SUPPLEMENTARY MATERIAL

The following supporting materials provide additional background information pertaining to the $^{40}Ar/^{39}Ar$ and U-Pb results, and intercalibration techniques discussed in the main text. Data Repository item one (DR. 1) includes sample locality information of individual ash beds and sample processing techniques used at UW-Madison. Complete $^{40}Ar/^{39}Ar$ methods with details on data treatment and all relevant analytical information are located within Data Repository item two (DR. 2). Data Repository item three (DR. 3) includes all pertinent U-Pb data and methodology along with one figure, which demonstrates that several of the reported $^{206}Pb/^{238}U$ weighted mean ages violate stratigraphic order. Data Repository item four (DR. 4) includes a table and figure that compare $^{206}Pb/^{238}U$ weighted mean ages to $^{40}Ar/^{39}Ar$ weighted mean ages of individual ash beds. Lastly, Data Repository item five (DR. 5) provides details on the orbital time scale and the Bayesian methodology that we develop for the intercalibration of radioisotopic and astrochronologic data.

Data Repository item DR 1. General background information

Table DR 1. Western Interior Basin (U.S.A.) Sample Sites

Locations and descriptions of UW sampled bentonites

Biozone	UW- Sample number	Obradovich sample number	Lat(N)*	Long(W)*	meters above sea level	Description	Ob93 site
Pseudaspidoceras flexuosum (modified from Obradovich (1993) was once *V. birchbyi)*	AZLP-08-05 Lohali Pt, AZ	90-O-34	36.1849	109.8836	~2029 2029.05	BM-17 (Kirkland, 1991), 20 cm thick bed, lower ~10 cm is orange, upper ~10 cm is grey, visible biotite. Sampled lower ~12 cm. Processed 9 kg, but did not yield sanidine. $^{40}Ar/^{39}Ar$ age based solely on Obradovich separate. New sample yielded zircon.	18
Watinoceras devonense (modified from Obradovich (1993) was once *P. flexuosum*)	AZLP-08-04 Lohali Pt., AZ	90-O-33	36.1849	109.8836	~2028.1	BM-15 (Kirkland, 1991), 60 cm thick bed, upper 10 cm is grey, middle 42 cm is massive olive green bentonitic clay, and lower 8 cm is orange and the most crystal rich layer. Processed 9 kg of lower 15 cm, which yielded sanidine ranging in size from ~125-150 µm. Sample yielded zircon.	19
	K-07-01C GSSP typle locality, Pueblo, CO		38.2803	104.7397	~1536.2	Bed 87 from GSSP type locality in Pueblo, CO (Kennedy et al 2005). Yielded 100-125 µm sanidine. Sample site was not previously dated by Obradovich.	
Neocardioceras juddii	K-07-01B GSSP typle locality, Pueblo, CO		38.2803	104.7397	~1536.2	Bed 80 from GSSP type locality in Pueblo, CO (Kennedy et al 2005), sampled separately by B. Sageman & D. Condon. Sample yielded 150-180 µm sanidine. Sample site was not previously dated by Obradovich. Sample yielded zircon.	
	NE-08-01 Thayer Co., NE	90-O-19	40.1731	97.4463	437.4	15-20 cm bed above HL-3? (Hattin, 1971), white bentonite that weathers to orange, and contains abundant medium grained biotite and feldspar. Processed 9 kg of lower ~12 cm, which yielded 125-150 µm sanidine. Sample yielded zircon.	20
	NM-08-02 Red Wash section, NM	90-O-49	36.8270	108.9550	1571.2	6-7 cm thick bed (Elder, 1991), grey, massive bentonite with light colored, thin 0.5 cm thick biotite-rich layers. $^{40}Ar/^{39}Ar$ age based solely on Obradovich separate. Sample not processed for zircon.	20
Euomphaloceras septemseriatum	AZLP-08-02 Lohali Pt., AZ	90-O-31	36.1835	109.8843	2021.1	BM-6 (Kirkland, 1991), 25 cm thick bed, distinct color gradient from dark olive at the top to a pale olive at the base, visible gypsum. Processed 9 kg from lower 5 cm. Yielded 150-180 µm sanidine, did not yield zircon.	21
Vascoceras diartianum	AZLP-08-01 Lohali Pt., AZ	90-O-30	36.1835	109.8843	2020	BM-5 (Kirkland, 1991), ~9 cm thick bed, massive grey bentonitic clay with dark upper layer, had visible biotite. Yielded <125 µm sanidine with detrital contamination. $^{40}Ar/^{39}Ar$ age based solely on Obradovich separate. Sample yielded zircon.	22

For further descriptions on outcrop localities please see the following references: (1) Lohali Point, Arizona (Kirkland, 1991), (2) Red Wash section, New Mexico (Elder, 1991), (3) Thayer County, Nebraska (Hattin, 1971), (4) GSSP type locality, Pueblo, CO (Kennedy et al., 2005). Previous radioisotopic studies on these bentonites include: (1) Kowalis et al. (1995), (2) Obradovich (1993), and (3) Obradovich and Cobban (1975). Biozones used here rely on Cobban et al. (2006).
Unless indicated all UW-samples were collected by B. Sageman, B. Singer and S. Siewert in September 2008.
*reported in GPS WGS-84 format

DR 1 cont'd. Sample Processing procedures at UW-Madison

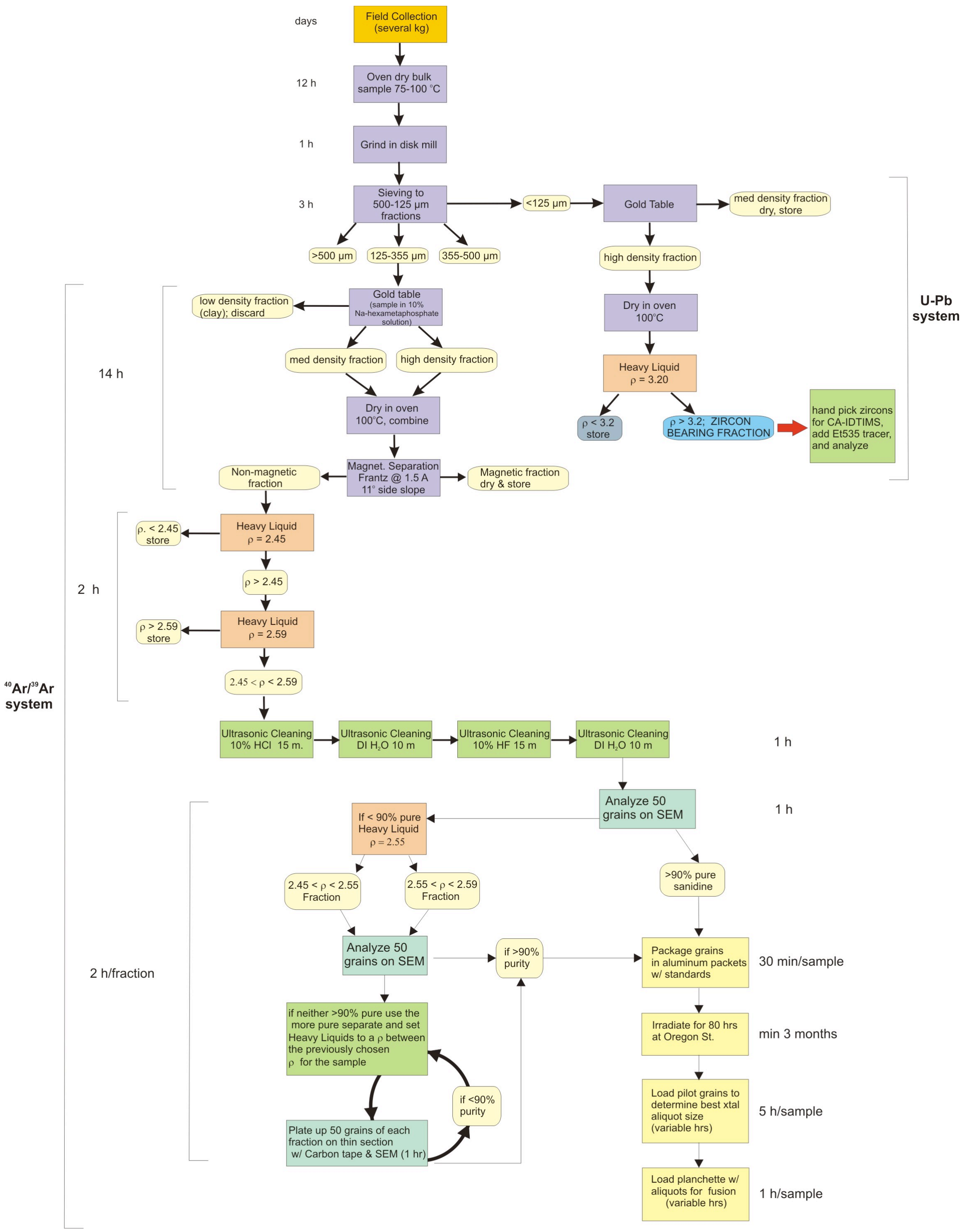


Figure DR 1. Sample Processing procedures at UW-Madison.

