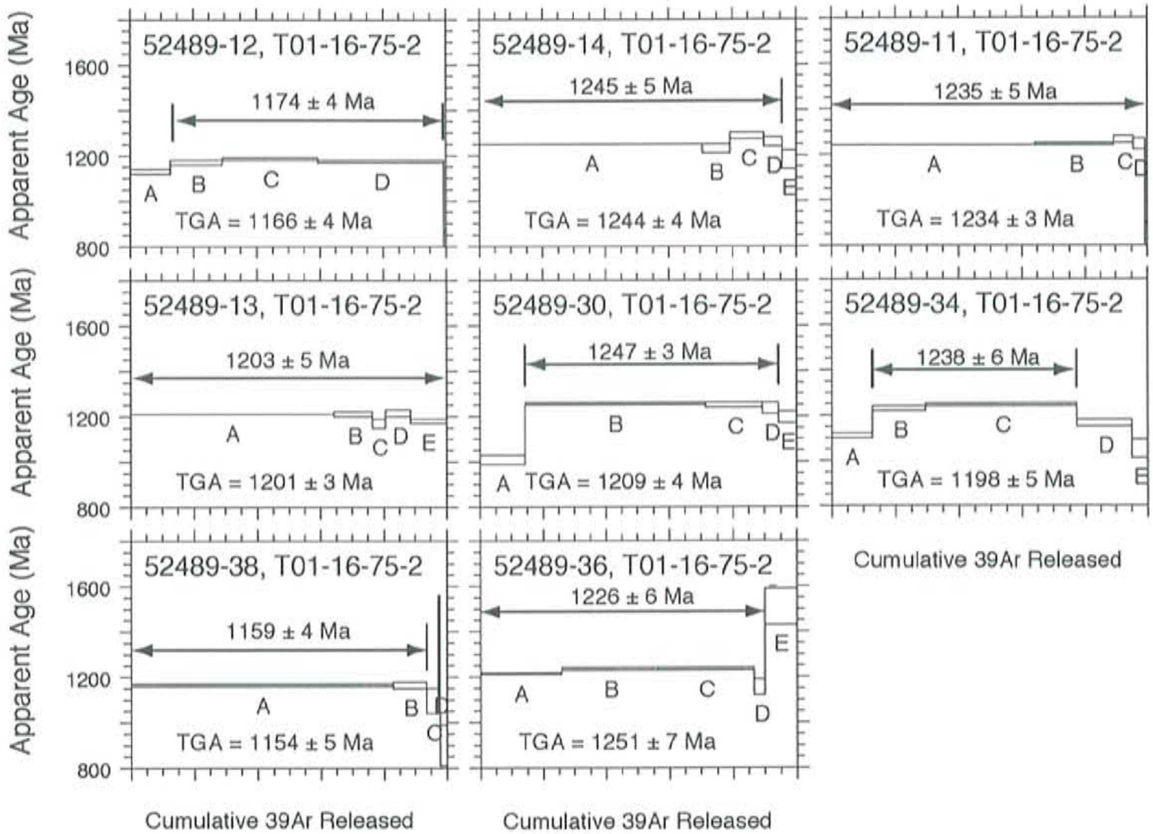
Single crystal muscovite age spectra for sample F03-5-11 (L# 54312)
Pioneer Shale Formation, Apache Group



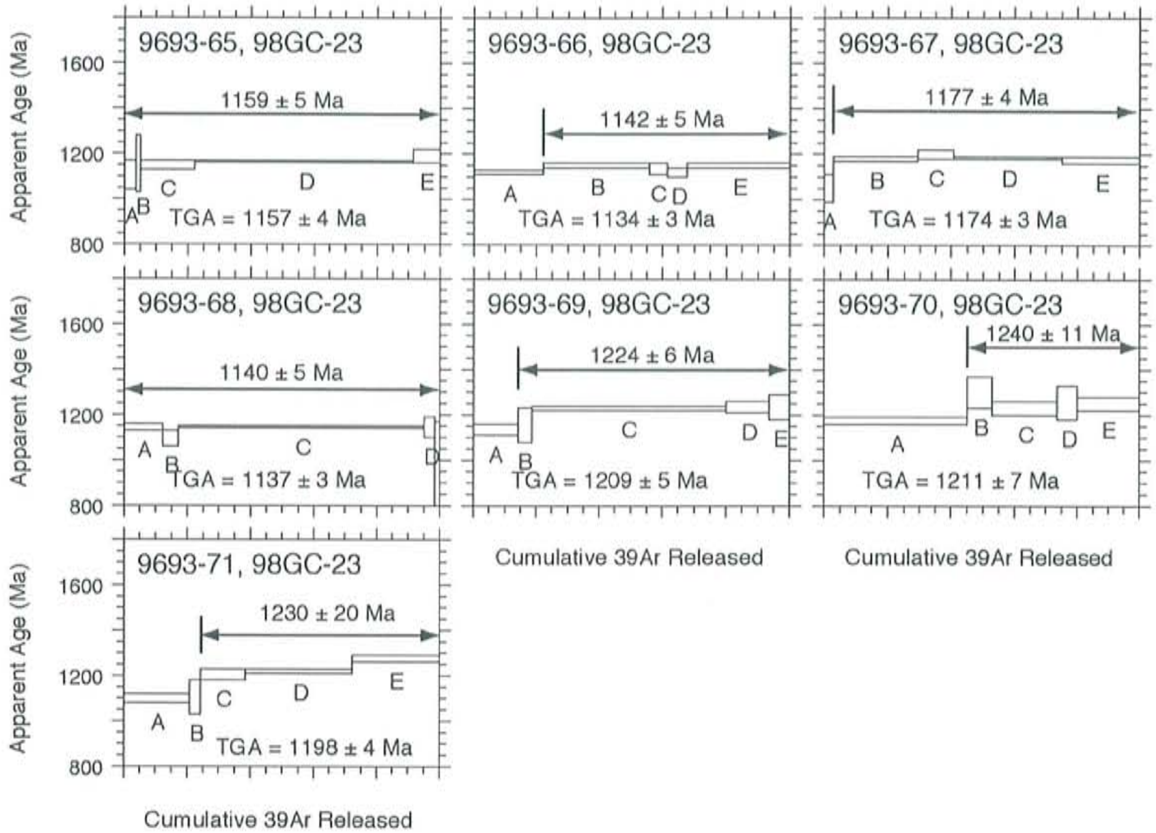
Single crystal muscovite age spectra for sample T-16-75-2 (L# 52489)
Escalante Creek Member, Dox Formation



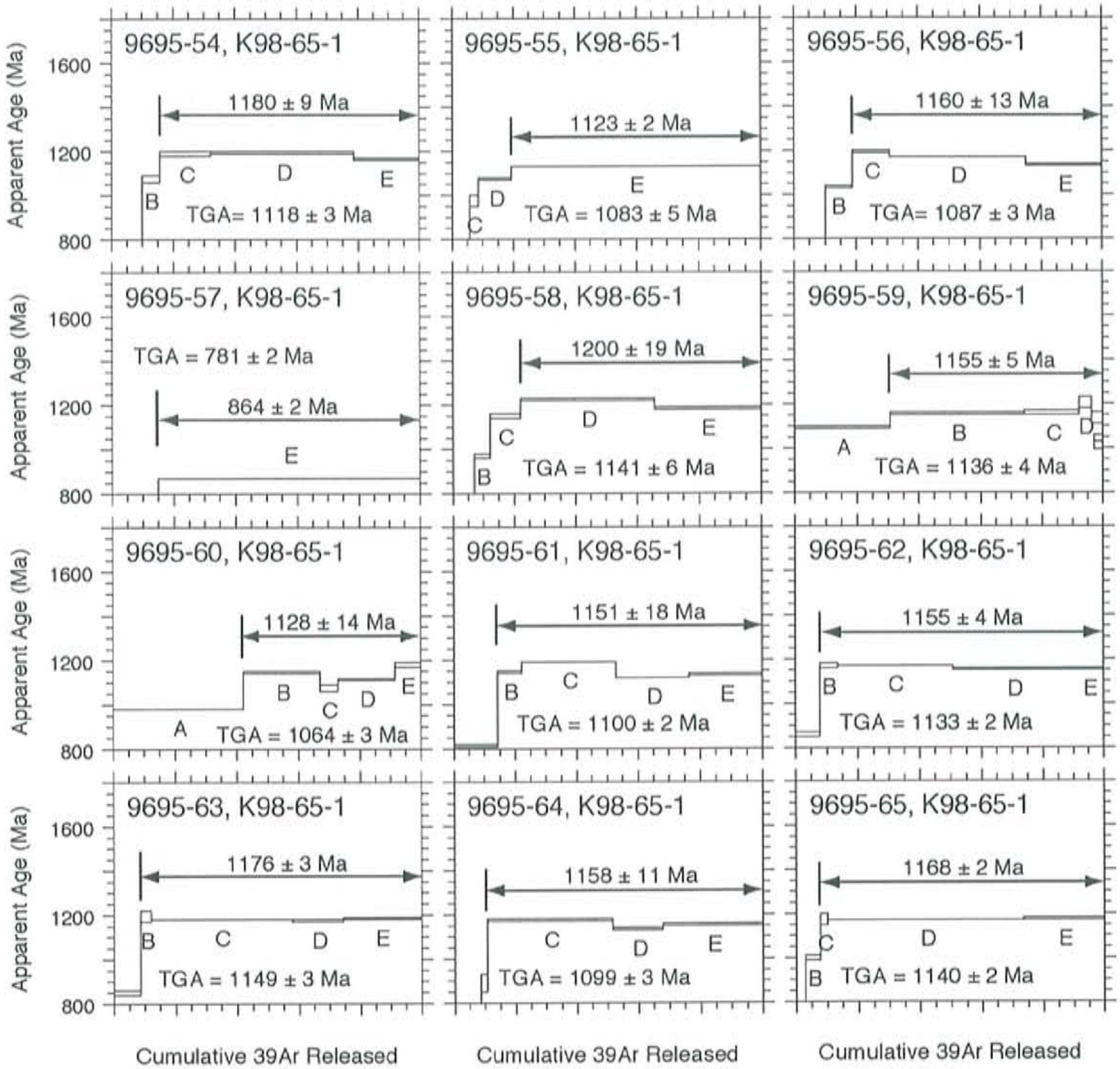
Single crystal muscovite age spectra for sample T-16-75-2 (L# 52489)
Escalante Creek Member, Dox Fomation



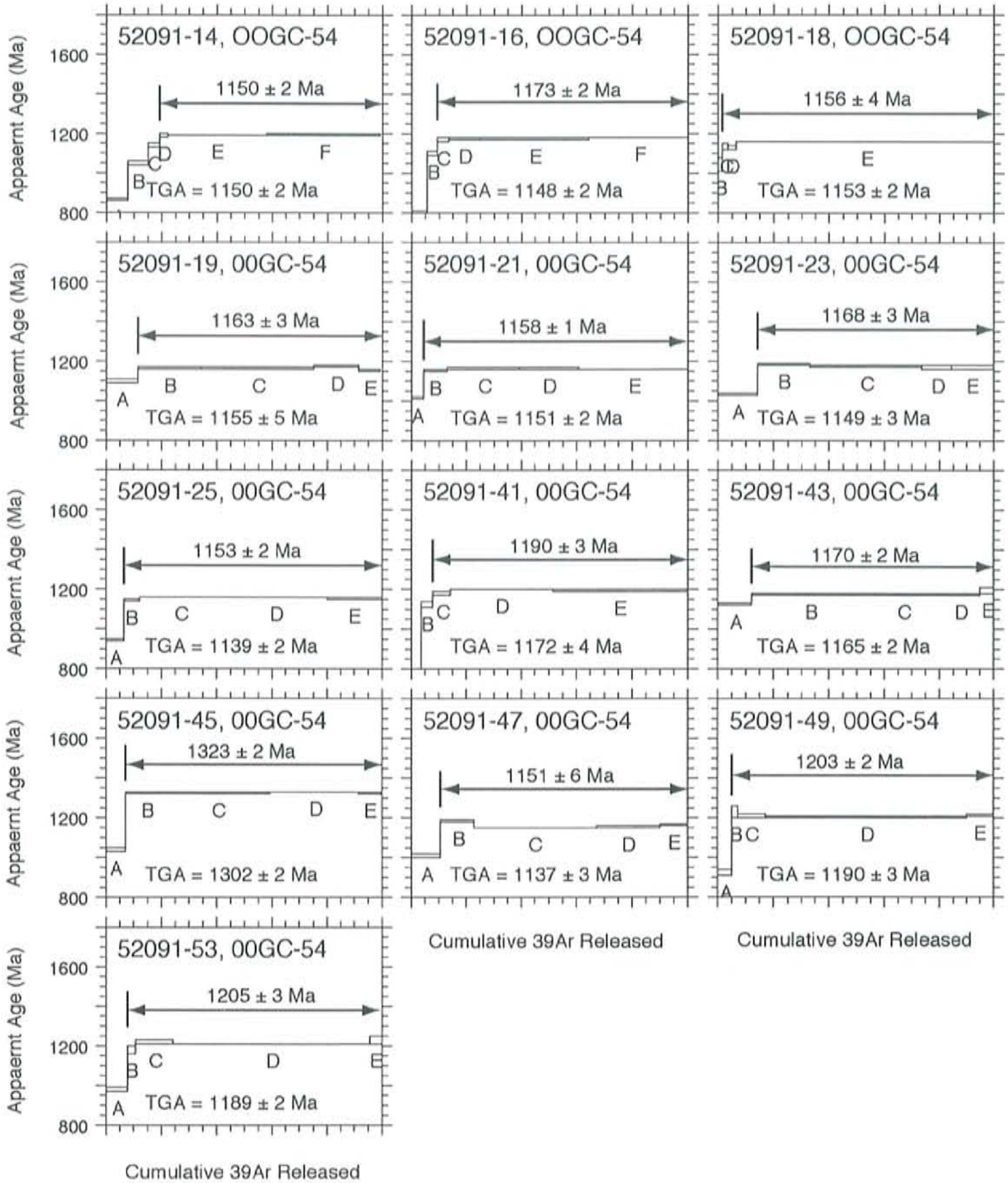
Single crystal muscovite age spectra for sample 98GC-23 (L# 9693)
Escalante Creek Member, Dox Formation



Single crystal muscovite age spectra for sample K98-65-1 (L# 9695)
Escalante Creek Member, Dox Formation

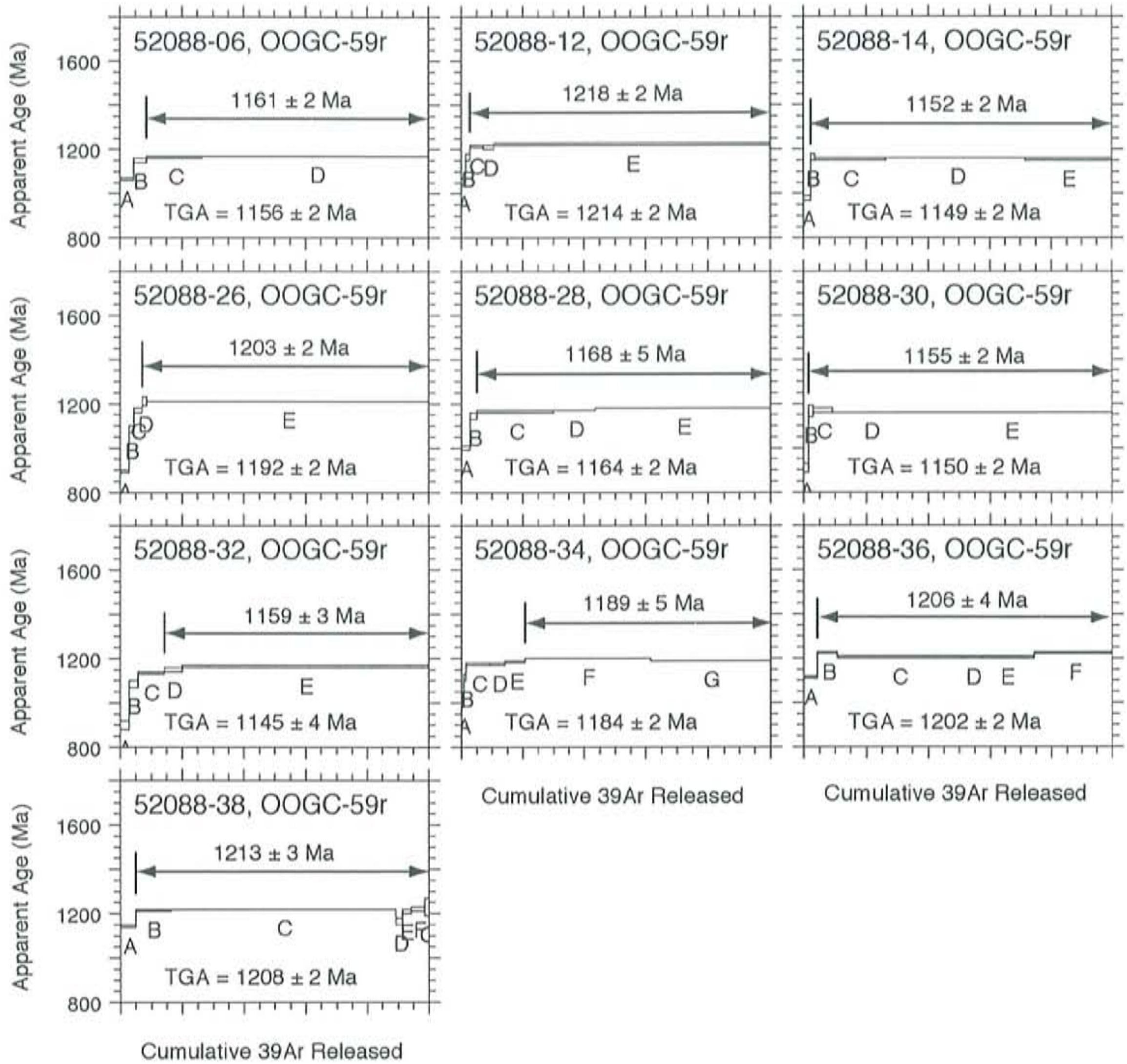


Single crystal muscovite age spectra for sample 00GC-54 (L# 52091)
Escalante Creek Member, Dox Formation.

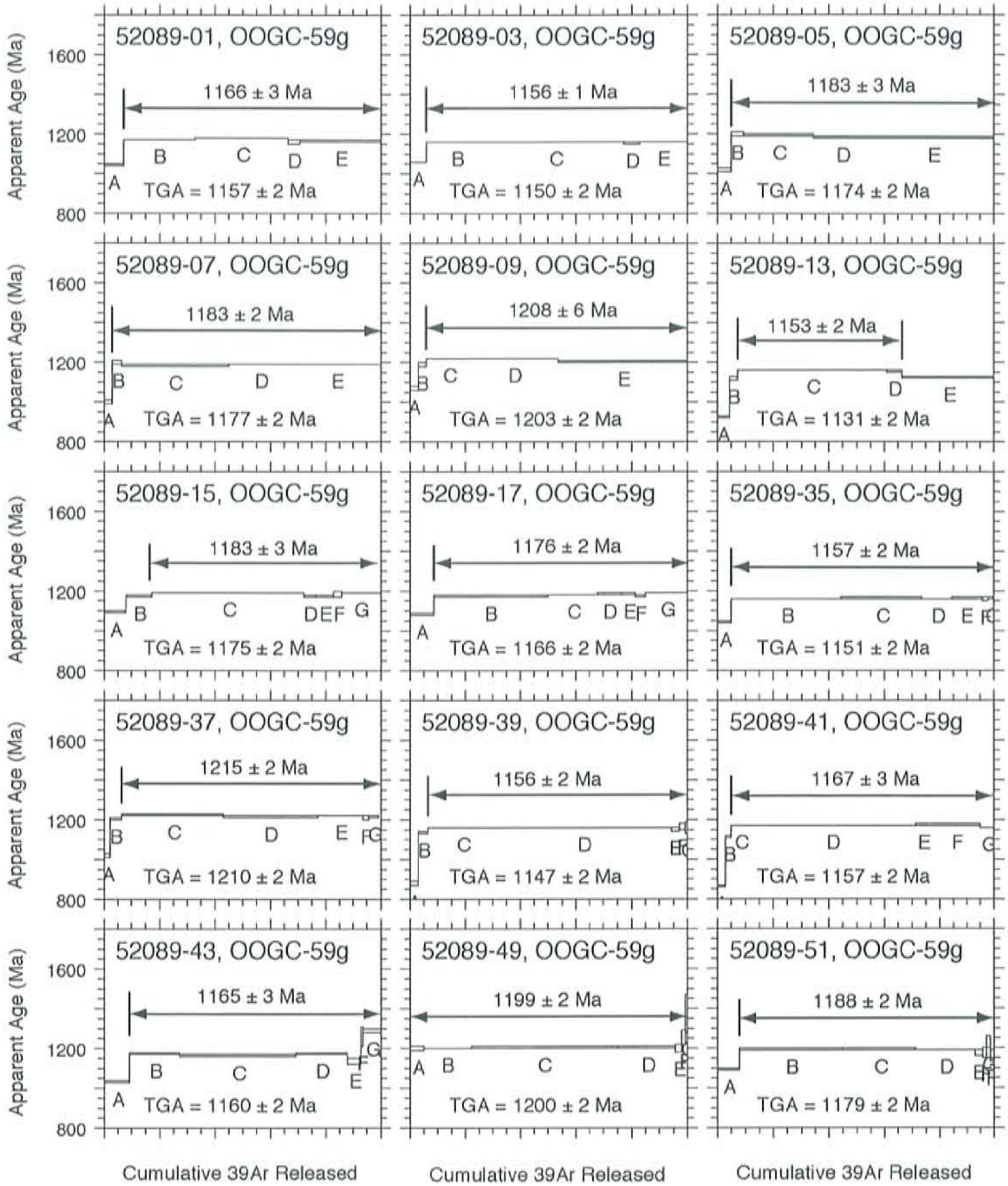


Single crystal muscovite age spectra for sample 00GC- 59r (L# 52088)

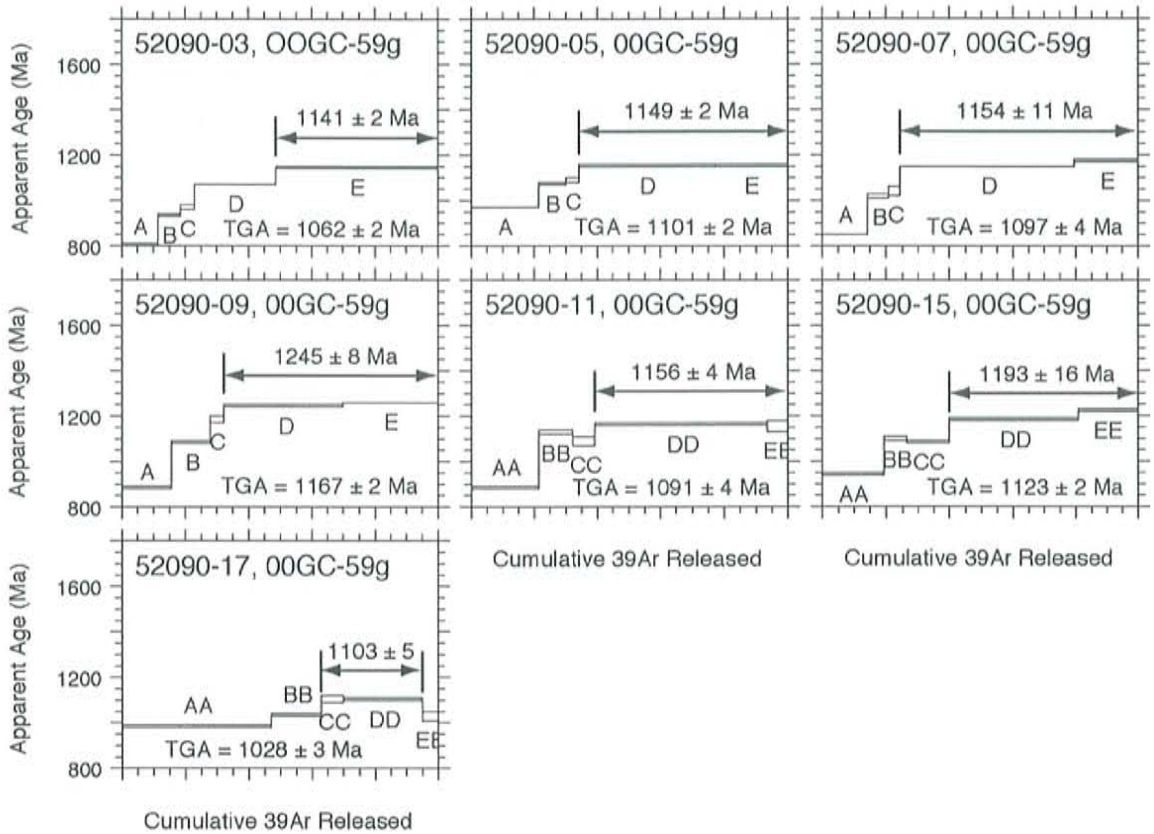
Solomon Temple Member, Dox Formation



Single crystal muscovite age spectra for sample 00GC-59g (L# 52089)
Solomon Temple Member, Dox Formation

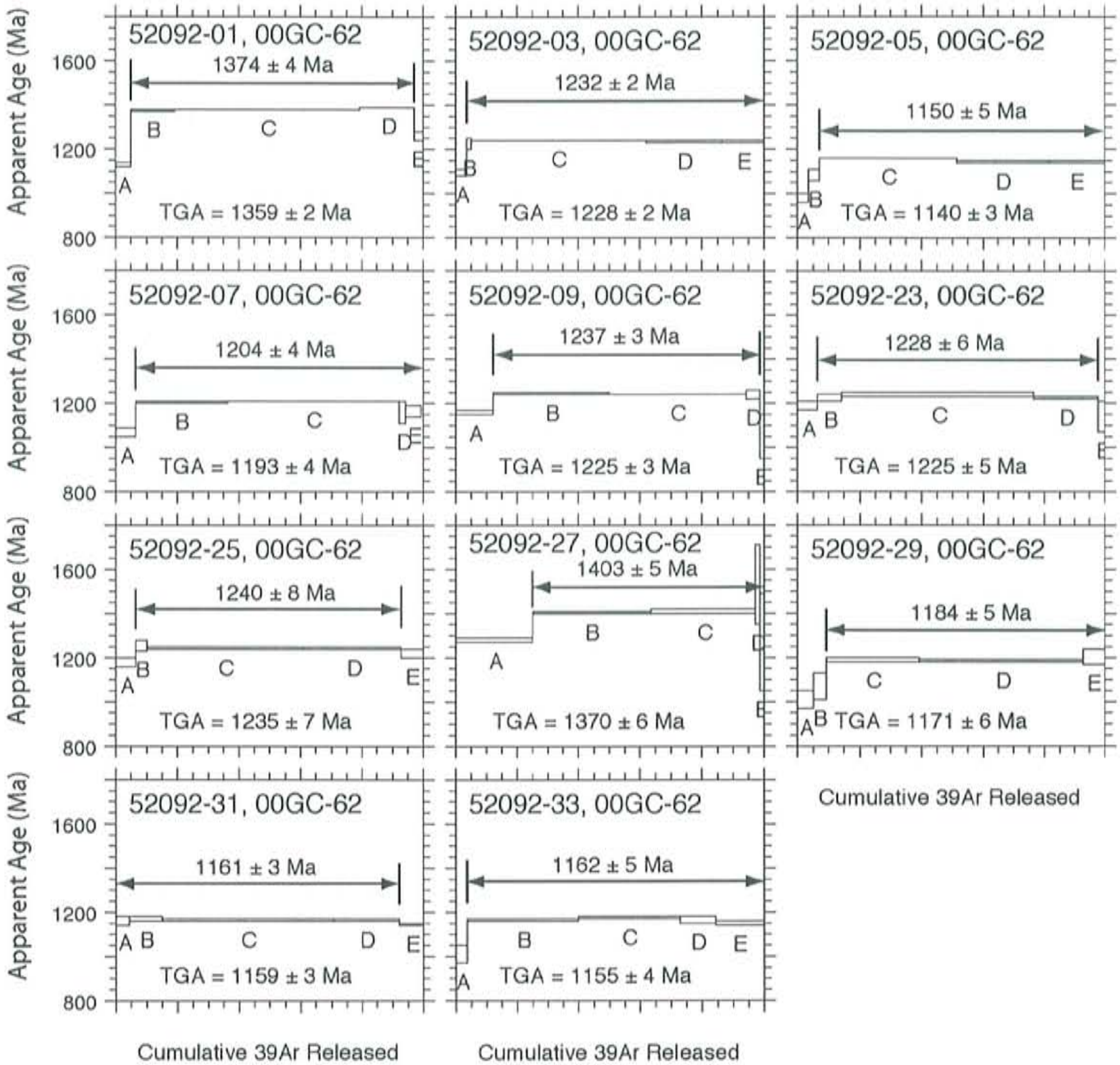


Single crystal biotite age spectra for sample 00GC-59g (L# 52090)
Solomon Temple Member, Dox Formation



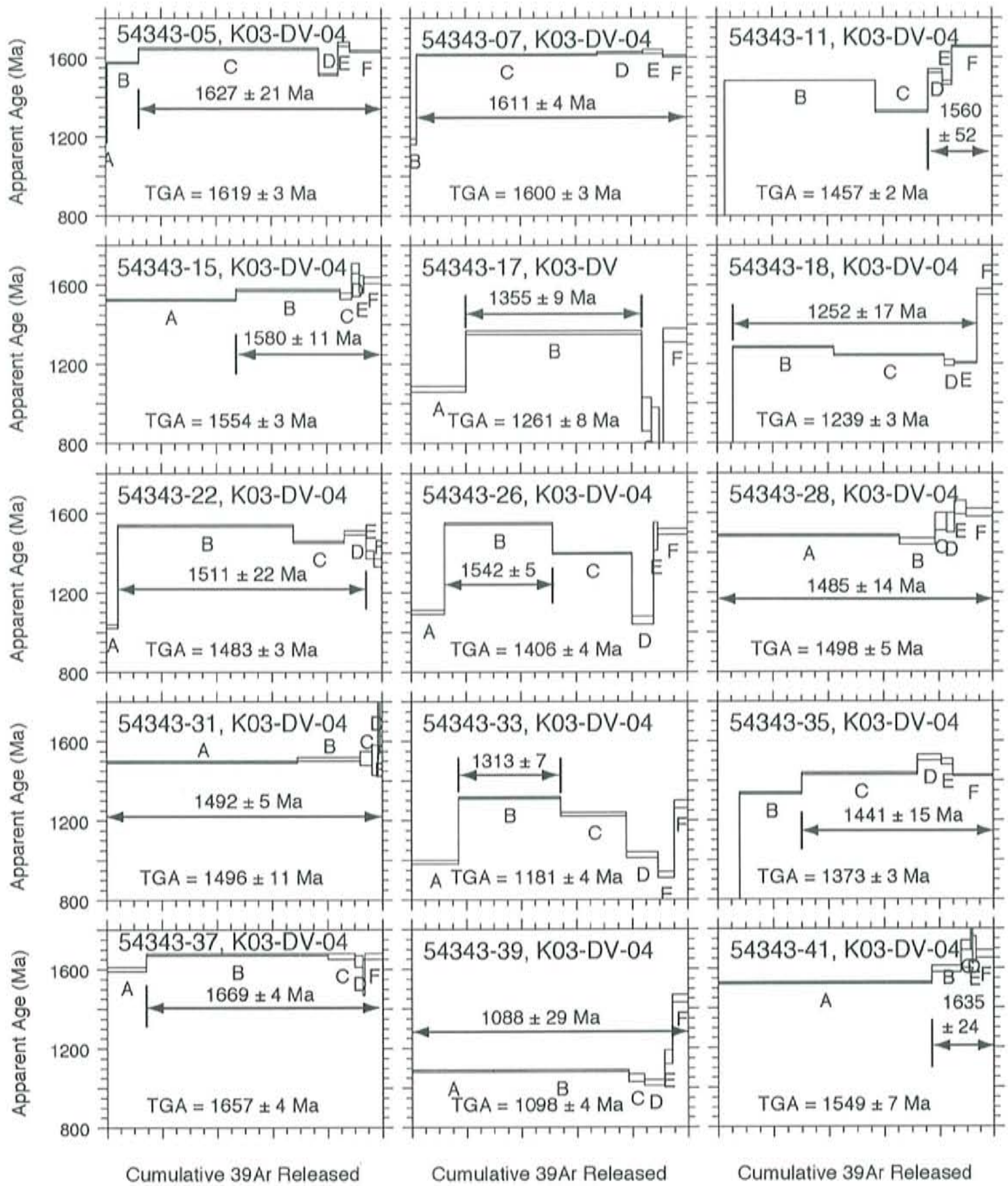
Single crystal muscovite age spectra for sample 00GC-62 (I# 529092)

Ochoa Point Member, Dox Formation

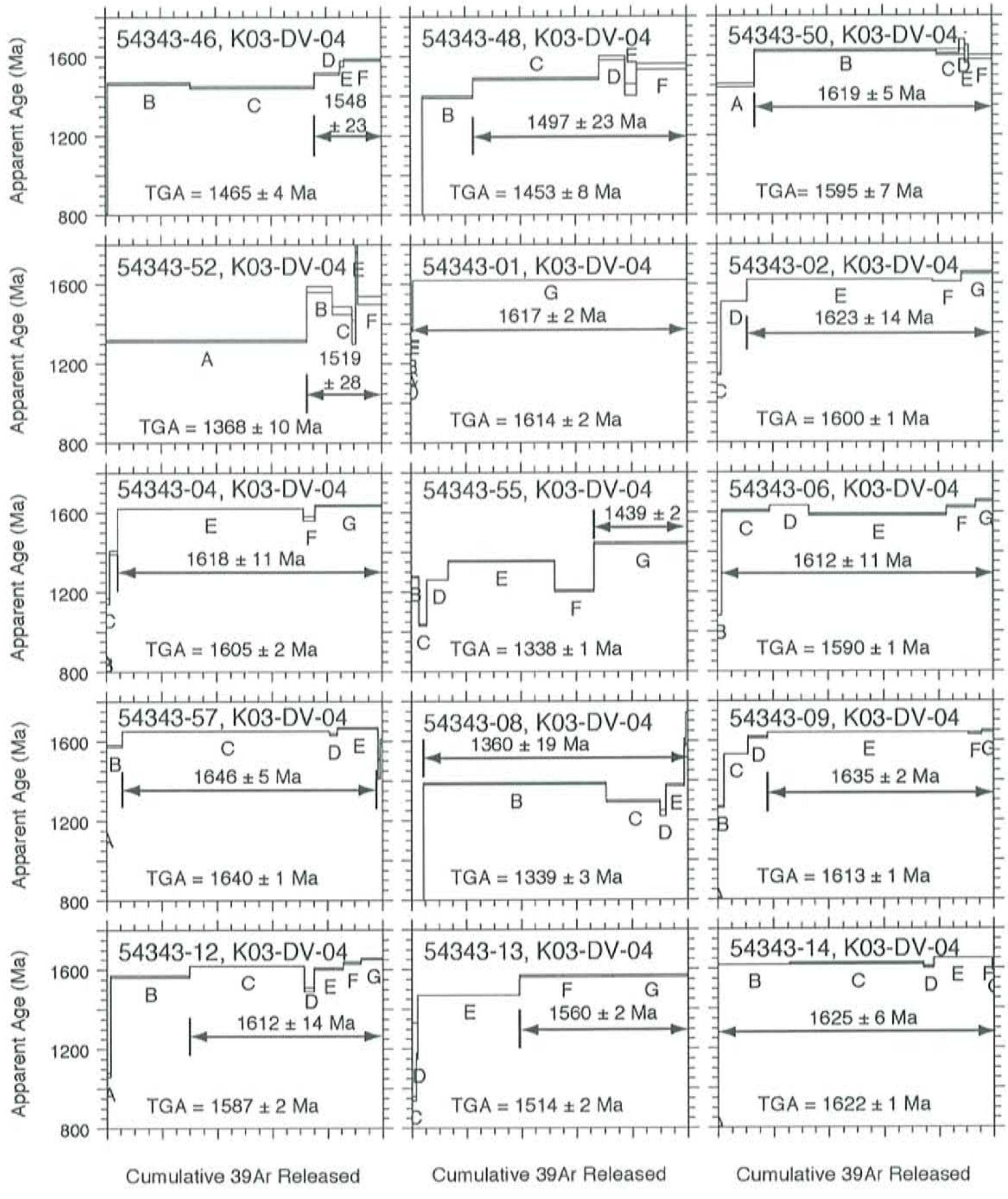


Single crystal muscovite age spectra for sample K03-DV-04 (L# 54343)

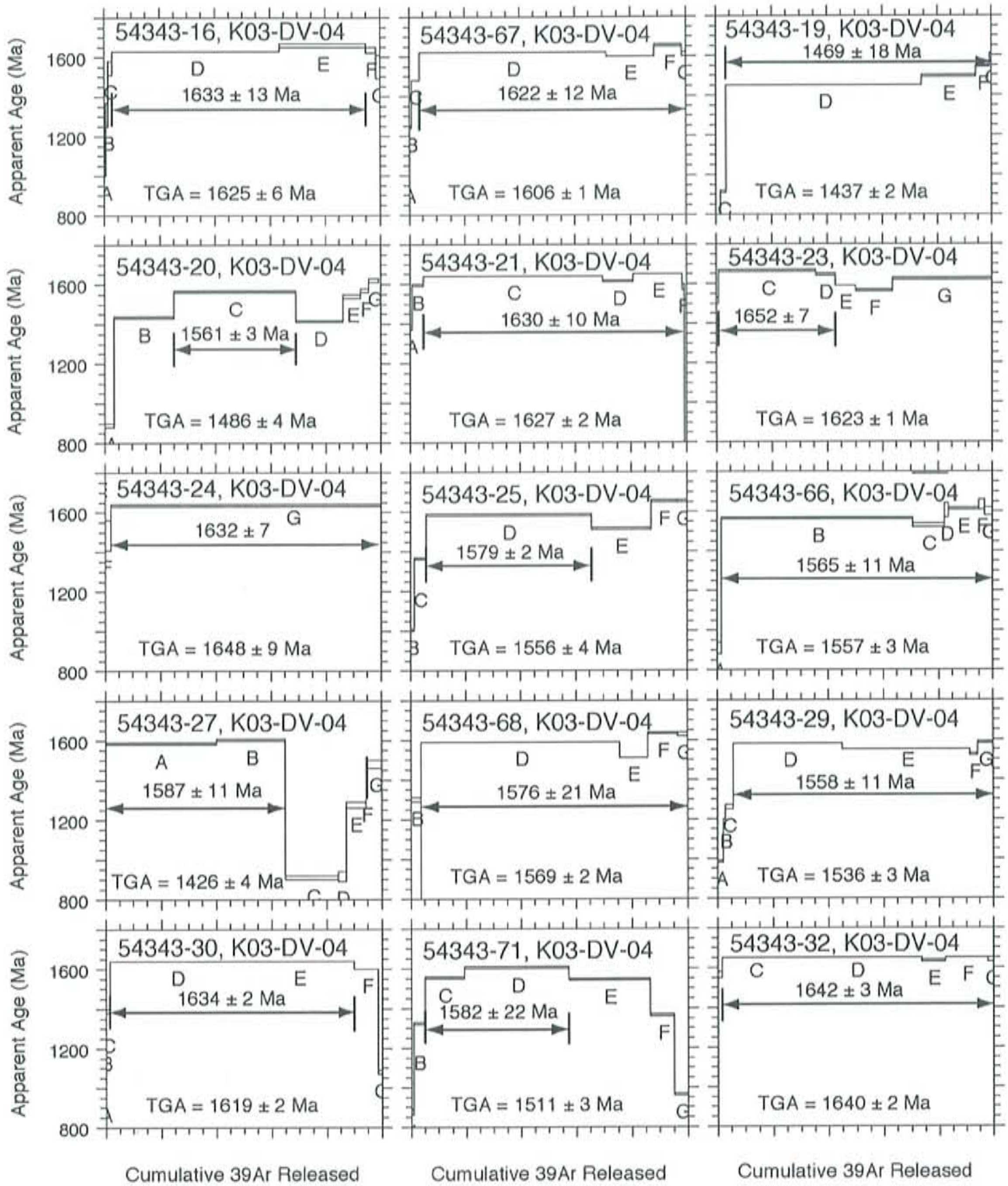
Arkose Member, Crystal Springs Formation



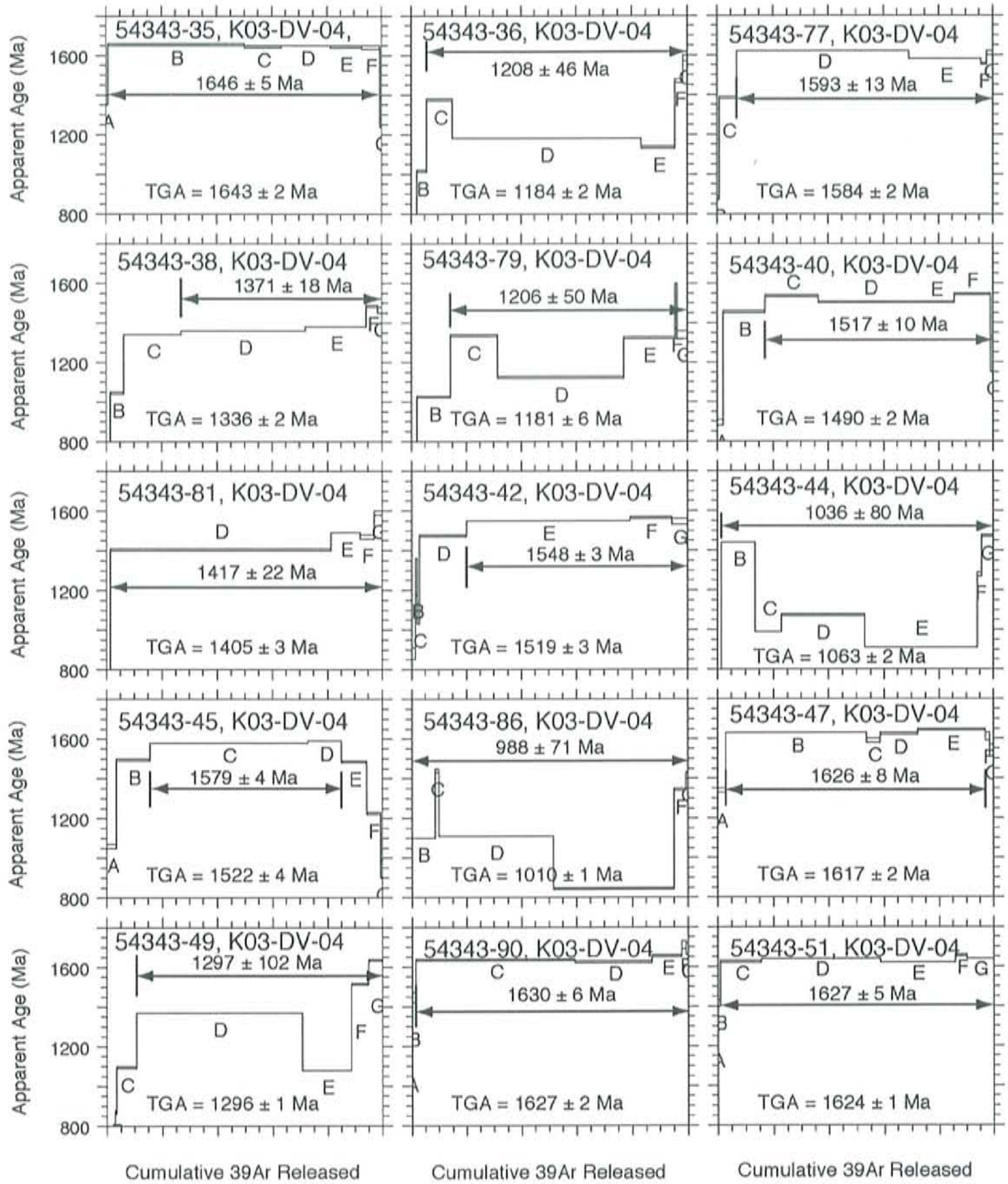
Single crystal muscovite age spectra for sample K03-DV-04 (L# 54343)
Arkose Member, Crystal Springs Formation



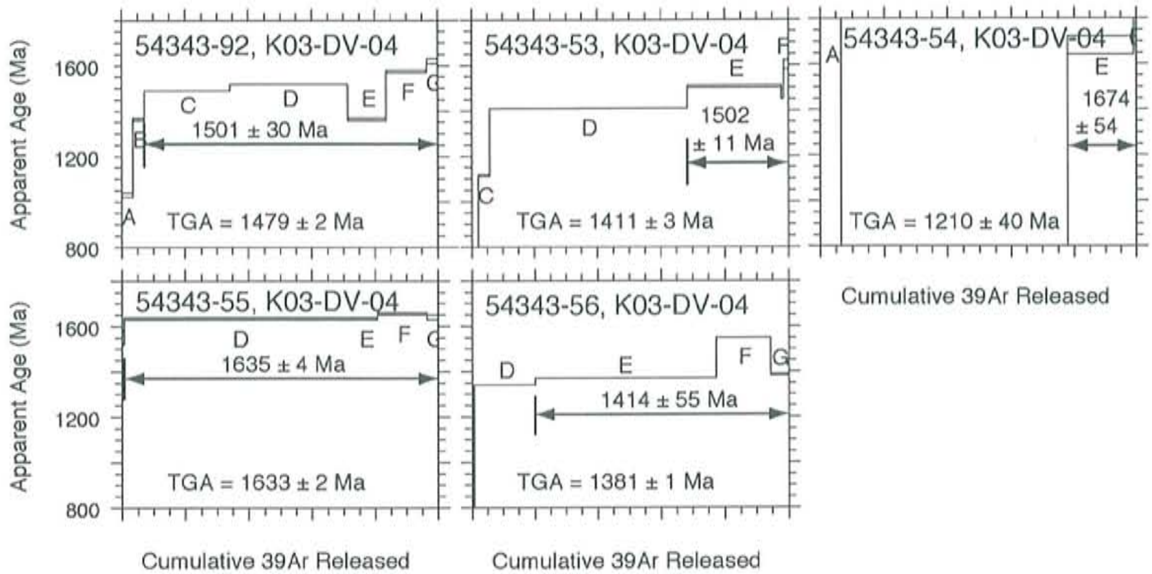
Single crystal muscovite age spectra for sample K03-DV-04 (L# 54343)
Arkose Member, Crystal Springs Formation



Single crystal muscovite age spectra for sample K03-DV-04 (L# 54343)
Arkose Member, Crystal Springs Formation

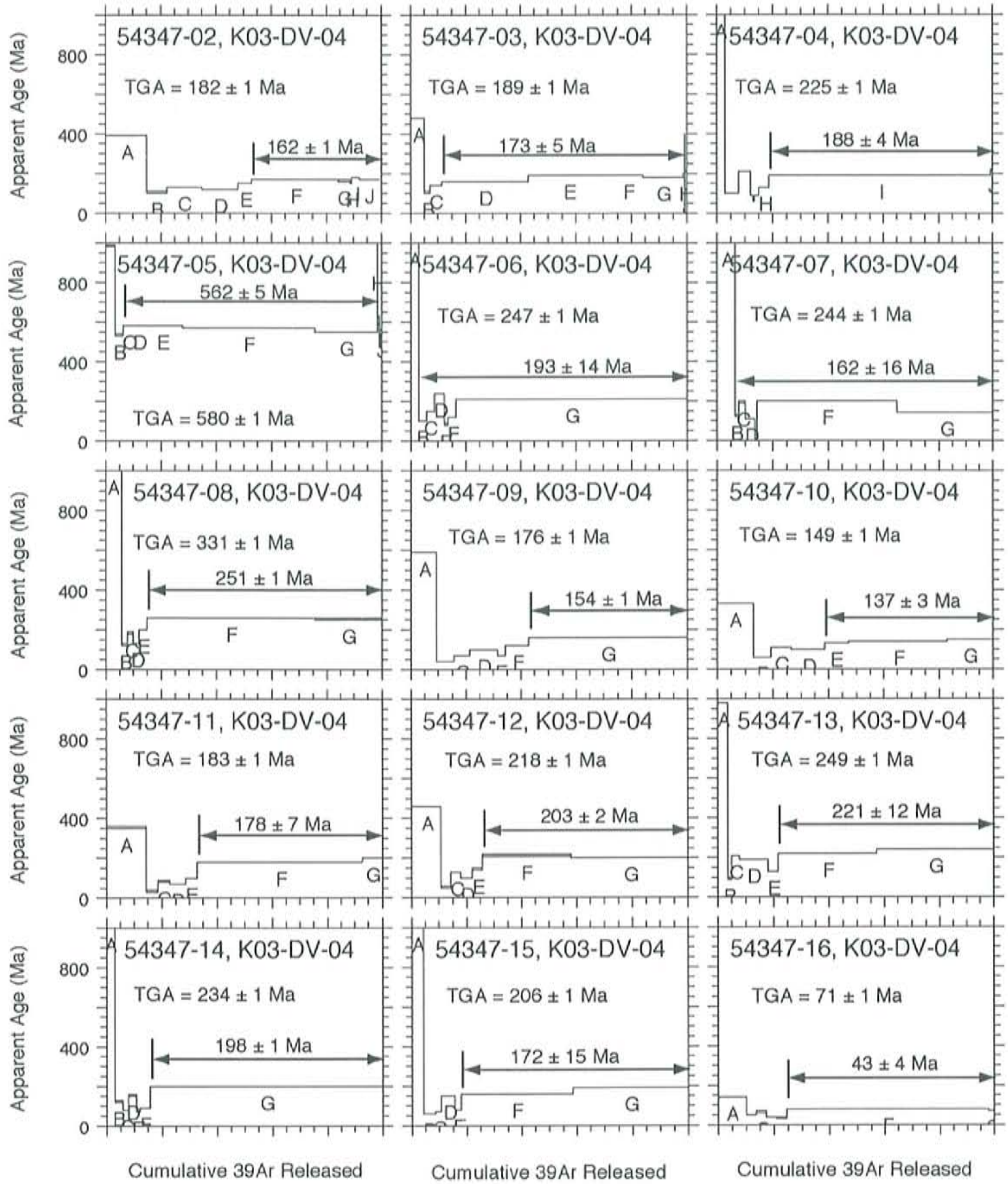


Single crystal muscovite age spectra for sample K03-DV-04 (L# 54343)
Arkose Member, Crystal Springs Formation

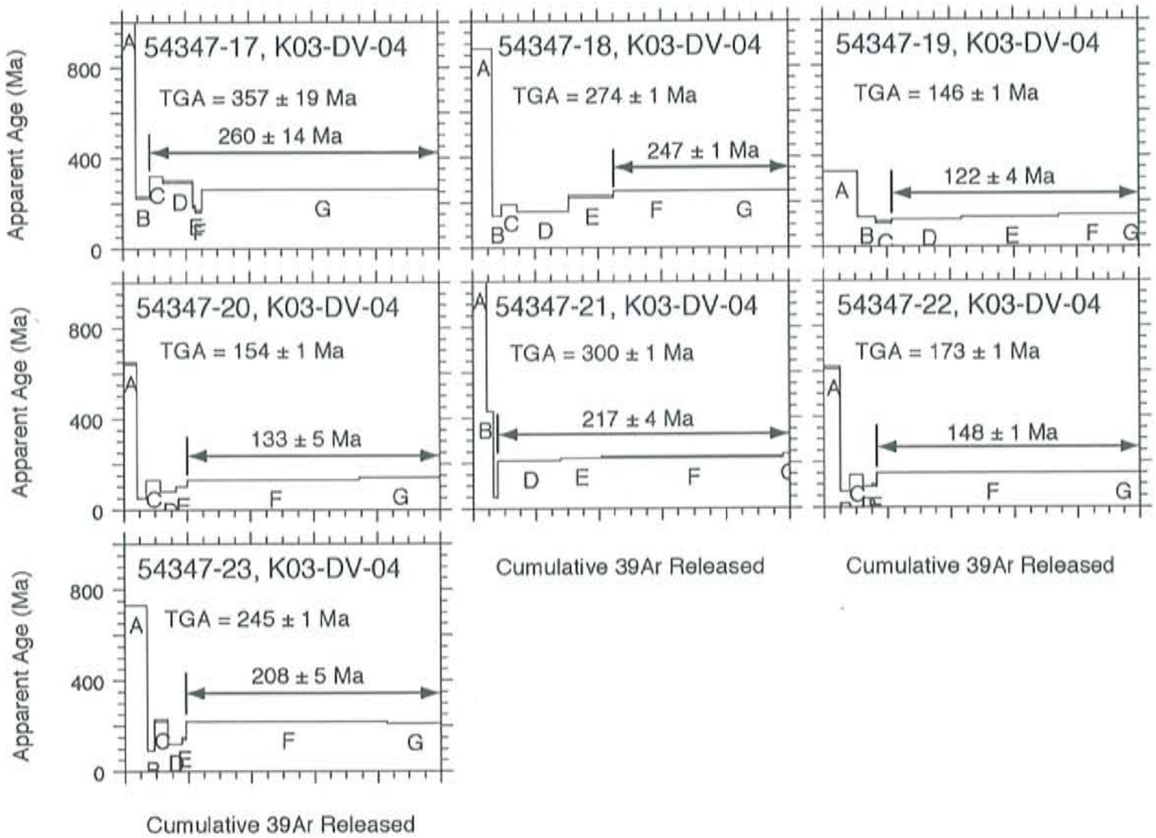


Single crystal feldspar age spectra for sample K03-DV-04 (L# 54347)

