UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Geochronological data for the Pioneer Mountains, southwestern Montana: Part I -- $^{40}Ar/^{39}Ar$ age-spectrum and conventional K/Ar dates for unaltered plutons.

By Lawrence W. Snee and John F. Sutter

Open-File Report 82-961

1982

The Pioneer batholith, southwestern Montana, crops out over an area of approximately 740 km^2 and comprises numerous plutons ranging in composition from hornblende gabbro to muscovite-biotite granite (Zen and others, 1975; Snee, 1978, 1982). The Pioneer Mountains and vicinity have been the subject of a detailed geochronologic study conducted to define 1) the ages and cooling histories of plutons of the Pioneer batholith and 2) the ages and cooling histories of alteration and mineralization events. $^{40}Ar/^{39}Ar$ age-spectrum and conventional K/Ar dates on hornblendes, biotites, and muscovites from unaltered samples were determined for the first part of this study. $^{40}Ar/^{39}Ar$ age-spectrum dates on muscovites, biotites, and whole rocks from altered and (or) mineralized samples were completed for the second part. The purpose of this report is to compile the $^{40}Ar/^{39}Ar$ age-spectrum and conventional K/Ar data for unaltered rocks that form the basis of part I of the study.

Techniques:

Sample collection

Representative samples of all phases of each pluton were collected as well as samples from selected aplites, mafic dikes, rhyolite dikes, and volcanic rocks. In general, one to five samples were collected from each unit depending on its relative size; as many as 10 samples were collected from the largest plutons.

Mineral separation

Thin-sections were prepared for each sample and studied petrographically. Samples for mineral dating were examined to determine character of hornblende, biotite, and muscovite with particular attention to grain size, alteration, intergrowths of other K-bearing minerals, and presence or overgrowths of other minerals.

Selected samples were crushed, pulverized, sized, and washed in tap water and acetone. Grain size used for mineral separation ranged from 125 to 250 µm. Within that range, the largest size fraction free of composite grains was chosen to facilitate mineral separation while minimizing surface area. Purified mineral separates of hornblende, biotite, and (or) muscovite were then obtained by techniques using one or more the following: heavy liquids, magnetic separation, and paper friction. Hand picking was usually necessary to ensure 99.9% purity. Mineral separates were then washed in acetone, ethyl alcohol, and distilled water, and dried to 100°C.

K/Ar analysis

After purification of mineral separates, representative aliquants of each sample were analyzed for K and Ar in the K/Ar Laboratory, The Ohio State University. Ar analysis was done by isotope-dilution mass spectrometry using a Nuclide Corporation, Model SGA-6-60 gas-source, 6-inch, 60° sector mass spectrometer operated in the static mode and equipped with a Cary Model 401 vibrating reed electrometer. Automatic peak-stepping was done by Hewlett-

Packard 9825 computer-assisted stepping to pre-determined magnetic field intensities after 10 second counting intervals. Peak intensities were collected on a Nuclide Integrating Ratiometer. Data were partially reduced using an on-line Hewlett-Packard 9825 desk-top computer. Final data reduction was completed on Ohio State University's IBM 370 Computer. Gas extraction was performed in an ultra-high vacuum extraction system that is on-line with the mass spectrometer. Extractions were not made if pressures were greater than 10^{-7} torr. Approximately 0.2 gm of biotite or 0.5 to 2 gm of rock sample, depending on K content, were loaded directly into a Mo crucible or into high-purity aluminum capsules that were dropped into the crucible from a side-arm on the extraction bottle. Total gas extraction was done in a single step by melting samples using a Lepel radio-frequency generator. Each sample was kept above its melting temperature for approximately 15 minutes. During heating, the gas was collected on a charcoal trap cooled to the temperature of liquid nitrogen. Immediately after heating, ^{38}Ar tracer was added to the extracted gas by means of a Dorflinger pipetting system. The gas was then purified by reaction with hot Cu-CuO, molecular sieve desiccant, and hot Ti foil. The purified gas was immediately transferred to the mass spectrometer for analysis. Air standards were analyzed periodically to determine the discrimination factor of Ar isotopes in the mass spectrometer. Samples were not analyzed if blank values were non-atmospheric.

Potassium analyses were made on duplicate representative aliquants of each sample on a Zeiss PF-5 flame photometer. Samples were prepared for dissolution by pulverizing rock samples to -100 mesh in a tungsten carbide mortar and pestle; micas were not pulverized. Samples were dissolved in HF, H_2SO_4, and HNO_3 acids and alkali elements were separated according to the technique of Cooper (1963). Standard solutions of 0-10 ppm K were prepared from stoichiometric K_2SO_4 by the same technique and analyzed by flame photometry to determine a calibration curve and to ensure accuracy. K content of samples was determined by bracketing each sample between standards of appropriate K concentration. K content of replicate analyses was demanded to be within 1% or new aliquants were prepared and analyzed. Overall precision of all K analyses (pooled coefficient of variation) done in the K/Ar Laboratory of Ohio State is <0.5%.

<u>$^{40}Ar/^{39}Ar$ analysis</u>

After purification mineral separates were loaded into aluminum capsules. Approximately 0.2 gm of biotite or muscovite and 1.8 gm of hornblende were used. Aluminum capsules were stacked in 6 mm (inside diameter) commercial quartz vials to a length that did not exceed 5.6 cm. Most irradiations were done in locations H3 or H4 of the Ford Reactor in the Phoenix Memorial Laboratory of the University of Michigan at a power level of 2 megawatts. For these irradiations, 14 quartz vials were systematically disposed around the inside wall of a 50 mm (inside diameter) commercial quartz sample-container fitted with an inner commercial quartz liner to fix sample-vial locations. One of the 14 vials was stacked with monitors ($\sim$.04 gm mica or $\sim$.15 gm hornblende) to cover the entire length of samples. The primary monitor was OSU DY-8c-71 biotite with %K = 8.113 ± 0.050% (23 determinations), $^{40}Ar_R$ = 1.407 ± 0.027 x 10^{-9} mol/g (6 determinations), and K-Ar age = 811 Ma. Other monitors were hornblende MMhb-1 (University of Minnesota) %K = 1.555 ± 0.001, $^{40}Ar_R$ = 1.624 ± 0.005 x 10^{-9} mol/g, and K/Ar age = 519.5 Ma) and an internal monitor from the Pioneer Mountains, 818 muscovite (%K = 8.509 ± 0.027, $^{40}Ar_R$ = 1.010 x 10^{-9} mol/g, and K/Ar age = 67.2 Ma). Samples were irradiated for 60-80 hours at 2 megawatts to ensure optimum $^{40}Ar_R/^{39}Ar_K$ ratios between 1 and 10 with low Ca-derived Ar (Dalrymple and others, 1981). The sample container was rotated throughout the irradiation to eliminate possible horizontal flux gradients. During this study, production ratios, as determined from CaF_2, for the University of Michigan reactor averaged $(^{36}Ar/^{37}Ar)_{Ca}$ = 2.73 ± 0.216 x 10^{-4} (7 determinations), $(^{39}Ar/^{37}Ar)_{Ca}$ = 7.24 ± 0.391 x 10^{-4} (7 determinations) over a 1.5 year period. In February and March, 1979, $(^{36}Ar/^{37}Ar)_{Ca}$ averaged 2.81 ± 0.056 x 10^{-4} (3 determinations) and $(^{39}Ar/^{37}Ar)_{Ca}$ averaged 7.24 ± 0.097 x 10^{-4} (4 determinations). In May, 1980, they averaged 2.87 x 10^{-4} (2 determinations) and 6.86 x 10^{-4} (2 determinations), respectively. Production ratio $(^{40}Ar/^{39}Ar)_K$ was not evaluated because of the difficulty in producing precise determination. However, because the thermal to fast neutron-flux ratio of the Michigan reactor is only about twice that of U.S. Geological Survey Triga Reactor (GSTR), an $(^{40}Ar/^{39}Ar)_K$ production ratio of 0.0059 (that of GSTR; Dalrymple and others, 1981) was assumed. In any event, using the data from Tetley and others (1980), the maximum $(^{40}Ar/^{39}Ar)_K$ ratio for facilities H3 and H4 in the Ford Reactor would be 0.0164. This difference would cause less than 0.1 Ma change in Pioneers samples and thus is insignificant.

A few samples analyzed during the early stages of this study were irradiated in GSTR. For these experiments, the sample container was like that described by Dalrymple and others (1981) (Exhibit C, Figure 7, p. 9). Irradiations were done for approximately 40 hours at 1 megawatt. The sample container was not rotated but horizontal gradients are negligible. Production ratios for GSTR are $(^{36}Ar/^{37}Ar)_{Ca}$ = 2.67 ± 0.017 x 10^{-4} (25 determinations), $(^{39}Ar/^{37}Ar)_{Ca}$ = 6.73 ± 0.037 x 10^{-4} (25 determinations), and $(^{40}Ar/^{39}Ar)_K$ = 0.59 ± 0.072 x 10^{-2} (4 determinations) (Dalrymple and others, 1981). Dalrymple and others (1981) pointed out that $(^{40}Ar/^{39}Ar)_K$ was difficult to reproduce but that it is a direct function of the integrated fast neutron flux, an inverse function of the age of the sample, and independent of the K/Ca ratio. For Pioneer samples, if no K-derived ^{40}Ar correction were made, the maximum error in age would be 0.2 Ma. Thus, even if a large error exists in the $(^{40}Ar/^{39}Ar)_K$ production ratio, the error in the calculated age will be insignificant.

Ar extraction from samples was similar to that for K/Ar dating except that the gas was released in 1 - 7 heating steps ranging from about 600° to 1350°C. Each fraction was analyzed separately by mass spectrometry. Data reduction was done in part on-line with a Hewlett-Packard 9825 table-top computer and in part with OSU's IBM-370.

