**VESPA Dating Study Supplemental File 6**

**Ar-Ar raw data (final J)**

For each of the 49 separates from the 33 samples, listed in P number order below, the following are given:

Ar-Ar data tables, step heating plot of ages, isochron plot, K/Ca plot.

***Analysed at UCSB***

P84602 groundmass

P84607 groundmass, plagioclase

P84621 groundmass, plagioclase

P84629 groundmass, plagioclase

P84639 groundmass, plagioclase

P84640 biotite, plagioclase

P84641 groundmass, plagioclase

P84658 plagioclase

P84670 groundmass, plagioclase

P84678 groundmass, plagioclase

P84688 groundmass

P84691 groundmass

P84694 groundmass

P84705 plagioclase

P84707 groundmass, plagioclase

P84711 groundmass

P84714 plagioclase

P84722 biotite, plagioclase, hornblende

P84733 groundmass

P84740 groundmass

P84744 groundmass

P84749 groundmass, plagioclase

P84754 groundmass, plagioclase

P84761 groundmass, plagioclase

P84771 groundmass

P84775 groundmass

P84781 groundmass

P84785 plagioclase

P84792 groundmass, plagioclase

P84798 groundmass

BATHUS-777 biotite

SEAPSO-D2C groundmass, plagioclase

***Analysed at USGS***

P84812 plagioclase

Note, for ages in data tables, for total fusion, weighted mean plateau, and inverse isochron ages, and for error bars plotted on age spectra, quoted errors are ±1 sigma.

For "Preferred ages" in this Supplemental File, and those used throughout the main paper, quoted errors are ±2 sigma.

**Sample: SB69-16 P84602 gm J=0.0041184 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 6.1e-15 | 3.6507 | 0.0e+0 | 4.9794 | 0.0020 | 0.098 | 0.06160 | 0.841 | 22.7 ± 0.2 |
| 650 | 14 | 1.1e-14 | 3.3764 | 0.0e+0 | 5.3984 | 0.0009 | 0.091 | 0.18142 | 0.920 | 22.9 ± 0.1 |
| 700 | 14 | 1.3e-14 | 3.3174 | 0.0e+0 | 6.3245 | 0.0006 | 0.077 | 0.32890 | 0.947 | 23.2 ± 0.1 |
| 750 | 14 | 7.6e-15 | 3.4043 | 0.0e+0 | 6.8840 | 0.0012 | 0.071 | 0.41220 | 0.899 | 22.6 ± 0.2 |
| 800 | 14 | 6.9e-15 | 5.7882 | 1.2e-3 | 10.8599 | 0.0107 | 0.045 | 0.45692 | 0.453 | 19.4 ± 0.4 |
| 860 | 14 | 1.1e-14 | 7.3227 | 2.8e-3 | 22.6527 | 0.0175 | 0.022 | 0.51117 | 0.293 | 15.8 ± 0.4 |
| 920 | 14 | 2.0e-14 | 4.5627 | 2.1e-3 | 22.5502 | 0.0071 | 0.022 | 0.67690 | 0.538 | 18.1 ± 0.2 |
| 980 | 14 | 2.3e-14 | 4.2152 | 2.5e-3 | 19.1193 | 0.0054 | 0.026 | 0.87964 | 0.620 | 19.3 ± 0.1 |
| 1040 | 14 | 1.2e-14 | 5.2457 | 5.0e-3 | 32.8265 | 0.0101 | 0.015 | 0.96684 | 0.433 | 16.8 ± 0.3 |
| 1120 | 14 | 4.8e-15 | 5.5579 | 9.8e-3 | 54.3462 | 0.0131 | 0.009 | 1.00000 | 0.303 | 12.5 ± 0.6 |

Total fusion age, TFA= 19.97 ± 0.07 Ma (including J)

Weighted mean age, WMA= 22.97 ± 0.08 Ma (including J) MSWD=3.67, so error expanded to ± 0.15 Ma.

Inverse isochron age =23.34 ± 0.24 Ma. (MSWD =2.37; 40Ar/36Ar=238.7 ± 32.4)

Steps used: 600, 650, 700, 750, (1–4/10 or 41% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age 23.0 ± 0.3 Ma**







**Sample: SB69-19 P84607 gm J=0.0040967 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 6.7e-14 | 3.4451 | 1.1e-3 | 0.3140 | 0.0005 | 1.6 | 0.27984 | 0.955 | 24.2 ± 0.1 |
| 650 | 14 | 5.8e-14 | 3.4125 | 8.0e-4 | 0.7128 | 0.0007 | 0.69 | 0.52423 | 0.938 | 23.5 ± 0.1 |
| 700 | 14 | 4.8e-14 | 3.4163 | 0.0e+0 | 1.4907 | 0.0008 | 0.33 | 0.72647 | 0.927 | 23.2 ± 0.1 |
| 750 | 14 | 3.3e-14 | 3.3571 | 0.0e+0 | 2.2829 | 0.0009 | 0.21 | 0.86722 | 0.921 | 22.7 ± 0.1 |
| 800 | 14 | 1.5e-14 | 3.2732 | 0.0e+0 | 3.1746 | 0.0016 | 0.15 | 0.93415 | 0.854 | 20.5 ± 0.1 |
| 860 | 14 | 5.1e-15 | 2.8099 | 9.3e-4 | 4.4241 | 0.0014 | 0.11 | 0.96062 | 0.850 | 17.6 ± 0.2 |
| 920 | 14 | 2.5e-15 | 2.4887 | 2.6e-3 | 3.6751 | 0.0020 | 0.13 | 0.97530 | 0.764 | 14.0 ± 0.3 |
| 980 | 14 | 1.7e-15 | 1.8786 | 7.9e-3 | 3.3298 | 0.0014 | 0.15 | 0.98833 | 0.785 | 10.8 ± 0.4 |
| 1100 | 14 | 1.9e-15 | 2.3576 | 1.2e-2 | 7.7152 | 0.0030 | 0.064 | 1.00000 | 0.621 | 10.8 ± 0.4 |

Total fusion age, TFA= 22.72 ± 0.05 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 23.25 ± 0.06 Ma (including J). MSWD=16, so error expanded to ± 0.24 Ma

Inverse isochron age =26.73 ± 1.71 Ma. (MSWD =24.93; 40Ar/36Ar=-301.6 ± 256.1)

Steps used: 650, 700, 750, (2–4/9 or 59% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 23.2± 0.7 Ma**



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**Sample: SB69-177 P84607 plg J=0.0038937 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 4.2e-14 | 3.6069 | 0.0e+0 | 9.8045 | 0.0007 | 0.050 | 0.16685 | 0.943 | 23.7 ± 0.1 |
| 920 | 14 | 6.4e-14 | 3.4812 | 0.0e+0 | 8.2385 | 0.0003 | 0.059 | 0.43002 | 0.972 | 23.6 ± 0.1 |
| 1000 | 14 | 5.5e-14 | 3.4835 | 0.0e+0 | 6.7213 | 0.0003 | 0.073 | 0.65506 | 0.976 | 23.7 ± 0.1 |
| 1080 | 14 | 3.7e-14 | 3.6546 | 0.0e+0 | 6.2969 | 0.0008 | 0.078 | 0.80075 | 0.933 | 23.8 ± 0.1 |
| 1160 | 14 | 1.2e-14 | 3.6876 | 0.0e+0 | 6.5049 | 0.0009 | 0.075 | 0.84810 | 0.930 | 23.9 ± 0.2 |
| 1240 | 14 | 5.0e-15 | 4.0053 | 0.0e+0 | 7.4772 | 0.0017 | 0.066 | 0.86589 | 0.872 | 24.4 ± 0.3 |
| 1320 | 14 | 2.2e-14 | 4.3386 | 0.0e+0 | 6.3362 | 0.0025 | 0.077 | 0.93765 | 0.830 | 25.1 ± 0.2 |
| 1450 | 14 | 1.9e-14 | 4.3065 | 0.0e+0 | 7.9752 | 0.0025 | 0.061 | 1.00000 | 0.828 | 24.9 ± 0.2 |

Total fusion age, TFA= 23.90 ± 0.06 Ma (including J)

Weighted mean plateau age, WMPA= 23.70 ± 0.06 Ma (including J)

Inverse isochron age =23.60 ± 0.12 Ma. (MSWD =0.37; 40Ar/36Ar=326.7 ± 18.8)

Steps used: 800, 920, 1000, 1080, (1–4/8 or 80% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 23.60 ± 0.24 Ma (isochron age)**

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**Sample: SB69-4 P84621 gm J=0.0041663 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 2.5e-14 | 3.6179 | 0.0e+0 | 0.5482 | 0.0015 | 0.89 | 0.02798 | 0.880 | 23.8 ± 0.1 |
| 650 | 14 | 4.5e-14 | 3.3572 | 0.0e+0 | 0.4875 | 0.0004 | 1.0 | 0.08202 | 0.961 | 24.1 ± 0.1 |
| 700 | 14 | 8.2e-14 | 3.2552 | 0.0e+0 | 0.3752 | 0.0001 | 1.3 | 0.18266 | 0.987 | 24.0 ± 0.0 |
| 750 | 14 | 1.2e-13 | 3.2024 | 0.0e+0 | 0.2801 | 0.0001 | 1.7 | 0.33558 | 0.994 | 23.8 ± 0.0 |
| 800 | 14 | 1.2e-13 | 3.1820 | 0.0e+0 | 0.2400 | 0.0001 | 2.0 | 0.48797 | 0.995 | 23.6 ± 0.0 |
| 860 | 14 | 1.3e-13 | 3.1781 | 0.0e+0 | 0.1951 | 0.0001 | 2.5 | 0.64833 | 0.995 | 23.6 ± 0.0 |
| 920 | 14 | 1.1e-13 | 3.1893 | 0.0e+0 | 0.1753 | 0.0001 | 2.8 | 0.78385 | 0.995 | 23.7 ± 0.1 |
| 980 | 14 | 6.5e-14 | 3.1875 | 0.0e+0 | 0.2554 | 0.0001 | 1.9 | 0.86472 | 0.994 | 23.6 ± 0.0 |
| 1040 | 14 | 5.1e-14 | 3.1961 | 0.0e+0 | 0.3312 | 0.0001 | 1.5 | 0.92867 | 0.989 | 23.6 ± 0.0 |
| 1100 | 14 | 4.5e-14 | 3.2287 | 0.0e+0 | 0.4462 | 0.0003 | 1.1 | 0.98441 | 0.977 | 23.5 ± 0.1 |
| 1160 | 14 | 1.3e-14 | 3.3248 | 3.7e-4 | 2.5360 | 0.0005 | 0.19 | 1.00000 | 0.952 | 23.6 ± 0.1 |

Total fusion age, TFA= 23.72 ± 0.05 Ma (including J)

Weighted mean plateau age, WMPA= 23.62 ± 0.05 Ma (including J)

Inverse isochron age =23.64 ± 0.05 Ma. (MSWD =0.87; 40Ar/36Ar=276.9 ± 19.3)

Steps used: 800, 860, 920, 980, 1040, 1100, 1160, (5–11/11 or 66% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 23.62 ± 0.10 Ma**

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**Sample: SB69-178, 179 P84621 plg J=0.0038618 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 4.8e-14 | 3.9149 | 0.0e+0 | 14.9205 | 0.0015 | 0.033 | 0.29679 | 0.885 | 24.0 ± 0.2 |
| 900 | 14 | 5.0e-14 | 3.5798 | 0.0e+0 | 14.1986 | 0.0004 | 0.035 | 0.63531 | 0.970 | 24.0 ± 0.1 |
| 980 | 14 | 3.1e-14 | 3.5841 | 0.0e+0 | 14.0843 | 0.0003 | 0.035 | 0.84544 | 0.974 | 24.2 ± 0.2 |
| 1080 | 14 | 1.9e-14 | 4.6972 | 0.0e+0 | 11.7606 | 0.0040 | 0.042 | 0.94561 | 0.747 | 24.3 ± 0.2 |
| 1200 | 14 | 6.3e-15 | 6.1493 | 0.0e+0 | 9.5987 | 0.0089 | 0.051 | 0.97042 | 0.573 | 24.4 ± 0.6 |
| 1400 | 14 | 6.5e-15 | 5.2927 | 0.0e+0 | 10.1252 | 0.0062 | 0.048 | 1.00000 | 0.653 | 23.9 ± 0.5 |

Total fusion age, TFA= 24.07 ± 0.09 Ma (including J)

Weighted mean plateau age, WMPA= 24.07 ± 0.09 Ma (including J)

Inverse isochron age =24.04 ± 0.13 Ma. (MSWD =0.33; 40Ar/36Ar=299.4 ± 4.0)

Steps used: 800, 900, 980, 1080, 1200, 1400, (1–6/6 or 100% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age 24.07 ± 0.26 (isochron)**

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**Sample: SB69-66 P84629 gm J=0.0041001 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 4.1e-14 | 11.3779 | 0.0e+0 | 0.5120 | 0.0271 | 0.96 | 0.01370 | 0.295 | 24.7 ± 0.2 |
| 650 | 14 | 5.3e-14 | 7.0805 | 0.0e+0 | 0.6207 | 0.0126 | 0.79 | 0.04194 | 0.473 | 24.6 ± 0.1 |
| 700 | 14 | 5.8e-14 | 4.6339 | 0.0e+0 | 0.7191 | 0.0045 | 0.68 | 0.08929 | 0.715 | 24.3 ± 0.1 |
| 750 | 14 | 6.6e-14 | 3.7146 | 0.0e+0 | 0.6204 | 0.0015 | 0.79 | 0.15653 | 0.879 | 24.0 ± 0.1 |
| 800 | 14 | 8.5e-14 | 3.4840 | 0.0e+0 | 0.4079 | 0.0008 | 1.2 | 0.24792 | 0.933 | 23.9 ± 0.1 |
| 860 | 14 | 1.1e-13 | 3.3821 | 0.0e+0 | 0.2530 | 0.0005 | 1.9 | 0.36538 | 0.958 | 23.8 ± 0.1 |
| 920 | 14 | 1.1e-13 | 3.3462 | 0.0e+0 | 0.1497 | 0.0003 | 3.3 | 0.48532 | 0.969 | 23.8 ± 0.0 |
| 980 | 14 | 1.1e-13 | 3.3160 | 0.0e+0 | 0.1227 | 0.0003 | 4.0 | 0.60787 | 0.978 | 23.8 ± 0.0 |
| 1040 | 14 | 1.5e-13 | 3.4905 | 0.0e+0 | 0.1423 | 0.0009 | 3.4 | 0.77029 | 0.928 | 23.8 ± 0.0 |
| 1120 | 14 | 2.3e-13 | 3.8405 | 0.0e+0 | 0.2461 | 0.0021 | 2.0 | 1.00000 | 0.842 | 23.8 ± 0.1 |

