$^{40}Ar/^{39}Ar$ Dates from the Harquahala and Little Harquahala Mountains, west-central Arizona. Part I

by
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INTRODUCTION

This report includes the analytical data for four $^{40}Ar/^{39}Ar$ cooling dates from samples collected in the Harquahala and Little Harquahala Mountains of west-central Arizona. The samples were collected to constrain the cooling history and timing of mineralization in this area [Richard et al., 1990; Richard, 1988]. Analyses were done at Stanford University. For each of the 4 samples described here, an incremental thermal release age spectra is included, along with a table summarizing the data used to calculate ages, and a table of raw data from each temperature increment. Argon correlation diagrams are included for each sample, on which the ratio of ^{40}Ar (radiogenic and atmospheric) to ^{36}Ar is plotted against the ratio $^{39}Ar/^{36}Ar$. The regression lines used to calculate isochron ages are indicated on the plots. Regressions were calculated using a simple least squares method. For the hornblende samples, a K/Ca ratio plot is included above the age spectra to provide an indication of the compositional consistency of the degassed material in each temperature increment. All ages are reported with 1σ uncertainties.

SAMPLE DESCRIPTIONS

2-1-86: Brown's Canyon granite. Location: lat. 33° 49.95'N, long 113° 14.04'E; Tiger Well, AZ 7 1/2' quadrangle or Aguila 15' AZ quadrangle. Collected from outcrops in the channel of a major wash. Medium fine-grained, equigranular, unfoliated, biotite-muscovite-garnet monzogranite. Outcrops are fractured and jointed, with minor hematitic alteration along the joints. Sample was trimmed from block bounded by joints and selected to be as free as possible of alteration. Sample location is about 80 m horizontally from the Eagle Eye detachment fault, and is closest unfoliated rock to detachment fault. Original distance from Eagle Eye fault estimated to have been 20-25 m. Biotite from this sample yielded a plateau date of 20.0 Ma, that is interpreted to record cooling during Miocene extension. The crystallization age of this pluton is 72±7 Ma [Isachsen et al., 1998].

3-2-86: Granite Wash Granodiorite; Location: lat. 33° 44.51', long. 113° 40.45'; Hope, AZ 7 1/2' quadrangle or Hope AZ 15' quadrangle. Sample collected from road cut along Highway 60. Medium-grained, equigranular hornblende-biotite granodiorite. Intrudes highly deformed Mesozoic sandstone, siltstone and conglomerate correlated with the McCoy Mountains Formation [Laubach and others, 1987; Richard and others, 1987]. Conventional biotite K-Ar ages of 66.5 and 70.8 ma have been reported from this unit [Shafiqullah and others, 1980; Eberly and Stanley, 1978]. A 5-10 m thick hornblende-hornfels facies contact metamorphic aureole around the southern margin of the pluton overprints a regional sub-greenschist-grade cleavage in surrounding Mesozoic metasedimentary rocks. Pluton is abundantly fractured with pervasive weak alteration of biotite to chlorite and hornblende to epidote and actinolite, especially near fractures. Sample was taken from the core of a 40 cm-diameter block, trimmed to obtain material as far removed from fractures as possible. Hornblende from this sample has yielded an apparent cooling age of 79.3±0.4 Ma. This sample was run to improve the precision of the previously obtained date.

03-03-87-09: Amphibolite gneiss, Location: lat. 33° 41.8751' N, long. 113° 34.9438'; Harrisburg Valley, AZ 7 1/2' quadrangle. Northeastern Little Harquahala Mountains. Sample collected in wash just east of a jeep trail; 10250 feet (3100m) east of Harquar peak. Elevation: 2100 feet. Amphibolite-plagioclase gneiss, from inclusion in leucogranite. Amphiboles slightly retrograded to biotite and chlorite. Amphibolite inclusion is ~10 m long. Map unit consists of fine-grained non-foliated to weakly foliated aplitic leucogranite with abundant inclusions of amphibole-rich gneiss. Gneiss is poly-deformed.

Early gneissic banding (S_1) is transposed by isoclinal folds; prominent foliation in outcrop is axial-planar to these folds (S_2). Leucogranite dikes parallel to this foliation post-date the isoclinal folding, but contain a weak foliation (shape fabric) parallel to the axial-planar foliation (S_2). Anastamosing disjunct cleavage and retrogression are associated with low-angle faults interpreted to be Mesozoic thrust faults [Reynolds et al., 1986]. Sample was collected to determine a minimum age for high-grade metamorphism affecting these rocks.

75-muscovite: Sericitized granite tectonite. Location: lat. 33° 46.9598'N, long. 113° 28.7461'W; Socorro Peak, AZ 7 1/2' quadrangle. Collected from a shear zone in the bulldozer cut at the San Marcos Mine. Protolith is Proterozoic muscovite granite of the Centennial suite [Richard, 1988]. Granite was altered to produce sericite from feldspars and mica; disseminated pyrite in the assemblage is now oxidized to hematite. Alteration assemblage is overprinted by cleavage related to thrust faults in western Harquahala Mountains [Richard et al, 1990; Reynolds et al, 1986]. Dated rock consists of quartz, white mica, and hematite (replacing pyrite at least in part). White mica grain size is 0.15-0.2 mm; mica grains define a schistosity that is crenulated by pressure solution or shear bands. The crenulation defines the megascopic foliation most apparent in outcrop. The megascopic foliation is parallel to the shear zone that cuts altered muscovite granite. Muscovite from the protolith muscovite granite of the Centennial plate yielded a $^{40}Ar/^{39}Ar$ age spectra with continuously increasing apparent ages in each step. The oldest apparent age obtained was 1160 Ma; these data are interpreted to indicate that the granite is Proterozoic in age [Richard, 1988].

ANALYTICAL TECHNIQUES

Mineral separates were prepared using standard separation techniques with a Frantz magnetic separator, heavy liquids, and paper shaking. Approximately 1 mg of K-feldspar, muscovite, and biotite or 10 mg of hornblende were hand picked to 100% purity. Mineral separates were washed in water, ethanol, and acetone, packaged in aluminum foil capsules and sealed in quartz vials in air. Samples were irradiated in the Central Thimble facility at the TRIGA reactor, U. S. Geological Survey, Denver, Colorado; the sample package was rotated during irradiation to minimize circumferential flux variations. Samples included in this study were irradiated in two different packages. The first package (XCIV) was irradiated without incident. During irradiation of the second group of samples, the sample container was placed in the reactor upside down during the first attempted irradiation (7/1991), and received a total neutron flux less than .5% of the desired irradiation. The samples were reloaded in quartz vials, along with several new monitors and several duplicates of samples already in the package, and returned to the reactor. The samples were fully irradiated in 9/1991. Analysis of duplicate samples that had experienced one or both of the irradiations yielded results not different within error. Fish Creek sanidine was used as a monitor mineral, with an assigned age of 27.895±.100 Ma.

Gases, including argon, were extracted from the irradiated mineral samples in a tantalum resistance furnace. Sample material in the furnace was contained in a close-fitting molybdenum liner inside a tantalum crucible in order to reduce corrosion of the tantalum due to reactions with silicate minerals. The aluminum foil packet containing the samples melted between 700° and 750° C, releasing a significant atmospheric Ar. Argon was purified from the extracted gas mixture by SAES getters. Temperatures of heating increments were monitored by a thermocouple in contact with the outside of the tantalum crucible. Accuracy is estimated to be ± 5° C. Each step included 2 minutes of heating; peak temperatures were maintained 10 minutes for K-feldspar and muscovite, and 15 minutes for biotite and hornblende; 4-6 minutes were allowed for cooling and equilibration with getters. The isotopic composition of the extracted and purified argon was measured with a MAP Model 216 mass spectrometer. Corrections for irradiation-produced argon isotopes are those reported by Dalrymple and others [1981]. Apparent K/Ca ratios were calculated using the equation given in Dalrymple et al. [1981]. All errors quoted are 2σ.

Reactor constants used: $(^{36}Ar/^{37}Ar)_{Ca}$: 2.64×10^{-4}
$(^{39}Ar/^{37}Ar)_{Ca}$: 6.73×10^{-4}
$(^{40}Ar/^{39}Ar)_{K}$: 1×10^{-3}.

Decay constants used: ^{37}Ar: 2.286×10^{-7}/sec; ^{39}Ar: 8.165×10^{-11}/sec; ^{40}K: 5.543×10^{-10}/year.

INTERPRETATION

2-1-86: Brown's Canyon granite. Total gas date is 29.3 Ma (weighted mean of all gas fractions, weighted by fraction of ^{39}Ar released. An isochron date of 29.8±0.2 Ma for steps 1-8, and 12-13 is quite close to the total gas date, and is not statistically different from mean date of 29.7±0.1 calculated from steps 4-14. Geologically, the difference between these dates is is not considered significant.

The muscovite cooling age of ~29.5 Ma is intermediate between the crystallization age of the granite (~72 Ma) and the biotite cooling age of 20 Ma from this sample [Richard et al, 1990]. This indicates either slow, post-intrusion cooling of the pluton, or argon-loss during an early Miocene thermal event.

3-2-86: Granite Wash Granodiorite. Plateau date: 78.6±0.4 Ma, based on 82% of the gas, released in 6 increments between 1075° and 1450°C. Isochron date is 78.4±0.6 Ma, based on all steps in the incremental release spectra. The plateau date and isochron dates are not statistically different.

This date records cooling of the Granite Wash Granodiorite through a temperature of about 500°C.

3-3-87-09: Amphibolite gneiss. Plateau date: 169.5±0.8Ma, based on 57% of gas, released in 4 increments between 1125° and 1450°C. An isochron date of 168.8±0.8 was calculated for steps 1-9 and 11. Step 10 was not used because the ^{36}Ar correction for interference from calcium-derived argon resulted in a value of less than 0. The plateau date and isochron date are not statistically distinct. The slightly younger isochron date is related to the high $^{40}Ar/^{36}Ar$ initial ratio calculated from the regression. Excess ^{40}Ar is a distinct possibility if this amphibolite had a Proterozoic protolith and experienced a Jurassic metamorphic event.

This date records cooling of the sample below a temperature of about 500°C. This date indicates that the crystalline complex in the Hercules Plate of the northeastern Little Harquahala Mountains [see Spencer et al., 1985; Reynolds et al., 1986] may have undergone a major deformation and metamorphism event in middle Jurassic time.

75-musc: Sericitized granite tectonite. Plateau date: 55.7±0.1 Ma, based on 54% of gas, released in 8 increments, 800°-925°C. The isochron date is 55.4±0.1 Ma, based on steps 1-9 and 11. Step 10 (experiment 2B1207) was not used because the corrected ^{36}Ar value is less than the uncertainty of the peak voltage measurement. Steps 12-18 could not be used for isochron analysis because the corrected ^{36}Ar values are less than 0. Given the high analytical precision of these numbers, the difference between the plateau and isochron dates is statistically significant. This difference is not geologically significant. The slightly younger isochron date is related to the initial $^{40}Ar/^{36}Ar$ ratio of 291±4, slightly lower than the assumed atmospheric $^{40}Ar/^{36}Ar$ ratio of 299.

This date indicates a minimum age for mineralization and deformation in the San Marcos Mine area, demonstrating that the sericitic alteration in this area is pre-Middle Tertiary.

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TABLES

Constant	Value
Reactor Calcium [36/37]	0.000264
Reactor Calcium [39/37]	0.000673
Reactor Potassium [40/39]	0.001
$\lambda^{37}Ar$	2.29E-07
$\lambda^{39}Ar$	8.17E-11
$\lambda^{40}Ar$	5.54E-10

Table 1. Reactor constants

Interval Number	Day Removed	Time Removed (UT)	Julian Day (UT)	Reactor Power (MW)	Irradiation duration (hours)
1	7/11/91	20:15	31969.17708	0.001	4.25
2	7/12/91	19:40	31970.15278	0.001	6.50
3	7/15/91	21:59	31973.24931	0.001	9.25
4	7/16/91	20:18	31974.17917	0.001	8.00
5	7/17/91	20:34	31975.19028	0.001	6.50
6	7/18/91	20:09	31976.17292	0.001	4.00
7	9/16/91	17:43	32036.07153	1	5.00
8	9/16/91	19:58	32036.16528	1	2.00
9	9/17/91	20:16	32037.17778	1	6.85
10	9/17/91	22:02	32037.25139	1	1.60
11	9/18/91	21:38	32038.23472	1	9.00
12	10/1/91	22:17	32051.26181	1	4.50
13	10/2/91	22:06	32052.25417	1	9.00
14	10/3/91	22:02	32053.25139	1	9.50
15	10/4/91	21:01	32054.20903	1	6.50

Table 2. Irradiation History. Stanford Irratiation #CI, Samples in Vial A.

