

$^{40}\text{Ar}/^{39}\text{Ar}$ Ages and Zircon Petrochronology for the Rear Arc of the Izu-Bonin-Marianas Intra-Oceanic Subduction Zone

Axel K. Schmitt, Kevin Konrad, Graham D. M. Andrews, Kenji Horie, Sarah R. Brown, Anthony A. Koppers, Mark Pecha, Cathy J. Busby, Yoshihiko Tamura

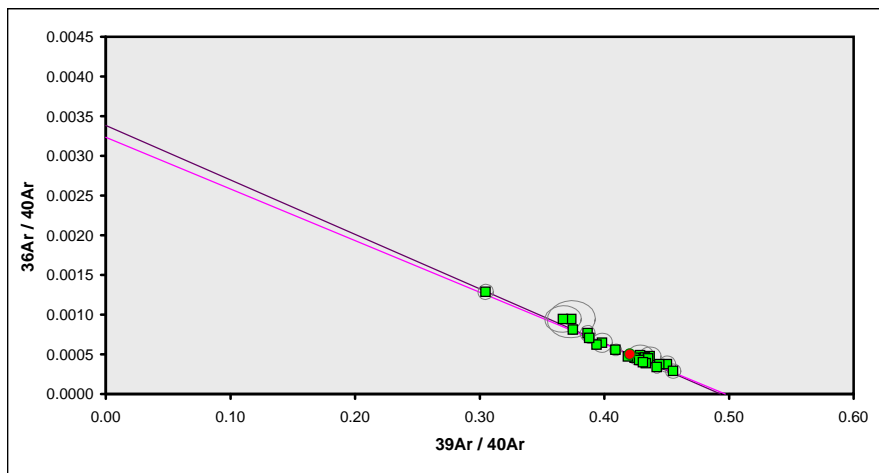
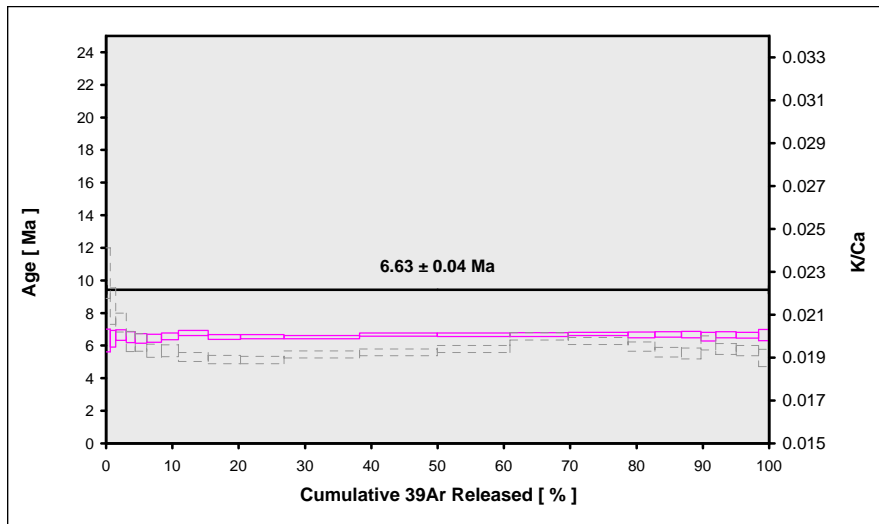
Supplementary Data Set 4: Full $^{40}\text{Ar}/^{39}\text{Ar}$ results of IODP Expedition 350 Site 1437 samples

350 U1437D 68R-2 45-49 > IODP U1437E > Plagioclase > IBM | IODP 350 (14-INT-02)
15-OSU-04 (4A4-15) > Incremental Heating > Kevin Konrad

Information on Analysis
and Constants Used in Calculations

Sample = 350 U1437D 68R-2 45-49
Material = Plagioclase
Location = IODP U1437E
Analyst = Kevin Konrad
Project = IBM | IODP 350 (14-INT-02)
Mass Discrimination Law = LIN
Irradiation = 15-OSU-04 (4A4-15)
J = 0.00181145 ± 0.00000303
FCT-NM = 28.201 ± 0.023 Ma
IGSN = N/A
Preferred Age = Plateau Age
Classification = Crystallization Age
Experiment Type = Incremental Heating
Extraction Method = In Situ Laser Heating
Heating = 0 sec
Isolation = 3.00 min
Instrument = ARGUS-VI-D
Lithology = Andesitic Tuff
Lat-Lon = Undefined - Undefined
Collector Calibrations = ³⁶Ar
Age Equations = Min et al. (2000)
Negative Intensities = Allowed
Decay Constant ⁴⁰K = 5.530 ± 0.048 E-10 1/a
Decay Constant ³⁹Ar = 2.940 ± 0.016 E-07 1/h
Decay Constant ³⁷Ar = 8.230 ± 0.012 E-04 1/h
Decay Constant ³⁶Cl = 2.257 ± 0.015 E-06 1/a
Decay Constant ⁴⁰K(EC,β⁺) = 0.580 ± 0.009 E-10 1/a
Decay Constant ⁴⁰K(β⁻) = 4.950 ± 0.043 E-10 1/a
Atmospheric Ratio ⁴⁰Ar/³⁶Ar = 295.50
Atmospheric Ratio ³⁸Ar/³⁶Ar = 0.1869
Production Ratio ³⁹Ar/³⁷Ar(ca) = 0.000676 ± 0.000009
Production Ratio ³⁸Ar/³⁷Ar(ca) = 0.000072 ± 0.000009
Production Ratio ³⁶Ar/³⁷Ar(ca) = 0.000266 ± 0.000000
Production Ratio ⁴⁰Ar/³⁹Ar(k) = 0.003823 ± 0.000102
Production Ratio ³⁸Ar/³⁹Ar(k) = 0.012031 ± 0.000019
Production Ratio ³⁶Ar/³⁸Ar(cl) = 262.80 ± 1.71
Scaling Ratio K/Ca = 0.430
Abundance Ratio ⁴⁰K/K = 1.1700 ± 0.0100 E-04
Atomic Weight K = 39.0983 ± 0.0001 g

Results	40(a)/36(a) ± 2σ	40(r)/39(k) ± 2σ	Age ± 2σ (Ma)	MSWD	39Ar(k) (%,n)	K/Ca ± 2σ
Age Plateau		2.02792 ± 0.01124 ± 0.55%	6.63 ± 0.04 ± 0.65% Full External Error ± 0.16 Analytical Error ± 0.04	1.21 23% 1.0984	100.00 22 2σ Confidence Limit Error Magnification	0.0194 ± 0.0002
Total Fusion Age		2.02699 ± 0.01038 ± 0.51%	6.63 ± 0.04 ± 0.61% Full External Error ± 0.15 Analytical Error ± 0.03		22 0.0194 ± 0.0000	
Normal Isochron	310.09 ± 25.22 ± 8.13%	2.00585 ± 0.03147 ± 1.57%	6.56 ± 0.11 ± 1.60% Full External Error ± 0.18 Analytical Error ± 0.10	1.25 20% 1.63 1.1170	100.00 22 2σ Confidence Limit Error Magnification 89 Number of Iterations Convergence	
Inverse Isochron	309.36 ± 25.23 ± 8.16%	2.01207 ± 0.03075 ± 1.53%	6.58 ± 0.10 ± 1.56% Full External Error ± 0.18 Analytical Error ± 0.10	1.19 26% 1.0888	100.00 22 2σ Confidence Limit Error Magnification 4 Number of Iterations Convergence 30% Spreading Factor	

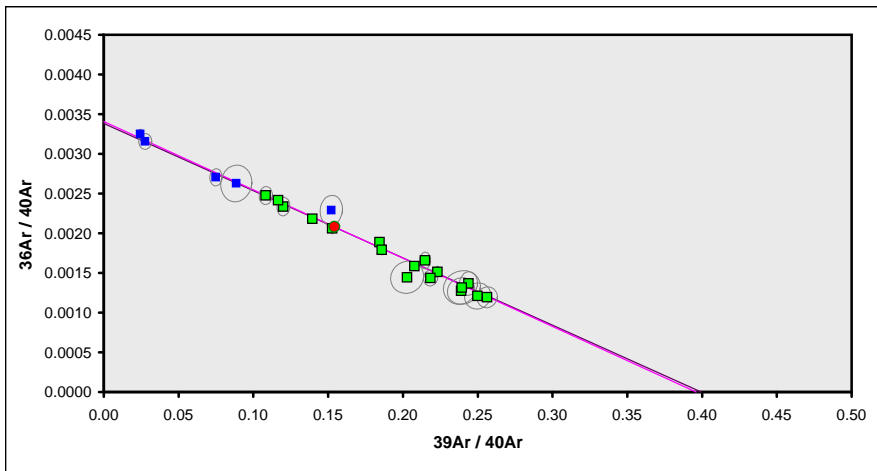
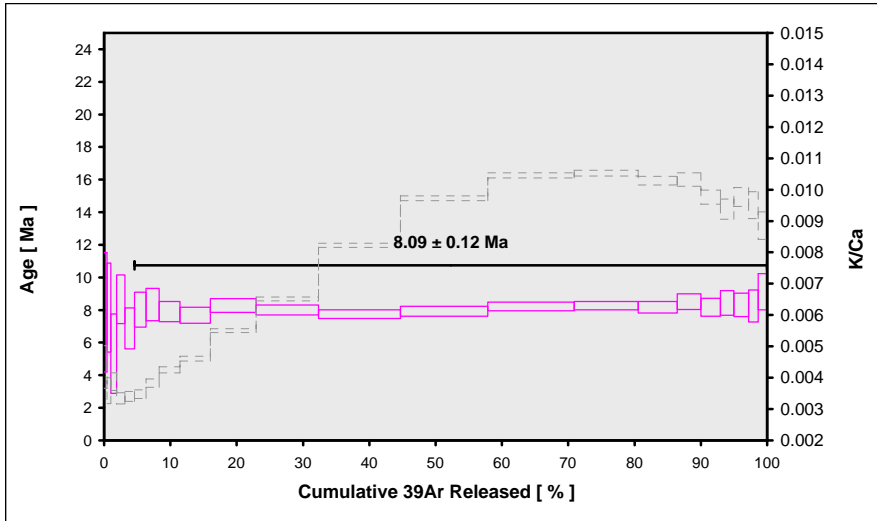