Ar extraction from monitors was done in a single fusion step. J-values for each monitor were calculated and a calibration curve for the length of the package was constructed. The appropriate J for each unknown was assigned by comparison with adjacent monitors. If the sample covered a length that included several monitors, the appropriate monitors' J-values were averaged.

For calculation of concentration of ^{39}Ar in Table 2, mass-spectrometer sensitivity was calculated for each package from the electronic signal produced corresponding to the amount of radiogenic ^{40}Ar in the monitors. Sensitivities by package are:

Irradiation Package	Sensitivity ($\times 10^{-14}$ moles/millivott)
OD 23	7.94
OD 27	5.57
OM 2	6.07
OM 3	7.80
OM 8	9.70
OM 12	1.02
OM 15	4.80
OM 16	4.77
OM 19	6.95
OM 20	6.82
OM 21	3.80
OM 22	4.60
OM 24	4.50

OD refers to packages irradiated in GSTR, Denver. OM packages were irradiated in the Ford Reactor, University of Michigan. Precision of sensitivities is approximately ± 10%.

Dalrymple and others (1981) measured K/Ca ratios by independent techniques on many samples of various ratios that were irradiated in GSTR, Denver. From these data, they determined that

$$K/Ca = (0.49 \pm 0.09)\ {}^{39}Ar_K/{}^{37}Ar_{Ca}$$

as production ratios in the Ford Reactor are similar to GSTR, this expression has been used to obtain approximate (±20%) K/Ca ratios for some samples in this study.

Decay constants and age calculations

In this study, the decay constants and isotopic abundances are those recommended by Steiger and Jäger (1977).

Decay constants	Isotopic abundances in atomic percent	
$\lambda_{\varepsilon} = 0.581 \times 10^{-10}/yr$	^{39}K	93.2581
$\lambda_{\beta-} = 4.962 \times 10^{-10}/yr$	^{40}K	0.01167
$\lambda = \lambda_{\varepsilon} + \lambda_{\beta} = 5.543 \times 10^{-10}/yr$	^{41}K	6.7302
	^{40}Ar	99.600
	^{38}Ar	0.0063
$^{40}Ar/^{39}Ar$ atmosphere = 295.5	^{36}Ar	0.337

K/Ar dates were calculated in the manner described by Dalrymple and Lanphere (1969). $^{40}Ar/^{39}Ar$ dates were calculated as described by Dalrymple and others (1981).

Presentation of the data

Sample locations are listed in Table 1 according to quadrangle. Sample numbers begin with a letter abbreviation of the quadrangle followed by a number. Sample numbers are followed by original field number, latitude, longitude, section, township, range, and county.

$^{40}Ar/^{39}Ar$ age-spectrum data are compiled in Table 2. Each sample is identified along its top line by sample number, material, J-value, number of its irradiation package, mass, and plutonic group. Plutonic groups are those defined by Snee (1982). Data for each temperature step are listed plus "total gas" (TG) and "plateau" (PLAT) data. In most cases, an M appears after a temperature fraction that is considered to be the "most preferred fraction" (Snee, 1982). Analytical precision at one standard deviation is given for age of most preferred fractions and plateaux.

Conventional K/Ar data are compiled in Table 3. The "Description" column lists plutonic group or rock-type as defined by Snee (1982).

Table 1. Sample locations

Argenta Quad		
A1	Argenta biotite	45° 17' 02" N, 112° 52' 15" W; SW¼ NE¼ Sec 30; T.6S., R.10W., Beaverhead County, MT.
Dewey Quad		
D1	809-76-2	45° 45' 44" N, 112° 48' 36" W; NW¼ SW¼ Sec 11; T.1S., R.10W., Beaverhead County, MT.
D2	813-78-3	45° 45' 40" N, 112° 48' 22" W; SE¼ SW¼ Sec 11; T.1S., R.10W., Beaverhead County, MT.
D3	813-78-2	45° 46' 37" N, 112° 49' 57" W; NW¼ SW¼ Sec 3; T.1S., R.10W., Beaverhead County, MT.
D4	827-78-1B	45° 46' 41" N, 112° 52' 12" W; NE¼ SW¼ Sec 5; T.1S., R.10W., Beaverhead County, MT.
Foolhen Ridge Quad		
FR1	729-78-2	45° 50' 46" N, 113° 09' 02" W; NE¼ SE¼ Sec 12; T.1N., R.12W., Beaverhead County, MT.
Maurice Mountain Quad		
MM1	906-76-1	45° 31' 29" N, 113° 05' 22" W; SW¼ SE¼ Sec 33; T.3S., R.12W., Beaverhead County, MT.
Odell Lake Quad		
OL1	FT36	45° 30' 29" N, 113° 12' 12" W; NE¼ NE¼ Sec 9; T.4S., R.13W., Beaverhead County, MT.
OL2	708-79-2	45° 35' 13" N, 113° 14' 33" W; NW¼ SW¼ Sec 8; T.3S., R.13W., Beaverhead County, MT.
Pine Hill Quad		
PH1	727-78-2	45° 45' 09" N, 113° 21' 53" W; SW¼ NW¼ Sec 17; T.1S., R.14W., Beaverhead County, MT.
PH2	727-78-4	45° 49' 19" N, 113° 17' 29" W; SW¼ NW¼ Sec 24; T.1N., R.14W., Deer Lodge County, MT.
PH3	727-78-5	45° 49' 14" N, 113° 16' 18" W; NW¼ SW¼ Sec 19; T.1N., R.13W., Deer Lodge County, MT.

Table 1 (cont'd)

Polaris Quad

P1	831-76-1	45° 19' 01" N, 113° 05" 02" W; NE¼ NW¼ Sec 16; T.6S., R.12W., Beaverhead County, MT.
P2	707-78-8B	45° 19' 14" N, 113° 05' 07" W; NW¼ NW¼ Sec 16; T.6S., R.12W., Beaverhead County, MT.
P3	707-78-1	45° 19' 00" N, 113° 05" 12" W; SW¼ NE¼ Sec 17; T.6S., R.12W., Beaverhead County, MT.
P4	707-78-5	45° 19' 01" N, 113° 05' 02" W; NE¼ NW¼ Sec 16; T.6S., R.12W., Beaverhead County, MT.
P5	709-78-2	45° 18' 56" N, 113° 02' 53" W; SW¼ NW¼ Sec 14; T.6S., R.12W., Beaverhead County, MT.
P6	709-78-1	45° 20' 15" N, 113° 01' 46" W; NE¼ SE¼ Sec 2; T.6S., R.12W., Beaverhead County, MT.
P7	FT1	45° 23' 41" N, 113° 00' 30" W; SE¼ SW¼ Sec 18; T.5S., R.11W., Beaverhead County, MT.
P8	FT24	45° 27' 33" N, 113° 03' 03" W; SE¼ NW¼ Sec 26; T.4S., R.10W., Beaverhead County, MT.
P9	FT16	45° 25' 50" N, 113° 00' 39" W; SE¼ NW¼ Sec 6; T.5S., R.11W., Beaverhead County, MT.
P10	FT26	45° 26' 41" N, 113° 04' 51" W; SE¼ NE¼ Sec 31; T.4S., R.12W., Beaverhead County, MT.
P11	FT27	45° 26' 49" N, 113° 07' 11" W; NE¼ NE¼ Sec 33; T.4S., R.12W., Beaverhead County, MT.
P12	FT28	45° 29' 06" N, 113° 11' 48" W; NE¼ SW¼ Sec 15; T.4S., R.13W., Beaverhead County, MT.
P13	FT23	45° 27' 34" N, 113° 02' 32" W; SE¼ NE¼ Sec 26; T.4S., R.10W., Beaverhead County, MT.

Proposal Rock Quad

PR1	727-78-1	45° 42' 41" N, 113° 19' 46" W; NW¼ NE¼ Sec 33; T.1S., R.14W., Beaverhead County, MT.

Table 1 (cont'd)

Shaw Mountain Quad		
SM1	731-79-4	45° 44' 33" N, 113° 07' 59" W; NE¼ NW¼ Sec 19; T.1S., R.12W., Beaverhead County, MT.
SM2	731-79-5	45° 44' 28" N, 113° 08' 09" W; NE¼ NW¼ Sec 19; T.1S., R.12W., Beaverhead County, MT.
Stewart Mountain Quad		
StM1	FT37	45° 35' 19" N, 113° 19' 56" W; NW¼ SE¼ Sec 16; T.3S., R.14W., Beaverhead County, MT.
StM2	FT31	45° 34' 30" N, 113° 16' 34" W; SE¼ NW¼ Sec 13; T.3S., R.14W., Beaverhead County, MT.
StM3	FT9	45° 36' 03" N, 113° 22' 11" W; SE¼ NE¼ Sec 6; T.3S., R.14W., Beaverhead County, MT.
StM4	801-79-6	45° 35' 43" N, 113° 16' 12" W; SW¼ SE¼ Sec 1; T.3S., R.14W., Beaverhead County, MT.
Stine Mountain Quad		
S1	1315-3	45° 39' 07" N, 113° 00' 04" W; SE¼ SE¼ Sec 19; T.2S., R.11W., Beaverhead County, MT.
Torrey Mountain Quad		
TM1	820-76-1	45° 25' 27" N, 112° 58' 13" W; NE¼ SW¼ Sec 4; T.5S., R.11W., Beaverhead County, MT.
TM2	806-76-1	45° 24' 27" N, 112° 58' 08" W; NW¼ SE¼ Sec 9; T.5S., R.11W., Beaverhead County, MT.
TM3	816-78-1	45° 25' 20" N, 112° 59' 34" W; NE¼ SW¼ Sec 5; T.5S., R.11W., Beaverhead County, MT.
TM7	820-76-3	45° 24' 59" N, 112° 59' 11" W; SW¼ NE¼ Sec 8; T.5S., R.11W., Beaverhead County, MT.
TM8	621-76-2	45° 29' 03" N, 112° 53' 06" W; NW¼ SE¼ Sec 18; T.4S., R.10W., Beaverhead County, MT.
TM9	630-76-1	45° 29' 54" N, 112° 58' 20" W; NE¼ SW¼ Sec 9; T.4S., R.11W., Beaverhead County, MT.