FIGURES AND TABLES

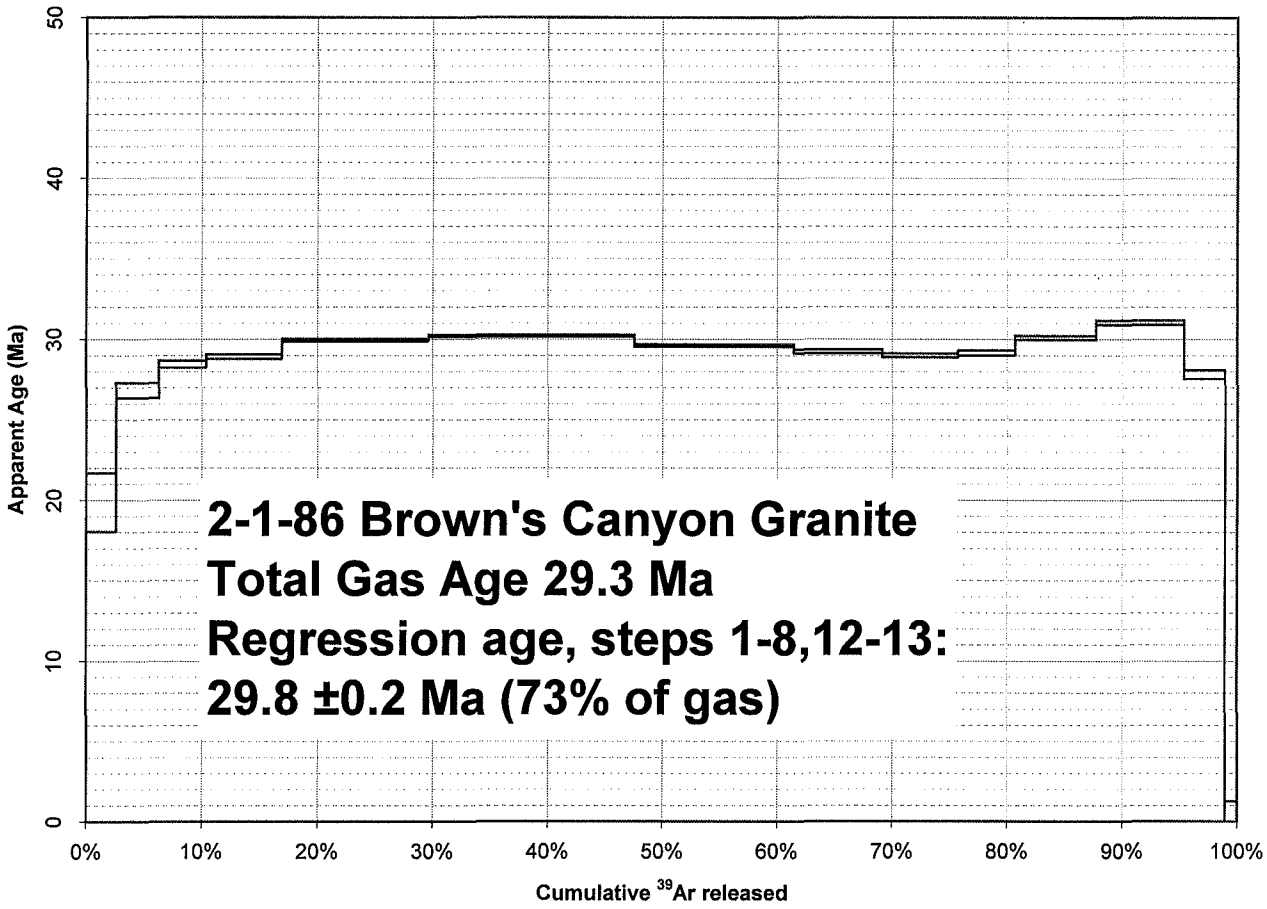
For each of the four samples discussed, this section includes an age spectra plot, isotope correlation plot, a table of reduced data, and a table of raw data.

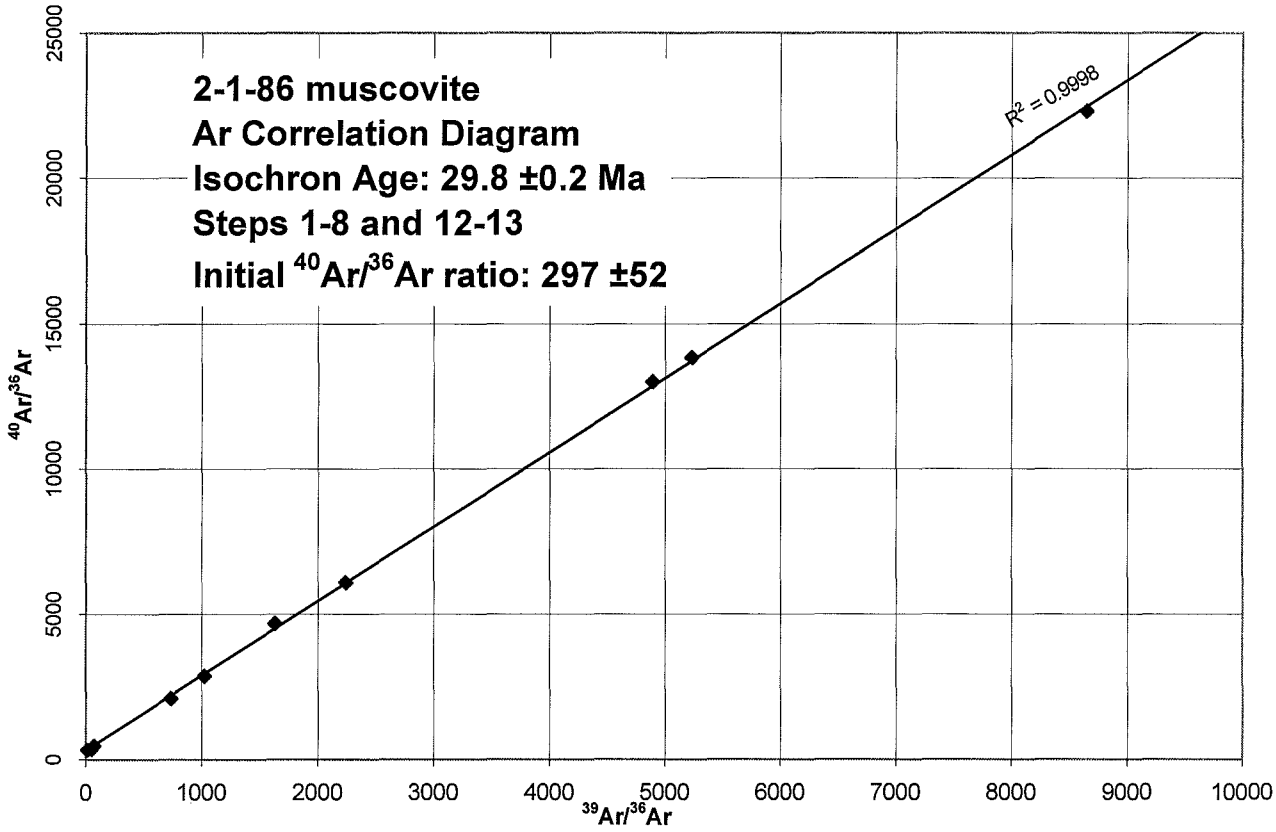
The age spectra plots the apparent age (Y axis) against cumulative fraction (as a percent) of ^{39}Ar released. The minimum and maximum apparent ages for each step heating experiment are determined by adding the uncertainty from the apparent age for each step. The two lines on these plots represent these minimum and maximum apparent ages.

The argon isotope correlation plots show $^{40}Ar/^{36}Ar$ plotted against $^{39}Ar/^{36}Ar$. The slope of a line through these points is a measure of the $^{40}Ar/^{39}Ar$ ratio (F) used to calculate a regression age using the standard age formula. For step-heating increments that yielded a 100% radiogenic yield, the ^{36}Ar value is 0 and a point could not be plotted. Thus, not all contiguous steps used to calculate plateau or average ages could be used in the regression calculations.

The reduced data tables summarize the data used for age calculation. The table includes columns for: *Step*--sequential number of each step heating increment; *Exp't*--the Stanford Laboratory Experiment number for the mass spectrometer run that provided the data used (these will be sequential unless a gas fraction had to be split or blanks were run during the course of the step heating experiment); *temp*--the thermocouple temperature in the furnace during degassing of a step; *fraction39Ar*--the percent of the total ^{39}Ar released during each degassing step (total ^{39}Ar value is reported in the upper right corner of the table, in volts; I do not have the sensitivity value for the mass spectrometer during these experiments to convert this to moles); *Age*--the apparent age and 1σ uncertainty for the calculated age; *F*--the $^{40}Ar/^{39}Ar$ ratio used to calculate the age; *rad_yield*--the percent of measured ^{40}Ar that is due to decay of ^{40}K in the gas fraction (assuming all measured ^{36}Ar is due to atmospheric argon); *Measured ratios* are the $^{40}Ar/^{39}Ar$, $^{36}Ar/^{39}Ar$ and $^{37}Ar/^{39}Ar$ ratios before applying corrections for interfering isotopes produced during irradiation or atmospheric argon contamination; *K/Ca*--the K/Ca ratio in the sample calculated based on the $^{37}Ar/^{39}Ar$ ratio; *corrected_39*--the corrected voltage reported for ^{39}Ar, proxy for moles ^{39}Ar, used to calculate total ^{39}Ar and fraction ^{39}Ar.

The raw data table reports *measured* voltages for each isotope on each mass spectrometer run. These are based on regressing a time series of 6 peak measurements (peak minus background) at approximately 20 seconds intervals after the sample was introduced into the mass spectrometer. Uncertainties are based on the goodness of the regression lines through the peak measurements. Uncertainty in the calculated isotopic ratios (and apparent ages) reported in the reduced data table are calculated by propagating these errors through the calculations that follow. The *blanks* column reports voltage values used to correct for system blanks for each experiment. These were estimated based on blank measurements at several temperatures, made after baking out the extraction line between samples. Blank corrected values are calculated by subtracting the blank voltage from the measurement. *Decay corrected* values are calculated by adding a voltage to the ^{39}Ar and ^{37}Ar blank-corrected measurements based on the decay constants for these isotopes, the quantity measured, and the time since irradiation. *Interference corrected* values are calculated by subtracting voltage from the ^{40}Ar, ^{39}Ar and ^{36}Ar measurements based on interfering isotope production ratios reported by Dalrymple et al.[1981] for the TRIGA reactor. No uncertainty in the decay constants or interfering isotope production ratios were propagated into the subsequent calculations.


2-1-86 Brown's Canyon Granite
Total Gas Age 29.3 Ma
Regression age, steps 1-8,12-13:
29.8 ±0.2 Ma (73% of gas)
Apparent Age (Ma)
0
10
20
30
40
50
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Cumulative ^{39}Ar released


2-1-86 muscovite
Ar Correlation Diagram
Isochron Age: 29.8 ±0.2 Ma
Steps 1-8 and 12-13
Initial $^{40}Ar/^{36}Ar$ ratio: 297 ±52
$R^2 = 0.9998$
$^{40}Ar/^{36}Ar$
$^{39}Ar/^{36}Ar$
0
5000
10000
15000
20000
25000
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000

Sample ID: 2-1-86 Muscovite, Brown's Canyon Granite

Regression age: 29.8 ±0.2 NSteps= 15 Total 39Ar: 6.19

J: 0.006501 ±0.000005 **Data summary:** Measured ratios:

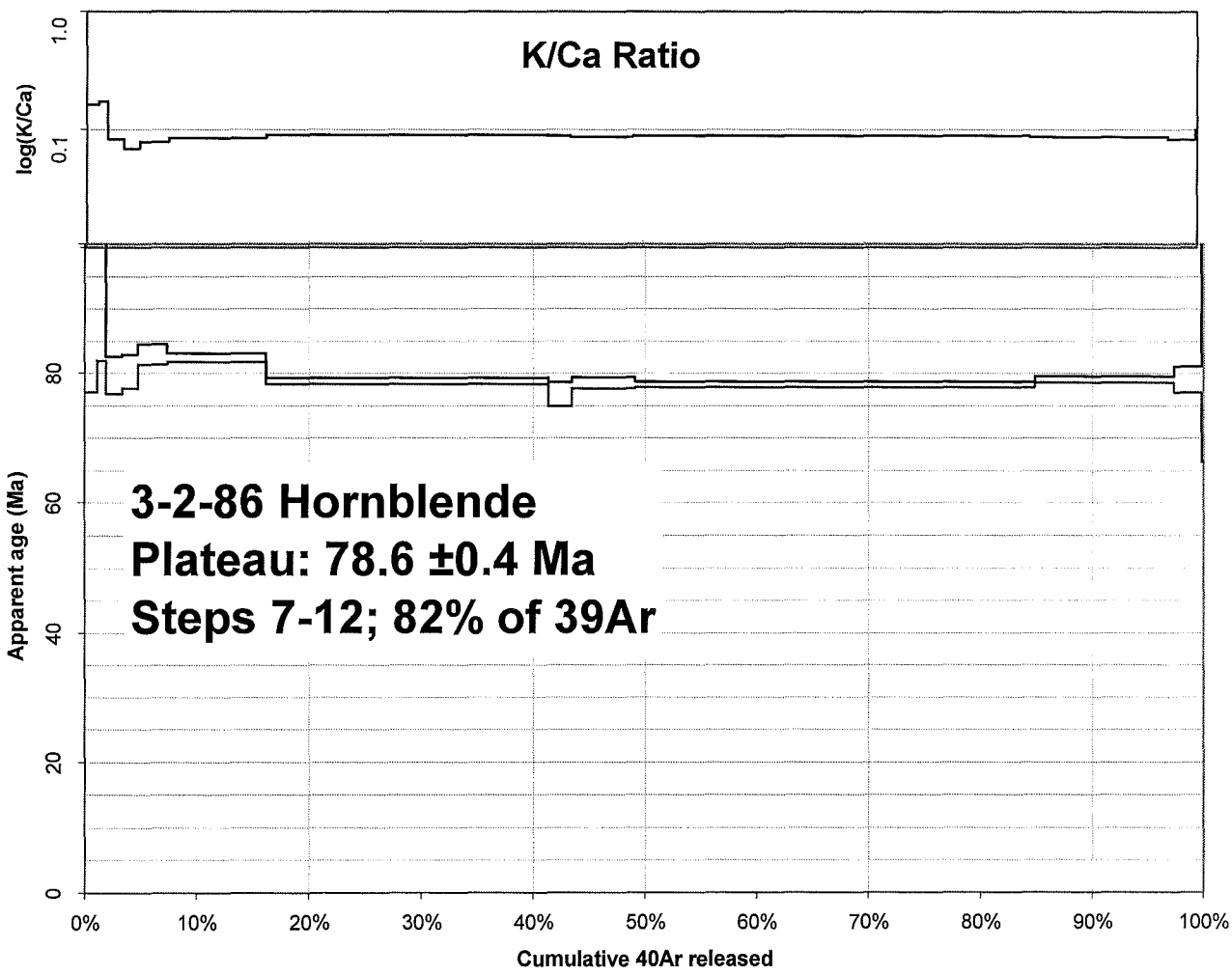
Step	Exp't.	temp	fraction 39Ar	Age	F	rad_yield	40/39	36/39	37/39	K/Ca	corrected_39
1	2B1277	650	0.36%	14 ±4	1.2083 ±0.352	17.6%	6.863 ±0.232	0.019 ±0.001	0.013 ±0.001	36.80	0.0222
2	2B1278	725	2.22%	20 ±2	1.7032 ±0.156	9.6%	17.825 ±0.022	0.055 ±0.001	0.001 ±0.000	404.70	0.1376
3	2B1279	775	3.74%	26.8 ±0.5	2.3039 ±0.040	36.2%	6.3626 ±0.007	0.0137 ±0.0001	0.0002 ±0.000	2033.00	0.2314
4	2B1280	800	4.09%	28.5 ±0.2	2.4457 ±0.019	85.9%	2.8491 ±0.003	0.0014 ±0.0001	0.0001 ±0.000	6474.46	0.2534
5	2B1281	825	6.55%	28.9 ±0.1	2.4849 ±0.012	89.6%	2.7729 ±0.003	0.0010 ±0.0000	0.0001 ±0.000	6795.34	0.4058
6	2B1282	840	12.68%	29.9 ±0.1	2.5742 ±0.007	95.1%	2.7070 ±0.002	0.0004 ±0.0000	0.0000 ±0.000		0.7849
7	2B1283	850	17.95%	30.2 ±0.1	2.5968 ±0.005	97.7%	2.6583 ±0.002	0.0002 ±0.0000	0.0000 ±0.000		1.1113
8	2B1284	860	13.87%	29.6 ±0.1	2.5444 ±0.005	98.7%	2.5796 ±0.002	0.0001 ±0.0000	0.0000 ±0.000		0.8588
9	2B1285	870	7.69%	29.2 ±0.1	2.5135 ±0.009	100.0%	2.5145 ±0.002	0.0000 ±0.0000	0.0000 ±0.000		0.4763
10	2B1286	885	6.59%	29.0 ±0.1	2.4923 ±0.011	100.0%	2.4933 ±0.003	0.0000 ±0.0000	0.0000 ±0.000		0.4080
11	2B1287	900	4.95%	29.2 ±0.2	2.5059 ±0.014	100.0%	2.5069 ±0.003	0.0000 ±0.0000	0.0000 ±0.000		0.3067
12	2B1288	950	7.01%	30.1 ±0.1	2.5862 ±0.010	97.9%	2.6437 ±0.003	0.0002 ±0.000	0.0001 ±0.000	4004.08	0.4341
13	2B1289	1050	7.68%	31.0 ±0.1	2.6693 ±0.011	93.7%	2.8514 ±0.003	0.0006 ±0.0000	0.0011 ±0.000	429.46	0.4756
14	2B1290	1200	3.55%	27.8 ±0.3	2.3898 ±0.023	100.0%	2.3903 ±0.003	0.0000 ±0.0001	0.0071 ±0.000	68.90	0.2200
15	2B1291	1400	1.06%	0.0 ±1.2	0.0018 ±0.106	0.0%	0.0000 ±0.008	0.0000 ±0.0004	0.0356 ±0.000	13.75	0.0659

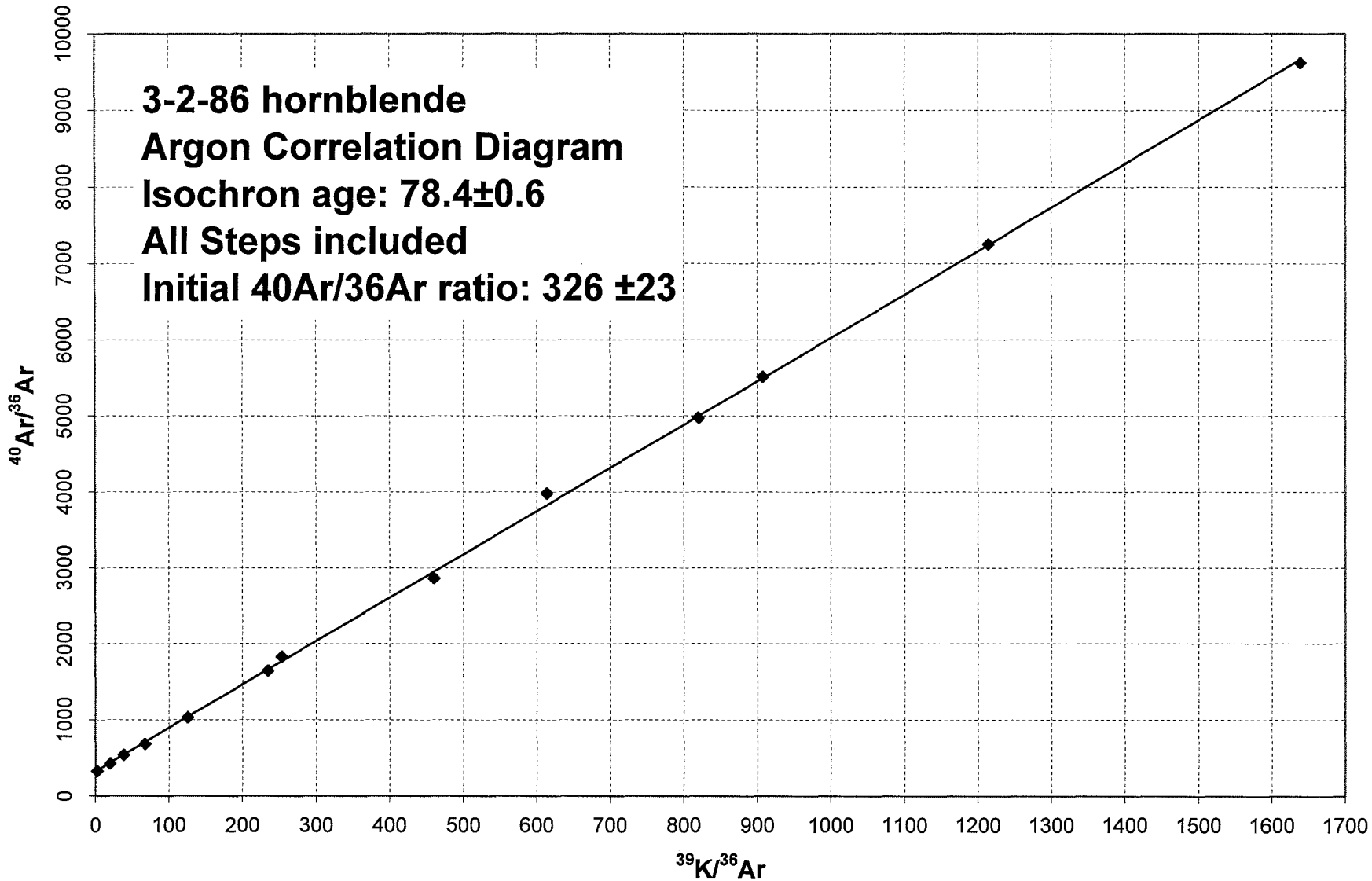
2-1-86 muscovite; Brown's Canyon Granite

		measured peaks:		blanks:		blank corrected:		Decay corrected:		Interference corrected:		
	Ar isotope	**V**	**±V**	**V**	**±V**	**V**	**±V**	**V_decay**	**±V**	**isotope**	**V**	**±V**
Experiment # **2B1277**	**40**	0.177691	0.004438	0.025210	0.000051	0.152480	0.004438	0.152480	0.004438	**40Ar, *+a**	0.152458	
day measured 5 Dec 1992	**39**	0.022469	0.000383	0.000321	0.000009	0.022148	0.000383	0.022217	0.000384	**39Ar,K**	0.022217	
time measured 17:29:35	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5471.307	**37**	0.000384	0.000018	0.000088	0.000007	0.000296	0.000020	0.000296	0.000020	**37Ar, Ca**	0.000296	
39Ar decay factor 1.003084	**36**	0.000549	0.000016	0.000123	0.000008	0.000425	0.000018	0.000425	0.000018	**36Ar,a**	0.000425	
Experiment # **2B1278**	**40**	2.478693	0.000997	0.025210	0.000051	2.453483	0.000998	2.453483	0.000998	**40Ar, *+a**	2.453345	
day measured 5 Dec 199	**39**	0.137543	0.000164	0.000321	0.000009	0.137222	0.000164	0.137646	0.000164	**39Ar,K**	0.137645	
time measured 17:51	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5472.984	**37**	0.000254	0.000014	0.000088	0.000007	0.000167	0.000016	0.000167	0.000016	**37Ar, Ca**	0.000167	
39Ar decay factor 1.003084	**36**	0.007632	0.000071	0.000123	0.000008	0.007509	0.000072	0.007509	0.000072	**36Ar,a**	0.007509	
Experiment # **2B1279**	**40**	1.497012	0.000628	0.024556	0.000054	1.472456	0.000630	1.472456	0.000630	**40Ar, *+a**	1.472225	
day measured 5 Dec 199	**39**	0.231071	0.000217	0.000359	0.000009	0.230712	0.000217	0.231424	0.000218	**39Ar,K**	0.231423	
time measured 18:14	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5474.687	**37**	0.000161	0.000012	0.000105	0.000007	0.000056	0.000014	0.000056	0.000014	**37Ar, Ca**	0.000056	
39Ar decay factor 1.003084	**36**	0.003305	0.000030	0.000128	0.000007	0.003178	0.000031	0.003178	0.000031	**36Ar,a**	0.003178	
Experiment # **2B1280**	**40**	0.746553	0.000438	0.024556	0.000054	0.721997	0.000442	0.721997	0.000442	**40Ar, *+a**	0.721743	
day measured 5 Dec 199	**39**	0.252994	0.000224	0.000359	0.000009	0.252635	0.000224	0.253415	0.000225	**39Ar,K**	0.253415	
time measured 18:36	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5476.366	**37**	0.000124	0.000011	0.000105	0.000007	0.000019	0.000013	0.000019	0.000013	**37Ar, Ca**	0.000019	
39Ar decay factor 1.003084	**36**	0.000473	0.000015	0.000128	0.000007	0.000345	0.000016	0.000345	0.000016	**36Ar,a**	0.000345	
Experiment # **2B1281**	**40**	1.151384	0.000544	0.026002	0.000054	1.125382	0.000547	1.125382	0.000547	**40Ar, *+a**	1.124976	
day measured 5 Dec 199	**39**	0.404959	0.000341	0.000359	0.000009	0.404600	0.000341	0.405848	0.000342	**39Ar,K**	0.405848	
time measured 18:59	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5478.046	**37**	0.000134	0.000012	0.000105	0.000007	0.000029	0.000014	0.000029	0.000014	**37Ar, Ca**	0.000029	
39Ar decay factor 1.003084	**36**	0.000522	0.000014	0.000128	0.000007	0.000394	0.000016	0.000394	0.000016	**36Ar,a**	0.000394	
Experiment # **2B1282**	**40**	2.151738	0.000842	0.026997	0.000054	2.124740	0.000844	2.124740	0.000844	**40Ar, *+a**	2.123956	
day measured 5 Dec 199	**39**	0.782847	0.000596	0.000359	0.000009	0.782488	0.000596	0.784902	0.000598	**39Ar,K**	0.784902	
time measured 19:21	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5479.724	**37**	0.000069	0.000013	0.000105	0.000007	0.000000	0.000014	0.000000	0.000014	**37Ar, Ca**	0.000000	
39Ar decay factor 1.003085	**36**	0.000478	0.000015	0.000128	0.000007	0.000350	0.000016	0.000350	0.000016	**36Ar,a**	0.000350	
Experiment # **2B1283**	**40**	2.981162	0.001028	0.026997	0.000054	2.954165	0.001030	2.954165	0.001030	**40Ar, *+a**	2.953053	
day measured 5 Dec 199	**39**	1.108249	0.000752	0.000359	0.000009	1.107890	0.000752	1.111308	0.000754	**39Ar,K**	1.111308	
time measured 19:44	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5481.408	**37**	0.000046	0.000012	0.000105	0.000007	0.000000	0.000014	0.000000	0.000014	**37Ar, Ca**	0.000000	
39Ar decay factor 1.003085	**36**	0.000365	0.000014	0.000138	0.000007	0.000227	0.000016	0.000227	0.000016	**36Ar,a**	0.000227	