Total fusion age, TFA= 23.88 ± 0.05 Ma (including J)

Weighted mean plateau age, WMPA= 23.81 ± 0.05 Ma (including J)

Inverse isochron age =23.83 ± 0.06 Ma. (MSWD =0.05; 40Ar/36Ar=290.8 ± 0.9)

Steps used: 860, 920, 980, 1040, 1120, (6–10/10 or 75% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 23.81 ± 0.10 Ma**







**Sample: SB69-183, 184 84629 plg J=0.0037881 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 3.4e-13 | 3.7317 | 0.0e+0 | 3.1565 | 0.0007 | 0.16 | 0.27545 | 0.946 | 24.0 ± 0.1 |
| 800 | 14 | 9.2e-14 | 3.6099 | 0.0e+0 | 1.8480 | 0.0002 | 0.27 | 0.35222 | 0.980 | 24.0 ± 0.1 |
| 900 | 14 | 2.1e-13 | 3.6259 | 0.0e+0 | 1.1402 | 0.0003 | 0.43 | 0.52946 | 0.976 | 24.0 ± 0.1 |
| 950 | 14 | 1.7e-13 | 3.5871 | 0.0e+0 | 0.6697 | 0.0002 | 0.73 | 0.66979 | 0.981 | 23.9 ± 0.1 |
| 1000 | 14 | 1.2e-13 | 3.6097 | 0.0e+0 | 0.4168 | 0.0003 | 1.2 | 0.76842 | 0.980 | 24.0 ± 0.1 |
| 1050 | 14 | 8.4e-14 | 3.8063 | 0.0e+0 | 0.4669 | 0.0007 | 1.0 | 0.83500 | 0.949 | 24.5 ± 0.1 |
| 1100 | 14 | 6.7e-14 | 3.9680 | 0.0e+0 | 0.5868 | 0.0014 | 0.84 | 0.88599 | 0.893 | 24.0 ± 0.1 |
| 1200 | 14 | 1.3e-13 | 3.8687 | 0.0e+0 | 0.4437 | 0.0011 | 1.1 | 0.98908 | 0.916 | 24.1 ± 0.1 |
| 1400 | 14 | 2.0e-14 | 5.4565 | 0.0e+0 | 3.2078 | 0.0066 | 0.15 | 1.00000 | 0.644 | 23.9 ± 0.2 |

Total fusion age, TFA= 24.02 ± 0.06 Ma (including J)

Weighted mean plateau age, WMPA= 24.01 ± 0.05 Ma (including J)

Inverse isochron age =24.00 ± 0.06 Ma. (MSWD =1.28; 40Ar/36Ar=296.4 ± 4.1)

Steps used: 800, 800, 900, 950, 1000, 1100, 1200, 1400, (1–9/9 or 93% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred age = 24.01 ± 0.1**

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**Sample: SB69-193 84639 gm J=0.0041939 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 5.3e-14 | 3.7956 | 0.0e+0 | 0.4786 | 0.0018 | 1.0 | 0.21857 | 0.859 | 24.5 ± 0.1 |
| 650 | 14 | 6.1e-14 | 3.9142 | 0.0e+0 | 0.8739 | 0.0023 | 0.56 | 0.46027 | 0.829 | 24.4 ± 0.1 |
| 700 | 14 | 5.6e-14 | 4.1595 | 0.0e+0 | 1.5934 | 0.0032 | 0.31 | 0.67016 | 0.770 | 24.1 ± 0.1 |
| 750 | 14 | 4.2e-14 | 4.6601 | 0.0e+0 | 2.2285 | 0.0050 | 0.22 | 0.81167 | 0.681 | 23.8 ± 0.1 |
| 800 | 14 | 2.9e-14 | 5.2957 | 0.0e+0 | 2.5382 | 0.0072 | 0.19 | 0.89683 | 0.599 | 23.9 ± 0.1 |
| 860 | 14 | 1.9e-14 | 5.9340 | 1.2e-3 | 2.9440 | 0.0096 | 0.17 | 0.94643 | 0.522 | 23.3 ± 0.3 |
| 920 | 14 | 9.5e-15 | 6.3892 | 3.3e-3 | 3.3791 | 0.0116 | 0.15 | 0.96969 | 0.465 | 22.3 ± 0.5 |
| 980 | 14 | 4.2e-15 | 5.3150 | 5.7e-3 | 4.3034 | 0.0092 | 0.11 | 0.98192 | 0.489 | 19.6 ± 0.7 |
| 1120 | 14 | 3.6e-15 | 3.0809 | 8.3e-3 | 11.0722 | 0.0052 | 0.044 | 1.00000 | 0.503 | 11.7 ± 0.6 |

Total fusion age, TFA= 23.83 ± 0.06 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 23.97 ± 0.07 Ma (including J). MSWD=2.3, so error expanded to ± 0.11 Ma.

Inverse isochron age =24.24 ± 0.20 Ma. (MSWD =0.83; 40Ar/36Ar=287.3 ± 5.0)

Steps used: 700, 750, 800, (3–5/9 or 44% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred age = 24.0 ± 0.2**

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**Sample: SB69-185, 186 84639 plg J=0.0037521 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 2.2e-14 | 4.0845 | 0.0e+0 | 23.2749 | 0.0017 | 0.021 | 0.23298 | 0.876 | 24.1 ± 0.2 |
| 900 | 14 | 2.3e-14 | 3.9006 | 0.0e+0 | 24.3053 | 0.0010 | 0.020 | 0.49306 | 0.920 | 24.1 ± 0.2 |
| 980 | 14 | 1.6e-14 | 3.8579 | 0.0e+0 | 23.3403 | 0.0009 | 0.021 | 0.67893 | 0.935 | 24.2 ± 0.2 |
| 1060 | 14 | 1.0e-14 | 4.6781 | 0.0e+0 | 21.8123 | 0.0038 | 0.022 | 0.77291 | 0.760 | 23.9 ± 0.4 |
| 1160 | 14 | 7.7e-15 | 6.7111 | 0.0e+0 | 19.3675 | 0.0103 | 0.025 | 0.82263 | 0.547 | 24.7 ± 0.5 |
| 1260 | 14 | 4.1e-15 | 7.7078 | 3.7e-4 | 19.1816 | 0.0142 | 0.026 | 0.84554 | 0.455 | 23.6 ± 0.9 |
| 1340 | 14 | 5.9e-15 | 5.9975 | 4.2e-4 | 16.0729 | 0.0076 | 0.030 | 0.88826 | 0.623 | 25.1 ± 0.5 |
| 1460 | 14 | 1.5e-14 | 5.7516 | 0.0e+0 | 17.9854 | 0.0065 | 0.027 | 1.00000 | 0.667 | 25.8 ± 0.3 |

Total fusion age, TFA= 24.36 ± 0.12 Ma (including J)

Weighted mean plateau age, WMPA= 24.14 ± 0.13 Ma (including J)

Inverse isochron age =24.11 ± 0.17 Ma. (MSWD =0.48; 40Ar/36Ar=297.3 ± 4.7)

Steps used: 800, 900, 980, 1060, 1160, 1260, (1–6/8 or 85% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 24.14 ± 0.26 Ma (WMPA)**

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**Sample: SB69-68 P84640 bio J=0.0040818 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 9.7e-16 | 14.1129 | 8.8e-3 | 0.1535 | 0.0348 | 3.2 | 0.00075 | 0.272 | 28.0 ± 6.4 |
| 650 | 14 | 9.5e-16 | 8.5864 | 9.4e-4 | 0.0993 | 0.0187 | 4.9 | 0.00196 | 0.356 | 22.3 ± 3.8 |
| 700 | 14 | 1.5e-15 | 6.6011 | 3.0e-3 | 0.0540 | 0.0103 | 9.1 | 0.00440 | 0.537 | 25.9 ± 1.9 |
| 750 | 14 | 2.8e-15 | 5.5000 | 0.0e+0 | 0.0410 | 0.0061 | 12 | 0.00987 | 0.670 | 26.9 ± 0.9 |
| 800 | 14 | 5.3e-15 | 4.4777 | 0.0e+0 | 0.0214 | 0.0039 | 23 | 0.02284 | 0.744 | 24.4 ± 0.4 |
| 850 | 14 | 1.2e-14 | 3.8146 | 0.0e+0 | 0.0095 | 0.0016 | 52 | 0.05594 | 0.874 | 24.4 ± 0.2 |
| 750 | 14 | 7.2e-16 | 6.3383 | 0.0e+0 | -0.0096 | 0.0112 | <0.001 | 0.05718 | 0.478 | 22.2 ± 3.6 |
| 900 | 14 | 2.2e-14 | 3.5103 | 0.0e+0 | 0.0078 | 0.0006 | 63 | 0.12604 | 0.948 | 24.3 ± 0.1 |
| 950 | 14 | 2.8e-14 | 3.4374 | 0.0e+0 | 0.0088 | 0.0004 | 56 | 0.21635 | 0.968 | 24.3 ± 0.1 |
| 1000 | 14 | 3.8e-14 | 3.4010 | 0.0e+0 | 0.0094 | 0.0003 | 52 | 0.33684 | 0.972 | 24.2 ± 0.1 |
| 1050 | 14 | 3.3e-14 | 3.4452 | 0.0e+0 | 0.0172 | 0.0004 | 29 | 0.44181 | 0.964 | 24.3 ± 0.1 |
| 1100 | 14 | 3.5e-14 | 3.8070 | 0.0e+0 | 0.0560 | 0.0016 | 8.8 | 0.54189 | 0.872 | 24.3 ± 0.1 |
| 1200 | 14 | 1.6e-13 | 3.8434 | 0.0e+0 | 0.0558 | 0.0018 | 8.8 | 1.00000 | 0.858 | 24.1 ± 0.1 |

Total fusion age, TFA= 24.23 ± 0.05 Ma (including J)

Weighted mean plateau age, WMPA= 24.20 ± 0.05 Ma (including J)

Inverse isochron age =24.26 ± 0.08 Ma. (MSWD =2.15; 40Ar/36Ar=293.1 ± 6.4)

Steps used: 600, 650, 700, 750, 800, 850, 750, 900, 950, 1000, 1050, 1100, 1200, (1–13/13 or 100% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 24.20 ± 0.10 Ma**







**Sample: SB69-187, 195 84640 plg J=0.0038941 (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 5.5e-14 | 3.5096 | 0.0e+0 | 6.2544 | 0.0003 | 0.078 | 0.20937 | 0.971 | 24.2 ± 0.1 |
| 880 | 14 | 6.0e-14 | 3.4618 | 0.0e+0 | 6.4365 | 0.0002 | 0.076 | 0.44000 | 0.981 | 24.1 ± 0.1 |
| 960 | 14 | 7.2e-14 | 3.5877 | 0.0e+0 | 6.5458 | 0.0007 | 0.075 | 0.70798 | 0.946 | 24.1 ± 0.1 |
| 1040 | 14 | 5.0e-14 | 3.5490 | 0.0e+0 | 6.3669 | 0.0005 | 0.077 | 0.89684 | 0.961 | 24.2 ± 0.1 |
| 1120 | 14 | 1.7e-14 | 3.7513 | 0.0e+0 | 6.1104 | 0.0011 | 0.080 | 0.95689 | 0.916 | 24.4 ± 0.2 |
| 1240 | 14 | 7.6e-15 | 4.3151 | 1.8e-4 | 5.9885 | 0.0031 | 0.082 | 0.98030 | 0.788 | 24.1 ± 0.3 |
| 1400 | 14 | 6.3e-15 | 4.2570 | 0.0e+0 | 6.4078 | 0.0027 | 0.076 | 1.00000 | 0.813 | 24.5 ± 0.4 |

Total fusion age, TFA= 24.12 ± 0.06 Ma (including J)

Weighted mean plateau age, WMPA= 24.10 ± 0.06 Ma (including J)

Inverse isochron age =24.09 ± 0.14 Ma. (MSWD =0.58; 40Ar/36Ar=307.3 ± 10.1)

Steps used: 800, 880, 960, 1040, (1–4/7 or 90% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 24.10 ± 0.12 Ma**

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TFA= 24.12 ± 0.06 Ma

WMPA= 24.10 ± 0.06 Ma

Note: Ages on y-axis of this plot are based on Fish Canyon Tuff = 27.6 Ma (not 28.1 Ma). Calculated TFA and WMPA ages, and those given in table above, are corrected.