Table 1 (cont'd)

<u>Torrey Mountain Quad</u> (cont'd)

TM10	825-76-1	45° 28' 04" N, 112° 56' 02" W; SE¼ SE¼ Sec 22; T.4S., R.11W., Beaverhead County, MT.
TM11	728-76-2	45° 27' 22" N, 112° 58' 23" W; NE¼ SW¼ Sec 28; T.4S., R.11W., Beaverhead County, MT.
TM12	713-76-1	45° 28' 03" N, 112° 56' 01" W; SE¼ SE¼ Sec 22; T.4S., R.11W., Beaverhead County, MT.
TM13	730-76-1	45° 26' 33" N, 112° 57' 54" W; NW¼ SE¼ Sec 33; T.4S., R.11W., Beaverhead County, MT.
TM14	829-76-1	45° 27' 48" N, 112° 53' 24" W; NE¼ NW¼ Sec 30; T.4S., R.10W., Beaverhead County, MT.
TM15	806-76-4	45° 24' 50" N, 112° 59' 59" W; SE¼ NE¼ Sec 7; T.5S., R.11W., Beaverhead County, MT.
TM16	FT7	45° 23' 25" N, 112° 58' 50" W; NE¼ NE¼ Sec 20; T.5S., R.11W., Beaverhead County, MT.

<u>Twin Adams Quad</u>

TA1	820-79-3	45° 24' 39" N, 112° 50' 53" W; NE¼ SW¼ Sec 9; T.5S., R.10W., Beaverhead County, MT.
TA2	820-79-2	45° 24' 39" N, 112° 50' 53" W; NE¼ SW¼ Sec 9; T.5S., R.10W., Beaverhead County, MT.

<u>Vipond Park Quad</u>

VP1	812-76-1	45" 34' 46" N, 112° 54' 33" W; NE¼ NW¼ Sec 13; T.3S., R.11W., Beaverhead County, MT.
VP2	812-76-6	45" 34' 37" N, 112° 54' 52" W; SE¼ NW¼ Sec 13; T.3S., R.11W., Beaverhead County, MT.
VP3	812-76-7	45° 34' 25" N, 112° 54' 44" W; SE¼ NW¼ Sec 13; T.3S., R.11W., Beaverhead County, MT.
VP6	313-1	45" 35' 36" N, 112° 57' 10" W; NE¼ NW¼ Sec 10; T.3S., R.11W., Beaverhead County, MT.

Table 1 (cont'd)

Wise River Quad

WR1 DCQMZ	45" 51' 34" N, 112° 59' 26" W; SW¼ SE¼ Sec 5; T.1N., R.11W., Silver Bow County, MT.

McCartney Mountain Sample

	45° 31' 16" N, 112° 36' 40" W; SE¼ NE¼ Sec 5; T.4S., R.8W., Madison County, MT.