Arkose Member, Crystal Springs Formation

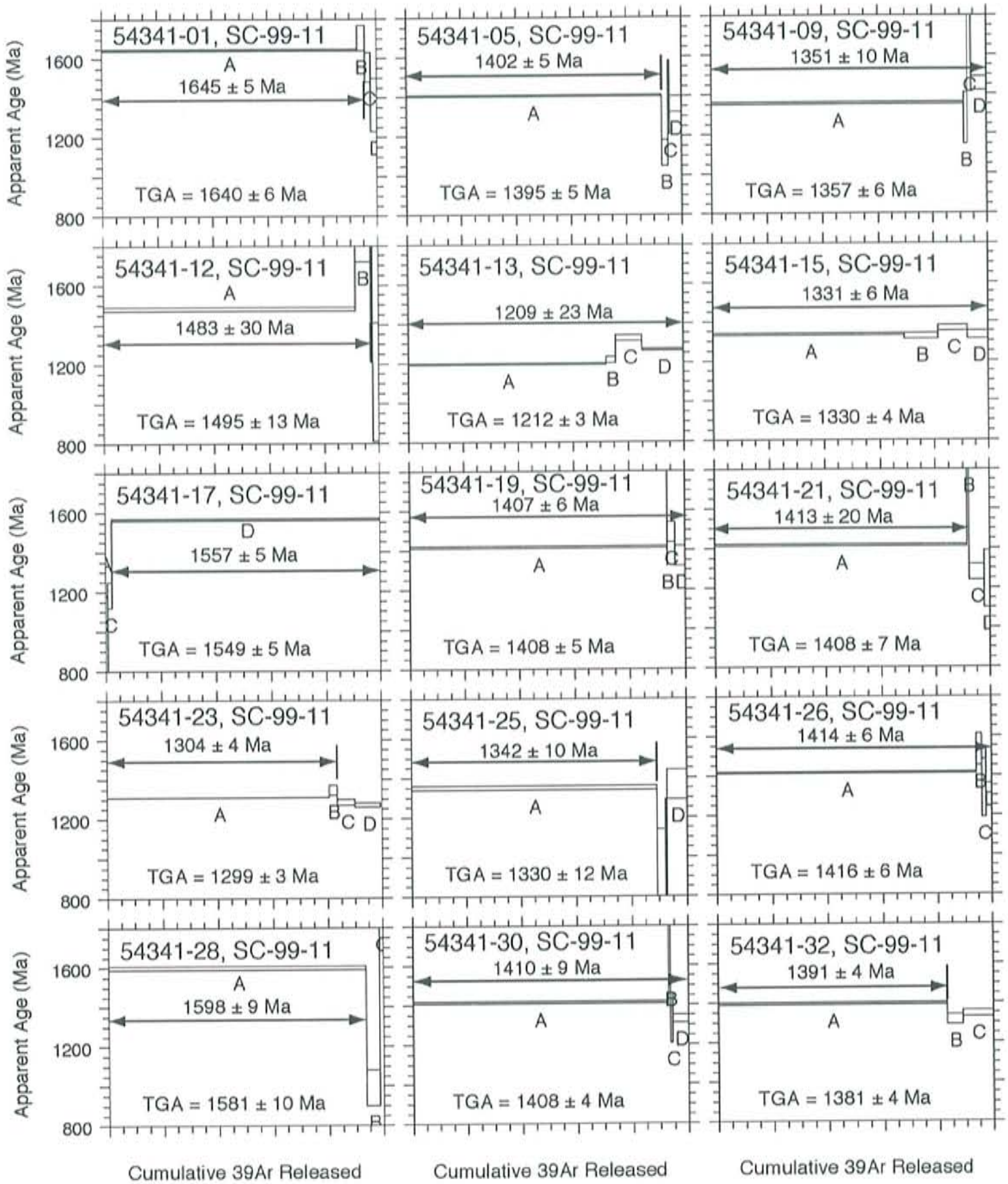


Single crystal feldspar age spectra for sample K03-DV-04 (L# 54347)
Arkose Member, Crystal Springs Formation

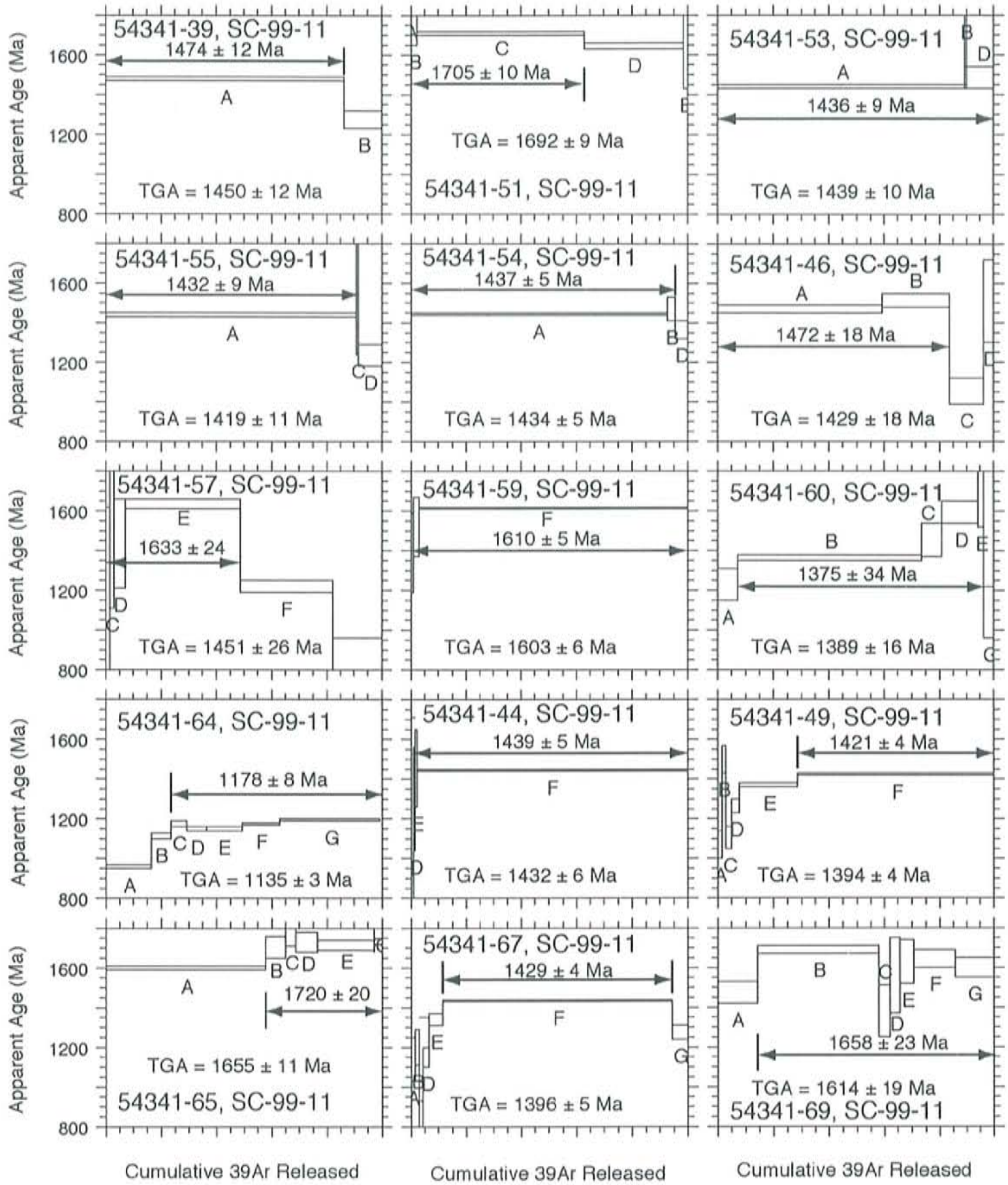


Single crystal muscovite age spectra for sample SC-99-11 (L# 54341)

Shale, Debaca Sequence

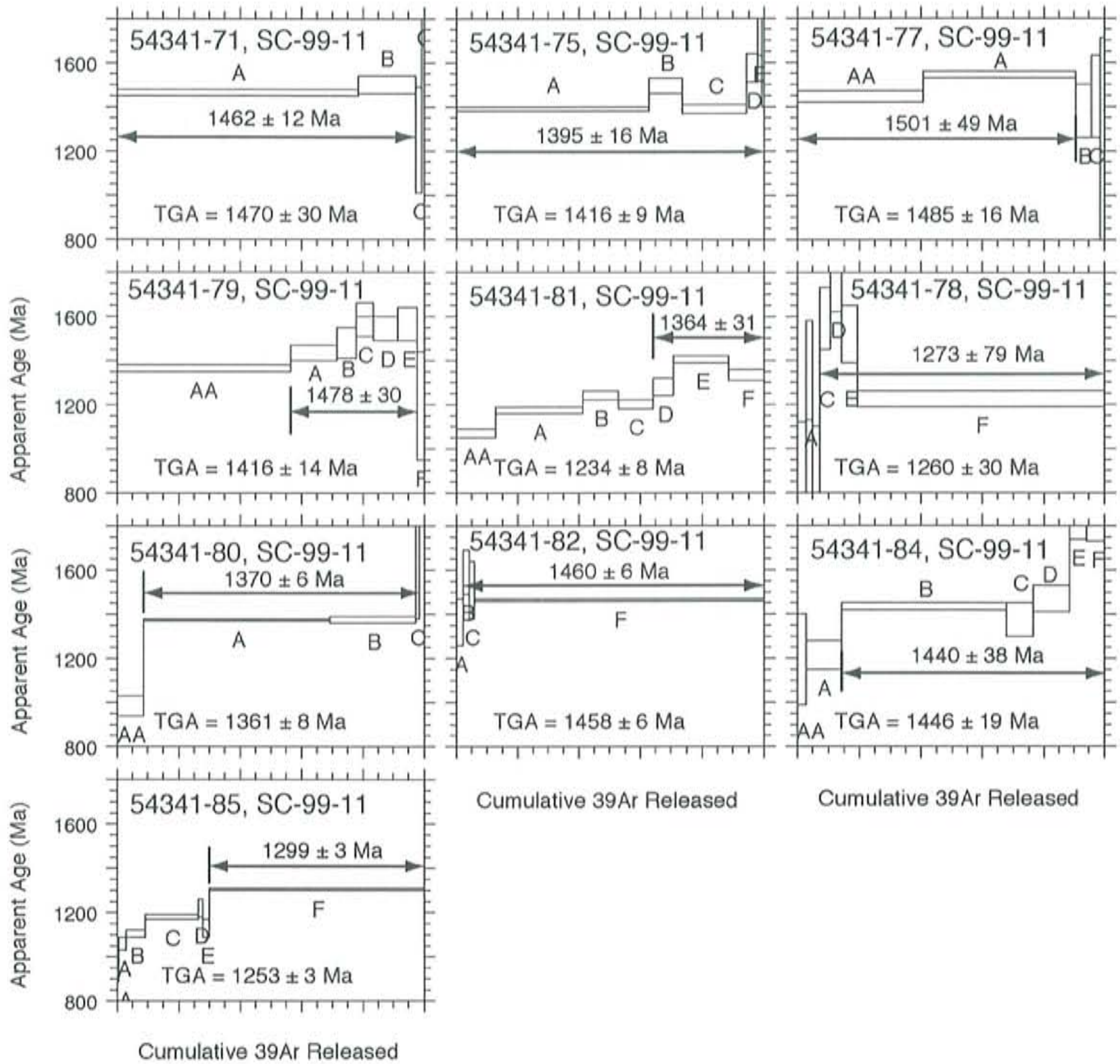


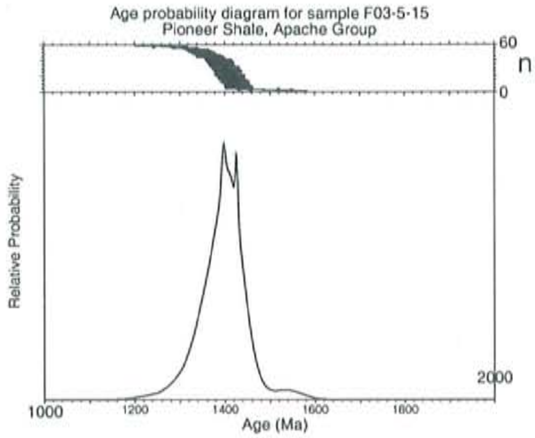
Single crystal muscovite age spectra for sample SC-99-11 (L# 54341)
Shale, Debaca Sequence

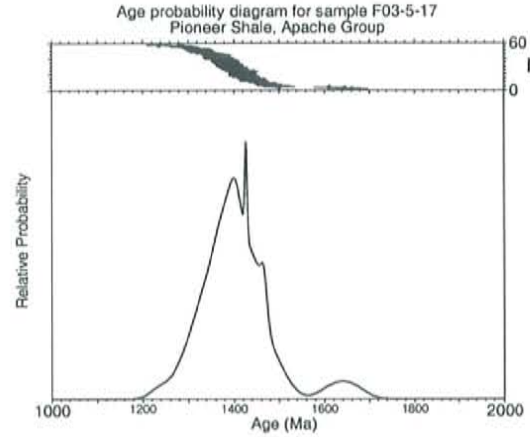


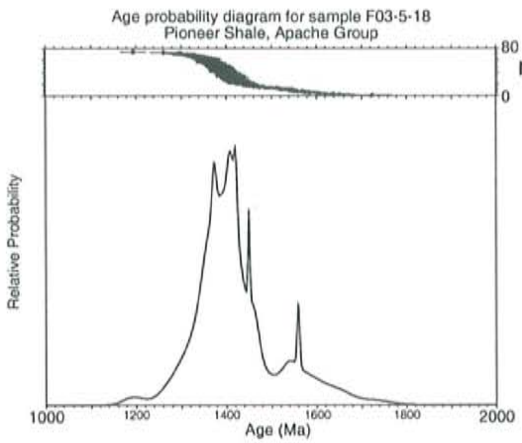
Single crystal muscovite age spectra for sample SC-99-11 (L# 54341)

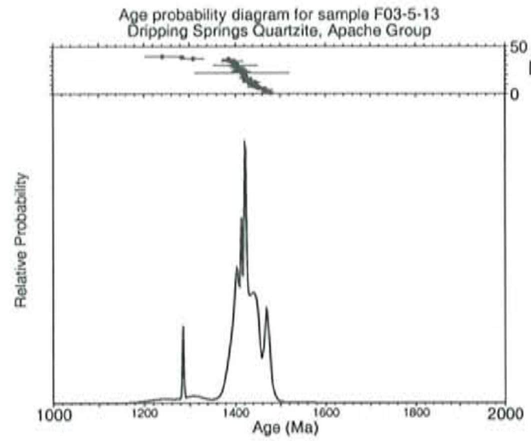
Shale, Debaca Sequence

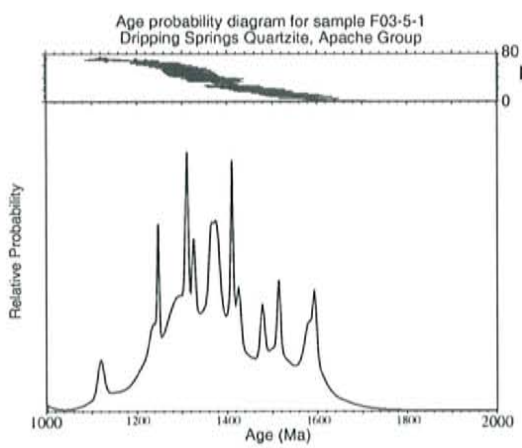


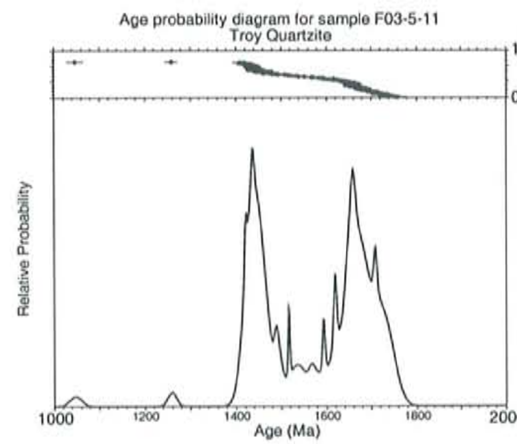

Age probability diagram for sample F03-5-15
Pioneer Shale, Apache Group
60
n
0
Relative Probability
2000
1000
1200
1400
1600
1800
Age (Ma)


Age probability diagram for sample F03-5-17
Pioneer Shale, Apache Group
60
n
0
Relative Probability
1000
1200
1400
1600
1800
2000
Age (Ma)

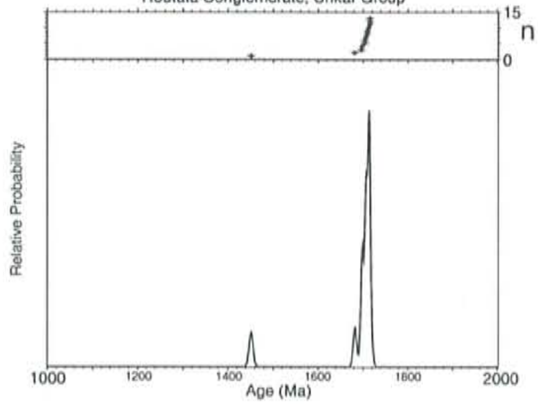

Age probability diagram for sample F03-5-18
Pioneer Shale, Apache Group
80
n
0
Relative Probability
1000
1200
1400
1600
1800
2000
Age (Ma)


Age probability diagram for sample F03-5-13
Dripping Springs Quartzite, Apache Group
50
n
0
Relative Probability
1000
1200
1400
1600
1800
2000
Age (Ma)

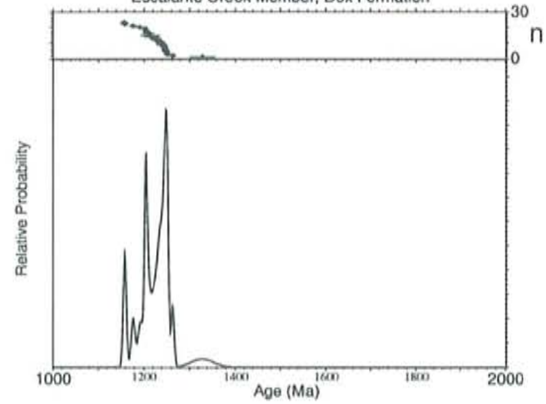

Age probability diagram for sample F03-5-1
Dripping Springs Quartzite, Apache Group
80
n
0
Relative Probability
1000
1200
1400
1600
1800
2000
Age (Ma)


Age probability diagram for sample F03-5-11
Troy Quartzite
150
n
0
Relative Probability
1000
1200
1400
1600
1800
2000
Age (Ma)

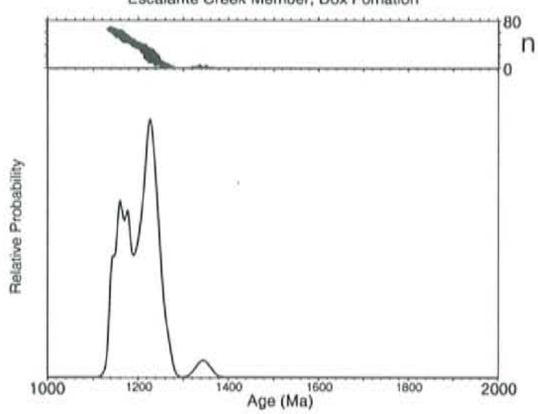
Age probability diagram for sample K03-77-2,
Houtata Conglomerate, Unkar Group



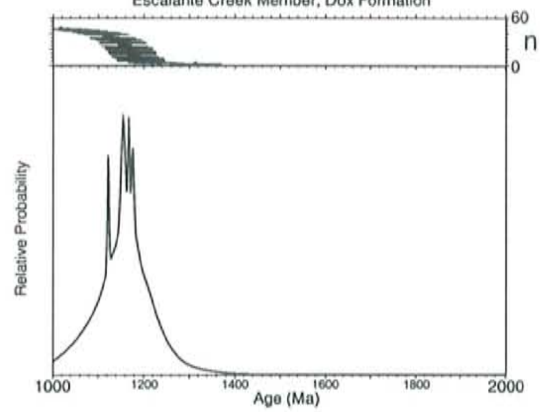
Age probability diagram for sample T-16-75-2,
Escalante Creek Member, Dox Formation



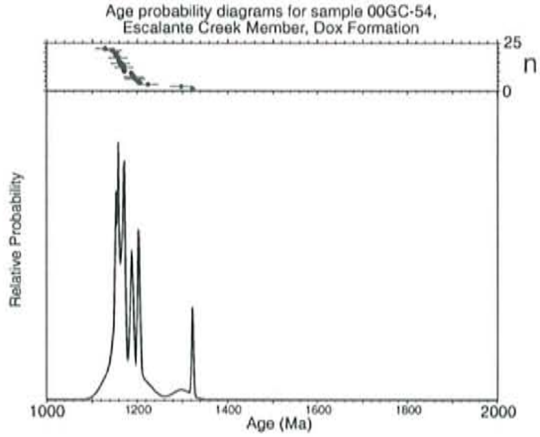
Age probability diagram for sample 98GC-23,
Escalante Creek Member, Dox Fomation



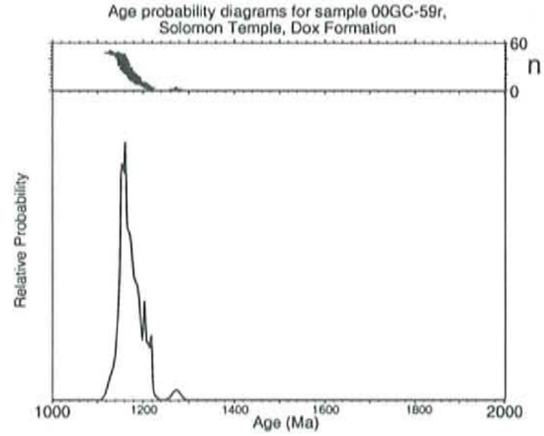
Age probability diagram for sample K98-65-1,
Escalante Creek Member, Dox Formation

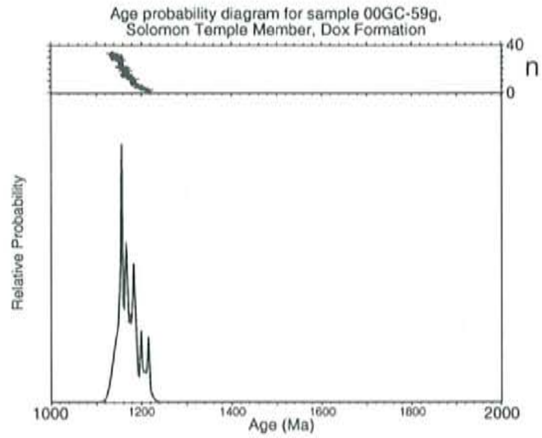


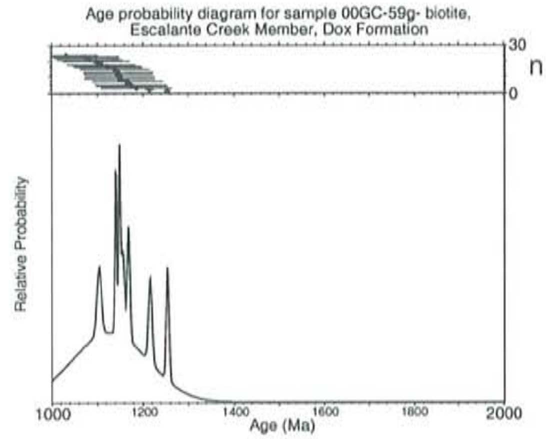
Age probability diagrams for sample 00GC-54,
Escalante Creek Member, Dox Formation

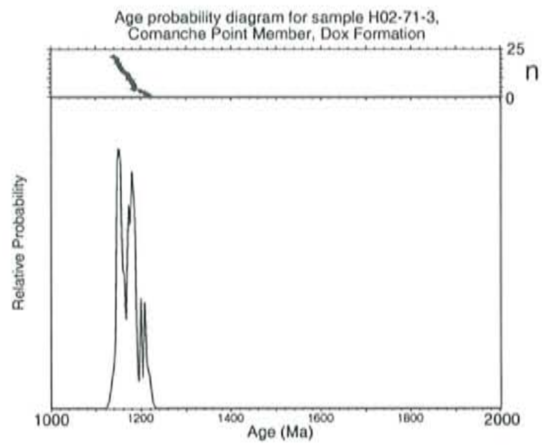


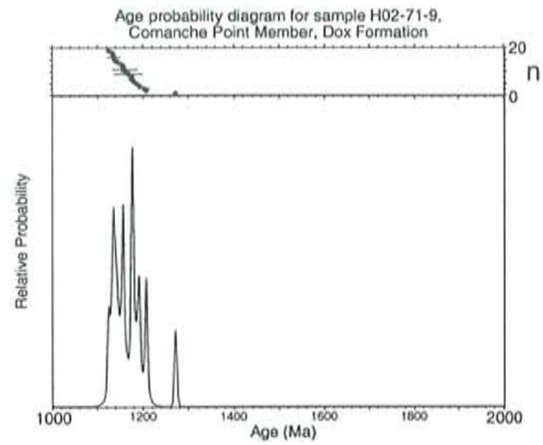
Age probability diagrams for sample 00GC-59r,
Solomon Temple, Dox Formation

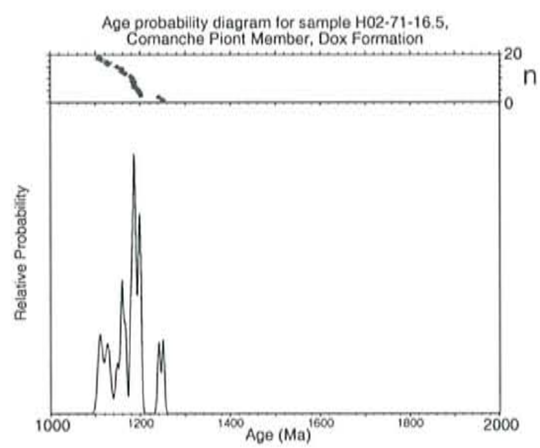


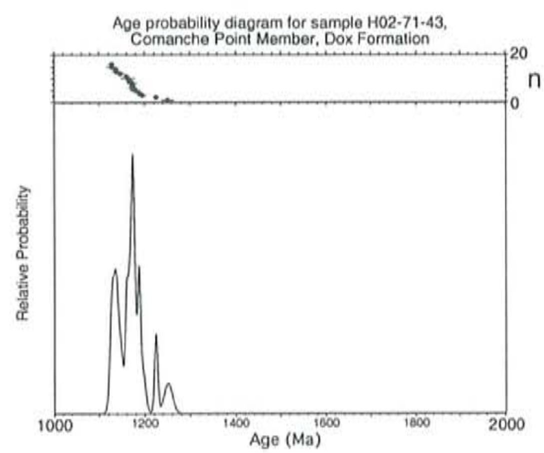

Age probability diagram for sample 00GC-59g,
Solomon Temple Member, Dox Formation
Relative Probability
n
Age (Ma)


Age probability diagram for sample 00GC-59g- biotite,
Escalante Creek Member, Dox Formation
Relative Probability
n
Age (Ma)

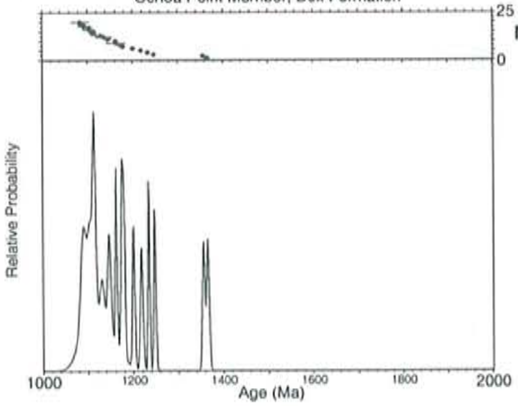

Age probability diagram for sample H02-71-3,
Comanche Point Member, Dox Formation
Relative Probability
n
Age (Ma)


Age probability diagram for sample H02-71-9,
Comanche Point Member, Dox Formation
Relative Probability
n
Age (Ma)

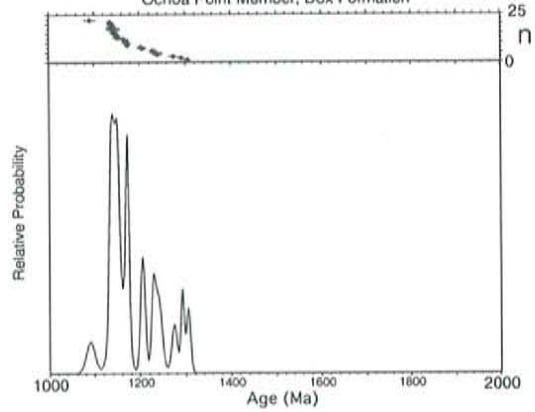

Age probability diagram for sample H02-71-16.5,
Comanche Piont Member, Dox Formation
Relative Probability
n
Age (Ma)


Age probability diagram for sample H02-71-43,
Comanche Point Member, Dox Formation
Relative Probability
n
Age (Ma)

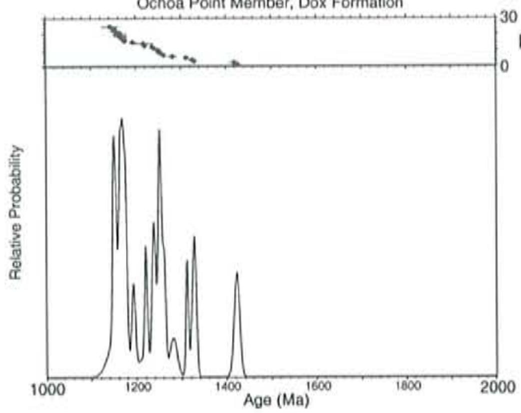
Age probability diagram for sample H02-71-124,
Ochoa Point Member, Dox Formation



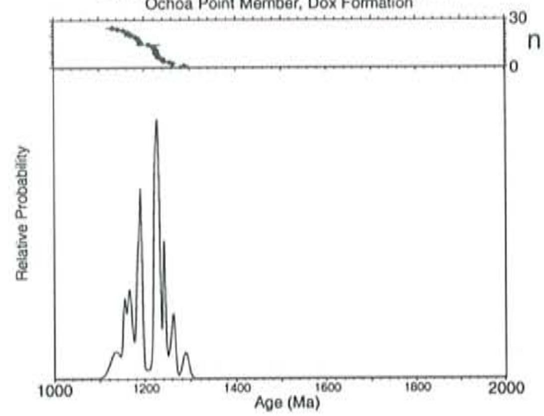
Age probability diagrams for sample H02-71-174,
Ochoa Point Member, Dox Formation



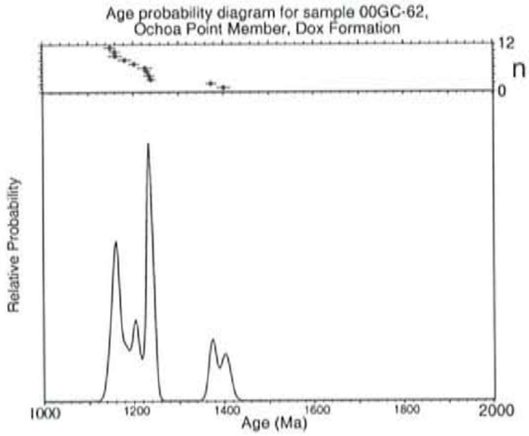
Age probability diagram for sample H02-71-181,
Ochoa Point Member, Dox Formation



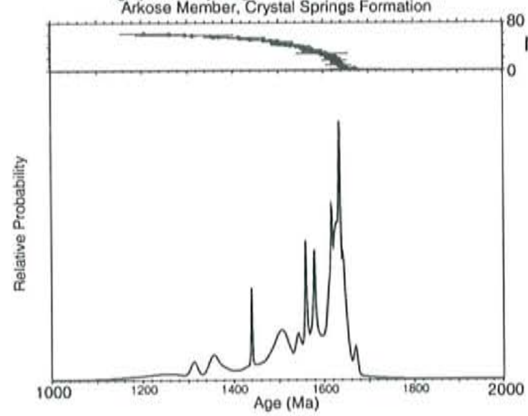
Age probability diagram for sample H02-71-200.2,
Ochoa Point Member, Dox Formation

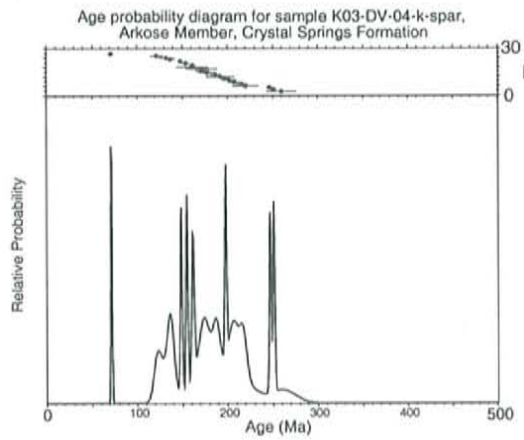


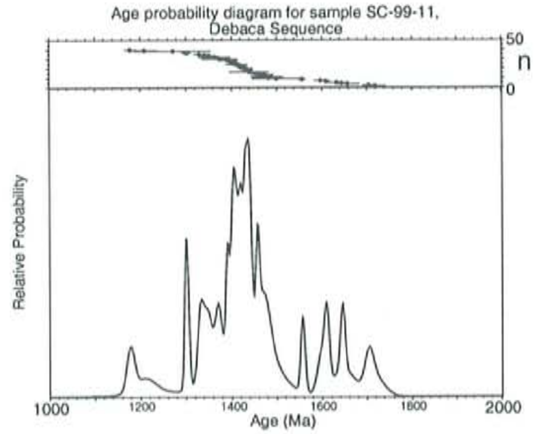
Age probability diagram for sample 00GC-62,
Ochoa Point Member, Dox Formation

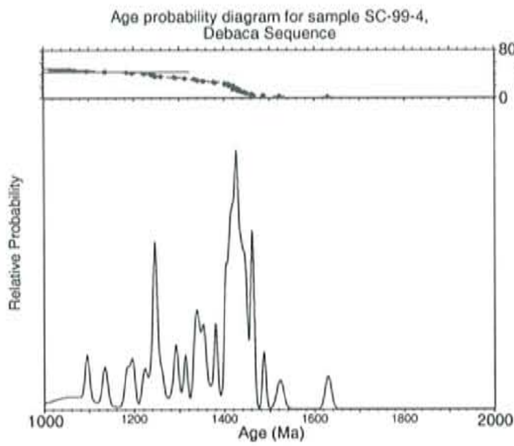


Age probability diagram for sample K03-DV-04,
Arkose Member, Crystal Springs Formation




Age probability diagram for sample K03-DV-04-k-spar,
Arkose Member, Crystal Springs Formation
n
Relative Probability
Age (Ma)


Age probability diagram for sample SC-99-11,
Debaca Sequence
n
Relative Probability
Age (Ma)


Age probability diagram for sample SC-99-4,
Debaca Sequence
n
Relative Probability
Age (Ma)

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ ($x 10^{-3}$)	$^{39}Ar_K$ ($x 10^{-15}$ mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
FO3-5-15, musc B1:171, muscovite, J=0.0192287±0.05%, D=1.00562±0.00081, NM-171, Lab#=54314-26										
# A	1	57.07	0.0015	1.869	1.81	337.9	99.0	45.9	1342.8	2.8
B	2	61.95	0.0018	0.3967	1.61	275.9	99.8	86.6	1430.1	2.7
C	5	59.47	-0.0004	1.825	0.440	-	99.1	97.8	1383.0	6.4
D	8	58.63	-0.0086	-0.4813	0.089	-	100.2	100.0	1380.5	22.4
Integrated age ± 1s		n=4			3.95				1384.1	2.1
Plateau ± 1s	steps B-D	n=3		MSWD=24.60	2.14	207.7		54.1	1422.6	12.3
FO3-5-15, musc B1:171, muscovite, J=0.0192287±0.05%, D=1.00562±0.00081, NM-171, Lab#=54314-29										
# A	1	58.22	0.0028	1.154	3.02	181.1	99.4	48.3	1365.6	2.3
B	2	62.46	0.0010	0.2918	2.48	521.0	99.9	88.0	1438.8	2.1
C	5	62.09	-0.0059	-0.6562	0.690	-	100.3	99.0	1437.5	5.5
D	8	54.50	-0.0373	-11.0129	0.065	-	106.0	100.0	1363.4	36.0
Integrated age ± 1s		n=4			6.26				1402.9	1.8
Plateau ± 1s	steps B-D	n=3		MSWD=2.21	3.24	399.7		51.7	1438.4	3.0
FO3-5-15, musc B1:171, muscovite, J=0.0192287±0.05%, D=1.00562±0.00081, NM-171, Lab#=54314-35										
# A	1	50.46	-0.0004	4.254	0.973	-	97.5	23.4	1215.4	4.1
B	2	60.85	0.0003	0.7911	2.84	1758.1	99.6	91.8	1410.5	2.3
C	5	58.60	-0.0057	-0.5103	0.241	-	100.3	97.6	1380.0	11.8
D	8	57.61	-0.0249	-3.6688	0.099	-	101.9	100.0	1379.1	27.3
Integrated age ± 1s		n=4			4.15				1364.1	2.2
Plateau ± 1s	steps B-D	n=3		MSWD=3.85	3.18	1570.2		76.6	1409.2	4.4
FO3-5-17, mu. B3: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54315-65										
# A	0	58.0760	0.0041	2.7561	1.416	123.20	98.6	41.0	1345.16	2.80
B	1	64.3593	0.0012	1.0862	1.531	435.03	99.5	85.3	1454.53	3.08
C	2	58.7361	0.0214	10.3576	0.083	23.89	94.8	87.7	1318.63	25.88
D	8	65.7356	-0.0013	1.5954	0.426	-	99.3	100.0	1473.63	6.92
Integrated age ± 1s		n=4			3.456				1409.69	2.22
Plateau ± 1s	steps B-D	n=3		MSWD=17.45	2.040	327.36		59.0	1456.06	11.69
FO3-5-17, mu. B3: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54315-66										
# A	0	42.6370	0.0262	4.9779	0.148	19.51	96.6	3.3	1055.72	17.01
# B	1	64.2558	0.0037	1.8351	1.095	138.08	99.2	28.1	1449.44	3.86
C	2	64.8537	0.0058	0.9163	2.266	87.67	99.6	79.2	1463.05	2.78
D	8	65.8894	0.0005	1.2853	0.920	985.33	99.4	100.0	1477.43	4.27
Integrated age ± 1s		n=4			4.429				1450.45	2.17
Plateau ± 1s	steps C-D	n=2		MSWD=7.96	3.186	346.86		71.9	1467.32	6.59
FO3-5-17, mu. B3: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54315-67										
# A	0	54.7128	0.0579	2.2098	0.594	8.81	98.8	21.1	1291.23	5.38
B	1	61.9051	0.0316	-1.2150	1.345	16.16	100.6	68.8	1426.58	3.12
C	2	61.4937	0.0256	-3.0540	0.724	19.91	101.5	94.5	1428.67	4.79
D	8	59.8246	0.0111	-8.4440	0.155	45.91	104.2	100.0	1427.43	13.46
Integrated age ± 1s		n=4			2.818				1399.47	2.49
Plateau ± 1s	steps B-D	n=3		MSWD=0.07	2.224	19.46		78.9	1427.21	2.62

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-17, mu. B3: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54315-68										
#	A	0	19.9300	0.0519	14.5995	0.055	9.84	78.3	2.8	474.40	50.34
#	B	1	55.6005	0.0063	2.0618	0.756	81.49	98.9	40.6	1307.01	4.33
	C	2	60.8694	0.0055	1.3597	0.819	92.60	99.3	81.6	1397.73	4.26
	D	8	61.6307	-0.0041	-1.0931	0.367	-	100.5	100.0	1421.57	7.76
	Integrated age ± 1s		n=4			1.997				1347.99	3.10
	Plateau ± 1s	steps C-D	n=2		MSWD=7.26	1.186	63.96		59.4	1403.25	10.07
	F03-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-90										
	A	0	58.0132	0.0011	0.8953	7.922	446.61	99.5	78.7	1353.24	2.11
	B	1	62.9812	0.0014	-2.7122	0.589	355.25	101.3	84.6	1450.52	10.07
	C	2	63.3489	0.0324	-6.4120	0.163	15.75	103.0	86.2	1473.40	27.37
	D	8	65.2365	0.0035	1.7231	1.390	145.56	99.2	100.0	1465.30	5.24
	Integrated age ± 1s		n=4			10.065				1376.90	2.07
	Plateau ± 1s	steps A-D	n=4		MSWD=156.81	10.065	392.70		100.0	1372.30	23.99
	F03-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-92										
#	A	0	20.2723	0.0073	9.0886	5.731	70.30	86.7	2.0	526.32	2.50
#	B	1	57.3545	0.0009	0.1901	50.850	538.64	99.9	19.9	1345.77	1.79
	C	2	63.8268	0.0007	0.0786	182.177	755.07	100.0	84.0	1450.85	2.93
	D	8	65.2440	0.0007	0.4079	45.384	711.88	99.8	100.0	1471.45	2.80
	Integrated age ± 1s		n=4			284.142				1421.01	2.13
	Plateau ± 1s	steps C-D	n=2		MSWD=25.84	227.561	746.46		80.1	1461.64	10.30
	F03-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-94										
#	A	0	54.5130	0.0002	2.4054	15.522	3060.61	98.7	9.5	1286.69	2.02
	B	1	62.9231	0.0004	0.1041	111.548	1261.32	100.0	78.1	1436.49	2.52
	C	2	64.4208	0.0006	0.2566	19.483	859.22	99.9	90.1	1459.32	2.50
	D	8	65.6581	-0.0002	0.2430	16.146	-	99.9	100.0	1478.62	2.56
	Integrated age ± 1s		n=4			162.700				1429.73	1.95
	Plateau ± 1s	steps B-D	n=3		MSWD=69.02	147.177	1069.71		90.5	1457.96	12.13
	F03-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-96										
	A	0	60.9413	-0.0004	0.2550	12.944	-	99.9	89.2	1404.14	2.71
	B	1	61.6939	-0.0600	-2.3417	0.546	-	101.1	92.9	1428.33	12.93
	C	2	62.3843	-0.0592	-2.0154	0.302	-	100.9	95.0	1437.74	20.78
	D	8	63.0784	-0.0559	-0.2180	0.722	-	100.1	100.0	1440.33	10.55
	Integrated age ± 1s		n=4			14.514				1407.58	2.63
	Plateau ± 1s	steps A-D	n=4		MSWD=5.31	14.514	0.00		100.0	1407.71	5.90

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-98										
#	A	0	30.8891	0.0040	67.9073	0.087	126.14	35.0	0.1	341.15	54.25
#	B	1	15.8637	-0.0361	9.8078	0.196	-	81.7	0.4	401.69	22.07
#	C	2	22.4490	-0.0088	8.7436	0.696	-	88.5	1.3	584.68	7.70
	D	8	63.7982	0.0006	0.4225	72.688	872.29	99.8	100.0	1448.80	2.22
	Integrated age ± 1s		n=4			73.666				1439.17	2.27
	Plateau ± 1s	steps D-D	n=1		MSWD=0.00	72.688	872.29		98.7	1448.80	2.22
	F03-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-10										
	0A	0	60.9913	0.0001	0.5084	16.913	3912.61	99.8	86.0	1403.74	2.39
	0B	1	64.3931	-0.0123	-0.2688	0.702	-	100.1	89.6	1461.30	10.45
	0C	2	64.0472	0.0044	1.3787	1.271	117.24	99.4	96.0	1448.28	6.17
	0D	8	63.6565	0.0070	-0.2540	0.785	73.11	100.1	100.0	1449.73	9.26
	Integrated age ± 1s		n=4			19.670				1410.58	2.26
	Plateau ± 1s	steps A-D	n=4		MSWD=28.22	19.670	3374.94		100.0	1413.81	11.29
	FO3-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-80										
	A	0	58.0400	0.0035	1.6801	2.528	145.95	99.1	70.6	1349.85	2.36
	B	1	61.8397	0.0010	1.4302	0.612	490.11	99.3	87.7	1413.00	7.04
	C	2	58.3721	0.0132	-11.7324	0.069	38.66	105.9	89.6	1419.77	44.97
	D	8	62.6022	0.0082	1.5687	0.372	61.99	99.3	100.0	1424.54	9.77
	Integrated age ± 1s		n=4			3.581				1370.04	2.56
	Plateau ± 1s	steps A-D	n=4		MSWD=40.20	3.581	193.97		100.0	1359.74	13.80
	FO3-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-81										
#	A	0	41.8552	0.0064	6.5283	0.549	79.84	95.4	20.5	1031.36	6.24
	B	1	59.3398	0.0023	0.7337	1.754	220.70	99.6	86.1	1375.86	3.04
	C	2	59.6548	-0.0046	4.4319	0.210	-	97.8	93.9	1363.08	14.50
	D	8	59.0337	-0.0026	7.3176	0.162	-	96.3	100.0	1338.65	18.88
	Integrated age ± 1s		n=4			2.675				1306.94	2.98
	Plateau ± 1s	steps B-D	n=3		MSWD=2.21	2.126	182.08		79.5	1374.43	4.40
	FO3-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-83										
#	B	1	60.6405	-2.3775	31.7896	0.002	-	84.1	4.2	1236.27	915.86
#	C	2	276.2861	-10.8193	208.5785	0.000	-	77.3	5.2	2950.35	2932.32
	D	8	77.5525	-0.0752	-17.6773	0.045	-	106.7	100.0	1726.56	40.01
	Integrated age ± 1s		n=3			0.047				1726.20	60.73
	Plateau ± 1s	steps D-D	n=1		MSWD=0.00	0.045	0.00		94.8	1726.56	40.01

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
FO3-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-84										
# A	0	36.9315	-0.0299	24.9242	0.107	-	80.0	2.0	814.27	19.81
# B	1	58.3860	-0.0034	1.5852	1.040	-	99.2	21.5	1356.03	3.27
C	2	62.1025	-0.0005	0.8587	3.068	-	99.6	78.8	1419.90	2.29
D	8	62.5596	-0.0016	0.7917	1.132	-	99.6	100.0	1427.50	3.57
Integrated age ± 1s		n=4			5.347				1398.82	1.86
Plateau ± 1s	steps C-D	n=2		MSWD=3.21	4.200	0.00		78.5	1422.11	3.49
FO3-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-85										
A	0	69.2513	0.0014	1.7446	1.987	357.19	99.3	72.4	1526.67	2.85
B	1	73.0457	-0.0009	0.5733	0.631	-	99.8	95.4	1587.98	5.02
C	2	69.2530	-0.0647	-2.6112	0.090	-	101.1	98.6	1545.86	21.70
D	11	64.2246	-0.1128	-0.9248	0.037	-	100.4	100.0	1461.51	48.10
Integrated age ± 1s		n=4			2.745				1540.71	2.67
Plateau ± 1s	steps A-D	n=4		MSWD=38.48	2.745	258.54		100.0	1541.45	15.27
FO3-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-86										
# A	0	48.4522	0.0242	2.1474	0.257	21.05	98.7	14.7	1180.96	9.38
B	1	62.5565	0.0051	0.4035	0.709	100.54	99.8	55.2	1429.28	4.90
C	2	61.5771	0.0198	4.2202	0.287	25.77	98.0	71.6	1395.53	8.26
D	11	61.9245	0.0110	2.0911	0.496	46.56	99.0	100.0	1411.25	5.98
Integrated age ± 1s		n=4			1.749				1383.96	3.35
Plateau ± 1s	steps B-D	n=3		MSWD=6.98	1.492	68.21		85.3	1417.43	9.12
FO3-5-18, mu. B5: 171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316-87										
# A	0	44.1280	0.5911	114.6392	0.006	0.86	23.3	0.3	326.10	456.40
# B	1	35.5001	0.3148	10.8572	0.008	1.62	91.0	0.7	874.71	253.26
# C	2	42.7876	0.1639	19.0083	0.022	3.11	86.9	1.8	976.47	98.59
D	11	71.4657	0.0023	1.5892	1.985	221.79	99.3	100.0	1560.40	3.11
Integrated age ± 1s		n=4			2.021				1550.16	3.58
Plateau ± 1s	steps D-D	n=1		MSWD=0.00	1.985	221.79		98.2	1560.40	3.11

ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-07										
A	0	59.2028	0.0005	0.2623	15.621	1075.25	99.9	80.3	1354.63	1.78
B	1	57.1133	0.0021	-2.7380	0.555	239.60	101.4	83.2	1335.06	9.65
C	1	71.4459	0.0071	39.3481	0.264	72.17	83.7	84.5	1365.83	16.35
D	2	60.4795	-0.0915	-3.5270	0.215	-	101.7	85.6	1392.83	17.75
E	2	59.5755	-0.0719	-7.7301	0.261	-	103.8	87.0	1398.22	13.45
F	3	60.1749	-0.0304	-6.5523	0.306	-	103.2	88.6	1402.27	13.93
G	8	63.9461	-0.0061	1.4433	2.225	-	99.3	100.0	1424.39	3.83
Integrated age ± 1s		n=7			19.446				1364.11	1.72
Plateau ± 1s	steps A-G	n=7		MSWD=49.66	19.446	871.56		100.0	1367.26	10.99

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-09										
#	A	0	44.7965	0.0021	2.7215	6.671	240.18	98.2	13.0	1091.66	1.98
#	B	1	60.2211	0.0000	0.1801	8.070	-	99.9	28.7	1371.42	2.77
	C	1	62.7682	-0.0001	0.1301	21.402	-	99.9	70.5	1412.05	1.77
	D	2	61.6008	-0.0051	0.5451	3.146	-	99.7	76.6	1391.70	2.94
	E	2	63.9472	-0.0003	0.7392	6.502	-	99.7	89.3	1427.65	2.71
	F	3	63.7903	-0.0119	-0.3654	1.302	-	100.2	91.8	1430.26	5.04
	G	8	64.8205	-0.0007	0.5863	4.204	-	99.7	100.0	1441.88	3.02
	Integrated age ± 1s		n=7			51.297				1370.71	1.33
	Plateau ± 1s	steps C-G	n=5		MSWD=43.06	36.556	0.00		71.3	1417.24	7.74
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-11										
#	A	0	45.4200	0.0006	3.3045	10.197	796.57	97.8	10.8	1100.07	2.13
#	B	1	59.4635	-0.0001	0.2378	15.244	-	99.9	27.1	1358.96	1.77
	C	1	65.2581	0.0002	-0.0097	49.878	3390.06	100.0	80.1	1451.32	1.89
	D	2	63.9560	-0.0046	0.4657	3.491	-	99.8	83.8	1429.04	3.93
	E	2	64.4074	-0.0300	-3.4058	0.550	-	101.6	84.4	1453.61	10.52
	F	3	65.2988	-0.0032	0.2244	0.826	-	99.9	85.3	1450.88	8.32
	G	8	65.5052	0.0025	0.0571	13.815	206.87	100.0	100.0	1454.81	1.67
	Integrated age ± 1s		n=7			94.002				1401.06	1.40
	Plateau ± 1s	steps C-G	n=5		MSWD=9.12	68.560	2511.16		72.9	1451.08	3.59
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-13										
#	A	0	45.1322	-0.0056	4.4404	1.123	-	97.1	5.6	1088.42	6.46
#	B	1	59.9914	-0.0001	0.3096	9.713	-	99.8	54.3	1367.12	1.91
	C	1	63.7745	0.0000	0.7198	5.096	-	99.7	79.9	1425.05	3.02
	D	2	63.3369	-0.0322	8.6199	0.236	-	96.0	81.1	1381.32	16.61
	E	2	63.9011	0.0065	-2.7844	0.153	78.05	101.3	81.8	1443.07	25.91
	F	3	64.2593	0.0078	0.2041	3.206	65.47	99.9	97.9	1434.96	3.16
	G	8	61.5124	0.0164	-0.5318	0.421	31.11	100.3	100.0	1395.38	13.99
	Integrated age ± 1s		n=7			19.947				1380.03	1.65
	Plateau ± 1s	steps C-G	n=5		MSWD=4.86	9.112	62.15		45.7	1428.28	4.74
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-15										
#	A	0	33.1332	0.0037	7.6430	2.340	137.94	93.2	3.1	828.38	4.05
#	B	1	56.6159	0.0023	1.7193	2.295	222.98	99.1	6.2	1305.13	3.37
#	C	1	56.6891	0.0007	0.8146	22.705	758.33	99.6	36.8	1310.78	1.71
	D	2	65.0895	0.0000	0.3650	29.789	-	99.8	76.9	1447.03	1.91
	E	2	63.2364	0.0003	0.3982	3.178	1717.28	99.8	81.2	1418.14	3.91
	F	3	66.4033	-0.0001	0.1784	12.540	-	99.9	98.0	1467.97	2.27
	G	8	66.0089	-0.0127	0.8869	1.450	-	99.6	100.0	1458.74	4.97
	Integrated age ± 1s		n=7			74.298				1387.77	1.35
	Plateau ± 1s	steps D-G	n=4		MSWD=44.29	46.957	317.87		63.2	1451.65	8.81