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Age = 24.09 ± 0.14 Ma

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**Sample: SB69=9 P84641 gm J=0.0041559 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 2.5e-14 | 5.9919 | 0.0e+0 | 0.2264 | 0.0089 | 2.2 | 0.03945 | 0.563 | 25.1 ± 0.1 |
| 650 | 14 | 3.4e-14 | 4.9446 | 0.0e+0 | 0.2367 | 0.0052 | 2.1 | 0.10598 | 0.688 | 25.3 ± 0.1 |
| 700 | 14 | 4.3e-14 | 4.4809 | 0.0e+0 | 0.2346 | 0.0038 | 2.1 | 0.19938 | 0.750 | 25.0 ± 0.1 |
| 750 | 14 | 5.0e-14 | 4.4030 | 0.0e+0 | 0.2545 | 0.0037 | 1.9 | 0.30789 | 0.750 | 24.6 ± 0.1 |
| 800 | 14 | 6.7e-14 | 4.7532 | 0.0e+0 | 0.2772 | 0.0050 | 1.8 | 0.44420 | 0.686 | 24.3 ± 0.1 |
| 860 | 14 | 9.7e-14 | 5.3217 | 0.0e+0 | 0.3166 | 0.0071 | 1.5 | 0.62026 | 0.607 | 24.1 ± 0.1 |
| 920 | 14 | 5.9e-14 | 4.8436 | 0.0e+0 | 0.3932 | 0.0056 | 1.2 | 0.73827 | 0.660 | 23.8 ± 0.1 |
| 980 | 14 | 2.5e-14 | 4.1689 | 0.0e+0 | 0.4656 | 0.0035 | 1.1 | 0.79512 | 0.751 | 23.3 ± 0.1 |
| 1040 | 14 | 2.9e-14 | 4.4645 | 0.0e+0 | 0.4631 | 0.0045 | 1.1 | 0.85718 | 0.703 | 23.4 ± 0.1 |
| 1120 | 14 | 7.9e-14 | 5.3059 | 0.0e+0 | 0.9483 | 0.0071 | 0.52 | 1.00000 | 0.604 | 23.9 ± 0.1 |

Total fusion age, TFA= 24.22 ± 0.05 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 23.79 ± 0.05 Ma (including J). MSWD=11.5, so error expanded to ± 0.17 Ma

Inverse isochron age =22.62 ± 0.28 Ma. (MSWD =2.80; 40Ar/36Ar=321.5 ± 6.0)

Steps used: 860, 920, 980, 1040, 1120, (6–10/10 or 56% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age 23.8 ± 0.6 Ma**

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**Sample: SB69-181, 182 P84641 plg J=0.0038228 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 5.1e-14 | 4.1690 | 0.0e+0 | 6.6800 | 0.0022 | 0.073 | 0.13609 | 0.844 | 24.1 ± 0.1 |
| 900 | 14 | 7.5e-14 | 3.7421 | 0.0e+0 | 6.5882 | 0.0008 | 0.074 | 0.35926 | 0.941 | 24.1 ± 0.1 |
| 980 | 14 | 7.6e-14 | 3.6043 | 0.0e+0 | 6.4628 | 0.0003 | 0.076 | 0.59213 | 0.975 | 24.1 ± 0.1 |
| 1060 | 14 | 6.3e-14 | 3.6950 | 0.0e+0 | 6.1908 | 0.0006 | 0.079 | 0.78174 | 0.952 | 24.1 ± 0.1 |
| 1160 | 14 | 3.0e-14 | 4.0502 | 0.0e+0 | 5.9527 | 0.0018 | 0.082 | 0.86381 | 0.872 | 24.2 ± 0.1 |
| 1260 | 14 | 9.8e-15 | 3.8430 | 0.0e+0 | 6.0440 | 0.0010 | 0.081 | 0.89191 | 0.921 | 24.3 ± 0.2 |
| 1340 | 14 | 1.9e-14 | 3.9073 | 0.0e+0 | 5.7288 | 0.0013 | 0.086 | 0.94694 | 0.904 | 24.2 ± 0.2 |
| 1460 | 14 | 1.9e-14 | 4.0489 | 0.0e+0 | 5.9101 | 0.0017 | 0.083 | 1.00000 | 0.875 | 24.3 ± 0.2 |

Total fusion age, TFA= 24.12 ± 0.06 Ma (including J)

Weighted mean plateau age, WMPA= 24.12 ± 0.06 Ma (including J)

Inverse isochron age =24.08 ± 0.08 Ma. (MSWD =0.37; 40Ar/36Ar=301.2 ± 4.6)

Steps used: 800, 900, 980, 1060, 1160, 1260, 1340, 1460, (1–8/8 or 100% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 24.12 ± 0.12 Ma**

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**Sample: SB69-197, 198 84658 plg J=0.0041733 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 2.0e-14 | 3.3407 | 0.0e+0 | 36.7485 | 0.0009 | 0.013 | 0.40639 | 0.919 | 23.0 ± 0.3 |
| 900 | 14 | 1.2e-14 | 3.3461 | 0.0e+0 | 34.3168 | 0.0007 | 0.014 | 0.65971 | 0.936 | 23.4 ± 0.4 |
| 980 | 14 | 6.7e-15 | 3.5045 | 0.0e+0 | 29.0172 | 0.0014 | 0.017 | 0.78959 | 0.879 | 23.0 ± 0.5 |
| 1060 | 14 | 4.5e-15 | 3.7268 | 5.3e-5 | 25.1951 | 0.0023 | 0.019 | 0.87090 | 0.820 | 22.9 ± 0.5 |
| 1180 | 14 | 3.2e-15 | 4.6687 | 9.4e-4 | 25.2687 | 0.0052 | 0.019 | 0.91702 | 0.671 | 23.4 ± 0.9 |
| 1300 | 14 | 2.6e-15 | 4.9822 | 1.2e-3 | 25.8302 | 0.0054 | 0.019 | 0.95218 | 0.677 | 25.2 ± 1.1 |
| 1400 | 14 | 2.7e-15 | 5.3159 | 1.0e-3 | 40.3912 | 0.0068 | 0.012 | 0.98765 | 0.619 | 24.6 ± 1.3 |
| 1480 | 14 | 1.0e-15 | 5.7793 | 2.9e-3 | 34.1061 | 0.0075 | 0.014 | 1.00000 | 0.615 | 26.6 ± 2.5 |

Total fusion age, TFA= 23.29 ± 0.19 Ma (including J)

Weighted mean plateau age, WMPA= 23.23 ± 0.19 Ma (including J)

Inverse isochron age =22.80 ± 0.34 Ma. (MSWD =0.55; 40Ar/36Ar=331.2 ± 14.5)

Steps used: 800, 900, 980, 1060, 1180, 1300, 1400, 1480, (1–8/8 or 100% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 23.2 ± 0.4 Ma**

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**Sample: SB69-71 P84670 gm J=0.0040646 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 4.6e-15 | 6.2689 | 0.0e+0 | 8.8549 | 0.0148 | 0.055 | 0.10166 | 0.301 | 13.8 ± 0.6 |
| 650 | 14 | 3.8e-15 | 4.6534 | 1.0e-3 | 13.3198 | 0.0074 | 0.037 | 0.21317 | 0.527 | 17.9 ± 0.6 |
| 700 | 14 | 3.8e-15 | 3.8553 | 7.6e-4 | 16.8936 | 0.0034 | 0.029 | 0.35094 | 0.742 | 20.8 ± 0.5 |
| 750 | 14 | 3.6e-15 | 3.4872 | 1.5e-3 | 24.8539 | 0.0020 | 0.020 | 0.49283 | 0.832 | 21.1 ± 0.5 |
| 800 | 14 | 3.2e-15 | 3.3622 | 0.0e+0 | 30.4322 | 0.0017 | 0.016 | 0.62507 | 0.854 | 20.9 ± 0.5 |
| 860 | 14 | 2.4e-15 | 3.3787 | 1.7e-3 | 31.5856 | 0.0027 | 0.016 | 0.72438 | 0.767 | 18.9 ± 0.7 |
| 920 | 14 | 1.6e-15 | 2.9672 | 3.5e-3 | 25.2644 | 0.0029 | 0.019 | 0.79787 | 0.709 | 15.4 ± 0.8 |
| 980 | 14 | 1.0e-15 | 2.4951 | 3.9e-3 | 17.7445 | 0.0057 | 0.028 | 0.85482 | 0.323 | 5.9 ± 1.1 |
| 1040 | 14 | 8.0e-16 | 1.8835 | 6.2e-3 | 19.2911 | 0.0047 | 0.025 | 0.91334 | 0.263 | 3.6 ± 1.0 |
| 1120 | 14 | 1.5e-15 | 2.5296 | 8.7e-3 | 72.6778 | 0.0057 | 0.007 | 1.00000 | 0.337 | 6.2 ± 0.9 |

Total fusion age, TFA= 16.14 ± 0.21 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 20.97 ± 0.29 Ma (including J). MSWD=0.093 (<1), so error left unchanged.

Inverse isochron age =21.20 ± 0.96 Ma. (MSWD =0.13; 40Ar/36Ar=282.4 ± 18.6)

Steps used: 700, 750, 800, (3–5/10 or 41% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 21.0 ± 1.0 Ma (likely a minimum age)**







**Sample: SB69-199, 200 84670 plg J=0.0041608 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 8.7e-15 | 8.8124 | 0.0e+0 | 222.5103 | 0.0197 | 0.002 | 0.28824 | 0.339 | 22.3 ± 1.2 |
| 900 | 14 | 6.8e-15 | 7.1014 | 0.0e+0 | 244.3908 | 0.0131 | 0.002 | 0.57061 | 0.455 | 24.1 ± 1.6 |
| 980 | 14 | 4.5e-15 | 7.7184 | 0.0e+0 | 251.7897 | 0.0142 | 0.002 | 0.74132 | 0.456 | 26.2 ± 2.1 |
| 1060 | 14 | 3.9e-15 | 18.9954 | 0.0e+0 | 237.0988 | 0.0537 | 0.002 | 0.80134 | 0.165 | 23.4 ± 3.4 |
| 1300 | 14 | 7.0e-15 | 30.6055 | 2.4e-3 | 104.4977 | 0.0901 | 0.005 | 0.86310 | 0.130 | 29.6 ± 3.3 |
| 1450 | 14 | 1.5e-14 | 31.3224 | 0.0e+0 | 155.3074 | 0.0952 | 0.003 | 1.00000 | 0.101 | 23.7 ± 2.3 |

Total fusion age, TFA= 24.18 ± 0.80 Ma (including J)

Weighted mean plateau age, WMPA= 23.86 ± 0.78 Ma (including J)

Inverse isochron age =23.15 ± 1.68 Ma. (MSWD =0.83; 40Ar/36Ar=299.1 ± 4.0)

Steps used: 800, 900, 980, 1060, 1300, 1450, (1–6/6 or 100% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 23.9 ± 1.5 Ma**

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**Sample: SB69-73 P84678 gm J=0.0040416 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 1.3e-14 | 4.9480 | 0.0e+0 | 2.2003 | 0.0056 | 0.22 | 0.15640 | 0.663 | 23.8 ± 0.2 |
| 650 | 14 | 1.4e-14 | 4.5132 | 0.0e+0 | 3.0894 | 0.0037 | 0.16 | 0.34513 | 0.760 | 24.8 ± 0.2 |
| 700 | 14 | 1.1e-14 | 4.2846 | 0.0e+0 | 5.2860 | 0.0024 | 0.093 | 0.50690 | 0.832 | 25.8 ± 0.2 |
| 750 | 14 | 7.7e-15 | 4.0065 | 0.0e+0 | 10.9628 | 0.0018 | 0.045 | 0.62518 | 0.866 | 25.1 ± 0.3 |
| 800 | 14 | 5.7e-15 | 3.7444 | 2.3e-3 | 17.8277 | 0.0014 | 0.027 | 0.71952 | 0.893 | 24.2 ± 0.4 |
| 860 | 14 | 4.9e-15 | 3.6299 | 2.9e-3 | 18.2572 | 0.0016 | 0.027 | 0.80263 | 0.872 | 22.9 ± 0.4 |
| 920 | 14 | 3.0e-15 | 3.2457 | 3.5e-3 | 18.1218 | 0.0015 | 0.027 | 0.86018 | 0.862 | 20.3 ± 0.5 |
| 980 | 14 | 2.6e-15 | 3.2467 | 3.7e-3 | 11.3888 | 0.0019 | 0.043 | 0.91014 | 0.830 | 19.5 ± 0.7 |
| 1040 | 14 | 3.6e-15 | 3.7042 | 1.1e-3 | 7.1121 | 0.0032 | 0.069 | 0.96888 | 0.741 | 19.9 ± 0.6 |
| 1120 | 14 | 2.2e-15 | 4.5045 | 6.0e-3 | 55.0629 | 0.0072 | 0.009 | 1.00000 | 0.525 | 17.1 ± 1.2 |

Total fusion age, TFA= 23.59 ± 0.12 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 24.69 ± 0.12 Ma (including J). MSWD=14.9, so error expanded to ± 0.46 Ma

Inverse isochron age =25.02 ± 0.94 Ma. (MSWD =14.07; 40Ar/36Ar=281.6 ± 38.4)

Steps used: 600, 650, 700, 750, 800, 860, (1–6/10 or 80% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 24.5 ± 2.0 Ma**







**Sample: SB69-201, 203 84678 plg J=0.0041441 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 8.8e-15 | 7.6956 | 0.0e+0 | 198.3098 | 0.0157 | 0.002 | 0.29066 | 0.396 | 22.6 ± 1.2 |
| 900 | 14 | 6.8e-15 | 6.1895 | 0.0e+0 | 200.5581 | 0.0107 | 0.002 | 0.57121 | 0.490 | 22.5 ± 1.5 |
| 980 | 14 | 4.3e-15 | 7.1925 | 0.0e+0 | 201.5203 | 0.0144 | 0.002 | 0.72558 | 0.410 | 21.9 ± 1.7 |
| 1060 | 14 | 3.4e-15 | 19.0313 | 0.0e+0 | 194.7492 | 0.0546 | 0.003 | 0.77079 | 0.153 | 21.6 ± 3.8 |
| 1180 | 14 | 8.7e-15 | 51.3237 | 4.5e-3 | 176.0486 | 0.1616 | 0.003 | 0.81341 | 0.070 | 26.5 ± 4.5 |
| 1300 | 14 | 4.9e-15 | 43.9527 | 0.0e+0 | 163.3421 | 0.1368 | 0.003 | 0.84118 | 0.080 | 26.2 ± 5.4 |
| 1450 | 14 | 1.8e-14 | 28.9057 | 2.1e-3 | 165.7833 | 0.0855 | 0.003 | 1.00000 | 0.126 | 27.1 ± 2.0 |

Total fusion age, TFA= 23.42 ± 0.75 Ma (including J)

Weighted mean plateau age, WMPA= 22.60 ± 0.78 Ma (including J)

Inverse isochron age =21.96 ± 1.36 Ma. (MSWD =0.06; 40Ar/36Ar=299.1 ± 0.9)

Steps used: 800, 900, 980, 1060, 1180, 1300, (1–6/7 or 84% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 22.6 ± 1.5 Ma**