Table 2. $^{40}Ar/^{39}Ar$ age-spectrum data

TEMP (°C)	$\frac{^{40}Ar}{^{39}Ar}$	$\frac{^{37}Ar}{^{39}Ar}$	$\frac{^{36}Ar}{^{39}Ar}$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
D1, hornblende; J = 0.007038; OD23; 1.6137g; Early Group											
700	14.74	9.631	0.02900	6.976	6.46	18.16	47.07	2.6	0.05	86.47	
1025	16.92	9.778	0.03968	6.010	12.10	8.46	35.31	1.2	0.05	74.74	√
1050_M	7.711	10.08	0.008448	6.058	2.68	30.54	78.06	4.3	0.05	75.32±2.80	√
1075	7.987	9.943	0.009321	6.064	5.59	12.56	75.45	1.8	0.05	75.10	√
FUSE	7.944	9.678	0.009002	6.093	2.82	30.28	76.23	4.3	0.05	75.75	√
TG	9.870	9.836	0.01510	6.323	--	100	62.75	14.2	0.05	77.44	√
PLAT				6.063		81.84				75.39±1.06	
D1, biotite; J = 0.007058; OD23; 0.3160g; Early Group											
525	7.265		0.007110	5.158	5.04	7.56	71.00	3.0		64.51	
750	6.381		0.001037	6.068	1.26	26.47	95.11	10.6		75.66	√
950_M	6.187		0.000739	5.963	0.95	44.08	96.38	17.6		74.37±1.35	√
1025	6.349		0.001446	5.916	1.67	18.74	93.18	7.5		73.80	√
1075	8.482		0.007969	6.121	7.85	2.62	72.17	1.0		76.30	√
FUSE	21.13		0.03479	10.844	10.14	0.54	51.32	0.2		133.1	
TG	6.491		0.001804	5.952	--	100	91.70	40.0		74.24	
PLAT				5.988		91.91				74.68±1.15	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
D2, hornblende; J = 0.006282; OM8; 1.6256g; Early Group											
800	48.48	4.119	0.1243	12.133	4.96	3.36	24.95	7.6	0.12	132.5	
1050	18.62	6.113	0.03927	7.554	2.23	17.37	40.39	3.9	0.08	83.64	
1100	14.26	7.512	0.02654	7.068	1.74	25.56	49.31	5.8	0.07	78.37	√
1150_M	10.16	7.632	0.01282	7.039	1.19	44.61	68.91	10.1	0.06	78.06±1.52	√
FUSE	23.59	8.182	0.05805	7.125	3.57	9.10	30.06	2.1	0.06	78.99	√
TG	15.19	7.273	0.02878	7.316	—	100	47.92	22.6	0.07	81.06	
PLAT				7.059		79.27				78.27±0.47	
D2, biotite; J = 0.006206; OM8; 0.3081g; Early Group											
600	12.80		0.02377	5.771	2.48	3.54	45.08	1.9		63.48	
650	8.165		0.004868	6.720	0.92	17.46	82.31	9.4		73.70	√
950	8.034		0.004229	6.778	0.89	19.96	84.37	10.8		74.33±1.31	√
1050	7.669		0.003091	6.750	0.83	25.24	88.01	13.6		74.03	√
$FUSE_M$	7.581		0.002854	6.732	0.82	33.80	88.80	18.2		73.83	√
TG	7.980		0.004280	6.709	—	100	84.08	54.0		73.59	
PLAT				6.740		96.46				73.92±0.27	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
D3, hornblende; J = 0.006217; OM8; 1.4683g; Early Group											
800	172.3	12.16	0.2454	101.683	1.94	0.99	58.50	0.2	0.04	883.8	
1050	19.46	9.124	0.03555	9.773	2.21	11.44	49.88	2.2	0.05	106.4	
1100	9.488	8.550	0.09717	7.366	1.10	27.01	77.16	5.2	0.06	80.78	√
1150_M	9.028	8.516	0.008587	7.237	1.04	36.14	79.66	7.0	0.06	79.39±1.41	√
FUSE	13.21	8.749	0.02103	7.762	1.50	24.42	58.44	4.7	0.06	85.02	
TG	12.98	8.688	0.01736	8.620	--	100	66.00	19.4	0.06	94.17	
PLAT				7.292		63.15				79.98±0.86	
D4, hornblende; J = 0.006248; OM8; 1.6102g; Early Group											
800	462.0	13.23	1.2142	105.360	5.35	0.88	22.58	0.2	0.04	912.4	
1050	171.1	8.924	0.5306	15.104	10.86	3.16	8.77	0.6	0.05	162.7	
1100	29.26	9.061	0.07187	8.830	3.19	13.89	29.98	2.6	0.05	86.87	
1150	20.86	8.347	0.04673	7.785	2.48	19.36	37.10	3.6	0.06	85.67±2.61	√
$FUSE_M$	17.56	10.91	0.03559	8.009	1.81	62.71	45.24	11.7	0.04	88.08±2.02	√
TG	28.57	10.12	0.06874	9.155		100	31.81	18.7	0.05	100.3	
PLAT				7.955		82.07				87.51±1.86	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
P1, hornblende; J = 0.07058; OD23; 0.4941g; Early Group											
800	212.8	14.72	0.04236	89.617	11.97	1.46	41.72	0.07	0.03	884.2	
1000	54.40	14.06	0.1247	18.847	13.75	5.74	34.34	0.3	0.03	225.3	
1025	12.47	9.917	0.01906	7.675	9.00	22.01	61.17	1.0	0.05	95.17	√
1050	12.39	9.005	0.01803	7.821	13.90	11.81	62.79	0.5	0.06	96.94	√
1075_M	9.800	8.601	0.01092	7.299	8.95	30.91	74.07	1.4	0.06	90.63±8.78	√
FUSE	11.18	10.69	0.01366	8.683	5.75	28.07	73.04	1.3	0.05	107.3	√
TG	16.78	9.928	0.02687	9.690	--	100	57.40	4.5	0.05	119.3	
PLAT				7.873		92.8				97.55±7.05	
P2, hornblende; J = 0.006215; OM8; 1.2462g; Early Group											
850	147.6	3.591	0.3761	36.851	3.93	2.91	24.90	0.6	0.14	372.0	
1050	30.87	6.650	0.07511	9.262	3.20	14.69	29.86	2.9	0.07	101.0	
1100	33.53	7.052	0.09076	7.327	4.62	10.77	21.74	2.1	0.07	80.33±4.62	
1150_M	14.59	6.985	0.02566	7.624	1.62	35.58	51.98	7.0	0.06	83.52	
FUSE	15.23	7.969	0.02662	8.065	1.60	36.05	52.66	7.1	0.06	88.23	
TG	23.13	7.199	0.05049	8.845	--	100	38.05	19.6	0.07	96.54	
PLAT										NONE	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
P3, hornblende; J = 0.006281; OM8; 1.6844g; Early Group											
750	44.81	1.872	0.1136	11.405	4.31	3.52	25.41	0.9	0.26	124.8	
1000	21.41	2.146	0.04476	8.370	3.09	5.59	39.03	1.5	0.23	92.43	
1050	18.71	5.229	0.03613	8.499	2.52	6.80	45.24	1.8	0.09	93.82	
1100_M	8.768	6.951	0.007360	7.201	0.95	44.72	81.71	12.0	0.07	79.80±1.35	√
FUSE	8.914	7.342	0.007915	7.217	0.98	39.38	80.54	10.6	0.07	79.98	√
TG	11.48	6.541	0.01536	7.510	--	100	65.13	26.9	0.07	83.15	
PLAT				7.209		84.10				79.88±0.77	
P3, biotite; J = 0.005993; OM8; 0.2994g; Early Group											
600	8.853	0.247	0.01645	4.008	2.47	5.62	45.26	2.8	1.98	42.82	
750	10.98	0.029	0.01395	6.855	1.32	15.17	62.42	7.6	16.90	72.63	
950	8.074	0.040	0.002896	7.215	0.87	22.52	89.37	11.3	12.25	76.36±1.30	√
1050_M	7.651	0.026	0.001747	7.131	0.79	33.92	93.21	16.9	18.85	75.49±1.25	√
FUSE	8.087	0.057	0.003770	6.972	0.86	22.76	86.21	11.4	8.60	73.84	
TG	8.418	0.049	0.005144	6.896	--	100	81.92	49.9	10.00	73.06	
PLAT				7.164		56.44				75.84±0.96	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
P4, hornblende; J = 0.006248; OM8; 1.5906g; Early Group											
800	80.28	10.73	0.1231	45.136	1.79	2.57	55.78	0.5	0.05	448.2	
1050	16.50	10.40	0.02249	10.792	1.36	22.36	64.92	4.2	0.05	117.7	
1100	11.87	10.11	0.01295	8.943	1.16	21.67	74.78	4.0	0.05	98.08	
1150_M	10.07	9.259	0.009738	8.006	1.06	29.35	79.00	5.5	0.05	88.05±1.42	
FUSE	11.98	11.83	0.01299	9.200	1.14	24.05	76.12	4.5	0.04	100.8	
TG	14.16	10.35	0.01698	10.072	--	100	70.60	18.6	0.05	110.10	
PLAT										NONE	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
SM1, hornblende; J = 0.005685; OM16; 1.800g; Pre-Main Group											
800	11.04	0.357	0.01361	7.049	1.28	13.16	63.81	4.0	1.37	70.89	
1000	8.593	3.963	0.006177	7.111	0.90	31.80	82.52	9.7	0.12	71.50	
1050_M	8.220	5.443	0.005058	7.200	0.84	40.87	87.24	12.4	0.09	72.38±1.28	√
1100	9.755	6.209	0.01037	7.234	1.17	10.52	73.82	3.2	0.08	72.71	√
FUSE	36.82	7.194	0.1020	7.319	5.14	3.65	19.78	1.1	0.07	73.55 5.13	
TG	9.916	4.447	0.01064	7.160	--	100	71.97	30.4	0.11	71.98	
PLAT				7.155		96.35				72.45±0.70	
SM1, biotite; J = 0.005398; OM15; 0.2887g; Pre-Main Group											
600	8.182		0.004012	6.990	0.87	20.96	85.44	7.8		66.81	
750	7.704		0.001456	7.297	0.77	24.31	94.70	9.1		69.69	√
850_M	7.592		0.001268	7.218	0.76	30.90	95.07	11.6		68.95±1.21	√
1000	7.989		0.002720	7.193	0.85	15.05	90.02	5.6		68.72	√
FUSE	9.173		0.006783	7.187	1.00	8.78	78.33	3.3		68.66	√
TG	7.942		0.002592	7.183	--	100	90.44	37.4		67.31	
PLAT				7.234		79.04				69.10±0.47	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ'_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
SM2, hornblende; J = 0.004687; OM19; 1.8320g; Pre-Main Group											
850	16.12	0.868	0.02479	8.863	1.49	15.10	54.96	7.6	0.56	73.43	
1025	10.19	1.228	0.006503	8.375	0.88	34.66	82.09	17.4	0.40	69.46	
1050	10.70	5.670	0.008264	8.761	0.92	21.20	81.53	10.7	0.09	72.60	√
$FUSE_M$	11.84	6.741	0.1224	8.823	1.02	29.04	74.14	14.6	0.07	73.10±1.40	√
TG	11.67	3.716	0.01130	8.660		100	73.98	50.3	0.13	71.78	
PLAT				8.797		50.24				72.89±0.71	
SM2, biotite; J = 0.005384; OM15; 0.2840g; Pre-Main Group											
600	22.58		0.05377	6.388	3.72	2.85	28.67	1.0		61.00	
750	8.750		0.005172	7.216	0.92	19.27	82.47	6.8		68.75	√
850	8.372		0.003745	7.259	0.85	16.06	86.71	5.6		69.16	√
1000	10.11		0.009561	7.282	1.04	30.87	72.01	10.8		69.37	√
$FUSE_M$	8.988		0.005862	7.260	0.92	30.94	80.77	10.9		69.17±1.33	√
TG	9.570		0.007898	7.233		100	75.58	35.1		68.91	
PLAT				7.257		95.15				69.14±0.26	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
FR1, hornblende; J = 0.004687; OM19; 1.6972g; Pre-Main Group											
800	69.88	0.806	0.2077	8.564	7.68	2.52	12.25	1.3	0.61	71.00	
1050	31.79	4.224	0.08036	8.412	3.34	10.31	26.38	5.2	0.12	69.76	
1125_M	13.58	4.600	0.01766	8.763	1.17	49.08	64.33	24.5	0.11	72.61±1.51	√
FUSE	19.81	4.805	0.03934	8.608	1.89	38.09	43.30	19.0	0.10	71.35	√
TG	19.25	4.543	0.03718	8.662	--	100	44.86	50.0	0.11	71.79	
PLAT				8.665		97.48				72.06±1.07	
FR1, biotite; J = 0.005384; OM15; 0.2673g; Pre-Main Group											