350 U1437E 15R-5 94-97 > IODP U1437E > Plagioclase > IBM | IODP 350 (14-INT-02)
15-OSU-04 (4A10-15) > Incremental Heating > Kevin Konrad

Information on Analysis
and Constants Used in Calculations

Sample = 350 U1437E 15R-5 94-97
Material = Plagioclase
Location = IODP U1437E
Analyst = Kevin Konrad
Project = IBM | IODP 350 (14-INT-02)
Mass Discrimination Law = LIN
Irradiation = 15-OSU-04 (4A10-15)
J = 0.00179172 ± 0.00000296
FCT-NM = 28.201 ± 0.023 Ma
IGSN = N/A
Preferred Age = Plateau Age
Classification = Crystallization Age
Experiment Type = Incremental Heating
Extraction Method = In Situ Laser Heating
Heating = 77 sec
Isolation = 3.00 min
Instrument = ARGUS-VI-D
Lithology = Andesitic Tuff
Lat-Lon = Undefined - Undefined
Collector Calibrations = ³⁶Ar
Age Equations = Min et al. (2000)
Negative Intensities = Allowed
Decay Constant ⁴⁰K = 5.530 ± 0.048 E-10 1/a
Decay Constant ³⁹Ar = 2.940 ± 0.016 E-07 1/h
Decay Constant ³⁷Ar = 8.230 ± 0.012 E-04 1/h
Decay Constant ³⁶Cl = 2.257 ± 0.015 E-06 1/a
Decay Constant ⁴⁰K(EC,β⁺) = 0.580 ± 0.009 E-10 1/a
Decay Constant ⁴⁰K(β⁻) = 4.950 ± 0.043 E-10 1/a
Atmospheric Ratio ⁴⁰Ar/³⁶Ar = 295.50
Atmospheric Ratio ³⁸Ar/³⁶Ar = 0.1869
Production Ratio ³⁹Ar/³⁷Ar(ca) = 0.000676 ± 0.000009
Production Ratio ³⁸Ar/³⁷Ar(ca) = 0.000072 ± 0.000009
Production Ratio ³⁶Ar/³⁷Ar(ca) = 0.000266 ± 0.000000
Production Ratio ⁴⁰Ar/³⁹Ar(k) = 0.003823 ± 0.000102
Production Ratio ³⁸Ar/³⁹Ar(k) = 0.012031 ± 0.000019
Production Ratio ³⁶Ar/³⁸Ar(cl) = 262.80 ± 1.71
Scaling Ratio K/Ca = 0.430
Abundance Ratio ⁴⁰K/K = 1.1700 ± 0.0100 E-04
Atomic Weight K = 39.0983 ± 0.0001 g

Results	40(a)/36(a) ± 2σ	40(r)/39(k) ± 2σ	Age ± 2σ (Ma)	MSWD	³⁹ Ar(k) (%.)	K/Ca ± 2σ
Age Plateau		2.50370 ± 0.03758 ± 1.50%	8.09 ± 0.12 ± 1.53% Full External Error ± 0.22 Analytical Error ± 0.12	1.48 10% 1.71 1.2155	95.42 17 2σ Confidence Limit Error Magnification	0.0072 ± 0.0012
Total Fusion Age		2.49289 ± 0.03297 ± 1.32%	8.06 ± 0.11 ± 1.36% Full External Error ± 0.21 Analytical Error ± 0.11		22	0.0073 ± 0.0000
Normal Isochron	294.13 ± 7.74 ± 2.63%	2.51324 ± 0.09255 ± 3.68%	8.12 ± 0.30 ± 3.69% Full External Error ± 0.35 Analytical Error ± 0.30	1.54 8% 1.73 1.2409	95.42 17 2σ Confidence Limit Error Magnification	
				18 0.0000235697	Number of Iterations Convergence	
Inverse Isochron	293.59 ± 7.77 ± 2.65%	2.52509 ± 0.09226 ± 3.65%	8.16 ± 0.30 ± 3.66% Full External Error ± 0.35 Analytical Error ± 0.30	1.56 7% 1.73 1.2507	95.42 17 2σ Confidence Limit Error Magnification	
				4 0.0000206728	Number of Iterations Convergence	
				37%	Spreading Factor	

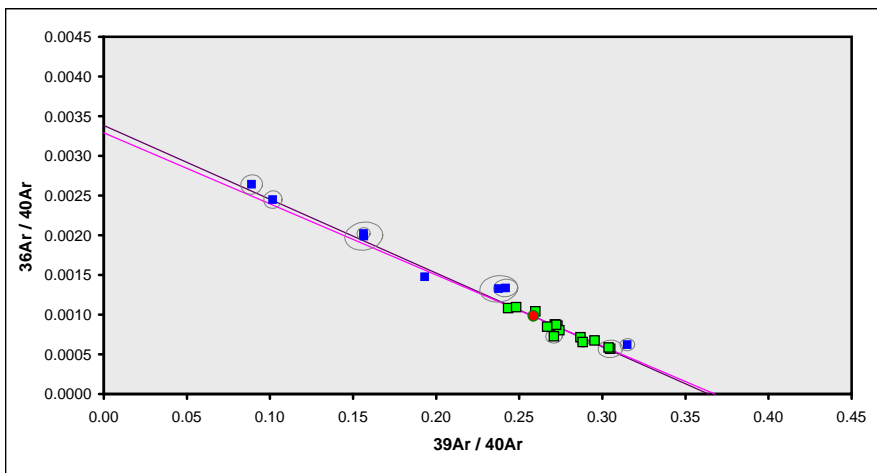
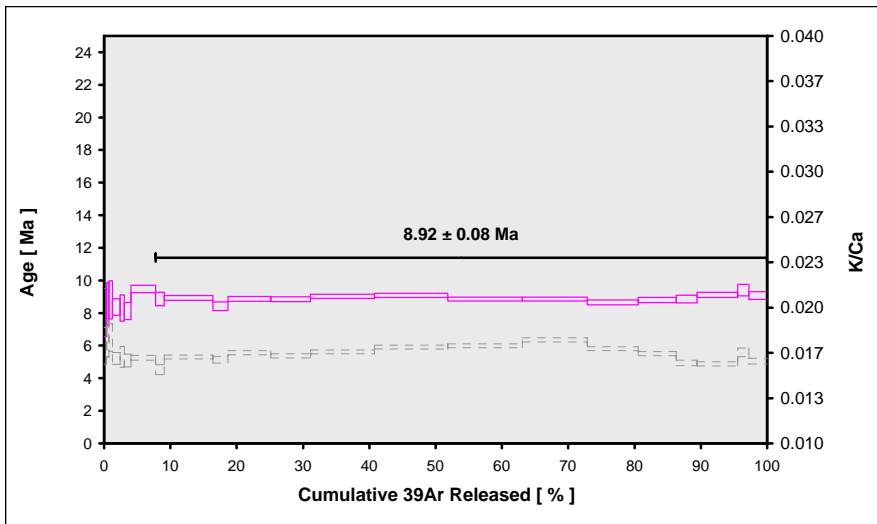


350 U1437E 17R-3 13-16 > IODP U1437E > Plagioclase > IBM | IODP 350 (14-INT-02)
15-OSU-04 (4A8-15) > Incremental Heating > Kevin Konrad

Information on Analysis
and Constants Used in Calculations

Sample = 350 U1437E 17R-3 13-16
Material = Plagioclase
Location = IODP U1437E
Analyst = Kevin Konrad
Project = IBM | IODP 350 (14-INT-02)
Mass Discrimination Law = LIN
Irradiation = 15-OSU-04 (4A8-15)
J = 0.00179883 ± 0.00000299
FCT-NM = 28.201 ± 0.023 Ma
IGSN = N/A
Preferred Age = Plateau Age
Classification = Crystallization Age
Experiment Type = Incremental Heating
Extraction Method = In Situ Laser Heating
Heating = 0 sec
Isolation = 3.00 min
Instrument = ARGUS-VI-D
Lithology = Andesitic Tuff
Lat-Lon = Undefined - Undefined
Collector Calibrations = ³⁶Ar
Age Equations = Min et al. (2000)
Negative Intensities = Allowed
Decay Constant ⁴⁰K = 5.530 ± 0.048 E-10 1/a
Decay Constant ³⁹Ar = 2.940 ± 0.016 E-07 1/h
Decay Constant ³⁷Ar = 8.230 ± 0.012 E-04 1/h
Decay Constant ³⁶Cl = 2.257 ± 0.015 E-06 1/a
Decay Constant ⁴⁰K(EC,β⁺) = 0.580 ± 0.009 E-10 1/a
Decay Constant ⁴⁰K(β⁻) = 4.950 ± 0.043 E-10 1/a
Atmospheric Ratio ⁴⁰Ar/³⁶Ar = 295.50
Atmospheric Ratio ³⁸Ar/³⁶Ar = 0.1869
Production Ratio ³⁹Ar/³⁷Ar(ca) = 0.000676 ± 0.000009
Production Ratio ³⁸Ar/³⁷Ar(ca) = 0.000072 ± 0.000009
Production Ratio ³⁶Ar/³⁷Ar(ca) = 0.000266 ± 0.000000
Production Ratio ⁴⁰Ar/³⁹Ar(k) = 0.003823 ± 0.000102
Production Ratio ³⁸Ar/³⁹Ar(k) = 0.012031 ± 0.000019
Production Ratio ³⁶Ar/³⁸Ar(cl) = 262.80 ± 1.71
Scaling Ratio K/Ca = 0.430
Abundance Ratio ⁴⁰K/K = 1.1700 ± 0.0100 E-04
Atomic Weight K = 39.0983 ± 0.0001 g