Data Repository item DR 2. $^{40}Ar/^{39}Ar$ methodology

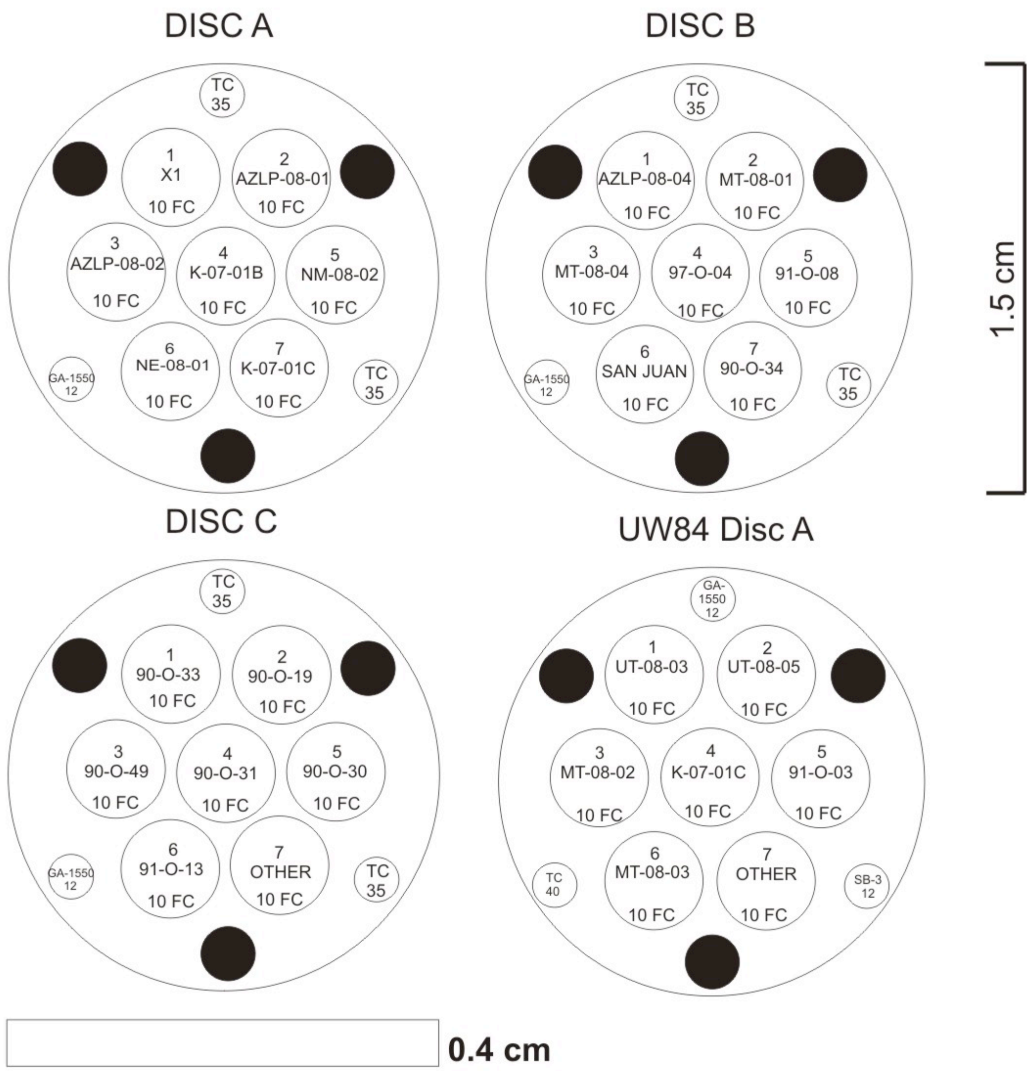
Approximately 9 kg of bulk material from each of the ash beds was processed for K-feldspar using separating techniques outlined above. Purity of our sanidine separates and those from Obradovich (1993) legacy samples were assessed using a Hitachi S3400-N Scanning Electron Microscope (SEM) such that single K-feldspars were isolated completely from quartz and plagioclase impurities. K-feldspars were loaded into aluminum packets and placed into 1.5 cm diameter aluminum discs and co-irradiated with flux monitors for 80 hrs (experiments UW76; UW84) at the Oregon State University TRIGA reactor in the Cadmium-Lined In-Core Irradiation Tube (CLICIT) where they received fast-neutron doses of ~7.5− 5 × 10^{18} cm^{-2}. Corrections for undesirable nucleogenic reactions on ^{40}K and ^{40}Ca are based on irradiation constants obtained by measuring CaF and KFeSi glass and are: $[^{40}Ar/^{39}Ar]_K = 0.0000 \pm 0.0010$, $[^{38}Ar/^{39}Ar]_K = 0.01206 \pm 0.0005$, $[^{36}Ar/^{37}Ar]_{Ca} = 0.000264 \pm 0.00004$, and $[^{39}Ar/^{37}Ar]_{Ca} = 0.000673 \pm 0.0004$. Sanidine from the Fish Canyon Tuff (FCs) was used as the primary neutron fluence monitor; its age and associated uncertainty are discussed in the main text. To minimize uncertainties associated with the J-value, ten grains of FCs were placed directly in wells with each unknown, allowing determination of a J-value for each unknown. No appreciable horizontal gradient in J was observed due to random rotation of the TRIGA tube during the several increments of the 80 hour irradiation.

At the University of Wisconsin Madison Rare Gas Geochronology Laboratory, sanidine samples and standards were fused using a 25 Watt CO_2 laser, following a "clean-up" heating at about 0.1 W power to remove small amounts of adsorbed argon prior to fusion. In a fully automated analytical system, gas from blanks, the air pipette, and fused sanidine was exposed to two SAES GP-50 getters for 180 seconds in a 350 cm^3 clean-up system, then expanded into an

MAP 215-50 mass spectrometer, where its isotopic composition is measured via 8 cycles of peak jumping into a Balzers SEV-217 electron multiplier during a ~1000 second period following procedures of Smith et al. (2003; 2008). Regression of peak signal data was performed using ArArCALC software (Koppers et al 2002). Blanks were measured after every two unknowns and average values for ^{40}Ar and ^{36}Ar were 5 x 10^{-17} and 2 x 10^{-19} moles, respectively. Mass discrimination was assessed by analysis of aliquots of air from an automated pipette system before, during and after the analytical session (correction made relative to atmospheric ^{40}Ar/^{36}Ar = 295.5; Steiger and Jäger, 1977). Two analytical sessions were required to measure the samples from irradiation UW76. During the longer analytical session, 46 measurements of air yield a mean mass discrimination of 1.0000 ± 0.0001 (1σ) per amu. During the shorter session 16 measurements of air gave a mean mass discrimination of 1.0016 ± 0.0002 per amu. Similarly, 47 air measurements during the analytical session devoted to the UW84 irradiation yield a mean mass discrimination of 1.0033 ± 0.0002 per amu.