600	12.10		0.02054	6.021	2.14	3.90	49.78	1.4		57.55	
750_M	7.806		0.001922	7.233	0.77	38.99	92.65	13.6		68.91±1.24	√
850	7.904		0.002501	7.159	0.84	17.76	90.58	6.2		68.22	√
1000	7.828		0.002005	7.229	0.81	27.84	92.36	9.7		68.88	√
FUSE	9.651		0.008106	7.250	1.08	11.50	75.12	4.0		69.07	√
TG	8.209		0.003485	7.173	--	100	87.38	35.0		68.35	
PLAT				7.219		96.10				68.79±0.38	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
PH3, hornblende; J = 0.004687; OM19; 1.603g; Pre-Main Group											
800	63.45	0.477	0.1842	9.071	6.52	3.02	14.29	1.5	1.02	75.11	
1025	13.26	4.492	0.01771	8.416	1.20	36.00	63.29	18.5	0.11	69.79	√
1050	12.32	4.891	0.01435	8.521	1.08	35.18	68.85	18.1	0.10	70.65	√
1125_M	9.996	5.151	0.006683	8.471	0.88	23.94	84.46	12.3	0.10	70.24±1.31	√
FUSE	34.80	5.103	0.08974	8.730	4.41	1.86	25.00	1.0	0.10	72.34	
TG	14.07	4.680	0.02026	8.492	--	100	60.17	51.4	0.10	70.41	
PLAT				8.469		95.12				70.22±0.43	
PH3, biotite; J = 0.005398; OM15; 0.3095g; Pre-Main Group											
600	25.11		0.06924	4.645	7.06	1.69	18.50	0.6		44.67	
750	8.865		0.007149	6.747	0.99	26.38	76.10	9.8		64.53	
850	11.27		0.01562	6.647	1.35	15.55	58.98	5.8		63.59	
1000	12.15		0.01785	6.870	1.36	22.80	56.54	8.5		65.69	√
$FUSE_M$	9.744		0.009702	6.871	1.07	33.58	70.52	12.5		65.70±1.46	√
TG	10.56		0.01281	6.766	--	100	64.08	37.1		64.71	
PLAT				6.871		56.38				65.70±0.80	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
PH2, hornblende; J = 0.004687; OM19; 1.7609g; Pre-Main Group											
800	37.62	1.292	0.09607	9.337	3.95	3.08	24.80	1.6	0.38	77.27	
1025	13.53	5.075	0.01918	8.304	1.25	22.88	61.18	11.8	0.10	68.88	
1050	10.99	5.157	0.01004	8.481	0.97	30.39	76.85	15.7	0.10	70.32	√
1125_M	9.301	5.416	0.004356	8.491	0.80	29.52	90.93	15.2	0.09	70.40±1.26	√
FUSE	10.85	5.498	0.008946	8.693	0.97	14.13	79.79	7.3	0.09	72.04	
TG	11.87	5.144	0.01295	8.500	--	100	71.32	51.6	0.10	70.48	
PLAT				8.486		59.91				70.36±0.62	
PH2, biotite; J = 0.005398; OM15; 0.3239g; Pre-Main Group											
600	16.09		0.03822	4.788	4.42	1.69	29.76	0.7		46.03	
750	7.490		0.002161	6.846	0.79	33.90	91.40	14.0		65.46	√
850	7.673		0.002519	6.923	0.85	18.08	90.22	7.5		66.19	√
1000_M	7.125		0.000886	6.857	0.76	25.35	96.24	10.5		65.57±1.26	√
FUSE	8.501		0.005436	6.889	0.93	20.98	81.04	8.7		65.87	√
TG	7.788		0.003199	6.837	--	100	87.79	41.4		65.38	
PLAT				6.872		98.31				65.71±0.33	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ'_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
VP6, hornblende; J = 0.005685; OM16; 1.7686g; Pre-Main Group											
800	19.27	1.452	0.02572	11.794	1.54	4.61	61.15	1.1	0.34	117.08	
1000	14.49	1.965	0.02218	8.103	1.56	11.95	55.85	3.0	0.25	81.25	
1050	11.38	4.752	0.001436	7.549	1.18	25.84	66.12	6.4	0.10	75.81±1.55	√
1100_M	8.452	6.731	0.005675	7.364	0.85	42.12	86.70	10.5	0.07	73.99±1.29	√
FUSE	9.621	7.526	0.009271	7.542	1.07	15.48	77.90	3.9	0.07	75.74	√
TG	10.61	5.530	0.01137	7.733	--	100	72.59	24.9	0.09	77.62	
PLAT				7.455		83.44				74.88±1.03	
P5, hornblende; J = 0.006281; OM8; 1.6925g; Pre-Main Group											
800	35.65	1.221	0.08324	11.162	3.34	4.96	31.28	1.4	0.40	122.2	
1050	14.88	4.474	0.02536	7.775	1.88	12.54	52.09	3.4	0.11	86.02	
1100	9.655	7.052	0.01129	6.935	1.18	27.25	71.46	7.5	0.07	76.92	
1150_M	10.22	6.856	0.01353	6.817	1.41	13.49	66.39	3.7	0.07	75.65±1.69	
FUSE	8.567	8.535	0.007363	7.138	0.94	41.76	82.81	11.4	0.06	79.12	
TG	11.22	7.032	0.01529	7.320	--	100	64.90	274.	0.07	81.09	
PLAT										NONE	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
P5, biotite; J = 0.006375; OM8; 0.3000g; Pre-Main Group											
600	14.56	0.348	0.03281	4.890	3.70	3.37	33.58	2.0	1.41	55.38	
750	8.323	0.041	0.006589	6.373	1.04	16.04	76.58	9.4	11.95	71.84	√
950_M	7.000	0.050	0.001747	6.482	0.80	31.94	92.60	18.8	9.80	73.05±1.25	√
1050	7.584	0.029	0.003812	6.455	0.98	17.29	85.10	10.1	16.90	72.75	√
FUSE	7.263	0.046	0.002722	6.457	0.82	31.37	88.90	18.4	10.65	72.77	√
TG	7.659	0.053	0.004243	6.398	--	100	83.63	58.7	9.25	72.12	
PLAT				6.452		96.63				72.71±0.70	
VP3, hornblende; J = 0.007038; OD23; 1.6162g; Pre-Main Group											
800	42.98	2.715	0.07685	20.516	14.17	1.40	47.65	0.3	0.18	243.3	
1025_M	7.061	6.397	0.004927	6.138	1.63	51.80	86.58	11.6	0.08	76.30±1.87	√
1050	7.450	6.367	0.006256	6.132	3.77	16.74	81.98	3.8	0.08	76.22	√
FUSE	7.057	6.387	0.005073	6.090	1.74	30.02	85.95	6.7	0.08	75.71	√
TG	7.628	6.338	0.006201	6.325	--	100	82.58	22.4	0.08	78.57	
PLAT				6.120		98.60				76.08±0.32	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ'_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
VP2, biotite; J = 0.006997; OD23; 0.3252g; Pre-Main Group											
525	39.89		0.1180	5.024	15.90	6.25	12.60	2.5		62.33	
700	9.603		0.01387	5.500	2.56	25.67	57.27	10.1		68.12	
850	8.600		0.008883	5.969	2.93	10.11	69.41	4.0		73.82±3.03	√
1000	8.757		0.009910	5.823	3.30	8.42	66.49	3.3		72.05	√
1050	7.933		0.007685	5.656	4.97	8.19	71.30	3.2		70.02	√
1075_M	6.735		0.003523	5.689	1.36	40.26	84.46	15.8		70.42±1.66	√
FUSE	33.35		0.07526	11.100	12.38	1.09	33.29	0.4		134.94	
TG	10.29		0.01554	5.695	--	100	55.34	39.3		70.49	
PLAT				5.744		66.98				71.09±1.73	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ'_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
A1, biotite; J = 0.005398; OM15; 0.2530g; Main Group											
600	17.20		0.03576	6.621	3.12	3.33	38.51	1.1		63.35	
750	8.919		0.004257	7.655	0.96	13.04	85.83	4.3		73.04	
850	8.463		0.003228	7.503	0.89	10.69	88.66	3.5		71.65	√
1025_M	7.854		0.001242	7.481	0.75	46.20	95.25	15.2		71.42±1.23	√
FUSE	7.921		0.001782	7.389	0.79	26.74	93.28	8.8		70.55	
TG	8.387		0.003142	7.453	--	100	88.86	32.8		71.55	
PLAT				7.486		56.89				71.46±0.59	
P6, biotite; J = 0.005398; OM15; 0.257g; Main Group											
600	8.580		0.005193	7.040	0.91	26.53	82.05	7.8		67.28	
800	8.591		0.002967	7.709	0.97	11.08	89.73	3.3		73.55	√
$FUSE_M$	8.417		0.002446	7.694	0.78	62.39	91.41	18.4		73.41	√
TG	8.480		0.003232	7.522	--	100	88.71	29.6		71.80	
PLAT				7.696		73.47				73.43±0.64	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
P6, hornblende; J = 0.005685; OM16; 1.9647g; Main Group											
800	47.89	1.816	0.1351	8.116	6.90	2.04	16.93	0.4	0.27	81.38	
1000	79.35	6.799	0.2473	6.858	1.12	6.19	8.60	1.2	0.07	69.00	
1050	10.60	8.179	0.01301	7.476	1.11	29.03	70.09	5.7	0.06	75.09	√
1100	9.346	8.027	0.008826	7.442	1.05	20.21	79.16	4.0	0.06	74.76	√
$FUSE_M$	9.256	8.711	0.008730	7.441	0.96	42.53	79.88	8.3	0.06	74.75±1.36	√
TG	14.793	8.160	0.02734	7.429	--	100	49.92	19.6	0.06	74.63	
PLAT				7.453		91.77				74.86±0.19	
TA1, biotite; J = 0.005398; OM15; 0.2750g; Main Group											
600	9.791		0.01093	6.556	1.25	18.27	66.95	3.9		62.74	
750	8.398		0.003369	7.397	0.90	17.86	88.07	3.8		70.63	√
1025_M	8.118		0.002113	7.507	0.77	47.70	92.47	10.2		71.66±1.24	√
FUSE	8.797		0.004950	7.349	1.04	16.17	83.53	3.5		70.18	√
TG	8.583		0.004407	7.288	--	100	84.90	21.3		69.61	
PLAT				7.452		81.73				71.14±0.76	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ'_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
P7a, hornblende; J = 0.004573; OM20; 1.7434g; Main Group											
800	25.87	1.588	0.05417	10.003	1.70	5.70	38.62	2.3	0.31	80.67	
1025	22.80	1.962	0.04841	8.671	1.60	9.80	37.97	3.9	0.25	70.15	
1050	16.45	6.100	0.02765	8.824	1.02	14.96	53.43	6.0	0.08	71.36	√
1100_M	12.51	6.964	0.1442	8.872	0.66	46.73	70.61	18.8	0.07	71.75±.87	√
FUSE	21.43	7.108	0.04478	8.831	1.26	22.81	41.02	9.2	0.07	71.42	√
TG	16.90	6.071	0.02892	8.892	--	100	52.45	40.1	0.09	72.26	
PLAT				8.853		84.5				71.59±0.21	
P7a, biotite; J = 01004573; OM20; 0.3048g; Main Group											
600	9.815	0.064	0.005831	8.092	0.56	23.81	82.44	17.4	15.31	65.55	
850	9.518	0.053	0.002859	8.672	0.49	26.18	91.11	19.1	18.49	70.16	√
1000_M	9.559	0.059	0.003107	8.641	0.49	29.40	90.39	21.5	16.61	69.91±1.09	√
1050	10.16	0.066	0.005348	8.581	0.56	15.42	84.44	11.3	14.85	69.44	√
FUSE	20.28	0.214	0.03872	8.522	1.33	5.17	43.64	3.7	4.58	71.59	
TG	10.26	0.068	0.005879	8.520	--	100	83.06	73.0	14.41	68.95	
PLAT				8.639		71.00				69.90±0.37	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
P7b, hornblende; J = 0.006904; OM2; 1.5639g; Main Group											
750	65.78	2.070	0.1900	9.819	16.56	2.99	14.91	0.9	0.24	118.32	
1000	24.10	3.860	0.06066	6.509	7.75	7.44	26.93	2.2	0.13	79.30	
1025	10.75	6.664	0.01720	6.242	5.14	4.77	57.81	1.4	0.07	76.11	