Results	40(a)/36(a) ± 2σ	40(r)/39(k) ± 2σ	Age ± 2σ (Ma)	MSWD	³⁹ Ar(k) (%,n)	K/Ca ± 2σ
Age Plateau						
Error Mean		2.74759 ± 0.02383 ± 0.87%	8.92 ± 0.08 ± 0.93%	3.38 0%	89.96 14	0.0167 ± 0.0003
			Full External Error ± 0.22 Analytical Error ± 0.08	1.78 1.8376	2σ Confidence Limit Error Magnification	
Total Fusion Age		2.74454 ± 0.01285 ± 0.47%	8.91 ± 0.05 ± 0.57%		22	0.0167 ± 0.0000
			Full External Error ± 0.21 Analytical Error ± 0.04			
Normal Isochron						
Error Chron	302.77 ± 29.78 ± 9.83%	2.71952 ± 0.09924 ± 3.65%	8.82 ± 0.32 ± 3.66%	3.45 0%	89.96 14	
			Full External Error ± 0.38 Analytical Error ± 0.32	1.82 1.8562	2σ Confidence Limit Error Magnification	
				59 0.0000259230	Number of Iterations Convergence	
Inverse Isochron						
Error Chron	303.93 ± 30.88 ± 10.16%	2.72067 ± 0.10042 ± 3.69%	8.83 ± 0.33 ± 3.70%	3.58 0%	89.96 14	
			Full External Error ± 0.38 Analytical Error ± 0.33	1.82 1.8924	2σ Confidence Limit Error Magnification	
				3 0.0000891159	Number of Iterations Convergence	
				17%	Spreading Factor	

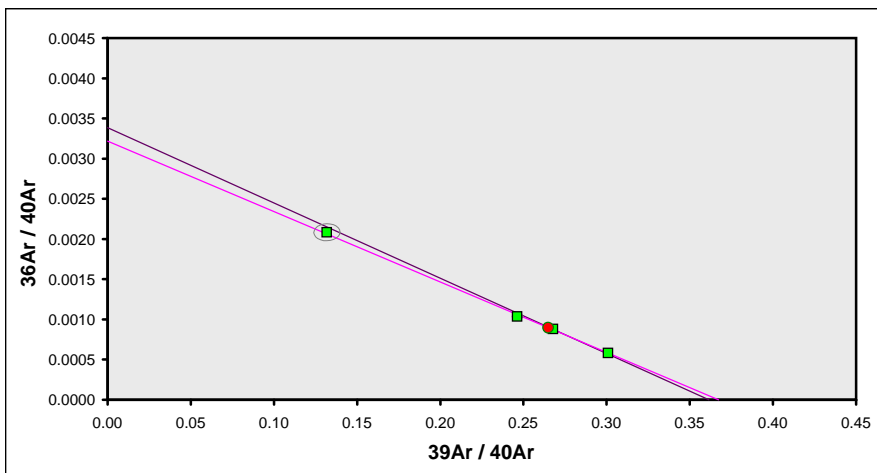
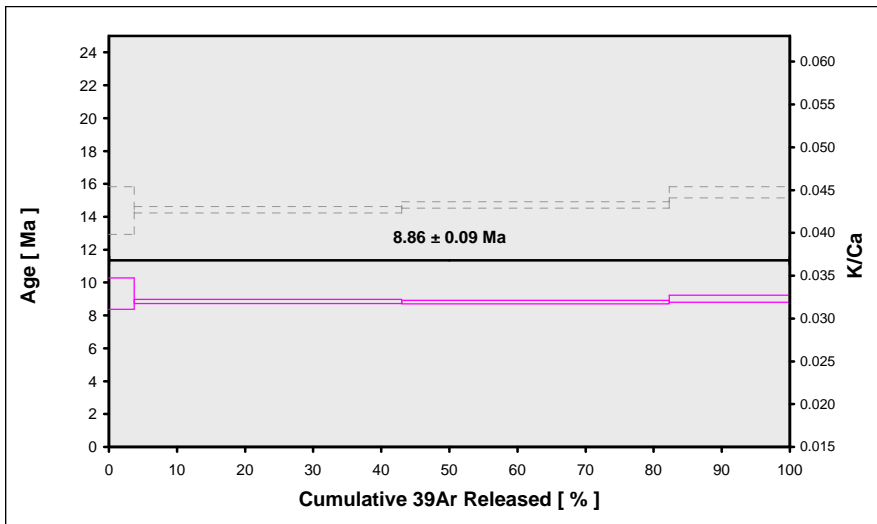


350 U1437E 19R-1 126-130 > IODP U1437E > Amphibole > IBM | IODP 350 (14-INT-02)
15-OSU-04 (4A15-15) > Incremental Heating > Kevin Konrad

Information on Analysis
and Constants Used in Calculations

Sample = 350 U1437E 19R-1 126-130
Material = Amphibole
Location = IODP U1437E
Analyst = Kevin Konrad
Project = IBM | IODP 350 (14-INT-02)
Mass Discrimination Law = LIN
Irradiation = 15-OSU-04 (4A15-15)
J = 0.00177485 ± 0.00000291
FCT-NM = 28.201 ± 0.023 Ma
IGSN = N/A
Preferred Age = Plateau Age
Classification = Crystallization Age
Experiment Type = Incremental Heating
Extraction Method = In Situ Laser Heating
Heating = 0 sec
Isolation = 3.00 min
Instrument = ARGUS-VI-D
Lithology = Andesitic Tuff
Lat-Lon = Undefined - Undefined
Collector Calibrations = ³⁶Ar
Age Equations = Min et al. (2000)
Negative Intensities = Allowed
Decay Constant ⁴⁰K = 5.530 ± 0.048 E-10 1/a
Decay Constant ³⁹Ar = 2.940 ± 0.016 E-07 1/h
Decay Constant ³⁷Ar = 8.230 ± 0.012 E-04 1/h
Decay Constant ³⁶Cl = 2.257 ± 0.015 E-06 1/a
Decay Constant 40K(EC,β⁺) = 0.580 ± 0.009 E-10 1/a
Decay Constant 40K(β⁻) = 4.950 ± 0.043 E-10 1/a
Atmospheric Ratio 40/36(a) = 295.50
Atmospheric Ratio 38/36(a) = 0.1869
Production Ratio 39/37(ca) = 0.000676 ± 0.000009
Production Ratio 38/37(ca) = 0.000072 ± 0.000009
Production Ratio 36/37(ca) = 0.000266 ± 0.000000
Production Ratio 40/39(k) = 0.003823 ± 0.000102
Production Ratio 38/39(k) = 0.012031 ± 0.000019
Production Ratio 36/38(cl) = 262.80 ± 1.71
Scaling Ratio K/Ca = 0.430
Abundance Ratio 40K/K = 1.1700 ± 0.0100 E-04
Atomic Weight K = 39.0983 ± 0.0001 g

Results	40(a)/36(a) ± 2σ	40(r)/39(k) ± 2σ	Age ± 2σ (Ma)	MSWD	³⁹ Ar(k) (%,n)	K/Ca ± 2σ
Age Plateau		2.76601 ± 0.02801 ± 1.01%	8.86 ± 0.09 ± 1.06% Full External Error ± 0.22 Analytical Error ± 0.09	1.33 26%	100.00 4	0.0432 ± 0.0008 2σ Confidence Limit Error Magnification
Total Fusion Age		2.77425 ± 0.02630 ± 0.95%	8.88 ± 0.09 ± 1.00% Full External Error ± 0.22 Analytical Error ± 0.08		4	0.0433 ± 0.0003
Normal Isochron	310.52 ± 18.38 ± 5.92%	2.72315 ± 0.05804 ± 2.13%	8.72 ± 0.19 ± 2.15% Full External Error ± 0.27 Analytical Error ± 0.19	0.53 59%	100.00 4	0.0432 ± 0.0008 2σ Confidence Limit Error Magnification 22 Number of Iterations Convergence
Inverse Isochron	310.83 ± 18.44 ± 5.93%	2.72254 ± 0.05823 ± 2.14%	8.72 ± 0.19 ± 2.16% Full External Error ± 0.27 Analytical Error ± 0.19	0.54 58%	100.00 4	0.0432 ± 0.0008 2σ Confidence Limit Error Magnification 3 Number of Iterations Convergence 46% Spreading Factor



350 U1437E 19R-1 126-130 > IODP U1437E > Plagioclase > IBM | IODP 350 (14-INT-02)
15-OSU-04 (4A14-15) > Incremental Heating > Kevin Konrad