^{40}Ar/^{39}Ar ages for bentonites in five biozones (Table 1 in main text) were determined on the basis of 394 total single and multi-crystal laser-fusion experiments on eleven sanidine separates. Single crystal fusion of sanidine was performed on four samples that contained large (>150 μm) grains. However, single crystal fusions from seven separates were too small (<150 μm) to yield adequate signal to blank ratios, thus fusions of 2-7 crystals were necessary. Apparent ^{40}Ar/^{39}Ar ages were excluded from incorporation into weighted mean age calculations on the basis of the following criteria: (1) a radiogenic ^{40}Ar* content below 97% for the samples and below 98% for FCs monitor crystals, (2) small amounts of ^{39}Ar (e.g. <2 x 10^{-16} moles) compared to other measurements from the same sample, and (3) apparent ages that were distinguishable from weighted mean age after applying 2σ uncertainties.

DR 2 cont'd. Irradiation configuration for Cenomanian-Turonian interval ash beds



	UW76						UW 84 Disc A	
	Disc A		Disc B		Disc C			
Position	J-Value	2σ						
1			0.0208751	±0.14%	0.0208660	±0.08%		
2			0.0208690	±0.12%	0.0208649	±0.08%		
3	0.0208688	±0.14%	0.0208477	±0.12%	0.0208724	±0.08%		
4	0.0208727	±0.07%	0.0208602	±0.14%	0.0208596	±0.14%	0.0207206	±0.13%
5			0.0208649	±0.12%	0.0208524	±0.12%		
6	0.0208427	±0.07%	0.0208545	±0.10%	0.0208603	±0.18%		
7			0.0208375	± 0.11%				

Figure DR 2. Irradiation configuration for Cenomanian-Turonian interval ash beds

Table DR 2. ^{40}Ar/^{39}Ar Results

Complete ^{40}Ar/^{39}Ar Summary and details for Cenomanian-Turonian bentonites
Crystal aliquots fused for 75 sec using ~8.7 Watts; reported relative to FCs 28.201 Ma (Kuiper et al., 2008)

Sample: 90-O-34 Lab #: UW76B7b J: 0.0208375±0.000026 (1σ) D/amu: 1.00 ±0.0001 (1σ) MSWD = 0.59
Sanidine: 5 crystal aliquot of 125-150 μm size fraction

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	%^{40}Ar*	^{0}Ar*/^{39}Ar$_{K}$	± 1σ	Age (Ma)	± 2σ (Ma)	K/Ca
1	7.822E-15	1.341930	0.000597	0.526018	0.000333	0.006415	0.000029	0.000732	0.000031	0.000076	0.000017	99.0	2.513913	0.01565	93.46	± 1.13	70.2
2	9.102E-15	1.559445	0.000574	0.616066	0.000322	0.007415	0.000068	0.000829	0.000039	0.000045	0.000031	99.8	2.515653	0.01825	93.52	± 1.32	71.4
3	5.080E-15	0.876447	0.000457	0.342136	0.000401	0.004025	0.000039	0.000532	0.000008	0.000072	0.000024	98.6	2.508188	0.02812	93.25	± 2.04	62.7
4	7.281E-15	1.247565	0.000598	0.488070	0.000433	0.005872	0.000057	0.000793	0.000023	0.000063	0.000014	99.1	2.521399	0.01581	93.73	± 1.15	58.2
5	4.021E-15	0.694463	0.000421	0.268557	0.000194	0.003407	0.000036	0.000480	0.000054	0.000069	0.000022	98.0	2.513346	0.03397	93.44	± 2.46	53.5
6	5.549E-15	0.953850	0.000469	0.371281	0.000326	0.004414	0.000042	0.000588	0.000019	0.000065	0.000011	98.8	2.520515	0.01969	93.70	± 1.43	59.1
7	7.007E-15	1.202110	0.000415	0.473232	0.000347	0.005770	0.000049	0.000650	0.000026	0.000039	0.000016	99.8	2.521503	0.01707	93.74	± 1.24	67.2
8	5.670E-15	0.975670	0.000338	0.381040	0.000220	0.004540	0.000028	0.000507	0.000025	0.000056	0.000018	99.6	2.532163	0.02204	94.12	± 1.60	68.7
9	5.004E-15	0.859615	0.000456	0.330364	0.000498	0.004132	0.000040	0.000854	0.000036	0.000113	0.000015	96.6	2.494202	0.02034	92.75	± 1.48	36.5
10	3.265E-15	0.566982	0.000423	0.214724	0.000473	0.004118	0.000083	0.000787	0.000099	0.000122	0.000025	94.7	2.472304	0.04210	91.95	± 3.05	26.5
11	7.900E-15	1.355522	0.000873	0.527698	0.000352	0.006485	0.000079	0.000729	0.000044	0.000089	0.000019	99.1	2.533266	0.01443	94.16	± 1.05	73.5
12	7.994E-15	1.372243	0.000840	0.526525	0.000752	0.008632	0.000083	0.003193	0.000623	0.000170	0.000022	97.8	2.536207	0.01607	94.27	± 1.16	15.3
13	1.574E-14	2.677334	0.001429	0.995071	0.000576	0.012604	0.000040	0.003007	0.000055	0.000521	0.000024	94.6	2.539023	0.00886	94.37	± 0.64	31.3
14	3.179E-15	0.553838	0.000175	0.213161	0.000228	0.002608	0.000028	0.000258	0.000024	0.000096	0.000010	95.9	2.462814	0.03121	91.61	± 2.26	121.6
15	3.828E-15	0.658816	0.006688	0.245769	0.000430	0.003886	0.000027	0.001992	0.000036	0.000162	0.000024	93.8	2.491240	0.04690	92.64	± 3.40	11.3
16	2.849E-15	0.492553	0.000436	0.190840	0.000200	0.002424	0.000035	0.000454	0.000020	0.000059	0.000014	98.2	2.502950	0.03776	93.06	± 2.74	39.3
17	5.405E-15	0.927256	0.000929	0.363184	0.000263	0.004459	0.000036	0.000456	0.000020	0.000044	0.000012	99.8	2.531965	0.01903	94.12	± 1.38	74.3
18	3.279E-15	0.568802	0.000686	0.220263	0.000240	0.003997	0.000110	0.001335	0.000073	0.000068	0.000044	98.6	2.519899	0.06502	93.68	± 4.71	15.1
19	1.429E-14	2.438774	0.005720	0.954334	0.002241	0.018370	0.000170	0.007580	0.000174	0.000086	0.000026	99.5	2.536402	0.01323	94.28	± 0.96	11.4
20	5.309E-15	0.918211	0.000281	0.359435	0.000167	0.004830	0.000067	0.001156	0.000100	0.000061	0.000013	99.1	2.516446	0.01951	93.55	± 1.41	31.3
21	7.761E-15	1.335688	0.001087	0.495657	0.000565	0.006194	0.000053	0.001310	0.000046	0.000314	0.000015	93.5	2.509877	0.01534	93.31	± 1.11	37.8
22	7.273E-15	1.252410	0.001091	0.419823	0.000516	0.005504	0.000049	0.001027	0.000048	0.000641	0.000004	85.2	2.531705	0.01043	94.11	± 0.76	36.4
23	8.564E-15	1.469927	0.000235	0.526921	0.000261	0.006441	0.000056	0.000968	0.000037	0.000523	0.000012	89.8	2.494545	0.00983	92.76	± 0.71	48.8
24	5.043E-15	0.872477	0.000868	0.326566	0.000181	0.003983	0.000046	0.000537	0.000032	0.000190	0.000010	94.3	2.498361	0.01546	92.90	± 1.12	54.5
25	6.332E-15	1.089161	0.000457	0.424698	0.000451	0.005138	0.000054	0.000826	0.000024	0.000061	0.000018	99.1	2.525762	0.01577	93.89	± 1.14	48.8
26	3.731E-15	0.647705	0.004612	0.243222	0.000257	0.003511	0.000047	0.001594	0.000032	0.000125	0.000012	95.7	2.523937	0.02921	93.82	± 2.12	14.3
27	4.118E-15	0.710747	0.000358	0.278309	0.000250	0.003346	0.000037	0.000812	0.000017	0.000042	0.000013	99.9	2.528906	0.02010	94.00	± 1.46	37.5
28	4.452E-15	0.766587	0.000229	0.296139	0.000314	0.003506	0.000024	0.000440	0.000023	0.000075	0.000010	98.6	2.532683	0.01689	94.14	± 1.22	88.5
29	1.951E-15	0.342300	0.000158	0.130993	0.000212	0.001591	0.000021	0.000273	0.000019	0.000044	0.000028	99.6	2.559027	0.07114	95.10	± 5.15	70.2
30	7.665E-15	1.319673	0.000904	0.518057	0.000343	0.006260	0.000035	0.000523	0.000008	0.000070	0.000012	99.6	2.506978	0.01401	93.21	± 1.02	60.7
31	1.082E-14	1.856519	0.000815	0.731315	0.000299	0.008714	0.000050	0.000712	0.000025	0.000089	0.000007	99.4	2.502827	0.00898	93.06	± 0.65	62.8
32	1.118E-14	1.923161	0.001013	0.736563	0.000299	0.008918	0.000038	0.000856	0.000025	0.000211	0.000014	97.4	2.528849	0.01023	94.00	± 0.74	53.0
33	1.290E-14	2.216190	0.001087	0.865587	0.000619	0.010354	0.000040	0.001004	0.000024	0.000108	0.000007	99.1	2.525689	0.00787	93.89	± 0.57	52.9
34	1.644E-14	2.818393	0.000893	1.100407	0.000572	0.013338	0.000032	0.001217	0.000024	0.000072	0.000014	99.7	2.544138	0.00698	94.56	± 0.51	55.0
35	1.154E-14	1.989071	0.000659	0.784042	0.000285	0.009568	0.000053	0.000831	0.000043	0.000063	0.000008	99.6	2.516525	0.00859	93.56	± 0.62	58.3
36	1.548E-14	2.658450	0.000913	1.048208	0.000607	0.012374	0.000057	0.000969	0.000028	0.000055	0.000022	99.8	2.522643	0.00873	93.78	± 0.63	65.3
37	1.901E-14	3.256357	0.000780	1.283915	0.000411	0.015470	0.000034	0.001276	0.000023	0.000079	0.000022	99.6	2.519053	0.00708	93.65	± 0.51	59.7
38	8.561E-15	1.485232	0.000395	0.584331	0.000312	0.007155	0.000052	0.000532	0.000018	0.000057	0.000011	99.4	2.514387	0.01226	93.48	± 0.89	63.9
39	1.391E-14	2.390974	0.000737	0.942718	0.000443	0.011380	0.000036	0.000839	0.000023	0.000092	0.000033	99.2	2.506886	0.01238	93.21	± 0.90	65.0
40	7.336E-15	1.273979	0.000619	0.495809	0.000507	0.006041	0.000044	0.000513	0.000009	0.000072	0.000009	98.9	2.523342	0.01402	93.80	± 1.02	55.5
41	9.964E-15	1.717316	0.000903	0.646072	0.000497	0.007884	0.000034	0.000677	0.000020	0.000210	0.000013	96.7	2.557570	0.01175	95.04	± 0.85	55.1
Weighted Mean Age (33 of 41; 10, 13, 15, 21, 22, 23, 24, 34, 41):															93.67	± 0.21	