1050	7.722	7.230	0.008403	5.864	2.75	13.43	75.54	4.0	0.07	71.59	√
1075_M	6.651	7.103	0.004672	5.884	1.15	47.52	88.02	14.3	0.07	71.83±1.49	√
FUSE	7.060	7.282	0.006495	5.770	2.19	23.86	81.30	7.2	0.07	70.47	√
TG	10.15	6.750	0.01590	6.036	--	100	59.17	30.1	0.07	73.65	
PLAT				5.848		84.81				71.41±0.73	
P7b, biotite; J = 0.007047; OM2; 0.3362g; Main Group											
550	6.004	0.023	0.003215	5.050	1.17	23.32	84.11	15.8	21.30	63.08	
650	6.044	0.005	0.002097	5.419	2.48	4.33	89.66	2.9	98.00	67.61	
800	6.015	0.016	0.001819	5.473	1.42	11.76	90.99	7.9	30.63	68.27	√
1000_M	5.679	0.072	0.000433	5.551	0.58	57.66	97.75	39.0	6.81	69.22±1.13	√
1075	7.993	0.342	0.009148	5.313	6.25	2.77	66.46	1.9	1.43	66.31	
FUSE	87.55	0.395	0.2748	6.369	93.26	0.17	7.27	0.1	1.24	79.20	
TG	6.012	0.059	0.002021	5.414	--	100	90.05	67.6	8.31	67.55	
PLAT				5.538		69.42				69.06±0.69	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
TM16, hornblende; J = 0.004573; OM20; 1.809g; Main Group											
800	26.02	0.713	0.05666	9.338	2.21	4.45	35.87	1.7	0.69	75.44	
1000	24.06	2.981	0.05286	8.700	1.72	7.77	36.09	3.0	0.16	70.38	
1050	14.34	6.561	0.02057	8.851	0.99	9.00	61.45	3.5	0.07	71.58	√
1100_M	11.46	7.045	0.01088	8.881	0.60	47.28	77.11	18.1	0.07	71.82±1.14	√
FUSE	12.42	7.250	0.01408	8.911	0.68	31.49	71.39	12.1	0.07	72.05	
TG	13.65	6.468	0.01806	8.885	--	100	64.87	38.3	0.08	71.85	
PLAT				8.889		87.77				71.88±0.24	
TM16, biotite; J = 0.004590; OM20; 0.2852g; Main Group											
600	12.38		0.01993	6.483	1.42	3.71	52.38	2.9		52.90	
850	9.473		0.003421	8.457	0.50	25.25	89.27	19.5		68.70	
1000_M	9.244		0.002236	8.578	0.47	32.60	92.79	25.2		69.67±1.08	√
1050	9.152		0.002285	8.470	0.47	24.56	92.56	19.0		68.81	√
FUSE	10.69		0.007390	8.502	0.60	13.89	79.52	10.7		69.06	√
TG	9.596		0.003919	8.433	--	100	87.87	77.2		68.51	
PLAT				8.526		71.05				69.25±0.44	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
P9, hornblende; J = 0.004573; OM20; 1.8298g; Main Group											
800	38.28	0.641	0.08902	12.027	2.04	4.59	31.41	1.6	0.76	96.59	
1025	18.45	4.835	0.03392	8.865	1.18	15.25	47.88	5.3	0.10	71.69	√
1050	17.12	8.420	0.03082	8.776	1.10	17.59	50.95	6.1	0.06	70.98	√
1100_M	10.39	9.161	0.008363	8.749	0.54	52.76	83.64	18.2	0.05	70.77±1.11	√
FUSE	18.58	10.065	0.03523	9.082	1.27	9.82	48.54	3.4	0.05	73.41	
TG	14.89	8.069	0.02255	8.944	--	100	59.81	34.6	0.06	72.32	
PLAT				8.775		85.6				70.98±0.48	
P9, biotite; J = 0.004560; OM20; 0.3032g; Main Group											
600	12.50		0.01637	7.659	0.95	5.88	61.26	4.7		61.93	
800	9.381		0.003327	8.392	0.50	23.11	89.46	18.7		67.75	
900	9.474		0.003412	8.460	0.59	9.93	89.29	8.0		68.29	√
1025	9.077		0.001870	8.519	0.46	20.25	93.85	16.3		68.75	√
$FUSE_M$	8.894		0.001605	8.414	0.46	40.83	94.60	33.0		67.92±1.08	√
TG	9.314		0.003105	8.390	--	100	90.09	80.7		67.73	
PLAT				8.450		71.01				68.21±0.42	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
OL1, hornblende; J = 0.004573; OM20; 1.6879; Main Group											
800	59.16	0.540	0.1622	11.271	3.33	4.78	19.04	1.8	0.91	90.67	
1025	18.92	1.844	0.03622	8.381	1.14	29.74	44.23	11.3	0.27	67.85	
1050	13.00	7.728	0.01704	8.664	0.75	25.24	66.28	9.6	0.06	70.10	√
1100_M	11.29	8.096	0.01127	8.683	0.69	23.30	76.52	8.8	0.06	70.25±1.19	√
FUSE	15.31	8.563	0.02442	8.869	0.93	16.95	57.58	6.4	0.06	71.72	√
TG	16.96	5.862	0.02958	8.735	--	100	51.35	37.9	0.08	70.66	
PLAT				8.724		65.49				70.57±0.90	
OL1, biotite; J = 0.004598; OM20; 0.2891; Main Group											
600	9.325		0.006117	7.512	0.57	24.50	80.55	19.7		61.26	
850_M	8.854		0.001380	8.441	0.45	36.52	95.33	29.3		68.70±1.08	√
1000	8.902		0.001804	8.363	0.49	15.81	93.95	12.7		68.07	√
1050	8.843		0.001657	8.347	0.48	15.42	94.40	12.4		67.94	√
FUSE	9.985		0.005369	8.393	0.58	7.75	84.05	6.2		68.31	√
TG	9.063		0.002960	8.183	--	100	90.28	80.3		66.63	
PLAT				8.401		75.50				68.37±0.33	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
P10, biotite; J = 0.004573; OM20; 0.3043g; Main Group											
600	140.38		0.4766	-0.462	196.18	1.33	-0.33	1.0		-3.82	
800	13.77		0.01811	8.411	0.76	32.51	61.09	23.4		68.09	√
950_M	11.63		0.01072	8.452	0.61	47.26	72.71	34.1		68.41±1.15	√
1050	26.39		0.06270	7.854	1.83	10.08	29.77	7.3		63.66	
FUSE	33.27		0.08583	7.901	2.25	8.82	23.75	6.4		64.03	
TG	17.43		0.03118	8.211	--	100	47.10	72.1		66.50	
PLAT				8.435		79.77				68.28±0.47	
P11, biotite; J = 0.004573; OM20; 0.2823g; Main Group											
600	11.45		0.01571	6.802	1.26	3.50	59.40	2.6		55.26	
750_M	9.134		0.002062	8.519	0.47	29.93	93.27	22.2		68.94±1.08	√
900	9.940		0.004448	8.620	0.54	14.92	86.72	11.1		69.75	√
1025	9.285		0.002647	8.497	0.48	20.67	91.51	15.3		68.77	√
FUSE	9.164		0.002093	8.540	0.47	30.98	93.19	23.0		69.11	√
TG	9.376		0.003026	8.476	--	100	90.40	74.1		68.60	
PLAT				8.536		96.50				69.08±0.43	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
StM2, hornblende; J = 0.004573; OM20; 1.7857; Main Group											
800	16.60	4.530	0.02594	9.344	0.95	13.92	56.11	7.1	0.11	75.48	
1025	11.22	5.901	0.01011	8.766	0.59	27.29	77.79	13.9	0.08	70.90	√
1050	10.28	6.043	0.007104	8.721	0.57	24.30	84.50	12.4	0.08	70.55	√
1100_M	9.634	6.280	0.005162	8.673	0.52	22.45	89.63	11.5	0.08	70.17±1.11	√
FUSE	11.04	6.414	0.009514	8.801	0.67	12.04	79.40	6.2	0.08	71.18	√
TG	11.36	5.891	0.01040	8.810	--	100	77.30	51.1	0.08	71.25	
PLAT				8.734		86.08				70.65±0.44	
StM2, biotite; J =0.004573; OM20; 0.3099g; Main Group											
600	11.96		0.02183	5.501	2.02	2.00	46.00	1.6		44.82	
800_M	8.909		0.002202	8.252	0.47	33.97	92.63	26.9		66.82±1.08	√
950	8.908		0.001976	8.319	0.47	18.53	93.38	14.7		67.36	√
1050	8.817		0.001910	8.247	0.47	20.58	93.53	16.3		66.78	√
FUSE	8.782		0.001884	8.219	0.47	24.91	93.59	19.8		66.56	√
TG	8.919		0.002413	8.200	--	100	91.94	79.3		66.41	
PLAT				8.254		98.00				66.84±0.34	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
StM1, biotite; J = 0.004573; OM20; 0.2991g; Main Group											
600	12.20		0.01485	7.812	1.09	7.51	64.01	2.7		63.32	
900_M	8.969		0.002211	8.309	0.47	44.07	92.65	16.0		67.28±1.08	√
1000	9.661		0.004526	8.318	0.69	12.82	86.10	4.6		67.35	√
1050	9.473		0.003991	8.288	0.53	20.12	87.49	7.3		67.11	√
FUSE	16.10		0.002644	8.285	1.05	15.48	51.45	5.6		67.09	√
TG	10.51		0.007566	8.265	--	100	78.67	36.2		66.93	
PLAT				8.302		92.49				67.22±0.13	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ'_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
StM3, biotite; J = 0.004598; OM20; 0.2749g; Late Group-A											
600	15.87		0.02801	7.588	1.09	13.62	47.81	9.7		61.87	
800	17.52		0.03318	7.713	1.10	24.67	44.01	17.5		62.87	
900	15.76		0.02685	7.823	1.04	12.89	49.63	9.2		63.75	
1025	12.47		0.01533	7.933	0.75	21.82	63.62	15.5		64.63	
$FUSE_M$	12.12		0.01368	8.072	0.70	27.00	66.59	19.2		65.74±1.20	
TG	14.51		0.02250	7.855	--	100	54.13	71.0		64.01	
PLAT										NONE	
P12, biotite; J - 0.004560; OM20; 0.2908g; Late Group-A											
600	10.98	1.408	0.01468	6.758	0.96	7.16	61.51	5.0	0.35	54.75	
750	8.960	0.094	0.001998	8.372	0.47	29.54	93.43	20.6	5.21	67.59	
900	9.357	0.084	0.002771	8.540	0.49	19.84	91.26	13.9	5.83	68.92	√
1025	9.424	0.102	0.002912	8.567	0.49	15.13	90.90	10.6	4.80	69.13	√
$FUSE_M$	9.565	0.092	0.003599	8.504	0.49	28.34	88.90	19.8	5.33	68.63±1.09	√
TG	9.425	0.187	0.003651	8.357	--	100	88.66	69.9	2.62	67.47	
PLAT				8.530		63.31				68.84±0.25	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar (x10^{-12} mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
TM11, biotite; J = 0.006175; OD27; 0.2745g; Late Group-B											
525	7.721		0.006589	5.768	6.85	7.25	74.71	1.6		63.13	
650	6.610		0.001238	6.238	1.40	23.01	94.38	5.1		68.18	√
800	6.481		0.000695	6.269	1.04	18.50	96.74	4.1		68.51	√
1000	6.810		0.001516	6.356	1.68	12.13	93.34	2.7		69.44	√
1050	6.524_M		0.000745	6.298	1.02	33.29	96.53	7.4		68.82±1.40	√
FUSE	7.628		0.004585	6.297	4.47	5.81	82.16	1.3		68.38	√
TG	6.722		0.001590	6.246	--	100	92.92	22.3		68.27	
PLAT				6.281		92.75				68.65±0.49	
TM10, biotite; J - 0.006418; OD27; 0.2815g; Late Group-B											
525	6.040		0.006012	4.257	8.49	4.89	70.49	0.6		48.63	
650	6.387		0.001904	5.818	2.22	9.35	91.10	1.1		66.13	√
800_M	6.828		0.003146	5.892	3.31	19.80	86.30	2.3		66.96	√
1000	6.729		0.001970	6.140	2.08	34.53	91.26	4.0		69.72±2.35	√
1050	6.444		0.001753	5.920	1.98	20.81	91.87	2.4		67.27	√
FUSE	7.418		0.004391	6.115	4.39	10.62	82.43	1.2		69.45	√
TG	6.696		0.002606	5.920	--	100	88.41	11.5		67.27	
PLAT				6.006		95.11				68.23±1.59	