Information on Analysis
and Constants Used in Calculations

Sample = 350 U1437E 19R-1 126-130
Material = Plagioclase
Location = IODP U1437E
Analyst = Kevin Konrad
Project = IBM | IODP 350 (14-INT-02)
Mass Discrimination Law = LIN
Irradiation = 15-OSU-04 (4A14-15)
J = 0.00177841 ± 0.00000292
FCT-NM = 28.201 ± 0.023 Ma
IGSN = N/A
Preferred Age = Undefined
Classification = Undefined
Experiment Type = Incremental Heating
Extraction Method = In Situ Laser Heating
Heating = 0 sec
Isolation = 3.00 min
Instrument = ARGUS-VI-D
Lithology = Andesitic Tuff
Lat-Lon = Undefined - Undefined
Collector Calibrations = 36Ar
Age Equations = Min et al. (2000)
Negative Intensities = Allowed
Decay Constant 40K = 5.530 ± 0.048 E-10 1/a
Decay Constant 39Ar = 2.940 ± 0.016 E-07 1/h
Decay Constant 37Ar = 8.230 ± 0.012 E-04 1/h
Decay Constant 36Cl = 2.257 ± 0.015 E-06 1/a
Decay Constant 40K(EC,β⁺) = 0.580 ± 0.009 E-10 1/a
Decay Constant 40K(β⁻) = 4.950 ± 0.043 E-10 1/a
Atmospheric Ratio 40/36(a) = 295.50
Atmospheric Ratio 38/36(a) = 0.1869
Production Ratio 39/37(ca) = 0.000676 ± 0.000009
Production Ratio 38/37(ca) = 0.000072 ± 0.000009
Production Ratio 36/37(ca) = 0.000266 ± 0.000000
Production Ratio 40/39(k) = 0.003823 ± 0.000102
Production Ratio 38/39(k) = 0.012031 ± 0.000019
Production Ratio 36/38(cl) = 262.80 ± 1.71
Scaling Ratio K/Ca = 0.430
Abundance Ratio 40K/K = 1.1700 ± 0.0100 E-04
Atomic Weight K = 39.0983 ± 0.0001 g

Results

40(a)/36(a) ± 2σ

40(r)/39(k) ± 2σ

Age ± 2σ
(Ma)

MSWD

39Ar(k)
(%,n)

K/Ca ± 2σ

Age Plateau
Cannot Calculate

Total Fusion Age

2.98466 ± 0.01088
± 0.36%

9.57 ± 0.05
± 0.49%

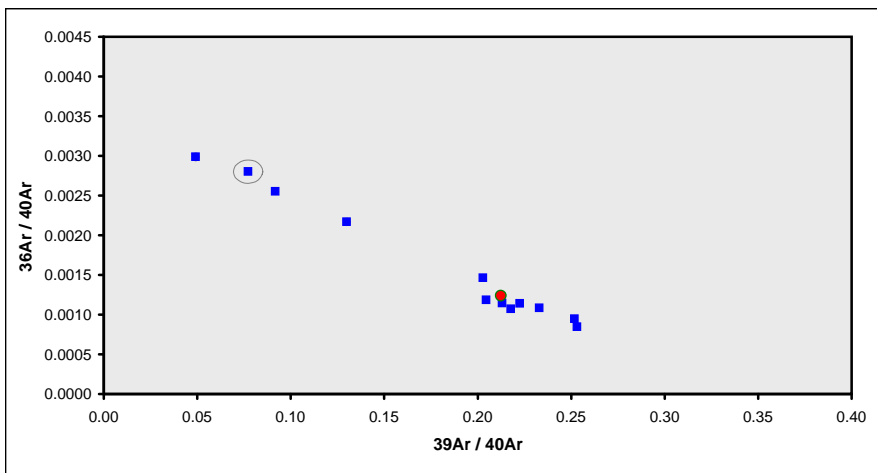
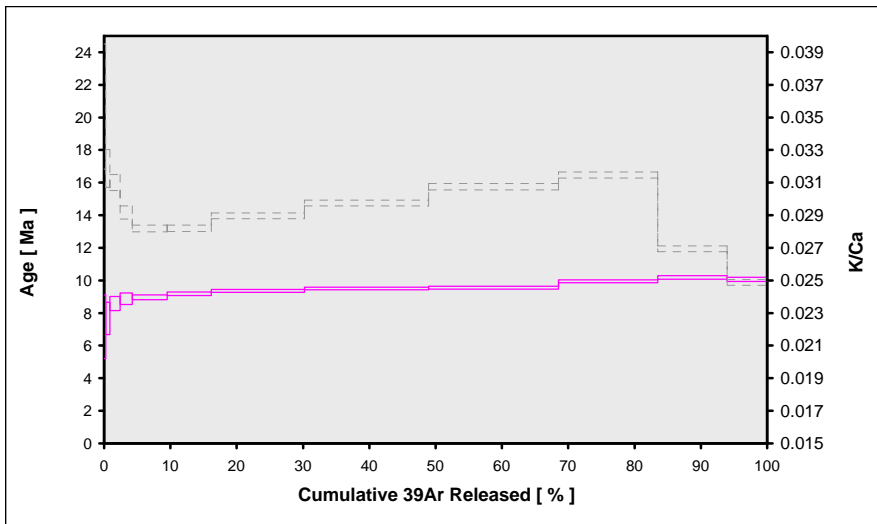
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0.0292 ± 0.0001

Full External Error ± 0.22
Analytical Error ± 0.03

Normal Isochron
Cannot Calculate

Inverse Isochron
Cannot Calculate

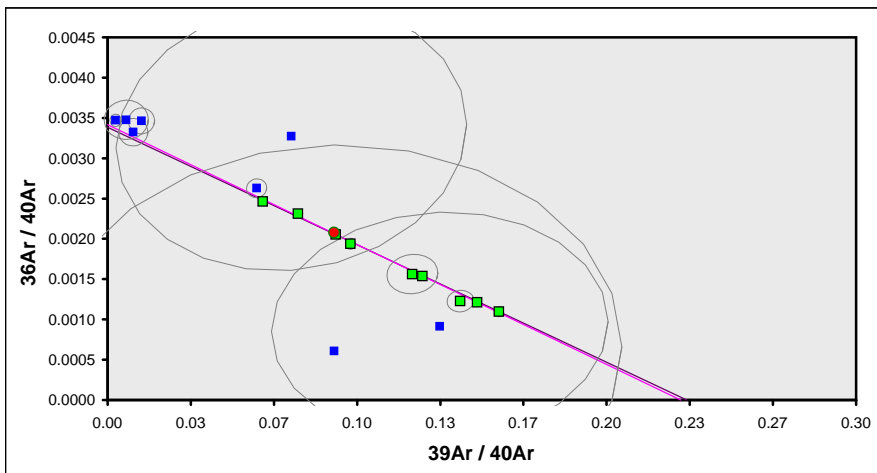
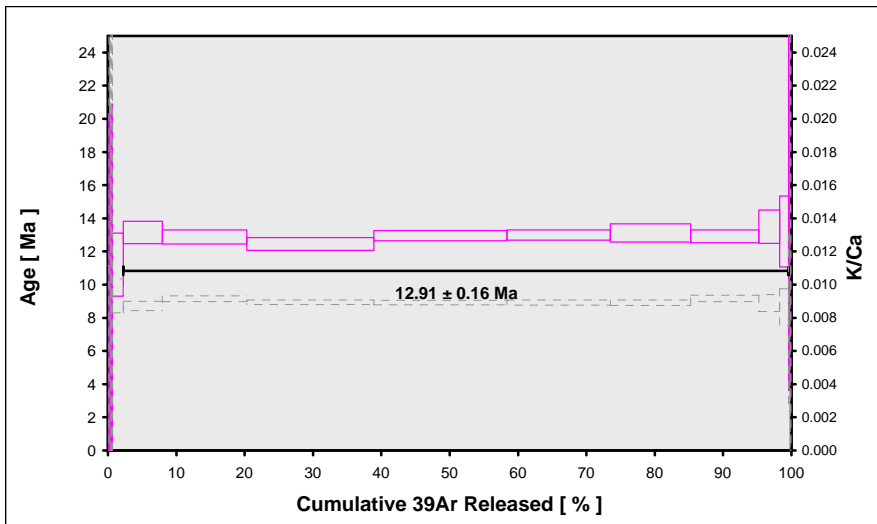


350-U1437E-35R-1 133/142 (300-212ÅμM) > IODP U1437E > Hornblende > IBM | IODP 350
(14-INT-02)
14-OSU-04 (R98) > Incremental Heating > Kevin Konrad

Information on Analysis
and Constants Used in Calculations

Sample = 350-U1437E-35R-1 133/142 (300-212ÅμM)
Material = Hornblende
Location = IODP U1437E
Analyst = Kevin Konrad
Project = IBM | IODP 350 (14-INT-02)
Mass Discrimination Law = LIN
Irradiation = 14-OSU-04 (R98)
J = 0.00166275 ± 0.00000210
FCT-NM = 28.201 ± 0.023 Ma
IGSN = N/A
Preferred Age = Plateau Age
Classification = Crystallization Age
Experiment Type = Incremental Heating
Extraction Method = In Situ Laser Heating
Heating = 77 sec
Isolation = 6.00 min
Instrument = ARGUS-VI-D
Lithology = Rhyolite
Lat-Lon = Undefined - Undefined
Collector Calibrations = 40Ar 36Ar
Age Equations = Min et al. (2000)
Negative Intensities = Allowed
Decay Constant 40K = 5.530 ± 0.048 E-10 1/a
Decay Constant 39Ar = 2.940 ± 0.016 E-07 1/h
Decay Constant 37Ar = 8.230 ± 0.012 E-04 1/h
Decay Constant 36Cl = 2.257 ± 0.015 E-06 1/a
Decay Constant 40K(EC,β⁺) = 0.580 ± 0.009 E-10 1/a
Decay Constant 40K(β⁻) = 4.950 ± 0.043 E-10 1/a
Atmospheric Ratio 40/36(a) = 295.50
Atmospheric Ratio 38/36(a) = 0.1869
Production Ratio 39/37(ca) = 0.000676 ± 0.000009
Production Ratio 38/37(ca) = 0.000072 ± 0.000009
Production Ratio 36/37(ca) = 0.000266 ± 0.000000
Production Ratio 40/39(k) = 0.003823 ± 0.000102
Production Ratio 38/39(k) = 0.012031 ± 0.000019
Production Ratio 36/38(cl) = 262.80 ± 1.71
Scaling Ratio K/Ca = 0.430
Abundance Ratio 40K/K = 1.1700 ± 0.0100 E-04
Atomic Weight K = 39.0983 ± 0.0001 g