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**Sample: SB69-21 P84688 gm J=0.0040794 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 3.0e-15 | 5.5422 | 3.1e-3 | 12.7959 | 0.0115 | 0.038 | 0.06919 | 0.388 | 15.8 ± 0.7 |
| 650 | 14 | 7.4e-15 | 7.2915 | 1.0e-3 | 20.0759 | 0.0158 | 0.024 | 0.19923 | 0.359 | 19.2 ± 0.4 |
| 700 | 14 | 9.1e-15 | 6.5670 | 1.1e-3 | 32.9709 | 0.0130 | 0.015 | 0.38006 | 0.416 | 20.0 ± 0.4 |
| 750 | 14 | 4.5e-15 | 3.4321 | 0.0e+0 | 36.5836 | 0.0015 | 0.013 | 0.55104 | 0.871 | 21.9 ± 0.4 |
| 800 | 14 | 2.7e-15 | 3.4689 | 4.5e-6 | 25.8933 | 0.0025 | 0.019 | 0.65261 | 0.785 | 19.9 ± 0.4 |
| 860 | 14 | 2.0e-15 | 3.5071 | 0.0e+0 | 15.6769 | 0.0037 | 0.031 | 0.72442 | 0.689 | 17.7 ± 0.6 |
| 920 | 14 | 1.7e-15 | 4.0192 | 1.5e-3 | 12.2200 | 0.0069 | 0.040 | 0.77901 | 0.495 | 14.6 ± 0.8 |
| 980 | 14 | 2.3e-15 | 5.3863 | 0.0e+0 | 13.3031 | 0.0133 | 0.037 | 0.83304 | 0.268 | 10.6 ± 0.9 |
| 1040 | 14 | 3.1e-15 | 5.3920 | 2.1e-3 | 23.6954 | 0.0158 | 0.021 | 0.90680 | 0.136 | 5.4 ± 0.8 |
| 1120 | 14 | 2.5e-15 | 3.5770 | 8.3e-3 | 97.2574 | 0.0090 | 0.005 | 1.00000 | 0.254 | 6.7 ± 0.7 |

Total fusion age, TFA= 16.63 ± 0.18 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 20.00 ± 0.20 Ma (including J). MSWD=10.3, so error expanded to ± 0.64 Ma

Inverse isochron age =20.43 ± 1.08 Ma. (MSWD =10.57; 40Ar/36Ar=286.8 ± 14.6)

Steps used: 650, 700, 750, 800, 860, (2–6/10 or 66% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = ≥ 22.0 Ma**







**Sample: SB69-49 P84691 gm J=0.0041949 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 2.4e-15 | 3.2795 | 0.0e+0 | 8.9478 | 0.0034 | 0.055 | 0.09032 | 0.694 | 17.1 ± 0.7 |
| 650 | 14 | 4.0e-15 | 3.1436 | 3.4e-4 | 13.7909 | 0.0014 | 0.036 | 0.24493 | 0.872 | 20.6 ± 0.4 |
| 700 | 14 | 5.4e-15 | 3.1625 | 2.3e-5 | 21.7190 | 0.0006 | 0.023 | 0.45558 | 0.943 | 22.4 ± 0.3 |
| 750 | 14 | 4.9e-15 | 3.2609 | 0.0e+0 | 25.4781 | 0.0006 | 0.019 | 0.64154 | 0.944 | 23.2 ± 0.4 |
| 800 | 14 | 2.9e-15 | 3.3853 | 0.0e+0 | 20.4362 | 0.0021 | 0.024 | 0.74832 | 0.817 | 20.8 ± 0.6 |
| 860 | 14 | 2.0e-15 | 3.4786 | 2.8e-3 | 15.5414 | 0.0034 | 0.032 | 0.81919 | 0.708 | 18.5 ± 0.9 |
| 920 | 14 | 1.6e-15 | 3.7102 | 1.0e-2 | 12.7720 | 0.0049 | 0.038 | 0.87123 | 0.612 | 17.1 ± 1.2 |
| 980 | 14 | 1.5e-15 | 4.1271 | 9.4e-3 | 13.1232 | 0.0069 | 0.037 | 0.91610 | 0.503 | 15.6 ± 1.3 |
| 1040 | 14 | 1.7e-15 | 5.1052 | 8.4e-3 | 16.4024 | 0.0122 | 0.030 | 0.95812 | 0.295 | 11.3 ± 1.4 |
| 1120 | 14 | 1.7e-15 | 5.1362 | 1.8e-2 | 91.2074 | 0.0105 | 0.005 | 1.00000 | 0.396 | 15.3 ± 1.7 |

Total fusion age, TFA= 20.01 ± 0.21 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 22.43 ± 0.24 Ma (including J). MSWD=5.6, so error expanded to ± 0.57 Ma

Inverse isochron age =22.54 ± 0.46 Ma. (MSWD =9.24; 40Ar/36Ar=176.0 ± 23.1)

Steps used: 700, 750, 800, (3–5/10 or 50% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 22.5 ± 1.2 Ma**







**Sample: SB69-24 P84694 gm J=0.0040524 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 9.5e-15 | 5.0583 | 0.0e+0 | 4.1436 | 0.0073 | 0.12 | 0.07146 | 0.575 | 21.1 ± 0.2 |
| 650 | 14 | 1.2e-14 | 3.8564 | 0.0e+0 | 5.3851 | 0.0037 | 0.091 | 0.18746 | 0.719 | 20.2 ± 0.1 |
| 700 | 14 | 1.2e-14 | 3.5391 | 0.0e+0 | 6.9324 | 0.0028 | 0.071 | 0.31317 | 0.764 | 19.7 ± 0.1 |
| 750 | 14 | 9.4e-15 | 3.5423 | 0.0e+0 | 7.0659 | 0.0029 | 0.069 | 0.41528 | 0.761 | 19.6 ± 0.2 |
| 800 | 14 | 8.0e-15 | 3.4924 | 2.6e-4 | 5.8466 | 0.0027 | 0.084 | 0.50249 | 0.770 | 19.6 ± 0.2 |
| 860 | 14 | 7.5e-15 | 3.3791 | 0.0e+0 | 4.7848 | 0.0026 | 0.10 | 0.58784 | 0.774 | 19.0 ± 0.2 |
| 920 | 14 | 7.2e-15 | 3.2597 | 0.0e+0 | 4.2681 | 0.0028 | 0.11 | 0.67212 | 0.745 | 17.7 ± 0.2 |
| 980 | 14 | 8.4e-15 | 3.2226 | 3.0e-4 | 4.6646 | 0.0039 | 0.11 | 0.77194 | 0.640 | 15.0 ± 0.2 |
| 1040 | 14 | 1.0e-14 | 3.4063 | 2.2e-3 | 7.1525 | 0.0058 | 0.069 | 0.88575 | 0.499 | 12.4 ± 0.2 |
| 1120 | 14 | 1.6e-14 | 5.4459 | 4.7e-3 | 15.4308 | 0.0134 | 0.032 | 1.00000 | 0.271 | 10.7 ± 0.2 |

Total fusion age, TFA= 17.28 ± 0.06 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 19.67 ± 0.08 Ma (including J). MSWD=8.7, so error expanded to ± 0.24 Ma.

Inverse isochron age =17.12 ± 0.74 Ma. (MSWD =0.77; 40Ar/36Ar=412.8 ± 30.1)

Steps used: 650, 700, 750, 800, 860, (2–6/10 or 52% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 19.7 ± 0.75 Ma**







**Sample: SB69-213, 214 84705 plg J=0.0040467 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 5.4e-15 | 13.7148 | 0.0e+0 | 367.2891 | 0.0348 | 0.001 | 0.21642 | 0.250 | 24.9 ± 2.4 |
| 900 | 14 | 4.0e-15 | 8.5255 | 0.0e+0 | 300.5581 | 0.0177 | 0.002 | 0.46737 | 0.387 | 23.9 ± 2.0 |
| 980 | 14 | 2.0e-15 | 5.6762 | 0.0e+0 | 247.5998 | 0.0078 | 0.002 | 0.64829 | 0.592 | 24.4 ± 2.2 |
| 1060 | 14 | 1.4e-15 | 6.8824 | 0.0e+0 | 193.9399 | 0.0106 | 0.003 | 0.74857 | 0.546 | 27.2 ± 3.6 |
| 1180 | 14 | 2.0e-15 | 9.5898 | 0.0e+0 | 90.4918 | 0.0209 | 0.005 | 0.84708 | 0.355 | 24.7 ± 3.1 |
| 1300 | 14 | 3.9e-15 | 46.0639 | 1.3e-2 | 232.8536 | 0.1348 | 0.002 | 0.89025 | 0.135 | 44.8 ± 7.4 |
| 1450 | 14 | 4.9e-15 | 22.6489 | 0.0e+0 | 230.9820 | 0.0590 | 0.002 | 1.00000 | 0.230 | 37.6 ± 3.8 |

Total fusion age, TFA= 27.03 ± 1.09 Ma (including J)

Weighted mean plateau age, WMPA= 24.67 ± 1.12 Ma (including J)

Inverse isochron age =24.85 ± 3.31 Ma. (MSWD =0.14; 40Ar/36Ar=294.8 ± 8.8)

Steps used: 800, 900, 980, 1060, 1180, (1–5/7 or 85% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 24.7 ± 2.2**

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**Sample: SB69-75 P84707 gm J=0.0040137 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 1.2e-14 | 7.7962 | 7.1e-3 | 1.9048 | 0.0216 | 0.26 | 0.11683 | 0.183 | 10.3 ± 0.4 |
| 650 | 14 | 1.1e-14 | 5.3360 | 3.7e-3 | 3.5820 | 0.0113 | 0.14 | 0.26625 | 0.376 | 14.5 ± 0.3 |
| 700 | 14 | 1.0e-14 | 4.5380 | 3.7e-3 | 6.0458 | 0.0074 | 0.081 | 0.43313 | 0.520 | 17.0 ± 0.3 |
| 750 | 14 | 9.1e-15 | 4.3455 | 2.7e-3 | 7.6062 | 0.0062 | 0.064 | 0.58608 | 0.579 | 18.1 ± 0.3 |
| 800 | 14 | 7.6e-15 | 4.3334 | 3.8e-3 | 8.0846 | 0.0059 | 0.061 | 0.71395 | 0.596 | 18.6 ± 0.3 |
| 860 | 14 | 6.2e-15 | 4.3758 | 4.8e-3 | 8.2856 | 0.0065 | 0.059 | 0.81806 | 0.559 | 17.6 ± 0.4 |
| 920 | 14 | 3.8e-15 | 4.2606 | 8.3e-3 | 8.2259 | 0.0071 | 0.060 | 0.88268 | 0.509 | 15.6 ± 0.6 |
| 980 | 14 | 2.2e-15 | 4.0454 | 1.0e-2 | 9.0561 | 0.0071 | 0.054 | 0.92342 | 0.480 | 14.0 ± 0.9 |
| 1040 | 14 | 1.8e-15 | 3.8445 | 9.4e-3 | 13.6500 | 0.0068 | 0.036 | 0.95807 | 0.480 | 13.3 ± 1.1 |
| 1120 | 14 | 2.9e-15 | 5.2737 | 4.9e-3 | 63.1663 | 0.0083 | 0.008 | 1.00000 | 0.537 | 20.4 ± 1.0 |

Total fusion age, TFA= 16.08 ± 0.13 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 18.16 ± 0.18 Ma (including J). MSWD=2.1, so error expanded to ± 0.26 Ma

Inverse isochron age =28.01 ± 1.50 Ma. (MSWD =0.19; 40Ar/36Ar=72.7 ± 14.9)

Steps used: 750, 800, 860, (4–6/10 or 38% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = ≥ 18.5 ± 1.0 Ma**







**Sample: SB69-204, 205 84707 plg J=0.0041260 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 1.7e-14 | 3.4893 | 0.0e+0 | 46.4135 | 0.0017 | 0.011 | 0.38647 | 0.855 | 22.1 ± 0.4 |
| 900 | 14 | 1.3e-14 | 3.2585 | 0.0e+0 | 47.4506 | 0.0009 | 0.010 | 0.69386 | 0.922 | 22.2 ± 0.4 |
| 980 | 14 | 6.6e-15 | 3.4782 | 0.0e+0 | 52.8579 | 0.0015 | 0.009 | 0.84442 | 0.870 | 22.4 ± 0.6 |
| 1060 | 14 | 3.2e-15 | 3.9605 | 0.0e+0 | 54.1876 | 0.0039 | 0.009 | 0.90904 | 0.706 | 20.7 ± 0.9 |
| 1180 | 14 | 2.8e-15 | 6.8207 | 0.0e+0 | 58.1681 | 0.0137 | 0.008 | 0.94190 | 0.407 | 20.5 ± 1.7 |
| 1300 | 14 | 3.0e-15 | 11.3924 | 0.0e+0 | 106.7539 | 0.0293 | 0.005 | 0.96367 | 0.241 | 20.3 ± 2.4 |
| 1450 | 14 | 3.5e-15 | 7.7339 | 0.0e+0 | 64.8640 | 0.0159 | 0.008 | 1.00000 | 0.394 | 22.5 ± 1.6 |

Total fusion age, TFA= 22.00 ± 0.25 Ma (including J)

Weighted mean plateau age, WMPA= 22.20 ± 0.25 Ma (including J)

Inverse isochron age =22.28 ± 0.99 Ma. (MSWD =0.15; 40Ar/36Ar=286.9 ± 38.4)

Steps used: 800, 900, 980, (1–3/7 or 84% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 22.2 ± 0.5 Ma**

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**Sample: SB69-28 P84711 gm J=0.0040202 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 1.2e-14 | 7.8506 | 0.0e+0 | 0.7475 | 0.0096 | 0.66 | 0.04779 | 0.640 | 36.1 ± 0.3 |
| 650 | 14 | 1.6e-14 | 7.6345 | 0.0e+0 | 0.6985 | 0.0087 | 0.70 | 0.11415 | 0.663 | 36.4 ± 0.2 |
| 700 | 14 | 1.4e-14 | 7.5305 | 0.0e+0 | 0.5860 | 0.0083 | 0.84 | 0.17414 | 0.674 | 36.5 ± 0.2 |
| 750 | 14 | 1.3e-14 | 7.9978 | 0.0e+0 | 0.7090 | 0.0102 | 0.69 | 0.22799 | 0.625 | 35.9 ± 0.3 |
| 800 | 14 | 1.0e-14 | 6.9712 | 0.0e+0 | 0.7982 | 0.0067 | 0.61 | 0.27408 | 0.714 | 35.7 ± 0.3 |
| 860 | 14 | 1.5e-14 | 7.0560 | 0.0e+0 | 0.8600 | 0.0071 | 0.57 | 0.33987 | 0.704 | 35.7 ± 0.2 |
| 920 | 14 | 2.9e-14 | 7.0867 | 0.0e+0 | 0.8952 | 0.0067 | 0.55 | 0.46897 | 0.723 | 36.8 ± 0.1 |
| 980 | 14 | 5.2e-14 | 7.2483 | 0.0e+0 | 1.6984 | 0.0073 | 0.29 | 0.70017 | 0.704 | 36.7 ± 0.1 |
| 1040 | 14 | 5.0e-14 | 8.7807 | 2.7e-4 | 2.3568 | 0.0132 | 0.21 | 0.88318 | 0.557 | 35.1 ± 0.1 |
| 1120 | 14 | 1.0e-13 | 27.8450 | 2.8e-3 | 10.9813 | 0.0786 | 0.045 | 1.00000 | 0.166 | 33.1 ± 0.4 |