Sample: 90-O-33 Lab #: UW76C1b J: 0.020866 ±0.000019 (1σ) D/amu: 1.00 ±0.0001 (1σ) MSWD = 0.48
Sanidine: 5 crystal aliquot of 125-150 μm size fraction

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	%^{40}Ar*	^{0}Ar*/^{39}Ar$_{K}$	± 1σ	Age (Ma)	± 2σ (Ma)	K/Ca
1	1.966E-15	0.348207	0.000215	0.133479	0.000100	0.001615	0.000046	0.000191	0.000023	0.000050	0.000012	97.9	2.510327	0.04790	93.46	± 3.48	63.1
2	2.655E-15	0.464436	0.000274	0.178520	0.000085	0.002136	0.000031	0.000222	0.000029	0.000054	0.000013	97.4	2.502342	0.03660	93.17	± 2.66	72.3
3	3.832E-15	0.663300	0.000508	0.259656	0.000286	0.003108	0.000076	0.000386	0.000028	0.000048	0.000011	98.3	2.486878	0.02366	92.60	± 1.72	59.4
4	3.799E-15	0.656059	0.000235	0.256553	0.000196	0.003080	0.000042	0.000338	0.000022	0.000035	0.000012	99.0	2.508570	0.02491	93.39	± 1.81	67.4
5	2.995E-15	0.519198	0.000402	0.201305	0.000161	0.002382	0.000024	0.000249	0.000043	0.000085	0.000024	96.2	2.452050	0.04449	91.34	± 3.23	72.9
6	2.940E-15	0.509199	0.000437	0.195407	0.000169	0.002377	0.000045	0.000332	0.000024	0.000062	0.000008	98.1	2.525543	0.02965	94.01	± 2.15	52.3
7	4.581E-15	0.786599	0.000424	0.308110	0.000210	0.003759	0.000035	0.000447	0.000022	0.000058	0.000025	99.6	2.522384	0.02983	93.89	± 2.17	60.9
8	4.016E-15	0.691244	0.000465	0.269233	0.000327	0.003162	0.000056	0.000316	0.000016	0.000067	0.000018	99.5	2.532731	0.02810	94.27	± 2.04	76.1
9	5.258E-15	0.904194	0.000614	0.349037	0.000143	0.004218	0.000025	0.000543	0.000040	0.000087	0.000011	99.1	2.548892	0.01776	94.85	± 1.29	56.3
10	6.516E-15	1.119498	0.000573	0.436956	0.000168	0.005184	0.000046	0.000580	0.000023	0.000090	0.000020	99.0	2.520633	0.01817	93.83	± 1.32	65.7
11	5.110E-15	0.884377	0.000432	0.338845	0.000397	0.004002	0.000024	0.000461	0.000032	0.000095	0.000009	97.8	2.535488	0.01659	94.37	± 1.20	64.3
12	6.408E-15	1.104490	0.000420	0.427908	0.000186	0.005191	0.000026	0.000579	0.000021	0.000093	0.000003	98.3	2.522393	0.01160	93.89	± 0.84	64.2
13	5.909E-15	1.019740	0.000602	0.400533	0.000403	0.004750	0.000041	0.000533	0.000022	0.000041	0.000019	99.7	2.520488	0.01867	93.82	± 1.36	65.8
14	6.147E-15	1.059797	0.000941	0.415454	0.000201	0.004954	0.000020	0.000600	0.000031	0.000064	0.000008	99.0	2.509311	0.01330	93.42	± 0.97	60.8
15	5.596E-15	0.965511	0.000507	0.369839	0.000207	0.004357	0.000040	0.000582	0.000036	0.000105	0.000019	97.6	2.529856	0.02050	94.16	± 1.49	56.8
16	5.653E-15	0.973928	0.000508	0.382967	0.000341	0.004648	0.000035	0.000529	0.000012	0.000054	0.000012	99.1	2.502442	0.01584	93.17	± 1.15	67.3
17	1.099E-14	1.882503	0.002755	0.740625	0.001314	0.009217	0.000060	0.001141	0.000028	0.000086	0.000013	99.0	2.506451	0.01365	93.31	± 0.99	37.8
18	1.468E-14	2.506866	0.012259	0.983175	0.002939	0.013056	0.000065	0.000982	0.000053	0.000161	0.000031	98.4	2.500430	0.01934	93.10	± 1.40	58.7
19	5.259E-15	0.912247	0.001931	0.356670	0.000343	0.004551	0.000054	0.000549	0.000020	0.000072	0.000023	98.5	2.498364	0.03104	93.02	± 2.25	38.7
20	1.505E-14	2.571407	0.000423	1.015178	0.000494	0.012441	0.000054	0.001058	0.000035	0.000057	0.000010	99.7	2.515792	0.00881	93.65	± 0.64	56.0
21	9.849E-15	1.691275	0.001585	0.666496	0.000386	0.008137	0.000043	0.001156	0.000038	0.000040	0.000010	99.8	2.520652	0.01354	93.83	± 0.98	33.4
22	5.751E-15	0.997337	0.000422	0.392790	0.000330	0.004773	0.000068	0.000287	0.000019	0.000054	0.000013	99.2	2.499464	0.02373	93.06	± 1.72	85.8
23	7.506E-15	1.295599	0.000821	0.509991	0.000256	0.006160	0.000031	0.000424	0.000019	0.000055	0.000016	99.4	2.509112	0.01910	93.41	± 1.39	72.6
24	3.342E-15	0.590544	0.000377	0.229877	0.000221	0.002720	0.000021	0.000214	0.000011	0.000044	0.000008	99.2	2.515040	0.03880	93.63	± 2.82	68.7
25	6.197E-15	1.075014	0.000878	0.420855	0.000194	0.004972	0.000028	0.000438	0.000032	0.000054	0.000021	99.3	2.517318	0.02491	93.71	± 1.81	57.5
26	8.949E-15	1.541909	0.000535	0.609084	0.000329	0.007360	0.000053	0.000502	0.000030	0.000040	0.000017	99.8	2.512258	0.01611	93.53	± 1.17	72.1
27	1.195E-14	2.050578	0.000562	0.808348	0.000250	0.009651	0.000044	0.000816	0.000012	0.000039	0.000008	99.9	2.522297	0.01084	93.89	± 0.79	57.6
28	1.590E-14	2.721064	0.000760	1.073657	0.000236	0.012863	0.000011	0.000931	0.000021	0.000044	0.000009	99.8	2.521698	0.00818	93.87	± 0.59	66.9