Table 2. (con'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ'_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
TA2, biotite; J= 0.005398; OM15; 0.2771g; Late Group-B											
600	15.065		0.03646	4.286	4.69	2.85	28.45	0.9		41.26	
750	9.510		0.007841	7.187	1.07	11.75	75.58	3.7		68.66	
1025_M	8.351		0.003137	7.418	0.81	40.45	88.83	12.8		70.83±1.31	√
FUSE	8.835		0.005123	7.316	0.88	44.95	82.80	14.2		69.87	√
TG	8.896		0.005534	7.255	--	100	81.55	31.5		69.30	
PLAT				7.364		85.40				70.32±0.59	
StM4, biotite; J = 0.005384; OM15; 0.3274g; Late Group-B											
600	6.565		0.01286	6.565	1.29	11.63	63.30	4.3		62.66	
750	6.919		0.001898	6.919	0.81	26.81	92.43	9.9		65.98	√
900_M	7.034		0.003247	7.034	0.91	12.35	87.93	4.6		67.06±1.38	√
1025_M	6.894		0.001196	6.894	0.76	38.42	95.05	14.2		65.75±1.23	√
FUSE	6.857		0.002838	6.857	0.88	10.78	89.03	4.0		65.40	
TG	6.876		0.003171	6.876	--	100	87.94	37.0		65.58	
PLAT				6.925		77.58				66.04±0.70	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
OL2, biotite; J = 0.005398; OM15; 0.3210g; Late Group-B											
600	14.89		0.02755	6.738	1.91	7.60	45.27	2.7		64.45	
750	7.861		0.002929	6.989	0.82	37.18	88.91	13.3		66.80	√
850_M	9.329		0.007685	7.052	1.06	10.83	75.59	3.9		67.40±1.43	√
1000_M	7.382		0.001384	6.967	0.77	31.90	94.38	11.4		66.60±1.24	√
FUSE	7.869		0.003430	6.850	0.93	12.49	87.04	4.5		65.50	
TG	8.401		0.004884	6.952	--	100	82.75	35.7		66.46	
PLAT				6.988		79.91				66.80±0.42	
PR1, biotite; J = 0.005384; OM15; 0.3073g; Late Group-B											
600	16.87		0.04628	3.190	13.56	0.97	18.91	0.4		30.72	
750	7.188		0.002944	6.312	0.82	42.30	87.82	16.1		60.28	√
900	7.092		0.002305	6.405	0.85	16.28	90.31	6.2		61.16	√
1025_M	6.799		0.001494	6.352	0.79	31.65	93.42	12.1		60.66±1.25	√
FUSE	7.733		0.004649	6.354	1.08	8.80	82.16	3.4		60.68	√
TG	7.191		0.002952	6.313	--	100	87.79	38.1		60.29	
PLAT				6.343		99.03				60.58±0.36	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
P13, biotite, J = 0.004590; OM20; 0.3224g; Late Group-B											
600	9.536		0.009827	6.626	0.76	13.98	69.48	10.0		54.05	
800_M	9.062		0.002877	8.209	0.48	56.55	90.58	40.5		66.72±1.09	√
900	9.027		0.002900	8.164	0.50	13.84	90.44	9.9		66.37	√
1025	9.322		0.003924	8.156	0.65	6.08	87.50	4.4		66.30	√
FUSE	10.17		0.006785	8.215	0.65	0.65	80.75	6.8		64.77	√
TG	9.245		0.004289	7.978	--	100	86.30	71.7		64.88	
PLAT				8.208		86.02				66.72±0.24	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ'_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
TM1, biotite; J = 0.010101; OM3; 0.3012g; Porphyry Group											
700	5.266	0.009	0.004912	3.809	1.73	18.57	72.34	19.8	54.44	68.11	√
900	4.204	0.007	0.001162	3.855	1.24	18.70	91.71	20.0	70.00	68.91	√
1050_M	4.056	0.030	0.000649	3.861	0.61	55.39	95.19	59.1	16.33	69.02±1.15	√
1150	4.561	0.075	0.002258	3.894	3.55	6.47	85.38	6.9	6.53	69.60	√
FUSE	13.60	0.299	0.030881	4.492	24.16	0.86	33.03	0.9	1.64	80.05	
TG	4.423	0.027	0.001902	3.858	--	100	87.21	106.7	18.15	68.97	
PLAT				3.852		99.14				68.86±0.61	
TM3, biotite; J = 0.010123; OM3; 0.3200g; Porphyry Group											
600	4.370	0.149	0.002177	3.733	0.87	36.69	85.42	26.2	3.27	66.92	√
750	4.330	--	0.001853	3.777	0.92	17.03	87.22	12.2		67.69	√
950	4.551	--	0.002604	3.776	0.91	17.56	82.97	12.5		67.67	√
1050_M	4.430	--	0.002129	3.795	0.97	20.85	85.67	14.9		68.01±1.37	√
FUSE	6.871	--	0.01043	3.782	1.82	7.87	55.04	5.6		67.78	√
TG	4.604	0.055	0.002837	3.765	--	100	81.76	71.5	8.91	67.48	
PLAT				3.765		100				67.48±0.46	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar (x10^{-12} mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
TM2, biotite; J = 0.010123; OM3; 0.3277g; Porphyry Group											
600	6.937	1.170	0.01109	3.755	1.90	6.17	54.08	4.7	0.42	67.30	√
750	4.885	0.042	0.003632	3.810	1.01	13.46	77.98	10.2	11.67	68.27	√
950	4.076	0.181	0.000820	3.843	0.81	13.79	94.28	10.2	2.71	68.85	√
1050	4.623	0.567	0.002580	3.904	1.02	9.72	84.40	7.3	0.86	69.92	√
$FUSE_M$	4.095	0.935	0.000906	3.902	0.75	56.87	95.21	43.0	0.52	69.89±1.23	√
TG	4.425	0.689	0.002052	3.872	--	100	87.46	75.5	0.71	69.36	
PLAT				3.872		100				69.36±1.11	
TM14b, biotite; J = 0.006891; OM2; 0.3158g; Porphyry Group											
525	7.323	0.027	0.01598	2.598	11.18	2.95	35.48	2.1	18.15	32.01	
650	7.411	0.007	0.006878	5.373	2.17	11.55	72.50	8.3	70.00	65.59	
800	6.522	0.005	0.003380	5.517	1.35	13.57	84.60	9.8	98.00	67.31	√
1000	6.338	0.007	0.002797	5.506	1.98	10.04	86.88	7.2	70.00	67.18	√
1050_M	6.319	0.009	0.002101	5.693	0.92	17.01	90.09	12.3	54.44	69.42±1.33	√
FUSE	7.243	0.019	0.005568	5.594	1.06	44.87	77.22	32.3	25.79	68.23	√
TG	6.919	0.013	0.004862	5.477	--	100	79.17	72.1	37.69	66.83	
PLAT				5.590		85.50				68.19±1.03	