Total fusion age, TFA= 35.78 ± 0.10 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 36.43 ± 0.09 Ma (including J). MSWD=6.0, so error expanded to ± 0.22 Ma

Inverse isochron age =37.09 ± 1.06 Ma. (MSWD =5.57; 40Ar/36Ar=283.1 ± 20.0)

Steps used: 600, 650, 700, 750, 800, 860, 920, 980, (1–8/10 or 70% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 36.4 ± 0.5 Ma**

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**Sample: SB69-206, 207 84714 plg J=0.0041091 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 3.5e-14 | 11.6697 | 0.0e+0 | 12.2778 | 0.0258 | 0.040 | 0.15802 | 0.347 | 29.8 ± 0.4 |
| 900 | 14 | 1.7e-14 | 10.4655 | 0.0e+0 | 7.8401 | 0.0228 | 0.062 | 0.24167 | 0.357 | 27.5 ± 0.5 |
| 980 | 14 | 8.6e-15 | 7.2967 | 6.2e-4 | 6.1690 | 0.0118 | 0.079 | 0.30387 | 0.523 | 28.1 ± 0.5 |
| 1060 | 14 | 1.3e-14 | 11.6619 | 1.3e-3 | 6.6836 | 0.0244 | 0.073 | 0.36172 | 0.381 | 32.6 ± 0.5 |
| 1180 | 14 | 1.4e-13 | 26.1044 | 6.0e-4 | 5.8199 | 0.0705 | 0.084 | 0.63376 | 0.202 | 38.7 ± 0.4 |
| 1300 | 14 | 1.0e-13 | 29.8912 | 5.0e-4 | 8.8212 | 0.0831 | 0.056 | 0.81617 | 0.179 | 39.2 ± 0.5 |
| 1450 | 14 | 1.5e-13 | 42.2252 | 1.8e-3 | 20.6773 | 0.1239 | 0.024 | 1.00000 | 0.133 | 41.2 ± 0.7 |

Total fusion age, TFA= 35.90 ± 0.21 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 38.87 ± 0.29 Ma (including J). MSWD=0.6 (<1), so error not expanded.

Inverse isochron age =35.80 ± 3.31 Ma. (MSWD =0.00; 40Ar/36Ar=301.1 ± 0.0)

Steps used: 1180, 1300, (5–6/7 or 45% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age 39 ± 1 Ma**

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**Sample: SB69-85 P84722 bio J=0.0038874 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 1.3e-15 | 15.5258 | 1.3e-2 | 6.1650 | 0.0409 | 0.079 | 0.00107 | 0.222 | 24.0 ± 4.9 |
| 680 | 14 | 3.3e-15 | 10.9538 | 4.1e-3 | 1.8717 | 0.0264 | 0.26 | 0.00505 | 0.287 | 21.9 ± 1.3 |
| 750 | 14 | 7.6e-15 | 5.5347 | 8.5e-4 | 0.0946 | 0.0070 | 5.2 | 0.02312 | 0.628 | 24.2 ± 0.3 |
| 810 | 14 | 1.4e-14 | 4.0176 | 3.9e-4 | 0.0387 | 0.0018 | 13 | 0.06893 | 0.870 | 24.3 ± 0.1 |
| 860 | 14 | 1.5e-14 | 3.7808 | 3.5e-4 | 0.0314 | 0.0011 | 16 | 0.12215 | 0.917 | 24.2 ± 0.1 |
| 910 | 14 | 1.3e-14 | 3.7128 | 5.3e-4 | 0.0362 | 0.0009 | 14 | 0.16857 | 0.927 | 24.0 ± 0.1 |
| 960 | 14 | 2.0e-14 | 3.8509 | 6.1e-5 | 0.0388 | 0.0014 | 13 | 0.23557 | 0.894 | 24.0 ± 0.1 |
| 1000 | 14 | 2.5e-14 | 3.7591 | 2.3e-4 | 0.1397 | 0.0011 | 3.5 | 0.32231 | 0.916 | 24.0 ± 0.1 |
| 1040 | 14 | 3.3e-14 | 3.7628 | 2.0e-3 | 1.1981 | 0.0011 | 0.41 | 0.43650 | 0.912 | 23.9 ± 0.1 |
| 1080 | 14 | 9.0e-14 | 3.5377 | 5.2e-4 | 0.2105 | 0.0004 | 2.3 | 0.77099 | 0.968 | 23.9 ± 0.1 |
| 1120 | 14 | 3.4e-14 | 3.6080 | 3.0e-4 | 0.0348 | 0.0006 | 14 | 0.89591 | 0.948 | 23.8 ± 0.1 |
| 1170 | 14 | 2.6e-14 | 3.5992 | 1.3e-4 | 0.0728 | 0.0005 | 6.7 | 0.99119 | 0.958 | 24.0 ± 0.1 |
| 1250 | 14 | 2.9e-15 | 4.2452 | 1.6e-3 | 1.7621 | 0.0027 | 0.28 | 1.00000 | 0.813 | 24.1 ± 0.5 |

Total fusion age, TFA= 23.94 ± 0.05 Ma (including J)

Weighted mean plateau age, WMPA= 23.89 ± 0.05 Ma (including J)

Inverse isochron age =23.83 ± 0.08 Ma. (MSWD =1.10; 40Ar/36Ar=310.4 ± 10.8)

Steps used: 910, 960, 1000, 1040, 1080, 1120, 1170, 1250, (6–13/13 or 88% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 23.89 ± 0.10 Ma**

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**Sample: SB69-215, 217 84722 plg J=0.0039870 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 3.3e-14 | 4.4816 | 0.0e+0 | 11.3687 | 0.0037 | 0.043 | 0.20507 | 0.753 | 24.1 ± 0.2 |
| 900 | 14 | 3.1e-14 | 3.8123 | 0.0e+0 | 12.6420 | 0.0015 | 0.039 | 0.43737 | 0.884 | 24.1 ± 0.2 |
| 980 | 14 | 2.7e-14 | 3.6085 | 0.0e+0 | 12.4257 | 0.0009 | 0.039 | 0.64613 | 0.923 | 23.8 ± 0.2 |
| 1080 | 14 | 2.5e-14 | 4.4299 | 0.0e+0 | 11.3331 | 0.0034 | 0.043 | 0.80688 | 0.772 | 24.4 ± 0.2 |
| 1200 | 14 | 3.3e-14 | 9.8188 | 0.0e+0 | 12.2779 | 0.0201 | 0.040 | 0.90293 | 0.394 | 27.6 ± 0.3 |
| 1400 | 14 | 3.6e-14 | 10.4714 | 0.0e+0 | 11.7353 | 0.0231 | 0.042 | 1.00000 | 0.347 | 26.0 ± 0.3 |

Total fusion age, TFA= 24.61 ± 0.10 Ma (including J)

Weighted mean plateau age, WMPA= 24.09 ± 0.10 Ma (including J)

Inverse isochron age =23.77 ± 0.23 Ma. (MSWD =0.92; 40Ar/36Ar=316.1 ± 12.2)

Steps used: 800, 900, 980, 1080, (1–4/6 or 81% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age 24.09 ± 0.20 Ma**

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**Sample: SB69-87 P84722 hbl J=0.0038709 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 3.7e-15 | 9.7051 | 1.3e-3 | 0.8988 | 0.0207 | 0.55 | 0.01161 | 0.371 | 25.0 ± 1.2 |
| 880 | 14 | 2.5e-15 | 6.4409 | 0.0e+0 | 0.8016 | 0.0095 | 0.61 | 0.02311 | 0.565 | 25.2 ± 1.0 |
| 950 | 14 | 3.0e-15 | 6.2617 | 1.3e-3 | 1.3949 | 0.0089 | 0.35 | 0.03757 | 0.581 | 25.2 ± 0.9 |
| 1000 | 14 | 1.2e-14 | 6.6581 | 8.7e-3 | 5.7198 | 0.0110 | 0.086 | 0.09415 | 0.512 | 23.7 ± 0.3 |
| 1030 | 14 | 6.5e-14 | 4.9894 | 1.3e-2 | 8.7295 | 0.0052 | 0.056 | 0.48949 | 0.691 | 23.9 ± 0.1 |
| 1060 | 14 | 3.2e-14 | 4.1402 | 1.2e-2 | 7.7422 | 0.0022 | 0.063 | 0.72140 | 0.840 | 24.1 ± 0.1 |
| 1090 | 14 | 8.2e-15 | 4.5054 | 1.1e-2 | 6.9605 | 0.0033 | 0.070 | 0.77609 | 0.784 | 24.5 ± 0.3 |
| 1120 | 14 | 1.1e-14 | 4.6120 | 1.4e-2 | 8.1942 | 0.0038 | 0.060 | 0.84953 | 0.757 | 24.2 ± 0.2 |
| 1150 | 14 | 1.3e-14 | 4.5322 | 1.5e-2 | 8.5308 | 0.0033 | 0.057 | 0.93365 | 0.782 | 24.6 ± 0.2 |
| 1180 | 14 | 6.2e-15 | 4.6284 | 1.4e-2 | 8.4627 | 0.0040 | 0.058 | 0.97393 | 0.746 | 23.9 ± 0.3 |
| 1220 | 14 | 2.8e-15 | 4.8762 | 1.0e-2 | 8.4597 | 0.0047 | 0.058 | 0.99101 | 0.718 | 24.3 ± 0.7 |
| 1320 | 14 | 1.6e-15 | 5.3695 | 1.3e-2 | 9.1243 | 0.0065 | 0.054 | 1.00000 | 0.641 | 23.9 ± 1.3 |

Total fusion age, TFA= 24.10 ± 0.07 Ma (including J)

Weighted mean plateau age, WMPA= 24.05 ± 0.07 Ma (including J)

Inverse isochron age =24.23 ± 0.17 Ma. (MSWD =1.71; 40Ar/36Ar=290.3 ± 5.2)

Steps used: 800, 880, 950, 1000, 1030, 1060, 1090, 1120, 1150, 1180, 1220, 1320, (1–12/12 or 100% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 24.05 ± 0.14 Ma**

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**Sample: SB69-53 P84733 gm J=0.0041844 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 1.8e-15 | 3.8959 | 0.0e+0 | 15.3503 | 0.0097 | 0.032 | 0.09945 | 0.261 | 7.7 ± 1.0 |
| 650 | 14 | 1.8e-15 | 2.8495 | 0.0e+0 | 24.8309 | 0.0050 | 0.020 | 0.23587 | 0.485 | 10.4 ± 0.8 |
| 700 | 14 | 2.0e-15 | 2.9279 | 0.0e+0 | 39.7373 | 0.0026 | 0.012 | 0.38870 | 0.735 | 16.2 ± 0.7 |
| 750 | 14 | 2.1e-15 | 3.2141 | 0.0e+0 | 58.1360 | 0.0031 | 0.008 | 0.53796 | 0.711 | 17.2 ± 0.8 |
| 800 | 14 | 2.0e-15 | 3.3403 | 0.0e+0 | 77.7609 | 0.0028 | 0.006 | 0.67354 | 0.754 | 18.9 ± 0.9 |
| 860 | 14 | 1.8e-15 | 3.3717 | 0.0e+0 | 70.0032 | 0.0032 | 0.007 | 0.79449 | 0.720 | 18.2 ± 1.0 |
| 920 | 14 | 1.2e-15 | 3.7481 | 0.0e+0 | 42.8198 | 0.0075 | 0.011 | 0.86572 | 0.405 | 11.4 ± 1.6 |
| 980 | 14 | 7.9e-16 | 4.5327 | 2.1e-3 | 28.5104 | 0.0109 | 0.017 | 0.90432 | 0.292 | 10.0 ± 2.5 |
| 1040 | 14 | 7.0e-16 | 4.7322 | 0.0e+0 | 28.9408 | 0.0105 | 0.017 | 0.93696 | 0.345 | 12.3 ± 3.2 |
| 1120 | 14 | 8.3e-16 | 3.0100 | 4.7e-3 | 82.1828 | 0.0078 | 0.006 | 1.00000 | 0.232 | 5.3 ± 1.8 |

Total fusion age, TFA= 13.92 ± 0.35 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 18.60 ± 0.66 Ma (including J). MSWD=0.27 (<1), so error not expanded.

Inverse isochron age =23.45 ± 2.90 Ma. (MSWD =0.00; 40Ar/36Ar=76.9 ± 0.0)

Steps used: 800, 860, (5–6/10 or 26% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.