29	1.614E-14	2.762694	0.001865	1.034831	0.000638	0.012411	0.000041	0.000941	0.000031	0.000077	0.000006	99.5	2.647964	0.00877	98.44	± 0.63	63.6
30	1.298E-14	2.227362	0.000724	0.818273	0.000489	0.009854	0.000057	0.000778	0.000015	0.000541	0.000018	93.1	2.526243	0.01220	94.03	± 0.89	61.0
31	1.840E-14	3.147224	0.001377	1.017710	0.000371	0.012660	0.000032	0.000923	0.000013	0.001939	0.000029	81.9	2.528947	0.01185	94.13	± 0.86	63.6
32	1.234E-14	2.120311	0.000855	0.822929	0.000300	0.010024	0.000058	0.000673	0.000010	0.000168	0.000007	98.1	2.516034	0.01055	93.66	± 0.77	71.1
33	9.737E-15	1.680208	0.001296	0.652523	0.000498	0.007933	0.000043	0.000584	0.000015	0.000093	0.000019	98.9	2.534358	0.01583	94.33	± 1.15	65.0
34	1.180E-14	2.030739	0.000859	0.799526	0.000451	0.009871	0.000025	0.000765	0.000025	0.000073	0.000009	99.4	2.514284	0.01119	93.60	± 0.81	60.3
35	1.660E-14	2.844122	0.001073	1.114489	0.000310	0.013432	0.000059	0.000944	0.000027	0.000098	0.000015	99.4	2.527827	0.00856	94.09	± 0.62	67.8
36	1.299E-14	2.232752	0.000554	0.806126	0.000335	0.009852	0.000028	0.000674	0.000023	0.000648	0.000009	91.9	2.536643	0.01103	94.41	± 0.80	69.1

Weighted Mean Age (31 of 36; 5, 29, 30, 31, 36): 93.76 ± 0.21

Sample: AZLP-08-04 Lab #: UW76B1b J: 0.0208751 ±0.000030 (1σ) D/amu: 1.00 ±0.0001 (1σ) MSWD = 0.32

Sanidine: 5 crystal aliquot of 125-150 μm size fraction

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	%^{40}Ar*	^{40}Ar*/^{39}Ar$_K$	± 1σ	Age (Ma)	± 2σ (Ma)	K/Ca
1	3.160E-15	0.543495	0.000229	0.212840	0.000193	0.002599	0.000023	0.000289	0.000026	0.000036	0.000013	100.0	2.523314	0.02797	93.97	± 2.03	70.7
2	3.154E-15	0.543671	0.000564	0.210801	0.000236	0.002488	0.000014	0.000309	0.000029	0.000071	0.000011	98.2	2.502831	0.02672	93.22	± 1.94	65.7
3	2.747E-15	0.475777	0.000336	0.183827	0.000224	0.002140	0.000038	0.000210	0.000019	0.000044	0.000014	99.8	2.547712	0.03326	94.85	± 2.41	89.0
4	2.626E-15	0.457015	0.000460	0.178869	0.000136	0.002142	0.000032	0.000307	0.000018	0.000043	0.000012	99.9	2.516100	0.03202	93.70	± 2.33	56.6
5	3.281E-15	0.568557	0.000313	0.222427	0.000129	0.002599	0.000040	0.000334	0.000026	0.000059	0.000009	99.0	2.501363	0.02387	93.17	± 1.73	64.0
6	4.001E-15	0.691010	0.000423	0.247840	0.000308	0.002988	0.000036	0.000298	0.000023	0.000233	0.000020	91.5	2.529885	0.03026	94.21	± 2.20	80.3
7	4.042E-15	0.698419	0.000204	0.273912	0.000299	0.003340	0.000033	0.000431	0.000037	0.000042	0.000013	99.6	2.514776	0.02176	93.66	± 1.58	58.4
8	3.498E-15	0.606115	0.000223	0.237200	0.000164	0.002890	0.000028	0.000305	0.000031	0.000053	0.000010	98.7	2.495206	0.02318	92.95	± 1.68	71.8
9	3.505E-15	0.607096	0.000376	0.237592	0.000137	0.002856	0.000043	0.000254	0.000025	0.000042	0.000004	99.0	2.501962	0.01982	93.19	± 1.44	85.1
10	3.337E-15	0.577803	0.000265	0.225685	0.000167	0.002720	0.000036	0.000391	0.000018	0.000034	0.000013	99.1	2.510080	0.02659	93.49	± 1.93	52.7
11	3.180E-15	0.550821	0.000484	0.215360	0.000150	0.002571	0.000039	0.000290	0.000027	0.000050	0.000020	98.3	2.485866	0.03507	92.61	± 2.55	70.2
12	2.765E-15	0.480222	0.000282	0.187771	0.000117	0.002293	0.000032	0.000237	0.000017	0.000022	0.000004	99.9	2.523314	0.02555	93.97	± 1.85	77.4
13	2.963E-15	0.513224	0.000400	0.184670	0.000203	0.002297	0.000035	0.000296	0.000026	0.000156	0.000013	92.2	2.535571	0.03287	94.41	± 2.39	59.1
14	3.247E-15	0.561273	0.000350	0.219066	0.000217	0.002675	0.000025	0.000314	0.000021	0.000027	0.000017	100.0	2.533510	0.03159	94.34	± 2.29	65.3
15	2.367E-15	0.412113	0.000393	0.158893	0.000081	0.001853	0.000052	0.000309	0.000012	0.000033	0.000012	99.6	2.546133	0.03701	94.79	± 2.69	47.5
16	2.333E-15	0.406301	0.000215	0.159153	0.000094	0.001893	0.000012	0.000202	0.000022	0.000042	0.000020	99.1	2.493556	0.04831	92.89	± 3.51	73.2
17	3.367E-15	0.581551	0.000171	0.221948	0.000175	0.002670	0.000022	0.000335	0.000034	0.000059	0.000018	98.6	2.556877	0.03167	95.18	± 2.30	59.8
18	2.925E-15	0.506690	0.000404	0.197172	0.000199	0.002316	0.000011	0.000165	0.000035	0.000044	0.000008	99.3	2.522080	0.02658	93.92	± 1.93	111.6
19	2.701E-15	0.468635	0.000335	0.178534	0.000100	0.002130	0.000035	0.000276	0.000034	0.000060	0.000016	98.3	2.547292	0.03697	94.84	± 2.68	60.1
20	2.808E-15	0.486759	0.000276	0.190217	0.000198	0.002342	0.000027	0.000228	0.000016	0.000035	0.000006	99.9	2.524458	0.02623	94.01	± 1.90	81.9
21	2.601E-15	0.451671	0.000383	0.176263	0.000183	0.002123	0.000038	0.000139	0.000019	0.000036	0.000006	99.8	2.523235	0.02835	93.96	± 2.06	151.2
22	6.416E-15	1.098002	0.000350	0.422309	0.000357	0.005004	0.000065	0.000611	0.000018	0.000110	0.000013	97.9	2.530787	0.01684	94.24	± 1.22	65.9
23	3.759E-15	0.651410	0.000296	0.255335	0.000177	0.003118	0.000031	0.000234	0.000026	0.000034	0.000013	99.8	2.518160	0.02680	93.78	± 1.95	67.9
24	7.027E-15	1.206120	0.000317	0.473630	0.000312	0.005746	0.000065	0.000388	0.000027	0.000056	0.000011	99.2	2.512208	0.01397	93.56	± 1.01	69.4
25	8.663E-15	1.484819	0.000617	0.583734	0.000257	0.007002	0.000053	0.000500	0.000013	0.000039	0.000011	99.8	2.525605	0.01133	94.05	± 0.82	66.3
26	7.488E-15	1.286240	0.000447	0.507338	0.000263	0.006187	0.000022	0.000481	0.000021	0.000039	0.000009	99.8	2.516242	0.01238	93.71	± 0.90	61.4
27	3.631E-15	0.633118	0.000272	0.247373	0.000281	0.002953	0.000028	0.000177	0.000026	0.000045	0.000015	99.5	2.520422	0.02982	93.86	± 2.17	103.6
28	4.043E-15	0.702655	0.000406	0.274352	0.000313	0.003294	0.000027	0.000256	0.000008	0.000042	0.000006	99.7	2.530127	0.02177	94.21	± 1.58	73.3
29	4.841E-15	0.837082	0.000407	0.327434	0.000339	0.003938	0.000030	0.000301	0.000017	0.000052	0.000011	99.3	2.519454	0.02011	93.83	± 1.46	71.3
30	5.979E-15	1.029172	0.000275	0.404251	0.000357	0.004712	0.000063	0.000378	0.000032	0.000034	0.000006	99.9	2.527682	0.01473	94.13	± 1.07	65.9
31	3.357E-15	0.582937	0.000281	0.228108	0.000210	0.002790	0.000030	0.000228	0.000016	0.000043	0.000016	99.3	2.510425	0.03271	93.50	± 2.38	60.1
32	2.793E-15	0.486152	0.000256	0.189698	0.000179	0.002241	0.000029	0.000160	0.000025	0.000042	0.000013	99.4	2.513938	0.03641	93.63	± 2.64	70.5