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-17										
#	A	0	67.3832	-0.1971	5.3508	0.030	-	97.6	0.2	1459.27	141.07
#	B	1	-124.7412	8.2962	-325.5727	-0.002	0.06	22.4	0.2	-1351.21	5934.39
#	C	1	77.4113	0.3244	295.3962	0.027	1.57	-12.8	0.3	-371.08	277.10
#	D	2	15.3510	0.0009	48.8338	0.073	548.72	5.8	0.7	30.13	71.19
#	E	2	21.8513	-0.0141	72.4806	0.087	-	1.9	1.3	13.70	70.19
#	F	3	10.8750	-0.0072	34.1229	0.176	-	7.0	2.3	25.73	29.67
	G	8	53.9037	-0.0003	0.7655	16.610	-	99.6	100.0	1264.26	1.70
	Integrated age ± 1s		n=7			17.000				1245.16	1.82
	Plateau ± 1s	steps G-G	n=1		MSWD=0.00	16.610	0.00		97.7	1264.26	1.70
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-37										
#	A	0	10.0119	0.0628	14.1241	0.334	8.13	58.3	1.2	187.67	12.89
#	B	1	57.9334	0.0013	0.7471	3.612	397.94	99.6	14.6	1331.62	4.26
	C	1	60.5215	0.0009	0.2430	19.767	599.75	99.9	88.0	1375.94	1.71
	D	2	56.0430	0.0020	6.3313	0.261	254.39	96.7	89.0	1272.65	16.59
	E	2	59.4868	-0.0421	6.0857	0.197	-	97.0	89.7	1331.13	19.83
	F	3	63.7477	0.0029	0.5946	0.938	177.66	99.7	93.2	1425.22	6.76
	G	8	63.7493	0.0009	-0.0500	1.830	553.79	100.0	100.0	1428.20	4.65
	Integrated age ± 1s		n=7			26.939				1363.23	1.63
	Plateau ± 1s	steps C-G	n=5		MSWD=50.37	22.993	570.25		85.4	1383.15	11.01
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-39										
#	A	0	45.1132	-0.0462	82.1973	0.135	-	46.1	0.1	597.32	34.94
#	B	1	15.2643	0.0040	10.1796	2.057	127.44	80.3	1.1	374.38	3.38
#	C	1	54.5589	0.0040	0.7619	8.004	128.63	99.6	5.1	1275.39	2.50
#	D	2	57.1964	0.0011	0.2907	7.737	482.55	99.9	9.0	1321.73	2.26
#	E	2	57.3987	-0.0003	0.0540	14.682	-	100.0	16.5	1326.21	2.09
	F	3	61.5791	0.0006	0.0969	141.937	826.24	100.0	88.1	1393.46	2.40
	G	8	63.4867	0.0002	0.1012	23.660	2181.29	100.0	100.0	1423.42	1.59
	Integrated age ± 1s		n=7			198.212				1376.19	1.90
	Plateau ± 1s	steps F-G	n=2		MSWD=108.27	165.597	1019.85		83.5	1414.27	13.81
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-41										
#	A	0	35.2954	0.0003	4.8666	2.220	2011.05	95.9	1.9	891.65	4.02
#	B	1	49.0899	-0.0099	-14.2364	0.077	-	108.6	2.0	1257.74	54.20
#	C	1	60.2766	-0.0004	0.0361	9.293	-	100.0	10.0	1372.99	2.06
	D	2	63.2202	0.0006	0.1714	82.471	785.29	99.9	81.0	1418.94	2.06
	E	2	63.2817	0.0004	3.3996	1.348	1387.18	98.4	82.2	1404.93	7.31
	F	3	66.0183	0.0011	-0.0709	14.645	465.13	100.0	94.8	1463.23	2.06
	G	8	66.0701	-0.0001	0.3729	6.031	-	99.8	100.0	1462.02	2.52
	Integrated age ± 1s		n=7			116.086				1414.19	1.69
	Plateau ± 1s	steps D-G	n=4		MSWD=104.85	104.495	702.86		90.0	1445.15	12.72

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-43										
#	A	0	63.7433	0.0017	5.5077	1.796	304.74	97.4	2.0	1402.41	4.53
#	B	1	54.5778	-0.0060	0.6412	1.723	-	99.7	3.9	1276.29	4.79
#	C	1	49.9784	-0.0017	0.0438	9.022	-	100.0	14.1	1200.01	2.23
#	D	2	51.4644	0.0013	0.0485	10.814	386.93	100.0	26.2	1225.99	1.94
	E	2	56.5131	0.0003	0.1174	28.029	1670.06	99.9	57.6	1311.28	2.14
	F	3	54.0665	0.0006	-0.0097	28.039	835.03	100.0	89.0	1270.91	1.89
#	G	8	50.3624	0.0007	0.3362	9.807	681.91	99.8	100.0	1205.25	2.04
	Integrated age ± 1s		n=7			89.230				1267.07	1.28
	Plateau ± 1s	steps E-F	n=2		MSWD=199.59	56.068	1252.47		62.8	1288.61	20.04
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-45										
#	A	0	14.3205	0.1656	35.7611	0.121	3.08	26.2	0.3	122.82	58.89
#	B	1	56.1364	-0.0010	2.2176	3.361	-	98.8	8.5	1294.67	3.15
	C	1	61.6254	0.0006	0.3068	26.719	908.32	99.9	73.9	1393.21	1.28
	D	2	63.6188	-0.0034	0.0879	6.766	-	100.0	90.4	1425.53	2.31
	E	2	62.3358	-0.0714	-1.2289	0.344	-	100.6	91.3	1411.42	16.92
	F	3	64.6617	-0.0101	0.5085	1.500	-	99.8	94.9	1439.76	5.51
	G	8	64.8364	-0.0069	0.4937	2.069	-	99.8	100.0	1442.53	4.04
	Integrated age ± 1s		n=7			40.880				1392.42	1.28
	Plateau ± 1s	steps C-G	n=5		MSWD=72.71	37.398	648.95		91.5	1405.09	9.00
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-51										
#	A	0	50.6550	0.0035	4.4625	2.362	146.15	97.4	4.5	1188.91	4.24
#	B	1	56.1623	0.0000	0.4983	4.812	1042.00	99.7	13.6	1303.58	3.26
	C	1	63.5715	0.0015	0.2838	15.929	351.14	99.9	43.7	1423.90	1.84
	D	2	63.6397	0.0025	0.4810	9.187	200.47	99.8	61.1	1424.06	1.81
	E	2	58.5170	0.0486	5.9856	0.291	10.50	97.0	61.7	1315.84	14.30
	F	3	57.1116	0.0793	10.6706	0.259	6.44	94.5	62.2	1269.18	14.97
	G	8	61.0019	0.0006	0.4672	19.974	797.19	99.8	100.0	1382.55	2.00
	Integrated age ± 1s		n=7			52.814				1386.30	1.36
	Plateau ± 1s	steps C-G	n=5		MSWD=109.39	45.640	511.89		86.4	1410.50	11.29
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-71										
#	A	0	55.9808	0.0091	-1.6008	1.114	56.04	100.8	4.9	1310.89	5.70
	B	1	64.8782	0.0018	0.1435	17.873	282.60	99.9	83.0	1444.79	1.89
	C	1	61.9501	0.0383	0.5148	0.488	13.32	99.8	85.1	1397.46	10.86
	D	2	63.3692	0.0222	-4.9523	0.329	23.02	102.3	86.6	1444.78	13.15
	E	2	63.2844	-0.0610	4.3745	0.319	-	97.9	87.9	1400.31	12.05
	F	3	64.7134	-0.0072	1.7271	1.396	-	99.2	94.1	1435.00	3.94
	G	8	64.8604	0.0011	1.7152	1.361	469.54	99.2	100.0	1437.34	5.81
	Integrated age ± 1s		n=7			22.880				1435.83	1.75
	Plateau ± 1s	steps B-G	n=6		MSWD=6.86	21.767	264.57		95.1	1440.85	4.20

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-73										
#	A	0	56.5223	-0.0022	1.7914	4.733	-	99.1	18.8	1303.21	2.61
#	B	1	57.8402	0.0002	0.6608	2.448	2635.35	99.7	28.6	1330.51	3.57
	C	1	62.8907	-0.0004	-0.1124	15.654	-	100.1	90.9	1415.09	1.66
	D	2	62.1021	-0.2294	-23.0239	0.048	-	110.9	91.1	1506.01	58.07
	E	2	64.7420	-0.0364	-1.5720	0.192	-	100.7	91.9	1450.43	17.76
	F	3	64.3928	-0.0507	-7.2836	0.134	-	103.3	92.4	1470.82	24.21
	G	8	64.7491	-0.0003	1.0398	1.907	-	99.5	100.0	1438.71	3.84
	Integrated age ± 1s		n=7			25.116				1388.95	1.48
	Plateau ± 1s	steps C-G	n=5		MSWD=10.44	17.935	0.00		71.4	1419.31	4.93
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-75										
	A	0	60.7878	0.0031	0.7047	8.964	166.14	99.7	78.6	1378.02	2.02
	B	1	62.6288	-0.0013	1.7596	1.050	-	99.2	87.8	1402.28	6.14
	C	1	59.9477	0.0015	1.9784	0.168	330.27	99.0	89.3	1358.48	20.61
	D	2	62.6681	0.0480	5.3273	0.135	10.62	97.5	90.5	1386.31	25.05
	E	2	60.1119	0.0800	6.6295	0.175	6.38	96.8	92.0	1338.99	19.69
	F	3	58.5775	0.0221	0.1810	0.074	23.09	99.9	92.7	1344.91	47.45
	G	8	61.5250	-0.0117	2.9377	0.835	-	98.6	100.0	1379.22	7.38
	Integrated age ± 1s		n=7			11.401				1379.36	2.00
	Plateau ± 1s	steps A-G	n=7		MSWD=3.36	11.401	136.39		100.0	1379.77	3.41
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-77										
#	A	0	77.0652	0.0012	2.4777	2.137	428.67	99.0	11.4	1613.83	4.10
#	B	1	50.4237	0.0017	0.4293	4.787	295.38	99.7	36.8	1205.85	3.10
	C	1	61.9972	0.0001	0.2720	9.250	7330.52	99.9	85.9	1399.26	1.93
	D	2	62.7536	0.0630	3.8082	0.226	8.10	98.2	87.1	1394.81	17.62
	E	2	61.3480	0.0321	0.2978	0.418	15.90	99.9	89.4	1388.91	11.77
	F	3	62.8278	0.0255	1.9981	0.497	20.00	99.1	92.0	1404.37	11.60
	G	8	63.2946	0.0126	2.1000	1.503	40.52	99.0	100.0	1411.21	5.75
	Integrated age ± 1s		n=7			18.818				1379.14	1.71
	Plateau ± 1s	steps C-G	n=5		MSWD=1.26	11.894	5707.42		63.2	1400.24	2.07
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-81										
	A	0	71.9188	0.0022	1.4077	2.970	233.83	99.4	31.3	1544.71	3.64
	B	1	56.8154	0.0012	0.1676	5.814	411.22	99.9	92.7	1316.04	2.33
	C	1	60.2995	0.1064	7.7461	0.171	4.79	96.2	94.5	1336.71	22.36
	D	2	59.4072	0.0114	4.0886	0.137	44.62	98.0	96.0	1339.61	25.32
	E	2	62.3253	-0.0285	-24.6911	0.063	-	111.7	96.6	1517.00	41.65
	F	3	63.4293	-0.0115	-16.1614	0.080	-	107.5	97.5	1495.94	35.16
	G	8	58.6826	0.0432	-0.5747	0.238	11.82	100.3	100.0	1350.28	15.17
	Integrated age ± 1s		n=7			9.474				1395.25	2.14
	Plateau ± 1s	steps A-G	n=7		MSWD=471.22	9.474	326.71		100.0	1382.15	41.92

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-83										
#	A	0	59.2211	-0.0004	1.0052	7.965	-	99.5	25.4	1351.37	2.28
#	B	1	59.8514	0.0018	0.1947	8.518	286.53	99.9	52.6	1365.42	1.84
	C	1	62.0443	0.0015	0.2025	12.352	329.74	99.9	92.0	1400.33	1.59
	D	2	62.7406	-0.0005	-4.1182	0.551	-	101.9	93.7	1431.21	10.80
	E	2	65.9704	0.0753	-9.7152	0.065	6.78	104.4	93.9	1505.61	46.13
	F	3	61.8943	0.0009	1.2153	1.411	546.78	99.4	98.4	1393.22	5.27
	G	8	62.9293	-0.0237	3.5304	0.497	-	98.3	100.0	1398.73	11.72
	Integrated age ± 1s		n=7			31.358				1378.96	1.35
	Plateau ± 1s	steps C-G	n=5		MSWD=3.80	14.875	327.70		47.4	1400.43	2.96
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-85										
	A	0	62.9457	-0.0006	0.4374	5.747	-	99.8	93.2	1413.41	2.60
	B	1	51.4632	-0.2655	-23.7276	0.037	-	113.6	93.8	1343.56	82.50
	C	1	57.5243	-0.3994	-78.1538	0.020	-	140.1	94.2	1672.30	150.66
	D	2	54.3085	-0.4678	-48.7741	0.024	-	126.5	94.6	1502.84	114.75
	E	2	54.3724	-0.3975	-84.2987	0.021	-	145.8	94.9	1654.03	137.35
	F	3	56.8963	-0.0043	-1.2940	0.283	-	100.7	99.5	1324.49	13.79
	G	8	36.7225	-0.2364	-131.6813	0.031	-	206.0	100.0	1603.59	81.57
	Integrated age ± 1s		n=7			6.164				1412.14	2.78
	Plateau ± 1s	steps A-G	n=7		MSWD=8.87	6.164	0.00		100.0	1410.68	7.63
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-01										
#	A	0	65.9436	0.0012	2.1700	4.214	422.88	99.0	9.4	1451.96	2.38
#	B	1	54.8976	0.0022	0.1196	7.135	230.36	99.9	25.4	1284.30	3.05
	C	1	62.2393	0.0011	0.1775	27.055	473.29	99.9	86.0	1403.52	2.12
	D	2	63.3494	0.0005	-0.0652	2.732	1044.64	100.0	92.2	1422.05	3.74
	E	2	64.1569	0.0205	1.7744	0.457	24.83	99.2	93.2	1426.19	11.58
	F	3	65.3806	0.0104	0.3877	1.461	49.29	99.8	96.5	1451.42	4.50
	G	8	64.2763	0.0011	0.7272	1.581	468.72	99.7	100.0	1432.82	4.07
	Integrated age ± 1s		n=7			44.635				1393.69	1.65
	Plateau ± 1s	steps C-G	n=5		MSWD=29.12	33.287	495.20		74.6	1417.22	8.44
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-02										
#	A	0	58.5989	0.0065	2.4432	2.871	78.51	98.8		1334.32	4.05
	B	1	62.7135	0.0003	1.0099	10.743	1523.45	99.5		1407.11	2.22
	C	1	60.6523	-0.0532	5.2970	0.473	-	97.4	23.8	1353.91	9.27
	D	2	63.5900	-0.0682	3.3789	0.133	-	98.4	30.5	1409.75	22.02
	E	2	58.0472	0.2096	29.2700	0.050	2.43	85.1	33.0	1190.43	55.49
	F	3	61.6789	0.1031	10.9199	0.075	4.95	94.8	36.8	1343.92	40.16
	G	8	63.1912	0.0167	0.9098	1.256	30.64	99.6	100.0	1415.11	5.18
	Integrated age ± 1s		n=7			15.600				1392.32	4.76
	Plateau ± 1s	steps B-G	n=6		MSWD=10.47	12.730	1288.90		100.0	1398.90	15.46

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-03										
#	A	0	57.3307	0.0063	1.0429	4.220	81.22	99.5	37.3	1320.29	2.53
	B	1	63.7254	0.0001	0.1116	6.142	5877.93	99.9	91.6	1427.09	1.83
	C	1	57.1427	-0.0396	1.1431	0.153	-	99.4	92.9	1316.60	20.65
	D	2	56.0860	-0.0665	-11.3661	0.100	-	106.0	93.8	1359.66	29.67
	E	2	59.4113	-0.2100	-19.0531	0.073	-	109.5	94.5	1447.54	41.74
	F	3	62.7213	0.0218	-2.4003	0.420	23.45	101.1	98.2	1423.05	12.27
	G	8	59.9171	-0.0162	-3.7340	0.206	-	101.8	100.0	1385.01	16.09
	Integrated age ± 1s		n=7			11.314				1385.11	1.74
	Plateau ± 1s	steps B-G	n=6		MSWD=8.03	7.095	5090.48		62.7	1425.44	5.10
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-04										
	A	0	60.2878	-0.0004	0.0841	9.295	-	100.0	89.9	1372.95	2.32
	B	1	54.5809	-0.1528	-33.1921	0.102	-	118.0	90.9	1437.62	32.08
	C	1	54.8516	0.0752	18.2711	0.120	6.79	90.2	92.1	1191.13	26.36
	D	2	63.4094	-0.0372	4.2263	0.136	-	98.0	93.4	1403.04	24.94
	E	2	65.1611	0.1032	1.5656	0.063	4.95	99.3	94.0	1442.86	48.60
	F	3	62.7393	-0.0315	-0.7206	0.113	-	100.3	95.1	1415.48	30.21
	G	8	61.5376	0.0313	-5.1226	0.510	16.32	102.5	100.0	1417.15	12.31
	Integrated age ± 1s		n=7			10.337				1375.09	2.37
	Plateau ± 1s	steps A-G	n=7		MSWD=11.63	10.337	13.26		100.0	1374.05	7.70
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-05										
#	A	0	55.1436	0.0037	1.3412	6.502	139.57	99.3	37.3	1282.37	3.85
	B	1	64.7314	0.0005	0.1997	7.516	1129.77	99.9	80.5	1442.27	3.24
	C	1	64.1526	-0.0232	-6.3156	0.421	-	102.9	82.9	1462.88	10.56
	D	2	65.0610	0.0092	0.0471	1.597	55.67	100.0	92.1	1448.06	5.49
	E	2	65.1853	-0.0039	-1.7461	0.351	-	100.8	94.1	1458.06	13.06
	F	3	64.9196	0.0090	-0.9304	0.889	56.50	100.4	99.2	1450.33	6.85
	G	8	66.8397	0.0368	1.7374	0.132	13.87	99.2	100.0	1467.69	27.13
	Integrated age ± 1s		n=7			17.408				1386.19	2.32
	Plateau ± 1s	steps B-G	n=6		MSWD=1.18	10.906	792.20		62.7	1446.34	2.72
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-06										
#	A	0	19.2388	-1.2555	-45.9135	0.005	-	170.1	0.0	866.67	754.34
#	B	1	18.4219	0.1991	-7.1805	0.014	2.56	111.6	0.2	590.91	275.70
#	C	1	8.3361	0.5392	-7.0913	0.022	0.95	125.8	0.4	324.51	196.81
#	D	2	7.0419	0.1016	32.9105	0.037	5.02	-38.6	0.7	-94.44	145.64
#	E	2	10.2766	-0.0501	16.0971	0.071	-	53.6	1.3	177.58	59.07
#	F	3	39.2532	-0.0310	3.9733	0.211	-	97.0	3.1	977.59	18.80
	G	8	61.5377	0.0008	0.3910	11.237	606.01	99.8	100.0	1391.43	1.68
	Integrated age ± 1s		n=7			11.597				1373.43	1.86
	Plateau ± 1s	steps G-G	n=1		MSWD=0.00	11.237	606.01		96.9	1391.43	1.68

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-08										
	A	0	61.4324	-0.0004	0.3713	11.201	-	99.8	87.2	1389.85	2.45
	B	1	61.5780	0.0000	-1.3545	0.439	8377.00	100.7	90.6	1400.22	12.67
	C	1	62.4603	0.0163	-2.0591	0.218	31.27	101.0	92.3	1417.40	18.43
	D	2	61.2315	0.0478	3.0996	0.610	10.68	98.5	97.0	1373.89	9.72
	E	2	59.9223	0.0350	-1.0358	0.220	14.59	100.5	98.7	1372.46	19.75
	F	3	56.6535	-0.2767	3.3555	0.016	-	98.2	98.9	1297.05	177.77
	G	8	59.0345	-0.0554	-12.3797	0.145	-	106.2	100.0	1411.35	24.26
	Integrated age ± 1s		n=7			12.849				1389.75	2.39
	Plateau ± 1s	steps A-G	n=7		MSWD=1.24	12.849			100.0	1389.67	2.60
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-10										
#	A	0	47.5506	-0.0006	1.6075	1.920	-	99.0	9.3	1148.39	4.16
#	B	1	56.0750	-0.0018	0.1225	4.707	-	99.9	32.0	1303.97	3.03
	C	1	62.3679	-0.0009	0.0796	12.609	-	100.0	93.0	1406.00	2.33
	D	2	58.1464	-0.0001	5.6479	0.317	-	97.1	94.5	1311.26	13.03
	E	2	61.7016	-0.0631	19.6027	0.095	-	90.6	95.0	1301.66	35.97
	F	3	61.3170	-0.0120	0.6806	1.025	-	99.7	99.9	1386.54	5.88
	G	8	47.2855	-0.0310	-22.2438	0.020	-	113.9	100.0	1267.26	145.65
	Integrated age ± 1s		n=7			20.691				1357.53	1.85
	Plateau ± 1s	steps C-G	n=5		MSWD=16.63	14.065	0.00		68.0	1400.49	8.72
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-12										
#	A	0	58.8278	-0.0002	1.0038	6.539	-	99.5	54.6	1344.99	2.34
	B	1	61.8476	0.0020	0.6714	4.128	255.55	99.7	89.0	1395.03	3.71
	C	1	61.4312	0.0183	-1.8055	0.439	27.83	100.9	92.7	1400.04	10.85
	D	2	61.5700	-0.0006	-2.6432	0.559	-	101.3	97.3	1406.10	9.63
	E	2	62.0261	-0.1198	-11.5305	0.081	-	105.5	98.0	1453.72	47.32
	F	3	64.7539	-0.0528	3.7143	0.173	-	98.3	99.4	1426.42	22.07
	G	8	59.8550	0.0229	3.5649	0.068	22.32	98.2	100.0	1349.44	48.84
	Integrated age ± 1s		n=7			11.986				1369.22	2.12
	Plateau ± 1s	steps B-G	n=6		MSWD=1.08	5.448	196.20		45.4	1397.49	3.41
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-14										
	A	0	61.1154	0.0030	1.2067	5.674	170.12	99.4	20.3	1380.88	3.04
	B	1	59.2429	0.0010	0.2419	20.010	514.32	99.9	92.0	1355.38	2.18
	C	1	54.6915	0.0084	11.1474	0.284	60.61	94.0	93.0	1225.09	14.90
	D	2	56.8002	0.0013	-2.1272	0.172	399.41	101.1	93.6	1326.98	19.38
	E	2	60.1372	-0.0787	-3.3015	0.070	-	101.6	93.9	1386.37	43.89
	F	3	60.1124	-0.0343	-2.6710	0.097	-	101.3	94.2	1383.08	33.97
	G	8	61.5926	-0.0194	0.5107	1.608	-	99.8	100.0	1391.70	4.60
	Integrated age ± 1s		n=7			27.916				1361.42	1.87
	Plateau ± 1s	steps A-G	n=7		MSWD=28.83	27.916	406.33		100.0	1365.67	8.78

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-16										
#	A	0	54.7567	-0.0486	3.9756	0.290	-	97.8	3.3	1262.55	13.69
	B	1	60.9986	0.0006	0.2027	8.086	799.19	99.9	96.2	1383.74	3.05
#	C	1	54.3504	0.0168	5.6166	0.165	30.45	96.9	98.1	1247.45	20.28
#	D	2	55.4857	0.1691	-14.7673	0.075	3.02	107.9	99.0	1366.66	41.77
#	G	8	62.0232	0.0665	-16.0836	0.087	7.68	107.7	100.0	1474.54	34.92
	Integrated age ± 1s		n=5			8.704				1378.12	3.00
	Plateau ± 1s	steps B-B	n=1		MSWD=0.00	8.086	799.19		92.9	1383.74	3.05
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1 00562±0.00081, NM-171, Lab#=54313-18										
#	A	0	25.2855	-0.0178	9.5938	0.428	-	88.8	3.4	636.76	10.75
#	B	0	48.3866	0.0068	6.4327	0.792	75.27	96.1	9.6	1137.69	7.41
#	C	1	61.2320	0.0012	0.8196	5.181	440.51	99.6	50.3	1384.56	2.86
	D	3	69.1496	0.0013	0.4302	6.312	395.42	99.8	100.0	1508.17	3.04
	Integrated age ± 1s		n=4			12.712				1412.78	2.13
	Plateau ± 1s	steps D-D	n=1		MSWD=0.00	6.312	395.42		49.7	1508.17	3.04
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-19										
#	A	0	52.5629	0.0002	0.7347	8.291	3196.77	99.6	36.0	1241.47	1.95
#	B	0	57.3234	0.0016	0.1900	3.126	329.04	99.9	49.5	1324.31	3.49
	C	1	60.4670	-0.0002	0.0076	8.264	-	100.0	85.3	1376.18	3.40
	D	3	62.1580	0.0025	0.4043	3.380	206.85	99.8	100.0	1401.18	4.16
	Integrated age ± 1s		n=4			23.061				1325.55	1.78
	Plateau ± 1s	steps C-D	n=2		MSWD=21.67	11.644	206.85		50.5	1386.20	12.27
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-26										
	A	0	61.1206	0.0002	0.4984	19.190	2404.35	99.8	76.7	1384.30	1.29
	B	0	62.4143	0.0090	4.4999	0.824	56.48	97.9	80.0	1386.09	8.67
	C	1	64.3100	0.0034	3.8737	0.725	150.30	98.2	82.9	1418.88	7.54
	D	3	64.5502	0.0024	0.7791	4.264	215.68	99.6	100.0	1436.83	3.22
	Integrated age ± 1s		n=4			25.004				1394.42	1.39
	Plateau ± 1s	steps A-D	n=4		MSWD=80.82	25.004	1888.28		100.0	1392.07	10.53
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-20										
#	A	0	51.8116	0.0013	0.5275	9.374	404.83	99.7	20.7	1229.55	1.91
#	B	0	55.0283	-0.0019	-0.7182	2.881	-	100.4	27.1	1290.64	3.81
	C	1	60.3696	-0.0002	0.1103	20.288	-	99.9	71.9	1374.13	2.40
	D	3	62.3954	0.0005	-0.0434	12.734	993.97	100.0	100.0	1407.00	2.22
	Integrated age ± 1s		n=4			45.276				1349.32	1.55
	Plateau ± 1s	steps C-D	n=2		MSWD=101.21	33.022	993.97		72.9	1391.84	16.39

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-21										
#	A	0	29.7494	0.0110	2.9697	5.375	46.53	97.1	43.4	784.63	2.35
#	B	0	36.1148	0.0055	0.4497	1.143	92.43	99.6	52.6	935.44	6.12
	C	1	53.9892	0.0031	0.0623	2.752	166.90	100.0	74.8	1269.25	5.09
	D	3	50.1311	0.0018	0.6300	3.125	281.66	99.6	100.0	1199.66	3.45
	Integrated age ± 1s		n=4			12.395				1023.52	1.91
	Plateau ± 1s	steps C-D	n=2		MSWD=128.00	5.877	227.92		47.4	1221.61	32.34
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-22										
	A	0	62.5310	0.0007	0.6915	12.545	747.55	99.7	80.9	1405.72	2.57
	B	0	64.7583	-0.0261	3.6423	0.256	-	98.3	82.5	1426.88	17.29
	C	1	67.1090	0.0010	2.0763	1.363	495.97	99.1	91.3	1470.18	5.59
	D	3	65.6145	-0.0118	0.1247	1.345	-	99.9	100.0	1456.15	4.05
	Integrated age ± 1s		n=4			15.509				1416.24	2.30
	Plateau ± 1s	steps A-D	n=4		MSWD=60.06	15.509	649.01		100.0	1426.73	15.57
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-23										
	A	0	59.4810	0.0005	0.6165	13.144	1094.39	99.7	84.9	1357.43	2.06
	B	0	65.3355	-0.0030	7.1161	0.193	-	96.8	86.1	1419.93	22.08
	C	1	66.9954	-0.0709	11.0780	0.177	-	95.1	87.3	1427.41	23.55
	D	3	65.4602	-0.0055	0.6628	1.973	-	99.7	100.0	1451.37	4.64
	Integrated age ± 1s		n=4			15.487				1371.27	2.00
	Plateau ± 1s	steps A-D	n=4		MSWD=117.57	15.487	928.84		100.0	1373.59	20.27
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-24										
	A	0	60.4992	0.0011	0.5168	10.221	446.02	99.7	91.1	1374.29	1.97
	B	0	61.0806	0.1013	0.8791	0.072	5.04	99.6	91.7	1382.06	40.78
	C	1	62.1582	-0.0184	4.1146	0.220	-	98.0	93.7	1383.78	15.74
	D	3	63.2254	0.0089	0.6108	0.706	57.43	99.7	100.0	1417.01	7.77
	Integrated age ± 1s		n=4			11.220				1377.25	2.00
	Plateau ± 1s	steps A-D	n=4		MSWD=9.55	11.220	410.02		100.0	1376.98	5.87
	F03-5-13, mu. A5:171, muscovite, J=0.0186087±0.05%, D=1.00562±0.00081, NM-171, Lab#=54313-17										
	3A	0	62.0149	0.0020	0.4696	13.906	251.18	99.8	92.1	1398.62	1.99
	3B	0	61.8882	0.0073	0.6960	0.104	70.28	99.7	92.8	1395.54	33.03
	3C	1	61.2362	0.0676	-0.5122	0.273	7.54	100.3	94.6	1391.00	15.92
#	3D	3	59.4617	0.0163	1.8479	0.817	31.35	99.1	100.0	1351.26	7.54
	Integrated age ± 1s		n=4			15.100				1395.93	2.01
	Plateau ± 1s	steps A-C	n=3		MSWD=0.12	14.284	245.20		94.6	1398.49	2.04

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	^{40}Ar* (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-01										
#	B	0	20.9557	0.0132	4.3424	0.000	38.68	93.9	3.2	561.92	23.33
#	C	0	42.4097	-0.0043	-0.4162	0.000	-	100.3	27.1	1052.51	4.00
	D	0	53.5856	-0.0005	0.4036	0.000	-	99.8	87.5	1247.51	1.98
	E	0	53.3302	-0.0030	0.4963	0.000	-	99.7	100.0	1242.72	6.24
	Integrated age ± 1s			n=4		0.000				1183.38	2.06
	Plateau ± 1s		steps D-E	n=2	MSWD=0.53	0.000	0.00		72.9	1247.07	2.11
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-02										
#	A	0	5.8649	0.0540	19.7588	0.000	9.44	0.0	0.9	0.10	82.15
#	B	0	16.5057	0.0156	7.1936	0.000	32.69	87.1	6.1	426.73	14.55
	C	0	38.2392	0.0022	0.9672	0.000	231.08	99.3	67.7	964.24	1.81
	D	0	36.4655	0.0040	2.0552	0.000	127.74	98.3	81.8	922.38	4.58
	E	0	42.6210	-0.0027	0.3549	0.000	-	99.8	100.0	1052.21	3.94
	Integrated age ± 1s			n=5		0.000				943.59	1.85
	Plateau ± 1s		steps C-E	n=3	MSWD=275.12	0.000	170.73		93.9	973.04	25.66
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-03										
#	A	0	10.1870	-0.0262	24.2491	0.000	-	29.4	0.5	97.51	42.85
#	B	0	15.7496	-0.0025	2.0529	0.000	-	96.1	2.4	446.80	10.68
#	C	0	40.6180	0.0015	1.4439	0.000	334.71	98.9	15.0	1007.92	2.20
	D	0	61.8503	0.0011	0.5892	0.000	476.43	99.7	77.2	1381.36	1.04
	E	0	65.0654	0.0009	2.0787	0.000	577.94	99.1	100.0	1424.47	1.89
	Integrated age ± 1s			n=5		0.000				1329.56	1.34
	Plateau ± 1s		steps D-E	n=2	MSWD=397.64	0.000	503.65		85.0	1391.36	18.23
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-04										
#	A	0	15.3920	-0.0306	25.9521	0.000	-	50.1	0.8	241.01	50.43
#	B	0	27.0297	0.0041	4.5734	0.000	125.79	95.0	5.2	704.09	7.86
#	C	0	50.1553	0.0023	0.9384	0.000	226.46	99.4	58.0	1185.79	1.58
	D	0	58.4964	0.0014	0.4830	0.000	365.01	99.8	87.8	1328.37	2.29
	E	0	53.3940	0.0020	2.4211	0.000	252.84	98.7	100.0	1234.15	4.16
	Integrated age ± 1s			n=5		0.000				1211.16	1.60
	Plateau ± 1s		steps D-E	n=2	MSWD=393.70	0.000	332.46		42.0	1306.45	39.83
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-05										
#	A	0	10.4633	0.0200	-29.1171	0.000	25.55	182.5	0.7	547.03	81.79
#	B	0	19.1667	0.0153	-4.2702	0.000	33.43	106.6	3.3	580.45	32.27
#	C	0	57.9036	0.0017	0.5894	0.000	305.20	99.7	53.2	1318.24	2.06
	D	0	60.5336	0.0027	0.3489	0.000	188.50	99.8	88.2	1361.68	2.63
	E	0	60.4092	-0.0048	-2.2259	0.000	-	101.1	100.0	1371.75	4.84
	Integrated age ± 1s			n=5		0.000				1319.64	1.96
	Plateau ± 1s		steps D-E	n=2	MSWD=3.34	0.000	141.09		46.8	1363.97	4.34

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-06										
#	A	0	9.3753	0.2721	87.0593	0.000	1.88	-175.0	1.2	-651.33	982.21
#	B	0	36.8353	0.0190	5.2510	0.000	26.80	95.8	13.9	910.77	15.20
	C	0	53.0438	0.0005	0.9467	0.000	1110.35	99.5	88.5	1235.60	3.48
	D	0	49.9393	-0.0206	-6.7458	0.000	-	104.0	93.6	1221.35	31.71
	E	0	55.6934	-0.0239	-8.8994	0.000	-	104.7	100.0	1327.83	26.75
	Integrated age ± 1s			n=5		0.000				1188.92	5.87
	Plateau ± 1s		steps C-E	n=3	MSWD=5.97	0.000	962.26		86.1	1236.95	8.43
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-07										
#	A	0	8.2994	-0.3156	9.0383	0.000	-	67.4	0.2	177.81	366.86
#	B	0	20.6535	-0.0119	17.1814	0.000	-	75.4	2.1	458.12	41.07
#	C	0	51.3035	0.0006	0.6555	0.000	859.80	99.6	66.3	1207.22	2.05
	D	0	54.6129	-0.0059	-1.3460	0.000	-	100.7	85.2	1273.44	4.04
	E	0	56.9172	-0.0075	-2.1593	0.000	-	101.1	100.0	1315.39	5.32
	Integrated age ± 1s			n=5		0.000				1223.35	2.11
	Plateau ± 1s		steps D-E	n=2	MSWD=39.48	0.000	0.00		33.7	1288.79	20.23
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-08										
#	A	0	6.3471	-0.1434	-57.4933	0.000	-	368.7	0.6	649.58	202.14
#	B	0	9.0045	-0.0102	3.3996	0.000	-	88.8	5.0	249.13	27.24
#	C	0	37.7330	-0.0023	-0.2646	0.000	-	100.2	39.0	961.42	3.68
	D	0	45.7892	-0.0029	-0.2249	0.000	-	100.1	80.5	1114.01	3.21
	E	0	49.2182	-0.0064	-1.8534	0.000	-	101.1	100.0	1183.86	5.79
	Integrated age ± 1s			n=5		0.000				1044.10	2.65
	Plateau ± 1s		steps D-E	n=2	MSWD=111.22	0.000	0.00		61.0	1130.38	29.60
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-09										
#	A	0	7.8014	-0.0139	2.2781	0.000	-	91.3	0.8	223.51	65.03
#	B	0	18.2197	0.0026	1.0155	0.000	194.99	98.4	4.5	518.21	11.12
#	C	0	54.0494	0.0006	0.8391	0.000	821.19	99.5	54.7	1253.18	1.99
	D	0	55.4731	-0.0046	1.0043	0.000	-	99.5	72.5	1276.20	3.84
	E	0	64.1398	0.0003	1.0101	0.000	1584.98	99.5	100.0	1415.08	2.68
	Integrated age ± 1s			n=5		0.000				1275.07	1.81
	Plateau ± 1s		steps D-E	n=2	MSWD=880.87	0.000	1584.98		45.3	1369.50	65.22
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-10										
#	B	0	12.8541	0.0116	9.6531	0.000	43.96	77.8	2.3	306.79	42.73
#	C	0	56.4842	0.0004	1.2886	0.000	-	99.3	61.7	1291.58	2.56
	D	0	67.6711	-0.0103	1.5599	0.000	-	99.3	70.8	1466.32	9.11
	E	0	68.5283	0.0017	1.4663	0.000	295.94	99.4	100.0	1479.57	3.65
	Integrated age ± 1s			n=4		0.000				1347.66	2.39
	Plateau ± 1s		steps D-E	n=2	MSWD=1.82	0.000	295.94		38.3	1477.74	4.69

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ ($\times 10^{-3}$)	$^{39}Ar_K$ ($\times 10^{-15}$ mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-11										
#	A	0	14.2935	0.1055	39.7590	0.000	4.84	17.7	0.8	82.80	287.49
#	B	0	34.0994	0.0156	3.9450	0.000	32.66	96.6	6.4	862.32	27.53
	C	0	57.4403	0.0032	0.9036	0.000	158.28	99.5	91.0	1309.17	2.86
	D	0	56.8212	-0.0039	-0.2724	0.000	-	100.1	93.7	1304.70	49.98
	E	0	57.5007	0.0042	3.0673	0.000	120.58	98.4	100.0	1299.68	22.00
	Integrated age ± 1s		n=5			0.000				1278.99	3.73
	Plateau ± 1s	steps C-E	n=3		MSWD=0.10	0.000	151.49		93.6	1309.00	3.00
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-12										
#	A	0	13.5086	-0.3092	-9.7660	0.000	-	121.2	0.1	478.54	980.07
#	B	0	19.8171	-0.0286	-7.1295	0.000	-	110.6	2.7	616.43	46.10
#	C	0	49.9748	0.0014	0.6165	0.000	370.87	99.6	73.4	1184.30	2.76
	D	0	58.7981	-0.0010	-3.7857	0.000	-	101.9	83.9	1353.49	9.65
	E	0	56.1980	-0.0040	-1.5831	0.000	-	100.8	100.0	1300.84	7.10
	Integrated age ± 1s		n=5			0.000				1208.55	3.01
	Plateau ± 1s	steps D-E	n=2		MSWD=19.31	0.000	0.00		26.6	1319.32	25.15
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-13										
#	A	0	17.8590	0.0613	-0.3883	0.000	8.32	100.7	0.6	519.77	114.03
#	B	0	24.5501	-0.0027	11.1066	0.000	-	86.6	2.3	600.76	35.53
#	C	0	52.1105	0.0023	1.1985	0.000	218.80	99.3	34.5	1218.36	2.59
	D	0	57.8005	0.0007	1.3458	0.000	771.05	99.3	91.9	1312.92	2.01
	E	0	57.2792	0.0024	1.4166	0.000	212.66	99.3	100.0	1304.05	7.21
	Integrated age ± 1s		n=5			0.000				1268.06	1.96
	Plateau ± 1s	steps D-E	n=2		MSWD=1.40	0.000	701.80		65.5	1312.28	2.49
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-14										
#	A	0	13.8903	0.0877	42.6725	0.000	5.82	9.1	2.0	41.71	156.00
#	B	0	27.1019	0.0401	8.1188	0.000	12.71	91.2	6.9	681.82	90.35
#	C	0	52.1151	-0.0021	-0.7611	0.000	-	100.4	71.4	1228.36	3.73
	D	0	66.1733	-0.0051	-1.3161	0.000	-	100.6	84.4	1456.58	13.43
	E	0	62.8798	0.0022	1.6524	0.000	230.52	99.2	100.0	1392.57	10.29
	Integrated age ± 1s		n=5			0.000				1246.04	5.17
	Plateau ± 1s	steps D-E	n=2		MSWD=14.31	0.000	230.52		28.6	1416.25	30.92
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-15										
#	A	0	26.5790	0.0504	19.1463	0.000	10.13	78.7	1.0	592.61	205.44
#	B	0	61.0620	-0.0062	2.7098	0.000	-	98.7	12.9	1358.97	16.02
	C	0	76.1411	0.0025	3.0835	0.000	206.71	98.8	93.9	1582.88	3.91
	D	0	72.3284	-0.0266	31.2730	0.000	-	87.2	96.1	1403.34	80.81
	E	0	72.2674	-0.0307	9.2668	0.000	-	96.2	100.0	1500.74	44.99
	Integrated age ± 1s		n=5			0.000				1542.73	4.77
	Plateau ± 1s	steps C-E	n=3		MSWD=4.10	0.000	192.19		87.1	1581.85	7.96

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-16										
#	A	0	41.2766	0.0669	176.0492	0.000	7.63	-26.1	0.4	-401.95	910.41
#	B	0	46.3437	0.0159	10.6625	0.000	32.10	93.2	5.8	1064.95	37.16
	C	0	59.8690	0.0076	-1.1014	0.000	67.29	100.5	87.6	1357.93	3.54
	D	0	59.0833	0.0153	-61.6159	0.000	33.29	130.8	89.7	1611.67	60.85
	E	0	59.9988	-0.0153	-4.9100	0.000	-	102.4	100.0	1377.77	14.57
	Integrated age ± 1s		n=5			0.000				1346.73	4.38
	Plateau ± 1s	steps C-E	n=3		MSWD=9.47	0.000	59.18		94.2	1359.84	10.60
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-17										
	A	0	42.8852	-0.2280	-106.5726	0.000	-	173.4	1.2	1570.40	220.83
	B	0	73.6354	-0.0112	-1 9466	0.000	-	100.8	72.3	1568.45	6.19
	C	0	76.9229	-0.0377	-4.2678	0.000	-	101.6	92.5	1623.92	14.42
	D	0	81.9027	-0.2200	-8.0427	0.000	-	102.9	94.8	1705.61	94.69
#	E	0	73.8199	-0.1164	20.9722	0.000	-	91.6	100.0	1472.29	46.55
	Integrated age ± 1s		n=5			0.000				1578.34	6.88
	Plateau ± 1s	steps A-D	n=4		MSWD=4.78	0.000	0.00		94.8	1577.53	12.45
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-18										
#	A	0	14.9433	0.0132	8.0639	0.000	38.55	84.0	1.9	377.84	41.05
#	B	0	32.7783	-0.0043	-1.2603	0.000	-	101.1	13.2	866.80	6.61
	C	0	51.6003	0.0008	0.2408	0.000	668.42	99.9	86.5	1214.45	2.00
	D	0	60.3675	-0.0067	0.4460	0.000	-	99.8	93.8	1358.56	9.47
	E	0	55.3258	-0.0074	9.5839	0.000	-	94.9	100.0	1230.97	11.73
	Integrated age ± 1s		n=5			0.000				1177.79	2.21
	Plateau ± 1s	steps C-E	n=3		MSWD=111.25	0.000	564.37		86.8	1220.91	20.41
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-19										
#	A	0	18.7522	-0.0418	24.9053	0.000	-	60.7	2.9	345.62	127.08
#	B	0	40.2852	0.0019	4.3980	0.000	271.40	96.8	45.0	984.52	8.01
	C	0	46.4702	-0.0009	1.0385	0.000	-	99.3	93.5	1119.61	6.83
	D	0	53.8295	0.0312	24.7043	0.000	16.34	86.4	99.5	1126.30	45.16
	E	0	51.5267	-0.0801	195.3643	0.000	-	-12.1	100.0	-221.87	964.64
	Integrated age ± 1s		n=5			0.000				1040.69	6.70
	Plateau ± 1s	steps C-E	n=3		MSWD=0.98	0.000	15.13		55.0	1119.69	6.81
	F03-5-1, musc, J=0.0183409±0.10%, D=1.0032001±0.0005, NM-178A, Lab#=54895-20										
#	A	0	12.7217	0.0448	17.6679	0.000	11.39	58.9	0.4	234.74	233.82
#	B	0	28.2277	0.0071	4.0162	0.000	71.65	95.8	3.2	734.87	21.02
#	C	0	56.5274	-0.0010	1 3941	0.000	-	99.3	50.8	1291.78	2.52
	D	0	60.2197	-0.0011	1.9757	0.000	-	99.0	87.5	1349.00	2.91
	E	0	60.3271	-0.0098	0.8386	0.000	-	99.6	100.0	1356.06	6.32
	Integrated age ± 1s		n=5			0.000				1304.50	2.19
	Plateau ± 1s	steps D-E	n=2		MSWD=1.03	0.000	0.00		49.2	1350.23	2.86

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ ($\times 10^{-3}$)	$^{39}Ar_K$ ($\times 10^{-15}$ mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	FO3-5-1mu, A1:171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-21										
	A	1	61.3683	-0.0191	-6.7312	0.076	-	103.2	20.7	1426.06	41.64
	B	2	73.5155	0.0010	40.0025	0.084	530.52	83.9	43.6	1399.93	38.21
	C	2	71.2144	-0.0293	31.9230	0.076	-	86.7	64.3	1401.24	41.58
	D	5	68.4593	-0.0186	29.4235	0.131	-	87.3	100.0	1369.03	25.00
	Integrated age ± 1s		n=4			0.367				1394.68	17.49
	Plateau ± 1s	steps A-D	n=4		MSWD=0.53	0.367	153.21		100.0	1390.16	17.06
	FO3-5-1mu, A1:171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-22										
#	A	1	58.5712	0.0007	-0.0673	6.328	693.97	100.0	39.8	1350.03	2.29
#	B	2	47.9857	0.0002	0.4158	1.306	2256.54	99.7	48.0	1166.28	3.35
#	C	2	51.6047	-0.0016	-0.8980	0.997	-	100.5	54.3	1237.09	4.01
	D	7	67.9233	0.0005	-0.2839	7.253	939.43	100.1	99.9	1497.36	2.69
	E	10	6.9093	-0.1043	-175.6841	0.021	-	854.5	100.0	1353.62	114.13
	Integrated age ± 1s		n=5			15.906				1398.13	1.75
	Plateau ± 1s	steps D-E	n=2		MSWD=1.59	7.275	936.69		45.7	1497.28	3.43
	FO3-5-1, musc A1:171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-23										
#	A	1	49.0030	0.0008	0.5945	12.142	632.22	99.6	68.8	1183.57	1.30
	B	3	56.5751	-0.0001	0.7594	3.422	-	99.6	88.3	1313.16	2.79
	C	5	56.4987	-0.0015	1.4284	2.026	-	99.3	99.7	1308.59	2.64
	D	8	51.8570	-0.0417	18.8241	0.046	-	89.3	100.0	1137.70	78.00
	Integrated age ± 1s		n=4			17.636				1223.92	1.31
	Plateau ± 1s	steps B-D	n=3		MSWD=3.17	5.494	0.00		31.2	1310.65	3.45
	FO3-5-1, musc A1:171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-24										
#	A	1	73.0117	0.0009	0.6902	22.573	551.63	99.7	76.4	1568.13	1.49
	B	3	76.0906	0.0010	0.6248	5.729	509.49	99.8	95.8	1612.39	1.74
	C	5	68.7011	-0.0021	0.8995	0.664	-	99.6	98.0	1503.78	7.15
	D	8	71.3603	0.0027	1.1311	0.586	187.93	99.5	100.0	1542.19	7.06
	Integrated age ± 1s		n=4			29.553				1574.87	1.44
	Plateau ± 1s	steps B-D	n=3		MSWD=147.78	6.980	435.65		23.6	1602.80	20.04
	FO3-5-1, musc A1:171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-25										
#	A	1	49.7806	0.0008	1.2218	21.264	622.58	99.3	51.2	1194.12	1.12
	B	3	58.9821	0.0006	0.3491	11.881	915.00	99.8	79.8	1354.72	1.38
	C	5	59.9166	0.0005	0.1125	7.280	942.38	99.9	97.4	1370.97	1.61
	D	8	61.6552	0.0023	-0.5921	1.099	222.39	100.3	100.0	1402.07	4.68
	Integrated age ± 1s		n=4			41.524				1278.56	1.09
	Plateau ± 1s	steps B-D	n=3		MSWD=65.15	20.261	887.26		48.8	1363.54	8.25

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	FO3-5-1, musc A1:171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-26										
#	A	1	64.7173	0.0007	1.5218	13.315	750.30	99.3	58.5	1440.26	1.32
	B	3	73.1485	-0.0001	0.6603	4.368	-	99.7	77.7	1570.23	2.17
	C	5	73.9786	0.0007	0.6870	3.095	681.00	99.7	91.3	1582.07	2.34
	D	8	74.1698	0.0003	1.4342	1.978	1510.82	99.4	100.0	1581.65	2.88
	Integrated age ± 1s		n=4			22.756				1498.02	1.29
	Plateau ± 1s	steps B-D	n=3		MSWD=8.54	9.441	1004.50		41.5	1577.09	4.10
	FO3-5-1, musc A1:171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-27										
	A	1	66.1580	0.0010	1.2288	5.742	498.93	99.5	71.9	1463.80	1.80
	B	3	75.8453	0.0025	-0.0538	1 904	207.29	100.0	95.7	1611.76	2.64
	C	5	63.9918	-0.0033	-4.0195	0.202	-	101.9	98.2	1454.34	12.66
	D	8	74.7956	-0.0052	-17.9030	0.140	-	107.1	100.0	1670.44	16.27
	Integrated age ± 1s		n=4			7.987				1503.68	1.69
	Plateau ± 1s	steps A-D	n=4		MSWD=755.46	7.987	408.07		100.0	1511.24	40.37
	FO3-5-1, musc A1:171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-28										
	A	1	68.2358	0.0010	1.0789	8.351	504.05	99.5	86.3	1496.00	1.65
	B	3	63.3970	-0.0064	-0.1824	0.386	-	100.1	90.3	1427.54	9.08
	C	5	59.3203	-0.0037	1.1834	0.418	-	99.4	94.6	1356.20	7.49
	D	8	69.0480	-0.0041	-0.0634	0.519	-	100.0	100.0	1513.21	6.74
	Integrated age ± 1s		n=4			9.673				1488.42	1.69
	Plateau ± 1s	steps A-D	n=4		MSWD=130.35	9.673	435.16		100.0	1489.01	17.61
	FO3-5-1, musc A1:171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-29										
	A	1	59.4363	0.0009	0.7454	10.205	552.53	99.6	91.1	1360.19	1.45
	B	3	61.0364	0 0054	-1.7292	0.351	93 63	100.8	94.2	1397.59	9.81
	C	5	56.3272	-0.0017	-11.5127	0.119	-	106.0	95.3	1368.48	23.67
	D	8	61.1391	0.0028	-1.7966	0.527	183.16	100.9	100.0	1399.53	6.57
	Integrated age ± 1s		n=4			11.203				1363.33	1.54
	Plateau ± 1s	steps A-D	n=4		MSWD=15 69	11.203	514.96		100.0	1362.77	5.58
	FO3-5-1, musc A1:171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-30										
#	A	1	45.0409	0.0028	1.7316	7.559	181.50	98.9	53.4	1105.20	1.41
	B	3	54.7508	0.0028	1.6248	3.937	183.66	99.1	81.3	1278.25	1.74
	C	5	52.3220	0.0016	2.2646	2.019	311.67	98.7	95.5	1233.33	2.58
	D	8	57.8130	0.0028	4.9530	0.630	183.12	97.5	100.0	1313.14	5.58
	Integrated age ± 1s		n=4			14.145				1182.79	1.25
	Plateau ± 1s	steps B-D	n=3		MSWD=140.27	6.585	222.85		46.6	1267.28	16.53

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	FO3-5-1, mu. A1: 171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-31										
	A	0	59.3593	-0.0008	1.6433	1.347	-	99.2	0.6	1354.63	3.12
	B	1	53.6753	-0.0303	-41.1692	0.038	-	122.7	0.6	1464.47	54.82
	C	2	53.2945	-0.0371	-40.4614	0.031	-	122.4	0.6	1455.41	63.69
	D	8	72.6874	-0.0294	34.0358	0.071	-	86.2	0.6	1414.63	30.79
	Integrated age ± 1s		n=4			1.488				1362.61	3.79
	Plateau ± 1s	steps A-D	n=4		MSWD=3.39	1.488	0.00		100.0	1355.83	5.73
	FO3-5-1, mu. A1: 171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-32										
	A	0	62.7968	0.0046	1.6407	0.786	110.61	99.2	2.3	1409.69	4.61
#	B	1	59.6295	0.0648	46.5619	0.030	7.87	76.9	2.3	1130.16	69.17
#	C	2	56.7391	0.0655	14.2102	0.021	7.79	92.6	2.3	1248.82	96.14
#	D	8	52.2982	0.0122	9.9018	0.023	41.83	94.4	2.3	1193.32	87.43
	Integrated age ± 1s		n=4			0.860				1391.39	5.81
	Plateau ± 1s	steps A-A	n=1		MSWD=0.00	0.786	110.61		91.4	0.00	0.00
	FO3-5-1, mu. A1: 171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-33										
#	A	0	25.0760	-0.0015	32.8839	0.997	-	61.2	3.4	460.04	4.65
#	B	1	50.0488	0.0011	1.3262	6.070	476.20	99.2	6.1	1198.33	1.52
	C	2	61.1858	0.0007	0.3458	35.892	698.81	99.8	21.5	1390.20	1.25
	D	11	61.8380	0.0005	0.5644	27.035	946.22	99.7	33.2	1399.54	1.26
	Integrated age ± 1s		n=4			69.995				1367.50	1.14
	Plateau ± 1s	steps C-D	n=2		MSWD=27.72	62.928	805.11		89.9	1394.82	4.70
	FO3-5-1, mu. A1: 171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310-34										
#	A	0	31.3273	-0.0115	9.9363	0.187	-	90.6	93.5	776.63	18.44
#	B	1	47.5831	-0.0052	1.2943	0.361	-	99.2	93.6	1154.30	9.57
	C	2	61.3296	0.0002	0.3228	7.177	3223.02	99.8	96.8	1392.60	1.66
	D	11	61.6816	0.0002	0.6614	7.170	2794.11	99.7	100.0	1396.61	1.56
	Integrated age ± 1s		n=28			224.781				1370.22	1.09
	Plateau ± 1s	steps A-D	n=15		MSWD=50.39	217.092	1020.39		96.6	1385.87	4.04
	FO3-5-11, musc A3:171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-14										
#	A	1	59.3146	0.0074	1.1769	6.358	69.40	99.4	54.3	1349.31	1.49
	B	3	67.1301	0.0110	0.4729	4.272	46.41	99.8	90.7	1474.76	2.06
	C	5	66.5481	0.0140	1.3357	0.917	36.39	99.4	98.6	1462.08	3.80
	D	8	63.9779	0.0200	2.7091	0.169	25.46	98.8	100.0	1416.24	13.22
	Integrated age ± 1s		n=4			11.715				1405.85	1.41
	Plateau ± 1s	steps B-D	n=3		MSWD=13.00	5.357	44.04		45.7	1470.86	6.49