Table 2. (cont'd)

TEMP (°C)	$\frac{^{40}Ar}{^{39}Ar}$	$\frac{^{37}Ar}{^{39}Ar}$	$\frac{^{36}Ar}{^{39}Ar}$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
TM14a, biotite; J = 0.006392; OD27; 0.2759g; Porphyry Group											
525	7.189		0.01095	3.946	16.35	8.09	54.89	1.0		44.94	
650	6.664		0.003562	5.606	3.92	12.78	84.11	1.6		63.51	
800	6.622		0.001406	6.201	1.66	13.54	93.64	1.7		70.12	
1000	6.833		0.002759	6.012	2.91	9.44	87.98	1.2		68.03	
1050	6.510		0.002849	5.662	3.14	19.18	86.98	2.4		64.14	
$FUSE_M$	6.526		0.000414	6.397	0.88	36.97	98.04	4.6		72.30 1.31	
TG	6.636		0.002492	5.894	--	100	88.82	12.4		66.72	
PLAT										NONE	

Table 2. (cont'd)

TEMP (°C)	$\frac{^{40}Ar}{^{39}Ar}$	$\frac{^{37}Ar}{^{39}Ar}$	$\frac{^{36}Ar}{^{39}Ar}$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\frac{x10^{-12}}{mole}$)	K/Ca ($\frac{mole}{mole}$)	App. Age (Ma)	On Plat. (√)
S1, muscovite, J = 0.005398; OM15; 0.2962; Felsic Group											
650	13.20		0.02106	6.965	1.56	7.25	52.79	3.5		66.58	
FUSE	8.286		0.004913	6.828	0.87	92.75	82.41	44.9		65.29±0.57	
TG	8.642		0.006085	6.838	--	100	79.13	48.4		65.39±0.80	
PH1, muscovite; J = 0.005398; OM15; 0.2770g; Felsic Group											
600	189.0		0.6163	6.905	40.46	0.29	3.65	0.1		66.02	
750	14.95		0.02817	6.615	1.96	11.06	44.26	4.2		63.29	√
900_M	7.763		0.003795	6.636	0.84	51.14	85.48	19.6		63.49±0.53	√
1025	9.163		0.009070	6.477	1.07	24.40	70.69	9.3		61.93	√
FUSE	15.05		0.02893	6.489	2.02	13.12	43.13	5.0		62.11	√
TG	10.38		0.01285	6.576	--	100	63.36	38.2		62.92	
PLAT				6.574		99.71				62.71±0.80	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
PH1, biotite; J = 0.005398; OM15; 0.2765g; Felsic Group											
600	19.98		0.05501	3.722	13.81	0.83	18.63	0.3		35.89	
750_M	6.944		0.001916	6.372	0.78	45.93	91.76	15.7		61.01±0.48	√
850	7.375		0.002959	6.495	0.90	10.10	88.06	3.4		62.16	√
1000	6.763		0.001222	6.395	0.77	35.98	94.57	12.3		61.22	√
FUSE	11.06		0.01552	6.471	1.65	7.17	58.50	2.4		61.94	√
TG	7.325		0.003185	6.378	--	100	87.07	34.1		61.06	
PLAT				6.401		99.17				61.28±0.55	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar (x10^{-12} mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
WR1a, hornblende; J = 0.006918; OM2; 1.6364; Dodgson Creek Quartz Monzonite											
750	160.1	3.999	0.4639	23.389	11.31	2.60	14.57	0.7	0.12	270.6	
1000	13.29	7.275	0.01869	8.412	2.27	22.54	62.95	6.4	0.07	102.0	
1050	8.338	7.734	0.005757	7.314	1.60	29.26	87.23	8.3	0.06	89.05	
1075	8.237	7.750	0.005259	7.362	1.51	23.32	88.87	6.6	0.06	89.62	
FUSE	8.928	7.980	0.005820	7.910	1.55	22.27	88.09	6.3	0.06	96.11	
TG	13.52	7.592	0.02050	8.125	--	100	59.79	28.5	0.06	98.65	
PLAT				7.360		52.58				89.59±1.39	
WR1a, biotite; J = 0.007009; OM2; 0.3375g; Dodgson Creek Quartz Monzonite											
550	470.7	0.975	1.5336	17.608	42.00	0.90	3.74	0.6	0.50	209.9	
650	51.91	0.117	0.1530	6.714	9.93	4.46	12.93	2.9	4.19	82.96	
800	13.01	--	0.02258	6.334	2.60	13.16	48.68	8.6	--	78.36	√
900	8.534	0.030	0.008042	6.154	1.82	15.50	72.11	10.1	16.33	76.18	√
1050	6.760	0.180	0.002038	6.168	0.87	21.30	91.23	13.7	2.72	76.35	√
FUSE	6.536	0.081	0.001185	6.187	0.71	44.95	94.65	29.4	6.05	76.58	√
TG	13.95	0.093	0.02582	6.323	--	100	45.33	65.3	5.27	78.23	
PLAT				6.198		94.64				76.71±1.01	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
WR1b, hornblende; J = 0.010101; OM3; 1.7141g; Dodgson Creek Quartz Monzonite											
850	35.51	3.753	0.07101	14.871	8.99	2.81	41.77	0.7	0.13	252.37	
1025	22.02	5.493	0.05367	6.636	14.48	4.49	30.02	1.1	0.09	117.00	
1050	8.488	8.002	0.01226	5.556	4.11	19.65	65.08	5.0	0.06	98.47	√
1075	8.350	8.024	0.01292	5.223	4.63	14.79	62.19	3.8	0.06	92.71	√
FUSE	6.288	8.045	0.006301	5.118	1.69	58.27	80.92	14.8	0.06	90.90	√
TG	8.551	7.798	0.01239	5.562	--	100	64.68	25.4	0.06	98.57	
PLAT				5.226		92.70				92.80±3.95	
WR1b, biotite; J = 0.010097; OM3; 0.3331g; Dodgson Creek Quartz Monzonite											
600	38.67		0.1250	1.734	24.74	1.75	4.48	1.1		31.31	
950	9.035		0.01596	4.313	1.78	19.86	47.74	12.2		76.90	√
1050	7.044		0.009501	4.230	1.39	19.01	60.06	11.7		75.45	√
FUSE	5.220		0.003385	4.213	0.90	59.38	80.72	36.4		75.15	√
TG	6.909		0.009170	4.193	--	100	60.69	61.4		74.80	
PLAT				4.236		98.25				75.56±0.94	

Table 2. (cont'd)

TEMP (°C)	$^{40}Ar/^{39}Ar$	$^{37}Ar/^{39}Ar$	$^{36}Ar/^{39}Ar$	F	σ_F (%)	^{39}Ar % of (Total)	$^{40}Ar_R$ (%)	^{39}Ar ($\times 10^{-12}$ mole)	K/Ca (mole/mole)	App. Age (Ma)	On Plat. (√)
McCartney Mountain, biotite; J = 0.003626; OM21; 0.1025g; Main Group(?)											
650	13.18		0.009658	10.319	1.00	21.02	78.30	2.0		66.27	
$FUSE_M$	12.54		0.003484	11.509	0.78	78.98	91.75	7.6		73.75±0.57	
TG	12.68		0.004781	11.259	--	100	88.81	9.6		72.18	

Table 3. Conventional K/A data

Sample No.	Description	Material	% K	Moles $^{40}Ar_R/g \times 10^{-10}$	$\%^{40}Ar_R$	Age x 10^6 yrs $\pm \sigma^{\alpha}$
TM1	Porphyry Group	Biotite	7.605	8.8671	91.2	66.07 ± 0.77
				9.1017	91.5	67.78 ± 0.84
					Average:	66.93 ± 0.81
TM2	Porphyry Group	Biotite	7.554	9.1235	96.0	68.40 ± 0.83
			7.493	9.0790	93.2	68.61 ± 0.77
					Average:	68.51 ± 0.80
TM3	Porphyry Group	Biotite	6.734	7.8531	91.3	66.08 ± 0.74
MM1	Late Group-A	Hornblende	0.668	0.8580	89.6	72.64 ± 1.16
		Biotite	7.871	9.8526	95.4	67.26 ± 0.94
TM7	Main Group	Hornblende	0.655	0.8099	74.1	69.92 ± 0.88
		Biotite	7.740	8.9438	88.7	65.44 ± 0.86
TM8	Main Group	Hornblende	0.474	0.5933	40.1	70.82 ± 1.73
		Biotite	5.990	6.9560	38.5	70.37 ± 3.07
TM9	Main Group	Biotite	5.529	6.6375	92.1	67.94 ± 1.17
TM10	Late Group-B	Biotite	6.602	7.7504	77.8	66.46 ± 1.07

Table 3. (cont'd)

Sample No.	Description	Material	% K	Moles $^{40}Ar_R$/g x 10^{-10}	$\%^{40}Ar_R$	Age x 10^6 yrs $\pm \sigma^{\alpha}$
TM11	Late Group-B	Biotite	7.236	8.8892	85.8	69.49 ± 1.13
TM12	Pre-Main Group	Hornblende Biotite	0.700 7.694	0.9342 9.3119	89.4 90.5	75.38 ± 0.88 68.49 ± 0.90
TM13	Aplite	Biotite	7.172	8.6157	87.5	67.99 ± 0.78
TM14	Breccia Porphyry Group	Biotite	6.593	7.9664	88.4	68.38 ± 0.83
VP1	Pre-Main Group	Biotite	6.859	8.8015	86.4	72.53 ± 1.05
P1	Early Group	Hornblende	0.430	0.9017	77.2	116.20 ± 1.42

α/ Error estimates reflect analytical precision only; calculated in a manner described by Cox and Dalrymple (1967).

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