Weighted Mean Age (29 of 32; 6, 13, 22): 93.81 ± 0.33

Sample: K-07-01C Lab #: UW84A4 J: 0.0207206 ±0.000027 (1σ) D/amu: 1.0033 ±0.00015 (1σ) MSWD = 0.15

Sanidine: 7 crystal aliquot of 100-125 μm size fraction

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	%^{40}Ar*	^{40}Ar*/^{39}Ar$_K$	± 1σ	Age (Ma)	± 2σ (Ma)	K/Ca
1	3.030E-16	0.058228	0.000151	0.020991	0.000059	0.000260	0.000007	0.000023	0.000008	0.000030	0.000006	99.2	2.518636	0.12021	93.12	± 8.67	74.7
2	8.329E-16	0.146777	0.000093	0.055117	0.000067	0.000692	0.000017	0.000694	0.000015	0.000032	0.000004	99.6	2.574631	0.03498	95.14	± 2.52	2.7
3	4.634E-16	0.084204	0.000141	0.031089	0.000056	0.000392	0.000004	0.000478	0.000014	0.000032	0.000004	99.5	2.559545	0.06187	94.59	± 4.46	2.2
4	9.715E-16	0.170348	0.000253	0.064513	0.000156	0.000786	0.000010	0.000639	0.000014	0.000039	0.000005	98.4	2.539149	0.03210	93.86	± 2.31	3.4
5	1.526E-15	0.264319	0.000268	0.102344	0.000158	0.001216	0.000012	0.000592	0.000010	0.000030	0.000003	99.8	2.542988	0.01777	94.00	± 1.28	5.9
6	2.063E-15	0.355398	0.000291	0.137969	0.000131	0.001659	0.000011	0.000289	0.000010	0.000033	0.000007	99.2	2.528288	0.01919	93.47	± 1.38	16.3
7	7.784E-16	0.137740	0.000311	0.052672	0.000078	0.000601	0.000017	0.000033	0.000004	0.000022	0.000004	99.7	2.527481	0.03725	93.44	± 2.68	63.2
8	1.478E-15	0.256412	0.000148	0.098953	0.000157	0.001193	0.000011	0.000441	0.000013	0.000025	0.000005	99.5	2.536913	0.02156	93.78	± 1.55	7.6
9	6.807E-16	0.121330	0.000076	0.044752	0.000053	0.000542	0.000008	0.000164	0.000008	0.000033	0.000004	96.8	2.532092	0.04454	93.61	± 3.21	9.9
10	1.576E-15	0.273082	0.000201	0.105553	0.000106	0.001271	0.000018	0.000356	0.000008	0.000023	0.000003	99.9	2.547715	0.01619	94.17	± 1.17	10.4
11	1.517E-15	0.263094	0.000214	0.101110	0.000201	0.001258	0.000014	0.000261	0.000011	0.000023	0.000004	99.8	2.559346	0.02021	94.59	± 1.46	13.9
12	8.268E-16	0.146198	0.000142	0.055137	0.000117	0.000663	0.000011	0.000561	0.000009	0.000030	0.000004	98.2	2.532022	0.03476	93.60	± 2.51	3.4
13	1.085E-15	0.190038	0.000199	0.071851	0.000187	0.000869	0.000017	0.000329	0.000009	0.000031	0.000004	98.2	2.542200	0.03210	93.97	± 2.31	7.5
14	1.879E-15	0.324749	0.000158	0.125739	0.000105	0.001575	0.000012	0.000438	0.000010	0.000027	0.000004	99.6	2.541844	0.01774	93.96	± 1.28	9.8
15	1.131E-15	0.198097	0.000194	0.076439	0.000127	0.000963	0.000008	0.000196	0.000004	0.000025	0.000004	99.7	2.532437	0.02905	93.62	± 2.09	13.5
16	8.332E-16	0.147654	0.000121	0.055425	0.000079	0.000672	0.000018	0.000313	0.000011	0.000032	0.000003	98.5	2.552720	0.03846	94.35	± 2.77	6.0
17	4.033E-15	0.689831	0.000569	0.268876	0.000350	0.003202	0.000023	0.001135	0.000012	0.000046	0.000004	99.3	2.537011	0.00885	93.78	± 0.64	8.0
18	1.483E-15	0.257702	0.000162	0.099492	0.000086	0.001242	0.000017	0.000782	0.000015	0.000032	0.000006	99.6	2.541694	0.02531	93.95	± 1.82	4.3
19	1.743E-15	0.301668	0.000227	0.116732	0.000158	0.001433	0.000008	0.000776	0.000012	0.000037	0.000004	99.1	2.529303	0.01955	93.50	± 1.41	5.1
20	1.525E-15	0.264761	0.000195	0.102585	0.000172	0.001216	0.000021	0.000253	0.000009	0.000026	0.000005	99.9	2.542434	0.02340	93.98	± 1.69	14.0
21	7.015E-16	0.124983	0.000165	0.047386	0.000104	0.000571	0.000012	0.000433	0.000013	0.000036	0.000007	97.1	2.478932	0.05689	91.69	± 4.10	3.7
22	1.096E-15	0.197004	0.000166	0.073350	0.000069	0.000881	0.000020	0.000573	0.000011	0.000053	0.000003	97.1	2.515189	0.04459	93.00	± 3.21	3.9
23	1.093E-15	0.197135	0.000083	0.073268	0.000097	0.000905	0.000019	0.000279	0.000012	0.000057	0.000002	96.4	2.486360	0.04329	91.96	± 3.12	8.3
24	2.405E-15	0.419490	0.000399	0.160023	0.000168	0.001943	0.000019	0.000842	0.000018	0.000060	0.000004	98.3	2.525557	0.02079	93.37	± 1.50	5.9
25	1.835E-15	0.322331	0.000191	0.122211	0.000073	0.001437	0.000017	0.000392	0.000019	0.000040	0.000007	99.4	2.553376	0.02974	94.37	± 2.14	9.9
26	1.719E-15	0.300364	0.000277	0.114000	0.000150	0.001388	0.000022	0.000524	0.000009	0.000040	0.000008	98.9	2.546334	0.03367	94.12	± 2.43	6.8
27	1.975E-15	0.342013	0.000328	0.130302	0.000163	0.001608	0.000020	0.000983	0.000010	0.000057	0.000002	97.4	2.517050	0.02404	93.06	± 1.73	4.1
28	1.027E-15	0.189363	0.000170	0.070680	0.000108	0.000865	0.000022	0.000448	0.000013	0.000044	0.000002	99.9	2.534532	0.02547	93.69	± 1.84	4.5
29	1.635E-15	0.289478	0.000151	0.110700	0.000237	0.001355	0.000022	0.000251	0.000006	0.000041	0.000005	99.5	2.527945	0.02021	93.46	± 1.46	13.0
30	1.025E-15	0.183252	0.000142	0.069031	0.000184	0.000828	0.000009	0.000414	0.000011	0.000033	0.000003	99.8	2.544599	0.02819	94.06	± 2.03	4.8