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	FO3-5-11, musc A3:171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-18										
	A	1	77.4612	0.0040	0.2740	5.894	128.97	99.9	64.1	1625.36	1.92
	B	3	78.7723	0.0028	0.4995	2.341	182.69	99.8	89.6	1642.59	2.50
	C	5	77.5014	-0.0005	-2.2099	0.498	-	100.8	95.0	1636.09	6.97
	D	8	78.4926	-0.0039	-0.7640	0.462	-	100.3	100.0	1643.87	7.87
	Integrated age ± 1s			n=4		9.195				1631.28	1.72
	Plateau ± 1s		steps A-D	n=4	MSWD=10.80	9.195	129.19		100.0	1632.36	4.84
	FO3-5-11, musc A3:171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-22										
#	A	1	71.8315	-0.0001	0.9615	2.227	-	99.6	54.6	1542.34	2.80
	B	2	73.4208	-0.0006	0.2422	1.774	-	99.9	98.0	1568.38	2.70
	C	5	64.6833	-0.0650	-11.6997	0.039	-	105.3	99.0	1491.93	65.69
	D	8	68.9511	-0.1093	-8.2037	0.041	-	103.5	100.0	1539.63	59.02
	Integrated age ± 1s			n=4		4.081				1553.20	2.27
	Plateau ± 1s		steps B-D	n=3	MSWD=0.79	1.853	0.00		45.4	1568.20	2.75
	FO3-5-11, musc A3:171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-24										
	A	1	76.9213	0.0047	0.7103	10.530	107.71	99.7	91.4	1616.03	1.62
	B	2	79.8559	0.0016	2.1190	0.683	328.06	99.2	97.3	1650.91	5.86
	C	5	78.7353	-0.0046	0.4590	0.156	-	99.8	98.7	1642.24	17.27
	D	8	79.2780	-0.0016	-6.6267	0.151	-	102.5	100.0	1678.23	18.62
	Integrated age ± 1s			n=4		11.521				1619.30	1.70
	Plateau ± 1s		steps A-D	n=4	MSWD=14.98	11.521	117.90		100.0	1619.12	6.04
	FO3-5-11, musc A3:171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-27										
	A	1	63.3509	0.0044	1.2066	4.360	115.75	99.4	89.6	1413.35	1.70
	B	2	63.4693	0.0067	2.2134	0.245	76.43	99.0	94.6	1410.55	10.17
	C	5	62.4878	0.0157	13.0992	0.099	32.54	93.8	96.7	1343.65	21.19
	D	8	62.2749	0.0282	2.4327	0.162	18.12	98.8	100.0	1390.78	13.52
	Integrated age ± 1s			n=4		4.867				1411.08	1.84
	Plateau ± 1s		steps A-D	n=4	MSWD=4.47	4.867	108.83		100.0	1412.50	3.56
	FO3-5-11, musc A3:171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-57										
	A	1	78.4853	0.0021	2.1223	4.404	237.87	99.2	88.0	1631.99	2.08
	B	2	78.3535	-0.0044	2.8825	0.413	-	98.9	96.2	1627.03	7.15
#	C	5	74.9365	0.0015	11.4036	0.104	344.29	95.5	98.3	1542.62	23.07
#	D	8	72.6970	0.0016	17.3516	0.085	321.96	92.9	100.0	1483.47	26.13
	Integrated age ± 1s			n=4		5.006				1627.34	2.16
	Plateau ± 1s		steps A-B	n=2	MSWD=0.44	4.817	217.47		96.2	1631.61	2.08

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	FO3-5-11, musc A3:171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-60										
#	A	1	74.2959	0.0032	0.6890	2.452	161.20	99.7	60.6	1579.03	2.48
	B	2	80.2326	0.0017	0.3518	1.396	301.31	99.9	95.0	1663.20	3.90
	C	5	77.0159	-0.0330	-2.6228	0.132	-	101.0	98.3	1631.00	25.13
	D	8	73.9834	-0.0176	2.9851	0.070	-	98.8	100.0	1564.79	43.84
	Integrated age ± 1s		n=4			4.050				1609.92	2.45
	Plateau ± 1s	steps B-D	n=3		MSWD=3.26	1.598	263.29		39.4	1661.70	6.96
	FO3-5-11, musc A3:171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-62										
	A	1	62.4181	0.0008	1.5972	1.908	671.50	99.2	90.9	1396.89	2.83
	B	2	64.4184	-0.0658	0.9096	0.064	-	99.6	94.0	1431.19	37.25
	C	5	63.5449	-0.0416	2.6413	0.121	-	98.8	99.8	1409.67	20.20
	D	8	57.3437	-0.8567	62.3785	0.005	-	67.7	100.0	990.14	469.90
	Integrated age ± 1s		n=4			2.098				1397.81	3.28
	Plateau ± 1s	steps A-D	n=4		MSWD=0.66	2.098	610.70		100.0	1397.31	2.85
	FO3-5-11, musc A3:171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-64										
	A	1	66.3562	0.0005	0.9206	4.138	1110.10	99.6	79.5	1461.00	2.12
	B	2	67.3236	-0.0136	1.1934	0.418	-	99.5	87.6	1474.42	7.19
	C	5	67.6019	-0.0090	0.6517	0.629	-	99.7	99.7	1481.05	5.31
	D	8	68.8157	-0.2881	-44.4447	0.017	-	119.1	100.0	1687.31	110.75
	Integrated age ± 1s		n=4			5.203				1465.31	2.06
	Plateau ± 1s	steps A-D	n=4		MSWD=6.13	5.203	882.91		100.0	1464.56	4.73
	FO3-5-11, musc A3:171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-96										
	A	1	72.1618	0.0010	1.3723	6.357	510.87	99.4	90.5	1545.38	1.70
	B	2	68.3433	0.0073	8.2719	0.180	69.83	96.4	93.1	1458.18	13.04
	C	5	69.5892	-0.0082	7.5806	0.212	-	96.8	96.1	1480.13	11.17
	D	8	72.7729	0.0005	4.8213	0.273	988.00	98.0	100.0	1539.43	8.84
	Integrated age ± 1s		n=4			7.023				1541.03	1.77
	Plateau ± 1s	steps A-D	n=4		MSWD=25.32	7.023	503.89		100.0	1542.41	8.24
	FO3-5-11, musc A3:171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-99										
	A	1	74.9835	0.0034	0.7818	4.401	151.19	99.7	79.4	1588.42	2.18
	B	2	75.8132	0.0000	1.5172	0.646	2308.00	99.4	91.1	1597.09	5.27
	C	5	77.0493	-0.0045	1.0779	0.482	-	99.6	99.8	1616.29	6.68
	D	8	62.0121	-0.2510	-27.1974	0.012	-	112.9	100.0	1519.99	170.92
	Integrated age ± 1s		n=4			5.540				1591.74	2.11
	Plateau ± 1s	steps A-D	n=4		MSWD=5.67	5.540	2811.88		100.0	1591.90	4.63

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	FO3-5-11, musc A3:171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-13										
	A	1	68.3549	0.0031	0.5875	3.292	165.28	99.7	88.8	1492.66	2.09
	B	2	68.1920	-0.0066	3.2102	0.141	-	98.6	92.6	1478.55	17.49
	C	5	64.2478	0.0394	-1.4391	0.048	12.95	100.7	93.9	1439.46	47.29
	D	8	68.0731	0.0121	-2.4012	0.225	42.28	101.0	100.0	1501.65	11.50
	Integrated age ± 1s			n=4		3.707				1491.99	2.28
	Plateau ± 1s		steps A-D	n=4	MSWD=0.84	3.707	149.64		100.0	1492.65	2.11
	FO3-5-11, mu. A3: 171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-10										
#	A	0	59.0113	0.0131	3.1640	0.258	38.90	98.4	30.1	1334.86	15.60
	B	1	63.8660	0.0076	-3.3464	0.367	66.98	101.6	72.8	1442.20	10.80
	C	2	60.9532	0.0264	-6.5153	0.146	19.34	103.2	89.8	1411.59	24.62
	D	11	62.2167	0.0349	1.6456	0.088	14.60	99.2	100.0	1393.56	40.86
	Integrated age ± 1s			n=4		0.859				1400.31	8.88
	Plateau ± 1s		steps B-D	n=3	MSWD=1.19	0.601	47.74		69.9	1434.84	10.50
	FO3-5-11, mu. A3: 171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-11										
#	A	0	74.7838	-0.0043	4.1001	0.267	-	98.4	13.6	1571.58	10.38
	B	1	81.7058	-0.0010	0.3790	1.476	-	99.9	88.6	1683.06	3.08
	C	2	76.2479	-0.0781	-4.2151	0.064	-	101.6	91.9	1626.80	34.87
	D	11	81.2717	-0.0158	-1.9187	0.160	-	100.7	100.0	1686.33	15.59
	Integrated age ± 1s			n=4		1.967				1666.74	3.29
	Plateau ± 1s		steps B-D	n=3	MSWD=1.32	1.700	0.00		86.4	1682.76	3.50
	FO3-5-11, mu. A3: 171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-20										
#	A	0	65.5800	-0.0087	-0.2390	0.318	-	100.1	6.3	1454.37	8.59
	B	1	78.1722	0.0006	0.0139	3.809	908.97	100.0	81.5	1636.28	2.66
	C	2	76 7971	-0.0014	0.1869	0.807	-	99.9	97.4	1616.45	5.12
	D	11	76.3051	-0.0289	-9.9585	0.131	-	103.9	100.0	1651.10	20.67
	Integrated age ± 1s			n=4		5.064				1622.61	2.42
	Plateau ± 1s		steps B-D	n=3	MSWD=6.33	4.747	729.36		93.7	1632.31	5.93
	FO3-5-11, mu. A3: 171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-21										
#	A	0	78.3357	-0.0031	1.7482	0.722	-	99.3	18.3	1631.44	5.17
	B	1	81.9144	0.0012	0.4141	2.677	410.83	99.9	86.2	1685.73	2.62
	C	2	80.2066	-0.0135	0.6329	0.411	-	99.8	96.6	1661.69	7.42
	D	11	71.1301	-0.0450	5.8871	0.133	-	97.5	100.0	1510.57	17.33
	Integrated age ± 1s			n=4		3.944				1667.71	2.39
	Plateau ± 1s		steps B-D	n=3	MSWD=53.19	3.222	341.33		81.7	1679.63	17.86

$^{40}Ar/^{39}Ar$ analytical data table for step heated crystals.

	ID	Power (Watts)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ ($\times 10^{-3}$)	$^{39}Ar_K$ ($\times 10^{-15}$ mol)	K/Ca	$^{40}Ar^*$ (%)	^{39}Ar (%)	Age (Ma)	±1σ (Ma)
	FO3-5-11, mu. A3: 171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-25										
#	A	0	51.6309	0.1199	8.3190	0.060	4.26	95.3	3.2	1183.74	30.14
#	B	1	59.7406	0.0290	-0.7749	0.077	17.60	100.4	7.4	1365.52	25.13
	C	2	67.6716	0.0037	0.7231	0.662	139.02	99.7	43.3	1481.80	4.93
	D	11	69.2179	0.0113	0.6844	1.046	45.22	99.7	100.0	1505.12	4.30
	Integrated age ± 1s		n=4			1.845				1481.47	3.43
	Plateau ± 1s	steps C-D	n=2		MSWD=12.71	1.708	81.58		92.6	1495.06	11.56
	FO3-5-11, mu. A3: 171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-23										
	A	0	75.5094	0.0137	1.1059	1.220	37.29	99.6	78.0	1594.54	3.06
	B	1	75.2927	0.0460	2.2125	0.274	11.10	99.1	95.5	1586.89	9.22
#	C	2	64.5398	0.0048	13.8671	0.027	107.06	93.7	97.3	1373.04	65.62
#	D	11	68.1314	0.0016	11.6820	0.043	317.35	94.9	100.0	1439.49	42.14
	Integrated age ± 1s		n=4			1.564				1585.53	3.38
	Plateau ± 1s	steps A-B	n=2		MSWD=0.62	1.494	32.49		95.5	1593.78	2.96
	FO3-5-11, mu. A3: 171, muscovite, J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312-26										
#	A	0	77.7064	0.0031	2.1920	1.581	166.90	99.2	45.2	1620.88	3.02
	B	1	79.6798	0.0005	-0.1716	1.413	992.23	100.1	85.6	1657.77	3.58
	C	2	77.9189	-0.0122	6.1387	0.218	-	97.7	91.8	1607.50	11.44
	D	11	83.0118	0.0060	3.3779	0.287	84.98	98.8	100.0	1688.72	9.14
	Integrated age ± 1s		n=4			3.498				1640.65	2.42
	Plateau ± 1s	steps B-D	n=3		MSWD=15.39	1.917	745.62		54.8	1657.63	12.56

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	T01-16-75-2 K:5:140 musc, Single crystal Muscovite, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-01										
	A	1	83.64	-0.0541	15.78	0.050	-	94.4	5.3	1461.3	164.1
	B	1	87.48	-0.0305	13.58	0.061	-	95.4	11.8	1517.7	135.7
	C	2	68.60	-0.0160	0.5138	0.364	-	99.8	50.4	1322.1	20.9
#	D	2	61.05	0.0004	1.264	0.264	1310.9	99.4	78.4	1212.0	9.3
#	E	3	63.94	-0.0080	6.249	0.151	-	97.1	94.5	1232.6	12.8
#	F	6	70.02	-0.0203	45.33	0.052	-	80.9	100.0	1151.7	41.3
	Integrated age ± 1s			n=6		0.943				1289.9	14.6
	Plateau ± 1s	steps A-C		n=3	MSWD=1.35	0.475	0.0		50.4	1328.7	23.8
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-60										
#	A	1	53.13	0.0203	2.887	0.251	25.1	98.4	13.1	1085.0	7.0
	B	1	57.92	0.0140	1.851	0.373	36.5	99.1	32.6	1163.2	4.9
	C	2	57.99	0.0085	3.023	0.401	60.1	98.5	53.5	1159.1	4.2
	D	3	56.96	0.0018	1.144	0.703	288.8	99.4	90.1	1151.9	4.6
#	E	6	43.40	0.0386	6.789	0.189	13.2	95.4	100.0	906.4	21.5
	Integrated age ± 1s			n=5		1.92				1124.1	3.5
	Plateau ± 1s	steps B-D		n=3	MSWD=1.46	1.48	162.9		77.0	1157.9	3.3
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-62										
	A	1	58.32	-0.0019	0.9801	0.500	-	99.5	50.3	1172.9	4.6
	B	1	60.29	-0.0123	1.334	0.177	-	99.3	68.1	1200.6	7.7
	C	2	61.72	-0.0035	1.886	0.222	-	99.1	90.4	1219.1	6.[illegible]
#	D	3	57.78	0.0449	3.729	0.075	11.4	98.1	98.0	1152.8	15.1
#	E	6	54.30	0.1338	23.16	0.020	3.8	87.4	100.0	1008.3	62.5
	Integrated age ± 1s			n=5		0.994				1183.7	3.7
	Plateau ± 1s	steps A-C		n=3	MSWD=17.26	0.899	0.0		90.4	1190.4	14.2
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-64										
	A	1	58.91	0.0007	2.838	0.353	698.9	98.6	33.9	1173.6	5.7
	B	1	59.51	0.0027	-0.4496	0.293	187.4	100.2	62.[illegible]	1196.9	6.2
	C	2	60.29	0.0253	4.575	0.293	20.2	97.8	90.3	1186.5	6.6
#	D	3	52.48	-0.0026	4.153	0.084	-	97.7	98.4	1069.0	21.8
#	E	6	46.13	0.0592	23.23	0.017	8.6	85.1	100.0	869.3	77.8
	Integrated age ± 1s			n=5		1.04				1171.1	4.1
	Plateau ± 1s	steps A-C		n=3	MSWD=3.86	0.94	327.5		90.3	1185.0	7.0

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-66										
#	A	1	60.18	0.0020	3.476	0.320	256.8	98.3	14.5	1189.6	4.9
	B	1	62.81	-0.0007	-0.0331	1.12	-	100.0	65.3	1243.0	2.3
	C	2	62.76	0.0032	2.526	0.227	161.9	98.8	75.5	1231.4	6.0
	D	3	63.74	0.0006	0.8466	0.400	901.6	99.6	93.7	1252.6	4.6
	E	6	61.03	0.0074	1.235	0.139	69.3	99.4	100.0	1211.9	9.4
	Integrated age ± 1s			n=5		2.21				1234.0	2.2
	Plateau ± 1s		steps B-E	n=4	MSWD=6.30	1.89	531.3		85.5	1242.2	4.9
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-80										
	A	1	63.10	0.0040	0.3202	0.551	128.5	99.9	62.1	1245.7	3.4
	B	1	64.50	-0.0129	2.915	0.125	-	98.7	76.2	1254.8	10.1
	C	2	64.43	-0.0241	1.385	0.158	-	99.4	94.0	1260.1	7.1
#	D	3	60.71	-0.0725	5.453	0.028	-	97.3	97.1	1188.7	36.0
#	E	6	53.84	0.0000	7.537	0.026		95.9	100.0	1074.7	41.3
	Integrated age ± 1s			n=5		0.887				1243.1	3.5
	Plateau ± 1s		steps A-C	n=3	MSWD=1.85	0.833	84.9		94.0	1249.0	4.1
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-82										
#	A	1	54.57	0.0065	5.061	0.184	78.2	97.3	9.8	1097.5	13.5
	B	1	62.68	-0.0011	0.6197	0.473	-	99.7	34.9	1238.4	3.5
	C	2	60.86	0.0007	0.8914	0.425	700.3	99.6	57.4	1210.9	4.7
	D	3	61.93	-0.0010	0.7858	0.609	-	99.6	89.7	1226.8	3.2
#	E	6	57.65	0.0112	5.842	0.194	45.5	97.0	100.0	1141.3	14.0
	Integrated age ± 1s			n=5		1.88				1205.2	2.9
	Plateau ± 1s		steps B-D	n=3	MSWD=11.13	1.51	287.6		79.9	1227.7	7.1
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-84										
#	A	1	62.14	0.0032	1.542	0.704	159.6	99.3	43.7	1226.6	3.2
	B	1	64.46	-0.0052	0.5263	0.586	-	99.8	80.0	1264.2	3.7
	C	2	64.39	-0.0217	1.539	0.214	-	99.3	93.3	1259.0	6.4
	D	3	63.13	0.0216	-6.0545	0.073	23.6	102.8	97.8	1273.0	17.3
	E	6	61.11	-0.0636	-4.9521	0.035	-	102.4	100.0	1239.4	36.8
	Integrated age ± 1s			n=5		1.61				1247.0	2.7
	Plateau ± 1s		steps B-E	n=4	MSWD=0.42	0.91	15.9		56.3	1263.1	3.2
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-86										
#	A	1	58.16	0.0336	1.530	0.245	15.2	99.2	16.4	1168.2	6.4
	B	1	64.47	0.0021	1.119	0.241	240.7	99.5	32.5	1262.0	5.6
	C	2	63.89	0.0089	1.876	0.654	57.2	99.1	76.4	1250.4	2.6
	D	3	63.07	-0.0043	-0.3281	0.237	-	100.2	92.3	1248.0	5.9
#	E	6	58.35	0.0150	2.046	0.115	34.0	99.0	100.0	1168.8	17.2
	Integrated age ± 1s			n=5		1.49				1232.5	2.8
	Plateau ± 1s		steps B-D	n=3	MSWD=1.97	1.13	84.3		75.9	1251.8	3.2

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-88										
	A	1	62.62	0.0057	1.175	0.511	89.9	99.4	69.2	1235.3	3.7
	B	1	64.68	-0.0057	-0.5370	0.095	-	100.2	82.0	1271.8	12.1
	C	2	62.45	-0.0002	-3.4771	0.069	-	101.6	91.3	1252.5	13.8
#	D	3	56.66	-0.1173	1.661	0.037	-	99.1	96.4	1144.8	30.2
#	E	6	57.59	-0.0259	5.984	0.027	-	96.9	100.0	1139.6	34.9
	Integrated age ± 1s		n=5			0.739				1233.8	4.0
	Plateau ± 1s	steps A-C	n=3		MSWD=4.67	0.675	68.1		91.3	1239.3	7.5
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-90										
	A	1	60.94	0.0007	1.840	0.381	697.9	99.1	88.6	1208.0	3.9
	B	1	59.34	-0.0414	6.945	0.023	-	96.5	94.0	1161.8	42.5
#	C	2	46.98	-0.2045	25.77	0.009	-	83.7	96.1	870.4	106.8
#	D	3	21.35	0.0792	-6.2506	0.006	6.4	108.6	97.6	561.2	183.1
#	E	6	51.34	-0.2509	-70.7373	0.010	-	140.7	100.0	1373.0	93.7
	Integrated age ± 1s		n=5			0.430				1195.1	5.8
	Plateau ± 1s	steps A-B	n=2		MSWD=1.17	0.404	658.1		94.0	1207.6	4.3
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-92										
	A	1	60.27	0.0023	1.190	0.917	226.0	99.4	53.7	1201.0	2.9
	B	1	60.37	-0.0073	1.942	0.231	-	99.0	67.2	1199.1	10.5
	C	2	62.73	-0.0020	-0.3471	0.480	-	100.2	95.3	1243.3	3.8
	D	3	59.83	0.0384	0.4498	0.069	13.3	99.8	99.4	1197.7	15.2
	E	6	50.76	0.0736	-24.9147	0.011	6.9	114.5	100.0	1174.5	93.3
	Integrated age ± 1s		n=5			1.71				1212.4	2.8
	Plateau ± 1s	steps A-E	n=5		MSWD=20.76	1.71	122.4		100.0	1215.3	10.1
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-16										
#	A	1	62.67	0.0043	2.143	0.647	117.4	99.0	40.5	1231.8	2.9
	B	1	63.26	-0.0025	-0.3487	0.606	-	100.2	78.5	1250.9	3.0
	C	2	63.32	0.0250	0.3376	0.157	20.4	99.8	88.3	1248.8	7.3
#	D	3	56.02	0.0069	-0.3117	0.071	74.0	100.2	92.7	1144.1	30.4
#	E	6	56.95	0.0303	4.622	0.116	16.9	97.6	100.0	1136.2	20.7
	Integrated age ± 1s		n=5			1.60				1230.2	3.0
	Plateau ± 1s	steps B-C	n=2		MSWD=0.07	0.76	20.4		47.8	1250.6	2.9
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-18										
	A	1	59.43	0.0063	2.161	0.309	80.6	98.9	29.2	1184.2	5.4
	B	1	62.14	-0.0013	0.9974	0.533	-	99.5	79.4	1229.0	3.5
	C	2	58.15	0.0030	5.488	0.084	168.6	97.2	87.4	1150.4	21.3
#	D	3	44.65	0.0234	11.04	0.090	21.8	92.7	95.8	906.1	26.6
#	E	6	49.74	0.0349	12.45	0.044	14.6	92.6	100.0	985.2	32.4
	Integrated age ± 1s		n=5			1.06				1174.6	4.3
	Plateau ± 1s	steps A-C	n=3		MSWD=28.63	0.93	63.0		87.4	1214.5	15.7

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-10										
#	A	1	53.55	0.0008	13.82	0.112	664.5	92.4	4.9	1040.5	11.4
	B	1	60.43	0.0001	1.164	0.413	7837.2	99.4	22.7	1203.4	3.9
	C	2	60.18	0.0011	0.4014	1.13	485.6	99.8	71.4	1203.1	2.2
	D	3	59.73	0.0046	0.8558	0.346	110.4	99.6	86.4	1194.4	4.7
	E	6	59.12	0.0007	1.825	0.315	754.3	99.1	100.0	1181.2	6.2
	Integrated age ± 1s			n=5		2.32				1191.3	2.2
	Plateau ± 1s	steps B-E		n=4	MSWD=4.46	2.20	1841.7		95.1	1200.3	3.7
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-12										
#	A	1	55.54	-0.0088	1.481	0.134	-	99.2	12.9	1128.8	10.7
	B	1	57.98	0.0061	1.755	0.176	84.0	99.1	29.9	1164.4	8.0
	C	2	59.02	-0.0006	1.897	0.313	-	99.0	60.0	1179.4	5.2
	D	3	57.80	0.0021	-0.8672	0.411	245.9	100.4	99.5	1173.4	6.1
#	E	6	31.59	0.0833	11.26	0.006	6.1	89.5	100.0	664.1	185.9
	Integrated age ± 1s			n=5		1.04				1165.5	3.8
	Plateau ± 1s	steps B-D		n=3	MSWD=1.26	0.90	188.5		86.5	1174.4	4.1
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-14										
	A	1	62.98	-0.0002	0.4770	0.600	-	99.8	70.9	1243.3	3.1
	B	1	60.05	-0.0154	-4.5927	0.071	-	102.3	79.3	1222.6	17.8
	C	2	63.80	-0.0185	-5.7961	0.091	-	102.7	90.1	1281.2	13.4
	D	3	58.78	0.0210	-16.6064	0.052	24.4	108.4	96.2	1255.5	23.9
#	E	6	59.34	0.0286	3.965	0.032	17.8	98.0	100.0	1175.1	42.8
	Integrated age ± 1s			n=5		0.846				1243.9	3.9
	Plateau ± 1s	steps A-D		n=4	MSWD=3.13	0.814	24.4		96.2	1244.8	5.4
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-11										
	A	1	61.93	-0.0030	-0.8341	0.887	-	100.4	64.6	1233.8	2.8
	B	1	61.58	-0.0011	-2.5064	0.345	-	101.2	89.7	1235.8	5.0
	C	2	61.93	-0.0196	-7.8932	0.091	-	103.8	96.3	1263.6	14.0
	D	3	61.98	-0.0020	-2.0784	0.043	-	101.0	99.5	1239.8	26.3
	E	6	53.68	0.2241	71.32	0.007	2.3	60.8	100.0	748.2	145.8
	Integrated age ± 1s			n=5		1.37				1234.2	2.9
	Plateau ± 1s	steps A-E		n=5	MSWD=3.88	1.37	2.3		100.0	1235.0	4.8
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-13										
	A	1	60.66	0.0427	1.396	0.697	12.0	99.3	64.3	1205.9	2.7
	B	1	61.59	0.0421	5.324	0.133	12.1	97.4	76.6	1202.4	9.0
	C	2	61.45	-0.0012	12.97	0.050	-	93.8	81.2	1166.8	22.7
	D	3	59.90	-0.0131	-1.8881	0.083	-	100.9	88.9	1208.9	11.5
	E	6	60.81	0.0291	8.789	0.120	17.5	95.7	100.0	1175.7	8.9
	Integrated age ± 1s			n=5		1.08				1200.6	2.9
	Plateau ± 1s	steps A-E		n=5	MSWD=3.35	1.08	11.4		100.0	1203.1	4.5

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-30										
#	A	1	50.66	0.1980	11.97	0.123	2.6	93.0	14.8	1003.0	19.2
	B	1	63.73	0.0031	2.155	0.470	167.0	99.0	71.4	1247.0	3.1
	C	2	64.54	0.0140	5.132	0.148	36.3	97.7	89.3	1246.0	7.7
	D	3	59.95	0.0070	-5.9704	0.044	72.4	102.9	94.6	1227.2	24.8
#	E	6	62.12	0.0294	9.427	0.045	17.4	95.5	100.0	1192.5	22.7
	Integrated age ± 1s			n=5		0.830				1208.5	4.4
	Plateau ± 1s		steps B-D	n=3	MSWD=0.32	0.662	131.4		79.8	1246.6	3.0
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-34										
#	A	1	54.52	0.0212	2.928	0.123	24.1	98.4	13.2	1106.5	11.8
	B	1	62.94	0.0064	4.259	0.156	80.2	98.0	29.9	1226.7	7.7
	C	2	63.44	0.0058	2.576	0.446	87.6	98.8	77.8	1241.1	4.1
#	D	3	57.75	0.0590	1.924	0.161	8.6	99.0	95.1	1160.3	16.2
#	E	6	52.18	0.1156	7.743	0.046	4.4	95.6	100.0	1047.6	39.2
	Integrated age ± 1s			n=5		0.931				1198.4	4.7
	Plateau ± 1s		steps B-C	n=2	MSWD=2.70	0.602	85.7		64.6	1237.9	6.1
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-38										
	A	1	57.61	0.0171	1.706	0.464	29.9	99.1	83.3	1159.2	3.5
	B	1	57.51	0.0735	1.400	0.061	6.9	99.3	94.2	1159.2	16.7
#	C	2	53.93	0.1965	4.780	0.017	2.6	97.4	97.3	1089.2	51.9
#	D	3	28.39	1.244	-142.9830	0.004	0.41	249.3	98.1	1354.3	202.3
#	E	6	33.69	0.3107	-23.9660	0.011	1.6	121.1	100.0	896.0	89.6
	Integrated age ± 1s			n=5		0.557				1153.8	4.5
	Plateau ± 1s		steps A-B	n=2	MSWD=0.00	0.525	27.2		94.2	1159.2	3.5
	T01-16-75-2 musc K:5:140, muscovite, single xstal, J=0.01553±0.10%, D=1.0052±0.00121, NM-140, Lab#=52489-36										
	A	1	60.99	0.0275	1.530	0.299	18.6	99.3	26.4	1210.1	5.7
	B	1	62.46	0.0159	1.995	0.348	32.0	99.1	57.0	1229.4	4.5
	C	2	62.17	0.0145	0.1882	0.336	35.1	99.9	86.6	1233.0	4.5
	D	3	54.59	0.1079	-6.7071	0.044	4.7	103.6	90.4	1151.2	34.2
#	E	6	89.62	0.1648	23.82	0.109	3.1	92.2	100.0	1507.0	78.1
	Integrated age ± 1s			n=5		1.14				1251.0	7.4
	Plateau ± 1s		steps A-D	n=4	MSWD=5.12	1.03	28.0		90.4	1225.7	6.4

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	98GC-23 R:1:#2, Single crystal musc, J=0.0157131±0.10%, D=1.00361±0.00157, NM-97, Lab#=9693-65										
	A	0	62.12	0.2440	32.31	0.054	2.1	84.7	3.6	1099.7	31.8
	B	0	62.64	0.1835	22.75	0.026	2.8	89.3	5.4	1151.4	63.6
	C	0	58.22	0.0037	9.052	0.253	136.6	95.4	22.3	1145.4	8.2
	D	1	57.20	0.0114	2.463	1.05	44.8	98.7	92.0	1159.5	3.1
	E	2	56.09	-0.0210	-7.0805	0.120	-	103.7	100.0	1185.2	12.7
	Integrated age ± 1s		n=5			1.50				1156.9	3.5
	Plateau ± 1s	steps A-E	n=5		MSWD=2.63	1.50	54.5		100.0	1158.6	4.7
	98GC-23 R:1:#2, Single crystal musc, J=0.0157131±0.10%, D=1.00361±0.00157, NM-97, Lab#=9693-66										
#	A	0	54.74	-0.0069	4.395	0.471	-	97.6	22.5	1112.9	4.8
	B	0	56.00	-0.0040	1.624	0.695	-	99.1	55.8	1145.0	3.2
	C	0	55.49	-0.0468	3.476	0.119	-	98.1	61.5	1128.6	11.8
	D	1	56.12	0.0087	9.075	0.147	58.6	95.2	68.5	1112.7	9.6
	E	2	55.88	0.0012	1.427	0.658	412.3	99.2	100.0	1144.1	4.0
	Integrated age ± 1s		n=5			2.09				1134.3	2.6
	Plateau ± 1s	steps B-E	n=4		MSWD=3.93	1.62	347.7		77.5	1142.0	4.8
	98GC-23 R:1:#2, Single crystal musc, J=0.0157131±0.10%, D=1.00361±0.00157, NM-97, Lab#=9693-67										
#	A	0	50.50	0.0309	4.390	0.042	16.5	97.4	3.1	1045.5	28.6
	B	0	58.38	0.0068	3.743	0.357	75.2	98.1	29.6	1171.7	5.4
	C	0	59.18	0.0192	1.263	0.157	26.6	99.4	41.2	1194.7	9.0
	D	1	58.61	0.0107	2.449	0.463	47.6	98.8	75.5	1180.8	4.6
	E	2	58.31	-0.0014	3.660	0.330	-	98.1	100.0	1170.9	5.9
	Integrated age ± 1s		n=5			1.35				1173.5	3.3
	Plateau ± 1s	steps B-E	n=4		MSWD=2.19	1.31	40.6		96.9	1177.3	4.3
	98GC-23 R:1:#2, Single crystal musc, J=0.0157131±0.10%, D=1.00361±0.00157, NM-97, Lab#=9693-68										
	A	0	56.45	0.0147	4.196	0.148	34.7	97.8	12.4	1140.3	9.0
	B	0	54.02	-0.0080	6.845	0.060	-	96.3	17.4	1090.2	19.7
	C	0	55.72	0.0039	1.565	0.934	132.1	99.2	95.2	1140.9	3.1
	D	1	57.56	0.0034	7.820	0.049	149.2	96.0	99.2	1140.8	22.9
	E	2	52.65	-0.2593	37.11	0.009	-	79.1	100.0	919.0	122.7
	Integrated age ± 1s		n=5			1.20				1136.7	3.3
	Plateau ± 1s	steps A-E	n=5		MSWD=2.42	1.20	118.9		100.0	1139.7	4.6
	98GC-23 R:1:#2, Single crystal musc, J=0.0157131±0.10%, D=1.00361±0.00157, NM-97, Lab#=9693-69										
#	A	0	54.89	0.0309	1.607	0.099	16.5	99.1	14.7	1128.0	13.4
	B	0	60.76	0.1200	15.99	0.026	4.3	92.2	18.6	1153.0	37.5
	C	0	61.35	0.0121	1.822	0.417	42.2	99.1	80.1	1224.3	5.1
	D	1	62.24	0.0228	3.132	0.093	22.4	98.5	93.9	1231.7	12.9
	E	2	63.17	0.3021	6.056	0.042	1.7	97.2	100.0	1233.2	27.9
	Integrated age ± 1s		n=5			0.677				1209.3	4.9
	Plateau ± 1s	steps B-E	n=4		MSWD=1.35	0.578	34.4		85.3	1224.4	5.5

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	98GC-23 R:1:#2, Single crystal musc, J=0.0157131±0.10%, D=1.00361±0.00157, NM-97, Lab#=9693-70										
#	A	0	58.20	0.0166	3.421	0.199	30.7	98.3	45.5	1170.4	7.8
	B	0	63.78	0.0154	-6.8469	0.033	33.2	103.2	52.9	1296.1	35.1
	C	0	61.51	0.0278	2.311	0.091	18.4	98.9	73.7	1224.6	15.4
	D	1	62.13	0.2110	-1.8718	0.028	2.4	100.9	80.1	1252.0	38.7
	E	2	62.65	0.0145	2.294	0.087	35.3	98.9	100.0	1241.3	14.4
	Integrated age ± 1s			n=5		0.438				1210.8	6.8
	Plateau ± 1s		steps B-E	n=4	MSWD=1.22	0.239	24.7		54.5	1239.5	10.8
	98GC-23 R:1:#2, Single crystal musc, J=0.0157131±0.10%, D=1.00361±0.00157, NM-97, Lab#=9693-71										
#	A	0	52.84	0.0194	2.035	0.178	26.3	98.9	21.2	1094.0	8.1
#	B	0	61.02	0.2393	28.60	0.029	2.1	86.2	24.7	1099.6	39.1
	C	0	60.85	0.0101	5.695	0.121	50.7	97.2	39.1	1200.1	12.1
	D	1	62.09	0.0508	6.991	0.281	10.1	96.7	72.6	1212.8	6.0
	E	2	63.24	0.0222	-1.9689	0.230	23.0	100.9	100.0	1268.0	7.6
	Integrated age ± 1s			n=5		0.839				1198.0	4.3
	Plateau ± 1s		steps C-E	n=3	MSWD=19.75	0.632	22.5		75.3	1229.5	19.5
	K98-65-1, musc., J=0.0157143±0.10%, D=1.00361±0.00157, NM-97, Lab#=9695-54										
#	A	0	23.37	-0.0052	-1.5700	0.119	-	102.0	10.7	580.4	10.7
#	B	0	47.83	-0.0253	-9.9139	0.062	-	106.1	16.2	1070.6	13.2
	C	0	57.50	-0.0069	-2.2127	0.184	-	101.1	32.6	1184.9	5.1
	D	1	58.03	-0.0005	-0.9425	0.516	-	100.5	78.8	1187.3	2.7
	E	2	55.80	-0.0186	-1.9409	0.237	-	101.0	100.0	1158.1	4.3
	Integrated age ± 1s			n=5		1.12				1118.2	2.6
	Plateau ± 1s		steps C-E	n=3	MSWD=17.16	0.94	0.000		83.8	1179.8	8.8
	K98-65-1, musc., J=0.0157143±0.10%, D=1.00361±0.00157, NM-97, Lab#=9695-55										
#	A	0	25.55	0.0434	31.05	0.144	11.8	64.7	3.9	421.1	17.3
#	B	0	33.95	-0.0605	2.913	0.081	-	97.5	6.1	764.0	28.3
#	C	0	46.01	0.0124	5.323	0.094	41.1	96.6	8.6	966.8	24.6
#	D	1	52.35	0.0113	5.324	0.418	45.3	97.0	19.9	1070.8	6.9
	E	2	54.31	0.0028	0.8479	2.97	180.4	99.5	100.0	1122.5	1.8
	Integrated age ± 1s			n=5		3.71				1082.6	2.3
	Plateau ± 1s		steps E-E	n=1	MSWD=0.00	2.97	180.4		80.1	1122.5	1.8

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K98-65-1, musc., J=0.0157143±0.10%, D=1.00361±0.00157, NM-97, Lab#=9695-56										
#	A	0	24.75	0.0799	19.51	0.405	6.4	76.7	10.7	476.4	7.6
#	B	0	48.38	-0.0107	0.5195	0.314	-	99.7	18.9	1029.7	8.2
	C	0	58.20	-0.0054	-0.2162	0.459	-	100.1	31.0	1186.7	4.9
	D	1	56.88	-0.0011	-0.0127	1.67	-	100.0	75.1	1165.9	2.6
	E	2	54.69	-0.0030	-0.3010	0.948	-	100.2	100.0	1133.7	3.7
	Integrated age ± 1s			n=5		3.80				1086.7	2.3
	Plateau ± 1s		steps C-E	n=3	MSWD=42.34	3.08	0.00		81.1	1160.3	12.7
	K98-65-1, musc., J=0.0157143±0.10%, D=1.00361±0.00157, NM-97, Lab#=9695-57										
#	A	0	28.06	0.0560	72.02	0.157	9.1	24.1	3.9	184.3	16.6
#	B	0	8.119	-0.0177	8.386	0.105	-	69.4	6.5	154.3	22.0
#	C	0	8.731	0.0123	4.304	0.149	41.6	85.4	10.2	201.7	14.8
#	D	1	12.82	-0.0029	0.3141	0.199	-	99.3	15.2	332.2	9.6
	E	2	38.82	0.0046	0.9722	3.41	112.0	99.3	100.0	864.0	1.6
	Integrated age ± 1s			n=5		4.02				781.2	1.9
	Plateau ± 1s		steps E-E	n=1	MSWD=0.00	3.41	112.0		84.8	864.0	1.6
	K98-65-1, musc., J=0.0157143±0.10%, D=1.00361±0.00157, NM-97, Lab#=9695-58										
#	A	0	23.35	0.0790	5.450	0.160	6.5	93.1	7.4	536.1	11.3
#	B	0	45.66	0.0852	4.476	0.109	6.0	97.1	12.5	965.2	13.5
#	C	0	57.13	0.0287	5.775	0.211	17.8	97.0	22.3	1143.6	8.6
	D	1	60.70	0.0107	1.456	0.948	47.9	99.3	66.2	1216.5	3.6
	E	2	58.35	0.0199	2.108	0.729	25.6	98.9	100.0	1178.6	4.1
	Integrated age ± 1s			n=5		2.16				1141.3	2.9
	Plateau ± 1s		steps D-E	n=2	MSWD=47.64	1.68	38.2		77.7	1199.7	18.8
	K98-65-1, musc., J=0.0157143±0.10%, D=1.00361±0.00157, NM-97, Lab#=9695-59										
#	A	0	52.45	-0.0068	1.513	0.355	-	99.1	30.8	1090.3	5.2
	B	0	56.14	0.0008	0.1943	0.506	653.1	99.9	74.8	1153.6	4.4
	C	0	56.43	0.0286	0.7231	0.205	17.8	99.6	92.6	1155.7	7.5
	D	1	56.61	-0.0046	-8.6917	0.045	-	104.5	96.5	1200.3	25.5
	E	2	57.06	0.1068	8.031	0.040	4.8	95.9	100.0	1132.4	27.2
	Integrated age ± 1s			n=5		1.15				1135.8	3.5
	Plateau ± 1s		steps B-E	n=4	MSWD=1.31	0.80	419.9		69.2	1154.7	4.3
	K98-65-1, musc., J=0.0157143±0.10%, D=1.00361±0.00157, NM-97, Lab#=9695-60										
#	A	0	45.60	0.0125	2.342	0.630	40.7	98.5	42.6	974.6	4.4
	B	0	54.81	-0.0031	-0.3505	0.374	-	100.2	67.8	1135.6	5.3
	C	0	48.98	0.0005	-6.3855	0.083	1052.6	103.9	73.4	1072.3	15.4
	D	1	53.00	-0.0099	-0.9054	0.274	-	100.5	91.9	1110.1	6.3
	E	2	57.66	-0.0012	-0.2319	0.120	-	100.1	100.0	1178.6	11.0
	Integrated age ± 1s			n=5		1.48				1064.0	3.2
	Plateau ± 1s		steps B-E	n=4	MSWD=14.85	0.85	183.4		57.4	1128.0	14.3

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K98-65-1, musc., J=0.0157143±0.10%, D=1.00361±0.00157, NM-97, Lab#=9695-61										
#	A	0	37.22	0.0042	5.739	0.393	120.5	95.4	14.6	809.6	4.9
	B	0	54.98	0.0229	-0.9745	0.218	22.3	100.5	22.7	1141.2	8.2
	C	0	58.10	0.0038	0.2861	0.815	133.8	99.9	53.1	1182.9	2.7
	D	1	53.77	0.0006	0.4335	0.638	881.3	99.8	76.8	1115.9	3.7
	E	2	54.87	0.0072	1.866	0.622	70.5	99.0	100.0	1126.4	3.7
	Integrated age ± 1s			n=5		2.69				1099.8	2.3
	Plateau ± 1s	steps B-E		n=4	MSWD=90.52	2.29	314.0		85.4	1150.5	17.5
	K98-65-1, musc., J=0.0157143±0.10%, D=1.00361±0.00157, NM-97, Lab#=9695-62										
#	A	0	40.35	-0.0059	8.434	0.248	-	93.9	8.1	852.9	7.4
	B	0	56.51	-0.0387	-1.5706	0.171	-	100.8	13.7	1167.1	9.4
	C	0	57.27	-0.0074	1.944	1.15	-	99.0	51.4	1162.9	2.9
	D	1	55.98	-0.0056	0.4639	1.21	-	99.8	91.1	1149.9	2.5
	E	2	56.20	-0.0272	1.741	0.273	-	99.1	100.0	1147.5	7.0
	Integrated age ± 1s			n=5		3.05				1133.2	2.3
	Plateau ± 1s	steps B-E		n=4	MSWD=4.81	2.80	0.000		91.9	1155.4	4.0
	K98-65-1, musc., J=0.0157143±0.10%, D=1.00361±0.00157, NM-97, Lab#=9695-63										
#	A	0	31.84	0.0263	-18.8459	0.128	19.4	117.5	9.0	843.9	10.2
	B	0	51.99	0.0592	-21.4561	0.048	8.6	112.2	12.4	1187.7	24.5
	C	0	57.47	0.0059	-0.1993	0.643	86.0	100.1	57.9	1175.6	3.2
	D	1	55.31	0.0014	-7.0750	0.239	369.4	103.8	74.8	1173.5	6.1
	E	2	56.83	0.0176	-3.0694	0.357	29.0	101.6	100.0	1178.7	5.1
	Integrated age ± 1s			n=5		1.41				1148.9	2.9
	Plateau ± 1s	steps B-E		n=4	MSWD=0.23	1.29	119.9		91.0	1176.1	2.6
	K98-65-1, musc., J=0.0157143±0.10%, D=1.00361±0.00157, NM-97, Lab#=9695-64										
#	A	0	21.49	0.0365	8.493	0.150	14.0	88.3	9.1	476.0	10.0
#	B	0	44.45	0.1488	16.05	0.032	3.4	89.4	11.1	885.3	36.3
	C	0	57.60	0.0029	1.094	0.669	176.0	99.4	52.0	1171.8	3.6
	D	1	55.72	0.0175	3.941	0.259	29.1	97.9	67.9	1130.1	6.5
	E	2	56.68	0.0129	2.340	0.525	39.6	98.8	100.0	1152.2	4.1
	Integrated age ± 1s			n=5		1.63				1099.5	2.8
	Plateau ± 1s	steps C-E		n=3	MSWD=17.60	1.45	100.5		88.9	1158.4	10.5

40Ar/39Ar analytical data table for step heated crystals.

ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
K98-65-1, musc., J=0.0157143±0.10%, D=1.00361±0.00157, NM-97, Lab#=9695-65										
# A	0	18.54	-0.0545	-7.1179	0.083	-	111.3	3.5	512.4	16.7
# B	0	42.81	-0.0893	-11.0205	0.117	-	107.6	8.5	993.8	12.7
C	0	53.07	-0.1488	-13.8854	0.041	-	107.7	10.2	1169.9	29.7
D	1	56.99	-0.0047	0.0451	1.50	-	100.0	73.6	1167.1	2.1
E	2	56.82	-0.0257	-0.7977	0.622	-	100.4	100.0	1168.4	3.7
Integrated age ± 1s			n=5		2.36				1139.7	2.3
Plateau ± 1s	steps C-E		n=3	MSWD=0.05	2.16	0.000		91.5	1167.4	2.0
OOGC-54 musc L:11:134, musc., J=0.0158283±0.10%, D=1.00782±0.00122, NM-134, Lab#=52091-14										
# A	1	38.87	0.0310	2.318	0.296	16.5	98.2	8.4	863.0	4.9
# B	1	49.74	0.0253	3.030	0.240	20.1	98.2	15.2	1045.5	6.0
# C	1	54.86	0.0254	1.073	0.153	20.1	99.4	19.6	1136.2	9.2
D	2	58.44	0.0368	1.984	0.116	13.9	99.0	22.9	1186.8	11.2
E	3	57.79	0.0067	0.7232	1.26	75.9	99.6	58.5	1182.6	2.2
F	10	58.22	0.0064	0.4621	1.46	80.0	99.8	100.0	1190.2	2.1
Integrated age ± 1s			n=6		3.52				1150.0	1.8
Plateau ± 1s	steps D-F		n=3	MSWD=3.17	2.83	75.5		80.4	1186.6	2.8
OOGC-54 musc L:11:134, musc., J=0.0158283±0.10%, D=1.00782±0.00122, NM-134, Lab#=52091-16										
# A	1	35.42	0.0130	2.024	0.237	39.1	98.3	6.3	801.4	6.3
# B	1	52.18	0.0121	0.7442	0.136	42.0	99.6	9.9	1095.7	9.6
C	1	56.92	0.0366	1.629	0.154	13.9	99.2	14.0	1165.4	9.2
D	2	57.22	0.0080	0.8540	0.428	63.5	99.6	25.3	1173.3	4.1
E	3	56.81	0.0024	0.3103	1.50	214.8	99.8	65.0	1169.6	1.8
F	10	57.20	0.0054	0.2431	1.32	95.0	99.9	100.0	1175.9	2.0
Integrated age ± 1s			n=6		3.78				1148.4	1.7
Plateau ± 1s	steps C-F		n=4	MSWD=2.07	3.40	140.1		90.1	1172.5	2.0
OOGC-54 musc L:11:134, musc., J=0.0158283±0.10%, D=1.00782±0.00122, NM-134, Lab#=52091-18										
# A	1	38.72	0.1667	1.887	0.020	3.1	98.6	0.5	862.8	62.9
# B	1	48.12	0.0317	-1.1784	0.037	16.1	100.7	1.5	1039.4	33.6
C	1	53.36	0.0201	-2.4726	0.082	25.4	101.4	3.6	1129.2	15.7
D	2	54.54	0.0377	2.409	0.110	13.5	98.7	6.5	1125.0	11.8
E	10	56.10	0.0078	0.6481	3.55	65.0	99.7	100.0	1157.3	1.6
Integrated age ± 1s			n=5		3.80				1153.2	1.9
Plateau ± 1s	steps C-E		n=3	MSWD=5.22	3.75	62.6		98.5	1156.4	3.7

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	00GC-54 musc L:11:134, Single crystal musovite, J=0.0158283±0.10%, D=1.00782±0.00122, nm-134, Lab#=52091-19										
#	A	0	52.28	0.0578	1.331	0.246	8.8	99.3	12.1	1094.5	6.1
	B	1	56.55	0.0170	1.197	0.451	30.0	99.4	34.4	1161.7	4.0
	C	1	56.29	0.0014	0.1507	0.827	356.2	99.9	75.2	1162.4	2.7
	D	2	56.92	0.0192	0.0276	0.334	26.6	100.0	91.7	1172.5	4.7
	E	10	55.72	-0.0129	0.7568	0.168	-	99.6	100.0	1150.8	8.4
	Integrated age ± 1s			n=5		2.03				1154.8	2.3
	Plateau ± 1s	steps B-E		n=4	MSWD=2.11	1.78	178.0		87.9	1163.3	3.0
	00GC-54 musc L:11:134, Single crystal musovite, J=0.0158283±0.10%, D=1.00782±0.00122, nm-134, Lab#=52091-21										
#	A	0	47.72	0.0432	3.028	0.237	11.8	98.1	5.0	1012.3	6.4
	B	1	55.81	0.0104	0.6164	0.391	49.1	99.7	13.1	1152.9	4.7
	C	1	55.94	0.0062	-0.2210	1.26	82.1	100.1	39.5	1158.7	2.2
	D	2	56.20	0.0014	0.3741	1.05	377.1	99.8	61.4	1160.0	2.4
	E	10	56.03	0.0028	0.2858	1.84	180.3	99.9	100.0	1157.8	1.7
	Integrated age ± 1s			n=5		4.77				1151.1	1.7
	Plateau ± 1s	steps B-E		n=4	MSWD=0.65	4.54	187.1		95.0	1158.2	1.4
	00GC-54 musc L:11:134, Single crystal musovite, J=0.0158283±0.10%, D=1.00782±0.00122, nm-134, Lab#=52091-23										
#	A	0	47.78	0.0443	-0.1784	0.170	11.5	100.1	14.4	1029.0	8.3
	B	1	57.47	0.0236	0.8270	0.226	21.6	99.6	33.5	1177.3	6.3
	C	1	56.79	0.0075	0.8990	0.476	67.8	99.5	73.7	1166.6	4.5
	D	2	56.32	-0.0152	-0.0879	0.126	-	100.0	84.3	1163.8	11.3
	E	10	56.37	0.0134	0.3205	0.186	38.1	99.8	100.0	1162.9	7.5
	Integrated age ± 1s			n=5		1.18				1148.6	3.2
	Plateau ± 1s	steps B-E		n=4	MSWD=0.96	1.01	44.6		85.6	1168.4	3.3
	00GC-54 musc L:11:134, Single crystal musovite, J=0.0158283±0.10%, D=1.00782±0.00122, nm-134, Lab#=52091-25										
#	A	0	43.00	0.0231	1.307	0.270	22.1	99.1	7.0	941.0	5.6
	B	1	55.28	-0.0131	1.057	0.212	-	99.4	12.4	1142.8	6.8
	C	1	55.84	0.0043	0.3537	1.17	118.7	99.8	42.6	1154.5	2.6
	D	2	55.83	0.0063	0.4889	1.47	80.9	99.7	80.6	1153.7	2.3
	E	10	55.60	0.0014	0.4077	0.754	361.8	99.8	100.0	1150.6	3.0
	Integrated age ± 1s			n=5		3.88				1138.7	1.9
	Plateau ± 1s	steps B-E		n=4	MSWD=1.11	3.61	156.3		93.0	1152.8	1.7
	00GC-54 musc L:11:134, Single crystal musovite, J=0.0158283±0.10%, D=1.00782±0.00122, nm-134, Lab#=52091-41										
#	A	0	33.93	-0.0067	1.875	0.087	-	98.4	4.0	774.1	16.9
#	B	1	51.88	0.0182	-4.4505	0.089	28.1	102.5	8.1	1115.1	15.0
	C	1	57.24	0.0525	0.6740	0.145	9.7	99.7	14.8	1174.6	9.7
	D	2	58.24	0.0013	-0.3677	0.800	397.5	100.2	51.6	1194.2	2.7
	E	10	58.06	0.0044	0.2649	1.05	115.2	99.9	100.0	1188.7	2.1
	Integrated age ± 1s			n=5		2.17				1172.2	2.1
	Plateau ± 1s	steps C-E		n=3	MSWD=2.63	2.00	220.8		91.9	1190.3	2.8

40Ar/39Ar analytical data table for step heated crystals.

ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
00GC-54 musc L:11:134, Single crystal musovite, J=0.0158283±0.10%, D=1.00782±0.00122, nm-134, Lab#=52091-43										
# A	0	52.82	-0.0012	-2.3792	0.212	-	101.3	12.4	1120.3	7.0
B	1	56.79	0.0052	0.4041	0.723	98.3	99.8	54.6	1168.8	2.9
C	1	56.92	0.0054	-0.2250	0.443	95.2	100.1	80.5	1173.7	3.9
D	2	56.29	0.0024	-0.7486	0.259	213.6	100.4	95.5	1166.5	5.6
E	10	56.91	0.0020	-3.6648	0.076	252.4	101.9	100.0	1188.9	16.6
Integrated age ± 1s			n=5		1.71				1164.7	2.4
Plateau ± 1s		steps B-E	n=4	MSWD=0.91	1.50	125.1		87.6	1170.2	2.3
00GC-54 musc L:11:134, Single crystal musovite, J=0.0158283±0.10%, D=1.00782±0.00122, nm-134, Lab#=52091-45										
# A	0	48.65	0.0187	1.061	0.188	27.3	99.4	7.8	1037.3	7.9
B	1	66.83	0.0019	-1.1772	0.354	261.8	100.5	22.4	1322.4	5.2
C	1	66.85	0.0019	-0.4361	0.906	269.5	100.2	59.9	1319.5	3.2
D	2	67.31	-0.0064	-0.4975	0.766	-	100.2	91.6	1326.3	3.1
E	10	67.11	0.0026	0.0350	0.204	197.1	100.0	100.0	1321.3	6.9
Integrated age ± 1s			n=5		2.42				1301.8	2.3
Plateau ± 1s		steps B-E	n=4	MSWD=0.80	2.23	178.5		92.2	1322.7	2.2
00GC-54 musc L:11:134, Single crystal musovite, J=0.0158283±0.10%, D=1.00782±0.00122, nm-134, Lab#=52091-47										
# A	0	45.96	0.0517	-1.9096	0.165	9.9	101.2	11.3	1007.4	8.9
B	1	56.62	0.0151	-2.9513	0.170	33.8	101.5	23.0	1181.4	8.2
C	1	55.30	0.0208	0.2659	0.652	24.6	99.9	67.8	1146.7	3.2
D	2	55.54	0.0248	0.8645	0.329	20.6	99.5	90.4	1147.6	4.9
E	10	56.08	0.0095	-0.0482	0.140	53.9	100.0	100.0	1160.1	9.5
Integrated age ± 1s			n=5		1.46				1137.1	2.7
Plateau ± 1s		steps B-E	n=4	MSWD=5.68	1.29	28.0		88.7	1150.9	5.9
00GC-54 musc L:11:134, Single crystal musovite, J=0.0158283±0.10%, D=1.00782±0.00122, nm-134, Lab#=52091-49										
# A	0	40.98	0.1056	-1.7360	0.083	4.8	101.3	5.2	921.8	16.5
B	1	55.99	0.0242	-15.6992	0.042	21.1	108.3	7.9	1228.2	29.3
C	1	59.50	0.0465	1.367	0.152	11.0	99.3	17.5	1205.5	8.7
D	2	59.02	0.0098	0.5625	1.15	51.8	99.7	90.2	1201.9	2.1
E	10	59.26	0.0052	-0.4936	0.154	97.4	100.2	100.0	1210.0	9.2
Integrated age ± 1s			n=5		1.58				1190.2	2.5
Plateau ± 1s		steps B-E	n=4	MSWD=0.55	1.50	51.5		94.8	1202.6	2.2

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	00GC-54 musc L:11:134, Single crystal musovite, J=0.0158283±0.10%, D=1.00782±0.00122, nm-134, Lab#=52091-53										
#	A	0	44.10	0.0226	-2.4838	0.136	22.6	101.7	7.9	979.1	10.0
	B	1	57.15	0.0532	-0.1714	0.061	9.6	100.1	11.5	1177.0	21.3
	C	1	59.31	0.0080	-1.6340	0.234	64.0	100.8	25.1	1215.8	6.5
	D	2	58.95	0.0042	-0.1181	1.22	120.4	100.1	95.9	1203.8	2.0
	E	10	59.31	0.0109	-3.2580	0.070	46.9	101.6	100.0	1223.0	17.9
	Integrated age ± 1s			n=5		1.72				1188.6	2.4
	Plateau ± 1s		steps B-E	n=4	MSWD=1.96	1.58	104.5		92.1	1204.8	2.8

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	OOGC-59r musc L:7:134, musc., J=0.0156508±0.10%, D=1.00782±0.00122, NM-134, Lab#=52088-06										
#	A	1	51.12	0.0659	3.097	0.206	7.7	98.2	5.0	1058.5	7.2
#	B	2	56.98	0.0255	4.784	0.168	20.0	97.5	9.1	1142.4	8.6
	C	2	57.01	0.0122	1.126	0.713	41.9	99.4	26.5	1159.3	3.0
	D	5	57.02	0.0075	0.5620	3.01	68.1	99.7	100.0	1161.9	1.5
	Integrated age ± 1s			n=4		4.10				1155.6	1.7
	Plateau ± 1s	steps C-D		n=2	MSWD=0.61	3.73	63.1		90.9	1161.3	1.6
	OOGC-59r musc L:7:134, musc., J=0.0156508±0.10%, D=1.00782±0.00122, NM-134, Lab#=52088-12										
#	A	1	50.18	0.0036	1.427	0.073	143.5	99.2	1.6	1051.3	18.5
#	B	1	55.68	-0.0130	-4.0387	0.075	-	102.1	3.2	1162.2	17.6
	C	2	60.22	0.0233	-0.1221	0.213	21.9	100.1	7.8	1212.7	5.9
	D	2	60.42	-0.0021	2.018	0.150	-	99.0	11.0	1206.4	8.3
	E	10	60.71	0.0021	0.2161	4.12	242.2	99.9	100.0	1218.5	1.5
	Integrated age ± 1s			n=5		4.63				1214.4	1.8
	Plateau ± 1s	steps C-E		n=3	MSWD=1.40	4.48	231.3		96.8	1217.8	2.0
	OOGC-59r musc L:7:134, musc., J=0.0156508±0.10%, D=1.00782±0.00122, NM-134, Lab#=52088-14										
#	A	1	46.62	0.0377	4.849	0.158	13.5	96.9	2.2	976.4	8.9
	B	1	57.06	-0.0282	1.070	0.122	-	99.4	3.9	1160.2	10.9
	C	2	56.34	0.0039	0.5411	1.66	130.8	99.7	26.9	1151.8	2.0
	D	2	56.33	0.0026	0.1873	3.22	198.4	99.9	71.5	1153.1	1.9
	E	10	56.23	0.0024	0.2455	2.06	211.3	99.9	100.0	1151.4	2.0
	Integrated age ± 1s			n=5		7.22				1148.8	1.7
	Plateau ± 1s	steps B-E		n=4	MSWD=0.33	7.06	186.1		97.8	1152.2	1.4
	OOGC-59r musc L:7:134, musc., J=0.0156508±0.10%, D=1.00782±0.00122, NM-134, Lab#=52088-26										
#	A	1	40.08	0.1274	0.0171	0.172	4.0	100.0	3.0	888.8	8.0
#	B	1	52.38	0.0634	3.318	0.090	8.0	98.1	4.6	1077.6	14.6
#	C	2	57.64	0.0483	1.473	0.166	10.6	99.3	7.5	1167.3	7.5
	D	2	59.56	-0.0118	-0.5398	0.070	-	100.3	8.7	1204.8	17.8
	E	10	59.69	0.0032	0.2827	5.24	161.4	99.9	100.0	1203.1	1.8
	Integrated age ± 1s			n=5		5.74				1191.5	2.0
	Plateau ± 1s	steps D-E		n=2	MSWD=0.01	5.31	161.4		92.5	1203.1	2.0
	OOGC-59r musc L:7:134, musc., J=0.0156508±0.10%, D=1.00782±0.00122, NM-134, Lab#=52088-28										
#	A	1	47.61	0.0590	3.467	0.138	8.6	97.9	3.1	999.7	9.8
#	B	1	56.54	0.0246	3.368	0.096	20.7	98.2	5.2	1142.0	13.3
	C	2	56.93	0.0019	0.5366	1.13	266.7	99.7	30.1	1160.7	2.2
	D	2	57.17	0.0008	0.1738	0.611	604.9	99.9	43.6	1165.9	3.2
	E	10	57.86	0.0037	0.4813	2.55	136.1	99.8	100.0	1175.0	1.8
	Integrated age ± 1s			n=5		4.52				1164.4	1.8
	Plateau ± 1s	steps C-E		n=3	MSWD=12.96	4.29	237.3		94.8	1168.6	4.7

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	OOGC-59r musc L:7:134, musc., J=0.0156508±0.10%, D=1.00782±0.00122, NM-134, Lab#=52088-30										
#	A	1	42.23	0.0975	4.127	0.062	5.2	97.1	2.0	905.2	20.7
	B	1	56.04	0.0399	-2.6817	0.046	12.8	101.4	3.5	1161.7	27.3
	C	2	57.64	0.0188	2.300	0.186	27.2	98.8	9.6	1163.6	7.7
	D	2	56.63	0.0021	0.6721	0.739	239.2	99.6	33.9	1155.6	2.5
	E	10	56.46	0.0034	0.4286	2.01	150.8	99.8	100.0	1154.0	2.1
	Integrated age ± 1s			n=5		3.05				1150.4	2.0
	Plateau ± 1s	steps B-E		n=4	MSWD=0.52	2.98	162.9		98.0	1155.1	1.8
	OOGC-59r musc L:7:134, musc., J=0.0156508±0.10%, D=1.00782±0.00122, NM-134, Lab#=52088-32										
#	A	1	40.85	0.0205	1.317	0.083	24.9	99.1	3.3	895.5	16.9
#	B	1	51.75	-0.0160	0.5958	0.074	-	99.7	6.2	1080.3	17.5
#	C	2	55.16	0.0081	1.744	0.213	63.1	99.1	14.7	1128.1	6.7
	D	2	55.77	0.0105	0.3621	0.140	48.6	99.8	20.2	1143.8	9.9
	E	10	56.80	0.0031	0.3829	2.01	163.8	99.8	100.0	1159.4	1.6
	Integrated age ± 1s			n=5		2.52				1145.5	2.0
	Plateau ± 1s	steps D-E		n=2	MSWD=2.38	2.15	156.3		85.3	1158.9	2.6
	OOGC-59r musc L:7:134, musc., J=0.0156508±0.10%, D=1.00782±0.00122, NM-134, Lab#=52088-34										
#	A	1	45.85	-0.0192	-3.4043	0.048	-	102.2	0.8	1004.2	27.9
#	B	1	53.77	0.0067	0.2860	0.086	76.0	99.8	2.1	1113.4	14.1
#	C	2	57.30	-0.0018	0.4354	0.494	-	99.8	9.8	1166.7	3.5
#	D	2	57.53	-0.0022	-0.1549	0.299	-	100.1	14.5	1172.7	5.0
#	E	3	58.28	0.0033	1.440	0.421	153.3	99.3	21.2	1177.0	4.3
	F	4	59.03	0.0021	0.1344	2.58	245.2	99.9	61.6	1194.0	1.8
	G	10	58.46	0.0013	0.2134	2.45	404.8	99.9	100.0	1185.1	1.6
	Integrated age ± 1s			n=7		6.37				1183.9	1.6
	Plateau ± 1s	steps F-G		n=2	MSWD=13.86	5.02	322.9		78.8	1189.0	4.5
	OOGC-59r musc L:7:134, musc., J=0.0156508±0.10%, D=1.00782±0.00122, NM-134, Lab#=52088-36										
#	A	1	53.82	0.0317	1.717	0.187	16.1	99.1	5.0	1107.5	7.5
	B	1	60.72	0.0142	0.0037	0.223	35.8	100.0	10.9	1219.5	6.5
	C	2	59.68	0.0033	0.5455	1.50	152.6	99.7	50.7	1201.8	2.1
	D	2	59.54	0.0003	0.8007	0.263	1804.1	99.6	57.7	1198.7	5.4
	E	3	59.77	0.0046	0.6577	0.623	109.9	99.7	74.3	1202.7	3.0
	F	10	60.68	0.0014	0.2630	0.965	371.7	99.9	100.0	1217.7	2.8
	Integrated age ± 1s			n=6		3.76				1202.3	1.9
	Plateau ± 1s	steps B-F		n=5	MSWD=7.34	3.57	318.6		95.0	1206.4	3.8

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	OOGC-59r musc L:7:134, musc., J=0.0156508±0.10%, D=1.00782±0.00122, NM-134, Lab#=52088-38										
#	A	1	56.18	-0.0031	2.257	0.221	-	98.8	5.2	1141.5	6.3
	B	1	60.15	-0.0006	0.2254	0.498	-	99.9	16.8	1210.1	3.6
	C	2	60.41	0.0016	0.2232	3.11	309.5	99.9	89.5	1213.9	1.7
	D	3	57.99	-0.0083	3.790	0.103	-	98.1	91.9	1162.1	12.2
	E	3	59.48	0.0063	-0.2853	0.119	80.6	100.1	94.7	1202.4	11.7
	F	4	61.03	-0.0075	2.181	0.195	-	98.9	99.2	1214.5	6.9
	G	10	61.48	0.0531	0.7872	0.033	9.6	99.6	100.0	1227.3	37.8
	Integrated age ± 1s		n=7			4.28				1208.4	1.8
	Plateau ± 1s	steps B-G	n=6		MSWD=3.86	4.06	273.2		94.8	1212.4	3.0
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-01										
#	A	1	49.12	0.0221	0.4834	0.220	23.1	99.7	7.2	1040.4	6.4
	B	1	57.14	0.0005	0.6836	0.791	954.9	99.6	33.0	1165.0	2.8
	C	2	57.46	-0.0012	0.0850	1.05	-	100.0	67.1	1172.5	2.4
	D	2	57.15	0.0000	2.509	0.120	-	98.7	71.0	1157.1	11.2
	E	10	56.94	0.0015	1.047	0.889	351.3	99.5	100.0	1160.3	2.7
	Integrated age ± 1s		n=5			3.07				1157.3	1.9
	Plateau ± 1s	steps B-E	n=4		MSWD=4.18	2.85	451.4		92.8	1166.4	3.2
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-03										
#	A	1	50.60	0.0110	2.611	0.485	46.5	98.5	6.4	1054.2	3.4
	B	1	56.64	0.0028	0.7045	1.65	182.3	99.6	28.1	1157.4	1.9
	C	2	56.37	0.0006	0.2865	3.73	903.8	99.8	77.4	1155.2	1.6
	D	2	56.46	0.0077	1.446	0.425	66.2	99.2	83.0	1151.3	4.2
	E	10	56.56	-0.0001	0.3806	1.29	-	99.8	100.0	1157.7	2.2
	Integrated age ± 1s		n=5			7.58				1149.6	1.6
	Plateau ± 1s	steps B-E	n=4		MSWD=0.87	7.09	521.9		93.6	1156.1	1.3
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-05										
#	A	1	47.89	0.0105	1.072	0.165	48.5	99.3	5.7	1017.6	8.5
	B	1	58.76	-0.0099	0.0482	0.110	-	100.0	9.4	1192.2	11.8
	C	2	58.55	-0.0013	0.0726	0.740	-	100.0	34.8	1189.0	3.2
	D	2	57.98	0.0011	0.6160	0.601	453.8	99.7	55.4	1178.0	3.2
	E	10	58.15	0.0014	0.5110	1.30	354.9	99.7	100.0	1181.0	2.5
	Integrated age ± 1s		n=5			2.92				1174.0	2.1
	Plateau ± 1s	steps B-E	n=4		MSWD=2.39	2.75	386.2		94.3	1182.6	2.7

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-07										
#	A	1	47.56	0.0393	5.189	0.123	13.0	96.8	3.4	992.1	11.2
	B	1	59.46	0.0046	1.167	0.116	111.5	99.4	6.7	1197.8	11.6
	C	2	58.20	0.0033	0.8033	1.39	152.4	99.6	45.4	1180.4	2.3
	D	2	58.39	0.0006	0.2434	0.816	837.8	99.9	68.1	1185.8	2.8
	E	10	58.18	0.0066	0.2648	1.14	77.8	99.9	100.0	1182.5	2.1
	Integrated age ± 1s			n=5		3.59				1176.8	1.9
	Plateau ± 1s	steps B-E		n=4	MSWD=1.30	3.47	287.7		96.6	1182.8	1.8
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-09										
#	A	1	52.46	-0.0004	5.875	0.132	-	96.7	3.0	1068.5	9.8
#	B	1	59.15	-0.0059	2.710	0.126	-	98.6	5.8	1186.3	10.1
	C	2	60.80	0.0013	1.302	0.747	391.7	99.4	22.5	1216.9	2.8
	D	2	60.55	-0.0006	0.8726	1.39	-	99.6	53.7	1215.1	2.3
	E	10	59.40	0.0030	0.8631	2.07	171.9	99.6	100.0	1198.2	2.0
	Integrated age ± 1s			n=5		4.47				1202.6	1.8
	Plateau ± 1s	steps C-E		n=3	MSWD=21.13	4.21	195.8		94.2	1208.0	6.3
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-13										
#	A	1	42.15	0.0200	0.9853	0.191	25.4	99.3	4.4	921.4	7.1
#	B	1	54.30	0.0050	2.078	0.147	102.4	98.9	7.7	1115.1	8.9
	C	2	56.28	0.0046	0.3023	2.32	111.0	99.8	61.0	1153.8	2.0
	D	2	55.75	0.0107	-0.0229	0.257	47.5	100.0	66.9	1147.1	5.5
#	E	10	54.45	0.0076	1.554	1.44	67.5	99.2	100.0	1119.9	2.1
	Integrated age ± 1s			n=5		4.36				1131.3	1.8
	Plateau ± 1s	steps C-D		n=2	MSWD=1.33	2.58	104.7		59.2	1153.0	2.3
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-15										
#	A	1	52.68	0.0056	1.760	0.324	91.5	99.0	8.1	1091.4	4.5
#	B	1	56.88	0.0002	-0.6043	0.384	2729.8	100.3	17.7	1166.9	3.9
	C	2	58.39	0.0022	0.1282	2.20	232.9	99.9	72.7	1186.3	2.6
	D	3	57.56	0.0072	0.8527	0.175	71.1	99.6	77.1	1170.6	7.6
	E	3	57.43	0.0007	0.9460	0.253	738.5	99.5	83.5	1168.2	6.0
	F	4	58.05	0.0248	0.9364	0.095	20.6	99.5	85.8	1177.7	13.8
	G	10	58.29	-0.0022	0.1386	0.566	-	99.9	100.0	1184.8	3.5
	Integrated age ± 1s			n=7		3.99				1174.7	2.1
	Plateau ± 1s	steps C-G		n=5	MSWD=2.70	3.29	217.0		82.3	1182.9	3.2

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-17										
#	A	1	51.61	-0.0051	0.9412	0.432	-	99.5	9.1	1078.1	3.8
	B	1	57.42	0.0005	0.1938	1.96	933.8	99.9	50.4	1171.4	2.2
	C	2	57.47	-0.0016	-0.2049	0.862	-	100.1	68.6	1174.0	2.5
	D	3	58.15	0.0021	1.203	0.399	245.1	99.4	77.0	1177.9	4.1
	E	3	57.65	0.0047	-0.8097	0.227	108.8	100.4	81.7	1179.4	6.2
	F	4	58.07	0.0042	2.330	0.174	120.1	98.8	85.4	1171.7	8.2
	G	10	58.22	-0.0004	0.0337	0.692	-	100.0	100.0	1184.2	3.0
	Integrated age ± 1s			n=7		4.74				1166.4	1.8
	Plateau ± 1s		steps B-G	n=6	MSWD=2.60	4.31	465.4		90.9	1175.6	2.3
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-35										
#	A	1	49.56	0.0140	2.213	0.394	36.5	98.7	5.4	1039.2	4.4
	B	1	56.31	0.0015	0.1095	2.88	332.8	99.9	44.4	1154.9	2.0
	C	2	56.62	0.0020	0.2827	2.16	253.5	99.9	73.7	1158.9	2.3
	D	3	56.32	0.0038	0.4690	0.803	134.3	99.8	84.6	1153.6	2.8
	E	3	56.61	0.0021	0.2351	0.846	241.7	99.9	96.1	1159.1	2.6
	F	4	56.47	0.0237	0.2181	0.132	21.5	99.9	97.9	1157.0	9.9
	G	10	57.21	0.0278	2.003	0.157	18.4	99.0	100.0	1160.2	8.6
	Integrated age ± 1s			n=7		7.37				1150.6	1.7
	Plateau ± 1s		steps B-G	n=6	MSWD=0.79	6.97	261.4		94.6	1156.7	1.4
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-37										
#	A	1	47.65	0.0209	0.9607	0.204	24.4	99.4	2.5	1014.2	6.5
#	B	1	63.76	0.0037	15.31	0.365	139.7	92.9	7.0	1199.4	4.7
	C	2	60.64	0.0010	0.2746	2.93	511.5	99.9	43.0	1219.0	1.9
	D	3	60.17	0.0029	0.3389	2.80	178.8	99.8	77.4	1211.8	2.3
	E	3	60.30	-0.0007	0.1236	1.33	-	99.9	93.8	1214.8	2.5
	F	4	59.73	0.0064	0.0095	0.176	79.3	100.0	95.9	1206.8	8.1
	G	10	59.91	0.0054	-0.7964	0.331	94.7	100.4	100.0	1212.9	4.9
	Integrated age ± 1s			n=7		8.13				1209.6	1.7
	Plateau ± 1s		steps C-G	n=5	MSWD=1.85	7.56	271.5		93.0	1215.4	1.9
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-39										
#	A	1	39.05	-0.0112	-0.3636	0.173	-	100.3	3.1	873.9	8.0
#	B	1	55.43	0.0024	2.072	0.192	208.5	98.9	6.5	1132.6	7.1
	C	2	56.59	0.0033	0.4525	1.44	153.3	99.8	31.9	1157.8	2.0
	D	3	56.34	0.0008	0.1564	3.55	634.7	99.9	95.0	1155.3	1.9
	E	3	56.15	0.0350	0.8482	0.139	14.6	99.6	97.4	1149.3	9.8
	F	4	55.55	-0.0158	-3.1654	0.105	-	101.7	99.3	1158.2	12.2
	G	10	56.88	0.0956	2.155	0.040	5.3	98.9	100.0	1154.5	30.4
	Integrated age ± 1s			n=7		5.64				1147.1	1.8
	Plateau ± 1s		steps C-G	n=5	MSWD=0.34	5.27	469.8		93.5	1156.4	1.6

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-41										
#	A	1	38.91	0.0013	1.891	0.215	392.8	98.6	2.9	859.6	6.3
#	B	1	53.06	0.0078	-0.6565	0.183	65.6	100.4	5.4	1108.4	7.7
#	C	2	57.64	-0.0022	2.506	0.490	-	98.7	12.0	1164.4	3.6
	D	3	57.03	0.0012	0.1202	4.46	409.0	99.9	72.0	1165.9	1.8
	E	3	57.91	0.0077	1.419	0.396	66.1	99.3	77.4	1173.4	4.2
	F	4	57.25	0.0020	0.0982	1.35	249.0	99.9	95.6	1169.4	2.3
	G	10	56.46	0.0025	0.6397	0.329	200.5	99.7	100.0	1154.9	4.6
	Integrated age ± 1s			n=7		7.42				1156.8	1.7
	Plateau ± 1s		steps D-G	n=4	MSWD=3.53	6.53	344.7		88.0	1166.9	2.5
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-43										
#	A	1	48.79	-0.0212	1.625	0.190	-	99.0	9.7	1029.6	7.3
	B	1	57.42	-0.0052	0.2686	0.347	-	99.9	27.3	1171.2	4.3
	C	2	56.81	0.0052	0.2504	0.836	97.7	99.9	69.8	1162.0	2.6
	D	3	57.46	0.0012	1.302	0.366	436.1	99.3	88.4	1167.1	4.1
#	E	3	55.90	0.0007	3.582	0.090	687.1	98.1	93.0	1133.0	14.4
#	F	4	59.65	-0.1353	-11.6823	0.024	-	105.8	94.2	1255.8	50.6
#	G	10	64.54	-0.0125	-2.7465	0.114	-	101.3	100.0	1288.0	11.1
	Integrated age ± 1s			n=7		1.97				1159.6	2.4
	Plateau ± 1s		steps B-D	n=3	MSWD=1.84	1.55	200.7		78.7	1165.0	2.8
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-49										
	A	1	58.17	0.0109	-1.8666	0.151	46.7	100.9	5.0	1191.9	8.5
	B	1	59.03	0.0089	0.2491	0.519	57.4	99.9	22.2	1195.3	3.5
	C	2	59.23	0.0042	0.2060	1.61	121.4	99.9	75.5	1198.5	1.9
	D	3	59.55	0.0025	0.5324	0.623	204.8	99.7	96.1	1201.8	2.7
	E	3	59.32	-0.0046	1.182	0.068	-	99.4	98.4	1195.6	17.8
	F	4	60.03	-0.0929	-8.9060	0.037	-	104.4	99.6	1249.5	31.9
	G	10	60.48	-0.2689	-36.3095	0.011	-	117.7	100.0	1368.9	98.0
	Integrated age ± 1s			n=7		3.02				1199.5	1.9
	Plateau ± 1s		steps A-G	n=7	MSWD=1.42	3.02	119.1		100.0	1198.8	1.9

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	OOGC-59g musc L:8:134, musc., J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089-51										
#	A	1	52.46	0.0116	1.809	0.280	44.1	99.0	8.4	1087.6	5.8
	B	1	58.78	0.0006	0.6905	1.23	907.8	99.7	45.3	1189.7	2.5
	C	1	58.60	-0.0003	0.1349	0.884	-	99.9	71.9	1189.5	3.0
	D	2	58.14	-0.0026	-0.2376	0.699	-	100.1	92.9	1184.2	3.1
	E	3	58.17	0.0236	3.312	0.116	21.6	98.3	96.4	1168.9	11.2
	F	3	58.33	0.0405	3.429	0.041	12.6	98.3	97.6	1170.8	29.0
	G	4	59.44	0.0674	-6.1822	0.040	7.6	103.1	98.8	1229.5	30.1
	H	10	58.21	0.0595	6.784	0.040	8.6	96.6	100.0	1153.9	32.0
	Integrated age ± 1s		n=8			3.33				1179.2	2.1
	Plateau ± 1s	steps B-H	n=7		MSWD=1.40	3.05	368.3		91.6	1187.7	2.1
	OOGC-59g biot L:10:134, Biotite, single crystal, J=0.0157867±0.10%, D=1.00782±0.00122, NM-134, Lab#=52090-03										
#	A	1	37.17	0.0163	8.012	0.704	31.3	93.7	11.9	799.4	3.3
#	B	2	43.58	0.0292	5.710	0.433	17.5	96.2	19.2	926.8	5.8
#	C	2	47.03	0.0416	10.03	0.240	12.3	93.7	23.3	964.1	9.7
#	D	5	51.70	0.0130	4.708	1.53	39.2	97.3	49.1	1067.2	2.0
	E	8	56.70	0.0110	5.858	3.01	46.6	97.0	100.0	1140.9	1.9
	Integrated age ± 1s		n=5			5.91				1061.5	1.8
	Plateau ± 1s	steps E-E	n=1		MSWD=0.00	3.01	46.6		50.9	1140.9	1.9
	00GC-59g biot L:10:134, Single crystal biotite, J=0.0157867±0.10%, D=1.00782±0.00122, NM-134, Lab#=52090-05										
#	A	1	45.98	0.0121	5.933	0.726	42.2	96.2	22.0	966.7	2.9
#	B	2	52.58	0.0216	6.453	0.267	23.6	96.4	30.0	1073.1	5.6
#	C	2	54.19	0.0224	10.34	0.150	22.8	94.4	34.6	1080.4	9.7
	D	5	56.42	0.0021	2.876	1.42	241.1	98.5	77.5	1149.7	2.0
	E	10	56.31	0.0020	2.817	0.744	250.8	98.5	100.0	1148.4	2.6
	Integrated age ± 1s		n=5			3.31				1101.4	1.8
	Plateau ± 1s	steps D-E	n=2		MSWD=0.17	2.16	244.4		65.4	1149.3	1.8
	00GC-59g biot L:10:134, Single crystal biotite, J=0.0157867±0.10%, D=1.00782±0.00122, NM-134, Lab#=52090-07										
#	A	1	42.06	0.0175	16.20	0.418	29.2	88.6	14.9	844.7	4.6
#	B	2	49.50	0.0375	8.880	0.173	13.6	94.7	21.1	1011.2	8.9
#	C	3	51.64	0.0084	11.15	0.101	60.6	93.6	24.7	1035.4	16.0
	D	5	56.99	0.0086	5.676	1.54	59.4	97.1	79.6	1145.8	2.3
	E	10	58.74	0.0401	6.417	0.571	12.7	96.8	100.0	1169.3	3.0
	Integrated age ± 1s		n=5			2.80				1096.6	2.1
	Plateau ± 1s	steps D-E	n=2		MSWD=38.10	2.11	46.8		75.3	1154.3	11.3

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	00GC-59g biot L:10:134, Single crystal biotite, J=0.0157867±0.10%, D=1.00782±0.00122, NM-134, Lab#=52090-09										
#	A	1	40.40	0.0182	4.414	0.305	28.0	96.8	16.3	877.5	5.1
#	B	2	51.79	0.0023	2.141	0.225	217.6	98.8	28.3	1080.8	6.2
#	C	3	58.81	0.0078	4.467	0.083	65.5	97.8	32.8	1179.0	15.2
	D	5	62.04	0.0014	2.082	0.697	366.5	99.0	70.1	1237.6	2.9
	E	10	63.50	0.0155	3.138	0.559	32.9	98.5	100.0	1254.3	3.4
	Integrated age ± 1s			n=5		1.87				1167.3	2.3
	Plateau ± 1s	steps D-E		n=2	MSWD=13.81	1.26	218.0		67.2	1244.6	8.3
	00GC-59g biot L:10:134, Single crystal biotite, J=0.0157867±0.10%, D=1.00782±0.00122, NM-134, Lab#=52090-11										
#	AA	1	40.82	0.0035	5.778	0.189	145.8	95.8	21.5	877.7	7.3
#	BB	2	54.71	-0.0063	2.733	0.095	-	98.5	32.2	1124.0	13.2
#	CC	3	54.23	0.0245	9.797	0.063	20.8	94.7	39.5	1083.6	19.6
	DD	5	57.34	0.0029	4.490	0.476	173.4	97.7	93.6	1156.5	3.6
	EE	10	57.12	0.0065	4.821	0.056	78.7	97.5	100.0	1151.7	22.1
	Integrated age ± 1s			n=5		0.879				1091.0	3.7
	Plateau ± 1s	steps DD-EE		n=2	MSWD=0.05	0.532	163.4		60.5	1156.4	3.7
	00GC-59g biot L:10:134, Single crystal biotite, J=0.0157867±0.10%, D=1.00782±0.00122, NM-134, Lab#=52090-15										
#	AA	1	44.18	0.0046	5.486	0.370	110.5	96.3	19.9	938.2	4.5
#	BB	2	53.54	0.0162	4.313	0.128	31.6	97.6	26.8	1098.4	10.8
#	CC	3	52.41	0.0203	5.078	0.257	25.1	97.1	40.7	1076.8	6.0
	DD	5	58.55	0.0074	2.776	0.743	68.6	98.6	80.7	1182.7	3.0
	EE	10	60.65	0.0122	2.249	0.357	41.8	98.9	100.0	1216.4	4.4
	Integrated age ± 1s			n=5		1.85				1122.7	2.4
	Plateau ± 1s	steps DD-EE		n=2	MSWD=39.68	1.10	59.9		59.3	1193.2	15.6
	00GC-59g biot L:10:134, Single crystal biotite, J=0.0157867±0.10%, D=1.00782±0.00122, NM-134, Lab#=52090-17										
#	AA	1	47.53	0.0069	9.197	0.626	74.2	94.3	47.3	976.8	3.5
#	BB	2	49.92	0.0199	6.631	0.212	25.6	96.1	63.3	1029.3	6.5
	CC	3	53.12	0.0407	3.429	0.092	12.5	98.1	70.3	1096.2	14.1
	DD	5	54.49	0.0088	6.291	0.331	58.3	96.6	95.3	1104.3	5.0
#	EE	10	49.35	-0.0209	6.073	0.062	-	96.4	100.0	1022.5	20.3
	Integrated age ± 1s			n=5		1.32				1028.2	3.0
	Plateau ± 1s	steps CC-DD		n=2	MSWD=0.30	0.42	48.3		32.0	1103.4	4.8

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	00GC-62 musc M:1:134, Single crystal musovite, J=0.015811±0.10%, D=1.00782±0.00122, nm-134, Lab#=52092-01										
#	A	1	54.58	0.0084	1.679	0.141	60.8	99.1	5.2	1128.2	10.1
	B	1	70.79	0.0042	1.309	0.392	120.1	99.5	19.7	1365.9	5.1
	C	2	71.05	0.0041	0.6101	1.62	125.8	99.7	79.5	1372.4	2.3
	D	2	71.97	0.0115	0.5175	0.488	44.3	99.8	97.6	1385.1	4.6
#	E	10	65.03	0.0536	9.498	0.065	9.5	95.7	100.0	1250.7	20.0
	Integrated age ± 2s			n=5		2.70				1358.9	4.6
	Plateau ± 2s	steps B-D		n=3	MSWD=4.40	2.50	109.0		92.4	1373.7	8.3
	00GC-62 musc M:1:134, Single crystal musovite, J=0.015811±0.10%, D=1.00782±0.00122, nm-134, Lab#=52092-03										
#	A	1	53.14	0.0919	4.696	0.118	5.6	97.4	3.6	1091.6	11.8
	B	1	61.14	0.1396	2.748	0.053	3.7	98.7	5.2	1223.0	23.6
	C	2	61.31	0.0012	0.5816	1.88	410.4	99.7	62.7	1234.7	3.1
	D	2	61.18	0.0040	0.8078	0.783	128.3	99.6	86.6	1231.8	2.6
	E	10	60.83	0.0024	0.5153	0.439	213.9	99.8	100.0	1227.9	4.6
	Integrated age ± 2s			n=5		3.27				1227.9	4.8
	Plateau ± 2s	steps B-E		n=4	MSWD=0.57	3.15	306.2		96.4	1232.2	4.0
	00GC-62 musc M:1:134, Single crystal musovite, J=0.015811±0.10%, D=1.00782±0.00122, nm-134, Lab#=52092-05										
#	A	1	46.83	0.0912	7.557	0.057	5.6	95.3	3.6	974.2	23.3
#	B	1	53.16	-0.0114	7.084	0.063	-	96.1	7.5	1080.5	21.3
	C	2	56.02	0.0055	0.6298	0.704	92.9	99.7	51.5	1155.1	2.6
	D	2	55.43	-0.0015	1.141	0.482	-	99.4	81.6	1143.7	3.8
	E	10	55.22	0.0060	1.203	0.294	85.1	99.4	100.0	1140.1	5.7
	Integrated age ± 2s			n=5		1.60				1139.8	5.1
	Plateau ± 2s	steps C-E		n=3	MSWD=4.83	1.48	69.3		92.5	1150.0	9.0
	00GC-62 musc M:1:134, Single crystal musovite, J=0.015811±0.10%, D=1.00782±0.00122, nm-134, Lab#=52092-07										
#	A	1	52.56	0.0863	7.794	0.066	5.9	95.6	6.5	1067.6	19.8
	B	1	59.27	-0.0041	0.9573	0.312	-	99.5	37.1	1202.9	5.6
	C	1	59.08	-0.0040	-0.2469	0.566	-	100.1	92.7	1205.3	3.6
	D	2	57.79	0.0186	7.322	0.023	27.4	96.3	95.0	1152.1	50.3
	E	10	57.78	0.0644	5.203	0.051	7.9	97.3	100.0	1161.5	25.5
	Integrated age ± 2s			n=5		1.02				1192.5	7.2
	Plateau ± 2s	steps B-E		n=4	MSWD=1.34	0.95	14.0		93.5	1203.9	7.1
	00GC-62 musc M:1:134, Single crystal musovite, J=0.015811±0.10%, D=1.00782±0.00122, nm-134, Lab#=52092-09										
#	A	1	56.39	0.0469	1.537	0.174	10.9	99.2	12.9	1156.8	8.0
	B	1	61.63	0.0029	0.2726	0.512	177.4	99.9	50.6	1240.8	4.1
	C	1	61.25	0.0076	0.5930	0.596	66.9	99.7	94.6	1233.7	3.4
	D	2	61.83	0.0455	1.431	0.061	11.2	99.3	99.1	1238.7	20.6
	E	10	46.78	0.2204	-7.1439	0.012	2.3	104.6	100.0	1045.8	98.3
	Integrated age ± 2s			n=5		1.35				1225.3	5.9
	Plateau ± 2s	steps B-E		n=4	MSWD=1.85	1.18	111.3		87.1	1236.5	7.2

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	00GC-62 musc M:1:134, Single crystal musovite, J=0.015811±0.10%, D=1.00782±0.00122, nm-134, Lab#=52092-23										
#	A	1	56.96	0.0947	-2.6573	0.059	5.4	101.4	6.6	1184.4	21.0
	B	1	61.71	-0.0225	5.694	0.073	-	97.3	14.9	1218.4	17.9
	C	1	61.36	-0.0006	0.7085	0.549	-	99.7	76.9	1234.9	6.1
	D	2	60.52	0.0085	1.466	0.188	59.9	99.3	98.0	1219.3	7.8
#	E	10	58.78	0.0458	14.44	0.017	11.1	92.7	100.0	1134.8	68.7
	Integrated age ± 2s			n=5		0.886				1225.0	9.9
	Plateau ± 2s	steps B-D		n=3	MSWD=1.40	0.810	59.9		91.4	1228.2	11.2
	00GC-62 musc M:1:134, Single crystal musovite, J=0.015811±0.10%, D=1.00782±0.00122, nm-134, Lab#=52092-25										
#	A	1	56.77	0.0547	-0.4637	0.071	9.3	100.3	6.5	1171.6	19.0
	B	1	63.46	0.0771	4.229	0.042	6.6	98.0	10.4	1250.6	28.2
	C	1	61.68	0.0020	0.7044	0.549	250.3	99.7	60.7	1239.6	3.7
	D	2	61.72	0.0052	0.1073	0.356	97.3	99.9	93.3	1242.8	4.6
#	E	10	60.37	-0.0420	1.986	0.073	-	99.0	100.0	1214.7	17.9
	Integrated age ± 2s			n=5		1.09				1235.1	6.8
	Plateau ± 2s	steps B-D		n=3	MSWD=0.20	0.95	181.9		86.8	1240.9	6.0
	00GC-62 musc M:1:134, Single crystal musovite, J=0.015811±0.10%, D=1.00782±0.00122, nm-134, Lab#=52092-27										
#	A	1	64.14	0.0588	1.739	0.135	8.7	99.2	25.7	1271.0	9.8
	B	1	73.20	0.0134	0.8173	0.202	38.2	99.7	64.1	1400.5	6.9
	C	1	72.80	0.0017	-1.7099	0.178	294.0	100.7	97.9	1405.2	8.1
	D	2	71.90	-0.6737	-35.8710	0.006	-	114.7	99.0	1523.5	177.9
	E	10	66.93	0.1161	12.41	0.005	4.4	94.5	100.0	1265.9	217.5
	Integrated age ± 2s			n=5		0.527				1369.9	11.3
	Plateau ± 2s	steps B-E		n=4	MSWD=0.35	0.392	153.4		74.3	1402.5	10.7
	00GC-62 musc M:1:134, Single crystal musovite, J=0.015811±0.10%, D=1.00782±0.00122, nm-134, Lab#=52092-29										
#	A	1	47.22	0.1731	2.464	0.030	2.9	98.5	5.6	1006.3	42.1
	B	1	51.47	0.1741	3.758	0.020	2.9	97.9	9.4	1069.4	59.2
	C	1	57.26	0.0478	-1.1414	0.161	10.7	100.6	39.6	1182.0	8.9
	D	2	57.05	-0.0155	-2.4019	0.286	-	101.2	93.2	1184.4	5.4
	E	10	58.33	-0.0487	-0.9049	0.036	-	100.5	100.0	1196.9	35.2
	Integrated age ± 2s			n=5		0.534				1170.7	11.5
	Plateau ± 2s	steps B-E		n=4	MSWD=1.31	0.504	3.5		94.4	1183.3	10.6

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	00GC-62 musc M:1:134, Single crystal musovite, J=0.015811±0.10%, D=1.00782±0.00122, nm-134, Lab#=52092-31										
	A	1	55.65	0.0281	-0.2882	0.066	18.1	100.2	3.1	1153.6	19.1
	B	1	56.53	-0.0145	0.4698	0.231	-	99.8	14.0	1163.7	6.9
	C	1	56.30	0.0013	0.3678	1.19	401.9	99.8	70.4	1160.5	4.3
	D	2	56.13	-0.0022	-0.3090	0.466	-	100.2	92.4	1161.1	5.3
#	E	10	55.97	0.0140	3.653	0.161	36.5	98.1	100.0	1140.7	8.8
	Integrated age ± 2s			n=5		2.12				1159.3	6.3
	Plateau ± 2s	steps A-D		n=4	MSWD=0.10	1.96	278.6		92.4	1161.1	6.2
	00GC-62 musc M:1:134, Single crystal musovite, J=0.015811±0.10%, D=1.00782±0.00122, nm-134, Lab#=52092-33										
#	A	1	48.86	0.3274	8.911	0.031	1.6	94.7	4.2	1002.1	41.1
	B	1	55.98	0.0197	-0.1766	0.268	25.9	100.1	40.6	1158.2	5.7
	C	1	56.68	-0.0047	-1.1251	0.240	-	100.6	73.3	1173.2	6.7
	D	2	55.90	0.0089	-1.0635	0.083	57.2	100.6	84.6	1161.0	15.3
	E	10	56.36	0.0192	3.934	0.113	26.6	97.9	100.0	1145.4	11.6
	Integrated age ± 2s			n=5		0.736				1155.1	8.8
	Plateau ± 2s	steps B-E		n=4	MSWD=1.77	0.705	26.6		95.8	1162.1	10.6

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-05										
#	A	0	52.15	-0.0853	12.73	0.140	-	92.8	1.0	1192.1	30.9
#	B	0	73.44	-0.0051	5.406	1.62	-	97.8	12.3	1574.1	5.5
	C	0	76.36	-0.0042	-0.0067	9.29	-	100.0	77.2	1639.2	3.2
	D	0	68.15	-0.0448	1.848	1.05	-	99.2	84.6	1510.7	8.6
	E	0	78.09	-0.0212	0.5998	0.646	-	99.8	89.1	1661.0	10.8
	F	0	75.88	-0.0162	1.208	1.56	-	99.5	100.0	1627.2	5.6
	Integrated age ± 1s			n=6		14.3				1618.5	2.6
	Plateau ± 1s	steps C-F		n=4	MSWD=69.01	12.5	0.000		87.7	1626.6	21.3
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-07										
#	A	0	32.85	-0.2673	-16.3838	0.051	-	114.7	0.4	986.9	86.1
#	B	0	47.57	-0.0086	1.227	0.222	-	99.2	2.4	1170.7	18.4
	C	0	74.27	0.0015	0.3610	7.62	340.5	99.9	68.3	1607.9	3.8
	D	0	75.17	0.0072	1.025	1.91	71.2	99.6	84.8	1617.9	5.9
	E	0	75.39	-0.0281	0.6628	0.817	-	99.7	91.8	1622.5	8.5
	F	0	73.94	-0.0082	0.5178	0.944	-	99.8	100.0	1602.3	6.9
	Integrated age ± 1s			n=6		11.6				1600.3	3.0
	Plateau ± 1s	steps C-F		n=4	MSWD=1.81	11.3	241.9		97.6	1610.7	3.7
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-11										
#	A	0	28.89	-0.0235	1.910	0.570	-	98.0	3.2	787.2	8.6
#	B	0	65.52	-0.0005	0.5111	9.53	-	99.8	57.5	1476.4	2.2
#	C	0	55.61	-0.0011	-0.1867	3.41	-	100.1	77.0	1319.4	3.3
	D	0	68.64	0.0377	0.1038	0.825	13.5	100.0	81.7	1526.0	8.4
	E	0	63.65	0.0162	-2.4723	0.652	31.5	101.2	85.4	1461.1	9.1
	F	0	76.98	0.0047	0.0159	2.57	107.7	100.0	100.0	1647.9	4.2
	Integrated age ± 1s			n=6		17.6				1456.6	1.8
	Plateau ± 1s	steps D-F		n=3	MSWD=220.80	4.0	76.2		23.0	1599.9	51.6
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-15										
#	A	0	68.89	-0.0086	1.855	2.29	-	99.2	47.4	1521.9	4.5
	B	0	71.89	-0.0089	0.0689	1.84	-	100.0	85.6	1574.4	4.6
	C	0	71.85	-0.0270	7.591	0.201	-	96.9	89.8	1540.8	18.9
	D	0	77.97	0.0738	-4.2444	0.126	6.9	101.6	92.4	1679.5	25.4
	E	0	70.53	-0.0696	-10.9308	0.084	-	104.6	94.2	1601.9	43.7
	F	0	76.91	-0.0238	6.686	0.282	-	97.4	100.0	1618.9	13.8
	Integrated age ± 1s			n=6		4.82				1554.3	3.3
	Plateau ± 1s	steps B-F		n=5	MSWD=7.33	2.53	1.8		52.6	1579.9	11.3

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-17										
#	A	0	43.61	0.0041	5.254	0.259	125.5	96.4	20.4	1074.0	14.9
	B	0	58.78	0.0066	3.463	0.807	77.7	98.3	84.1	1354.5	8.5
#	C	0	50.49	0.0761	51.17	0.045	6.7	70.0	87.6	940.0	88.6
#	D	0	51.72	-0.5510	70.53	0.030	-	59.6	90.0	842.7	131.2
#	E	0	43.59	-1.0615	116.9	0.020	-	20.5	91.6	286.4	275.0
#	F	0	56.32	0.0834	-1.3740	0.106	6.1	100.7	100.0	1337.4	35.2
	Integrated age ± 1s		n=6			1.27				1261.0	8.4
	Plateau ± 1s	steps B-B	n=1	MSWD=0.00		0.81	77.7		63.7	1354.5	8.5
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-18										
#	A	0	23.92	0.0004	-0.3122	0.452	1304.5	100.4	6.0	687.0	9.6
	B	0	53.79	0.0071	1.178	2.75	71.8	99.4	42.8	1281.5	3.9
	C	0	50.99	0.0012	0.3793	2.99	416.9	99.8	82.6	1236.9	4.0
	D	0	49.57	-0.0288	2.127	0.252	-	98.7	86.0	1202.2	16.3
	E	0	48.69	0.0392	-0.3502	0.660	13.0	100.2	94.8	1199.7	7.7
#	F	0	71.77	-0.0132	3.000	0.390	-	98.8	100.0	1559.9	13.4
	Integrated age ± 1s		n=6			7.50				1238.8	2.6
	Plateau ± 1s	steps B-E	n=4	MSWD=42.91		6.66	218.2		88.8	1251.6	16.8
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-22										
#	A	0	41.83	0.0419	7.418	0.380	12.2	94.8	4.6	1026.5	12.6
	B	0	69.01	0.0094	0.6638	5.18	54.4	99.7	67.9	1529.0	3.0
	C	0	64.54	0.0073	2.649	1.56	69.6	98.8	87.0	1451.3	5.7
	D	0	66.83	-0.0075	0.8286	0.616	-	99.6	94.5	1495.2	8.9
#	E	0	56.77	-0.0454	-9.4116	0.274	-	104.9	97.8	1383.9	16.2
#	F	0	54.28	-0.0293	-9.4861	0.176	-	105.2	100.0	1343.2	22.7
	Integrated age ± 1s		n=6			8.19				1482.5	2.7
	Plateau ± 1s	steps B-D	n=3	MSWD=73.21		7.36	53.1		89.9	1510.5	22.0

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-26										
#	A	0	44.04	0.0390	3.134	0.414	13.1	97.9	12.8	1094.2	9.6
	B	0	70.20	0.0012	1.685	1.27	429.0	99.3	52.0	1542.3	4.8
#	C	0	60.06	-0.0002	1.173	0.917	-	99.4	80.4	1386.6	6.1
#	D	0	43.57	-0.0661	8.356	0.248	-	94.3	88.1	1055.1	16.4
#	E	0	62.46	-0.5895	-8.9874	0.050	-	104.2	89.6	1471.1	69.7
#	F	0	68.68	0.0306	6.389	0.336	16.7	97.3	100.0	1498.3	15.5
	Integrated age ± 1s		n=6			3.23				1405.7	3.8
	Plateau ± 1s	steps B-B	n=1		MSWD=0.00	1.27	429.0		39.2	1542.3	4.8
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-28										
	A	0	65.87	-0.0208	0.8568	1.37	-	99.6	66.0	1480.2	4.7
	B	0	64.92	0.1778	5.176	0.271	2.9	97.7	79.1	1445.9	14.6
	C	0	71.37	0.2939	3.401	0.080	1.7	98.6	83.0	1552.8	43.7
	D	0	71.56	0.2566	5.598	0.063	2.0	97.7	86.0	1545.8	49.1
	E	0	77.50	0.2715	8.639	0.085	1.9	96.7	90.1	1619.7	36.3
	F	0	75.69	-0.0603	8.175	0.205	-	96.8	100.0	1594.9	22.1
	Integrated age ± 1s		n=6			2.07				1498.2	5.1
	Plateau ± 1s	steps A-F	n=6		MSWD=10.13	2.07	1.7		100.0	1484.9	13.9
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-31										
	A	0	66.22	-0.0059	0.2517	1.29	-	99.9	70.0	1488.4	5.3
	B	0	68.08	0.0013	3.391	0.415	393.5	98.5	92.5	1502.7	11.1
	C	0	67.87	-0.2283	1.822	0.081	-	99.2	97.0	1506.2	35.0
	D	0	70.39	-0.5126	10.85	0.038	-	95.4	99.0	1503.3	74.6
	E	0	92.90	-1.9420	22.38	0.009	-	92.7	99.5	1770.9	240.9
	F	0	74.27	-2.5271	-76.6380	0.009	-	130.3	100.0	1905.2	279.9
	Integrated age ± 1s		n=6			1.84				1496.4	5.5
	Plateau ± 1s	steps A-F	n=6		MSWD=1.02	1.84	295.8		100.0	1491.6	4.8
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-33										
#	A	0	37.42	-0.0255	-0.1503	0.529	-	100.1	17.5	982.8	8.7
	B	0	55.17	-0.0060	-0.3025	1.13	-	100.2	55.0	1312.5	7.4
#	C	0	49.47	-0.0370	-1.9543	0.700	-	101.2	78.2	1222.0	8.3
#	D	0	40.25	0.0498	3.157	0.342	10.2	97.7	89.5	1020.3	10.3
#	E	0	36.12	0.1083	5.487	0.185	4.7	95.5	95.6	921.8	17.4
#	F	0	56.82	0.1485	12.82	0.133	3.4	93.4	100.0	1274.7	24.3
	Integrated age ± 1s		n=6			3.02				1180.9	4.2
	Plateau ± 1s	steps B-B	n=1		MSWD=0.00	1.13	0.0		37.5	1312.5	7.4

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-35										
#	A	0	30.69	0.0454	8.516	0.500	11.2	91.8	8.3	783.9	9.1
#	B	0	56.75	-0.0318	0.9090	1.34	-	99.5	30.4	1333.1	5.4
	C	0	62.75	-0.0100	0.3331	2.56	-	99.8	72.8	1433.8	4.2
	D	0	67.86	-0.0460	0.9254	0.483	-	99.6	80.8	1510.3	11.5
	E	0	65.00	-0.1076	-4.0634	0.270	-	101.8	85.2	1489.1	14.7
	F	0	62.74	0.0095	2.996	0.893	53.9	98.6	100.0	1421.2	7.4
	Integrated age ± 1s		n=6			6.05				1372.8	2.9
	Plateau ± 1s	steps C-F	n=4		MSWD=18.94	4.21	53.9		69.6	1440.7	14.7
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-37										
#	A	0	73.37	-0.0008	0.5040	0.461	-	99.8	14.3	1594.1	11.3
	B	0	78.64	0.0078	-0.0902	2.12	65.4	100.0	80.4	1671.7	4.3
	C	0	78.31	0.0081	1.709	0.310	63.4	99.4	90.0	1659.6	14.2
	D	0	71.29	0.1567	-15.3252	0.097	3.3	106.4	93.0	1631.8	31.4
	E	0	66.46	-0.0812	-14.8026	0.028	-	106.6	93.9	1559.1	90.3
	F	0	76.87	0.0652	-3.5672	0.197	7.8	101.4	100.0	1661.4	16.7
	Integrated age ± 1s		n=6			3.22				1656.8	4.0
	Plateau ± 1s	steps B-F	n=5		MSWD=0.98	2.75	58.2		85.7	1669.3	4.0
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-39										
	A	0	43.03	0.0278	2.928	0.914	18.3	98.0	29.9	1076.0	5.9
	B	0	43.14	0.0016	1.839	1.49	317.6	98.7	78.8	1084.3	4.9
	C	0	39.92	-0.1397	-1.9632	0.187	-	101.4	84.9	1043.2	18.4
	D	0	38.54	-0.0537	-2.3744	0.219	-	101.8	92.1	1018.5	15.8
	E	0	53.20	-0.0859	24.05	0.074	-	86.6	94.5	1150.1	38.8
#	F	0	63.88	-0.0364	1.847	0.168	-	99.1	100.0	1444.5	20.7
	Integrated age ± 1s		n=6			3.05				1098.1	3.8
	Plateau ± 1s	steps A-E	n=5		MSWD=5.72	2.89	170.1		94.5	1076.9	8.5
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-41										
#	A	0	68.52	-0.0041	1.085	2.56	-	99.5	77.3	1519.8	3.1
	B	0	74.61	-0.0190	5.148	0.355	-	98.0	88.0	1592.2	13.8
	C	0	78.32	-0.1032	-10.4338	0.124	-	103.9	91.8	1709.2	27.4
	D	0	73.86	0.0156	-37.4869	0.035	32.7	115.0	92.8	1757.0	75.4
	E	0	69.76	0.3266	-34.3716	0.034	1.6	114.6	93.9	1689.5	63.1
	F	0	75.19	0.1103	-9.7797	0.203	4.6	103.9	100.0	1663.7	17.5
	Integrated age ± 1s		n=6			3.31				1548.6	3.4
	Plateau ± 1s	steps B-F	n=5		MSWD=5.74	0.75	7.8		22.7	1635.4	23.7