**Sample: SB69-31 P84740 gm J=0.0039946 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 9.1e-15 | 5.6023 | 0.0e+0 | 3.7824 | 0.0071 | 0.13 | 0.03239 | 0.623 | 25.0 ± 0.3 |
| 650 | 14 | 1.6e-14 | 4.5339 | 0.0e+0 | 3.8441 | 0.0033 | 0.13 | 0.10324 | 0.785 | 25.5 ± 0.1 |
| 700 | 14 | 2.3e-14 | 3.9433 | 0.0e+0 | 3.2250 | 0.0013 | 0.15 | 0.21834 | 0.904 | 25.5 ± 0.1 |
| 750 | 14 | 2.4e-14 | 3.6995 | 0.0e+0 | 2.2002 | 0.0006 | 0.22 | 0.34708 | 0.952 | 25.2 ± 0.1 |
| 800 | 14 | 2.5e-14 | 3.5677 | 0.0e+0 | 1.6223 | 0.0004 | 0.30 | 0.48781 | 0.971 | 24.8 ± 0.1 |
| 860 | 14 | 2.7e-14 | 3.4249 | 0.0e+0 | 1.4270 | 0.0002 | 0.34 | 0.64596 | 0.980 | 24.0 ± 0.1 |
| 920 | 14 | 1.9e-14 | 3.4029 | 0.0e+0 | 1.5888 | 0.0003 | 0.31 | 0.75992 | 0.974 | 23.7 ± 0.1 |
| 980 | 14 | 1.4e-14 | 3.4311 | 0.0e+0 | 1.7637 | 0.0005 | 0.28 | 0.83901 | 0.953 | 23.4 ± 0.1 |
| 1040 | 14 | 1.7e-14 | 3.5991 | 0.0e+0 | 1.2972 | 0.0011 | 0.38 | 0.93151 | 0.907 | 23.4 ± 0.1 |
| 1120 | 14 | 1.4e-14 | 3.9815 | 0.0e+0 | 1.8460 | 0.0025 | 0.27 | 1.00000 | 0.817 | 23.3 ± 0.1 |

Total fusion age, TFA= 24.40 ± 0.06 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 23.50 ± 0.07 Ma (including J). MSWD=3.0, so error expanded to ± 0.12 Ma

Inverse isochron age =23.65 ± 0.13 Ma. (MSWD =2.73; 40Ar/36Ar=271.2 ± 14.8)

Steps used: 920, 980, 1040, 1120, (7–10/10 or 35% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred age = 23.5 ± 0.3 Ma**







**Sample: SB69-35 P84744 gm J=0.0038944**

**Sample: SB69-35 P84744 gm J=0.0039543 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 1.6e-14 | 6.0219 | 0.0e+0 | 1.3508 | 0.0099 | 0.36 | 0.01702 | 0.513 | 21.9 ± 0.2 |
| 650 | 14 | 3.7e-14 | 6.5506 | 0.0e+0 | 1.4156 | 0.0114 | 0.35 | 0.05397 | 0.487 | 22.6 ± 0.1 |
| 700 | 14 | 4.9e-14 | 4.9730 | 0.0e+0 | 1.3057 | 0.0058 | 0.38 | 0.11875 | 0.653 | 23.0 ± 0.1 |
| 750 | 14 | 5.5e-14 | 3.8260 | 0.0e+0 | 1.0037 | 0.0020 | 0.49 | 0.21165 | 0.848 | 23.0 ± 0.1 |
| 800 | 14 | 6.6e-14 | 3.5768 | 0.0e+0 | 0.6322 | 0.0011 | 0.78 | 0.33189 | 0.909 | 23.1 ± 0.1 |
| 860 | 14 | 8.5e-14 | 3.6105 | 0.0e+0 | 0.4806 | 0.0012 | 1.0 | 0.48482 | 0.902 | 23.1 ± 0.1 |
| 920 | 14 | 9.0e-14 | 3.7274 | 0.0e+0 | 0.3812 | 0.0016 | 1.3 | 0.64255 | 0.877 | 23.2 ± 0.1 |
| 980 | 14 | 9.8e-14 | 4.0981 | 0.0e+0 | 0.3584 | 0.0028 | 1.4 | 0.79865 | 0.796 | 23.1 ± 0.1 |
| 1040 | 14 | 9.8e-14 | 4.7513 | 0.0e+0 | 0.4385 | 0.0051 | 1.1 | 0.93241 | 0.681 | 22.9 ± 0.1 |
| 1120 | 14 | 5.4e-14 | 5.2361 | 0.0e+0 | 0.7242 | 0.0066 | 0.68 | 1.00000 | 0.625 | 23.2 ± 0.1 |

Total fusion age, TFA= 23.04 ± 0.05 Ma (including J)

Weighted mean plateau age, WMPA= 23.10 ± 0.05 Ma (including J)

Inverse isochron age =23.11 ± 0.07 Ma. (MSWD =1.75; 40Ar/36Ar=294.0 ± 3.2)

Steps used: 700, 750, 800, 860, 920, 980, (3–8/10 or 74% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 23.1 ± 0.1 Ma**







**Sample: SB69-78 P84749 gm J=0.0039828 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 2.6e-15 | 5.2989 | 5.1e-4 | 10.6309 | 0.0107 | 0.046 | 0.08999 | 0.402 | 15.2 ± 0.8 |
| 650 | 14 | 3.2e-15 | 4.1377 | 5.1e-4 | 14.1909 | 0.0063 | 0.035 | 0.22997 | 0.547 | 16.2 ± 0.6 |
| 700 | 14 | 3.6e-15 | 4.0901 | 9.0e-4 | 19.9669 | 0.0048 | 0.025 | 0.39055 | 0.656 | 19.2 ± 0.5 |
| 750 | 14 | 3.4e-15 | 4.2862 | 0.0e+0 | 24.8664 | 0.0052 | 0.020 | 0.53670 | 0.644 | 19.7 ± 0.6 |
| 800 | 14 | 3.0e-15 | 4.5269 | 3.9e-3 | 26.7218 | 0.0059 | 0.018 | 0.65765 | 0.617 | 19.9 ± 0.7 |
| 860 | 14 | 2.4e-15 | 4.8617 | 5.1e-3 | 27.1637 | 0.0087 | 0.018 | 0.75053 | 0.472 | 16.4 ± 0.9 |
| 920 | 14 | 1.6e-15 | 5.5157 | 6.3e-3 | 26.3906 | 0.0106 | 0.019 | 0.80259 | 0.432 | 17.0 ± 1.4 |
| 980 | 14 | 1.2e-15 | 5.8117 | 1.1e-2 | 27.2661 | 0.0128 | 0.018 | 0.84146 | 0.347 | 14.4 ± 2.0 |
| 1040 | 14 | 1.3e-15 | 6.6671 | 1.1e-2 | 40.0652 | 0.0176 | 0.012 | 0.87851 | 0.222 | 10.6 ± 2.2 |
| 1120 | 14 | 4.5e-15 | 7.2348 | 5.7e-3 | 107.9127 | 0.0169 | 0.005 | 1.00000 | 0.310 | 16.0 ± 0.9 |

Total fusion age, TFA= 17.33 ± 0.27 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 19.83 ± 0.45 Ma (including J). MSWD=0.05 (<1), so error not expanded.

Inverse isochron age =18.25 ± 8.16 Ma. (MSWD =0.00; 40Ar/36Ar=336.0 ± 0.0)

Steps used: 750, 800, (4–5/10 or 27% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 19.8 ± 0.9 Ma**







**Sample: SB69-208, 210 84749 plg J=0.0040897 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 4.4e-15 | 5.1988 | 0.0e+0 | 252.0947 | 0.0070 | 0.002 | 0.23855 | 0.600 | 22.9 ± 1.5 |
| 900 | 14 | 4.3e-15 | 4.4302 | 0.0e+0 | 229.0453 | 0.0047 | 0.002 | 0.51271 | 0.687 | 22.3 ± 1.4 |
| 980 | 14 | 3.7e-15 | 4.6056 | 0.0e+0 | 195.5165 | 0.0049 | 0.003 | 0.73219 | 0.683 | 23.1 ± 1.4 |
| 1060 | 14 | 2.5e-15 | 5.6016 | 0.0e+0 | 171.4694 | 0.0077 | 0.003 | 0.85291 | 0.591 | 24.3 ± 2.4 |
| 1180 | 14 | 3.2e-15 | 16.3038 | 0.0e+0 | 171.8642 | 0.0271 | 0.003 | 0.90599 | 0.509 | 60.2 ± 3.2 |
| 1300 | 14 | 3.2e-15 | 24.7101 | 5.2e-3 | 248.3956 | 0.0552 | 0.002 | 0.94233 | 0.340 | 61.0 ± 5.1 |
| 1450 | 14 | 3.7e-15 | 17.5316 | 0.0e+0 | 168.5648 | 0.0325 | 0.003 | 1.00000 | 0.452 | 57.5 ± 3.7 |

Total fusion age, TFA= 28.34 ± 0.75 Ma (including J)

Weighted mean plateau age, WMPA= 22.91 ± 0.77 Ma (including J)

Inverse isochron age =20.69 ± 6.29 Ma. (MSWD =0.06; 40Ar/36Ar=350.0 ± 35.7)

Steps used: 800, 900, 980, 1060, (1–4/7 or 85% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 22.9 ± 1.5 Ma**

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**Sample: SB69-38 P84754 gm J=0.0039182 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 4.0e-15 | 6.7178 | 7.1e-4 | 10.4157 | 0.0125 | 0.047 | 0.12623 | 0.449 | 21.2 ± 0.7 |
| 650 | 14 | 4.4e-15 | 4.6286 | 0.0e+0 | 13.3999 | 0.0058 | 0.037 | 0.32604 | 0.627 | 20.4 ± 0.5 |
| 700 | 14 | 3.6e-15 | 4.1004 | 1.1e-3 | 19.5045 | 0.0030 | 0.025 | 0.51358 | 0.784 | 22.6 ± 0.5 |
| 750 | 14 | 2.6e-15 | 4.1918 | 5.8e-4 | 25.3514 | 0.0029 | 0.019 | 0.64576 | 0.798 | 23.5 ± 0.7 |
| 800 | 14 | 2.1e-15 | 4.3230 | 2.5e-3 | 25.1637 | 0.0046 | 0.019 | 0.75027 | 0.686 | 20.9 ± 0.8 |
| 860 | 14 | 1.6e-15 | 4.1292 | 3.0e-3 | 25.2707 | 0.0057 | 0.019 | 0.83281 | 0.593 | 17.2 ± 1.0 |
| 920 | 14 | 1.1e-15 | 4.4286 | 8.6e-3 | 22.0137 | 0.0081 | 0.022 | 0.88472 | 0.462 | 14.4 ± 1.6 |
| 980 | 14 | 8.6e-16 | 4.7987 | 1.5e-2 | 18.7688 | 0.0110 | 0.026 | 0.92234 | 0.322 | 10.9 ± 2.0 |
| 1040 | 14 | 7.6e-16 | 5.9250 | 1.7e-2 | 24.5947 | 0.0164 | 0.020 | 0.94939 | 0.183 | 7.6 ± 2.9 |
| 1120 | 14 | 1.2e-15 | 5.3446 | 9.4e-3 | 99.8674 | 0.0144 | 0.005 | 1.00000 | 0.205 | 7.7 ± 1.8 |

Total fusion age, TFA= 19.46 ± 0.27 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 21.69 ± 0.25 Ma (including J). MSWD=4.5, so error expanded to ± 0.53 Ma

Inverse isochron age =22.44 ± 1.12 Ma. (MSWD =5.71; 40Ar/36Ar=274.9 ± 26.9)

Steps used: 600, 650, 700, 750, 800, (1–5/10 or 75% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 21.7 ± 1.1 Ma**







**Sample: SB69-219 84754 plg J=0.0039965 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 4.1e-15 | 5.0536 | 0.0e+0 | 133.0098 | 0.0064 | 0.004 | 0.37507 | 0.624 | 22.6 ± 1.6 |
| 920 | 14 | 2.7e-15 | 3.9460 | 0.0e+0 | 151.9299 | 0.0022 | 0.003 | 0.69799 | 0.833 | 23.6 ± 1.7 |
| 1060 | 14 | 2.2e-15 | 4.2736 | 0.0e+0 | 147.9483 | 0.0039 | 0.003 | 0.93686 | 0.732 | 22.4 ± 1.8 |
| 1350 | 14 | 1.6e-15 | 11.9529 | 0.0e+0 | 131.1904 | 0.0308 | 0.004 | 1.00000 | 0.238 | 20.4 ± 4.5 |

Total fusion age, TFA= 22.72 ± 0.97 Ma (including J)

Weighted mean plateau age, WMPA= 22.75 ± 0.96 Ma (including J)

Inverse isochron age =23.27 ± 1.51 Ma. (MSWD =0.06; 40Ar/36Ar=281.9 ± 6.0)

Steps used: 800, 920, 1060, 1350, (1–4/4 or 100% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 22.8 ± 1.9 Ma**

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**le: SB69-80 P84761 gm J=0.0039532 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| T | t | 40(mol) | 40/39 | 38/39 | 37/39 | 36/39 | K/Ca | ∑ 39Ar | 40Ar\* | Age (Ma) |
| 600 | 14 | 1.5e-14 | 7.7182 | 5.0e-3 | 4.8166 | 0.0152 | 0.10 | 0.20949 | 0.420 | 23.0 ± 0.3 |
| 650 | 14 | 1.2e-14 | 7.1205 | 3.7e-3 | 10.6987 | 0.0132 | 0.046 | 0.38292 | 0.454 | 22.9 ± 0.4 |
| 700 | 14 | 1.0e-14 | 6.9296 | 1.9e-3 | 16.9150 | 0.0122 | 0.029 | 0.53728 | 0.481 | 23.6 ± 0.4 |
| 750 | 14 | 9.0e-15 | 7.6970 | 2.1e-3 | 20.1879 | 0.0150 | 0.024 | 0.66323 | 0.424 | 23.1 ± 0.5 |
| 800 | 14 | 9.5e-15 | 10.4067 | 2.3e-3 | 21.3332 | 0.0246 | 0.023 | 0.76190 | 0.301 | 22.2 ± 0.6 |
| 860 | 14 | 1.0e-14 | 13.6523 | 3.4e-3 | 20.6656 | 0.0347 | 0.024 | 0.84396 | 0.248 | 24.0 ± 0.7 |
| 920 | 14 | 6.2e-15 | 13.5256 | 1.0e-2 | 20.4382 | 0.0344 | 0.024 | 0.89337 | 0.248 | 23.7 ± 1.1 |
| 980 | 14 | 3.8e-15 | 12.2886 | 7.9e-3 | 20.3200 | 0.0329 | 0.024 | 0.92649 | 0.210 | 18.3 ± 1.4 |
| 1040 | 14 | 3.8e-15 | 12.0631 | 9.4e-3 | 24.7206 | 0.0332 | 0.020 | 0.96031 | 0.187 | 16.0 ± 1.5 |
| 1120 | 14 | 6.3e-15 | 17.6527 | 8.6e-3 | 80.6518 | 0.0510 | 0.006 | 1.00000 | 0.146 | 18.3 ± 1.6 |

Total fusion age, TFA= 22.54 ± 0.19 Ma (including J)

Weighted mean plateau age, WMPA= 23.09 ± 0.17 Ma (including J)

Inverse isochron age =22.88 ± 0.53 Ma. (MSWD =1.18; 40Ar/36Ar=297.3 ± 4.3)

Steps used: 600, 650, 700, 750, 800, 860, 920, (1–7/10 or 89% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 23.09 ± 0.34 Ma**

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**Sample: SB69-211, 212 84761 plg J=0.0040685 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 1.2e-14 | 5.1829 | 0.0e+0 | 138.9058 | 0.0064 | 0.004 | 0.43805 | 0.635 | 24.0 ± 0.8 |
| 900 | 14 | 6.8e-15 | 5.9622 | 0.0e+0 | 130.4218 | 0.0089 | 0.004 | 0.65940 | 0.558 | 24.3 ± 1.0 |
| 980 | 14 | 2.9e-15 | 8.4432 | 8.1e-4 | 104.7006 | 0.0191 | 0.005 | 0.72555 | 0.333 | 20.5 ± 2.3 |
| 1060 | 14 | 6.5e-15 | 25.6309 | 2.5e-3 | 67.4654 | 0.0789 | 0.007 | 0.77280 | 0.090 | 16.8 ± 2.7 |
| 1180 | 14 | 1.5e-14 | 38.5162 | 2.9e-3 | 84.8723 | 0.1213 | 0.006 | 0.84562 | 0.069 | 19.5 ± 2.4 |
| 1300 | 14 | 5.9e-15 | 25.8307 | 2.3e-4 | 121.4547 | 0.0771 | 0.004 | 0.88981 | 0.118 | 22.2 ± 3.1 |
| 1450 | 14 | 2.1e-14 | 35.6277 | 2.5e-3 | 91.2119 | 0.1096 | 0.005 | 1.00000 | 0.091 | 23.7 ± 1.9 |