31	1.865E-15	0.325043	0.000332	0.125284	0.000250	0.001503	0.000018	0.000113	0.000007	0.000034	0.000002	99.4	2.526801	0.01492	93.41	± 1.08	33.7
32	8.514E-16	0.153332	0.000124	0.056950	0.000073	0.000681	0.000019	0.000383	0.000009	0.000033	0.000003	98.9	2.539374	0.03333	93.87	± 2.40	4.3
33	9.568E-16	0.171365	0.000122	0.064372	0.000145	0.000755	0.000014	0.000623	0.000015	0.000031	0.000004	99.6	2.539539	0.03233	93.87	± 2.33	2.9
34	1.180E-15	0.209362	0.000069	0.079552	0.000099	0.000977	0.000016	0.000303	0.000009	0.000032	0.000004	99.5	2.529441	0.02466	93.51	± 1.78	7.5
35	9.906E-16	0.177148	0.000156	0.066444	0.000112	0.000829	0.000007	0.000257	0.000015	0.000033	0.000005	99.2	2.537297	0.03441	93.79	± 2.48	7.4
36	1.172E-15	0.207251	0.000165	0.078285	0.000151	0.000981	0.000016	0.000302	0.000007	0.000033	0.000007	99.5	2.547132	0.03485	94.15	± 2.51	7.4
37	6.546E-16	0.119187	0.000036	0.043307	0.000068	0.000549	0.000014	0.000391	0.000007	0.000034	0.000005	98.7	2.562620	0.05096	94.70	± 3.67	3.2
38	1.099E-15	0.193892	0.000166	0.073641	0.000139	0.000913	0.000015	0.000279	0.000007	0.000030	0.000003	99.8	2.540868	0.02548	93.92	± 1.84	7.6
39	1.017E-15	0.180258	0.000150	0.067970	0.000119	0.000846	0.000009	0.000389	0.000009	0.000028	0.000003	99.9	2.553208	0.02732	94.37	± 1.97	5.0

Weighted Mean Age (33 of 39; 2, 9, 21, 22, 23, 27): 93.83 ± 0.30

Sample: 90-O-19 Lab #: UW76C2b J: 0.0208649 ±0.000019 (1σ) D/amu: 1.00 ±0.0001 (1σ) MSWD = 0.29

Sanidine: 2-3 crystal aliquot of 125-150 μm size fraction

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± 1σ_{40} (10^{-15} V)	^{39}Ar (10^{-15} V)	±1σ_{39} (10^{-15} V)	^{38}Ar (10^{-15} V)	± 1σ_{38} (10^{-15} V)	^{37}Ar (10^{-15} V)	± 1σ_{37} (10^{-15} V)	^{36}Ar (10^{-15} V)	± 1σ_{36} (10^{-15} V)	%^{40}Ar*	^{40}Ar*/^{39}Ar$_K$	± 1σ	Age (Ma)	± 2σ (Ma)	K/Ca
1	4.600E-15	0.796406	0.000252	0.310417	0.000321	0.003735	0.000036	0.000306	0.000024	0.000056	0.000017	99.2	2.521218	0.02222	93.85	± 1.61	59.3
2	6.843E-15	1.177312	0.000432	0.461592	0.000741	0.005539	0.000036	0.000356	0.000019	0.000039	0.000020	99.9	2.531208	0.01710	94.21	± 1.24	76.0
3	6.592E-15	1.134922	0.000407	0.444550	0.000632	0.005412	0.000027	0.000388	0.000007	0.000040	0.000010	99.9	2.533802	0.01315	94.30	± 0.95	67.5
4	4.813E-15	0.832923	0.000335	0.326907	0.000307	0.003832	0.000016	0.000354	0.000017	0.000043	0.000015	99.8	2.521281	0.01994	93.85	± 1.45	54.7
5	3.597E-15	0.625387	0.000356	0.244744	0.000259	0.002876	0.000026	0.000158	0.000013	0.000046	0.000025	99.7	2.518146	0.03596	93.73	± 2.61	98.2
6	4.562E-15	0.788161	0.000446	0.307715	0.000404	0.003680	0.000040	0.000246	0.000016	0.000048	0.000013	99.7	2.529926	0.01990	94.16	± 1.44	76.8
7	4.984E-15	0.858575	0.000366	0.336787	0.000428	0.004074	0.000019	0.000312	0.000015	0.000066	0.000009	99.0	2.502715	0.01646	93.17	± 1.20	66.1
8	2.959E-15	0.515050	0.000252	0.200162	0.000148	0.002343	0.000041	0.000166	0.000023	0.000048	0.000013	99.3	2.520315	0.03043	93.81	± 2.21	78.9
9	4.110E-15	0.710198	0.000343	0.277186	0.000314	0.003244	0.000044	0.000211	0.000012	0.000032	0.000012	100.0	2.534798	0.02150	94.34	± 1.56	84.8
10	4.164E-15	0.719523	0.000469	0.283136	0.000222	0.003340	0.000024	0.000132	0.000024	0.000029	0.000005	99.9	2.513488	0.01770	93.57	± 1.28	153.5
11	2.897E-15	0.505892	0.000280	0.197081	0.000233	0.002451	0.000022	0.000199	0.000018	0.000024	0.000026	99.8	2.524277	0.04616	93.96	± 3.35	65.9
12	2.548E-15	0.447229	0.000450	0.172881	0.000145	0.002096	0.000008	0.000156	0.000015	0.000035	0.000009	98.8	2.515265	0.03141	93.63	± 2.28	78.1
13	3.542E-15	0.616040	0.000364	0.233457	0.000131	0.002890	0.000022	0.000239	0.000011	0.000077	0.000011	97.0	2.530023	0.02488	94.17	± 1.81	64.3
14	4.814E-15	0.831345	0.000354	0.301789	0.000396	0.003603	0.000035	0.000305	0.000020	0.000240	0.000015	91.9	2.511450	0.02198	93.49	± 1.60	63.4
15	3.297E-15	0.573571	0.000338	0.215712	0.000180	0.002572	0.000046	0.000158	0.000018	0.000108	0.000013	96.1	2.523552	0.02695	93.93	± 1.96	100.4
16	5.358E-15	0.923052	0.000470	0.361581	0.000270	0.004345	0.000050	0.000333	0.000018	0.000042	0.000009	100.0	2.531138	0.01450	94.21	± 1.05	68.6
17	3.458E-15	0.602075	0.000291	0.233868	0.000305	0.002766	0.000036	0.000181	0.000027	0.000047	0.000021	99.8	2.539303	0.03267	94.50	± 2.37	87.2
18	5.937E-15	1.022403	0.000528	0.400722	0.000313	0.004702	0.000039	0.000327	0.000015	0.000047	0.000012	99.9	2.529350	0.01406	94.14	± 1.02	75.8
19	6.969E-15	1.197798	0.000435	0.450240	0.000583	0.005472	0.000039	0.000482	0.000025	0.000192	0.000012	96.2	2.542412	0.01309	94.61	± 0.95	55.5
20	4.924E-15	0.851253	0.000222	0.332826	0.000246	0.004054	0.000019	0.000227	0.000023	0.000045	0.000011	99.7	2.526093	0.01659	94.02	± 1.20	90.9
21	4.217E-15	0.731069	0.000458	0.286540	0.000214	0.003461	0.000025	0.000262	0.000037	0.000043	0.000018	99.6	2.514990	0.02467	93.62	± 1.79	65.5
22	5.330E-15	0.919431	0.000468	0.358254	0.000310	0.004478	0.000038	0.000336	0.000013	0.000035	0.000008	100.0	2.544386	0.01414	94.69	± 1.03	62.7
23	4.421E-15	0.765118	0.000473	0.298423	0.000225	0.003500	0.000037	0.000244	0.000013	0.000041	0.000014	99.6	2.530778	0.02060	94.19	± 1.49	71.5
24	5.943E-15	1.023171	0.000417	0.400629	0.000426	0.004826	0.000013	0.000381	0.000019	0.000039	0.000012	99.8	2.529318	0.01442	94.14	± 1.05	60.3