Results	40(a)/36(a) ± 2σ	40(r)/39(k) ± 2σ	Age ± 2σ (Ma)	MSWD	39Ar(k) (%,n)	K/Ca ± 2σ
Age Plateau		4.30770 ± 0.05115 ± 1.19%	12.91 ± 0.16 ± 1.21%	1.09 37%	97.34 9	0.0090 ± 0.0001
			Full External Error ± 0.33 Analytical Error ± 0.15	2.00 1.0430	2σ Confidence Limit Error Magnification	
Total Fusion Age		4.25414 ± 0.05710 ± 1.34%	12.75 ± 0.17 ± 1.36%		17	0.0090 ± 0.0001
			Full External Error ± 0.34 Analytical Error ± 0.17			
Normal Isochron	292.70 ± 4.90 ± 1.67%	4.35274 ± 0.09577 ± 2.20%	13.04 ± 0.29 ± 2.21%	1.06 39%	97.34 9	0.0090 ± 0.0001
			Full External Error ± 0.41 Analytical Error ± 0.29	2.07 1.0276	2σ Confidence Limit Error Magnification	
				22 0.0000380595	Number of Iterations Convergence	
Inverse Isochron	292.82 ± 4.93 ± 1.68%	4.35265 ± 0.09620 ± 2.21%	13.04 ± 0.29 ± 2.22%	1.07 38%	97.34 9	0.0090 ± 0.0001
			Full External Error ± 0.41 Analytical Error ± 0.29	2.07 1.0335	2σ Confidence Limit Error Magnification	
				3 0.0000855875	Number of Iterations Convergence	
				41%	Spreading Factor	

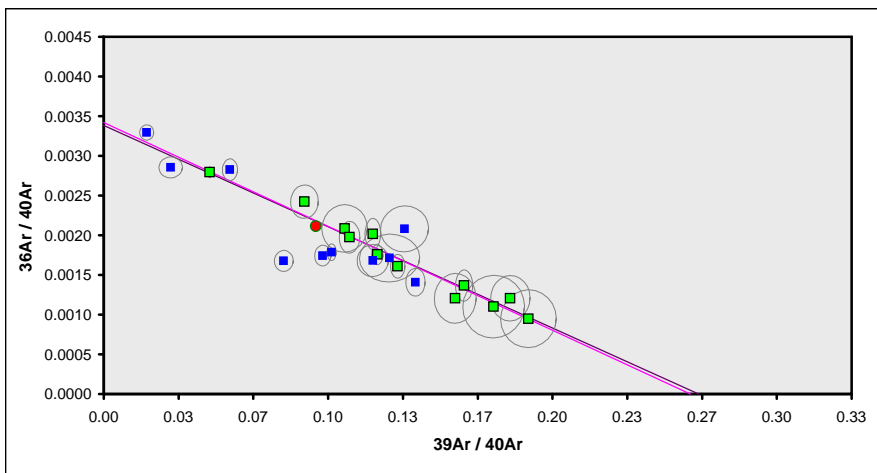
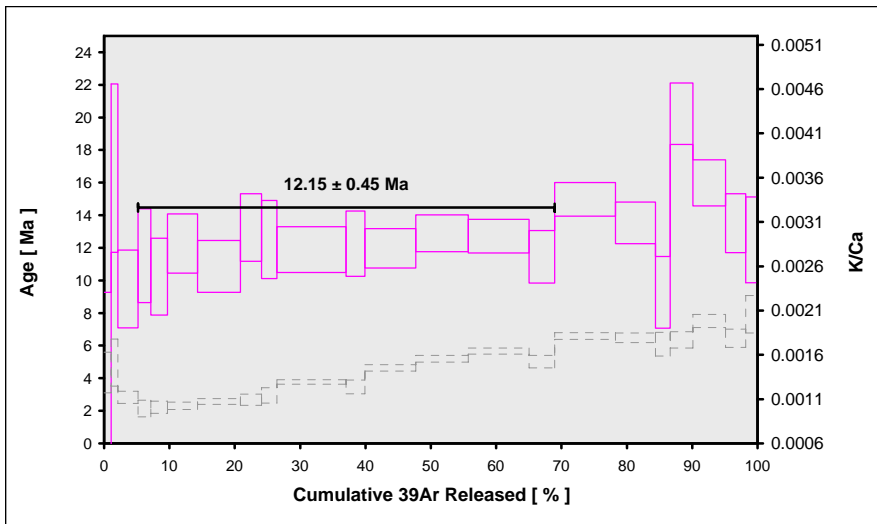


350 U1437E 43R-2 105-109 > IODP U1437E > Plagioclase > IBM | IODP 350 (14-INT-02)
15-OSU-04 (4A11-15) > Incremental Heating > Kevin Konrad

Information on Analysis
and Constants Used in Calculations

Sample = 350 U1437E 43R-2 105-109
Material = Plagioclase
Location = IODP U1437E
Analyst = Kevin Konrad
Project = IBM | IODP 350 (14-INT-02)
Mass Discrimination Law = LIN
Irradiation = 15-OSU-04 (4A11-15)
J = 0.00178827 ± 0.00000295
FCT-NM = 28.201 ± 0.023 Ma
IGSN = N/A
Preferred Age = Plateau Age
Classification = Crystallization Age
Experiment Type = Incremental Heating
Extraction Method = In Situ Laser Heating
Heating = 0 sec
Isolation = 3.00 min
Instrument = ARGUS-VI-D
Lithology = Andesitic Tuff
Lat-Lon = Undefined - Undefined
Collector Calibrations = 36Ar
Age Equations = Min et al. (2000)
Negative Intensities = Allowed
Decay Constant 40K = 5.530 ± 0.048 E-10 1/a
Decay Constant 39Ar = 2.940 ± 0.016 E-07 1/h
Decay Constant 37Ar = 8.230 ± 0.012 E-04 1/h
Decay Constant 36Cl = 2.257 ± 0.015 E-06 1/a
Decay Constant 40K(EC,β⁺) = 0.580 ± 0.009 E-10 1/a
Decay Constant 40K(β⁻) = 4.950 ± 0.043 E-10 1/a
Atmospheric Ratio 40/36(a) = 295.50
Atmospheric Ratio 38/36(a) = 0.1869
Production Ratio 39/37(ca) = 0.000676 ± 0.000009
Production Ratio 38/37(ca) = 0.000072 ± 0.000009
Production Ratio 36/37(ca) = 0.000266 ± 0.000000
Production Ratio 40/39(k) = 0.003823 ± 0.000102
Production Ratio 38/39(k) = 0.012031 ± 0.000019
Production Ratio 36/38(cl) = 262.80 ± 1.71
Scaling Ratio K/Ca = 0.430
Abundance Ratio 40K/K = 1.1700 ± 0.0100 E-04
Atomic Weight K = 39.0983 ± 0.0001 g

Results	40(a)/36(a) ± 2σ	40(r)/39(k) ± 2σ	Age ± 2σ (Ma)	MSWD	39Ar(k) (%n)	K/Ca ± 2σ
Age Plateau		3.77118 ± 0.13998 ± 3.71%	12.15 ± 0.45 ± 3.71% Full External Error ± 0.53 Analytical Error ± 0.45	0.97 47%	63.74 12	0.0013 ± 0.0001
Total Fusion Age		3.96832 ± 0.11282 ± 2.84%	12.79 ± 0.36 ± 2.85% Full External Error ± 0.46 Analytical Error ± 0.36		22	0.0014 ± 0.0000
Normal Isochron	293.15 ± 9.54 ± 3.25%	3.78008 ± 0.21842 ± 5.78%	12.18 ± 0.70 ± 5.77% Full External Error ± 0.75 Analytical Error ± 0.70	1.06 39%	63.74 12	0.0013 ± 0.0001
Inverse Isochron	292.55 ± 9.33 ± 3.19%	3.82545 ± 0.21112 ± 5.52%	12.33 ± 0.68 ± 5.51% Full External Error ± 0.73 Analytical Error ± 0.68	1.01 43%	63.74 12	0.0013 ± 0.0001
				0.0000332779	23 Convergence	
				0.0000170727	3 Convergence	
				54%	Spreading Factor	

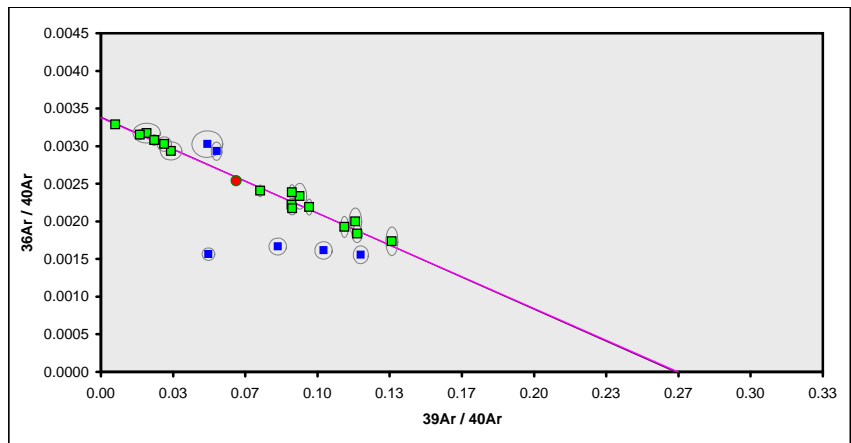
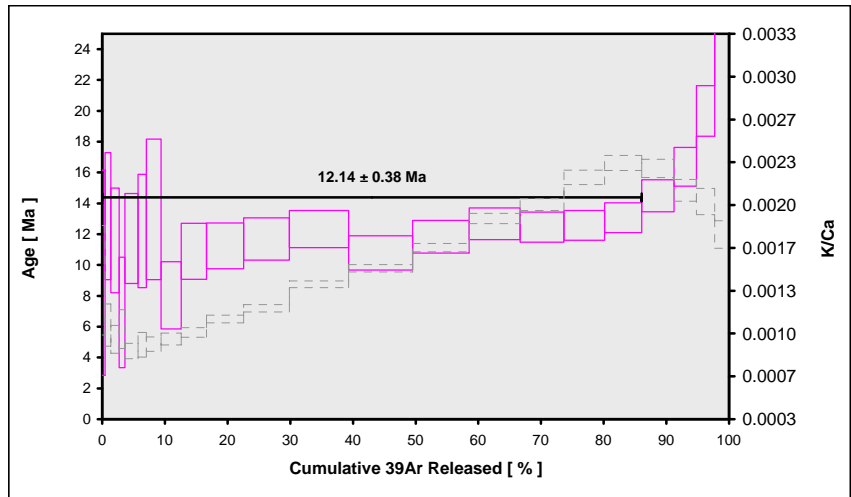