Total fusion age, TFA= 23.03 ± 0.55 Ma (including J)

Weighted mean plateau age, WMPA= 24.09 ± 0.62 Ma (including J)

Inverse isochron age =23.26 ± 5.55 Ma. (MSWD =0.00; 40Ar/36Ar=311.0 ± 0.0)

Steps used: 800, 900, (1–2/7 or 66% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 24.1 ± 1.2 Ma**

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**Sample: SB69-55 P84771 gm J=0.0041756 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 6.1e-15 | 4.7661 | 0.0e+0 | 3.3419 | 0.0070 | 0.15 | 0.12886 | 0.564 | 20.1 ± 0.4 |
| 650 | 14 | 7.0e-15 | 3.6566 | 1.9e-5 | 4.6635 | 0.0031 | 0.11 | 0.31997 | 0.750 | 20.5 ± 0.2 |
| 700 | 14 | 6.3e-15 | 3.3475 | 1.0e-4 | 8.0224 | 0.0014 | 0.061 | 0.51002 | 0.876 | 21.9 ± 0.3 |
| 750 | 14 | 5.1e-15 | 3.2973 | 1.9e-3 | 13.6153 | 0.0010 | 0.036 | 0.66508 | 0.913 | 22.5 ± 0.3 |
| 800 | 14 | 3.5e-15 | 3.3060 | 3.9e-3 | 14.0430 | 0.0011 | 0.035 | 0.77270 | 0.904 | 22.4 ± 0.5 |
| 860 | 14 | 2.3e-15 | 3.1772 | 8.8e-3 | 10.8359 | 0.0020 | 0.045 | 0.84423 | 0.810 | 19.3 ± 0.6 |
| 920 | 14 | 1.5e-15 | 3.1035 | 1.2e-2 | 9.2497 | 0.0037 | 0.053 | 0.89117 | 0.650 | 15.1 ± 1.0 |
| 980 | 14 | 1.2e-15 | 3.5550 | 1.6e-2 | 10.8524 | 0.0048 | 0.045 | 0.92489 | 0.598 | 15.9 ± 1.3 |
| 1040 | 14 | 1.2e-15 | 3.7790 | 1.4e-2 | 17.6594 | 0.0079 | 0.028 | 0.95785 | 0.382 | 10.8 ± 1.4 |
| 1120 | 14 | 1.6e-15 | 3.9140 | 1.4e-2 | 95.2009 | 0.0098 | 0.005 | 1.00000 | 0.258 | 7.6 ± 1.3 |

Total fusion age, TFA= 19.90 ± 0.16 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 22.48 ± 0.26 Ma (including J). MSWD<1, so error not expanded.

Inverse isochron age =24.10 ± 1.53 Ma. (MSWD =0.00; 40Ar/36Ar=78.4 ± 0.0)

Steps used: 750, 800, (4–5/10 or 26% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 22.5 ± 0.5 Ma**







**Sample: SB69-42 P84775 gm J=0.0038767 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 2.3e-14 | 29.8120 | 2.2e-4 | 7.1752 | 0.0898 | 0.068 | 0.09878 | 0.110 | 22.8 ± 1.0 |
| 650 | 14 | 2.2e-14 | 17.6983 | 1.1e-3 | 12.6297 | 0.0485 | 0.039 | 0.25698 | 0.190 | 23.4 ± 0.7 |
| 700 | 14 | 1.2e-14 | 8.7583 | 0.0e+0 | 20.7383 | 0.0183 | 0.024 | 0.43948 | 0.384 | 23.4 ± 0.4 |
| 750 | 14 | 6.9e-15 | 5.8299 | 6.8e-4 | 21.4591 | 0.0087 | 0.023 | 0.59201 | 0.560 | 22.7 ± 0.4 |
| 800 | 14 | 1.2e-14 | 12.1742 | 0.0e+0 | 17.1867 | 0.0298 | 0.029 | 0.71665 | 0.277 | 23.5 ± 0.6 |
| 860 | 14 | 4.8e-15 | 6.2830 | 1.4e-4 | 18.3957 | 0.0107 | 0.027 | 0.81512 | 0.497 | 21.7 ± 0.6 |
| 920 | 14 | 2.4e-15 | 4.9100 | 1.6e-3 | 16.4914 | 0.0064 | 0.030 | 0.87883 | 0.618 | 21.1 ± 0.8 |
| 980 | 14 | 1.8e-15 | 5.1176 | 3.2e-3 | 13.1758 | 0.0086 | 0.037 | 0.92289 | 0.505 | 18.0 ± 1.2 |
| 1040 | 14 | 2.0e-15 | 5.2130 | 4.2e-3 | 12.4588 | 0.0081 | 0.039 | 0.97299 | 0.542 | 19.6 ± 1.1 |
| 1120 | 14 | 1.7e-15 | 8.3999 | 0.0e+0 | 56.3515 | 0.0183 | 0.009 | 1.00000 | 0.355 | 20.7 ± 2.0 |

Total fusion age, TFA= 22.43 ± 0.24 Ma (including J)

Weighted mean plateau age, WMPA= 23.15 ± 0.25 Ma (including J)

Inverse isochron age =23.07 ± 0.40 Ma. (MSWD =0.56; 40Ar/36Ar=296.0 ± 1.2)

Steps used: 600, 650, 700, 750, 800, (1–5/10 or 72% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 23.15 ± 0.50 Ma**







**Sample: SB69-59 P84781 gm J=0.0041581 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 4.3e-15 | 4.0553 | 1.0e-4 | 11.9898 | 0.0057 | 0.041 | 0.06436 | 0.582 | 17.6 ± 0.4 |
| 650 | 14 | 5.3e-15 | 3.3597 | 0.0e+0 | 12.0103 | 0.0026 | 0.041 | 0.16079 | 0.772 | 19.4 ± 0.3 |
| 700 | 14 | 6.6e-15 | 3.2720 | 0.0e+0 | 12.4298 | 0.0017 | 0.039 | 0.28406 | 0.845 | 20.6 ± 0.2 |
| 750 | 14 | 6.3e-15 | 3.6021 | 1.4e-3 | 14.0159 | 0.0024 | 0.035 | 0.39082 | 0.802 | 21.5 ± 0.3 |
| 800 | 14 | 4.7e-15 | 4.7609 | 5.6e-3 | 15.5056 | 0.0071 | 0.032 | 0.45070 | 0.561 | 19.9 ± 0.5 |
| 860 | 14 | 9.3e-15 | 7.3746 | 9.7e-3 | 23.7573 | 0.0206 | 0.021 | 0.52797 | 0.173 | 9.5 ± 0.5 |
| 920 | 14 | 2.1e-14 | 6.0909 | 6.2e-3 | 31.8318 | 0.0168 | 0.015 | 0.74483 | 0.184 | 8.4 ± 0.3 |
| 980 | 14 | 2.0e-14 | 6.9265 | 4.3e-3 | 37.3520 | 0.0186 | 0.013 | 0.92274 | 0.208 | 10.8 ± 0.3 |
| 1040 | 14 | 6.1e-15 | 7.9943 | 4.8e-3 | 42.6139 | 0.0225 | 0.011 | 0.96988 | 0.169 | 10.1 ± 0.8 |
| 1120 | 14 | 4.4e-15 | 9.1558 | 4.0e-3 | 49.7613 | 0.0260 | 0.010 | 1.00000 | 0.162 | 11.1 ± 1.3 |

Total fusion age, TFA= 14.33 ± 0.12 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 20.86 ± 0.17 Ma (including J). MSWD=4.8, so error expanded to ± 0.37 Ma.

Inverse isochron age =21.15 ± 0.90 Ma. (MSWD =8.41; 40Ar/36Ar=280.1 ± 39.6)

Steps used: 700, 750, 800, (3–5/10 or 29% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 21 ± 1 Ma**







**Sample: SB69-220, 221 84785 plg J=0.0039670 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 9.8e-15 | 3.6973 | 3.4e-2 | 158.6645 | 0.0016 | 0.003 | 0.70864 | 0.874 | 22.9 ± 0.7 |
| 900 | 14 | 3.0e-15 | 4.3653 | 0.0e+0 | 148.5785 | 0.0043 | 0.003 | 0.88942 | 0.707 | 21.9 ± 1.5 |
| 980 | 14 | 1.3e-15 | 7.1218 | 0.0e+0 | 120.9122 | 0.0143 | 0.004 | 0.93702 | 0.408 | 20.7 ± 3.4 |
| 1070 | 14 | 9.9e-16 | 9.7810 | 0.0e+0 | 117.1831 | 0.0241 | 0.004 | 0.96345 | 0.272 | 18.9 ± 4.8 |
| 1200 | 14 | 1.0e-15 | 20.3590 | 0.0e+0 | 116.6134 | 0.0643 | 0.004 | 0.97662 | 0.067 | 9.8 ± 9.0 |
| 1320 | 14 | 6.7e-16 | 20.8384 | 0.0e+0 | 161.5347 | 0.0699 | 0.003 | 0.98531 | 0.009 | 1.4 ± 13.8 |
| 1460 | 14 | 1.0e-15 | 19.0360 | 1.3e-2 | 164.2437 | 0.0515 | 0.003 | 1.00000 | 0.200 | 27.0 ± 8.2 |

Total fusion age, TFA= 22.20 ± 0.66 Ma (including J)

Weighted mean plateau age, WMPA= 22.69 ± 0.67 Ma (including J)

Inverse isochron age =23.43 ± 1.84 Ma. (MSWD =0.00; 40Ar/36Ar=246.8 ± 0.0)

Steps used: 800, 900, (1–2/7 or 89% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 22.7 ± 1.3 Ma**

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**Sample: SB69-82 P84792 gm J=0.0039227 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 8.8e-14 | 3.4315 | 0.0e+0 | 0.4587 | 0.0001 | 1.1 | 0.13770 | 0.988 | 23.8 ± 0.1 |
| 650 | 14 | 1.2e-13 | 3.5123 | 0.0e+0 | 0.5720 | 0.0001 | 0.86 | 0.31656 | 0.991 | 24.5 ± 0.1 |
| 700 | 14 | 1.3e-13 | 3.5814 | 0.0e+0 | 0.7582 | 0.0001 | 0.65 | 0.51019 | 0.990 | 24.9 ± 0.1 |
| 750 | 14 | 1.1e-13 | 3.5895 | 0.0e+0 | 0.9472 | 0.0001 | 0.52 | 0.67877 | 0.990 | 25.0 ± 0.1 |
| 800 | 14 | 7.8e-14 | 3.5768 | 0.0e+0 | 1.0611 | 0.0002 | 0.46 | 0.79672 | 0.985 | 24.8 ± 0.1 |
| 860 | 14 | 4.3e-14 | 3.4191 | 0.0e+0 | 1.0372 | 0.0003 | 0.47 | 0.86408 | 0.976 | 23.5 ± 0.1 |
| 920 | 14 | 2.3e-14 | 3.0534 | 0.0e+0 | 0.8002 | 0.0005 | 0.61 | 0.90530 | 0.948 | 20.4 ± 0.1 |
| 980 | 14 | 1.6e-14 | 2.9339 | 0.0e+0 | 0.6403 | 0.0006 | 0.77 | 0.93485 | 0.941 | 19.4 ± 0.1 |
| 1040 | 14 | 1.7e-14 | 2.7756 | 0.0e+0 | 0.7500 | 0.0007 | 0.65 | 0.96789 | 0.930 | 18.2 ± 0.1 |
| 1120 | 14 | 1.4e-14 | 2.3592 | 2.6e-3 | 3.1794 | 0.0010 | 0.15 | 1.00000 | 0.870 | 14.5 ± 0.1 |

Total fusion age, TFA= 23.67 ± 0.05 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 24.91 ± 0.05 Ma (including J). MSWD=0.33, so error not expanded.

Inverse isochron age =25.32 ± 0.12 Ma. (MSWD =0.76; 40Ar/36Ar=-145.3 ± 79.1)

Steps used: 700, 750, 800, (3–5/10 or 48% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 24.9 ± 0.2 Ma**

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**Sample: SB69-222 84792 plg J=0.0039471 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 4.7e-14 | 3.5128 | 0.0e+0 | 4.3408 | 0.0002 | 0.11 | 0.63421 | 0.983 | 24.4 ± 0.1 |
| 920 | 14 | 1.8e-14 | 3.5638 | 0.0e+0 | 9.3526 | 0.0005 | 0.052 | 0.86953 | 0.961 | 24.2 ± 0.2 |
| 1060 | 14 | 6.3e-15 | 3.6327 | 0.0e+0 | 10.9576 | 0.0021 | 0.045 | 0.95150 | 0.833 | 21.4 ± 0.4 |
| 1350 | 14 | 6.3e-15 | 6.1637 | 6.0e-5 | 16.2484 | 0.0104 | 0.030 | 1.00000 | 0.499 | 21.8 ± 0.7 |

Total fusion age, TFA= 24.00 ± 0.09 Ma (including J)

Weighted mean plateau age, WMPA= 24.39 ± 0.08 Ma (including J)

Inverse isochron age =24.56 ± 0.16 Ma. (MSWD =0.00; 40Ar/36Ar=194.3 ± 0.0)

Steps used: 800, 920, (1–2/4 or 87% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 24.4 ± 0.2 Ma**

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**Sample: SB69-61 P84798 gm J=0.0041432 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 2.7e-14 | 4.7509 | 0.0e+0 | 1.3131 | 0.0040 | 0.37 | 0.04963 | 0.749 | 26.4 ± 0.1 |
| 650 | 14 | 4.7e-14 | 3.7976 | 0.0e+0 | 1.3614 | 0.0011 | 0.36 | 0.15713 | 0.916 | 25.8 ± 0.1 |
| 700 | 14 | 6.7e-14 | 3.5023 | 0.0e+0 | 1.4166 | 0.0003 | 0.35 | 0.32261 | 0.971 | 25.2 ± 0.1 |
| 750 | 14 | 6.8e-14 | 3.4119 | 0.0e+0 | 1.1749 | 0.0002 | 0.42 | 0.49372 | 0.978 | 24.8 ± 0.1 |
| 800 | 14 | 5.7e-14 | 3.4226 | 0.0e+0 | 0.9490 | 0.0003 | 0.52 | 0.63717 | 0.978 | 24.8 ± 0.1 |
| 860 | 14 | 5.0e-14 | 3.4163 | 0.0e+0 | 0.9299 | 0.0003 | 0.53 | 0.76424 | 0.974 | 24.7 ± 0.1 |
| 920 | 14 | 3.4e-14 | 3.3813 | 0.0e+0 | 0.8107 | 0.0004 | 0.60 | 0.85188 | 0.964 | 24.2 ± 0.1 |
| 980 | 14 | 2.4e-14 | 3.3199 | 1.6e-4 | 0.7444 | 0.0005 | 0.66 | 0.91447 | 0.955 | 23.5 ± 0.1 |
| 1040 | 14 | 2.0e-14 | 3.2833 | 2.9e-4 | 0.9060 | 0.0007 | 0.54 | 0.96829 | 0.936 | 22.8 ± 0.1 |
| 1120 | 14 | 1.3e-14 | 3.4568 | 1.1e-3 | 4.1181 | 0.0015 | 0.12 | 1.00000 | 0.872 | 22.4 ± 0.1 |

Total fusion age, TFA= 24.74 ± 0.05 Ma (including J)

Weighted mean age (not statistical plateau), WMA = 24.78 ± 0.05 Ma (including J). MSWD<1, so error not expanded.