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-46										
#	A	0	31.47	0.0504	10.21	0.243	10.1	90.4	1.3	790.3	17.6
#	B	0	64.68	0.0048	1.612	5.63	106.1	99.3	31.3	1458.2	3.5
	C	0	63.09	-0.0017	0.4176	8.40	-	99.8	76.2	1438.8	2.1
	D	0	67.68	0.0003	0.4114	1.66	1665.2	99.8	85.0	1510.0	5.9
	E	0	71.40	-0.0173	1.778	0.364	-	99.3	87.0	1559.8	12.5
	F	0	72.13	0.0046	0.3444	2.44	110.2	99.9	100.0	1576.8	5.3
	Integrated age ± 1s		n=6			18.7				1464.9	2.0
	Plateau ± 1s	steps D-F	n=3		MSWD=35.98	4.5	685.4		23.8	1548.3	22.5
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-48										
#	A	0	26.81	0.0718	5.736	0.139	7.1	93.7	4.5	713.4	25.2
#	B	0	59.54	0.0069	-1.5221	0.577	73.8	100.8	22.9	1391.1	8.2
	C	0	65.89	0.0049	1.781	1.44	104.0	99.2	68.8	1476.3	5.4
	D	0	73.41	-0.0815	2.646	0.303	-	98.9	78.5	1585.4	13.6
	E	0	64.23	-0.0971	6.788	0.116	-	96.9	82.2	1426.8	28.6
	F	0	70.41	-0.0249	3.205	0.556	-	98.7	100.0	1538.8	11.3
	Integrated age ± 1s		n=6			3.13				1453.4	4.2
	Plateau ± 1s	steps C-F	n=4		MSWD=25.47	2.41	62.0		77.1	1497.2	22.9
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-50										
#	A	0	63.82	-0.0315	1.856	0.681	-	99.1	14.1	1443.5	8.1
	B	0	75.33	-0.0092	0.6000	3.16	-	99.8	79.4	1622.0	3.9
	C	0	74.82	-0.0763	0.6116	0.435	-	99.8	88.3	1614.6	12.1
	D	0	75.01	-0.1967	-7.7016	0.112	-	103.0	90.6	1651.9	27.7
	E	0	72.72	-0.2736	-3.3078	0.067	-	101.3	92.0	1600.6	45.3
	F	0	72.49	0.0195	-0.0526	0.387	26.1	100.0	100.0	1583.8	13.5
	Integrated age ± 1s		n=6			4.85				1594.6	3.4
	Plateau ± 1s	steps B-F	n=5		MSWD=2.28	4.16	26.1		85.9	1619.1	5.3
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.0073±0.001, NM-171, Lab#=54343-52										
#	A	0	55.93	-0.0021	3.315	1.92	-	98.2	73.0	1307.3	5.4
	B	0	70.00	0.0382	-5.2137	0.246	13.3	102.2	82.4	1569.7	17.5
	C	0	61.97	-0.1071	-9.1375	0.181	-	104.3	89.3	1465.4	20.7
	D	0	60.50	0.1097	10.10	0.043	4.7	95.1	91.0	1350.7	59.8
	E	0	70.00	-0.8038	-92.4453	0.015	-	138.9	91.5	1913.0	153.1
	F	0	70.02	-0.0124	7.121	0.222	-	97.0	100.0	1515.4	16.5
	Integrated age ± 1s		n=6			2.63				1367.7	5.0
	Plateau ± 1s	steps B-F	n=5		MSWD=7.43	0.71	5.0		27.0	1518.6	27.8

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu, G1:171, Muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-01										
#	A	0	91.45	-1.0444	130.2	0.027	-	57.8	0.0	1271.7	89.4
#	B	0	65.08	-0.4804	33.75	0.076	-	84.6	0.1	1309.2	40.4
#	C	0	54.91	-0.2614	12.94	0.082	-	93.0	0.1	1239.9	30.2
#	D	0	48.80	-0.2243	6.601	0.110	-	96.0	0.2	1163.6	25.4
#	E	0	60.62	-0.0208	7.077	1.40	-	96.5	1.0	1367.1	4.5
#	F	0	60.17	-0.0380	5.874	0.363	-	97.1	1.2	1365.6	10.5
	G	0	75.06	0.0009	0.9033	173.1	600.2	99.6	100.0	1616.9	1.6
	Integrated age ± 1s			n=7		175.2				1613.9	1.7
	Plateau ± 1s		steps G-G	n=1	MSWD=0.00	173.1	600.2		98.8	1616.9	1.6
	K03-DV-04, mu, G1:171, Muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-02										
#	A	0	20.94	-0.0577	29.28	0.196	-	58.6	0.2	383.1	43.4
#	B	0	23.57	0.0407	6.970	0.239	12.5	91.3	0.3	626.4	23.7
#	C	0	46.16	-0.0009	2.408	1.85	-	98.5	1.8	1138.3	4.7
#	D	0	67.63	0.0017	0.8934	11.7	304.3	99.6	10.9	1507.0	1.9
	E	0	74.78	0.0011	0.2663	86.1	464.6	99.9	78.2	1615.5	1.5
	F	0	73.95	0.0001	0.4182	14.0	8229.1	99.8	89.1	1603.0	2.0
	G	0	77.33	0.0003	0.3829	13.9	1649.0	99.9	100.0	1651.3	1.8
	Integrated age ± 1s			n=7		127.9				1599.5	1.3
	Plateau ± 1s		steps E-G	n=3	MSWD=184.71	113.9	1561.4		89.1	1623.3	13.5
	K03-DV-04, mu, G1:171, Muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-04										
#	A	0	43.73	0.1767	15.14	0.047	2.9	89.8	0.2	1019.5	92.0
#	B	0	34.92	0.1243	-4.9607	0.087	4.1	104.2	0.5	961.3	46.8
#	C	0	45.95	0.0132	-0.8794	0.281	38.7	100.6	1.6	1152.4	14.4
#	D	0	60.57	0.0148	1.409	0.716	34.5	99.3	4.5	1393.8	7.5
	E	0	75.04	0.0023	0.6974	16.9	224.6	99.7	71.5	1617.4	2.0
	F	0	71.89	0.0089	2.089	1.14	57.4	99.1	76.1	1565.7	6.0
	G	0	75.80	-0.0011	0.4385	6.02	-	99.8	100.0	1629.5	2.7
	Integrated age ± 1s			n=7		25.2				1604.5	1.7
	Plateau ± 1s		steps E-G	n=3	MSWD=47.09	24.0	160.5		95.5	1618.1	10.5
	K03-DV-04, mu, G1:171, Muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-55										
#	A	0	28.68	-0.0114	22.31	0.377	-	77.0	0.5	640.4	11.6
#	B	0	54.02	-0.0017	4.094	2.00	-	97.8	3.1	1270.6	4.7
#	C	0	40.39	0.0037	2.597	2.54	136.9	98.1	6.3	1026.2	3.9
#	D	0	52.49	-0.0008	1.646	5.97	-	99.1	14.0	1256.6	2.0
#	E	0	57.63	0.0002	0.6220	30.1	2485.2	99.7	52.7	1349.4	1.4
#	F	0	49.06	-0.0015	0.9931	10.9	-	99.4	66.8	1199.1	1.7
	G	0	63.12	0.0007	0.5531	25.8	711.4	99.7	100.0	1438.7	1.4
	Integrated age ± 1s			n=7		77.7				1338.0	1.1
	Plateau ± 1s		steps G-G	n=1	MSWD=0.00	25.8	711.4		33.2	1438.7	1.4

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu. G1:171 , Muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-06										
#	A	0	31.30	0.0301	18.10	1.31	16.9	82.9	0.4	732.9	4.6
#	B	0	42.81	0.0123	2.048	4.88	41.3	98.6	1.8	1076.7	2.1
	C	0	73.78	0.0015	0.6338	58.7	343.0	99.7	18.8	1599.5	1.3
	D	0	75.68	0.0015	0.2959	48.8	349.9	99.9	32.9	1628.3	1.4
	E	0	72.42	0.0007	0.2749	175.4	769.5	99.9	83.5	1581.3	1.4
	F	0	75.13	0.0005	0.4052	36.8	1078.7	99.8	94.2	1619.9	1.6
	G	0	77.13	-0.0002	0.3692	20.3	-	99.9	100.0	1648.5	1.8
	Integrated age ± 1s			n=7		346.2				1590.5	1.2
	Plateau ± 1s		steps C-G	n=5	MSWD=274.62	340.0	623.2		98.2	1612.0	11.1
	K03-DV-04, mu. G1:171 , Muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-57										
#	A	0	52.59	-0.0201	13.14	0.522	-	92.6	0.4	1198.0	15.8
#	B	0	72.74	-0.0032	3.559	6.81	-	98.6	5.8	1571.7	3.1
	C	0	77.09	0.0004	1.334	95.8	1291.3	99.5	80.9	1643.9	1.3
	D	0	76.28	-0.0002	2.128	3.53	-	99.2	83.6	1629.2	4.6
	E	0	77.93	-0.0006	0.5752	20.0	-	99.8	99.3	1658.9	2.4
#	F	0	66.26	-0.0571	8.023	0.142	-	96.4	99.4	1453.2	48.9
#	G	0	74.35	-0.0121	4.073	0.795	-	98.4	100.0	1593.0	11.5
	Integrated age ± 1s			n=7		127.6				1640.0	1.4
	Plateau ± 1s		steps C-E	n=3	MSWD=21.97	119.3	1037.2		93.5	1646.3	5.3
	K03-DV-04, mu. G1:171 , Muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-08										
#	A	0	26.55	-0.0060	2.740	1.03	-	96.9	4.3	727.8	6.0
	B	0	59.68	-0.0002	1.189	16.1	-	99.4	71.3	1380.3	1.7
	C	0	54.18	-0.0063	0.7635	4.63	-	99.6	90.5	1290.4	3.2
	D	0	50.12	-0.0441	-0.5335	0.412	-	100.3	92.2	1226.0	14.8
	E	0	58.71	-0.0108	0.2013	1.55	-	99.9	98.6	1369.2	6.6
	F	0	70.86	-0.0443	-5.8979	0.272	-	102.5	99.7	1585.2	21.2
	G	0	68.96	-0.4599	-29.2022	0.063	-	112.5	100.0	1655.7	76.1
	Integrated age ± 1s			n=7		24.1				1339.4	1.6
	Plateau ± 1s		steps B-G	n=6	MSWD=164.39	23.1	0.000		95.7	1360.1	18.9
	K03-DV-04, mu. G1:171 , Muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-09										
#	A	0	38.77	-0.0384	16.63	0.668	-	87.3	0.6	908.2	11.2
#	B	0	53.56	-0.0003	3.961	2.59	-	97.8	2.8	1263.2	4.9
#	C	0	69.09	0.0006	1.327	9.60	912.4	99.4	11.2	1527.2	2.5
#	D	0	74.23	0.0006	0.5192	7.74	814.5	99.8	18.0	1606.6	3.4
	E	0	76.12	0.0006	0.3168	84.0	801.2	99.9	91.3	1634.5	1.2
	F	0	76.20	-0.0005	1.293	5.65	-	99.5	96.2	1631.6	4.0
	G	0	77.03	0.0006	2.051	4.38	815.2	99.2	100.0	1640.1	3.3
	Integrated age ± 1s			n=7		114.6				1612.8	1.3
	Plateau ± 1s		steps E-G	n=3	MSWD=1.66	94.0	756.1		82.0	1634.9	1.5

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu. G1:171 , Muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-12										
#	A	0	42.48	-0.0407	3.093	0.428	-	97.8	2.1	1064.3	14.1
#	B	0	71.23	-0.0050	0.5832	5.70	-	99.8	30.6	1562.5	3.8
	C	0	74.59	0.0020	0.2888	8.18	257.9	99.9	71.5	1612.8	2.4
	D	0	67.23	0.0055	1.332	0.713	92.2	99.4	75.0	1498.9	9.3
	E	0	73.77	-0.0121	0.4676	2.26	-	99.8	86.3	1600.1	5.1
	F	0	76.03	0.0048	0.8232	1.19	107.0	99.7	92.2	1631.1	8.5
	G	0	78.19	0.0104	2.618	1.56	48.9	99.0	100.0	1654.1	5.5
	Integrated age ± 1s			n=7		20.0				1587.3	2.0
	Plateau ± 1s		steps C-G	n=5	MSWD=54.47	13.9	174.0		69.4	1612.1	14.1
	K03-DV-04, mu. G1:171 , Muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-13										
#	B	0	20.53	0.0458	36.22	0.086	11.1	47.8	0.2	312.5	76.2
#	C	0	42.03	0.0320	21.20	0.642	15.9	85.1	1.6	948.2	10.4
#	D	0	51.08	0.0624	14.82	0.352	8.2	91.4	2.3	1161.5	15.2
#	E	0	65.05	0.0007	0.9812	17.5	687.0	99.6	40.0	1466.9	2.0
	F	0	71.09	0.0010	1.008	15.6	492.9	99.6	73.5	1558.5	2.0
	G	0	71.25	0.0025	0.9008	12.3	207.6	99.6	100.0	1561.4	2.5
	Integrated age ± 1s			n=6		46.6				1513.6	1.5
	Plateau ± 1s		steps F-G	n=2	MSWD=0.81	27.9	367.1		60.0	1559.6	1.7
	K03-DV-04, mu. G1:171 , Muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-14										
#	A	0	50.42	0.0193	54.91	0.404	26.4	67.8	0.3	915.3	18.2
	B	0	75.60	0.0017	2.601	35.4	297.7	99.0	26.1	1617.4	1.8
	C	0	74.99	0.0005	0.1455	67.0	1094.4	99.9	74.8	1619.0	1.6
	D	0	74.04	0.0035	1.468	4.22	143.9	99.4	77.9	1599.8	4.5
	E	0	76.67	0.0007	0.3393	24.3	777.4	99.9	95.5	1642.3	2.1
	F	0	77.19	0.0016	0.9720	5.54	311.1	99.6	99.6	1647.0	3.0
	G	0	76.17	0.0352	8.227	0.601	14.5	96.8	100.0	1601.8	13.4
	Integrated age ± 1s			n=7		137.4				1621.5	1.4
	Plateau ± 1s		steps B-G	n=6	MSWD=36.66	137.0	766.8		99.7	1625.2	5.9
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-16										
#	A	0	36.27	0.1856	-16.2576	0.078	2.7	113.3	1.0	1055.3	59.3
#	B	0	48.96	0.2773	-19.7846	0.077	1.8	112.0	1.9	1305.5	56.3
#	C	0	64.02	0.1189	-18.9471	0.130	4.3	108.8	3.5	1541.3	37.6
	D	0	75.60	0.0080	0.6571	4.86	63.5	99.7	63.8	1625.6	3.3
	E	0	77.51	0.0016	0.0702	2.52	321.9	100.0	95.1	1655.2	5.6
#	F	0	74.64	0.0459	-3.8790	0.302	11.1	101.5	98.9	1631.1	18.5
#	G	0	70.63	0.1137	2.333	0.092	4.5	99.0	100.0	1546.1	57.3
	Integrated age ± 1s			n=7		8.06				1625.4	3.1
	Plateau ± 1s		steps D-E	n=2	MSWD=20.43	7.38	151.7		91.6	1633.3	13.0

40Ar/39Ar analytical data table for step heated crystals.

K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-67

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
#	A	0	41.59	0.0196	13.80	0.490	26.0	90.2	0.3	984.0	12.4
#	B	0	53.95	0.0022	9.190	1.75	227.7	95.0	1.4	1243.0	5.1
#	C	0	69.62	0.0041	14.55	4.12	125.4	93.8	4.0	1475.7	3.9
	D	0	74.75	0.0012	0.4943	109.2	440.3	99.8	72.1	1614.1	1.5
	E	0	73.50	0.0008	0.5084	27.2	614.3	99.8	89.1	1596.0	2.4
	F	0	77.16	0.0012	0.3686	15.8	435.0	99.9	99.0	1649.1	1.8
	G	0	74.63	0.0121	2.360	1.61	42.1	99.1	100.0	1604.5	6.9
	Integrated age ± 1s			n=7		160.2				1605.7	1.4
	Plateau ± 1s		steps D-G	n=4	MSWD=122.74	153.8	466.3		96.0	1621.8	11.6

K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-19

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
#	A	0	16.35	0.0071	-1.5912	0.351	71.8	102.9	0.7	506.6	15.6
#	B	0	23.04	0.0571	1.493	0.496	8.9	98.1	1.6	653.2	10.3
#	C	0	34.07	0.0145	0.4955	1.37	35.2	99.6	4.2	909.6	4.8
	D	0	63.58	0.0013	0.4945	37.2	402.1	99.8	74.8	1446.2	1.9
	E	0	66.32	0.0012	0.3859	10.6	425.5	99.8	95.0	1489.3	2.5
	F	0	69.76	0.0068	0.5121	2.40	74.8	99.8	99.5	1541.0	4.8
	G	0	70.78	-0.0039	-5.5597	0.260	-	102.3	100.0	1582.5	21.5
	Integrated age ± 1s			n=7		52.7				1437.1	1.6
	Plateau ± 1s		steps D-G	n=4	MSWD=158.74	50.5	389.4		95.8	1469.2	17.8

K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-20

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
#	A	0	33.98	0.0142	4.112	0.742	35.8	96.4	4.0	885.0	7.6
#	B	0	62.85	0.0106	1.685	3.88	48.3	99.2	25.1	1429.0	3.1
	C	0	71.08	0.0035	0.5154	8.18	145.8	99.8	69.6	1560.6	3.0
#	D	0	61.42	0.0077	0.8775	3.15	65.9	99.6	86.6	1409.9	3.6
#	E	0	69.77	0.0056	1.603	1.18	91.5	99.3	93.0	1536.2	6.5
#	F	0	71.42	-0.0066	1.360	0.559	-	99.4	96.1	1561.9	10.1
#	G	0	75.48	0.0070	1.968	0.722	72.9	99.2	100.0	1618.4	8.6
	Integrated age ± 1s			n=7		18.4				1485.6	1.9
	Plateau ± 1s		steps C-C	n=1	MSWD=0.00	8.2	145.8		44.4	1560.6	3.0

K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-21

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
#	A	0	64.49	0.0657	18.77	0.548	7.8	91.4	1.1	1374.2	10.9
#	B	0	74.95	0.0116	7.408	2.16	43.9	97.1	5.7	1587.5	4.9
	C	0	76.16	0.0014	0.8072	30.9	370.7	99.7	70.3	1633.0	1.9
	D	0	74.70	0.0111	1.323	5.21	46.0	99.5	81.2	1609.9	2.9
	E	0	77.09	-0.0018	0.7669	8.49	-	99.7	99.0	1646.4	2.9
	F	0	74.67	0.0474	8.609	0.444	10.8	96.6	99.9	1578.2	14.1
	G	0	61.47	1.129	214.8	0.026	0.45	-3.1	100.0	-68.5	164.1
	Integrated age ± 1s			n=7		47.8				1627.0	1.6
	Plateau ± 1s		steps C-G	n=5	MSWD=50.37	45.1	259.6		94.3	1630.2	9.8

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-23										
#	A	0	63.63	-0.3793	30.07	0.152	-	86.0	0.3	1303.0	30.7
#	B	0	75.42	-0.0531	26.26	0.402	-	89.7	0.9	1511.5	14.6
	C	0	77.83	-0.0007	0.6346	21.0	-	99.8	35.8	1657.3	3.1
	D	0	77.33	0.0003	2.477	4.33	1664.1	99.1	43.0	1642.6	4.2
#	E	0	72.75	-0.0072	0.7749	4.63	-	99.7	50.7	1584.0	3.9
#	F	0	71.09	-0.0015	0.8614	8.05	-	99.6	64.1	1559.2	3.4
#	G	0	75.28	0.0005	0.5082	21.7	1048.7	99.8	100.0	1621.6	1.9
	Integrated age ± 1s			n=7		60.3				1623.2	1.7
	Plateau ± 1s		steps C-D	n=2	MSWD=7.83	25.4	1664.1		42.1	1652.2	7.0
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-24										
#	A	0	24.00	-0.2622	50.07	-0.020	-	38.3	-1.1	293.9	356.7
#	B	0	18.36	1.825	52.25	-0.019	0.28	16.7	-2.1	103.7	405.3
#	D	0	24.65	6.445	21.75	0.006	0.079	76.1	-1.8	559.3	913.5
#	E	0	82.75	2.447	-272.8993	0.007	0.21	197.7	-1.4	2585.5	662.2
#	F	0	78.62	0.4723	45.11	0.077	1.1	83.1	2.8	1476.1	75.5
	G	0	76.83	0.0044	3.368	1.81	116.6	98.7	100.0	1631.7	6.6
	Integrated age ± 1s			n=6		1.86				1648.2	9.0
	Plateau ± 1s		steps G-G	n=1	MSWD=0.00	1.81	116.6		97.2	1631.7	6.6
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-25										
#	A	0	43.13	-0.9615	15.09	0.276	-	89.5	0.2	1005.2	382.4
#	B	0	41.34	0.0047	10.39	1.65	109.5	92.6	1.5	999.3	8.3
#	C	0	58.71	0.0135	2.207	5.82	37.7	98.9	6.2	1359.5	5.4
	D	0	72.25	0.0007	0.2731	74.9	691.2	99.9	66.1	1578.8	1.8
#	E	0	67.90	0.0016	0.7246	26.9	328.2	99.7	87.6	1511.9	2.4
#	F	0	77.36	0.0020	0.4943	11.4	252.4	99.8	96.8	1651.3	3.0
#	G	0	77.50	0.0050	0.8476	4.05	101.9	99.7	100.0	1651.8	5.2
	Integrated age ± 1s			n=7		125.1				1556.5	1.8
	Plateau ± 1s		steps D-D	n=1	MSWD=0.00	74.9	691.2		59.9	1578.8	1.8
	K03-DV-04, mu, G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-66										
#	A	0	32.22	-0.1899	-5.0022	0.177	-	104.5	1.8	904.4	29.9
	B	0	71.37	-0.0010	1.082	7.00	-	99.6	71.2	1562.4	3.5
	C	0	68.57	0.0009	-0.2330	1.14	596.0	100.1	82.5	1526.4	7.2
	D	0	74.10	-0.0306	1.534	0.172	-	99.4	84.2	1600.3	32.0
	E	0	73.95	0.0159	-1.4658	1.10	32.0	100.6	95.1	1611.0	7.8
	F	0	72.15	-0.0293	-11.2288	0.206	-	104.6	97.2	1626.5	25.8
	G	0	74.70	0.0109	4.566	0.284	46.8	98.2	100.0	1596.0	19.2
	Integrated age ± 1s			n=7		10.1				1557.0	3.0
	Plateau ± 1s		steps B-G	n=6	MSWD=14.59	9.9	251.5		98.2	1565.1	11.0

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-27										
	A	0	72.62	-0.0121	1.774	2.24	-	99.3	40.4	1577.8	6.1
	B	0	73.76	-0.0170	0.6186	1.39	-	99.8	65.3	1599.3	7.2
#	C	0	33.37	-0.0220	-1.1839	1.06	-	101.0	84.4	905.3	5.3
#	D	0	32.09	-0.2110	-7.0529	0.189	-	106.5	87.8	914.3	25.3
#	E	0	54.01	0.1378	4.533	0.373	3.7	97.5	94.6	1268.5	16.8
#	F	0	73.87	0.1941	43.78	0.044	2.6	82.5	95.3	1406.8	103.9
#	G	0	69.33	0.1513	13.73	0.259	3.4	94.2	100.0	1475.1	20.9
	Integrated age ± 1s			n=7		5.56				1425.6	3.8
	Plateau ± 1s	steps A-B		n=2	MSWD=5.16	3.63	0.0		65.3	1586.8	10.6
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-68										
#	A	0	24.83	0.0023	32.09	0.103	217.7	61.8	0.5	467.7	54.0
#	B	0	56.35	-0.0114	6.397	0.697	-	96.6	3.7	1298.9	9.4
#	C	0	32.13	-1.0447	127.6	0.013	-	-17.7	3.7	-208.8	612.8
	D	0	72.60	0.0009	0.5294	15.6	592.6	99.8	75.8	1582.9	1.9
	E	0	67.60	-0.0012	1.409	2.16	-	99.4	85.7	1504.3	4.0
	F	0	76.45	-0.0011	1.691	2.35	-	99.3	96.6	1633.4	5.2
	G	0	75.84	-0.0098	1.368	0.744	-	99.5	100.0	1626.1	9.3
	Integrated age ± 1s			n=7		21.7				1569.1	1.8
	Plateau ± 1s	steps D-G		n=4	MSWD=163.88	20.9	443.3		96.3	1576.1	20.7
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-29										
#	A	0	41.56	0.0015	14.05	0.793	337.4	90.0	2.3	981.8	7.5
#	B	0	48.44	-0.0485	2.513	0.409	-	98.5	3.5	1179.6	14.9
#	C	0	53.29	-0.0281	4.453	0.923	-	97.5	6.1	1256.0	7.1
	D	0	72.20	-0.0010	0.4454	13.6	-	99.8	45.2	1577.4	2.2
	E	0	69.96	0.0015	0.6159	16.3	336.9	99.7	92.0	1543.4	1.9
	F	0	69.15	-0.0435	3.437	0.826	-	98.5	94.4	1518.7	7.6
	G	0	72.57	-0.0198	1.083	1.96	-	99.6	100.0	1580.0	5.2
	Integrated age ± 1s			n=7		34.8				1536.3	1.6
	Plateau ± 1s	steps D-G		n=4	MSWD=58.86	32.6	287.6		93.9	1558.1	10.6
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-30										
#	A	0	52.29	-0.3186	48.29	0.118	-	72.7	0.2	993.6	48.7
#	B	0	57.11	-0.1135	21.08	0.193	-	89.1	0.6	1236.7	32.4
#	C	0	62.40	-0.0722	9.304	0.591	-	95.6	1.7	1385.4	12.8
	D	0	76.05	-0.0014	0.4547	26.0	-	99.8	49.9	1632.9	2.5
	E	0	76.11	-0.0009	0.2149	21.8	-	99.9	90.3	1634.7	2.2
#	F	0	73.58	-0.0080	0.8002	4.48	-	99.7	98.6	1595.9	2.9
#	G	0	41.88	-0.0861	-0.6768	0.730	-	100.5	100.0	1074.0	8.4
	Integrated age ± 1s			n=7		53.9				1619.0	1.8
	Plateau ± 1s	steps D-E		n=2	MSWD=0.32	47.7	0.000		88.7	1633.9	1.7

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-71										
#	A	0	35.07	0.0643	10.44	0.444	7.9	91.2	1.4	868.3	13.8
#	B	0	56.44	0.0126	2.459	1.20	40.4	98.7	5.2	1320.4	6.6
	C	0	70.47	0.0036	0.1392	4.66	142.7	99.9	19.9	1553.1	3.3
	D	0	73.57	0.0039	0.1937	11.9	131.5	99.9	57.6	1598.4	2.5
#	E	0	69.82	0.0030	0.6758	9.33	168.0	99.7	87.1	1541.2	2.9
#	F	0	58.52	-0.0045	0.6481	2.52	-	99.7	95.1	1363.9	4.3
#	G	0	37.02	0.0089	2.711	1.56	57.0	97.8	100.0	957.4	4.7
	Integrated age ± 1s			n=7		31.6				1510.7	1.7
	Plateau ± 1s		steps C-D	n=2	MSWD=118.28	16.6	134.6		52.4	1581.6	21.9
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-32										
#	A	0	66.50	0.1134	16.01	0.154	4.5	92.9	0.4	1420.0	33.2
#	B	0	72.04	-0.0366	3.485	0.376	-	98.6	1.5	1561.8	14.1
	C	0	77.47	0.0007	2.617	8.91	683.8	99.0	26.4	1644.0	2.7
	D	0	76.93	0.0011	1.125	16.9	473.7	99.6	73.7	1642.6	2.1
	E	0	76.16	0.0038	1.809	3.21	133.2	99.3	82.7	1628.8	3.8
	F	0	76.99	0.0028	0.4616	5.43	180.1	99.8	97.9	1646.2	3.3
	G	0	77.50	-0.0114	4.149	0.742	-	98.4	100.0	1638.0	10.0
	Integrated age ± 1s			n=7		35.7				1640.4	1.7
	Plateau ± 1s		steps C-G	n=5	MSWD=3.51	35.2	440.5		98.5	1641.7	2.6
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-35										
#	A	0	70.86	0.2279	41.09	0.165	2.2	82.9	1.0	1370.8	25.0
	B	0	78.38	0.0044	3.636	7.85	117.3	98.6	50.1	1652.6	3.3
	C	0	77.35	0.0232	2.588	2.26	22.0	99.0	64.2	1642.5	5.0
	D	0	77.31	0.0069	1.895	2.79	74.3	99.3	81.6	1644.8	4.1
	E	0	76.72	0.0039	1.575	1.89	130.6	99.4	93.4	1637.8	6.3
	F	0	76.71	0.0092	2.664	1.01	55.4	99.0	99.7	1633.0	7.7
	G	0	58.14	0.3619	10.38	0.046	1.4	94.8	100.0	1310.3	78.9
	Integrated age ± 1s			n=7		16.0				1643.2	2.3
	Plateau ± 1s		steps B-G	n=6	MSWD=5.42	15.8	93.4		99.0	1645.6	4.9
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-36										
#	A	0	25.10	0.0151	12.40	0.739	33.9	85.4	2.6	624.6	7.6
#	B	0	37.18	-0.0118	-5.2916	1.10	-	104.2	6.4	1008.7	5.9
	C	0	58.04	-0.0160	-1.7493	2.56	-	100.9	15.2	1367.7	3.8
	D	0	47.62	0.0013	0.4208	19.8	402.1	99.7	83.8	1176.0	1.7
	E	0	44.82	0.0032	-0.4472	3.53	158.9	100.3	96.0	1129.0	3.7
	F	0	65.53	0.0361	2.444	0.751	14.1	98.9	98.6	1467.8	8.5
	G	0	73.66	0.0730	5.401	0.402	7.0	97.8	100.0	1577.4	13.0
	Integrated age ± 1s			n=7		28.9				1184.4	1.5
	Plateau ± 1s		steps C-G	n=5	MSWD=1080.14	27.1	348.6		93.6	1208.3	46.4

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-77										
#	A	0	17.60	0.0386	1.833	0.094	13.2	97.0	0.2	513.2	46.0
#	B	0	34.23	0.0537	6.079	0.502	9.5	94.8	1.0	878.0	9.0
#	C	0	59.71	0.0098	1.101	3.60	52.3	99.5	7.2	1381.2	3.8
	D	0	74.87	0.0016	0.2697	36.7	320.2	99.9	69.9	1616.9	1.9
	E	0	72.12	0.0033	0.4713	15.1	155.8	99.8	95.8	1576.1	1.8
	F	0	70.40	0.0257	1.610	1.42	19.9	99.3	98.2	1545.7	5.2
	G	0	74.18	0.0275	0.5547	1.06	18.5	99.8	100.0	1605.8	6.1
	Integrated age ± 1s			n=7		58.5				1584.1	1.6
	Plateau ± 1s	steps D-G		n=4	MSWD=109.35	54.3	260.7		92.8	1593.3	13.1
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-38										
#	A	0	33.62	0.0164	23.66	0.629	31.0	79.2	2.1	748.6	10.7
#	B	0	41.91	0.0130	5.855	1.55	39.2	95.9	7.1	1037.2	5.4
#	C	0	56.91	0.0052	1.474	6.33	97.6	99.2	27.8	1333.1	3.0
	D	0	57.92	0.0011	0.6725	13.6	462.5	99.7	72.2	1353.9	2.4
	E	0	59.35	0.0024	1.055	6.90	209.0	99.5	94.7	1375.5	2.8
	F	0	65.71	-0.0169	0.5405	1.31	-	99.8	98.9	1479.2	7.0
	G	0	66.62	0.0347	8.135	0.328	14.7	96.4	100.0	1458.4	14.1
	Integrated age ± 1s			n=7		30.6				1335.8	1.7
	Plateau ± 1s	steps D-G		n=4	MSWD=110.05	22.1	349.6		72.2	1371.3	18.2
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-79										
#	A	0	19.76	-0.0187	17.79	0.148	-	73.3	2.5	444.5	24.2
#	B	0	39.59	-0.0060	0.5582	0.711	-	99.6	14.7	1022.2	6.8
	C	0	56.78	0.0082	1.767	0.990	62.1	99.1	31.5	1329.4	6.7
	D	0	45.06	0.0004	1.537	2.68	1302.2	99.0	77.3	1122.5	3.6
	E	0	55.42	-0.0272	-0.6777	1.10	-	100.4	96.1	1318.7	5.9
	F	0	47.98	-1.0962	-59.9003	0.031	-	136.7	96.6	1479.0	115.1
	G	0	56.26	-0.1655	-0.9496	0.197	-	100.5	100.0	1333.9	21.4
	Integrated age ± 1s			n=7		5.87				1181.0	2.8
	Plateau ± 1s	steps C-G		n=5	MSWD=319.14	5.01	710.5		85.3	1206.0	49.7
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-40										
#	A	0	35.38	-0.1959	8.268	0.276	-	93.0	2.5	888.1	17.7
#	B	0	64.01	-0.0188	1.814	1.64	-	99.2	17.4	1446.8	5.2
	C	0	69.68	-0.0089	2.009	2.17	-	99.1	37.1	1533.1	4.4
	D	0	67.30	-0.0071	1.464	3.99	-	99.4	73.2	1499.5	3.7
	E	0	67.51	-0.0336	1.535	1.42	-	99.3	86.2	1502.3	5.8
	F	0	69.53	-0.0039	-0.3645	1.47	-	100.2	99.5	1541.4	5.4
	G	0	62.83	-0.7323	40.04	0.050	-	81.1	100.0	1237.4	87.8
	Integrated age ± 1s			n=7		11.0				1490.4	2.3
	Plateau ± 1s	steps C-G		n=5	MSWD=18.29	9.1	0.000		82.6	1516.5	9.8

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-81										
#	A	0	26.22	-0.4569	43.99	0.042	-	50.2	0.2	408.2	142.0
#	B	0	19.27	-0.0360	3.787	0.252	-	94.2	1.3	541.5	21.7
#	C	0	22.66	-0.0237	-2.8950	0.163	-	103.8	1.9	675.2	31.1
	D	0	60.80	0.0024	0.8820	18.8	210.3	99.6	81.9	1400.0	1.7
	E	0	66.18	0.0011	0.7747	2.45	444.0	99.7	92.4	1485.3	4.5
	F	0	64.85	-0.0069	0.4895	1.18	-	99.8	97.4	1466.0	6.4
	G	0	71.88	-0.0642	-1.9946	0.620	-	100.8	100.0	1583.1	11.1
	Integrated age ± 1s			n=7		23.5				1404.6	1.7
	Plateau ± 1s	steps D-G		n=4	MSWD=202.70	23.1	218.8		98.1	1417.1	21.9
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-42										
#	A	0	31.31	-0.2824	-3.8575	0.178	-	103.6	1.9	877.6	28.1
#	B	0	35.12	-0.4555	-59.2074	0.035	-	149.8	2.3	1266.3	87.0
#	C	0	40.57	-0.3812	-5.3748	0.071	-	103.8	3.0	1075.0	52.5
#	D	0	65.31	0.0089	1.678	1.66	57.5	99.2	20.7	1467.8	5.5
	E	0	70.33	0.0041	1.201	5.55	125.5	99.5	79.7	1546.4	3.0
	F	0	71.40	0.0195	2.804	1.39	26.1	98.8	94.5	1555.4	5.4
	G	0	70.64	0.0239	3.487	0.514	21.3	98.5	100.0	1541.0	11.4
	Integrated age ± 1s			n=7		9.41				1518.9	2.5
	Plateau ± 1s	steps E-G		n=3	MSWD=1.28	7.46	99.8		79.3	1548.1	2.9
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-44										
#	A	0	21.59	0.0477	13.75	0.716	10.7	81.2	1.6	525.3	8.5
	B	0	63.29	0.0006	1.843	5.81	826.1	99.1	14.3	1435.2	3.1
	C	0	38.23	-0.0053	1.958	4.14	-	98.5	23.3	986.6	2.9
	D	0	42.30	-0.0001	1.269	13.7	-	99.1	53.3	1071.3	1.8
	E	0	34.14	0.0027	1.294	18.9	187.7	98.9	94.7	906.0	1.4
	F	0	52.46	-0.0122	-2.5409	0.597	-	101.4	96.0	1277.6	9.3
	G	0	65.34	0.0125	1.385	1.82	40.8	99.4	100.0	1469.7	5.0
	Integrated age ± 1s			n=7		45.7				1062.7	1.2
	Plateau ± 1s	steps B-G		n=6	MSWD=6819.27	45.0	240.4		98.4	1036.2	79.5
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-45										
#	A	0	43.96	-0.0084	9.771	0.771	-	93.4	4.0	1054.7	7.2
#	B	0	66.55	0.0008	1.128	2.39	657.1	99.5	16.2	1489.5	4.2
	C	0	72.15	0.0013	0.5806	11.1	402.1	99.8	73.3	1576.0	2.3
	D	0	72.95	-0.0015	1.001	2.40	-	99.6	85.6	1585.9	3.8
#	E	0	66.13	0.0018	2.653	1.78	286.0	98.8	94.8	1476.0	4.9
#	F	0	50.73	0.0074	2.598	0.943	68.8	98.5	99.6	1220.6	5.5
#	G	0	29.33	-0.0931	-20.5506	0.071	-	120.7	100.0	940.4	46.5
	Integrated age ± 1s			n=7		19.5				1521.6	1.8
	Plateau ± 1s	steps C-D		n=2	MSWD=5.00	13.5	330.6		69.4	1578.6	4.4

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-86										
#	A	0	27.00	0.4178	4.133	0.031	1.2	95.6	0.1	729.7	117.8
	B	0	44.10	0.0056	2.791	4.70	91.5	98.1	9.2	1097.3	2.6
	C	0	62.23	0.0285	-1.3387	0.470	17.9	100.6	10.1	1433.5	11.6
	D	0	44.05	0.0005	0.9554	21.4	1086.7	99.4	51.7	1106.5	1.6
	E	0	30.99	0.0003	1.172	22.4	1675.5	98.9	95.2	838.8	1.3
	F	0	57.16	-0.0137	0.8230	2.11	-	99.6	99.3	1340.5	4.3
	G	0	59.62	-0.0514	-4.9440	0.363	-	102.4	100.0	1408.6	12.3
	Integrated age ± 1s			n=7		51.5				1010.4	1.2
	Plateau ± 1s		steps B-G	n=6	MSWD=5879.80	51.4	1190.2		99.9	988.1	70.7
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-47										
#	A	0	59.45	-0.0413	9.550	0.441	-	95.2	2.9	1335.6	11.2
	B	0	75.64	0.0029	0.8830	7.86	173.6	99.7	53.9	1625.3	3.3
	C	0	73.63	0.0043	3.636	0.740	118.6	98.5	58.7	1584.5	7.6
	D	0	75.26	-0.0019	1.330	2.09	-	99.5	72.3	1617.9	4.5
	E	0	76.52	-0.0020	0.7296	3.90	-	99.7	97.6	1638.4	3.4
#	F	0	77.33	0.0624	11.40	0.241	8.2	95.6	99.2	1605.0	21.8
#	G	0	75.55	-0.1792	21.76	0.128	-	91.5	100.0	1533.2	30.7
	Integrated age ± 1s			n=7		15.4				1617.0	2.3
	Plateau ± 1s		steps B-E	n=4	MSWD=15.34	14.6	99.5		94.7	1625.5	7.9
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-49										
#	A	0	21.70	-0.0277	5.823	1.35	-	92.1	3.2	588.0	3.9
#	B	0	33.23	-0.0512	4.338	0.421	-	96.1	4.2	867.3	9.4
#	C	0	43.60	0.0101	2.484	2.85	50.6	98.3	11.0	1089.5	4.0
	D	0	58.46	0.0015	0.3911	25.2	330.0	99.8	71.2	1364.1	1.8
	E	0	42.50	0.0076	0.9222	7.48	67.3	99.4	89.0	1077.2	2.1
	F	0	68.45	0.0104	1.930	2.72	49.0	99.2	95.5	1514.8	4.9
	G	0	75.37	-0.0164	-0.6815	1.88	-	100.3	100.0	1628.1	4.3
	Integrated age ± 1s			n=7		41.9				1296.3	1.4
	Plateau ± 1s		steps D-G	n=4	MSWD=6644.25	37.3	240.1		89.0	1296.9	102.4
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-90										
#	A	0	53.21	0.0899	29.01	0.114	5.7	83.9	0.6	1123.2	37.8
#	B	0	64.28	0.0741	4.511	0.235	6.9	97.9	1.7	1438.6	21.4
	C	0	75.99	0.0025	0.4917	11.6	203.1	99.8	59.5	1631.9	2.3
	D	0	74.98	-0.0020	0.1395	5.58	-	99.9	87.3	1619.0	3.1
	E	0	77.18	-0.0006	0.8009	2.20	-	99.7	98.2	1647.5	5.4
	F	0	81.55	-0.0836	1.175	0.231	-	99.6	99.3	1706.4	19.2
	G	0	81.63	-0.1916	6.879	0.132	-	97.5	100.0	1684.2	28.5
	Integrated age ± 1s			n=7		20.1				1626.6	2.0
	Plateau ± 1s		steps C-G	n=5	MSWD=10.82	19.7	119.3		98.3	1630.3	5.8

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-51										
#	A	0	67.06	0.1091	55.95	0.168	4.7	75.3	0.3	1230.7	29.6
#	B	0	63.80	0.0162	9.242	0.406	31.5	95.7	0.9	1408.6	13.3
	C	0	75.64	0.0001	2.534	9.06	4854.5	99.0	15.9	1618.4	3.2
	D	0	76.04	0.0005	0.5340	26.0	1024.3	99.8	59.0	1632.4	1.8
	E	0	74.78	-0.0003	0.2231	16.5	-	99.9	86.2	1615.8	2.0
	F	0	76.95	0.0002	0.3927	2.67	2884.1	99.8	90.7	1645.9	4.7
	G	0	76.37	-0.0029	1.123	5.65	-	99.6	100.0	1634.6	2.2
	Integrated age ± 1s			n=7		60.4				1624.2	1.4
	Plateau ± 1s	steps C-G		n=5	MSWD=19.16	59.8	1358.0		99.1	1627.4	4.6
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-92										
#	A	0	41.96	-0.0299	8.258	1.06	-	94.2	3.6	1024.2	6.7
#	B	0	59.61	-0.0228	4.678	1.17	-	97.7	7.5	1362.2	5.3
	C	0	66.24	-0.0036	0.8379	8.08	-	99.6	34.8	1486.1	2.4
	D	0	68.27	0.0020	0.7770	10.9	255.3	99.7	71.5	1517.3	2.0
	E	0	58.38	-0.0074	1.241	3.61	-	99.4	83.7	1358.7	3.8
	F	0	71.80	0.0031	0.9500	3.83	165.3	99.6	96.6	1569.3	3.4
	G	0	75.93	0.0189	4.232	1.00	27.1	98.4	100.0	1615.3	7.4
	Integrated age ± 1s			n=7		29.6				1478.7	1.5
	Plateau ± 1s	steps C-G		n=5	MSWD=540.24	27.4	185.7		92.5	1500.8	29.6
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-53										
#	A	0	21.68	-0.0005	22.04	0.283	-	69.9	1.1	462.8	18.8
#	B	0	28.76	0.0976	8.678	0.270	5.2	91.1	2.2	738.8	15.7
#	C	0	44.88	0.0214	2.863	0.977	23.9	98.1	6.0	1111.7	7.1
#	D	0	61.04	0.0045	0.5929	15.9	114.5	99.7	69.0	1405.2	1.6
	E	0	67.03	0.0009	0.4038	7.33	579.3	99.8	98.0	1500.1	2.7
	F	0	66.01	0.0553	4.824	0.267	9.2	97.8	99.1	1464.4	19.7
	G	0	69.86	-0.0184	-12.1495	0.240	-	105.1	100.0	1597.4	17.5
	Integrated age ± 1s			n=7		25.3				1411.3	1.6
	Plateau ± 1s	steps E-G		n=3	MSWD=16.92	7.8	542.1		31.0	1501.7	11.0
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-54										
#	A	0	247.4	0.1607	75.67	0.026	3.2	91.0	6.5	3041.8	138.3
#	B	0	15.97	0.1720	21.91	0.053	3.0	59.5	19.5	303.4	89.3
#	C	0	14.05	-0.2904	-15.3953	0.058	-	132.3	33.7	552.3	79.0
#	D	0	10.49	0.0715	-6.6434	0.180	7.1	118.9	78.1	388.0	21.8
	E	0	73.42	-0.2201	-17.9338	0.087	-	107.2	99.6	1672.3	39.0
	F	0	1291.8	14.36	279.5	0.001	0.036	93.7	99.8	5826.2	3373.3
	G	0	1680.8	-4.8757	-2970.3843	0.001	-	152.2	100.0	7128.0	3575.5
	Integrated age ± 1s			n=7		0.406				1206.4	22.1
	Plateau ± 1s	steps E-G		n=3	MSWD=1.92	0.089	0.0		21.9	1673.5	54.1

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-55										
#	A	0	77.72	-0.0107	151.5	0.023	-	42.4	0.1	889.1	132.1
#	B	0	71.63	-0.1350	11.51	0.029	-	95.2	0.3	1520.0	95.0
#	C	0	66.52	-0.3139	-11.5372	0.117	-	105.1	1.0	1545.2	30.2
	D	0	76.06	0.0012	0.6566	12.6	413.1	99.7	73.2	1632.3	2.8
	E	0	75.86	0.0230	1.158	1.41	22.2	99.6	81.3	1627.3	5.2
	F	0	77.25	0.0043	1.223	2.64	118.0	99.5	96.5	1646.7	4.2
	G	0	78.23	0.0004	6.401	0.607	1435.6	97.6	100.0	1638.9	9.1
	Integrated age ± 1s			n=7		17.4				1632.7	2.3
	Plateau ± 1s		steps D-G	n=4	MSWD=3.67	17.2	372.0		99.0	1635.3	4.0
	K03-DV-04, mu. G1:171, muscovite, J=0.0190463±0.05%, D=1.00562±0.00081, NM-171, Lab#=54343-56										
#	A	0	103.9	0.4923	301.6	0.036	1.0	14.2	0.1	452.4	134.1
#	B	0	12.02	-0.0690	14.44	0.223	-	64.4	0.5	250.6	20.7
#	C	0	10.85	-0.0354	-0.1015	0.448	-	100.2	1.4	342.9	9.6
#	D	0	56.94	-0.0016	0.8740	9.54	-	99.5	20.3	1336.5	2.0
	E	0	58.50	0.0006	0.3354	29.1	830.1	99.8	77.7	1365.1	1.6
	F	0	69.86	0.0019	0.3986	8.70	271.0	99.8	94.9	1543.0	2.5
	G	0	59.75	-0.0035	1.695	2.57	-	99.2	100.0	1379.1	4.7
	Integrated age ± 1s			n=7		50.6				1381.4	1.4
	Plateau ± 1s		steps E-G	n=3	MSWD=1889.33	40.4	656.8		79.7	1413.7	55.3
	K03-DV-04, fsp. H1:171, feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-02										
#	A	0	13.61	0.0110	3.685	19.5	46.2	92.0	15.2	388.8	1.0
#	B	0	3.229	0.0105	0.7779	9.04	48.6	92.8	22.2	100.17	0.68
#	C	0	4.030	0.0171	1.267	17.1	29.8	90.7	35.6	121.61	0.48
#	D	0	3.786	0.0532	0.7561	16.1	9.6	94.2	48.1	118.71	0.43
#	E	0	4.535	0.0401	0.8269	6.14	12.7	94.7	52.9	142.16	0.86
	F	0	5.035	0.0302	0.5387	41.0	16.9	96.9	84.7	160.80	0.43
	G	0	5.110	0.0562	0.8772	5.33	9.1	95.0	88.9	160.1	1.1
	H	0	5.176	0.0216	2.479	0.935	23.6	85.8	89.6	147.0	4.6
	I	0	5.418	0.0311	0.6731	3.50	16.4	96.4	92.3	171.7	1.6
	J	0	5.016	0.0159	0.2871	9.86	32.2	98.3	100.0	162.52	0.87
	Integrated age ± 1s			n=10		128.5				182.40	0.31
	Plateau ± 1s		steps F-J	n=5	MSWD=14.17	60.6	18.8		47.1	161.5	1.3

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, fsp. H1:171, feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-03										
#	A	0	16.25	0.0015	1.568	4.80	335.8	97.2	5.6	477.9	1.5
#	B	0	2.999	0.0033	0.1734	1.62	153.8	98.3	7.5	98.5	3.3
#	C	0	4.181	-0.0068	0.1988	3.70	-	98.6	11.8	136.6	1.5
	D	0	4.809	0.0006	0.1859	26.5	903.0	98.9	42.9	156.85	0.37
	E	0	5.645	-0.0002	0.2012	25.7	-	98.9	72.9	183.12	0.38
	F	0	5.764	-0.0008	0.3697	9.99	-	98.1	84.6	185.28	0.72
	G	0	5.515	0.0014	0.2531	12.4	366.9	98.6	99.1	178.57	0.55
	H	0	5.435	-0.0565	-0.6431	0.659	-	103.4	99.9	184.2	6.4
	I	0	3.723	-1.1859	1.324	0.015	-	86.5	99.9	107.5	291.2
	J	0	6.608	0.0477	6.387	0.081	10.7	71.4	100.0	156.0	45.7
	Integrated age ± 1s			n=10		85.5				188.95	0.30
	Plateau ± 1s		steps D-J	n=7	MSWD=499.66	75.4	432.5		88.2	172.8	5.1
	K03-DV-04, fsp. H1:171, feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-04										
#	A	0	66.02	0.0164	28.89	15.7	31.0	87.1	3.0	1346.9	2.4
#	B	0	3.642	0.0060	2.939	18.2	85.2	76.0	6.4	92.78	0.63
#	C	0	3.502	0.0097	2.588	9.70	52.7	78.0	8.3	91.57	0.75
#	D	0	7.942	0.0080	5.229	21.7	64.0	80.5	12.4	208.44	0.98
#	E	0	3.007	0.0127	1.729	3.33	40.1	82.9	13.0	83.6	1.3
#	F	0	2.311	0.0158	1.739	4.41	32.4	77.5	13.9	60.3	1.1
#	G	0	2.974	0.0288	1.288	9.12	17.7	87.2	15.6	86.88	0.73
#	H	0	4.106	0.0273	1.481	18.0	18.7	89.3	19.0	122.06	0.56
	I	0	6.120	0.0093	1.380	423.9	54.8	93.3	99.5	187.12	0.28
#	J	0	6.890	-0.0087	0.6968	2.46	-	97.0	100.0	217.2	2.1
	Integrated age ± 1s			n=10		526.5				225.42	0.34
	Plateau ± 1s		steps I-I	n=1	MSWD=0.00	423.9	54.8		80.5	0.0	0.0
	K03-DV-04, fsp. H1:171, feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-05										
#	A	0	39.50	0.0306	7.211	2.92	16.7	94.6	4.2	978.6	3.4
#	B	0	17.87	0.0632	0.4676	1.99	8.1	99.3	7.0	529.3	3.2
	C	0	19.77	0.0984	1.166	2.46	5.2	98.3	10.5	572.8	2.6
	D	0	20.04	0.1218	1.724	2.41	4.2	97.5	14.0	575.5	2.9
	E	0	19.91	0.0434	1.367	9.81	11.8	98.0	28.0	574.8	1.2
	F	0	19.23	0.0376	0.6603	33.3	13.6	99.0	75.7	562.71	0.92
	G	0	18.50	0.0368	0.3815	16.2	13.9	99.4	99.0	546.1	1.1
#	H	0	20.71	0.2244	-52.1426	0.045	2.3	174.6	99.0	953.4	76.4
#	I	0	18.75	0.0251	-6.7506	0.240	20.3	110.7	99.4	605.8	16.6
#	J	0	18.25	0.0123	0.2159	0.434	41.6	99.7	100.0	540.7	9.9
	Integrated age ± 1s			n=10		69.8				580.12	0.74
	Plateau ± 1s		steps C-G	n=5	MSWD=91.03	64.2	12.7		91.9	562.2	5.5

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-06										
#	A	0	63.55	0.0114	27.66	4.79	44.6	87.2	3.4	1311.6	3.6
	B	0	3.337	0.0115	1.548	3.73	44.2	86.2	6.0	96.3	1.6
	C	0	5.832	0.0091	4.591	3.77	55.8	76.6	8.6	148.0	2.0
	D	0	8.383	0.0096	4.019	5.99	53.0	85.8	12.8	233.0	1.7
	E	0	3.125	-0.0110	2.489	1.24	-	76.2	13.7	80.0	4.1
	F	0	4.064	-0.0030	1.724	4.90	-	87.4	17.1	118.3	1.2
	G	0	6.703	0.0040	1.624	118.5	129.2	92.8	100.0	203.04	0.32
	Integrated age ± 1s		n=7			142.9				246.82	0.41
	Plateau ± 1s	steps B-G	n=6		MSWD=2182.19	138.1	121.0		96.6	192.6	13.8
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-07										
#	A	0	43.62	0.0016	7.345	7.19	328.7	95.0	6.7	1059.6	1.9
	B	0	3.925	-0.0124	0.8491	1.53	-	93.6	8.1	122.2	2.9
	C	0	6.285	0.0011	1.724	1.99	451.5	91.9	10.0	189.1	2.3
	D	0	3.462	0.0001	0.7804	4.18	4836.1	93.3	13.9	107.8	1.3
	E	0	1.972	-0.0219	5.418	0.408	-	17.5	14.3	11.8	9.8
	F	0	6.234	0.0016	0.4978	54.8	329.1	97.7	65.4	198.81	0.37
	G	0	4.195	0.0021	0.8051	37.0	247.3	94.3	100.0	131.37	0.36
	Integrated age ± 1s		n=7			107.1				243.76	0.36
	Plateau ± 1s	steps B-G	n=6		MSWD=3902.88	99.9	492.2		93.3	161.5	15.6
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-08										
#	A	0	58.35	0.0053	3.913	6.98	96.2	98.0	6.1	1342.1	2.6
#	B	0	3.644	0.0047	0.2732	2.78	108.0	97.8	8.5	118.6	1.6
#	C	0	5.955	-0.0001	1.592	2.07	-	92.1	10.3	179.9	2.4
#	D	0	4.006	0.0013	0.8907	2.96	393.4	93.4	12.9	124.4	1.6
#	E	0	6.369	0.0017	1.389	2.72	308.3	93.5	15.2	194.8	1.8
	F	0	7.861	0.0037	0.2348	69.9	137.6	99.1	76.0	251.04	0.41
	G	0	7.843	0.0015	0.2387	27.7	341.9	99.1	100.0	250.47	0.49
	Integrated age ± 1s		n=7			115.1				330.83	0.43
	Plateau ± 1s	steps F-G	n=2		MSWD=0.81	97.6	195.5		84.8	250.8	0.3
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-09										
#	A	0	22.71	0.0012	9.712	6.94	435.4	87.4	9.4	583.1	2.4
#	B	0	1.075	0.0020	0.1649	4.80	260.3	95.4	15.9	34.25	0.89
#	C	0	1.813	0.0002	-0.2880	4.34	2735.7	104.8	21.8	63.7	1.1
#	D	0	3.147	0.0030	0.6493	7.42	172.7	93.9	31.9	98.71	0.76
#	E	0	2.353	0.0006	1.258	2.01	825.7	84.0	34.7	66.4	2.2
#	F	0	3.816	0.0019	0.8000	6.43	272.0	93.8	43.4	119.13	0.85
	G	0	4.776	0.0017	0.3280	41.6	303.5	98.0	100.0	154.47	0.28
	Integrated age ± 1s		n=7			73.6				176.11	0.37
	Plateau ± 1s	steps G-G	n=1		MSWD=0.00	41.6	303.5		56.6	154.47	0.28