Experiment # **2B1284**	**40**	2.242569	0.001064	0.027197	0.000054	2.215371	0.001065	2.215371	0.001065	**40Ar, *+a**	2.214513	
day measured 5 Dec 199:	**39**	0.856529	0.000570	0.000359	0.000009	0.856171	0.000570	0.858812	0.000572	**39Ar,K**	0.858812	
time measured 20:06	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5483.097	**37**	0.000074	0.000012	0.000105	0.000007	0.000000	0.000013	0.000000	0.000013	**37Ar, Ca**	0.000000	
39Ar decay factor 1.003085	**36**	0.000237	0.000013	0.000138	0.000007	0.000099	0.000015	0.000099	0.000015	**36Ar,a**	0.000099	
Experiment # **2B1285**	**40**	1.225166	0.000635	0.027497	0.000054	1.197669	0.000637	1.197669	0.000637	**40Ar, *+a**	1.197192	
day measured 5 Dec 199:	**39**	0.475193	0.000367	0.000359	0.000009	0.474834	0.000367	0.476299	0.000368	**39Ar,K**	0.476299	
time measured 20:30	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5484.872	**37**	0.000058	0.000012	0.000105	0.000007	0.000000	0.000013	0.000000	0.000013	**37Ar, Ca**	0.000000	
39Ar decay factor 1.003085	**36**	0.000119	0.000013	0.000138	0.000007	0.000000	0.000014	0.000000	0.000014	**36Ar,a**	*0.00000*	
Experiment # **2B1286**	**40**	1.045815	0.000706	0.028497	0.000054	1.017317	0.000708	1.017317	0.000708	**40Ar, *+a**	1.016909	
day measured 5 Dec 199:	**39**	0.407120	0.000307	0.000359	0.000009	0.406762	0.000307	0.408016	0.000308	**39Ar,K**	0.408016	
time measured 20:52	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5486.564	**37**	0.000071	0.000011	0.000105	0.000007	0.000000	0.000013	0.000000	0.000013	**37Ar, Ca**	0.000000	
39Ar decay factor 1.003085	**36**	0.000138	0.000012	0.000138	0.000007	0.000000	0.000014	0.000000	0.000014	**36Ar,a**	*0.00000*	
Experiment # **2B1287**	**40**	0.797540	0.000490	0.028697	0.000054	0.768843	0.000493	0.768843	0.000493	**40Ar, *+a**	0.768536	
day measured 5 Dec 199:	**39**	0.306110	0.000261	0.000359	0.000009	0.305752	0.000261	0.306695	0.000262	**39Ar,K**	0.306695	
time measured 21:15	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5488.251	**37**	0.000045	0.000012	0.000105	0.000007	0.000000	0.000013	0.000000	0.000013	**37Ar, Ca**	0.000000	
39Ar decay factor 1.003085	**36**	0.000089	0.000012	0.000148	0.000007	0.000000	0.000014	0.000000	0.000014	**36Ar,a**	*0.00000*	
Experiment # **2B1288**	**40**	1.179619	0.000667	0.031998	0.000054	1.147621	0.000669	1.147621	0.000669	**40Ar, *+a**	1.147187	
day measured 5 Dec 199:	**39**	0.433123	0.000367	0.000359	0.000009	0.432765	0.000367	0.434100	0.000369	**39Ar,K**	0.434100	
time measured 21:37	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5489.939	**37**	0.000158	0.000012	0.000105	0.000007	0.000053	0.000013	0.000053	0.000013	**37Ar, Ca**	0.000053	
39Ar decay factor 1.003085	**36**	0.000241	0.000012	0.000158	0.000007	0.000083	0.000014	0.000083	0.000014	**36Ar,a**	0.000083	
Experiment # **2B1289**	**40**	1.404156	0.000765	0.048004	0.000054	1.356152	0.000767	1.356152	0.000767	**40Ar, *+a**	1.355676	
day measured 5 Dec 199:	**39**	0.474511	0.000399	0.000359	0.000009	0.474153	0.000399	0.475616	0.000400	**39Ar,K**	0.475615	
time measured 21:59	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5491.627	**37**	0.000648	0.000014	0.000105	0.000007	0.000543	0.000015	0.000543	0.000015	**37Ar, Ca**	0.000543	
39Ar decay factor 1.003085	**36**	0.000499	0.000016	0.000208	0.000007	0.000292	0.000017	0.000292	0.000017	**36Ar,a**	0.000291	
Experiment # **2B1290**	**40**	0.622734	0.000580	0.096869	0.000178	0.525865	0.000606	0.525865	0.000606	**40Ar, *+a**	0.525645	
day measured 5 Dec 199:	**39**	0.219854	0.000195	0.000530	0.000018	0.219325	0.000196	0.220001	0.000196	**39Ar,K**	0.220000	
time measured 22:22	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5493.313	**37**	0.001662	0.000018	0.000097	0.000007	0.001565	0.000020	0.001565	0.000020	**37Ar, Ca**	0.001565	
39Ar decay factor 1.003085	**36**	0.000202	0.000015	0.000372	0.000009	0.000000	0.000017	0.000000	0.000017	**36Ar,a**	*0.00000*	
Experiment # **2B1291**	**40**	0.154757	0.000437	0.278793	0.000253	0.000000	0.000505	0.000000	0.000505	**40Ar, *+a**	*0.00000*	
day measured 5 Dec 199:	**39**	0.066161	0.000087	0.000495	0.000016	0.065665	0.000089	0.065868	0.000089	**39Ar,K**	0.065866	
time measured 22:44	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5495.003	**37**	0.002451	0.000024	0.000103	0.000008	0.002348	0.000025	0.002348	0.000025	**37Ar, Ca**	0.002348	
39Ar decay factor 1.003086	**36**	0.000054	0.000019	0.000989	0.000014	0.000000	0.000023	0.000000	0.000023	**36Ar,a**	*0.00000*	

Numbers in italics have been set to 0.0 because the calculated correction produces a negative number


K/Ca Ratio
log(K/Ca)
1.0
0.1
Apparent age (Ma)
0
20
40
60
80
3-2-86 Hornblende
Plateau: 78.6 ±0.4 Ma
Steps 7-12; 82% of 39Ar
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Cumulative 40Ar released


3-2-86 hornblende
Argon Correlation Diagram
Isochron age: 78.4±0.6
All Steps included
Initial 40Ar/36Ar ratio: 326 ±23
40Ar/36Ar
39K/36Ar
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700

Sample ID: 3-2-86 hbld

Interpretation:

NSteps= 13 Total 39Ar: 4.82

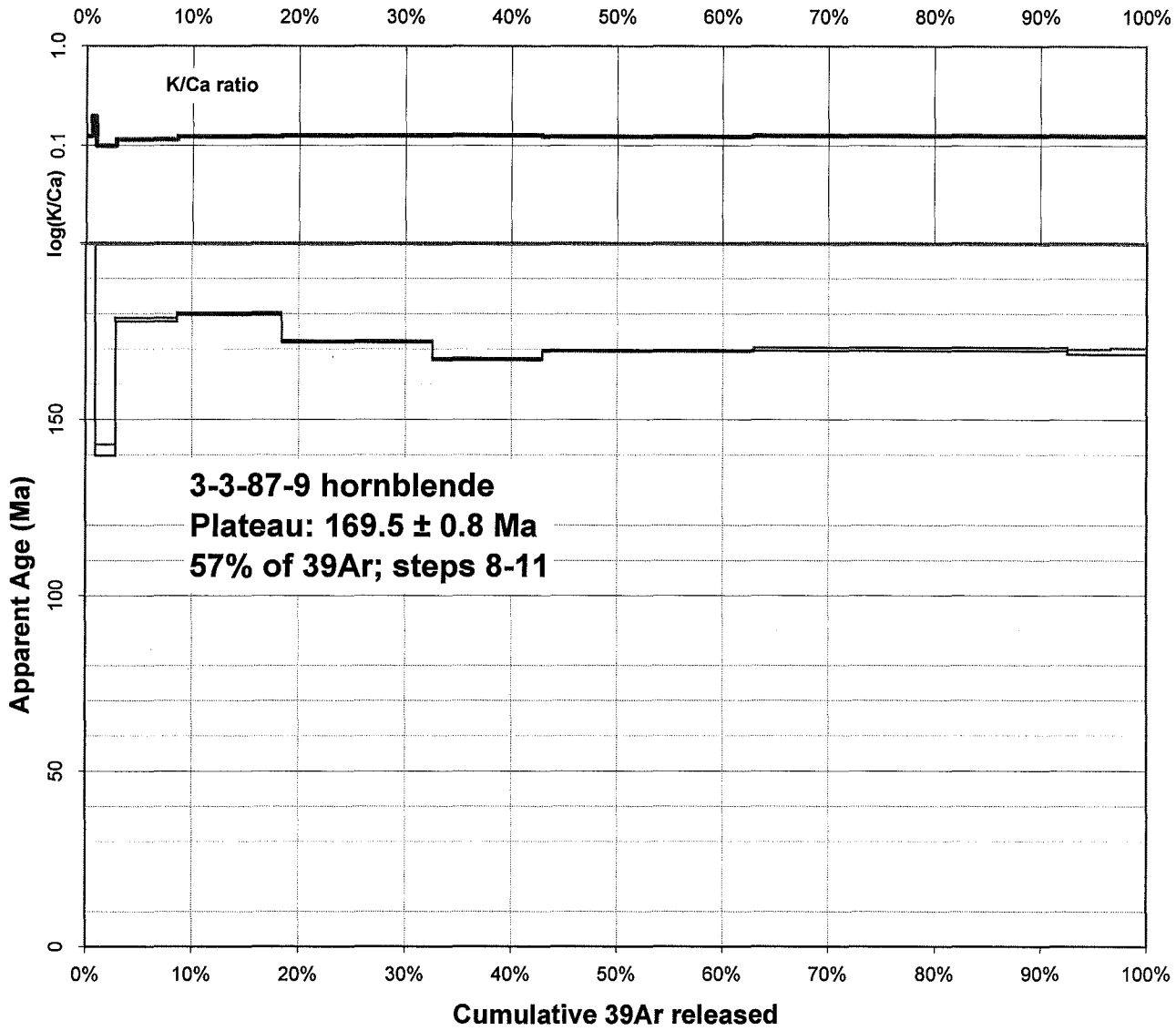
J: 0.007795 ±0.000037 **Data summary:** Measured ratios:

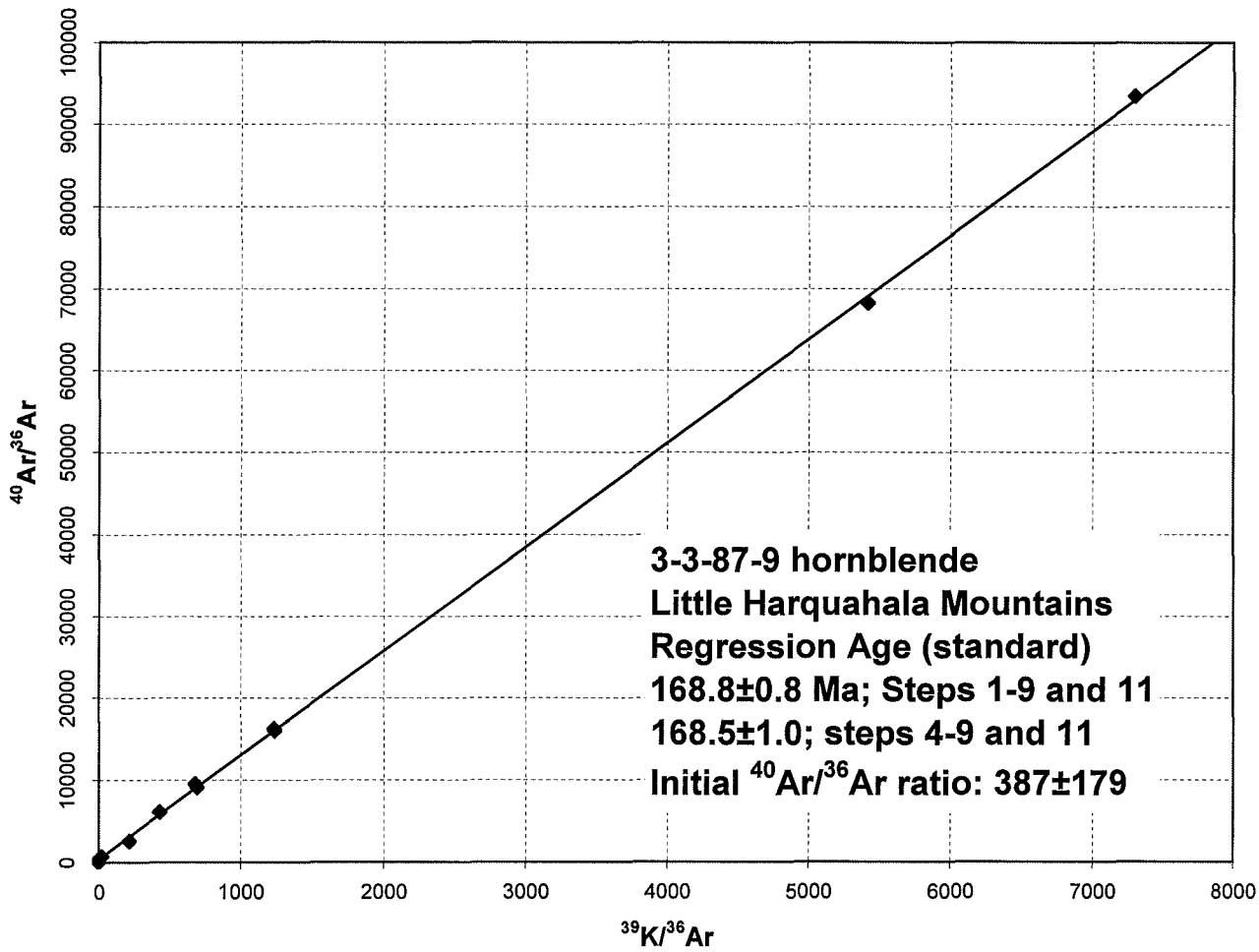
Step	Exp't.	temp °C	fraction ^{39}Ar	Age	F	rad_yield	40/39	36/39	37/39	K/Ca	corrected_39
1	92A0044	750	0.01	193 ±116	14.49 ±9.183	9.19%	157.33 ±6.101	0.48 ±0.023	3.00 ±0.263	0.16	0.0543
2	92A0045	850	0.01	91.2 ±9.3	6.6502 ±0.692	30.38%	21.851 ±0.436	0.052 ±0.002	2.844 ±0.142	0.17	0.0373
3	92A0046	950	0.01	79.7 ±2.9	5.7924 ±0.212	56.81%	10.157 ±0.124	0.016 ±0.001	5.931 ±0.038	0.08	0.0697
4	92A0047	1000	0.01	80.3 ±2.6	5.8372 ±0.192	71.28%	8.1514 ±0.125	0.0098 ±0.0005	7.0971 ±0.084	0.07	0.0684
5	92A0048	1025	0.03	83.0 ±1.6	6.0366 ±0.113	83.82%	7.1729 ±0.068	0.0056 ±0.0003	6.2003 ±0.028	0.08	0.1255
6	92A0049	1050	0.09	82.4 ±0.7	5.9947 ±0.044	92.57%	6.4518 ±0.020	0.0032 ±0.0001	5.8116 ±0.016	0.08	0.4228
7	92A0050	1075	0.25	78.8 ±0.5	5.7290 ±0.023	95.92%	5.9516 ±0.009	0.0023 ±0.0001	5.4362 ±0.024	0.09	1.2146
8	92A0052	1100	0.02	76.7 ±1.9	5.5737 ±0.135	89.67%	6.1936 ±0.084	0.0036 ±0.0004	5.5145 ±0.028	0.09	0.1008
9	92A0053	1150	0.06	78.5 ±0.9	5.7054 ±0.059	94.06%	6.0439 ±0.031	0.0027 ±0.0002	5.6322 ±0.033	0.09	0.2707
10	92A0054	1200	0.36	78.3 ±0.5	5.6865 ±0.020	96.93%	5.8460 ±0.006	0.0021 ±0.0001	5.5265 ±0.021	0.09	1.7232
11	92A0055	1300	0.13	79.1 ±0.5	5.7473 ±0.026	94.64%	6.0507 ±0.015	0.0026 ±0.0001	5.6634 ±0.025	0.09	0.6022
12	92A0056	1450	0.02	79.1 ±2.0	5.7470 ±0.145	82.04%	6.9788 ±0.089	0.0058 ±0.0004	5.8964 ±0.015	0.08	0.1184
13	92A0057	1600	0.00	87.6 ±21.3	6.3828 ±1.590	45.03%	14.1292 ±1.164	0.0276 ±0.004	4.8677 ±0.205	0.10	0.0092