350 U1437E 43R-2 105-109 > IODP U1437E > Plagioclase > IBM | IODP 350 (14-INT-02)
15-OSU-04 (4A11-15) > Incremental Heating > Kevin Konrad

Information on Analysis
and Constants Used in Calculations

Sample = 350 U1437E 43R-2 105-109
Material = Plagioclase
Location = IODP U1437E
Analyst = Kevin Konrad
Project = IBM | IODP 350 (14-INT-02)
Mass Discrimination Law = LIN
Irradiation = 15-OSU-04 (4A11-15)
J = 0.00178827 ± 0.00000295
FCT-NM = 28.201 ± 0.023 Ma
IGSN = N/A
Preferred Age = Plateau Age
Classification = Crystallization Age
Experiment Type = Incremental Heating
Extraction Method = In Situ Laser Heating
Heating = 77 sec
Isolation = 1.50 min
Instrument = ARGUS-VI-D
Lithology = Andesitic Tuff
Lat-Lon = Undefined - Undefined
Collector Calibrations = 36Ar
Age Equations = Min et al. (2000)
Negative Intensities = Allowed
Decay Constant 40K = 5.530 ± 0.048 E-10 1/a
Decay Constant 39Ar = 2.940 ± 0.016 E-07 1/h
Decay Constant 37Ar = 8.230 ± 0.012 E-04 1/h
Decay Constant 36Cl = 2.257 ± 0.015 E-06 1/a
Decay Constant 40K(β⁻) = 0.580 ± 0.009 E-10 1/a
Decay Constant 40K(β⁺) = 4.950 ± 0.043 E-10 1/a
Atmospheric Ratio 40/36(a) = 295.50
Atmospheric Ratio 38/36(a) = 0.1869
Production Ratio 39/37(ca) = 0.000676 ± 0.000009
Production Ratio 38/37(ca) = 0.000072 ± 0.000009
Production Ratio 36/37(ca) = 0.000266 ± 0.000000
Production Ratio 40/39(k) = 0.003823 ± 0.000102
Production Ratio 38/39(k) = 0.012031 ± 0.000019
Production Ratio 36/38(cl) = 262.80 ± 1.71
Scaling Ratio K/Ca = 0.430
Abundance Ratio 40K/K = 1.1700 ± 0.0100 E-04
Atomic Weight K = 39.0983 ± 0.0001 g

Results	40(a)/36(a) ± 2σ	40(r)/39(k) ± 2σ	Age ± 2σ (Ma)	MSWD	39Ar(k) (% ,n)	K/Ca ± 2σ
Age Plateau		3.76809 ± 0.11755 ± 3.12%	12.14 ± 0.38 ± 3.13% Full External Error ± 0.47 Analytical Error ± 0.38	1.17 29% 1.73 1.0825	81.93 16 2σ Confidence Limit Error Magnification	0.0014 ± 0.0002
Total Fusion Age		3.99248 ± 0.10531 ± 2.64%	12.86 ± 0.34 ± 2.65% Full External Error ± 0.45 Analytical Error ± 0.34		22	0.0015 ± 0.0000
Normal Isochron	296.19 ± 2.88 ± 0.97%	3.73027 ± 0.15011 ± 4.02%	12.02 ± 0.48 ± 4.02% Full External Error ± 0.55 Analytical Error ± 0.48	1.28 21% 1.76 1.1294	81.93 16 2σ Confidence Limit Error Magnification	
				9 0.0000265155	Number of Iterations Convergence	
Inverse Isochron	296.13 ± 2.84 ± 0.96%	3.75175 ± 0.14707 ± 3.92%	12.09 ± 0.47 ± 3.92% Full External Error ± 0.55 Analytical Error ± 0.47	1.23 24% 1.76 1.1104	81.93 16 2σ Confidence Limit Error Magnification	
				2 0.0006435031	Number of Iterations Convergence	
				48%	Spreading Factor	

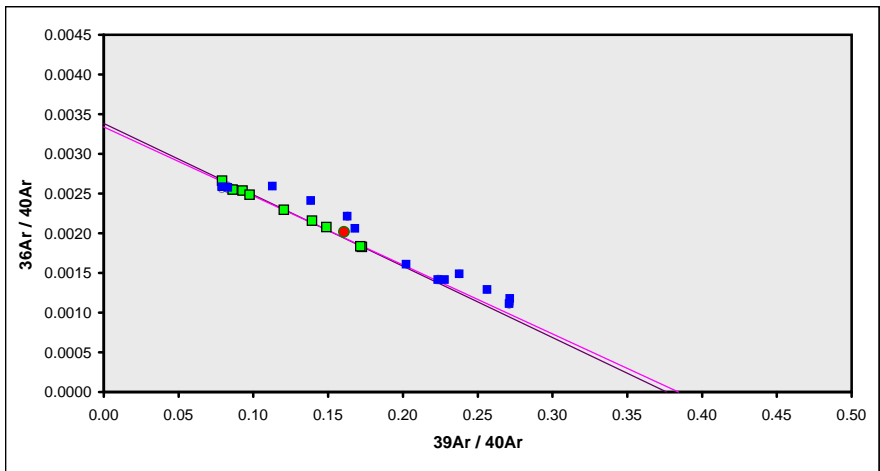
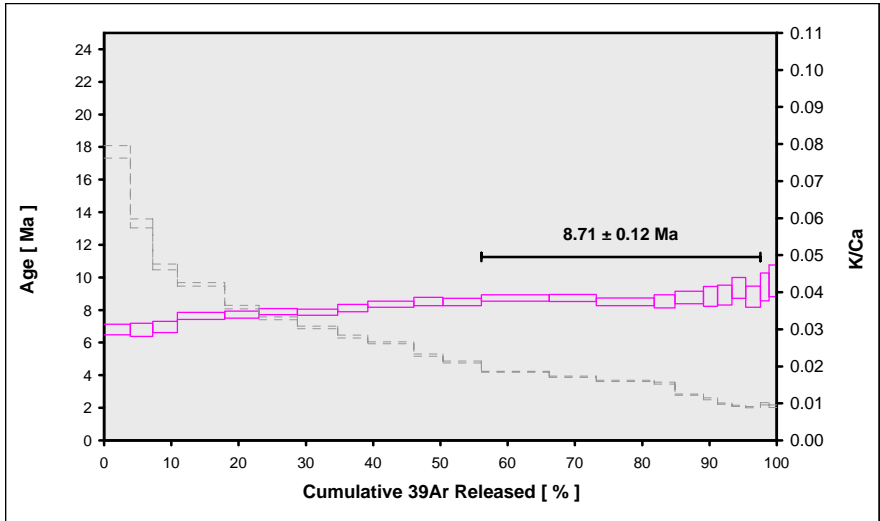


350 U1437E 56R-5 126-130 > IODP U1437E > Groundmass > IBM | IODP 350 (14-INT-02)
15-OSU-04 (4A2-15) > Incremental Heating > Kevin Konrad

Information on Analysis
and Constants Used in Calculations

Sample = 350 U1437E 56R-5 126-130
Material = Groundmass
Location = IODP U1437E
Analyst = Kevin Konrad
Project = IBM | IODP 350 (14-INT-02)
Mass Discrimination Law = LIN
Irradiation = 15-OSU-04 (4A2-15)
J = 0.00181665 ± 0.00000305
FCT-NM = 28.201 ± 0.023 Ma
IGSN = N/A
Preferred Age = Plateau Age
Classification = Eruption Age
Experiment Type = Incremental Heating
Extraction Method = In Situ Laser Heating
Heating = 0 sec
Isolation = 3.00 min
Instrument = ARGUS-VI-D
Lithology = Andesitic Tuff
Lat-Lon = Undefined - Undefined
Collector Calibrations = 36Ar
Age Equations = Min et al. (2000)
Negative Intensities = Allowed
Decay Constant 40K = 5.530 ± 0.048 E-10 1/a
Decay Constant 39Ar = 2.940 ± 0.016 E-07 1/h
Decay Constant 37Ar = 8.230 ± 0.012 E-04 1/h
Decay Constant 36Cl = 2.257 ± 0.015 E-06 1/a
Decay Constant 40K(EC,β⁺) = 0.580 ± 0.009 E-10 1/a
Decay Constant 40K(β⁻) = 4.950 ± 0.043 E-10 1/a
Atmospheric Ratio 40/36(a) = 295.50
Atmospheric Ratio 38/36(a) = 0.1869
Production Ratio 39/37(ca) = 0.000676 ± 0.000009
Production Ratio 38/37(ca) = 0.000072 ± 0.000009
Production Ratio 36/37(ca) = 0.000266 ± 0.000000
Production Ratio 40/39(k) = 0.003823 ± 0.000102
Production Ratio 38/39(k) = 0.012031 ± 0.000019
Production Ratio 36/38(cl) = 262.80 ± 1.71
Scaling Ratio K/Ca = 0.430
Abundance Ratio 40K/K = 1.1700 ± 0.0100 E-04
Atomic Weight K = 39.0983 ± 0.0001 g