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-10										
#	A	0	11.04	0.0004	2.687	10.1	1316.0	92.8	13.2	323.76	0.96
#	B	0	1.667	-0.0081	0.2428	4.67	-	95.6	19.3	53.5	1.2
#	C	0	3.193	-0.0055	0.4571	5.55	-	95.7	26.6	102.06	0.95
#	D	0	3.034	-0.0023	0.6342	9.51	-	93.8	39.1	95.14	0.63
#	E	0	4.167	-0.0012	1.269	6.36	-	91.0	47.4	126.0	1.1
	F	0	4.239	0.0008	0.6434	27.1	672.3	95.5	83.0	134.31	0.39
	G	0	4.474	-0.0008	0.7170	13.0	-	95.2	100.0	141.14	0.50
	Integrated age ± 1s			n=7		76.2				149.01	0.30
	Plateau ± 1s		steps F-G	n=2	MSWD=115.15	40.1	454.6		52.6	136.9	3.3
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-11										
#	A	0	12.02	0.0051	2.956	12.6	99.5	92.7	14.4	349.8	1.1
#	B	0	1.132	-0.0042	0.7211	3.85	-	80.6	18.8	30.6	1.5
#	C	0	2.454	-0.0015	0.2519	3.90	-	96.9	23.3	79.7	1.5
#	D	0	2.082	0.0054	0.4576	5.25	95.1	93.5	29.3	65.3	1.1
#	E	0	3.044	0.0041	0.8418	3.56	124.0	91.8	33.3	93.5	1.7
	F	0	5.462	0.0192	0.5077	52.7	26.5	97.3	93.5	174.59	0.41
	G	0	6.134	-0.0023	0.6920	5.70	-	96.7	100.0	193.89	0.89
	Integrated age ± 1s			n=7		87.6				182.54	0.36
	Plateau ± 1s		steps F-G	n=2	MSWD=386.78	58.4	23.9		66.7	178.0	7.4
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-12										
#	A	0	15.16	-0.0004	1.225	7.71	-	97.6	11.2	451.3	1.2
#	B	0	1.692	-0.0101	0.5175	2.42	-	90.8	14.7	51.6	1.7
#	C	0	3.702	0.0066	-0.3981	2.28	77.3	103.2	18.0	126.9	1.9
#	D	0	2.964	0.0097	0.5576	3.02	52.8	94.4	22.4	93.6	1.4
#	E	0	4.457	0.0027	0.6516	2.58	186.4	95.7	26.1	141.2	1.9
	F	0	6.529	0.0029	0.2775	22.3	174.1	98.8	58.4	209.96	0.49
	G	0	6.120	0.0006	0.2349	28.7	809.8	98.9	100.0	197.65	0.42
	Integrated age ± 1s			n=7		69.0				218.18	0.35
	Plateau ± 1s		steps F-G	n=2	MSWD=365.30	51.0	532.4		73.9	202.8	6.1
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-13										
#	A	0	39.32	0.0037	6.991	5.25	136.9	94.8	3.8	976.1	2.2
#	B	0	2.984	-0.0061	1.015	2.28	-	89.8	5.4	89.8	2.1
#	C	0	6.557	0.0059	0.8165	3.52	86.2	96.3	7.9	205.9	1.5
#	D	0	5.679	-0.0007	0.2021	14.5	-	98.9	18.4	184.16	0.51
#	E	0	3.874	-0.0078	0.4399	4.85	-	96.6	21.9	124.42	0.94
	F	0	6.526	0.0010	0.2026	49.1	515.6	99.1	57.2	210.54	0.40
	G	0	7.303	0.0011	0.2162	59.6	454.8	99.1	100.0	234.26	0.46
	Integrated age ± 1s			n=7		139.1				248.52	0.35
	Plateau ± 1s		steps F-G	n=2	MSWD=1530.96	108.7	482.3		78.1	220.8	11.8

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-14										
#	A	0	59.43	0.0245	7.663	3.33	20.8	96.2	3.0	1341.7	3.0
#	B	0	3.716	0.0185	0.3502	3.49	27.6	97.2	6.2	120.2	1.5
#	C	0	2.346	0.0129	0.2078	2.55	39.6	97.4	8.5	76.6	1.7
#	D	0	4.831	0.0096	0.9083	3.07	53.1	94.4	11.3	150.8	1.6
#	E	0	2.798	0.0021	2.103	1.32	244.8	77.6	12.5	73.0	3.4
#	F	0	2.876	0.0227	0.8682	3.84	22.5	91.1	16.0	87.7	1.4
	G	0	6.227	0.0508	0.6075	92.1	10.0	97.2	100.0	197.70	0.36
	Integrated age ± 1s		n=7			109.7				233.97	0.40
	Plateau ± 1s	steps G-G	n=1		MSWD=0.00	92.1	10.0		84.0	197.70	0.36
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-15										
#	A	0	46.22	0.0082	27.42	10.1	62.5	82.5	4.6	993.7	2.6
#	B	0	2.006	0.0019	1.462	9.07	266.1	78.2	8.7	52.77	0.70
#	C	0	2.655	0.0030	2.084	4.75	168.8	76.6	10.8	68.4	1.2
#	D	0	5.278	0.0046	3.033	11.7	110.1	82.9	16.1	145.01	0.87
#	E	0	2.976	0.0204	2.117	5.46	25.0	78.8	18.6	78.8	1.1
	F	0	5.095	0.0138	1.510	88.8	36.9	91.2	58.6	153.57	0.36
	G	0	5.828	0.0116	0.6674	91.7	43.9	96.6	100.0	184.58	0.30
	Integrated age ± 1s		n=7			221.7				206.34	0.34
	Plateau ± 1s	steps F-G	n=2		MSWD=4480.46	180.5	40.4		81.4	171.9	15.2
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-16										
#	A	0	7.850	0.0093	13.11	7.02	55.1	50.5	10.1	132.0	1.7
#	B	0	2.857	-0.0042	5.100	2.73	-	46.7	14.1	45.2	2.4
#	C	0	3.759	0.0030	6.964	2.31	169.0	44.8	17.4	57.1	3.2
#	D	0	1.685	-0.0065	1.976	2.61	-	64.7	21.2	36.8	2.2
#	E	0	1.672	0.0012	2.825	2.18	440.7	49.2	24.3	27.8	2.4
	F	0	3.009	0.0059	2.987	51.4	86.9	70.4	98.5	71.31	0.49
	G	0	3.117	0.0586	3.951	1.06	8.7	62.4	100.0	65.5	4.3
	Integrated age ± 1s		n=7			69.3				73.30	0.47
	Plateau ± 1s	steps F-G	n=2		MSWD=1.74	52.4	85.3		75.7	71.2	0.6
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-17										
#	A	0	89.66	0.0083	5.908	6.23	61.6	98.1	4.3	1792.6	3.6
#	B	0	6.906	0.0097	0.4016	6.84	52.5	98.3	9.0	220.48	0.98
	C	0	10.33	0.0125	0.9912	5.59	40.8	97.2	12.9	317.7	1.2
	D	0	9.225	0.0038	0.4312	13.7	133.5	98.6	22.3	290.11	0.69
	E	0	5.623	0.0126	0.3625	1.71	40.5	98.1	23.5	181.0	2.4
	F	0	4.951	0.0027	0.3871	2.47	192.5	97.7	25.2	159.5	1.6
	G	0	7.945	0.0040	0.2282	108.5	127.0	99.2	100.0	253.66	0.36
	Integrated age ± 1s		n=7			145.1				356.50	0.46
	Plateau ± 1s	steps C-G	n=5		MSWD=2312.03	132.0	124.2		91.0	260.0	14.4

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-18										
#	A	0	34.99	0.0057	9.175	9.93	90.1	92.3	7.0	872.2	1.8
#	B	0	4.615	0.0137	1.588	3.27	37.1	89.8	9.3	137.4	1.7
#	C	0	6.222	0.0050	2.173	7.94	102.8	89.6	14.9	182.94	0.84
#	D	0	4.869	0.0059	0.7063	23.3	86.9	95.7	31.4	153.88	0.41
#	E	0	6.926	0.0056	0.5619	19.5	91.1	97.6	45.1	219.61	0.48
	F	0	7.815	0.0107	0.5177	36.9	47.9	98.1	71.2	247.15	0.54
	G	0	7.738	0.0029	0.3438	40.8	178.1	98.7	100.0	246.33	0.49
	Integrated age ± 1s			n=7		141.6				274.26	0.38
	Plateau ± 1s	steps F-G		n=2	MSWD=1.26	77.7	116.2		54.9	246.7	0.4
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-19										
#	A	0	12.82	0.0258	8.805	5.74	19.8	79.7	11.2	322.9	2.1
#	B	0	4.156	0.0191	1.518	2.80	26.7	89.2	16.7	123.3	1.9
#	C	0	3.381	0.0183	1.228	2.77	27.8	89.2	22.1	100.8	1.8
	D	0	3.649	0.0069	0.7336	11.1	73.8	94.0	43.7	114.34	0.51
	E	0	3.852	0.0044	0.5860	15.8	116.7	95.5	74.6	122.35	0.43
	F	0	4.203	0.0024	0.4856	10.2	211.9	96.6	94.5	134.65	0.70
	G	0	4.241	-0.0018	0.8147	2.82	-	94.3	100.0	132.7	1.7
	Integrated age ± 1s			n=7		51.2				146.13	0.41
	Plateau ± 1s	steps D-G		n=4	MSWD=196.48	39.9	120.8		77.9	122.2	4.1
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-20										
#	A	0	25.35	0.0046	10.73	7.09	111.1	87.5	4.9	640.9	2.1
#	B	0	1.500	0.0041	0.6343	3.76	124.1	87.3	7.5	44.0	1.3
#	C	0	4.224	-0.0012	1.168	6.57	-	91.8	12.1	128.81	0.95
#	D	0	2.622	-0.0030	0.9158	6.35	-	89.6	16.5	78.77	0.80
#	E	0	3.042	-0.0018	0.9781	5.39	-	90.4	20.2	92.06	0.92
	F	0	3.992	0.0027	0.4680	79.0	188.9	96.5	74.9	128.01	0.25
	G	0	4.270	0.0023	0.3149	36.2	221.2	97.8	100.0	138.42	0.28
	Integrated age ± 1s			n=7		144.4				153.94	0.25
	Plateau ± 1s	steps F-G		n=2	MSWD=765.12	115.3	199.0		79.8	132.5	5.2
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-21										
#	A	0	69.44	0.0030	10.11	5.88	172.7	95.7	4.4	1490.1	3.2
#	B	0	14.23	-0.0062	1.211	3.08	-	97.5	6.8	426.1	2.0
#	C	0	1.723	-0.0107	1.531	1.69	-	73.3	8.0	42.5	2.5
	D	0	6.539	0.0010	0.8519	26.6	505.3	96.2	28.2	205.06	0.58
	E	0	6.873	0.0018	0.4465	16.9	282.5	98.1	41.0	219.08	0.55
	F	0	6.881	0.0012	0.3321	75.7	410.3	98.6	98.1	220.35	0.39
	G	0	7.413	-0.0002	0.4961	2.45	-	98.0	100.0	235.1	2.1
	Integrated age ± 1s			n=7		132.3				299.94	0.41
	Plateau ± 1s	steps D-G		n=4	MSWD=193.96	121.7	405.0		92.0	216.9	3.8

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-22										
#	A	0	21.73	0.0019	2.696	3.91	267.8	96.3	5.7	610.4	2.3
#	B	0	2.153	-0.0145	0.5497	1.56	-	92.3	8.0	66.7	2.6
#	C	0	4.154	-0.0029	0.1850	3.12	-	98.7	12.6	135.9	1.5
#	D	0	2.426	-0.0158	-0.3495	2.01	-	104.3	15.5	84.6	2.1
#	E	0	2.627	-0.0411	-0.6705	0.944	-	107.5	16.9	94.3	5.2
	F	0	4.570	0.0018	0.2842	49.5	282.3	98.2	89.2	148.33	0.30
	G	0	4.597	0.0008	0.4689	7.41	632.4	97.0	100.0	147.44	0.82
	Integrated age ± 1s			n=7		68.4				173.12	0.33
	Plateau ± 1s		steps F-G	n=2	MSWD=1.02	56.9	327.9		83.1	148.2	0.3
	K03-DV-04, fsp. H1:171, Feldspar, J=0.0189829±0.05%, D=1.00562±0.00081, NM-171, Lab#=54347-23										
#	A	0	26.48	0.0038	3.021	10.9	136.0	96.6	7.3	722.4	1.5
#	B	0	2.514	-0.0088	-0.2714	3.62	-	103.2	9.8	86.8	1.3
#	C	0	7.014	0.0045	0.8230	6.18	113.3	96.5	14.0	219.95	0.98
#	D	0	3.705	0.0000	0.4339	5.87		96.5	17.9	119.03	0.91
#	E	0	4.277	-0.0090	0.1146	2.47	-	99.2	19.6	140.5	1.7
	F	0	6.565	0.0033	0.2545	94.3	152.4	98.9	83.2	211.28	0.29
	G	0	6.250	0.0009	0.3139	25.0	564.7	98.5	100.0	200.97	0.40
	Integrated age ± 1s			n=7		148.3				245.25	0.31
	Plateau ± 1s		steps F-G	n=2	MSWD=438.17	119.3	238.7		80.4	207.8	4.9

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-01										
	A	0	77.14	0.0266	0.8438	1.37	19.2	99.7	93.4	1644.5	5.2
	B	0	74.21	-0.3838	-22.6355	0.040	-	109.0	96.1	1699.5	61.5
#	C	1	74.13	-0.1699	12.39	0.036	-	95.0	98.5	1551.3	75.8
#	D	6	98.99	-0.2226	138.0	0.022	-	58.8	100.0	1359.3	131.0
	Integrated age ± 1s			n=4		1.47				1639.9	5.8
	Plateau ± 1s	steps A-B		n=2	MSWD=0.79	1.41	18.6		96.1	1644.5	5.2
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-05										
	A	0	61.06	-0.0042	0.8815	1.80	-	99.6	93.2	1402.1	4.5
#	B	0	55.17	-0.2455	37.44	0.035	-	79.9	95.0	1110.8	68.8
#	C	1	68.87	0.7375	29.67	0.014	0.69	87.4	95.8	1392.4	183.8
#	D	6	63.10	-0.0929	17.95	0.082	-	91.6	100.0	1352.9	37.4
	Integrated age ± 1s			n=4		1.93				1395.1	4.8
	Plateau ± 1s	steps A-A		n=1	MSWD=0.00	1.80	0.000		93.2	1402.1	4.5
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-09										
	A	0	59.19	0.0174	5.584	1.32	29.4	97.2	91.9	1349.0	4.7
	B	0	64.71	0.2959	38.36	0.021	1.7	82.5	93.3	1279.0	130.2
	C	1	70.42	-0.3439	-31.2072	0.014	-	113.1	94.3	1682.3	155.9
	D	6	56.40	-0.1942	-25.2537	0.082	-	113.2	100.0	1450.4	35.2
	Integrated age ± 1s			n=4		1.44				1357.3	5.5
	Plateau ± 1s	steps A-D		n=4	MSWD=4.33	1.44	27.0		100.0	1351.0	9.7
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-12										
	A	0	65.25	-0.0151	-1.0729	0.474	-	100.5	91.5	1477.4	10.5
	B	0	66.57	-0.4111	-70.7151	0.029	-	131.4	97.2	1787.2	76.9
	C	1	61.45	-2.5385	-97.0392	0.005	-	146.3	98.3	1817.4	428.4
#	D	6	73.57	-0.0886	101.1	0.009	-	59.4	100.0	1103.4	297.5
	Integrated age ± 1s			n=4		0.518				1494.7	12.6
	Plateau ± 1s	steps A-C		n=3	MSWD=8.27	0.509	0.000		98.3	1483.3	30.0

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-13										
	A	0	51.81	0.0051	12.04	3.39	100.3	93.1	72.6	1187.9	3.4
	B	0	49.74	-0.1275	0.7840	0.169	-	99.5	76.3	1210.4	17.4
	C	1	55.25	-0.0100	-2.0314	0.421	-	101.1	85.3	1320.6	10.8
	D	6	52.64	-0.0026	1.131	0.686	-	99.4	100.0	1260.0	7.6
	Integrated age ± 1s			n=4		4.66				1211.8	3.0
	Plateau ± 1s	steps A-D		n=4	MSWD=63.54	4.66	72.8		100.0	1209.2	23.4
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-15										
	A	0	57.48	0.0100	4.042	1.78	51.2	97.9	69.4	1328.1	4.2
	B	0	55.57	0.0031	-0.4174	0.312	164.7	100.2	81.6	1318.1	14.5
	C	1	56.95	-0.0326	-4.4637	0.286	-	102.3	92.7	1360.9	11.0
	D	6	58.35	-0.0062	7.317	0.186	-	96.3	100.0	1326.3	20.9
	Integrated age ± 1s			n=4		2.56				1330.4	4.0
	Plateau ± 1s	steps A-D		n=4	MSWD=2.90	2.56	55.6		100.0	1331.1	6.4
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-17										
#	A	0	53.58	-1.3514	-77.4309	0.010	-	142.5	0.6	1636.1	207.0
#	B	0	32.64	-1.9439	2.830	0.008	-	97.0	1.0	858.9	318.2
#	C	1	43.87	-0.1576	-13.5340	0.031	-	109.1	2.7	1180.8	66.5
	D	6	71.23	-0.0009	1.277	1.75	-	99.5	100.0	1557.2	4.6
	Integrated age ± 1s			n=4		1.80				1549.2	4.9
	Plateau ± 1s	steps D-D		n=1	MSWD=0.00	1.75	0.000		97.3	1557.2	4.6
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-19										
	A	0	61.77	0.0846	2.483	1.68	6.0	98.8	93.7	1406.2	4.9
	B	0	61.18	-0.1923	-38.5359	0.007	-	118.6	94.1	1582.1	266.2
	C	1	51.36	0.0156	-50.5855	0.052	32.8	129.1	97.0	1488.8	50.3
	D	6	57.40	0.0385	-4.1295	0.054	13.2	102.1	100.0	1366.9	50.3
	Integrated age ± 1s			n=4		1.79				1408.2	5.2
	Plateau ± 1s	steps A-D		n=4	MSWD=1.25	1.79	7.0		100.0	1406.6	5.5

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-21										
	A	0	61.41	0.0048	-0.0766	1.15	105.8	100.0	91.7	1412.4	6.3
	B	0	66.44	0.3208	-217.3656	0.008	1.6	196.7	92.3	2279.3	275.8
#	C	1	53.46	-0.2093	1.135	0.076	-	99.3	98.4	1273.7	37.4
#	D	6	72.94	-0.7542	73.86	0.020	-	70.0	100.0	1237.8	143.7
	Integrated age ± 1s			n=4		1.25				1408.4	6.9
	Plateau ± 1s		steps A-B	n=2	MSWD=9.88	1.16	105.1		92.3	1412.8	19.7
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-23										
	A	0	55.20	-0.0064	1.274	3.23	-	99.3	81.3	1303.3	2.8
	B	0	54.69	-0.1338	-7.4117	0.117	-	104.0	84.3	1337.7	25.2
#	C	1	54.59	-0.0365	3.009	0.251	-	98.4	90.6	1284.1	14.5
#	D	6	53.56	-0.0142	3.603	0.373	-	98.0	100.0	1263.3	11.7
	Integrated age ± 1s			n=4		3.97				1299.4	2.9
	Plateau ± 1s		steps A-B	n=2	MSWD=1.83	3.34	0.000		84.3	1303.8	3.8
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-25										
	A	0	57.38	-0.0248	0.8007	0.496	-	99.6	89.7	1342.2	9.7
#	B	0	48.18	0.0498	41.82	0.014	10.2	74.4	92.2	948.0	187.8
#	C	1	33.06	1.941	49.88	0.004	0.26	55.8	93.0	549.4	739.3
#	D	6	57.45	0.2161	-2.7743	0.039	2.4	101.5	100.0	1361.4	71.8
	Integrated age ± 1s			n=4		0.553				1329.7	11.8
	Plateau ± 1s		steps A-A	n=1	MSWD=0.00	0.496	0.0		89.7	1342.2	9.7
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-26										
	A	0	62.03	0.0104	1.725	1.25	49.2	99.2	94.5	1413.7	5.7
	B	0	63.09	0.0339	-18.5516	0.031	15.0	108.7	96.8	1523.3	82.5
	C	1	50.29	-0.2940	-21.1281	0.017	-	112.4	98.1	1331.8	144.5
	D	6	54.12	-0.2225	-31.6306	0.026	-	117.3	100.0	1444.2	93.3
	Integrated age ± 1s			n=4		1.33				1415.9	6.3
	Plateau ± 1s		steps A-D	n=4	MSWD=0.73	1.33	46.8		100.0	1414.2	5.7
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-28										
	A	0	73.93	-0.0050	1.065	0.485	-	99.6	93.8	1597.7	9.1
#	B	0	62.08	0.3463	82.64	0.029	1.5	60.7	99.5	986.2	86.9
#	C	1	158.2	-5.8278	-308.4280	0.003	-	157.3	100.0	3181.4	638.3
	Integrated age ± 1s			n=3		0.517				1581.3	10.2
	Plateau ± 1s		steps A-A	n=1	MSWD=0.00	0.485	0.0		93.8	1597.7	9.1

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-30										
	A	0	61.51	-0.0173	0.2786	2.20	-	99.9	93.3	1412.2	3.8
	B	0	56.72	-1.7724	-79.8367	0.011	-	141.4	93.7	1688.8	183.0
	C	1	50.65	1.187	-19.3863	0.016	0.43	111.5	94.4	1331.9	123.8
	D	6	59.25	0.1042	10.51	0.132	4.9	94.8	100.0	1325.8	21.6
	Integrated age ± 1s			n=4		2.36				1408.4	3.9
	Plateau ± 1s		steps A-D	n=4	MSWD=6.08	2.36	4.4		100.0	1409.7	9.1
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-32										
	A	0	61.22	0.0276	3.812	1.87	18.5	98.2	83.0	1390.8	3.8
#	B	0	55.72	0.1633	1.503	0.129	3.1	99.2	88.7	1311.3	21.9
#	C	1	58.60	0.0268	5.637	0.255	19.0	97.2	100.0	1338.8	15.1
	Integrated age ± 1s			n=3		2.26				1380.5	3.9
	Plateau ± 1s		steps A-A	n=1	MSWD=0.00	1.87	18.5		83.0	1390.8	3.8
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-39										
	A	0	66.83	-0.0066	4.932	0.389	-	97.8	86.9	1474.4	11.9
#	B	10	55.43	0.0630	8.313	0.058	8.1	95.6	100.0	1271.6	45.6
	Integrated age ± 1s			n=2		0.447				1449.1	11.8
	Plateau ± 1s		steps A-A	n=1	MSWD=0.00	0.389	0.0		86.9	1474.4	11.9
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-51										
	A	0	142.0	-0.3374	-86.8843	0.008	-	118.1	0.6	2613.8	592.7
	B	0	93.61	0.1257	15.77	0.027	4.1	95.0	2.6	1807.5	159.4
	C	1	81.45	-0.0039	0.8938	0.821	-	99.7	63.2	1704.1	8.4
#	D	8	78.26	0.0216	5.310	0.487	23.6	98.0	99.2	1641.7	12.4
#	E	8	146.8	-0.0493	197.3	0.011	-	60.3	100.0	1800.9	373.3
	Integrated age ± 1s			n=5		1.35				1691.8	8.7
	Plateau ± 1s		steps A-C	n=3	MSWD=1.39	0.86	0.1		63.2	1704.6	9.9
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-53										
	A	0	63.32	0.0068	1.634	0.824	74.8	99.2	89.7	1434.7	8.8
	D	10	97.64	0.0144	108.5	0.094	35.6	67.1	100.0	1477.5	53.9
	Integrated age ± 1s			n=2		0.918				1439.1	9.7
	Plateau ± 1s		steps A-D	n=2	MSWD=0.61	0.918	70.8		100.0	1435.8	8.7

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-55										
	A	0	62.62	-0.0210	-0.2621	0.479	-	100.1	91.0	1432.4	9.4
	C	1	54.29	-2.1117	-125.3038	0.003	-	167.8	91.6	1832.9	597.5
#	D	10	58.81	-0.0152	28.07	0.044	-	85.9	100.0	1228.5	57.1
	Integrated age ± 1s			n=3		0.526				1419.0	10.5
	Plateau ± 1s	steps A-C		n=2	MSWD=0.45	0.482	0.000		91.6	1432.4	9.4
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-54										
	A	0	62.96	0.1307	0.0624	1.30	3.9	100.0	93.1	1436.6	4.8
	B	1	53.56	-0.1106	-38.1226	0.037	-	121.0	95.7	1465.6	59.9
#	D	10	49.56	-0.1267	-28.9158	0.059	-	117.2	100.0	1358.0	43.3
	Integrated age ± 1s			n=3		1.40				1434.1	5.1
	Plateau ± 1s	steps A-B		n=2	MSWD=0.23	1.34	3.8		95.7	1436.8	4.8
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-46										
	A	0	69.16	0.0315	15.17	0.210	16.2	93.5	59.5	1463.7	17.5
	B	1	68.01	0.0206	0.9643	0.087	24.8	99.6	84.0	1510.4	37.7
#	C	1	57.72	0.3284	56.74	0.045	1.6	71.0	96.6	1051.6	66.2
#	D	10	64.27	1.350	-9.6582	0.012	0.38	104.6	100.0	1503.9	212.0
	Integrated age ± 1s			n=4		0.354				1429.4	17.5
	Plateau ± 1s	steps A-B		n=2	MSWD=1.27	0.297	18.7		84.0	1472.0	17.9
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-57										
#	B	0	145.7	-2.5822	347.0	0.001	-	29.5	2.4	1088.4	522.6
	C	0	85.81	-4.7084	21.79	0.000	-	92.1	4.1	1670.3	566.4
	D	0	59.21	-0.9754	-11.4486	0.001	-	105.6	9.5	1428.9	222.1
	E	0	70.91	-0.0276	-17.4988	0.013	-	107.3	59.6	1633.1	23.5
#	F	0	50.43	-0.0622	2.890	0.010	-	98.3	100.0	1211.8	30.2
	Integrated age ± 1s			n=5		0.025				1450.8	25.6
	Plateau ± 1s	steps C-E		n=3	MSWD=0.42	0.014	0.000		57.1	1633.1	23.5
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-59										
#	B	0	7.100	-1.5504	-13.0701	0.000	-	153.4	0.2	341.9	1327.1
#	D	0	38.71	-0.4437	-72.1103	0.001	-	155.0	1.4	1388.6	199.5
	E	0	54.76	0.0149	-44.6842	0.002	34.3	124.1	3.1	1514.1	149.5
	F	0	74.34	0.0036	-0.3331	0.109	141.2	100.1	100.0	1609.6	5.2
	Integrated age ± 1s			n=4		0.112				1603.4	6.4
	Plateau ± 1s	steps E-F		n=2	MSWD=0.41	0.110	139.4		98.6	1609.6	5.2

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-60										
#	A	0	54.23	-1.6468	12.84	0.052	-	92.8	7.8	1223.8	80.5
	B	0	60.01	-0.1761	6.305	0.439	-	96.9	74.0	1358.7	13.1
	C	0	71.29	-1.4336	24.85	0.047	-	89.5	81.0	1449.4	84.9
	D	0	67.67	-0.8225	-18.7074	0.089	-	108.1	94.5	1590.1	51.5
	E	0	102.5	-4.9337	46.13	0.014	-	86.3	96.5	1796.5	284.6
#	G	0	41.45	-0.6190	-4.6016	0.023	-	103.2	100.0	1085.4	126.4
	Integrated age ± 1s			n=6		0.664				1389.4	16.1
	Plateau ± 1s	steps B-E		n=4	MSWD=7.31	0.589	0.000		88.7	1375.3	34.0
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-64										
#	A	0	36.81	-0.0133	1.420	0.624	-	98.9	16.9	959.5	9.7
#	B	0	43.70	0.0352	-0.9618	0.254	14.5	100.7	23.8	1109.1	14.4
	C	0	45.81	0.0388	-4.9538	0.206	13.2	103.2	29.4	1170.4	14.9
	D	0	45.15	0.0461	-2.5500	0.263	11.1	101.7	36.5	1145.1	13.8
	E	0	45.76	0.0493	-1.2994	0.485	10.4	100.9	49.6	1149.5	9.7
	F	0	47.25	0.0041	-0.2662	0.499	125.4	100.2	63.2	1171.2	7.8
	G	0	48.92	0.0229	1.717	1.36	22.3	99.0	100.0	1191.0	4.6
	Integrated age ± 1s			n=7		3.69				1135.4	3.4
	Plateau ± 1s	steps C-G		n=5	MSWD=5.80	2.81	36.8		76.2	1177.8	8.3
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-44										
#	A	0	123.4	0.5416	322.0	0.008	0.94	22.9	0.5	785.5	380.5
#	C	0	71.15	-0.3911	214.2	0.006	-	11.0	0.9	252.9	659.2
	D	0	57.58	0.1489	10.81	0.010	3.4	94.4	1.5	1295.9	258.7
	E	0	50.60	-0.1352	-45.1297	0.015	-	126.3	2.5	1451.8	195.5
	F	0	63.91	-0.0099	2.694	1.56	-	98.8	100.0	1439.1	4.9
	Integrated age ± 1s			n=5		1.60				1432.1	5.8
	Plateau ± 1s	steps D-F		n=3	MSWD=0.16	1.59	0.022		99.1	1439.1	4.9
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-49										
#	A	0	74.88	-0.2987	111.9	0.059	-	55.8	2.0	1067.0	68.6
#	B	0	49.67	-0.5155	-57.9833	0.042	-	134.4	3.4	1495.4	71.0
#	C	0	50.95	0.1272	25.54	0.049	4.0	85.2	5.0	1098.4	51.8
#	D	0	54.31	0.1427	6.907	0.095	3.6	96.3	8.2	1259.7	30.7
#	E	0	59.48	-0.0093	3.985	0.615	-	98.0	28.7	1361.5	8.6
	F	0	62.36	0.0012	1.384	2.14	433.3	99.3	100.0	1420.7	4.2
	Integrated age ± 1s			n=6		3.00				1393.5	4.1
	Plateau ± 1s	steps F-F		n=1	MSWD=0.00	2.14	433.3		71.3	1420.7	4.2

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-65										
#	A	0	73.49	-0.0397	-0.3597	0.393	-	100.1	58.4	1597.3	11.6
	B	0	72.14	-0.3917	-29.6444	0.050	-	112.1	65.8	1699.5	54.2
	C	0	76.08	-1.4302	-43.4374	0.021	-	116.7	68.9	1804.0	96.7
	D	0	80.96	-0.1813	-6.8338	0.055	-	102.5	77.1	1728.1	50.3
	E	0	78.50	-0.0494	-10.3682	0.138	-	103.9	97.5	1709.2	24.3
	F	0	70.08	0.1920	-101.3073	0.017	2.7	142.8	100.0	1945.0	129.2
	Integrated age ± 1s			n=6		0.673				1655.0	11.2
	Plateau ± 1s	steps B-F		n=5	MSWD=1.04	0.280	2.7		41.6	1720.1	20.0
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-67										
#	A	0	47.28	0.3609	7.098	0.029	1.4	95.7	1.8	1132.7	112.6
#	B	0	45.52	-0.0714	-10.4043	0.021	-	106.7	3.2	1194.0	92.2
#	C	0	53.76	-0.6410	80.11	0.020	-	55.8	4.4	823.8	101.4
#	D	0	53.15	-0.1397	25.32	0.038	-	85.9	6.8	1140.4	50.2
#	E	0	58.86	0.0358	7.488	0.074	14.3	96.2	11.5	1334.1	29.4
	F	0	62.65	0.0073	0.5438	1.33	70.2	99.7	94.8	1429.1	3.6
#	G	0	60.34	-0.0215	25.99	0.083	-	87.3	100.0	1266.1	34.8
	Integrated age ± 1s			n=7		1.59				1395.7	4.7
	Plateau ± 1s	steps F-F		n=1	MSWD=0.00	1.33	70.2		83.4	1429.1	3.6
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-69										
#	A	0	69.32	-0.1314	14.56	0.048	-	93.8	14.5	1468.6	57.5
	B	0	83.65	-0.0417	13.46	0.143	-	95.2	57.9	1683.2	21.3
	C	0	76.56	0.3632	59.82	0.015	1.4	76.9	62.4	1371.8	131.7
	D	0	82.37	0.8996	39.97	0.011	0.57	85.7	65.7	1554.6	185.7
	E	0	66.37	0.3821	-31.3426	0.016	1.3	114.0	70.7	1627.4	109.3
	F	0	74.87	-0.0350	-4.9453	0.051	-	101.9	86.3	1636.6	46.5
	G	0	67.92	-0.3560	-19.3239	0.045	-	108.4	100.0	1597.3	50.5
	Integrated age ± 1s			n=7		0.330				1614.1	18.7
	Plateau ± 1s	steps B-G		n=6	MSWD=1.63	0.282	0.35		85.5	1658.0	22.5
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-71										
	A	0	65.99	0.1655	5.439	0.265	3.1	97.6	79.4	1459.3	13.0
	B	0	65.67	0.2674	-2.6350	0.061	1.9	101.2	97.7	1491.5	39.8
#	C	0	60.90	-0.0084	32.51	0.008	-	84.2	100.0	1242.5	241.9
	Integrated age ± 1s			n=3		0.334				1460.3	13.8
	Plateau ± 1s	steps A-B		n=2	MSWD=0.59	0.326	2.9		97.7	1462.4	12.4

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-75										
	A	0	59.69	-0.0269	-0.6542	0.500	-	100.3	62.9	1387.3	8.6
	B	0	62.79	-0.2572	-12.6131	0.088	-	105.9	74.0	1491.5	35.0
	C	0	61.02	-0.2202	4.536	0.162	-	97.8	94.4	1383.6	17.7
	D	0	64.13	-0.8652	-26.5125	0.031	-	112.1	98.3	1571.9	62.6
	E	0	79.92	-2.6504	-28.9725	0.011	-	110.5	99.7	1796.2	174.3
	F	0	163.1	-1.9718	93.39	0.002	-	83.0	100.0	2322.5	924.4
	Integrated age ± 1s			n=6		0.795				1415.6	9.0
	Plateau ± 1s		steps A-F	n=6	MSWD=4.62	0.795	0.000		100.0	1394.9	16.2
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-77										
	AA	0	64.00	0.0422	2.588	0.169	12.1	98.8	40.9	1441.0	22.1
	A	0	68.70	0.0040	-3.4021	0.207	126.5	101.5	90.9	1540.3	17.9
#	B	0	64.86	-0.4934	19.53	0.021	-	91.0	95.9	1373.4	121.3
#	C	0	71.64	-1.2523	28.19	0.013	-	88.2	99.1	1439.8	189.3
#	F	0	49.68	-1.0339	31.42	0.004	-	81.1	100.0	1037.6	668.4
	Integrated age ± 1s			n=5		0.413				1484.8	16.2
	Plateau ± 1s		steps AA-A	n=2	MSWD=12.19	0.375	75.1		90.9	1501.0	48.5
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-79										
#	AA	0	58.93	0.0155	2.495	0.324	32.9	98.8	57.0	1359.7	11.9
	A	0	61.08	-0.1798	-4.8311	0.082	-	102.3	71.4	1429.2	33.7
	B	0	63.16	-0.0206	-6.7561	0.038	-	103.2	78.1	1470.9	69.5
	C	0	70.41	0.2444	-6.3717	0.034	2.1	102.7	84.0	1579.0	77.1
	D	0	67.48	0.3608	-8.2999	0.045	1.4	103.7	91.9	1544.3	57.9
	E	0	67.26	0.4048	-12.4678	0.035	1.3	105.5	98.0	1559.5	79.5
	F	0	80.57	1.206	109.5	0.011	0.42	60.0	100.0	1190.0	249.6
	Integrated age ± 1s			n=7		0.568				1415.5	13.5
	Plateau ± 1s		steps A-F	n=6	MSWD=1.51	0.244	1.5		43.0	1478.3	29.5
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-81										
#	AA	0	43.78	0.0913	7.760	0.182	5.6	94.8	13.5	1061.4	18.6
#	A	0	49.08	0.0733	6.098	0.381	7.0	96.3	41.9	1170.5	15.9
#	B	0	51.45	0.1007	2.200	0.156	5.1	98.8	53.5	1233.9	23.9
#	C	0	52.84	0.1615	14.43	0.150	3.2	92.0	64.7	1194.2	24.1
	D	0	57.99	0.2218	15.91	0.086	2.3	91.9	71.1	1277.5	40.9
	E	0	61.37	0.0287	2.644	0.244	17.8	98.7	89.2	1398.8	18.3
	F	0	63.56	0.2114	24.44	0.145	2.4	88.7	100.0	1329.3	26.1
	Integrated age ± 1s			n=7		1.34				1234.2	8.3
	Plateau ± 1s		steps D-F	n=3	MSWD=4.93	0.47	10.3		35.3	1364.2	31.3

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-78										
#	AA	0	40.39	2.157	25.35	0.016	0.24	81.9	2.9	891.4	223.5
#	A	0	58.67	0.2291	3.473	0.013	2.2	98.3	5.3	1351.1	224.0
#	B	0	62.72	0.4160	112.3	0.012	1.2	47.1	7.6	813.9	278.8
	C	0	74.81	-0.0085	7.727	0.020	-	97.0	11.3	1581.9	140.1
	D	0	74.90	0.4002	-39.4873	0.018	1.3	115.6	14.7	1776.9	162.8
	E	0	62.60	0.7496	-18.3651	0.028	0.68	108.8	19.9	1516.4	128.0
	F	0	56.14	0.0393	20.63	0.429	13.0	89.1	100.0	1220.3	32.5
	Integrated age ± 1s			n=7		0.536				1259.7	29.7
	Plateau ± 1s		steps C-F	n=4	MSWD=6.90	0.495	11.8		92.4	1272.7	79.3
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-80										
#	AA	0	39.68	0.0086	7.634	0.152	59.6	94.3	8.6	980.6	44.2
	A	0	59.26	0.0100	1.609	1.08	51.1	99.2	69.8	1369.5	7.0
	B	0	59.74	0.0134	2.165	0.492	38.0	98.9	97.7	1374.6	15.0
	C	0	62.42	0.2965	-35.6500	0.022	1.7	116.9	98.9	1588.5	214.4
#	D	0	70.77	-1.0258	-331.7298	0.009	-	238.4	99.4	2622.3	589.7
#	F	0	75.30	-0.5015	-250.9638	0.010	-	198.4	100.0	2456.0	504.4
	Integrated age ± 1s			n=6		1.76				1361.2	8.3
	Plateau ± 1s		steps A-C	n=3	MSWD=0.57	1.59	46.4		90.3	1370.6	6.4
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-82										
#	AA	0	62.60	1.170	-6.0004	0.013	0.44	103.0	0.6	1461.2	356.2
#	A	0	62.37	0.0737	14.90	0.042	6.9	92.9	2.5	1356.1	105.3
	B	0	63.43	-0.2209	-31.5687	0.046	-	114.7	4.5	1584.9	102.2
	C	0	57.80	0.3468	-31.4753	0.033	1.5	116.2	6.0	1501.7	131.0
	F	0	64.42	0.0067	0.6382	2.10	75.8	99.7	100.0	1456.7	3.9
	Integrated age ± 1s			n=5		2.24				1458.3	5.5
	Plateau ± 1s		steps B-F	n=3	MSWD=0.84	2.18	74.7		97.5	1456.9	4.0
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-84										
#	AA	0	61.52	0.6251	44.37	0.016	0.82	78.8	3.5	1192.0	204.4
#	A	0	55.34	0.3670	20.83	0.050	1.4	88.9	14.5	1205.7	64.6
	B	0	62.08	0.0361	-0.8240	0.246	14.2	100.4	68.1	1426.6	15.6
	C	0	58.70	0.3724	0.0432	0.041	1.4	100.0	77.1	1368.6	75.9
	D	0	61.27	0.2575	-11.3909	0.056	2.0	105.5	89.3	1463.4	62.8
	E	0	75.38	-0.2958	-57.5285	0.025	-	122.5	94.7	1850.4	115.0
	F	0	77.50	-0.1404	-47.7986	0.024	-	118.2	100.0	1841.1	115.3
	Integrated age ± 1s			n=7		0.458				1445.8	19.0
	Plateau ± 1s		steps B-F	n=5	MSWD=6.65	0.392	9.3		85.5	1439.9	37.7

40Ar/39Ar analytical data table for step heated crystals.

	ID	Power (Watts)	40Ar/39Ar	37Ar/39Ar	36Ar/39Ar (x 10-3)	39ArK (x 10-15 mol)	K/Ca	)Ar* (%)	39Ar (%)	Age (Ma)	±1s (Ma)
	SC-99-11, mu, F3:171, Muscovite, J=0.0190071±0.05%, D=1.00562±0.00081, NM-171, Lab#=54341-85										
#	AA	0	36.63	0.0539	1.254	0.059	9.5	99.0	1.0	956.9	67.0
#	A	0	42.03	0.0164	2.722	0.141	31.1	98.1	3.5	1056.2	27.9
#	B	0	44.64	0.0328	4.097	0.341	15.6	97.3	9.4	1098.5	12.6
#	C	0	47.72	0.0169	0.7503	0.988	30.3	99.5	26.7	1174.4	6.0
#	D	0	47.91	0.1645	-6.4322	0.097	3.1	104.0	28.4	1216.4	41.7
#	E	0	46.86	0.1906	6.378	0.096	2.7	96.0	30.0	1128.0	40.7
	F	0	54.92	0.0099	1.209	4.01	51.7	99.4	100.0	1298.8	3.4
	Integrated age ± 1s			n=7		5.73				1253.3	3.1
	Plateau ± 1s		steps F-F	n=1	MSWD=0.00	4.01	51.7		70.0	1298.8	3.4

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
FO3-5-15, musc B1:171, muscovite, J=0.0192287±0.05%, D=1.00562±0.00081, NM-171, Lab#=54314								
60	51.81	0.0161	5.006	0.208	31.7	97.1	1235.7	16.9
10	53.04	0.0039	1.140	2.483	132.2	99.4	1277.4	2.3
05	54.74	0.0031	2.405	2.452	167.1	98.7	1300.5	3.0
13	55.14	0.0011	2.472	2.571	463.1	98.7	1307.0	2.5
46	56.31	0.0062	2.168	2.033	82.9	98.9	1328.5	2.8
44	56.39	0.0024	1.468	4.389	216.7	99.2	1333.3	2.0
101	57.11	0.0024	3.147	7.577	208.4	98.4	1337.1	1.8
22	57.03	0.0029	2.496	5.271	173.5	98.7	1339.0	2.0
19	56.44	0.0016	-0.1586	1.501	314.1	100.1	1342.3	3.6
17	57.19	0.0037	2.000	3.720	137.5	99.0	1344.2	2.2
21	57.63	0.0028	2.360	0.685	180.8	98.8	1349.9	6.2
18	57.82	0.0020	2.298	1.763	258.8	98.8	1353.3	3.1
59	58.16	0.0046	2.604	0.612	111.4	98.7	1357.5	6.3
12	57.97	0.0008	1.530	3.337	613.4	99.2	1359.5	2.4
14	57.68	-0.0016	0.4994	1.056	-	99.7	1359.9	4.2
23	58.80	0.0065	4.228	0.637	78.8	97.9	1360.2	6.6
51	58.99	0.0005	1.804	1.477	1019.2	99.1	1375.1	3.4
47	59.76	0.0039	4.005	2.200	129.3	98.0	1377.1	2.7
20	59.15	0.0022	1.795	1.648	236.3	99.1	1377.8	3.3
04	59.56	0.0030	3.033	2.496	167.3	98.5	1378.6	3.2
40	59.50	0.0000	2.380	0.691	28825.1	98.8	1380.9	6.1
15	58.86	-0.0016	0.1158	1.554	-	99.9	1381.3	3.0
48	59.96	0.0010	3.682	3.720	521.3	98.2	1382.0	1.9
07	59.17	0.0010	0.7158	5.848	515.6	99.6	1383.5	1.6
16	59.34	0.0015	0.6822	7.045	348.8	99.7	1386.4	1.7
42	60.99	-0.0003	5.909	0.643	-	97.1	1388.2	6.7
32	59.59	-0.0031	0.4022	0.881	-	99.8	1391.9	6.1
54	59.98	0.0034	1.644	2.162	151.2	99.2	1392.4	2.9
31	60.31	0.0007	2.131	1.099	772.8	99.0	1395.4	4.0
39	59.98	0.0011	0.9167	5.590	472.5	99.5	1395.7	2.0
34	60.35	-0.0008	1.854	2.048	-	99.1	1397.2	3.1
27	60.62	-0.0043	2.568	0.627	-	98.7	1398.3	5.7
24	60.28	0.0085	1.261	1.697	60.2	99.4	1399.0	3.0
02	61.19	0.0050	4.331	2.620	101.6	97.9	1399.1	2.8
61	61.31	0.0038	4.404	0.467	135.4	97.9	1400.7	7.7
53	60.78	0.0052	2.380	0.591	98.0	98.8	1401.8	6.8
06	60.60	0.0004	1.743	2.434	1142.7	99.1	1401.9	2.9
57	61.27	0.0045	3.632	0.717	114.5	98.2	1403.7	5.8
58	60.65	0.0021	1.365	4.217	244.4	99.3	1404.6	2.1
50	61.13	0.0008	2.840	3.645	637.8	98.6	1405.3	2.2
11	60.67	-0.0008	0.9215	2.128	-	99.6	1407.0	3.1
28	62.56	0.0021	6.583	2.234	245.6	96.9	1410.5	2.8
37	60.99	0.0008	0.9094	2.803	610.3	99.6	1412.3	2.4
49	61.54	-0.0047	2.657	0.510	-	98.7	1412.8	6.7
52	61.49	-0.0006	2.304	1.508	-	98.9	1413.7	3.0

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
41	60.77	-0.0009	-0.2006	0.878	-	100.1	1414.0	4.7
30	61.38	0.0007	1.165	6.179	742.1	99.4	1417.3	1.8
33	61.44	-0.0007	1.108	3.277	-	99.5	1418.5	2.1
55	61.63	0.0027	1.149	1.315	191.2	99.4	1421.4	4.2
01	62.03	0.0022	2.461	1.986	233.7	98.8	1421.7	3.4
09	61.90	-0.0005	1.735	2.298	-	99.2	1423.0	2.5
43	61.50	0.0010	0.3915	1.898	527.3	99.8	1423.0	3.3
08	62.98	-0.0003	0.0412	1.862	-	100.0	1448.3	3.0
56	67.77	0.0038	3.328	0.472	135.8	98.5	1508.0	8.2
25	69.74	0.0021	3.529	0.626	241.9	98.5	1537.2	6.7

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
FO3-5-17, musc B3:171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54315								
39	51.38	0.0113	5.027	2.370	45.1	97.1	1218.4	2.2
28	53.44	-0.0005	3.511	0.951	-	98.1	1262.4	4.7
13	53.50	0.0632	2.317	3.113	8.1	98.7	1269.7	2.2
44	52.32	0.0083	-2.6273	1.018	61.8	101.5	1274.6	4.5
11	55.46	0.0077	2.998	1.762	66.3	98.4	1299.9	2.9
58	55.94	0.0043	3.539	2.971	118.0	98.1	1305.3	2.1
43	56.01	0.0053	3.743	1.328	96.3	98.0	1305.5	3.5
50	55.90	0.0016	3.003	1.481	312.3	98.4	1307.4	3.0
40	54.53	0.0016	-1.9126	0.751	321.4	101.0	1308.8	5.6
35	55.05	0.0132	-1.5095	1.233	38.6	100.8	1315.6	3.9
34	56.82	0.0063	2.520	1.391	80.6	98.7	1325.3	3.0
10	56.49	0.0075	0.5232	0.658	68.3	99.7	1329.6	6.3
06	57.46	-0.0017	1.601	1.173	-	99.2	1340.6	4.0
37	58.63	0.0114	4.999	0.890	44.9	97.5	1343.4	4.5
56	57.03	0.0039	-0.7022	1.480	131.2	100.4	1344.8	2.6
55	59.07	0.0032	5.843	0.607	157.2	97.1	1346.5	6.1
41	58.63	0.0003	4.123	1.335	1780.8	97.9	1347.6	3.7
08	58.63	0.0113	3.826	0.547	45.0	98.1	1349.2	8.7
31	58.54	-0.0007	3.377	1.234	-	98.3	1349.8	3.4
36	58.46	0.0046	0.8988	1.755	111.3	99.5	1360.6	2.7
38	59.24	0.0049	3.411	2.112	105.1	98.3	1361.2	2.5
57	59.65	0.0055	4.634	0.519	93.2	97.7	1362.1	5.6
02	59.04	0.0021	2.158	7.772	247.6	98.9	1364.0	1.6
33	58.93	0.0038	1.642	1.479	133.2	99.2	1364.8	3.0
03	60.89	0.0044	7.512	1.408	114.7	96.4	1368.5	3.6
14	59.15	0.0028	1.065	5.966	183.3	99.5	1371.2	1.6
54	59.73	0.0024	2.879	1.448	209.5	98.6	1371.9	3.2
17	59.20	0.0095	0.8859	2.182	53.5	99.6	1372.9	2.6
09	60.18	0.0040	3.107	1.046	126.5	98.5	1378.2	4.9
51	60.39	-0.0028	3.791	1.064	-	98.1	1378.3	4.1
16	60.64	0.0001	4.127	0.606	4519.1	98.0	1380.8	6.1
52	58.26	0.0024	-6.0163	0.353	209.9	103.1	1390.8	8.7
45	60.28	-0.0046	-0.6669	0.488	-	100.3	1397.9	7.8
61	61.11	0.0018	2.091	2.686	288.5	99.0	1398.1	2.4
23	61.22	0.0035	2.295	3.377	145.4	98.9	1399.0	2.1
04	59.88	-0.0034	-2.3005	1.427	-	101.1	1399.3	3.2
15	61.54	0.0025	3.210	1.941	201.9	98.5	1399.7	3.0
21	61.10	0.0011	1.564	2.748	447.8	99.2	1400.5	2.5
47	61.84	-0.0002	3.811	0.455	-	98.2	1401.6	7.5

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
19	61.82	0.0030	2.699	1.578	169.7	98.7	1406.7	3.2
46	62.06	0.0024	1.306	1.883	210.4	99.4	1417.2	2.8
29	61.48	-0.0001	-1.3131	1.318	-	100.6	1420.2	3.3
05	62.50	-0.0006	1.776	3.138	-	99.2	1421.9	2.2
42	62.80	0.0013	2.612	1.130	398.7	98.8	1422.7	3.9
27	62.57	0.0016	1.221	5.461	321.5	99.4	1425.6	2.0
07	63.51	0.0026	0.6669	1.877	198.0	99.7	1443.2	3.1
22	63.92	0.0012	-0.3545	2.358	427.3	100.2	1454.3	2.4
32	62.57	0.0183	-7.2912	0.439	27.9	103.4	1465.3	7.1
01	66.00	0.0036	2.277	2.871	140.0	99.0	1474.6	2.9
53	67.30	0.0025	5.510	0.625	207.6	97.6	1479.9	6.1
30	73.66	0.0027	2.712	2.393	192.5	98.9	1587.8	2.9
49	76.64	-0.0012	5.108	0.648	-	98.0	1620.5	6.0
48	76.03	-0.0014	-0.9530	0.903	-	100.4	1637.3	4.3

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
FO3-5-18, musc B5:171, muscovite, J=0.0190249±0.05%, D=1.00562±0.00081, NM-171, Lab#=54316								
74	48.33	0.0580	2.467	1.276	8.8	98.5	1177.1	5.2
14	52.54	0.0044	4.127	1.350	115.1	97.7	1243.5	3.2
01	53.34	0.0925	3.550	0.033	5.519	98.0	1260.7	83.3
15	54.05	-0.0016	3.067	0.819	-	98.3	1275.3	4.1
21	54.21	0.0097	2.7940	0.399	52.763	98.5	1279.5	7.6
18	53.47	-0.0014	-0.224	1.506	-	100.1	1282.0	3.5
27	54.72	0.0059	1.5374	2.261	86.150	99.2	1294.7	2.9
72	53.04	-0.0056	-4.9253	0.527	-	102.7	1298.6	10.3
48	55.46	0.0019	0.2013	2.813	265.1	99.9	1313.9	2.4
46	56.08	0.0026	0.8699	2.345	195.3	99.5	1321.1	2.5
60	56.45	0.0025	0.826	1.959	205.2	99.6	1327.5	4.8
34	56.97	0.0033	1.4140	5.641	155.7	99.3	1333.4	1.5
10	56.74	0.0033	0.458	1.004	156.3	99.8	1334.3	3.9
35	58.19	0.0080	4.8407	0.447	63.6	97.5	1336.9	7.9
65	56.98	0.0354	0.712	4.175	14.4	99.6	1337.0	3.6
30	57.15	0.0022	1.024	4.101	229.0	99.5	1338.3	2.0
05	57.99	0.0035	2.829	2.241	145.7	98.6	1343.3	2.5
36	58.14	0.0202	2.854	4.551	25.3	98.6	1345.8	2.2
20	57.74	0.0071	1.219	0.333	71.6	99.4	1347.2	8.9
24	58.05	0.0049	1.217	2.507	104.4	99.4	1352.3	2.2
08	58.63	0.0019	1.841	0.973	273.0	99.1	1358.8	3.9
07	58.87	0.0013	2.080	4.263	397.9	99.0	1361.6	1.8
38	58.72	0.0078	1.024	1.234	65.5	99.5	1364.4	3.3
03	59.21	0.0025	2.483	4.317	203.9	98.8	1365.3	2.0
11	59.22	0.0003	2.484	1.332	1617.6	98.8	1365.5	3.4
02	60.34	0.0033	6.0180	1.180	156.6	97.1	1366.6	3.8
09	58.77	0.0034	0.196	2.283	147.9	99.9	1369.1	2.7
32	59.33	0.0033	2.0867	1.930	152.8	99.0	1369.2	2.7
59	58.92	0.0023	0.484	6.148	224.4	99.8	1370.3	3.1
45	59.73	0.0308	2.4350	2.126	16.5	98.8	1374.1	2.7
51	59.27	0.0006	0.857	4.150	809.7	99.6	1374.1	2.1
40	59.56	0.0042	1.800	1.812	122.589	99.1	1374.2	2.5
75	59.82	-0.0044	2.357	0.949	-	98.8	1375.9	7.3
53	59.92	-0.0006	1.772	1.329	-	99.1	1380.4	3.2
43	59.95	0.0024	1.402	2.200	214.534	99.3	1382.6	3.0
06	61.25	-0.0004	4.8296	1.792	-	97.7	1387.2	2.9