3-2-86 hornblende Raw Data Table

		measured peaks:		blanks:		blank corrected:		Decay corrected:		Interference corrected:		
	Ar isotope	V	±V	V	±V	V	±V	V_decay	±V	isotope	V	±V
Experiment # **92A0044**	**40**	8.560000	0.018200	0.017747	0.008464	8.542253	0.020072	8.542253	0.020072	**40Ar, *+a**	8.542198	
day measured 1/3/92	**39**	0.054500	0.002100	0.000244	0.000021	0.054256	0.002100	0.054294	0.002102	**39Ar,K**	0.054184	
time measured 21:34	**38**	0.010300	0.000111	0.000026	0.000010	0.010274	0.000111	0.010274	0.000111	**38**	0.010274	0.000111
37Ar decay factor 7.068368	**37**	0.023200	0.000377	0.000139	0.000010	0.023061	0.000377	0.163005	0.012823	**37Ar, Ca**	0.163005	
39Ar decay factor 1.000703	**36**	0.026400	0.000744	0.000107	0.000033	0.026293	0.000745	0.026293	0.000745	**36Ar,a**	0.026250	
Experiment # **92A0045**	**40**	0.832575	0.005046	0.017747	0.008464	0.814828	0.009853	0.814828	0.009853	**40Ar, *+a**	0.814791	
day measured 1/3/92	**39**	0.037508	0.000592	0.000244	0.000021	0.037264	0.000592	0.037290	0.000593	**39Ar,K**	0.037219	
time measured 21:51	**38**	0.003324	0.000024	0.000026	0.000010	0.003299	0.000026	0.003299	0.000026	**38**	0.003299	0.000026
37Ar decay factor 7.070053	**37**	0.015138	0.000147	0.000139	0.000010	0.015000	0.000147	0.106048	0.005001	**37Ar, Ca**	0.106048	
39Ar decay factor 1.000703	**36**	0.002055	0.000051	0.000107	0.000033	0.001948	0.000060	0.001948	0.000060	**36Ar,a**	0.001920	
Experiment # **92A0046**	**40**	0.725894	0.000570	0.017747	0.008464	0.708147	0.008483	0.708147	0.008483	**40Ar, *+a**	0.708077	
day measured 1/3/92	**39**	0.069917	0.000160	0.000244	0.000021	0.069672	0.000161	0.069721	0.000161	**39Ar,K**	0.069443	
time measured 22:13	**38**	0.007131	0.000019	0.000026	0.000010	0.007105	0.000021	0.007105	0.000021	**38**	0.007105	0.000021
37Ar decay factor 7.072114	**37**	0.058612	0.000073	0.000139	0.000010	0.058473	0.000073	0.413528	0.002495	**37Ar, Ca**	0.413528	
39Ar decay factor 1.000703	**36**	0.001251	0.000024	0.000107	0.000033	0.001144	0.000041	0.001144	0.000041	**36Ar,a**	0.001035	
Experiment # **92A0047**	**40**	0.575446	0.000297	0.017747	0.008464	0.557699	0.008469	0.557699	0.008469	**40Ar, *+a**	0.557631	
day measured 1/3/92	**39**	0.068614	0.000122	0.000244	0.000021	0.068370	0.000124	0.068418	0.000124	**39Ar,K**	0.068091	
time measured 22:35	**38**	0.009123	0.000051	0.000026	0.000010	0.009097	0.000052	0.009097	0.000052	**38**	0.009097	0.000052
37Ar decay factor 7.074257	**37**	0.068778	0.000168	0.000139	0.000010	0.068639	0.000168	0.485568	0.005710	**37Ar, Ca**	0.485568	
39Ar decay factor 1.000704	**36**	0.000777	0.000009	0.000107	0.000033	0.000670	0.000034	0.000670	0.000034	**36Ar,a**	0.000542	
Experiment # **92A0048**	**40**	0.918106	0.000598	0.017747	0.008464	0.900358	0.008485	0.900358	0.008485	**40Ar, *+a**	0.900233	
day measured 1/3/92	**39**	0.125678	0.000143	0.000244	0.000021	0.125434	0.000145	0.125522	0.000145	**39Ar,K**	0.124998	
time measured 22:55	**38**	0.017256	0.000052	0.000026	0.000010	0.017230	0.000053	0.017230	0.000053	**38**	0.017230	0.000053
37Ar decay factor 7.076245	**37**	0.110122	0.000098	0.000139	0.000010	0.109984	0.000099	0.778271	0.003355	**37Ar, Ca**	0.778271	
39Ar decay factor 1.000704	**36**	0.000805	0.000020	0.000107	0.000033	0.000698	0.000038	0.000698	0.000038	**36Ar,a**	0.000493	
Experiment # **92A0049**	**40**	2.745799	0.000364	0.017747	0.008464	2.728052	0.008472	2.728052	0.008472	**40Ar, *+a**	2.727630	
day measured 1/3/92	**39**	0.422784	0.000268	0.000244	0.000021	0.422540	0.000268	0.422837	0.000269	**39Ar,K**	0.421183	
time measured 23:15	**38**	0.062613	0.000030	0.000026	0.000010	0.062587	0.000032	0.062587	0.000032	**38**	0.062587	0.000032
37Ar decay factor 7.078192	**37**	0.347312	0.000197	0.000139	0.000010	0.347173	0.000197	2.457361	0.006704	**37Ar, Ca**	2.457361	
39Ar decay factor 1.000704	**36**	0.001442	0.000045	0.000107	0.000033	0.001335	0.000055	0.001335	0.000055	**36Ar,a**	0.000686	

Experiment # **92A0050**	**40**	7.246775	0.003943	0.017747	0.008464	7.229028	0.009337	7.229028	0.009337	**40Ar, *+a**	7.227817	
day measured 1/3/92	**39**	1.214019	0.000838	0.000244	0.000021	1.213775	0.000838	1.214629	0.000839	**39Ar,K**	1.210185	
time measured 23:43	**38**	0.222853	0.000187	0.000026	0.000010	0.222827	0.000187	0.222827	0.000187	**38**	0.222827	0.000187
37Ar decay factor 7.08084	**37**	0.932657	0.000847	0.000139	0.000010	0.932518	0.000847	6.603011	0.028800	**37Ar, Ca**	6.603011	
39Ar decay factor 1.000704	**36**	0.002847	0.000080	0.000107	0.000033	0.002740	0.000087	0.002740	0.000087	**36Ar,a**	0.000997	
Experiment # **92A0052**	**40**	0.642152	0.000375	0.017747	0.008464	0.624405	0.008472	0.624405	0.008472	**40Ar, *+a**	0.624304	
day measured 1/4/92	**39**	0.100987	0.000031	0.000244	0.000021	0.100743	0.000037	0.100814	0.000037	**39Ar,K**	0.100440	
time measured 10:07	**38**	0.018898	0.000073	0.000026	0.000010	0.018872	0.000074	0.018872	0.000074	**38**	0.018872	0.000074
37Ar decay factor 7.141695	**37**	0.077983	0.000083	0.000139	0.000010	0.077844	0.000084	0.555940	0.002841	**37Ar, Ca**	0.555940	
39Ar decay factor 1.000707	**36**	0.000472	0.000016	0.000107	0.000033	0.000365	0.000036	0.000365	0.000036	**36Ar,a**	0.000218	
Experiment # **92A0053**	**40**	1.656835	0.000975	0.021053	0.008099	1.635782	0.008157	1.635782	0.008157	**40Ar, *+a**	1.635512	
day measured 1/4/92	**39**	0.270697	0.000312	0.000237	0.000020	0.270460	0.000313	0.270651	0.000313	**39Ar,K**	0.269625	
time measured 10:31	**38**	0.048071	0.000077	0.000041	0.000010	0.048030	0.000078	0.048030	0.000078	**38**	0.048030	0.000078
37Ar decay factor 7.144114	**37**	0.213520	0.000256	0.000149	0.000013	0.213371	0.000256	1.524349	0.008720	**37Ar, Ca**	1.524349	
39Ar decay factor 1.000707	**36**	0.000846	0.000034	0.000115	0.000031	0.000731	0.000046	0.000731	0.000046	**36Ar,a**	0.000329	
Experiment # **92A0054**	**40**	10.094610	0.005346	0.021053	0.008099	10.073557	0.009704	10.073557	0.009704	**40Ar, *+a**	10.071840	
day measured 1/4/92	**39**	1.722183	0.000815	0.000237	0.000020	1.721946	0.000815	1.723163	0.000816	**39Ar,K**	1.716754	
time measured 10:52	**38**	0.320357	0.000157	0.000041	0.000010	0.320316	0.000158	0.320316	0.000158	**38**	0.320316	0.000158
37Ar decay factor 7.146123	**37**	1.332765	0.001050	0.000149	0.000013	1.332616	0.001050	9.523038	0.035689	**37Ar, Ca**	9.523038	
39Ar decay factor 1.000707	**36**	0.003676	0.000105	0.000115	0.000031	0.003562	0.000109	0.003562	0.000109	**36Ar,a**	0.001047	
Experiment # **92A0055**	**40**	3.665035	0.002182	0.021053	0.008099	3.643982	0.008387	3.643982	0.008387	**40Ar, *+a**	3.643382	
day measured 1/4/92	**39**	0.602049	0.000436	0.000237	0.000020	0.601811	0.000436	0.602237	0.000437	**39Ar,K**	0.599942	
time measured 11:15	**38**	0.094714	0.000074	0.000041	0.000010	0.094673	0.000075	0.094673	0.000075	**38**	0.094673	0.000075
37Ar decay factor 7.148426	**37**	0.477280	0.000440	0.000149	0.000013	0.477131	0.000440	3.410736	0.014952	**37Ar, Ca**	3.410736	
39Ar decay factor 1.000707	**36**	0.001676	0.000031	0.000115	0.000031	0.001562	0.000044	0.001562	0.000044	**36Ar,a**	0.000661	
Experiment # **92A0056**	**40**	0.863644	0.000319	0.037008	0.010455	0.826636	0.010460	0.826636	0.010460	**40Ar, *+a**	0.826518	
day measured 1/4/92	**39**	0.118728	0.000115	0.000362	0.000156	0.118366	0.000193	0.118450	0.000193	**39Ar,K**	0.117980	
time measured 11:35	**38**	0.017888	0.000065	0.000049	0.000011	0.017839	0.000066	0.017839	0.000066	**38**	0.017839	0.000066
37Ar decay factor 7.150384	**37**	0.097830	0.000035	0.000154	0.000017	0.097676	0.000039	0.698423	0.001324	**37Ar, Ca**	0.698423	
39Ar decay factor 1.000707	**36**	0.000856	0.000033	0.000169	0.000032	0.000687	0.000046	0.000687	0.000046	**36Ar,a**	0.000503	
Experiment # **92A0057**	**40**	0.166903	0.000220	0.037008	0.010455	0.129895	0.010458	0.129895	0.010458	**40Ar, *+a**	0.129885	
day measured 1/4/92	**39**	0.009548	0.000038	0.000362	0.000156	0.009187	0.000160	0.009193	0.000160	**39Ar,K**	0.009163	
time measured 12:05	**38**	0.001398	0.000014	0.000049	0.000011	0.001349	0.000018	0.001349	0.000018	**38**	0.001349	0.000018
37Ar decay factor 7.153267	**37**	0.006410	0.000048	0.000154	0.000017	0.006256	0.000051	0.044751	0.001719	**37Ar, Ca**	0.044751	
39Ar decay factor 1.000708	**36**	0.000423	0.000011	0.000169	0.000032	0.000253	0.000033	0.000253	0.000033	**36Ar,a**	0.000242	