Results	40(a)/36(a) ± 2σ	40(r)/39(k) ± 2σ	Age ± 2σ (Ma)	MSWD	39Ar(k) (%,n)	K/Ca ± 2σ
Age Plateau		2.65702 ± 0.03432 ± 1.29%	8.71 ± 0.12 ± 1.33% Full External Error ± 0.23 Analytical Error ± 0.11	1.14 33% 2.00 1.0684	41.51 9 2σ Confidence Limit Error Magnification	0.0136 ± 0.0025
Total Fusion Age		2.51531 ± 0.01928 ± 0.77%	8.24 ± 0.07 ± 0.83% Full External Error ± 0.20 Analytical Error ± 0.06		22	0.0205 ± 0.0001
Normal Isochron	299.31 ± 5.65 ± 1.89%	2.60139 ± 0.08772 ± 3.37%	8.53 ± 0.29 ± 3.38% Full External Error ± 0.35 Analytical Error ± 0.29	1.03 41% 2.07 1.0158	41.51 9 2σ Confidence Limit Error Magnification	
				6 0.0000181379	Number of Iterations Convergence	
Inverse Isochron	299.36 ± 5.63 ± 1.88%	2.60182 ± 0.08711 ± 3.35%	8.53 ± 0.29 ± 3.36% Full External Error ± 0.34 Analytical Error ± 0.28	1.03 41% 2.07 1.0147	41.51 9 2σ Confidence Limit Error Magnification	
				3 0.0000134130	Number of Iterations Convergence	
				24%	Spreading Factor	

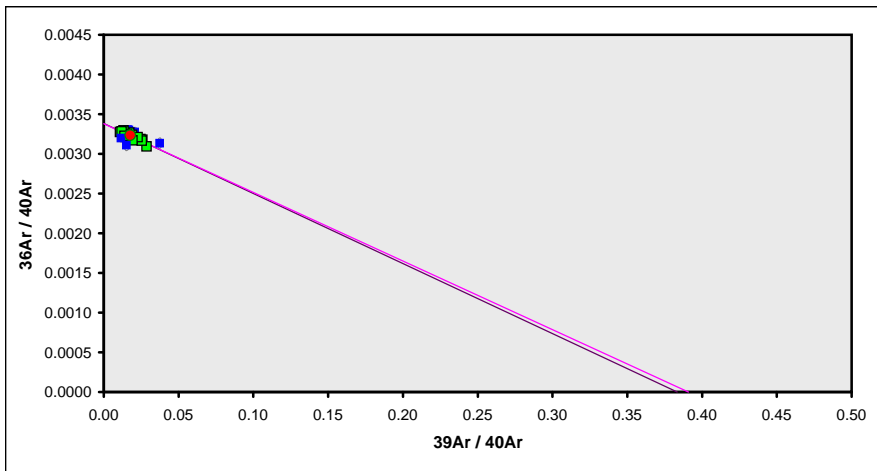
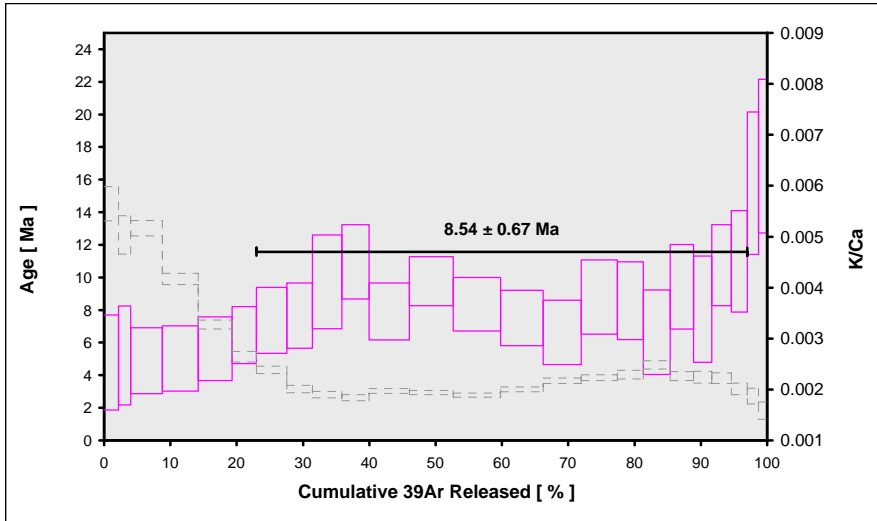


350 U1437E 56R-5 126-130 > IODP U1437E > Plagioclase > IBM | IODP 350 (14-INT-02)
15-OSU-04 (4A3-15) > Incremental Heating > Kevin Konrad

Information on Analysis
and Constants Used in Calculations

Sample = 350 U1437E 56R-5 126-130
Material = Plagioclase
Location = IODP U1437E
Analyst = Kevin Konrad
Project = IBM | IODP 350 (14-INT-02)
Mass Discrimination Law = LIN
Irradiation = 15-OSU-04 (4A3-15)
J = 0.00181402 ± 0.00000303
FCT-NM = 28.201 ± 0.023 Ma
IGSN = N/A
Preferred Age = Plateau Age
Classification = Crystallization Age
Experiment Type = Incremental Heating
Extraction Method = In Situ Laser Heating
Heating = 0 sec
Isolation = 3.00 min
Instrument = ARGUS-VI-D
Lithology = Andesitic Tuff
Lat-Lon = Undefined - Undefined
Collector Calibrations = 36Ar
Age Equations = Min et al. (2000)
Negative Intensities = Allowed
Decay Constant 40K = 5.530 ± 0.048 E-10 1/a
Decay Constant 39Ar = 2.940 ± 0.016 E-07 1/h
Decay Constant 37Ar = 8.230 ± 0.012 E-04 1/h
Decay Constant 36Cl = 2.257 ± 0.015 E-06 1/a
Decay Constant 40K(EC,β⁺) = 0.580 ± 0.009 E-10 1/a
Decay Constant 40K(β⁻) = 4.950 ± 0.043 E-10 1/a
Atmospheric Ratio 40/36(a) = 295.50
Atmospheric Ratio 38/36(a) = 0.1869
Production Ratio 39/37(ca) = 0.000676 ± 0.000009
Production Ratio 38/37(ca) = 0.000072 ± 0.000009
Production Ratio 36/37(ca) = 0.000266 ± 0.000000
Production Ratio 40/39(k) = 0.003823 ± 0.000102
Production Ratio 38/39(k) = 0.012031 ± 0.000019
Production Ratio 36/38(cl) = 262.80 ± 1.71
Scaling Ratio K/Ca = 0.430
Abundance Ratio 40K/K = 1.1700 ± 0.0100 E-04
Atomic Weight K = 39.0983 ± 0.0001 g

Results	40(a)/36(a) ± 2σ	40(r)/39(k) ± 2σ	Age ± 2σ (Ma)	MSWD	39Ar(k) (%.n)	K/Ca ± 2σ
Age Plateau		2.60811 ± 0.20562 ± 7.88%	8.54 ± 0.67 ± 7.87% Full External Error ± 0.70 Analytical Error ± 0.67	1.61 6% 1.2691	74.02 16 2σ Confidence Limit Error Magnification	0.0020 ± 0.0001
Total Fusion Age		2.45833 ± 0.14124 ± 5.75%	8.05 ± 0.46 ± 5.74% Full External Error ± 0.50 Analytical Error ± 0.46		24	0.0023 ± 0.0000
Normal Isochron	295.81 ± 4.09 ± 1.38%	2.54923 ± 0.72217 ± 28.33%	8.34 ± 2.36 ± 28.27% Full External Error ± 2.37 Analytical Error ± 2.36	1.72 4% 1.3113	74.02 16 2σ Confidence Limit Error Magnification Number of Iterations Convergence	
Inverse Isochron Clustered Points	295.81 ± 4.09 ± 1.38%	2.55856 ± 0.63569 ± 24.85%	8.37 ± 2.08 ± 24.79% Full External Error ± 2.08 Analytical Error ± 2.08	1.73 4% 1.3159	74.02 16 2σ Confidence Limit Error Magnification Number of Iterations Convergence Spreading Factor	