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
76	60.23	-0.0063	0.946	0.931	-	99.5	1389.3	5.6
26	60.39	0.0029	1.4410	4.164	179.013	99.3	1389.5	2.0
73	59.88	-0.0042	-0.358	0.790	-	100.2	1389.9	6.9
28	60.95	0.0060	2.6509	0.505	84.9	98.7	1392.8	8.6
39	60.51	0.0035	0.835	3.462	146.413	99.6	1394.4	2.5
49	60.88	-0.0038	1.5275	0.747	-	99.3	1397.0	5.0
17	59.49	-0.0030	-4.3018	1.132	-	102.1	1402.5	3.4
13	60.81	0.0008	-0.0851	1.550	672.206	100.0	1403.6	2.6
71	60.86	-0.0025	-0.7705	1.750	-	100.4	1407.6	5.2
23	61.49	0.0028	0.970	1.933	182.7	99.5	1409.6	3.3
04	62.01	0.0048	2.484	3.656	106.905	98.8	1410.8	2.1
16	62.66	-0.0063	3.986	0.676	-	98.1	1414.0	4.6
69	62.22	0.0108	2.0108	1.408	47.3	99.0	1416.4	6.4
68	62.72	0.0016	0.4477	1.960	328.570	99.8	1431.6	4.5
19	63.82	-0.0066	0.303	0.570	-	99.9	1449.7	5.8
25	64.30	0.0463	1.5266	3.653	11.020	99.3	1451.7	2.3
52	66.57	-0.0037	0.6360	0.430	-	99.7	1490.9	7.2
56	66.90	-0.0007	0.769	1.451	-	99.7	1495.3	5.4
12	67.42	-0.0007	1.7578	0.502	-	99.2	1498.9	7.0
47	69.08	0.0021	0.7854	3.704	247.5	99.7	1528.3	2.0
22	70.30	0.0044	0.8887	5.363	116.6	99.6	1546.2	1.9
66	70.50	0.0083	0.137	3.637	61.2	99.9	1552.4	3.8
54	71.61	0.0324	1.7786	0.751	15.7	99.3	1561.8	8.7
63	72.65	0.0015	0.8658	12.693	338.7	99.6	1581.0	2.7
57	74.76	0.0053	0.2599	1.171	96.2	99.9	1614.2	6.0
67	75.7888	0.0017	0.5917	4.620	302.38	99.8	1627.42	2.72

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
FO3-5-1, musc A1:171, muscovite, J=0.0186883±0.05%, D=1.00562±0.00081, NM-171, Lab#=54310								
33	43.60	0.0019	1.596	6.513	265.5	98.9	1078.9	1.6
24	46.77	0.0011	1.162	28.498	459.5	99.3	1140.2	1.1
39	49.04	0.0020	1.440	4.255	254.4	99.1	1179.8	2.0
34	49.14	0.0036	1.599	2.440	143.1	99.0	1180.7	2.3
03	49.23	0.0007	1.105	30.771	730.3	99.3	1184.9	1.0
32	49.61	0.0024	0.8809	4.126	210.3	99.5	1192.9	1.8
23	50.59	0.0010	1.136	40.766	510.9	99.3	1208.8	1.1
10	51.99	0.0015	3.799	5.938	345.0	97.8	1219.6	1.9
01	53.62	0.0012	6.046	1.920	414.2	96.7	1236.4	2.9
51	52.02	-0.0012	0.6170	1.820	-	99.6	1236.6	3.2
16	52.65	0.0010	0.9762	21.023	516.8	99.5	1245.6	1.2
50	52.98	0.0013	1.085	7.479	390.9	99.4	1250.7	1.6
43	53.01	0.0012	0.9458	11.682	410.4	99.5	1252.0	1.3
40	53.13	0.0019	0.9252	3.497	272.3	99.5	1254.1	2.1
04	53.42	0.0008	1.138	15.260	670.9	99.4	1258.0	1.3
14	53.49	0.0006	0.9452	19.024	872.3	99.5	1260.2	1.3
45	53.76	0.0014	1.065	13.323	353.6	99.4	1264.2	1.3
12	54.61	0.0015	1.954	11.728	347.6	98.9	1274.2	1.3
08	56.02	0.0008	1.615	27.224	672.4	99.1	1299.6	1.1
21	56.09	0.0150	0.8532	18.540	34.0	99.6	1304.6	1.3
17	56.37	0.0010	1.532	8.652	528.7	99.2	1305.9	1.6
31	56.58	-0.0002	1.226	4.174	-	99.4	1311.0	2.1
101	59.01	0.0009	2.725	1.838	563.1	98.6	1343.8	3.0
41	59.02	0.0023	1.515	2.166	226.6	99.2	1349.8	3.0
18	58.92	0.0005	0.4916	7.790	1056.5	99.8	1353.0	1.7
02	60.86	0.0004	1.706	11.189	1277.4	99.2	1378.6	1.4
06	61.69	0.0006	0.8427	19.959	795.6	99.6	1395.8	1.3
30	61.77	0.0009	0.7142	9.151	561.8	99.7	1397.8	1.5
05	62.45	0.0003	0.7333	7.988	1916.6	99.7	1408.4	1.7
26	63.16	0.0012	1.824	11.865	435.3	99.1	1414.5	2.0
20	64.83	0.0008	0.8907	19.899	646.6	99.6	1444.9	1.3
37	66.19	0.0005	1.421	1.361	978.2	99.4	1463.5	3.4
36	67.31	0.0013	3.926	2.399	399.8	98.3	1469.3	2.6
28	66.86	0.0014	0.8116	16.250	368.8	99.6	1476.3	1.3
22	67.51	0.0009	1.016	17.018	578.1	99.6	1485.4	1.5
47	68.10	0.0000	1.338	3.358	67663.4	99.4	1492.8	2.4
48	68.98	0.0003	1.136	4.374	1511.3	99.5	1506.8	2.6
52	72.66	-0.0023	1.212	1.558	-	99.5	1560.8	3.7

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
FO3-5-11, Musc., J=0.0185549±0.05%, D=1.00562±0.00081, NM-171, Lab#=54312								
01	40.52	-0.0047	0.2737	0.653	-	99.8	1021.6	6.7
21	52.04	0.0008	0.8350	8.556	624.3	99.5	1229.3	1.5
90	60.93	0.0027	0.8219	4.001	188.2	99.6	1376.9	2.9
09	61.56	0.0022	1.072	2.219	236.2	99.5	1385.8	2.6
89	61.76	0.0064	1.255	2.525	79.6	99.4	1388.1	3.1
75	62.23	-0.0009	2.423	1.127	-	98.8	1390.0	5.7
19	62.05	0.0043	1.742	2.789	118.3	99.2	1390.4	2.5
37	62.79	0.0066	3.437	1.442	77.7	98.4	1394.1	5.6
05	62.17	0.0018	1.256	2.937	276.2	99.4	1394.6	2.3
54	61.99	0.0033	0.4843	6.670	156.0	99.8	1395.3	2.5
79	62.21	0.0031	0.5232	3.673	162.5	99.8	1398.6	3.8
28	62.29	-0.0039	0.3325	1.509	-	99.8	1400.7	4.1
10	62.68	0.0013	1.050	2.959	378.3	99.5	1403.5	2.1
26	62.74	0.0020	1.213	4.452	253.9	99.4	1403.7	2.0
31	62.97	0.0002	1.952	3.506	2357.7	99.1	1403.9	3.7
36	62.98	0.0051	1.948	1.476	99.1	99.1	1404.1	5.8
78	62.79	0.0065	1.106	6.901	79.0	99.5	1405.1	3.0
68	63.04	-0.0006	1.923	1.849	-	99.1	1405.1	4.6
66	62.92	0.0029	1.034	3.090	175.7	99.5	1407.4	3.4
49	62.72	0.0036	0.2043	2.227	143.2	99.9	1408.2	3.4
94	63.73	0.0131	3.317	1.049	39.1	98.5	1409.5	6.3
39	64.03	0.0033	3.807	1.299	154.8	98.2	1411.9	6.0
46	63.34	0.0013	1.206	2.979	380.0	99.4	1413.2	3.8
76	63.51	0.0030	1.608	1.709	170.8	99.3	1414.0	4.2
58	63.43	0.0008	0.6740	3.082	604.1	99.7	1417.0	4.7
98	63.87	-0.0007	1.702	0.251	-	99.2	1419.1	15.6
38	63.97	0.0087	1.707	2.420	58.6	99.2	1420.6	4.1
12	63.74	0.0015	0.8873	3.532	337.8	99.6	1420.8	2.3
93	63.53	0.0032	0.0081	0.263	158.1	100.0	1421.7	14.6
91	64.02	0.0008	1.380	1.251	605.7	99.4	1422.9	5.1
87	64.16	0.0036	1.599	1.686	140.3	99.3	1424.1	4.5
80	64.58	0.0041	2.611	0.901	125.3	98.8	1426.0	7.2
107	63.88	-0.0017	-0.2202	2.945	-	100.1	1428.1	3.5
65	64.18	0.0012	0.6674	4.326	428.4	99.7	1428.7	3.3

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
07	65.34	0.0015	2.015	1.670	331.2	99.1	1440.5	3.4
70	65.60	0.0034	1.309	2.456	150.6	99.4	1447.6	4.7
45	66.19	0.0067	0.7439	3.929	76.5	99.7	1459.3	4.1
86	67.80	0.0030	2.687	0.876	170.9	98.8	1475.0	5.9
63	69.01	0.0049	0.7735	4.141	104.7	99.7	1501.7	3.2
02	69.32	0.0017	1.813	3.025	298.4	99.2	1501.7	2.5
44	69.26	0.0028	0.5741	4.281	184.0	99.8	1506.3	3.5
35	70.08	0.0033	0.6198	7.890	153.8	99.7	1518.1	2.8
56	71.46	0.0018	0.8025	3.482	279.8	99.7	1537.6	4.2
72	72.61	0.0074	1.933	1.262	68.8	99.2	1549.4	5.9
61	72.86	0.0027	1.009	3.824	188.4	99.6	1557.0	3.1
34	73.20	0.0025	1.184	4.691	205.4	99.5	1561.3	2.8
74	74.85	0.0019	1.716	2.913	263.0	99.3	1582.6	4.2
83	74.80	0.0038	1.449	3.311	135.3	99.4	1583.1	3.5
40	75.22	0.0034	1.238	6.566	149.4	99.5	1589.9	2.2
25	75.35	0.0038	0.8798	4.539	133.3	99.7	1593.3	2.2
84	76.16	0.0026	2.449	2.021	193.6	99.0	1598.1	5.4
108	76.09	-0.0001	-0.0630	1.293	-	100.0	1607.6	7.1
67	76.90	-0.0002	1.554	4.288	-	99.4	1612.2	3.3
17	76.82	0.0028	0.5637	7.142	181.6	99.8	1615.2	1.6
85	77.21	0.0061	1.324	1.632	84.1	99.5	1617.6	4.8
106	76.99	-0.0012	0.2608	3.540	-	99.9	1618.8	3.0
47	77.13	0.0044	0.4214	1.105	116.9	99.8	1620.1	5.6
73	77.41	0.0029	1.157	3.704	174.2	99.6	1621.1	3.8
20	77.50	0.0026	1.257	4.472	199.8	99.5	1621.9	1.9
88	77.76	0.0032	2.121	2.120	160.0	99.2	1621.9	4.7
29	77.64	0.0079	1.191	6.278	64.6	99.5	1624.1	3.3
101	77.26	0.0053	-0.3392	2.187	96.1	100.1	1625.1	4.6
102	77.66	-0.0002	0.7151	2.580	-	99.7	1626.4	4.6
32	77.62	0.0022	0.2777	3.451	236.7	99.9	1627.6	4.6
104	76.85	-0.0061	-2.5705	0.485	-	101.0	1628.6	11.5
30	77.99	0.0004	1.092	4.575	1183.8	99.6	1629.4	3.3
08	78.41	0.0014	1.774	4.859	359.6	99.3	1632.4	2.2
06	78.23	0.0162	0.9740	6.561	31.6	99.6	1633.2	1.7
95	79.28	0.0031	1.860	2.224	167.1	99.3	1644.0	4.3
16	79.09	0.0042	1.154	1.475	122.3	99.6	1644.3	3.6
13	78.91	0.0020	0.5503	5.866	260.5	99.8	1644.3	1.9
53	79.37	0.0022	1.947	2.134	227.0	99.3	1645.0	5.2

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ ($\times 10^{-3}$)	$^{39}Ar_K$ ($\times 10^{-15}$ mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
41	79.10	0.0092	0.9893	4.795	55.3	99.6	1645.2	3.8
48	79.41	0.0049	1.012	2.684	103.3	99.6	1649.3	4.5
92	80.37	-0.0059	3.374	0.648	-	98.8	1652.9	10.0
51	79.53	0.0024	0.2225	5.272	213.3	99.9	1654.1	2.9
82	80.04	0.0022	1.653	1.810	233.6	99.4	1655.3	4.8
23	80.04	0.0052	1.595	9.582	98.1	99.4	1655.6	1.7
11	80.27	0.0043	1.400	4.134	119.3	99.5	1659.5	2.3
55	80.73	0.0037	0.0217	2.726	139.6	100.0	1671.3	4.0
33	81.44	0.0015	0.7042	2.668	343.2	99.7	1678.2	4.8
42	82.09	0.0048	2.436	1.485	106.7	99.1	1680.1	4.8
15	81.80	0.0026	0.5945	9.892	193.6	99.8	1683.4	1.7
105	81.62	0.0005	-0.0270	1.556	1023.9	100.0	1683.5	4.7
77	81.73	0.0036	0.1916	3.892	141.0	99.9	1684.1	3.9
100	80.87	0.0108	-3.0024	0.734	47.2	101.1	1685.3	7.3
43	82.28	0.0042	1.619	2.045	121.8	99.4	1685.9	5.2
97	82.91	0.0020	2.072	2.200	251.4	99.3	1692.5	5.3
71	83.44	0.0030	2.143	1.516	170.0	99.2	1699.4	4.9
04	83.37	0.0028	0.8460	2.536	181.9	99.7	1703.6	2.8
50	83.15	0.0025	-0.3242	1.738	203.8	100.1	1705.2	4.5
69	83.81	-0.0027	1.820	1.260	-	99.4	1705.5	5.1
81	84.12	0.0052	0.0566	1.670	98.9	100.0	1716.6	5.8
03	150.8	-0.0017	2.057	1.694	-	99.6	2431.0	3.9

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
98GC-23 R:1:#1, Single crystal muscovite, J=0.0157131±0.10%, D=1.00362±0.00105, NM-97, Lab#=9693								
12	54.87	0.0026	0.3776	2.997	198.9	99.8	1133.3	2.2
01	55.43	0.0060	2.205	1.199	84.8	98.8	1133.5	3.2
07	55.61	0.0024	1.888	2.196	216.8	99.0	1137.8	1.8
47	55.35	0.0027	0.8460	4.735	186.3	99.5	1138.5	1.7
59	55.55	-0.0006	1.202	0.990	-	99.4	1139.9	3.2
42	55.39	-0.0002	0.2819	5.111	-	99.8	1141.7	1.7
10	55.82	0.0017	0.9982	2.306	302.3	99.5	1145.0	2.5
14	55.66	-0.0009	0.0674	1.674	-	100.0	1146.8	3.2
41	55.74	0.0009	0.2871	2.326	541.2	99.8	1147.0	2.0
08	56.26	0.0027	1.627	1.948	192.4	99.1	1148.9	2.3
22	56.16	0.0023	1.036	2.770	225.9	99.5	1150.1	2.2
48	56.20	0.0002	0.6354	3.964	2208.7	99.7	1152.5	1.9
61	56.66	0.0061	1.727	1.338	83.7	99.1	1154.5	2.9
28	56.33	0.0003	0.1708	1.925	1596.4	99.9	1156.6	1.9
49	56.81	0.0023	0.6426	1.551	217.8	99.7	1161.7	2.8
20	56.76	0.0025	0.3113	3.290	202.7	99.8	1162.5	2.3
46	57.20	0.0005	1.269	1.906	1044.9	99.3	1164.8	2.3
63	57.33	0.0043	1.698	1.468	118.3	99.1	1164.9	2.3
23	57.22	0.0033	0.4012	3.754	152.9	99.8	1169.0	2.0
05	57.10	-0.0115	-0.2222	0.351	-	100.1	1170.0	5.8
15	57.28	0.0008	0.1799	2.769	667.5	99.9	1170.9	1.9
54	58.00	0.0025	0.6923	6.927	200.8	99.6	1179.5	1.7
43	58.75	0.0049	1.833	1.817	104.0	99.1	1185.7	2.2
16	58.45	0.0012	0.5877	1.346	419.3	99.7	1186.8	3.1
39	58.33	-0.0006	-0.0304	2.760	-	100.0	1187.6	2.3
11	58.54	0.0022	0.5756	9.159	234.8	99.7	1188.1	1.7
51	58.77	0.0004	1.109	2.007	1192.3	99.4	1189.2	2.0
40	58.82	-0.0023	0.7371	1.050	-	99.6	1191.6	3.1
44	59.09	0.0010	0.9198	2.858	499.8	99.5	1194.9	1.9
25	59.39	0.0017	1.448	1.410	301.8	99.3	1197.0	2.5
19	59.77	0.0027	2.030	1.945	188.9	99.0	1200.0	2.2
52	60.16	0.0030	2.912	1.283	169.4	98.6	1201.9	3.1
03	59.64	0.0013	0.5749	2.727	386.6	99.7	1204.5	1.8
13	59.62	0.0024	0.1565	2.684	213.3	99.9	1206.0	1.7
09	60.13	0.0026	1.645	2.236	196.0	99.2	1207.1	1.9

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ ($\times 10^{-3}$)	$^{39}Ar_K$ ($\times 10^{-15}$ mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
06	60.31	0.0025	2.093	2.038	200.8	99.0	1207.8	2.1
62	60.04	-0.0003	0.8742	2.367	-	99.6	1209.2	2.2
32	60.01	0.0077	0.4660	3.112	66.2	99.8	1210.6	1.9
55	60.65	0.0026	2.138	1.382	199.0	99.0	1212.6	2.9
58	60.45	0.0046	1.139	1.372	112.1	99.4	1214.0	3.0
37	60.50	0.0044	1.246	1.853	115.2	99.4	1214.3	2.5
24	60.73	0.0078	1.800	1.278	65.6	99.1	1215.3	3.5
02	60.31	-0.0001	0.3419	4.708	-	99.8	1215.4	2.0
53	60.64	-0.0002	1.286	2.865	-	99.4	1216.2	1.7
30	60.40	0.0015	0.4328	1.991	346.9	99.8	1216.4	2.4
56	60.59	-0.0003	0.9989	1.402	-	99.5	1216.7	2.4
33	60.54	0.0016	0.5319	4.583	328.7	99.7	1217.9	2.1
31	60.43	-0.0018	0.0958	2.204	-	100.0	1218.2	2.3
04	60.71	0.0117	0.9219	2.416	43.5	99.6	1218.9	2.7
27	60.93	0.0005	1.267	1.541	1007.7	99.4	1220.6	2.7
21	61.03	0.0017	0.4711	3.308	303.3	99.8	1225.5	2.0
64	61.47	0.0028	1.689	1.379	184.8	99.2	1226.7	3.2
29	61.44	-0.0002	1.176	1.632	-	99.4	1228.4	2.6
18	61.48	0.0020	0.8589	1.825	251.6	99.6	1230.5	2.3
38	61.67	0.0000	0.1353	2.443	-	99.9	1236.3	2.1
57	61.84	-0.0003	0.5088	2.715	-	99.8	1237.1	1.8
60	62.16	0.0007	1.190	1.304	733.7	99.4	1238.9	3.2
17	67.67	0.0011	0.3600	3.178	446.8	99.8	1320.8	2.1
45	68.80	0.0035	0.4551	4.381	145.4	99.8	1336.2	2.2

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
K98-65-1 R:5:97#4, single crystal musc, J=0.0157143±0.10%, D=1.00362±0.00105, NM-97, Lab#=9695								
28	45.54	0.0034	1.097	1.910	149.8	99.3	979.8	1.8
47	46.55	-0.0015	1.458	1.000	-	99.1	994.9	2.6
50	48.43	0.0017	3.207	5.466	305.1	98.0	1017.5	1.5
12	49.92	0.0096	5.177	1.624	53.4	96.9	1032.3	2.5
42	49.75	0.0004	0.9120	2.143	1242.9	99.5	1050.0	2.0
30	50.39	0.0008	0.9810	1.989	610.1	99.4	1059.9	2.0
51	50.32	-0.0003	0.6520	2.224	-	99.6	1060.5	1.9
41	51.19	0.0291	1.177	2.945	17.5	99.3	1071.8	1.6
43	51.69	-0.0004	1.714	1.693	-	99.0	1077.3	2.3
35	52.20	0.0183	1.237	4.370	27.8	99.3	1087.7	1.6
22	52.31	0.0027	1.053	6.611	189.8	99.4	1090.3	1.5
34	52.37	0.0018	1.076	2.588	285.1	99.4	1091.1	1.6
17	52.93	0.0010	0.9573	2.765	516.7	99.5	1100.4	1.7
53	53.14	0.0015	0.7527	1.694	330.2	99.6	1104.7	2.7
52	53.81	0.0016	1.730	6.684	311.3	99.1	1110.7	1.6
16	53.86	0.0019	1.833	2.072	261.9	99.0	1110.9	2.7
11	54.14	0.0040	1.901	2.837	126.6	99.0	1115.1	1.6
20	54.39	0.0007	0.9944	2.888	755.4	99.5	1123.0	1.8
49	54.44	0.0010	1.066	1.084	517.4	99.4	1123.5	2.8
24	54.35	0.0008	0.7351	3.890	653.8	99.6	1123.7	2.1
46	55.34	0.0052	2.941	4.509	97.6	98.4	1128.8	1.8
37	54.72	0.0007	0.4483	2.059	686.1	99.8	1130.6	1.9
18	54.71	0.0013	0.3148	1.185	393.1	99.8	1131.1	2.5
27	55.03	0.0007	1.380	2.476	709.4	99.3	1131.2	2.1
23	54.88	0.0043	0.6809	10.662	119.9	99.6	1132.1	1.2
45	55.27	0.0034	1.196	2.284	151.6	99.4	1135.7	1.9
29	55.24	0.0015	0.9267	3.822	346.9	99.5	1136.5	1.9
08	55.82	0.0036	1.292	2.630	142.6	99.3	1143.8	2.0
25	55.97	0.0008	1.105	7.206	634.3	99.4	1146.9	1.6
09	56.05	0.0052	1.242	2.046	98.3	99.3	1147.6	2.0
36	55.93	0.0000	0.5674	3.011	28503.0	99.7	1148.7	1.9
31	56.58	-0.0009	2.584	0.810	-	98.7	1149.6	3.8
33	57.53	0.0011	0.6745	3.691	461.2	99.7	1172.5	1.6
44	58.49	0.0002	0.6524	5.839	2165.6	99.7	1187.1	1.6
32	63.76	0.0019	0.7442	5.639	262.8	99.7	1264.1	1.7

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
OOGC-54 musc L:11:134, Muscovite, single crystal, J=0.0158283±0.10%, D=1.00782±0.00122, NM-134, Lab#=52091								
10	53.80	0.0110	2.112	1.196	46.3	98.8	1114.8	2.5
07	54.51	0.0422	1.094	1.329	12.1	99.4	1130.6	2.3
03	55.35	0.0094	1.332	1.339	54.5	99.3	1142.6	2.2
01	55.67	0.0286	1.055	2.047	17.8	99.4	1148.9	2.0
05	56.08	0.0230	0.9985	1.417	22.1	99.5	1155.3	2.3
08	57.70	0.0163	1.302	2.530	31.3	99.3	1178.7	1.9
02	58.06	0.0041	1.826	1.937	123.6	99.1	1181.8	2.1
04	59.76	0.0076	1.381	1.739	67.1	99.3	1209.3	2.3
09	64.87	0.0298	1.995	1.081	17.1	99.1	1281.3	2.9

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
OOGC-59r musc L:7:134, Muscovite, single crystal, J=0.0156508±0.10%, D=1.00782±0.00122, NM-134, Lab#=52088								
47	54.76	0.0048	1.426	0.853	107.4	99.2	1123.5	2.4
42	55.37	0.0055	2.996	0.911	93.5	98.4	1125.7	2.4
13	55.85	0.0087	1.476	0.709	58.5	99.2	1140.0	3.0
24	55.85	0.0066	0.8553	1.249	76.9	99.5	1142.8	2.3
43	55.77	0.0023	0.3499	3.169	226.1	99.8	1143.9	1.8
50	56.03	0.0042	0.9601	1.382	122.0	99.5	1145.1	1.7
23	56.21	0.0107	1.334	0.884	47.6	99.3	1146.2	2.7
07	56.37	0.0010	1.533	1.939	520.3	99.2	1147.8	1.9
48	56.47	0.0032	1.513	1.613	158.7	99.2	1149.3	2.3
44	56.50	0.0090	1.208	0.764	56.7	99.4	1151.2	3.3
45	56.45	0.0050	0.9828	1.267	101.5	99.5	1151.3	2.2
09	56.46	0.0021	1.023	2.508	243.2	99.5	1151.4	1.7
22	56.64	0.0062	1.251	0.969	82.6	99.3	1153.1	2.1
10	56.57	0.0049	0.9151	1.276	103.9	99.5	1153.6	2.5
37	56.58	0.0061	0.9348	1.315	84.0	99.5	1153.7	2.4
16	56.66	0.0001	0.5401	1.567	7105.9	99.7	1156.6	2.0
01	56.89	0.0002	1.151	0.951	2131.2	99.4	1157.3	2.4
53	56.87	0.0109	1.068	0.600	46.6	99.4	1157.4	3.5
29	57.31	0.0188	2.362	0.535	27.1	98.8	1158.3	3.5
46	56.92	0.0040	0.6377	1.416	128.1	99.7	1160.0	1.9
39	57.18	0.0102	1.091	1.001	49.8	99.4	1162.0	3.4
40	57.20	0.0058	0.9977	1.314	87.6	99.5	1162.7	2.2
35	57.19	0.0055	0.6513	3.270	92.1	99.7	1164.1	1.6
31	57.58	0.0353	1.454	0.858	14.5	99.3	1166.4	2.8
51	57.97	0.0116	1.923	0.914	44.2	99.0	1170.3	2.4
03	57.77	0.0071	0.9310	0.695	72.0	99.5	1171.7	2.8
25	57.99	0.0019	1.216	0.986	264.5	99.4	1173.6	2.6
27	57.95	0.0115	0.7003	1.272	44.4	99.6	1175.3	2.1
52	58.80	0.0116	3.426	0.561	43.9	98.3	1176.0	3.9
33	58.11	0.0037	0.8651	1.372	137.1	99.6	1177.1	2.0
11	58.35	0.0063	1.494	1.023	80.6	99.2	1177.9	2.4
19	58.22	0.0048	0.7183	2.127	106.3	99.6	1179.3	2.3
15	58.52	0.0030	-0.0412	1.082	168.2	100.0	1187.1	2.3
21	58.82	0.0001	0.5461	0.782	4075.1	99.7	1189.1	2.5
04	59.01	0.0023	0.8616	2.640	219.7	99.6	1190.4	1.8
17	59.37	0.0074	1.651	0.982	68.8	99.2	1192.4	2.8
41	60.29	0.0038	0.9628	1.289	136.0	99.5	1209.0	2.2
05	64.16	0.0061	0.6723	1.297	83.6	99.7	1266.4	2.0

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
OOGC-59g musc L:8:134, Muscovite, single crystal, J=0.0156842±0.10%, D=1.00782±0.00122, NM-134, Lab#=52089								
21	54.88	0.0047	0.8959	1.495	109.6	99.5	1129.6	1.9
28	56.44	0.0097	4.725	0.668	52.4	97.5	1136.1	3.1
06	55.42	0.0050	0.8788	1.790	101.7	99.5	1137.9	2.2
27	55.44	0.0017	0.7800	1.170	297.2	99.6	1138.8	2.2
23	55.51	0.0026	0.8944	1.269	193.7	99.5	1139.3	2.2
22	56.16	0.0119	2.650	0.493	42.8	98.6	1141.3	3.7
10	55.86	0.0047	0.8431	3.054	109.1	99.6	1144.8	1.7
24	56.20	0.0033	0.8013	1.481	153.4	99.6	1150.2	2.0
19	56.56	-0.0022	1.692	0.759	-	99.1	1151.8	3.1
16	56.73	0.0041	1.048	1.336	124.3	99.5	1157.1	2.4
26	56.97	0.0092	1.620	0.515	55.7	99.2	1158.3	3.4
04	56.73	0.0022	0.4607	3.807	231.2	99.8	1159.8	1.5
29	56.89	0.0026	0.6517	3.772	198.0	99.7	1161.3	1.6
18	57.20	0.0020	0.7848	1.393	260.8	99.6	1165.5	2.1
08	57.93	0.0093	1.169	1.349	54.7	99.4	1174.9	2.4
14	58.40	0.0032	0.6972	1.368	160.4	99.6	1184.0	2.3
25	59.14	0.0042	1.500	1.150	120.3	99.3	1191.5	2.2
20	59.83	-0.0003	0.5207	2.881	-	99.7	1206.0	1.4

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
OOGC-59g biot L:10:134, Biotite, single crystal, J=0.0157867±0.10%, D=1.00782±0.00122, NM-134, Lab#=52090								
29	46.93	0.0163	8.435	1.691	31.3	94.7	970.7	2.3
10	48.86	0.0236	7.306	0.413	21.6	95.6	1008.3	5.7
19	50.09	0.0129	10.51	0.867	39.4	93.8	1013.1	2.7
04	49.72	0.0136	8.110	0.912	37.6	95.2	1018.5	2.7
23	51.37	0.0144	10.79	1.016	35.5	93.8	1032.8	2.6
27	50.40	0.0166	5.248	1.109	30.7	96.9	1043.5	2.6
32	50.58	0.0340	3.588	1.084	15.0	97.9	1054.4	2.9
12	52.24	0.0219	8.503	0.749	23.3	95.2	1057.9	3.2
24	52.63	0.0133	7.164	0.613	38.3	96.0	1070.4	3.5
28	52.11	0.0149	3.775	0.981	34.2	97.9	1078.1	3.1
22	52.18	0.0122	3.974	0.697	41.7	97.8	1078.3	2.8
26	52.42	0.0183	4.323	1.831	27.9	97.6	1080.6	2.2
06	52.68	0.0119	5.046	1.008	43.0	97.2	1081.2	2.7
31	53.23	0.0099	3.501	1.324	51.7	98.1	1097.2	2.6
14	53.83	0.0070	4.133	1.098	73.3	97.7	1103.7	2.5
20	54.13	0.0089	4.394	1.944	57.3	97.6	1107.2	2.0
13	54.89	0.0142	5.224	0.603	36.0	97.2	1115.3	3.0

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	$^{39}Ar_K$	K/Ca	$^{40}Ar^*$	Age	±1σ
			(x 10^{-3})	(x 10^{-15} mol)		(%)	(Ma)	(Ma)
H02-71-3-mu, G1:158, single crystal muscovite, J=0.0117±0.16%, D=1.0052±0.00121, NM-158, Lab#=53631								
24	74.56	-0.0062	1.847	0.488	-	99.3	1138.7	5.9
19	76.10	0.0031	4.714	1.333	165.6	98.2	1146.7	3.0
15	75.29	0.0014	1.941	4.736	364.9	99.2	1146.9	1.9
23	75.78	-0.0001	3.106	0.699	-	98.8	1148.4	4.3
16	75.29	0.0018	0.6349	3.043	275.9	99.8	1151.2	2.1
17	75.34	-0.0009	0.2962	1.784	-	99.9	1152.9	2.6
11	76.30	0.0036	2.854	3.722	142.8	98.9	1155.2	2.2
04	76.32	0.0032	1.898	2.032	160.0	99.3	1158.6	2.7
18	76.15	0.0019	0.1848	2.724	267.7	99.9	1162.5	2.3
07	77.10	-0.0032	1.266	2.327	-	99.5	1169.6	2.8
13	77.40	0.0026	1.525	1.802	193.3	99.4	1172.0	3.1
01	76.89	-0.0038	-0.7618	3.461	-	100.3	1173.9	3.0
21	79.81	0.0063	8.489	0.351	80.4	96.9	1176.0	8.6
05	78.01	0.0001	1.455	2.344	6214.4	99.4	1179.1	2.2
06	78.59	-0.0030	2.886	1.112	-	98.9	1180.9	3.4
14	78.32	0.0002	0.8291	1.955	2089.3	99.7	1184.7	3.1
20	78.81	0.0035	2.136	1.381	146.6	99.2	1185.9	3.4
03	79.83	0.0052	5.546	0.375	98.4	97.9	1186.0	7.1
12	79.76	0.0011	1.319	5.095	452.5	99.5	1199.1	2.0
08	80.92	-0.0020	2.559	3.569	-	99.1	1207.9	2.3
25	81.55	-0.0036	2.488	0.570	-	99.1	1215.0	5.6

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ ($\times 10^{-3}$)	$^{39}Ar_K$ ($\times 10^{-15}$ mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
H02-71-9-mu, G2:158, single crystal muscovite, J=0.0117±0.16%, D=1.0052±0.00121, NM-158, Lab#=53632								
06	73.69	0.0057	3.244	1.569	88.8	98.7	1124.1	2.9
18	74.12	0.0024	2.442	1.317	211.2	99.0	1131.7	3.0
01	74.53	0.0034	2.882	2.373	148.8	98.9	1134.9	2.4
16	74.75	0.0084	3.263	0.240	60.5	98.7	1136.1	11.7
03	74.30	0.1336	0.7816	1.085	3.8	99.7	1139.6	3.2
22	75.65	0.0028	4.035	0.922	182.6	98.4	1143.9	4.5
12	76.17	0.0031	2.967	1.387	167.2	98.8	1153.4	4.3
23	75.97	0.0091	1.557	3.284	56.4	99.4	1155.8	2.1
14	80.49	-0.0167	15.79	0.110	-	94.2	1159.3	23.9
04	76.13	-0.0056	0.3036	0.521	-	99.9	1161.8	6.6
17	75.86	-0.0151	-2.4411	0.097	-	100.9	1167.9	26.6
09	77.71	0.0004	1.607	2.938	1311.6	99.4	1175.3	2.3
15	77.77	0.0036	1.717	1.108	141.2	99.3	1175.6	3.6
02	77.87	0.0004	1.572	2.291	1402.8	99.4	1177.2	2.6
05	78.25	-0.0015	0.4948	1.111	-	99.8	1185.1	3.7
20	78.91	0.0027	0.8952	2.733	188.2	99.7	1191.0	2.5
08	80.64	-0.0080	3.542	0.316	-	98.7	1201.6	8.3
19	80.39	0.0045	1.254	2.440	113.7	99.5	1206.3	2.3
11	86.31	0.0067	1.314	2.279	75.9	99.6	1270.3	3.0

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
H02-71-16.5-mu, G3:158, single crystal muscovite, J=0.0117±0.16%, D=1.0052±0.00121, NM-158, Lab#=53633								
08	83.86	0.0209	42.27	0.883	24.4	85.1	1108.3	4.5
24	72.74	-0.0014	3.806	0.407	-	98.5	1111.1	6.4
26	74.98	0.0003	7.016	0.357	1459.4	97.2	1126.0	7.1
20	74.57	-0.0045	5.498	0.460	-	97.8	1126.5	5.5
03	75.16	0.0062	1.287	0.830	82.4	99.5	1147.5	4.2
04	75.80	0.0066	0.1895	1.113	77.4	99.9	1158.4	3.4
13	75.94	-0.0026	0.6599	1.239	-	99.7	1158.5	3.1
17	77.08	0.0005	2.267	1.941	952.6	99.1	1166.0	2.6
15	78.22	0.0009	2.703	1.501	567.8	99.0	1177.4	2.7
12	77.70	0.0050	-0.6824	1.159	102.7	100.3	1182.8	3.3
19	79.56	-0.0020	5.158	0.654	-	98.1	1184.3	4.6
01	81.28	0.0161	10.49	1.642	31.7	96.2	1185.9	2.8
09	78.85	0.0047	1.890	1.662	108.9	99.3	1187.1	3.1
07	79.84	0.0072	4.643	0.813	70.5	98.3	1189.0	4.5
16	79.49	-0.0003	1.528	2.354	-	99.4	1195.4	2.4
06	80.00	0.0036	2.522	2.357	142.2	99.1	1197.8	2.5
14	79.43	-0.0001	-0.1780	1.660	-	100.1	1200.3	2.6
23	83.89	0.0016	2.650	1.366	319.5	99.1	1240.0	2.9
11	84.30	0.0021	1.099	1.478	239.4	99.6	1249.4	2.9

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
H02-71-43-mu, G4:158, single crystal muscovite, J=0.0117±0.16%, D=1.0052±0.00121, NM-158, Lab#=53634								
02	73.93	-0.0026	3.145	0.839	-	98.7	1127.1	4.0
13	74.60	0.0083	5.330	0.493	61.5	97.9	1127.4	5.8
04	74.39	-0.0042	2.220	0.874	-	99.1	1135.6	4.2
20	75.59	-0.0006	5.622	0.592	-	97.8	1137.9	5.1
03	78.16	0.0219	11.81	0.684	23.2	95.5	1146.3	5.2
05	75.57	-0.0054	-0.9703	1.142	-	100.4	1159.8	3.0
23	76.09	-0.0153	-0.1822	0.275	-	100.1	1163.0	10.4
18	78.39	-0.0004	6.493	1.106	-	97.6	1166.7	3.4
10	76.36	-0.0114	-2.1473	0.436	-	100.8	1172.6	6.2
19	77.80	-0.0010	2.495	1.759	-	99.1	1173.4	2.7
08	77.21	-0.0027	0.3464	0.938	-	99.9	1173.8	4.3
12	78.32	-0.0072	2.206	0.477	-	99.2	1180.1	5.9
22	79.16	0.0004	2.936	1.735	1206.7	98.9	1187.1	2.8
15	80.50	0.0083	5.381	0.422	61.7	98.0	1194.0	6.2
06	81.80	-0.0038	0.6752	1.250	-	99.8	1223.6	3.4
07	82.65	-0.0178	-4.7503	0.247	-	101.7	1250.2	9.1

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
H02-71-124-mu, G5:158, single crystal muscovite, J=0.0117±0.16%, D=1.0052±0.00121, NM-158, Lab#=53635								
21	82.46	0.0051	44.65	0.167	100.6	84.0	1083.6	16.1
16	76.77	0.0160	24.02	0.781	31.9	90.8	1088.4	5.3
15	85.66	0.0092	53.46	0.356	55.8	81.6	1090.6	9.2
25	78.83	0.0109	26.81	0.650	46.7	89.9	1102.9	5.1
17	75.15	0.0082	14.22	0.345	62.4	94.4	1103.3	9.2
14	83.19	0.0174	38.72	3.504	29.2	86.2	1112.7	2.8
09	78.14	0.0146	21.59	0.681	34.9	91.8	1112.8	4.6
22	107.0	0.0378	114.4	0.859	13.5	68.4	1129.1	5.8
23	77.93	0.0298	14.22	0.181	17.1	94.6	1135.6	14.0
11	75.03	0.0023	1.380	1.021	223.6	99.5	1145.7	3.5
01	76.31	0.0007	1.161	8.577	748.2	99.6	1161.0	2.0
24	79.42	0.0009	11.23	0.131	575.5	95.8	1162.6	17.9
10	77.43	0.0012	1.079	4.122	419.0	99.6	1173.9	2.3
13	77.93	0.0004	1.397	2.658	1246.8	99.5	1178.5	2.4
07	79.82	0.0006	1.321	2.944	911.2	99.5	1199.7	2.5
12	81.57	0.0029	1.713	1.849	178.3	99.4	1217.8	2.9
02	82.89	0.0050	1.242	4.349	102.6	99.6	1233.7	1.9
03	84.69	0.0043	3.122	2.307	117.6	98.9	1247.2	2.2
06	94.89	0.0005	2.729	3.766	1000.2	99.2	1355.3	2.8
05	95.47	-0.0007	1.517	1.872	-	99.5	1364.7	2.8

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
H02-71-174-mu, H1:158, single crystal muscovite, J=0.0117±0.16%, D=1.0052±0.00121, NM-158, Lab#=53637								
17	67.50	1.603	-6.8732	0.242	0.32	103.2	1089.4	9.5
03	74.35	-0.0004	2.438	0.938	-	99.0	1134.3	3.9
22	73.82	0.0071	-0.3312	0.716	72.0	100.1	1137.6	4.5
23	73.91	0.0119	-0.4458	0.376	42.8	100.2	1139.2	7.1
19	76.79	-0.0077	9.013	0.237	-	96.5	1140.1	11.8
07	76.34	0.0258	6.603	0.214	19.8	97.4	1143.1	12.2
06	75.34	0.0172	2.898	0.570	29.6	98.9	1144.1	5.5
04	75.83	0.0025	4.343	0.617	204.0	98.3	1144.8	5.3
02	75.67	-0.0011	1.918	0.924	-	99.3	1151.2	3.5
09	76.47	0.0197	4.615	0.530	25.9	98.2	1151.3	5.8
16	75.54	0.0762	-2.2596	0.365	6.7	100.9	1163.8	6.7
01	76.77	0.0019	-0.1076	1.079	268.3	100.0	1170.5	3.4
13	77.11	0.0058	0.7660	0.410	88.5	99.7	1171.4	6.9
15	77.10	0.0087	0.2598	1.313	58.7	99.9	1173.0	3.0
12	80.13	0.0096	1.344	0.609	53.0	99.5	1203.1	5.2
11	81.10	0.0126	3.619	0.767	40.5	98.7	1206.4	4.5
05	83.49	-0.0025	4.994	0.668	-	98.2	1228.2	4.4
21	85.58	-0.0053	9.409	0.306	-	96.7	1236.7	9.9
20	84.32	-0.0050	4.220	0.493	-	98.5	1239.7	6.4
08	88.05	0.0209	6.107	0.507	24.4	98.0	1273.7	6.1
18	88.56	-0.0001	2.172	1.145	-	99.3	1291.5	3.6
10	89.95	0.0063	2.624	0.734	81.1	99.1	1304.6	4.5

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
H02-71-181-mu, G6:158, single crystal muscovite, J=0.0117±0.16%, D=1.0052±0.00121, NM-158, Lab#=53636								
05	80.75	0.0251	21.70	0.182	20.3	92.1	1142.5	13.7
03	75.59	0.0092	2.788	2.799	55.5	98.9	1147.4	2.4
02	75.75	0.0077	2.016	1.337	66.6	99.2	1151.8	2.9
21	75.35	0.0144	-0.5836	0.333	35.3	100.2	1156.0	8.1
22	76.61	0.0091	1.638	2.026	56.0	99.4	1162.8	2.5
23	76.66	-0.0157	1.667	0.253	-	99.4	1163.3	10.9
11	76.85	-0.0110	1.380	0.239	-	99.5	1166.4	11.4
20	76.84	0.0120	0.8718	1.457	42.6	99.7	1168.0	2.7
16	77.67	0.0122	2.581	1.081	42.0	99.0	1171.6	3.5
12	77.66	0.0028	1.389	1.479	184.7	99.5	1175.5	3.0
18	79.64	0.0032	3.047	1.043	161.8	98.9	1192.1	3.7
25	78.20	-0.0173	-9.2720	0.156	-	103.5	1216.4	17.0
13	81.70	0.1863	1.596	1.645	2.7	99.4	1219.9	2.8
07	83.37	0.0055	2.263	1.071	92.4	99.2	1235.6	3.5
10	84.56	0.0022	4.898	1.019	234.4	98.3	1240.1	3.6
04	84.86	0.0156	2.989	1.462	32.7	99.0	1249.5	3.2
09	84.77	0.0038	2.243	1.200	134.7	99.2	1250.9	3.1
14	85.05	0.0042	2.004	1.243	120.5	99.3	1254.6	3.6
17	85.87	0.1382	2.810	1.701	3.7	99.0	1261.0	3.1
24	86.70	-0.0045	-0.5582	0.393	-	100.2	1280.3	8.1
01	90.42	0.0041	2.353	1.812	124.1	99.2	1310.3	2.7
15	91.37	-0.0002	1.159	0.807	-	99.6	1323.9	4.5
08	91.77	0.0831	1.095	1.488	6.1	99.7	1328.3	3.5
06	101.6	0.0159	3.898	0.594	32.1	98.9	1419.2	5.9
19	101.3	0.0075	1.053	0.659	67.8	99.7	1423.9	5.3

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
H02-71-200.2-mu, H2:158, single crystal muscovite, J=0.0117±0.16%, D=1.0052±0.00121, NM-158, Lab#=53638								
03	75.41	0.0144	7.378	0.221	35.3	97.1	1129.8	10.6
13	74.15	-0.0072	-0.7158	0.280	-	100.3	1142.7	11.6
06	75.82	-0.0020	1.615	1.245	-	99.4	1153.9	3.0
19	76.35	-0.0053	0.4194	0.745	-	99.8	1164.0	4.7
17	76.47	0.0064	-0.0246	0.568	80.2	100.0	1166.7	5.5
24	75.66	0.0041	-3.2248	0.269	124.9	101.3	1168.3	8.4
22	78.37	0.0048	1.515	0.863	105.7	99.4	1183.0	4.0
23	78.17	0.0029	0.6582	1.553	177.1	99.8	1183.6	2.6
02	79.32	0.0390	2.995	2.364	13.1	98.9	1188.7	2.2
07	78.93	-0.0006	0.8920	1.412	-	99.7	1191.3	3.2
09	79.25	0.0315	1.848	2.242	16.2	99.3	1191.8	2.6
10	78.71	0.1572	-5.2265	0.143	3.2	102.0	1209.1	21.9
08	81.55	0.0003	0.8196	2.415	1695.0	99.7	1220.4	2.4
20	81.05	-0.0052	-1.3869	1.088	-	100.5	1222.1	3.4
11	81.75	0.0018	0.5001	0.687	283.4	99.8	1223.6	6.0
05	82.38	0.0050	2.145	1.074	102.1	99.2	1225.3	3.2
26	82.21	0.0072	1.392	1.091	70.7	99.5	1225.8	3.4
25	82.35	0.0044	1.328	1.059	117.1	99.5	1227.5	3.3
16	82.16	0.0025	0.0171	1.605	203.4	100.0	1229.7	2.7
14	82.31	0.0027	-0.0347	0.929	189.5	100.0	1231.5	3.6
12	83.27	0.0002	0.3092	4.314	2143.7	99.9	1240.9	2.2
04	83.93	0.0057	2.100	1.441	90.0	99.3	1242.3	2.9
18	83.27	-0.0057	-4.2524	0.432	-	101.5	1255.3	6.4
01	85.76	0.0265	2.195	1.033	19.3	99.2	1261.7	3.7
15	86.96	0.1184	-1.9714	0.386	4.3	100.7	1287.6	6.7

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
SC-99-4, mu, F1:171, muscovite, J=0.0191207±0.05%, D=1.00562±0.00081, NM-171, Lab#=54340								
147	17.82	-0.1685	49.08	0.021	-	18.4	111.0	227.1
158	19.86	-0.0869	42.93	0.031	-	36.0	233.7	127.1
42	17.77	0.0294	8.786	0.240	17.3	85.4	464.6	16.0
19	19.07	0.0164	9.406	0.361	31.2	85.4	494.5	13.5
61	17.06	-0.1412	-0.5938	0.180	-	101.0	519.0	23.6
92	15.52	-0.0775	-7.0558	0.115	-	113.5	529.1	33.9
23	22.66	0.1567	12.69	0.204	3.3	83.6	563.8	15.5
25	32.79	0.5151	44.99	0.012	0.99	59.6	579.9	199.5
127	15.50	0.3855	-14.4357	0.092	1.3	127.8	585.9	35.8
98	20.66	-0.0764	-5.0908	0.068	-	107.3	644.5	57 3
27	22.24	0.0674	-0.4481	0.093	7.6	100.7	649.9	32.3
96	25.87	-0.0325	10.66	0.145	-	87.8	658.2	26.2
55	22.50	-0.2086	-1.6469	0.099	-	102.1	664.2	39.3
68	31.59	0.0679	27.91	0.032	7.5	74.0	674.0	110.5
110	19.31	-0.6193	-15.1982	0.065	-	123.1	683.0	56.1
64	30.16	0.0898	13.17	0.063	5.7	87.1	742.9	54.6
125	29.10	-0.2000	9.344	0.022	-	90.6	745.0	139.5
59	33.61	-0.2772	15.09	0.043	-	86.7	807.9	85.2
153	21.30	-0.0611	-31.1765	0.006	-	143.4	839.0	484.2
108	40.11	-1.5927	24.71	0.018	-	81.5	885.0	174.8
40	39.66	0.0387	14.63	0.173	13.2	89.2	942.8	20.8
36	47.59	-0.0513	22.19	0.065	-	86.2	1057.1	41.1
14	41.22	0.1333	-1.3135	0.076	3.8	101.0	1069.0	41.0
103	42.74	0.0012	-0.6969	1.498	412.7	100.5	1094.2	4.9
114	45.86	0.0067	2.775	1.326	76.3	98.2	1133.9	5.7
123	39.89	0.9938	-17.3819	0.016	0.51	113.1	1136.2	182.3
85	47.99	-0.0029	0.9085	1.123	-	99.4	1183.5	5.7
145	48.61	-0.0019	0.7511	1.447	-	99.5	1195.6	4.8
132	51.24	0.0040	4.699	1.405	127.7	97.3	1222.0	5.8
155	50.84	0.0047	0.3472	1.289	107.8	99.8	1237.9	6.4
45	51.26	0.0006	0.5848	3.193	831.2	99.7	1243.9	3.7
115	52.43	-0.0001	4.072	1.535	-	97.7	1246.4	5.3
49	51.86	-0.0003	2.035	1.571	-	98.8	1247.0	3.8
117	52.44	-0.0103	1.779	1.140	-	99.0	1258.5	5.9
119	54.73	-0.0147	3.645	0.530	-	98.0	1288.8	12.5
74	54.46	0.0071	2.248	1.695	71.7	98.8	1291.3	4.7

$^{40}Ar/^{39}Ar$ analytical data for total fusion crystals

ID	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$ (x 10^{-3})	$^{39}Ar_K$ (x 10^{-15} mol)	K/Ca	$^{40}Ar^*$ (%)	Age (Ma)	±1σ (Ma)
34	55.54	0.0030	1.706	1.581	169.2	99.1	1312.5	4.3
62	56.78	0.0009	1.586	1.153	599.3	99.2	1334.0	4.7
157	56.73	-0.0232	0.5687	0.753	-	99.7	1338.1	7.9
138	57.57	-0.0015	2.805	1.773	-	98.6	1341.3	4.9
79	57.90	-0.0072	1.536	1.468	-	99.2	1353.1	4.6
15	59.78	-0.0040	7.645	0.840	-	96.2	1354.3	7.9
94	58.48	-0.0258	-1.2053	0.597	-	100.6	1376.0	9.7
78	59.27	-0.0070	0.5723	1.654	-	99.7	1380.3	3.3
76	60.97	0.0046	1.883	4.867	110.3	99.1	1401.8	3.1
106	61.32	-0.0296	1.291	1.001	-	99.4	1410.1	8.5
130	61.73	0.0238	2.604	0.768	21.4	98.8	1410.6	7.6
140	61.76	0.0037	2.602	0.801	137.8	98.8	1411.1	7.5
121	61.32	0.0216	1.040	0.752	23.6	99.5	1411.5	9.2
51	61.17	-0.0011	0.0647	1.405	-	100.0	1413.6	5.6
101	62.19	0.0119	2.334	0.697	42.8	98.9	1419.3	8.2
91	61.49	-0.0044	-0.6111	1.150	-	100.3	1422.0	6.1
66	62.45	-0.0043	1.845	1.040	-	99.1	1425.7	7.2
47	61.99	-0.0052	0.1107	2.432	-	99.9	1426.5	3.5
105	61.70	0.0005	-1.0893	1.471	1006.1	100.5	1427.6	4.5
112	62.80	-0.0435	2.439	0.529	-	98.8	1428.5	11.2
38	62.86	-0.0109	2.086	0.543	-	99.0	1431.2	11.1
134	63.43	0.0072	3.113	1.114	70.4	98.5	1435.4	8.1
08	62.46	0.0024	-0.3311	3.362	211.8	100.2	1436.2	4.0
70	64.42	0 0056	5.190	1.356	90.4	97.6	1441.4	5.1
81	63.06	-0.0143	-0.2516	2.303	-	100.1	1445.3	3.8
89	63.36	0.0031	-0.2687	0.939	162.7	100.1	1450.1	5.5
12	64.13	0.0013	0.2659	3.106	405.3	99.9	1459.7	3.3
28	64.25	-0.0059	0.5186	2.299	-	99.8	1460.5	3.6
57	64.31	-0.0077	0.1229	3.186	-	99.9	1463.2	3.2
100	65.67	0.0008	-0.2490	1.691	652.9	100.1	1486.2	3.8
128	69.08	0.0153	3.394	0.917	33.4	98.5	1521.9	7.6
151	75.10	-0.0222	-0.8653	0.954	-	100.3	1629.1	6.6