0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
1.0
0.1
log(K/Ca)
K/Ca ratio
150
100
50
0
Apparent Age (Ma)
3-3-87-9 hornblende
Plateau: 169.5 ± 0.8 Ma
57% of 39Ar; steps 8-11
Cumulative 39Ar released


3-3-87-9 hornblende
Little Harquahala Mountains
Regression Age (standard)
168.8±0.8 Ma; Steps 1-9 and 11
168.5±1.0; steps 4-9 and 11
Initial $^{40}Ar/^{36}Ar$ ratio: 387±179
$^{40}Ar/^{36}Ar$
$^{39}K/^{36}Ar$
0
10000
20000
30000
40000
50000
60000
70000
80000
90000
100000
0
1000
2000
3000
4000
5000
6000
7000
8000

Sample ID: 3-3-87-9 hbld

Plateau Age: 169.5 ±0.2 NSteps= 18 Total 39Ar: 3.93

J: 0.007738 ±0.000036 **Data summary:** Measured ratios:

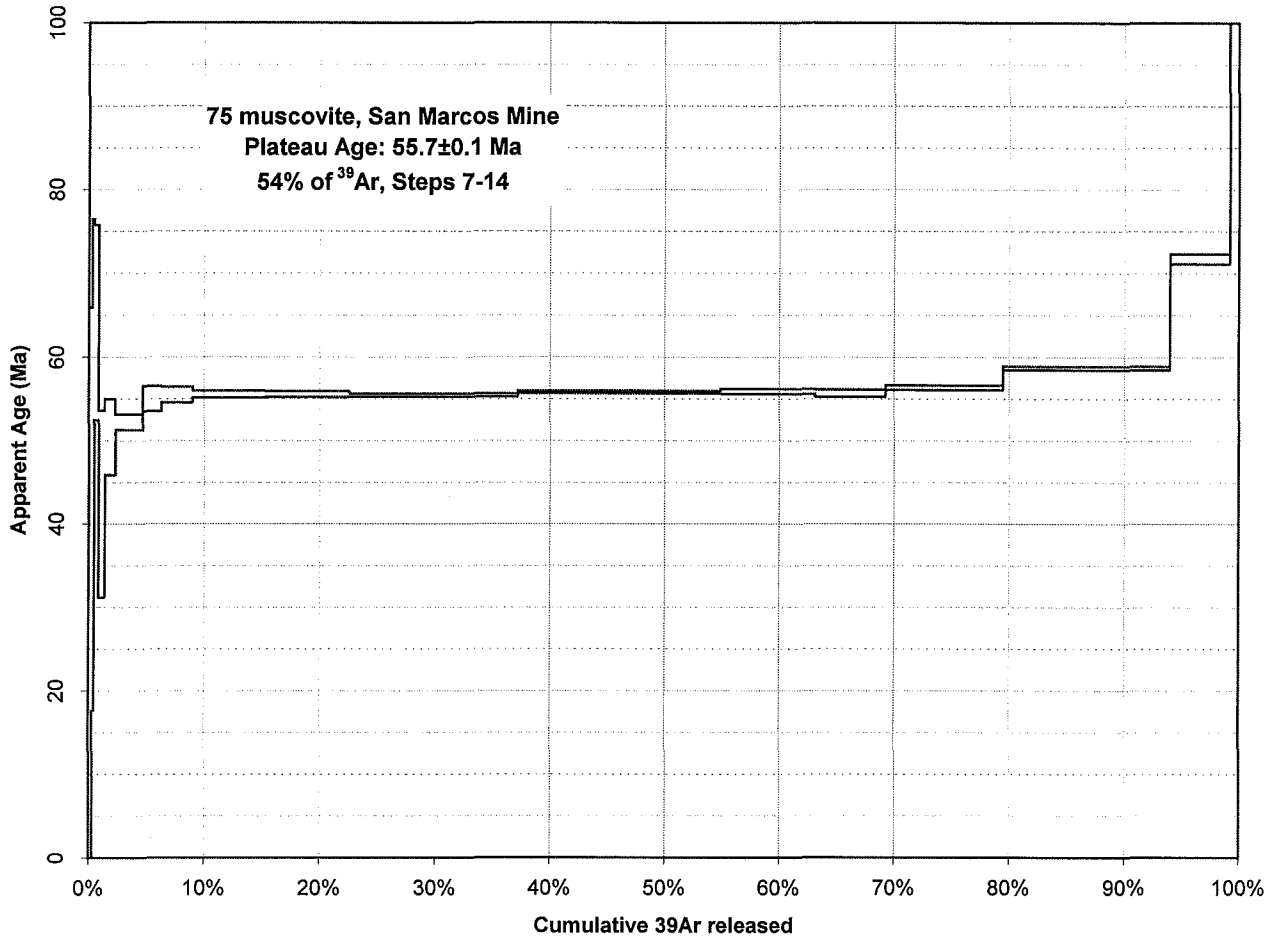
Step	Exp't.	temp	fraction 39Ar	Age	F	rad_yield	40/39	36/39	37/39	K/Ca	corrected_39
1	91A5261	750	0.5%	480.2 ±10.3	39.4056 ±0.960	23.85%	164.764 ±0.589	0.426 ±0.003	3.973 ±0.070	0.12	0.0215
2	91A5262	850	0.4%	223.5 ±8.0	17.0422 ±0.650	56.47%	30.132 ±0.432	0.045 ±0.002	2.489 ±0.054	0.20	0.0145
3	91A5263	950	1.9%	141.3 ±1.6	10.5270 ±0.124	88.42%	11.8677 ±0.084	0.0059 ±0.0003	4.9162 ±0.031	0.10	0.0736
4	91A5264	1000	5.8%	178.3 ±0.5	13.4241 ±0.040	95.15%	14.0692 ±0.028	0.0034 ±0.0001	4.2660 ±0.029	0.11	0.2284
5	91A5265	1025	9.8%	180.0 ±0.3	13.5553 ±0.025	96.89%	13.9535 ±0.019	0.0025 ±0.0001	3.9847 ±0.027	0.12	0.3844
6	91A5266	1050	14.2%	172.1 ±0.3	12.9357 ±0.021	98.18%	13.1422 ±0.017	0.0018 ±0.0000	3.9155 ±0.017	0.12	0.5556
7	91A5267	1075	10.4%	167.1 ±0.3	12.5398 ±0.023	99.57%	12.5623 ±0.017	0.0012 ±0.0001	3.8977 ±0.036	0.13	0.4071
8	91A5268	1125	20.0%	169.5 ±0.2	12.7289 ±0.015	98.15%	12.9346 ±0.013	0.0019 ±0.0000	3.9789 ±0.024	0.12	0.7855
9	91A5270	1175	29.5%	170.0 ±0.5	12.7672 ±0.036	99.68%	12.7749 ±0.026	0.0012 ±0.0001	3.9166 ±0.015	0.12	1.1599
10	91A5271	1225	4.1%	169.2 ±0.7	12.7103 ±0.056	100.00%	12.6570 ±0.040	0.0010 ±0.0001	3.9361 ±0.032	0.12	0.1606
11	91A5272	1450	3.4%	169.4 ±0.9	12.7209 ±0.069	96.75%	13.1138 ±0.047	0.0025 ±0.0002	3.9346 ±0.025	0.12	0.1343

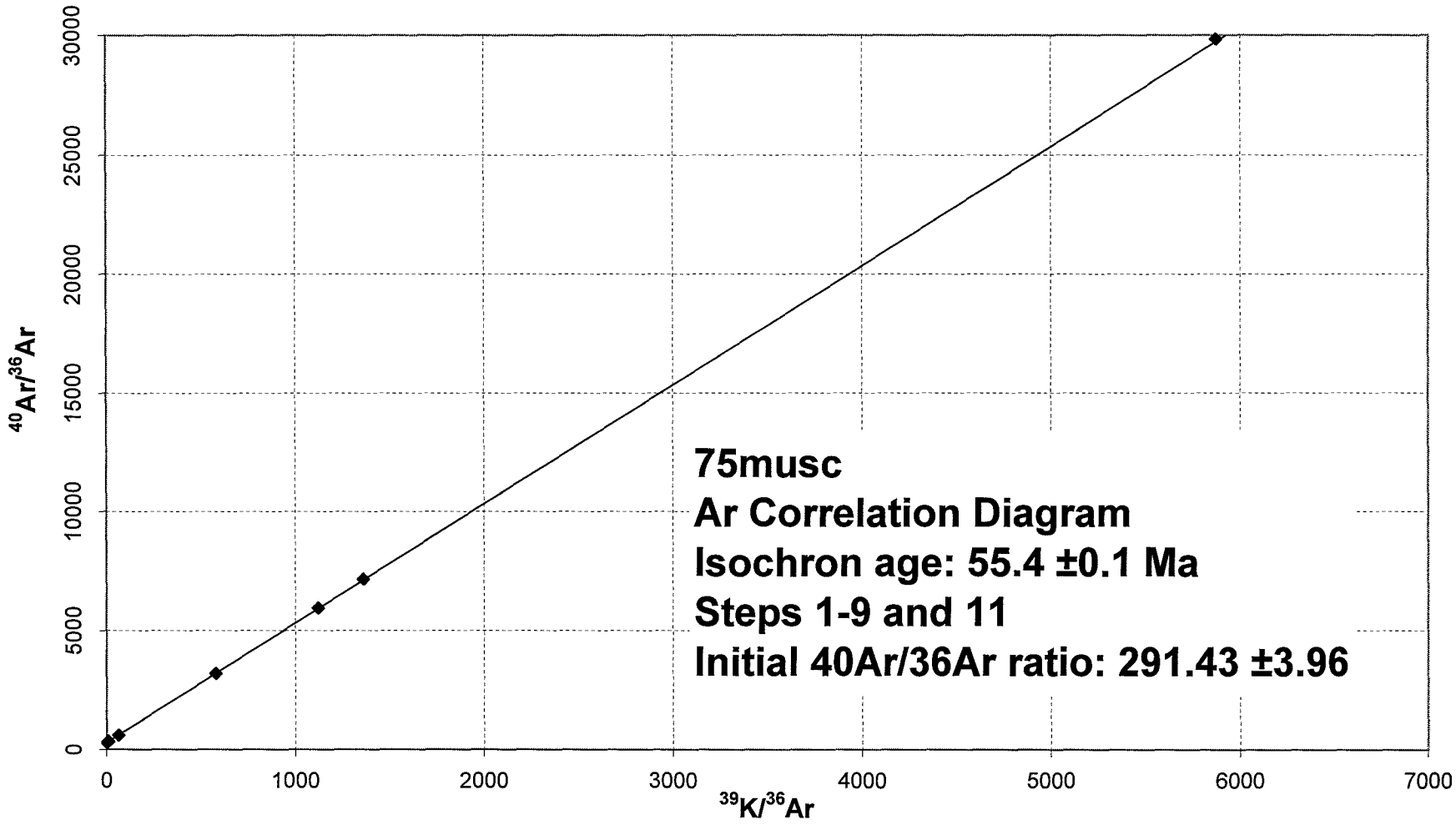
Sample: 3-3-87-9 Hornblende Raw data Table