Inverse isochron age =25.34 ± 0.41 Ma. (MSWD =1.83; 40Ar/36Ar=12.7 ± 12.7)

Steps used: 750, 800, 860, (4–6/10 or 44% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 24.8 ± 0.2 Ma**







**Sample: SB69-94 BATHUS-777 bio J=0.0041936 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 7.7e-15 | 3.6023 | 0.0e+0 | 0.0333 | 0.0069 | 15 | 0.02299 | 0.433 | 11.8 ± 0.3 |
| 660 | 14 | 9.0e-15 | 3.9442 | 0.0e+0 | 0.0240 | 0.0050 | 20 | 0.04742 | 0.625 | 18.6 ± 0.3 |
| 720 | 14 | 1.2e-14 | 4.0850 | 0.0e+0 | 0.0175 | 0.0042 | 28 | 0.07993 | 0.697 | 21.4 ± 0.2 |
| 780 | 14 | 2.0e-14 | 4.1370 | 2.6e-4 | 0.0160 | 0.0032 | 31 | 0.13217 | 0.771 | 24.0 ± 0.1 |
| 840 | 14 | 3.1e-14 | 3.8456 | 0.0e+0 | 0.0100 | 0.0018 | 49 | 0.21810 | 0.864 | 25.0 ± 0.1 |
| 900 | 14 | 4.5e-14 | 3.5752 | 0.0e+0 | 0.0087 | 0.0009 | 57 | 0.35337 | 0.928 | 24.9 ± 0.1 |
| 960 | 14 | 3.5e-14 | 3.5343 | 0.0e+0 | 0.0244 | 0.0009 | 20 | 0.46018 | 0.925 | 24.6 ± 0.1 |
| 1020 | 14 | 3.4e-14 | 3.7807 | 0.0e+0 | 0.0220 | 0.0015 | 22 | 0.55752 | 0.880 | 25.0 ± 0.1 |
| 1080 | 14 | 3.2e-14 | 3.9842 | 0.0e+0 | 0.0359 | 0.0021 | 14 | 0.64377 | 0.841 | 25.2 ± 0.1 |
| 1140 | 14 | 4.1e-14 | 3.6966 | 1.2e-4 | 0.0584 | 0.0014 | 8.4 | 0.76312 | 0.891 | 24.7 ± 0.1 |
| 1200 | 14 | 6.4e-14 | 3.4905 | 6.1e-5 | 0.0471 | 0.0009 | 10 | 0.95805 | 0.927 | 24.3 ± 0.1 |
| 1280 | 14 | 1.3e-14 | 3.4465 | 0.0e+0 | 0.0238 | 0.0009 | 21 | 0.99879 | 0.926 | 24.0 ± 0.1 |
| 1360 | 14 | 6.3e-16 | 5.5887 | 0.0e+0 | 1.3367 | 0.0052 | 0.37 | 1.00000 | 0.724 | 30.4 ± 4.4 |

Total fusion age, TFA= 24.13 ± 0.05 Ma (including J)

Weighted mean plateau age, WMPA= 24.87 ± 0.05 Ma (including J)

Inverse isochron age =24.44 ± 0.22 Ma. (MSWD =4.77; 40Ar/36Ar=338.2 ± 20.7)

Steps used: 840, 900, 960, 1020, 1080, 1140, (5–10/13 or 63% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 24.9 ± 0.4 Ma**

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**Sample: SB69-64 SEAPSO-D2C gm J=0.0041212 FINAL J (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 600 | 14 | 3.7e-14 | 6.2069 | 0.0e+0 | 0.5437 | 0.0016 | 0.90 | 0.17342 | 0.924 | 42.1 ± 0.1 |
| 650 | 14 | 6.0e-14 | 5.8949 | 0.0e+0 | 0.6404 | 0.0010 | 0.77 | 0.47049 | 0.950 | 41.1 ± 0.1 |
| 700 | 14 | 4.1e-14 | 5.9306 | 0.0e+0 | 0.9048 | 0.0014 | 0.54 | 0.67460 | 0.932 | 40.7 ± 0.1 |
| 750 | 14 | 2.5e-14 | 6.2239 | 0.0e+0 | 1.1145 | 0.0024 | 0.44 | 0.79089 | 0.886 | 40.5 ± 0.2 |
| 800 | 14 | 1.6e-14 | 7.0618 | 0.0e+0 | 1.3529 | 0.0054 | 0.36 | 0.85888 | 0.772 | 40.1 ± 0.2 |
| 860 | 14 | 1.3e-14 | 9.7625 | 0.0e+0 | 1.3734 | 0.0149 | 0.36 | 0.89827 | 0.549 | 39.4 ± 0.4 |
| 920 | 14 | 1.4e-14 | 13.5481 | 8.9e-4 | 1.5020 | 0.0284 | 0.33 | 0.92947 | 0.380 | 37.8 ± 0.6 |
| 980 | 14 | 1.8e-14 | 14.5058 | 2.5e-3 | 1.9123 | 0.0320 | 0.26 | 0.96620 | 0.348 | 37.1 ± 0.6 |
| 1040 | 14 | 1.2e-14 | 14.5980 | 2.2e-3 | 3.5905 | 0.0333 | 0.14 | 0.99036 | 0.326 | 35.1 ± 0.8 |
| 1120 | 14 | 4.6e-15 | 14.0669 | 2.9e-3 | 8.9701 | 0.0313 | 0.055 | 1.00000 | 0.342 | 35.4 ± 1.7 |

Total fusion age, TFA= 40.55 ± 0.09 Ma (including J)

Weighted mean age (not statistical plateau), WMA= 40.62 ± 0.10 Ma (including J). MSWD=0.8 (<1), so error not expanded.

Inverse isochron age =40.80 ± 0.26 Ma. (MSWD =0.00; 40Ar/36Ar=280.5 ± 0.0)

Steps used: 700, 750, (3–4/10 or 32% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 40.6 ± 0.4 Ma**







**Sample: SB69-175 Seaspo plg J=0.0038573. (28.1 FCT)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T** | **t** | **40(mol)** | **40/39** | **38/39** | **37/39** | **36/39** | **K/Ca** | **∑ 39Ar** | **40Ar\*** | **Age (Ma)** |
| 800 | 14 | 4.8e-15 | 10.4512 | 0.0e+0 | 22.4140 | 0.0149 | 0.022 | 0.19336 | 0.579 | 42.2 ± 1.2 |
| 920 | 14 | 3.4e-15 | 7.6367 | 0.0e+0 | 46.0214 | 0.0055 | 0.011 | 0.38194 | 0.785 | 42.0 ± 1.3 |
| 1040 | 14 | 5.5e-15 | 9.1737 | 0.0e+0 | 51.5249 | 0.0118 | 0.010 | 0.64177 | 0.620 | 39.7 ± 1.1 |
| 1140 | 14 | 2.5e-15 | 10.5536 | 0.0e+0 | 51.6857 | 0.0158 | 0.009 | 0.74280 | 0.558 | 41.1 ± 2.2 |
| 1220 | 14 | 7.7e-16 | 12.6334 | 0.0e+0 | 56.8436 | 0.0237 | 0.009 | 0.76913 | 0.446 | 39.4 ± 8.1 |
| 1400 | 14 | 7.5e-15 | 14.0561 | 4.7e-3 | 65.6131 | 0.0274 | 0.007 | 1.00000 | 0.423 | 41.6 ± 1.3 |

Total fusion age, TFA= 41.18 ± 0.62 Ma (including J)

Weighted mean plateau age, WMPA= 41.28 ± 0.59 Ma (including J)

Inverse isochron age =41.00 ± 1.38 Ma. (MSWD =0.64; 40Ar/36Ar=298.3 ± 10.1)

Steps used: 800, 920, 1040, 1140, 1220, 1400, (1–6/6 or 100% ∑ 39Ar

t = dwell time in minutes.

40(mol) = moles corrected for blank and reactor-produced 40.

Ratios are corrected for blanks, decay, and interference.

∑39Ar is cumulative, 40Ar\* = rad fraction.

**Preferred Age = 41.3 ± 1.2 Ma**

****

TFA= 41.18±0.62 Ma

WMPA= 41.28±0.59

Note: Ages on y-axis of this plot are based on Fish Canyon Tuff = 27.6 Ma (not 28.1 Ma). Calculated TFA and WMPA ages, and those given in table above, are corrected.

****

Age=41.00±1.38 Ma

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**Sample: SB70 - 82&83 P84812 plag**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| P84812 Plagioclase | |  | | |  | |  | |  |  | | |  |  | |  | |  | |  | |  | |
|  | |  | | |  | |  | |  |  | | |  |  | |  | |  | |  | |  | |
| T(°C) | Age(Ma) | | %40Ar\* | K/Ca | | K/Cl | | moles 40Ar\* | | | 𝚺39Ar | 40Ar | | | 39Ar | | 38Ar | | 37Ar | | 36Ar | |
| 600 | 25.95±0.20 | | 83.45 | 0.04 | | 15006 | | 2.69E-13 | | | 0.1 | 0.988145±0.001606 | | | 0.316225±0.000525 | | 0.004078±0.000052 | | 4.274632±0.012713 | | 0.001702±0.000010 | |
| 675 | 25.66±0.22 | | 90.71 | 0.03 | | 80263 | | 6.66E-13 | | | 0.35 | 2.247380±0.002282 | | | 0.792796±0.000856 | | 0.009985±0.000109 | | 13.560557±0.026965 | | 0.004362±0.000021 | |
| 775 | 26.03±0.24 | | 92.48 | 0.03 | | -29500 | | 9.43E-13 | | | 0.7 | 3.122186±0.002928 | | | 1.108592±0.001099 | | 0.013773±0.000133 | | 21.587616±0.040551 | | 0.006618±0.000020 | |
| 850 | 27.31±0.29 | | 88.78 | 0.02 | | -9370 | | 4.78E-13 | | | 0.87 | 1.648521±0.002028 | | | 0.536342±0.000729 | | 0.006572±0.000038 | | 11.605526±0.031610 | | 0.003754±0.000020 | |
| 925 | 31.76±0.34 | | 75.27 | 0.02 | | -19189 | | 1.82E-13 | | | 0.92 | 0.740096±0.001396 | | | 0.175387±0.000357 | | 0.002266±0.000026 | | 3.799292±0.018970 | | 0.001639±0.000011 | |
| 1025 | 33.24±0.41 | | 57.11 | 0.03 | | 6627 | | 1.28E-13 | | | 0.96 | 0.685255±0.001149 | | | 0.117644±0.000274 | | 0.001725±0.000042 | | 2.422996±0.010650 | | 0.001638±0.000012 | |
| 1100 | 44.67±0.55 | | 51.13 | 0.02 | | 4868 | | 9.75E-14 | | | 0.98 | 0.582995±0.000964 | | | 0.066510±0.000077 | | 0.001066±0.000009 | | 1.415446±0.007612 | | 0.001336±0.000010 | |
| 1200 | 65.06±0.65 | | 48.4 | 0.02 | | 2148 | | 1.26E-13 | | | 1 | 0.795856±0.001421 | | | 0.058707±0.000118 | | 0.001106±0.000047 | | 1.272298±0.007675 | | 0.001719±0.000011 | |
|  | |  | | |  | |  | |  |  | | |  |  | |  | |  | |  | |  | |

Packet SB70-82+83, Experiment #21Z0059, 0.0552 g Plagioclase, all errors ±1 sigma

J = 0.00551215900000000±1.102E-05

40Ar\* is radiogenic argon, isotopes in volts (3.27e-13 moles/volt), corrected for blank, background, discrimination, and decay

Calculated bulk K/Ca = 0.027 ± 0.013

Total Gas Age = 27.85 ± 0.13 Ma

Weighted Mean Plateau Age = 25.88 ± 0.14 Ma (±1 sigma, including ±J), 69.96% 39Ar released

Weighted Mean Plateau Age = 25.88 ± 0.14 Ma (A priori, including ±J), 69.96% 39Ar released

Weighted Mean Plateau Age = 25.88 ± 0.29 Ma (95% confidence, including ±J)

MSWD = 0.75 (Good fit, MSWD < 3.69)

Steps 3 of 8 (600,675,775°C)

Isochron Age = 25.6 ± 0.4 Ma (±1 sigma, including ±J)

Isochron Age = 25.6 ± 0.4 Ma (A Priori Errors, including ±J)

Isochron Age = 25.6 ± 1.1 Ma (95% confidence, including ±J)

MSWD = 1.23 (Good fit, MSWD < 5.02)

40Ar/36Ar intercept = 315.9 ± 33.6 (±1 sigma)

40Ar/36Ar intercept = 315.9 ± 30.3 (A Priori)

40Ar/36Ar intercept = 315.9 ± 86.3 (95% confidence)

Steps 3 of 8 (600,675,775°C)