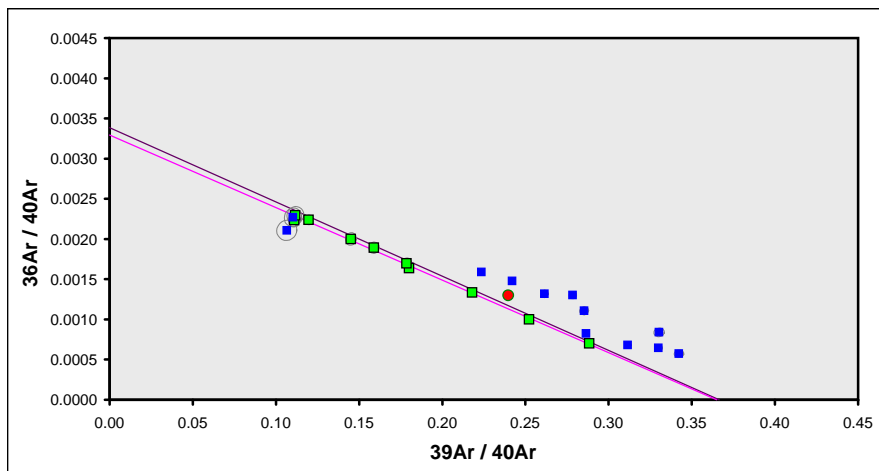
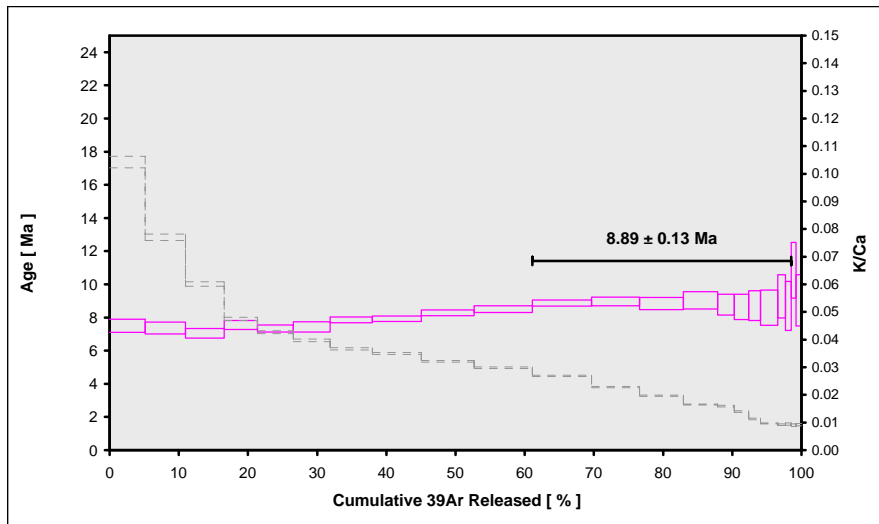


350 U1437E 57R-2 27-32 > IODP U1437E > Groundmass > IBM | IODP 350 (14-INT-02)
15-OSU-04 (4A6-15) > Incremental Heating > Kevin Konrad

Information on Analysis
and Constants Used in Calculations

Sample = 350 U1437E 57R-2 27-32
Material = Groundmass
Location = IODP U1437E
Analyst = Kevin Konrad
Project = IBM | IODP 350 (14-INT-02)
Mass Discrimination Law = LIN
Irradiation = 15-OSU-04 (4A6-15)
J = 0.00180607 ± 0.00000302
FCT-NM = 28.201 ± 0.023 Ma
IGSN = N/A
Preferred Age = Plateau Age
Classification = Eruption Age
Experiment Type = Incremental Heating
Extraction Method = In Situ Laser Heating
Heating = 0 sec
Isolation = 3.00 min
Instrument = ARGUS-VI-D
Lithology = Andesite
Lat-Lon = Undefined - Undefined
Collector Calibrations = 36Ar
Age Equations = Min et al. (2000)
Negative Intensities = Allowed
Decay Constant 40K = 5.530 ± 0.048 E-10 1/a
Decay Constant 39Ar = 2.940 ± 0.016 E-07 1/h
Decay Constant 37Ar = 8.230 ± 0.012 E-04 1/h
Decay Constant 36Cl = 2.257 ± 0.015 E-06 1/a
Decay Constant 40K(EC,β⁺) = 0.580 ± 0.009 E-10 1/a
Decay Constant 40K(β⁻) = 4.950 ± 0.043 E-10 1/a
Atmospheric Ratio 40/36(a) = 305.90 ± 7.59
Atmospheric Ratio 38/36(a) = 0.1869 ± 0.0019
Production Ratio 39/37(ca) = 0.000676 ± 0.000009
Production Ratio 38/37(ca) = 0.000072 ± 0.000009
Production Ratio 36/37(ca) = 0.000266 ± 0.000000
Production Ratio 40/39(k) = 0.003823 ± 0.000102
Production Ratio 38/39(k) = 0.012031 ± 0.000019
Production Ratio 36/38(cl) = 262.80 ± 1.71
Scaling Ratio K/Ca = 0.430
Abundance Ratio 40K/K = 1.1700 ± 0.0100 E-04
Atomic Weight K = 39.0983 ± 0.0001 g

Results	40(a)/36(a) ± 2σ	40(r)/39(k) ± 2σ	Age ± 2σ (Ma)	MSWD	39Ar(k) (%,n)	K/Ca ± 2σ
Age Plateau Overestimated Error		2.72819 ± 0.03890 ± 1.43%	8.89 ± 0.13 ± 1.46%	0.25 99%	37.44 10	0.0158 ± 0.0037
			Full External Error ± 0.24 Analytical Error ± 0.13	1.94 1.0000	2σ Confidence Limit Error Magnification	
Total Fusion Age		2.51708 ± 0.02430 ± 0.97%	8.20 ± 0.08 ± 1.02%		22	0.0264 ± 0.0001
			Full External Error ± 0.20 Analytical Error ± 0.08			
Normal Isochron	303.67 ± 6.32 ± 2.08%	2.74045 ± 0.04377 ± 1.60%	8.93 ± 0.15 ± 1.63%	0.73 66%	37.44 10	
			Full External Error ± 0.25 Analytical Error ± 0.14	2.00 1.0000	2σ Confidence Limit Error Magnification	
				29 0.0000268432	Number of Iterations Convergence	
Inverse Isochron	303.82 ± 6.35 ± 2.09%	2.74066 ± 0.04397 ± 1.60%	8.93 ± 0.15 ± 1.63%	0.75 65%	37.44 10	
			Full External Error ± 0.25 Analytical Error ± 0.14	2.00 1.0000	2σ Confidence Limit Error Magnification	
				3 0.0000340427	Number of Iterations Convergence	
				49%	Spreading Factor	



350 U1437E 57R-2 27-32 > IODP U1437E > Plagioclase > IBM | IODP 350 (14-INT-02)
15-OSU-04 (4A7-15) > Incremental Heating > Kevin Konrad

Information on Analysis
and Constants Used in Calculations

Sample = 350 U1437E 57R-2 27-32
Material = Plagioclase
Location = IODP U1437E
Analyst = Kevin Konrad
Project = IBM | IODP 350 (14-INT-02)
Mass Discrimination Law = LIN
Irradiation = 15-OSU-04 (4A7-15)
J = 0.00180253 ± 0.00000299
FCT-NM = 28.201 ± 0.023 Ma
IGSN = N/A
Preferred Age = Plateau Age
Classification = Crystallization Age
Experiment Type = Incremental Heating
Extraction Method = In Situ Laser Heating
Heating = 0 sec
Isolation = 3.00 min
Instrument = ARGUS-VI-D
Lithology = Andesite
Lat-Lon = Undefined - Undefined
Collector Calibrations = ³⁶Ar
Age Equations = Min et al. (2000)
Negative Intensities = Allowed
Decay Constant ⁴⁰K = 5.530 ± 0.048 E-10 1/a
Decay Constant ³⁹Ar = 2.940 ± 0.016 E-07 1/h
Decay Constant ³⁷Ar = 8.230 ± 0.012 E-04 1/h
Decay Constant ³⁶Cl = 2.257 ± 0.015 E-06 1/a
Decay Constant ⁴⁰K(EC,β⁺) = 0.580 ± 0.009 E-10 1/a
Decay Constant ⁴⁰K(β⁻) = 4.950 ± 0.043 E-10 1/a
Atmospheric Ratio ⁴⁰Ar/³⁶Ar = 295.50
Atmospheric Ratio ³⁸Ar/³⁶Ar = 0.1869
Production Ratio ³⁹Ar/³⁷Ar(ca) = 0.000676 ± 0.000009
Production Ratio ³⁸Ar/³⁷Ar(ca) = 0.000072 ± 0.000009
Production Ratio ³⁶Ar/³⁷Ar(ca) = 0.000266 ± 0.000000
Production Ratio ⁴⁰Ar/³⁹Ar(k) = 0.003823 ± 0.000102
Production Ratio ³⁸Ar/³⁹Ar(k) = 0.012031 ± 0.000019
Production Ratio ³⁶Ar/³⁸Ar(cl) = 262.80 ± 1.71
Scaling Ratio K/Ca = 0.430
Abundance Ratio ⁴⁰K/K = 1.1700 ± 0.0100 E-04
Atomic Weight K = 39.0983 ± 0.0001 g

Results	40(a)/36(a) ± 2σ	40(r)/39(k) ± 2σ	Age ± 2σ (Ma)	MSWD	³⁹ Ar(k) (%.n)	K/Ca ± 2σ
Age Plateau		3.20575 ± 0.13234 ± 4.13%	10.42 ± 0.43 ± 4.13%	1.29	98.31	0.0020 ± 0.0001
			Full External Error ± 0.49	1.60	2σ Confidence Limit	
			Analytical Error ± 0.43	1.1379	Error Magnification	
Total Fusion Age		3.22736 ± 0.12257 ± 3.80%	10.49 ± 0.40 ± 3.80%		24	0.0020 ± 0.0000
			Full External Error ± 0.46			
			Analytical Error ± 0.40			
Normal Isochron	294.65 ± 2.91 ± 0.99%	3.27301 ± 0.27680 ± 8.46%	10.64 ± 0.90 ± 8.44%	1.35	98.31	
			Full External Error ± 0.93	13%	23	
			Analytical Error ± 0.90	1.1604	2σ Confidence Limit	
				6	Error Magnification	
					Number of Iterations	
				0.0000065519	Convergence	
Inverse Isochron	294.70 ± 2.92 ± 0.99%	3.27838 ± 0.27288 ± 8.32%	10.65 ± 0.88 ± 8.31%	1.36	98.31	
			Full External Error ± 0.92	12%	23	
			Analytical Error ± 0.88	1.62	2σ Confidence Limit	
				1.1670	Error Magnification	
				3	Number of Iterations	
				0.0000021984	Convergence	
				21%	Spreading Factor	