		measured peaks:		blanks:		blank corrected:		Decay corrected:		Interference corrected:		
	Ar isotope	**V**	**± V**	**V**	**± V**	**V**	**± V**	**V**	**± V**		**V**	**± V**
Experiment # **91A5261**	**40**	3.606488	0.000315	0.068710	0.006117	3.537778	0.006125	3.537778	0.006125	**40Ar, *+a**	3.537757	
day measured 12/10/91	**39**	0.021579	0.000067	0.000119	0.000003	0.021460	0.000067	0.021472	0.000067	**39Ar,K**	0.021414	
time measured 20:14	**38**	0.004464	0.000022	0.000020	0.000002	0.004444	0.000022	0.004444	0.000022	**38**	0.004444	0.000022
37Ar decay factor 4.395485	**37**	0.019472	0.000043	0.000062	0.000003	0.019410	0.000044	0.085317	0.001479	**37Ar, Ca**	0.085317	
39Ar decay factor 1.000533	**36**	0.009389	0.000042	0.000250	0.000021	0.009139	0.000047	0.009139	0.000047	**36Ar,a**	0.009116	
Experiment # **91A5262**	**40**	0.504870	0.000203	0.068710	0.006117	0.436160	0.006120	0.436160	0.006120	**40Ar, *+a**	0.436146	
day measured 12/10/91	**39**	0.014586	0.000043	0.000119	0.000003	0.014467	0.000043	0.014475	0.000043	**39Ar,K**	0.014451	
time measured 20:37	**38**	0.001358	0.000004	0.000020	0.000002	0.001338	0.000004	0.001338	0.000004	**38**	0.001338	0.000004
37Ar decay factor 4.396872	**37**	0.008256	0.000022	0.000062	0.000003	0.008194	0.000023	0.036027	0.000769	**37Ar, Ca**	0.036027	
39Ar decay factor 1.000534	**36**	0.000902	0.000011	0.000250	0.000021	0.000652	0.000024	0.000652	0.000024	**36Ar,a**	0.000643	
Experiment # **91A5263**	**40**	0.973521	0.000589	0.099600	0.006117	0.873921	0.006145	0.873921	0.006145	**40Ar, *+a**	0.873848	
day measured 12/10/91	**39**	0.073718	0.000048	0.000119	0.000003	0.073599	0.000048	0.073639	0.000048	**39Ar,K**	0.073395	
time measured 20:58	**38**	0.008096	0.000024	0.000020	0.000002	0.008076	0.000024	0.008076	0.000024	**38**	0.008076	0.000024
37Ar decay factor 4.398138	**37**	0.082375	0.000066	0.000062	0.000003	0.082313	0.000066	0.362025	0.002237	**37Ar, Ca**	0.362025	
39Ar decay factor 1.000534	**36**	0.000802	0.000008	0.000364	0.000021	0.000438	0.000023	0.000438	0.000023	**36Ar,a**	0.000343	
Experiment # **91A5264**	**40**	3.313599	0.001658	0.099600	0.006117	3.213999	0.006338	3.213999	0.006338	**40Ar, *+a**	3.213771	
day measured 12/10/91	**39**	0.228440	0.000074	0.000119	0.000003	0.228321	0.000074	0.228443	0.000074	**39Ar,K**	0.227787	
time measured 21:19	**38**	0.034945	0.000036	0.000020	0.000002	0.034925	0.000036	0.034925	0.000036	**38**	0.034925	0.000036
37Ar decay factor 4.399405	**37**	0.221579	0.000194	0.000062	0.000003	0.221517	0.000194	0.974543	0.006586	**37Ar, Ca**	0.974543	
39Ar decay factor 1.000534	**36**	0.001149	0.000005	0.000364	0.000021	0.000785	0.000022	0.000785	0.000022	**36Ar,a**	0.000528	
Experiment # **91A5265**	**40**	5.463798	0.002468	0.099600	0.006117	5.364198	0.006596	5.364198	0.006596	**40Ar, *+a**	5.363815	
day measured 12/10/91	**39**	0.384348	0.000200	0.000119	0.000003	0.384229	0.000200	0.384435	0.000200	**39Ar,K**	0.383404	
time measured 21:41	**38**	0.060893	0.000052	0.000020	0.000002	0.060873	0.000052	0.060873	0.000052	**38**	0.060873	0.000052
37Ar decay factor 4.400733	**37**	0.348157	0.000305	0.000062	0.000003	0.348095	0.000305	1.531873	0.010371	**37Ar, Ca**	1.531873	
39Ar decay factor 1.000534	**36**	0.001332	0.000008	0.000364	0.000021	0.000968	0.000022	0.000968	0.000022	**36Ar,a**	0.000564	
Experiment # **91A5266**	**40**	7.401920	0.003656	0.099600	0.006117	7.302320	0.007126	7.302320	0.007126	**40Ar, *+a**	7.301766	
day measured 12/10/91	**39**	0.555463	0.000483	0.000119	0.000003	0.555344	0.000483	0.555641	0.000483	**39Ar,K**	0.554177	
time measured 22:02	**38**	0.088477	0.000048	0.000020	0.000002	0.088457	0.000048	0.088457	0.000048	**38**	0.088457	0.000048
37Ar decay factor 4.402	**37**	0.494296	0.000274	0.000062	0.000003	0.494234	0.000274	2.175619	0.009331	**37Ar, Ca**	2.175619	
39Ar decay factor 1.000534	**36**	0.001389	0.000011	0.000364	0.000021	0.001025	0.000024	0.001025	0.000024	**36Ar,a**	0.000450	

Experiment # **91A5267**	**40**	5.213677	0.002622	0.099600	0.006117	5.114077	0.006655	5.114077	0.006655	**40Ar, *+a**	5.113671	
day measured 12/10/91	**39**	0.407000	0.000142	0.000119	0.000003	0.406881	0.000142	0.407098	0.000142	**39Ar,K**	0.406030	
time measured 22:23	**38**	0.065054	0.000073	0.000020	0.000002	0.065034	0.000073	0.065034	0.000073	**38**	0.065034	0.000073
37Ar decay factor 4.403268	**37**	0.360416	0.000435	0.000062	0.000003	0.360354	0.000435	1.586733	0.014782	**37Ar, Ca**	1.586733	
39Ar decay factor 1.000534	**36**	0.000858	0.000007	0.000364	0.000021	0.000494	0.000022	0.000494	0.000022	**36Ar,a**	0.000075	
Experiment # **91A5268**	**40**	10.259120	0.004781	0.099600	0.006117	10.159520	0.007764	10.159520	0.007764	**40Ar, *+a**	10.158737	
day measured 12/10/91	**39**	0.785151	0.000481	0.000119	0.000003	0.785032	0.000481	0.785451	0.000481	**39Ar,K**	0.783348	
time measured 22:45	**38**	0.125523	0.000103	0.000020	0.000002	0.125503	0.000103	0.125503	0.000103	**38**	0.125503	0.000103
37Ar decay factor 4.404597	**37**	0.709596	0.000551	0.000062	0.000003	0.709534	0.000551	3.125213	0.018729	**37Ar, Ca**	3.125213	
39Ar decay factor 1.000534	**36**	0.001824	0.000008	0.000364	0.000021	0.001460	0.000022	0.001460	0.000022	**36Ar,a**	0.000635	
Experiment # **91A5269**	**40**	Signal saturates meter								**40Ar, *+a**	0.000000	
day measured 12/10/91	**39**	next experiment is split from this								**39Ar,K**	0.000000	
time measured 23:02	**38**									**38**	0.000000	0.000000
37Ar decay factor 4.405624	**37**									**37Ar, Ca**	0.000000	
39Ar decay factor 1.000534	**36**									**36Ar,a**	0.000000	
Experiment # **91A5270**	**split**	2.634224	0.001484	0.061557	0.004671	2.572667	0.004901	2.572667	0.004901	**40Ar, *+a**	2.572467	
day measured 12/10/91	**39**	0.201396	0.000150	0.000119	0.000003	0.201277	0.000150	0.201384	0.000150	**39Ar,K**	0.200854	
time measured 23:17	**38**	0.032230	0.000047	0.000019	0.000003	0.032211	0.000047	0.032211	0.000047	**38**	0.032211	0.000047
37Ar decay factor 4.40653	**37**	0.179056	0.000089	0.000062	0.000003	0.178994	0.000089	0.788741	0.003021	**37Ar, Ca**	0.788741	
39Ar decay factor 1.000534	**36**	0.000476	0.000005	0.000240	0.000016	0.000236	0.000017	0.000236	0.000017	**36Ar,a**	0.000028	
Experiment # **91A5271**	**40**	2.132890	0.001293	0.099600	0.006117	2.033290	0.006252	2.033290	0.006252	**40Ar, *+a**	2.033130	
day measured 12/11/91	**39**	0.160678	0.000138	0.000119	0.000003	0.160559	0.000138	0.160645	0.000138	**39Ar,K**	0.160220	
time measured 0:00	**38**	0.025674	0.000044	0.000020	0.000002	0.025654	0.000044	0.025654	0.000044	**38**	0.025654	0.000044
37Ar decay factor 4.409129	**37**	0.143471	0.000149	0.000062	0.000003	0.143409	0.000149	0.632310	0.005054	**37Ar, Ca**	0.632310	
39Ar decay factor 1.000535	**36**	0.000520	0.000004	0.000364	0.000021	0.000156	0.000021	0.000156	0.000021	**36Ar,a**	*0.00000*	
Experiment # **91A5272**	**40**	1.861011	0.000893	0.099600	0.006117	1.761411	0.006182	1.761411	0.006182	**40Ar, *+a**	1.761277	
day measured 12/11/91	**39**	0.134364	0.000095	0.000119	0.000003	0.134245	0.000095	0.134317	0.000095	**39Ar,K**	0.133961	
time measured 0:21	**38**	0.021442	0.000014	0.000020	0.000002	0.021422	0.000014	0.021422	0.000014	**38**	0.021422	0.000014
37Ar decay factor 4.410399	**37**	0.119890	0.000096	0.000062	0.000003	0.119828	0.000096	0.528489	0.003270	**37Ar, Ca**	0.528489	
39Ar decay factor 1.000535	**36**	0.000697	0.000009	0.000364	0.000021	0.000333	0.000023	0.000333	0.000023	**36Ar,a**	0.000193	

Numbers in italics have been set to 0.0 because the calculated correction produces a negative number


75 muscovite, San Marcos Mine
Plateau Age: 55.7±0.1 Ma
54% of ^{39}Ar, Steps 7-14
Apparent Age (Ma)
0
20
40
60
80
100
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Cumulative 39Ar released


75musc
Ar Correlation Diagram
Isochron age: 55.4 ±0.1 Ma
Steps 1-9 and 11
Initial 40Ar/36Ar ratio: 291.43 ±3.96
40Ar/36Ar
39K/36Ar
0
5000
10000
15000
20000
25000
30000
0
1000
2000
3000
4000
5000
6000
7000

Sample ID: 75 Muscovite; San Marcos Mine

Plateau age: 55.67 ±0.10 NSteps= 18 Total 39Ar: 6.16

J: 0.006204 ±0.000005 **Data summary:** Measured ratios:

	Exp't.	temp	fraction 39Ar	Age	F	rad_yield	40/39	36/39	37/39	K/Ca	corrected_39
1	2B1197	650	0.00	25 ±41	2.2396 ±3.711	0.80%	280.979 ±2.059	0.943 ±0.010	0.000 ±0.000		0.0187
2	2B1198	660	0.00	47 ±29	4.2577 ±2.695	3.27%	130.248 ±1.247	0.426 ±0.008	0.000 ±0.000		0.0103
3	2B1199	680	0.00	64.1 ±11.6	5.8293 ±1.078	7.86%	74.1419 ±0.425	0.2312 ±0.0034	0.0000 ±0.000		0.0241
4	2B1200	700	0.01	42.4 ±11.2	3.8313 ±1.026	4.37%	87.6778 ±0.430	0.2837 ±0.0032	0.0000 ±0.000		0.0318
5	2B1202	750	0.01	50.4 ±4.6	4.5693 ±0.419	11.08%	41.1130 ±0.101	0.1250 ±0.0013	4.7859 ±2.083	0.10	0.0573
6	2B1203	775	0.02	52.2 ±0.9	4.7322 ±0.087	50.03%	9.4604 ±0.014	0.0160 ±0.0003	0.0000 ±0.000		0.1474
7	2B1204	800	0.02	55.0 ±1.5	4.9919 ±0.139	90.72%	5.4981 ±0.010	0.0021 ±0.0003	1.5358 ±1.172	0.32	0.1017
8	2B1205	820	0.03	55.5 ±1.0	5.0350 ±0.088	95.03%	5.2900 ±0.008	0.0016 ±0.0002	2.7100 ±0.737	0.18	0.1656
9	2B1206	840	0.06	55.5 ±0.4	5.0401 ±0.039	95.87%	5.2532 ±0.006	0.0011 ±0.0001	1.4410 ±0.329	0.34	0.3813
10	2B1207	850	0.07	55.6 ±0.4	5.0427 ±0.032	99.99%	5.0414 ±0.006	0.0002 ±0.0001	0.8115 ±0.273	0.60	0.4535
11	2B1208	875	0.15	55.4 ±0.2	5.0295 ±0.018	99.01%	5.0791 ±0.005	0.0003 ±0.0000	0.5037 ±0.144	0.97	0.9005
12	2B1209	900	0.18	55.8 ±0.2	5.0649 ±0.015	100.00%	5.0611 ±0.005	0.0002 ±0.000	0.6201 ±0.121	0.79	1.0909
13	2B1210	900	0.08	55.9 ±0.3	5.0711 ±0.029	100.00%	5.0215 ±0.006	0.0000 ±0.0001	0.6216 ±0.247	0.79	0.5067
14	2B1211	925	0.06	55.7 ±0.4	5.0531 ±0.039	100.00%	4.9848 ±0.006	0.0000 ±0.0001	0.8512 ±0.332	0.58	0.3797
15	2B1212	975	0.10	56.4 ±0.3	5.1152 ±0.025	100.00%	5.0921 ±0.005	0.0002 ±0.0001	0.8603 ±0.204	0.57	0.6268
16	2B1213	1075	0.14	58.7 ±0.2	5.3265 ±0.018	100.00%	5.1736 ±0.005	0.0003 ±0.0000	2.9395 ±0.153	0.17	0.8931
17	2B1214	1200	0.05	71.7 ±0.6	6.5371 ±0.055	100.00%	5.1266 ±0.007	0.0000 ±0.0001	17.1276 ±0.477	0.03	0.3225
18	2B1215	1350	0.01	216 ±4	20.4882 ±0.379	100.00%	8.5259 ±0.024	0.0109 ±0.001	165.52 ±3.298	0.00	0.0485

75 muscovite; San Marcos mine — Raw Data Table

		measured peaks:		blanks:		blank corrected:		Decay corrected:		Interference corrected:		
	Ar isotope	V	Δ V	V	Δ V	V	Δ V	V_decay	Δ V	isotope	V	Δ V
Experiment # **2B1197**	**40**	5.294778	0.003732	0.028810	0.000172	5.265968	0.003736	5.265968	0.003736	**40Ar, *+a**	5.265949	
day measured 12/1/92	**39**	0.019078	0.000134	0.000394	0.000027	0.018684	0.000136	0.018742	0.000137	**39Ar,K**	0.018742	
time measured 16:29	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5051.599	**37**	0.000123	0.171270	0.000145	0.000022	0.000000	0.171270	0.000000	0.171270	**37Ar, Ca**	0.000000	
39Ar decay factor 1.003055	**36**	0.017864	0.000146	0.000186	0.000022	0.017678	0.000147	0.017678	0.000147	**36Ar,a**	0.017678	
Experiment # **2B1198**	**40**	1.371229	0.001257	0.028810	0.000172	1.342419	0.001269	1.342419	0.001269	**40Ar, *+a**	1.342409	
day measured 12/1/92	**39**	0.010669	0.000094	0.000394	0.000027	0.010275	0.000098	0.010307	0.000098	**39Ar,K**	0.010307	
time measured 16:59	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5053.662	**37**	0.000029	0.154983	0.000145	0.000022	0.000000	0.154983	0.000000	0.154983	**37Ar, Ca**	0.000000	
39Ar decay factor 1.003056	**36**	0.004580	0.000069	0.000186	0.000022	0.004394	0.000072	0.004394	0.000072	**36Ar,a**	0.004394	
Experiment # **2B1199**	**40**	1.814114	0.001444	0.028810	0.000172	1.785304	0.001454	1.785304	0.001454	**40Ar, *+a**	1.785280	
day measured 12/1/92	**39**	0.024400	0.000133	0.000394	0.000027	0.024006	0.000136	0.024080	0.000136	**39Ar,K**	0.024080	
time measured 17:23	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5055.302	**37**	0.000034	0.162045	0.000145	0.000022	0.000000	0.162045	0.000000	0.162045	**37Ar, Ca**	0.000000	
39Ar decay factor 1.003056	**36**	0.005752	0.000071	0.000186	0.000022	0.005567	0.000074	0.005567	0.000074	**36Ar,a**	0.005567	
Experiment # **2B1200**	**40**	2.812931	0.002321	0.028810	0.000172	2.784121	0.002327	2.784121	0.002327	**40Ar, *+a**	2.784090	
day measured 12/1/92	**39**	0.032051	0.000151	0.000394	0.000027	0.031657	0.000153	0.031754	0.000154	**39Ar,K**	0.031754	
time measured 17:45	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5056.87	**37**	0.000019	0.157295	0.000145	0.000022	0.000000	0.157295	0.000000	0.157295	**37Ar, Ca**	0.000000	
39Ar decay factor 1.003056	**36**	0.009196	0.000087	0.000186	0.000022	0.009010	0.000090	0.009010	0.000090	**36Ar,a**	0.009010	
Experiment # **2B1202**	**40**	2.391381	0.001694	0.036142	0.000178	2.355239	0.001704	2.355239	0.001704	**40Ar, *+a**	2.355182	
day measured 12/2/92	**39**	0.057513	0.000132	0.000401	0.000025	0.057112	0.000135	0.057287	0.000135	**39Ar,K**	0.057102	
time measured 11:12	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5130.015	**37**	0.274276	0.119312	0.000109	0.000020	0.274167	0.119312	0.274167	0.119312	**37Ar, Ca**	0.274167	
39Ar decay factor 1.003061	**36**	0.007332	0.000066	0.000173	0.000022	0.007160	0.000070	0.007160	0.000070	**36Ar,a**	0.007087	
Experiment # **2B1203**	**40**	1.430934	0.001143	0.036142	0.000178	1.394792	0.001157	1.394792	0.001157	**40Ar, *+a**	1.394644	
day measured 12/2/92	**39**	0.147386	0.000180	0.000401	0.000025	0.146985	0.000182	0.147435	0.000183	**39Ar,K**	0.147435	
time measured 11:35	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5131.625	**37**	0.000077	0.000023	0.000109	0.000020	0.000000	0.000030	0.000000	0.000030	**37Ar, Ca**	0.000000	
39Ar decay factor 1.003061	**36**	0.002531	0.000037	0.000173	0.000022	0.002359	0.000043	0.002359	0.000043	**36Ar,a**	0.002359	
Experiment # **2B1204**	**40**	0.595528	0.000555	0.036142	0.000178	0.559385	0.000583	0.559385	0.000583	**40Ar, *+a**	0.559284	
day measured 12/2/92	**39**	0.101832	0.000149	0.000401	0.000025	0.101432	0.000151	0.101742	0.000152	**39Ar,K**	0.101637	
time measured 12:08	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5133.957	**37**	0.156367	0.119191	0.000109	0.000020	0.156258	0.119191	0.156258	0.119191	**37Ar, Ca**	0.156258	
39Ar decay factor 1.003061	**36**	0.000390	0.000027	0.000173	0.000022	0.000217	0.000035	0.000217	0.000035	**36Ar,a**	0.000176	
Experiment # **2B1205**	**40**	0.913506	0.000817	0.037498	0.000178	0.876008	0.000836	0.876008	0.000836	**40Ar, *+a**	0.875843	
day measured 12/2/92	**39**	0.165493	0.000172	0.000401	0.000025	0.165093	0.000174	0.165598	0.000174	**39Ar,K**	0.165296	
time measured 12:39	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5136.092	**37**	0.448887	0.122041	0.000109	0.000020	0.448778	0.122041	0.448778	0.122041	**37Ar, Ca**	0.448778	
39Ar decay factor 1.003061	**36**	0.000439	0.000028	0.000173	0.000022	0.000266	0.000036	0.000266	0.000036	**36Ar,a**	0.000147	
Experiment # **2B1206**	**40**	2.042049	0.001390	0.039003	0.000178	2.003046	0.001402	2.003046	0.001402	**40Ar, *+a**	2.002665	
day measured 12/2/92	**39**	0.380537	0.000351	0.000401	0.000025	0.380137	0.000352	0.381300	0.000353	**39Ar,K**	0.380931	
time measured 13:01	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5137.687	**37**	0.549578	0.125462	0.000109	0.000020	0.549469	0.125462	0.549469	0.125462	**37Ar, Ca**	0.549469	
39Ar decay factor 1.003061	**36**	0.000618	0.000028	0.000193	0.000022	0.000425	0.000036	0.000425	0.000036	**36Ar,a**	0.000280	

Experiment # **2B1207**	**40**	2.325302	0.001912	0.039003	0.000178	2.286299	0.001920	2.286299	0.001920	**40Ar, *+a**	2.285845	
day measured 12/2/92	**39**	0.452518	0.000361	0.000401	0.000025	0.452118	0.000362	0.453502	0.000363	**39Ar,K**	0.453254	
time measured 13:24	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5139.283	**37**	0.368137	0.123683	0.000109	0.000020	0.368028	0.123683	0.368028	0.123683	**37Ar, Ca**	0.368028	
39Ar decay factor 1.003062	**36**	0.000291	0.000027	0.000193	0.000022	0.000098	0.000035	0.000098	0.000035	**36Ar,a**	0.000001	
Experiment # **2B1208**	**40**	4.613939	0.002541	0.040498	0.000178	4.573441	0.002548	4.573441	0.002548	**40Ar, *+a**	4.572541	
day measured 12/2/92	**39**	0.898103	0.000799	0.000401	0.000025	0.897702	0.000800	0.900451	0.000802	**39Ar,K**	0.900146	
time measured 13:47	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5140.897	**37**	0.453685	0.129847	0.000109	0.000020	0.453576	0.129847	0.453576	0.129847	**37Ar, Ca**	0.453576	
39Ar decay factor 1.003062	**36**	0.000476	0.000029	0.000203	0.000022	0.000273	0.000036	0.000273	0.000036	**36Ar,a**	0.000153	
Experiment # **2B1209**	**40**	5.563152	0.003172	0.042108	0.000178	5.521044	0.003177	5.521044	0.003177	**40Ar, *+a**	5.519954	
day measured 12/2/92	**39**	1.087945	0.000771	0.000401	0.000025	1.087545	0.000771	1.090875	0.000774	**39Ar,K**	1.090419	
time measured 14:10	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5142.494	**37**	0.676585	0.131834	0.000109	0.000020	0.676475	0.131834	0.676475	0.131834	**37Ar, Ca**	0.676475	
39Ar decay factor 1.003062	**36**	0.000381	0.000028	0.000213	0.000022	0.000169	0.000036	0.000169	0.000036	**36Ar,a**	*0.000000*	
Experiment # **2B1210**	**40**	2.586371	0.001832	0.042108	0.000178	2.544263	0.001841	2.544263	0.001841	**40Ar, *+a**	2.543757	
day measured 12/2/92	**39**	0.505525	0.000432	0.000401	0.000025	0.505124	0.000432	0.506671	0.000434	**39Ar,K**	0.506459	
time measured 14:32	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5144.065	**37**	0.315067	0.124907	0.000109	0.000020	0.314958	0.124907	0.314958	0.124907	**37Ar, Ca**	0.314958	
39Ar decay factor 1.003062	**36**	0.000150	0.000026	0.000213	0.000022	*0.00000*	0.000034	*0.00000*	0.000034	**36Ar,a**	*0.00000*	
Experiment # **2B1211**	**40**	1.936485	0.001641	0.044003	0.000195	1.892482	0.001652	1.892482	0.001652	**40Ar, *+a**	1.892102	
day measured 12/2/92	**39**	0.378894	0.000348	0.000400	0.000029	0.378494	0.000349	0.379653	0.000350	**39Ar,K**	0.379436	
time measured 14:54	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5145.649	**37**	0.323285	0.126166	0.000136	0.000021	0.323148	0.126166	0.323148	0.126166	**37Ar, Ca**	0.323148	
39Ar decay factor 1.003062	**36**	0.000101	0.000027	0.000222	0.000023	*0.00000*	0.000036	*0.00000*	0.000036	**36Ar,a**	*0.00000*	
Experiment # **2B1212**	**40**	3.239956	0.001560	0.048004	0.000195	3.191952	0.001572	3.191952	0.001572	**40Ar, *+a**	3.191326	
day measured 12/2/92	**39**	0.625330	0.000537	0.000400	0.000029	0.624930	0.000538	0.626843	0.000540	**39Ar,K**	0.626480	
time measured 15:17	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5147.232	**37**	0.539392	0.127679	0.000136	0.000021	0.539256	0.127679	0.539256	0.127679	**37Ar, Ca**	0.539256	
39Ar decay factor 1.003062	**36**	0.000339	0.000029	0.000242	0.000023	0.000098	0.000038	0.000098	0.000038	**36Ar,a**	*0.00000*	
Experiment # **2B1213**	**40**	4.684760	0.002805	0.063995	0.000195	4.620765	0.002812	4.620765	0.002812	**40Ar, *+a**	4.619874	
day measured 12/2/92	**39**	0.890819	0.000638	0.000400	0.000029	0.890420	0.000638	0.893146	0.000640	**39Ar,K**	0.891379	
time measured 15:39	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5148.815	**37**	2.625503	0.137067	0.000136	0.000021	2.625367	0.137067	2.625367	0.137067	**37Ar, Ca**	2.625367	
39Ar decay factor 1.003062	**36**	0.000531	0.000030	0.000272	0.000023	0.000260	0.000038	0.000260	0.000038	**36Ar,a**	*0.00000*	
Experiment # **2B1214**	**40**	1.746321	0.001486	0.092863	0.000250	1.653458	0.001506	1.653458	0.001506	**40Ar, *+a**	1.653140	
day measured 12/2/92	**39**	0.321944	0.000299	0.000402	0.000028	0.321542	0.000301	0.322527	0.000302	**39Ar,K**	0.318809	
time measured 16:02	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5150.398	**37**	5.524267	0.153910	0.000150	0.000023	5.524117	0.153910	5.524117	0.153910	**37Ar, Ca**	5.524117	
39Ar decay factor 1.003062	**36**	0.000259	0.000032	0.000335	0.000028	*0.00000*	0.000042	0.000000	0.000042	**36Ar,a**	*0.00000*	
Experiment # **2B1215**	**40**	0.506020	0.000583	0.092863	0.000250	0.413157	0.000634	0.413157	0.000634	**40Ar, *+a**	0.413114	
day measured 12/2/92	**39**	0.048713	0.000109	0.000402	0.000028	0.048311	0.000113	0.048459	0.000113	**39Ar,K**	0.043061	
time measured 16:24	**38**	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	**38**	0.000000	0.000000
37Ar decay factor 5151.985	**37**	8.021255	0.158722	0.000150	0.000023	8.021104	0.158722	8.021104	0.158722	**37Ar, Ca**	8.021104	
39Ar decay factor 1.003062	**36**	0.000865	0.000034	0.000335	0.000028	0.000530	0.000044	0.000530	0.000044	**36Ar,a**	*0.00000*	

Numbers in italics have been set to 0.0 because the calculated correction produces a negative number

Experiment #2B1201 is a blank measurement