Weighted Mean Age (21 of 24; 14, 15, 19): 94.07 ± 0.31

Sample: 90-O-49 Lab #: UW76C3b J: 0.0208724 ±0.000017 (1σ) D/amu: 1.00 ±0.0001 (1σ) MSWD = 0.35

Sanidine: 1 crystal aliquot of 150-180 μm size fraction

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± 1σ_{40} (10^{-15} V)	^{39}Ar (10^{-15} V)	±1σ_{39} (10^{-15} V)	^{38}Ar (10^{-15} V)	± 1σ_{38} (10^{-15} V)	^{37}Ar (10^{-15} V)	± 1σ_{37} (10^{-15} V)	^{36}Ar (10^{-15} V)	± 1σ_{36} (10^{-15} V)	%^{40}Ar*	^{40}Ar*/^{39}Ar$_K$	± 1σ	Age (Ma)	± 2σ (Ma)	K/Ca
1	9.309E-15	1.602531	0.000567	0.614787	0.000391	0.007503	0.000021	0.000533	0.000045	0.000139	0.000019	98.2	2.545661	0.01325	94.77	± 0.96	71.1
2	9.708E-15	1.669494	0.000766	0.655010	0.000536	0.007941	0.000048	0.000504	0.000030	0.000044	0.000009	99.9	2.535174	0.01003	94.39	± 0.73	79.1
3	1.286E-14	2.204012	0.000387	0.866921	0.000631	0.010292	0.000075	0.000741	0.000022	0.000045	0.000006	99.9	2.530235	0.00727	94.21	± 0.53	69.0
4	7.828E-15	1.352463	0.000586	0.523424	0.000251	0.006220	0.000068	0.000433	0.000020	0.000094	0.000009	98.8	2.535098	0.01249	94.38	± 0.91	71.0
5	9.089E-15	1.567331	0.000532	0.613571	0.000380	0.007174	0.000049	0.000446	0.000016	0.000054	0.000063	99.7	2.528798	0.03194	94.15	± 2.32	79.5
6	8.306E-15	1.434891	0.000428	0.562564	0.000268	0.006655	0.000027	0.000523	0.000032	0.000058	0.000022	99.6	2.519681	0.01587	93.82	± 1.15	62.0
7	1.068E-14	1.835593	0.001136	0.721467	0.000424	0.008701	0.000046	0.000662	0.000030	0.000047	0.000005	99.8	2.523524	0.00864	93.96	± 0.63	62.9
8	9.429E-15	1.622898	0.000516	0.629750	0.000209	0.007600	0.000032	0.000539	0.000023	0.000112	0.000003	98.6	2.522994	0.00944	93.94	± 0.69	67.4
9	6.819E-15	1.177383	0.000409	0.460481	0.000256	0.005432	0.000054	0.000664	0.000026	0.000046	0.000010	99.6	2.526871	0.01449	94.08	± 1.05	39.9
10	2.816E-15	0.497258	0.000254	0.190622	0.000251	0.002286	0.000039	0.000234	0.000024	0.000067	0.000010	97.4	2.504810	0.03510	93.28	± 2.55	46.4
11	4.918E-15	0.850321	0.000307	0.327725	0.000437	0.004019	0.000045	0.000213	0.000026	0.000070	0.000008	98.2	2.529440	0.01973	94.18	± 1.43	92.3
12	5.448E-15	0.939604	0.000574	0.352380	0.000227	0.004211	0.000030	0.000245	0.000023	0.000165	0.000015	95.3	2.523409	0.02120	93.96	± 1.54	87.6
13	8.140E-15	1.399297	0.000649	0.540672	0.000294	0.006544	0.000056	0.000428	0.000014	0.000101	0.000019	98.5	2.533956	0.01429	94.34	± 1.04	74.5
14	6.273E-15	1.082326	0.000451	0.423485	0.000656	0.005106	0.000029	0.000346	0.000016	0.000044	0.000014	99.7	2.526820	0.01632	94.08	± 1.18	72.7
15	5.024E-15	0.869746	0.000362	0.339368	0.000079	0.004176	0.000026	0.000305	0.000019	0.000066	0.000012	98.8	2.509367	0.01893	93.45	± 1.37	66.1
16	6.027E-15	1.039285	0.000398	0.406040	0.000412	0.004886	0.000032	0.000355	0.000019	0.000050	0.000017	99.5	2.526718	0.01801	94.08	± 1.31	67.5
17	5.923E-15	1.020967	0.000425	0.400347	0.000219	0.004822	0.000038	0.000356	0.000034	0.000037	0.000010	99.9	2.526622	0.01537	94.07	± 1.12	66.4
18	5.452E-15	0.940713	0.000216	0.368178	0.000171	0.004394	0.000035	0.000297	0.000024	0.000038	0.000020	99.8	2.529210	0.02158	94.17	± 1.57	73.5
19	3.968E-15	0.688683	0.000464	0.268640	0.000429	0.003190	0.000021	0.000219	0.000020	0.000050	0.000005	99.2	2.515205	0.02096	93.66	± 1.52	73.1
20	3.984E-15	0.691179	0.000469	0.268875	0.000148	0.003288	0.000028	0.000241	0.000019	0.000061	0.000006	98.8	2.510505	0.02080	93.49	± 1.51	66.3
21	4.577E-15	0.791285	0.000422	0.305668	0.000198	0.003599	0.000028	0.000246	0.000016	0.000073	0.000011	98.5	2.524237	0.02025	93.99	± 1.47	73.6
22	4.351E-15	0.752867	0.000617	0.285520	0.000150	0.003533	0.000016	0.000184	0.000023	0.000115	0.000008	96.7	2.525252	0.02048	94.03	± 1.49	93.4
23	5.134E-15	0.885238	0.000351	0.343986	0.000265	0.004177	0.000033	0.000293	0.000019	0.000036	0.000010	99.9	2.548072	0.01772	94.85	± 1.29	69.2
24	4.198E-15	0.726644	0.000362	0.281792	0.000366	0.003333	0.000044	0.000174	0.000023	0.000052	0.000007	99.2	2.531341	0.02062	94.25	± 1.50	96.9

Weighted Mean Age (21 of 24; 10, 12, 22): 94.15 ± 0.23

Sample: K-07-01-B Lab #: UW76A4b J: 0.0208727 ±0.000016 (1σ) D/amu: 1.00 ±0.0001 (1σ) MSWD = 0.35

Sanidine: 1 crystal aliquot of 150-180 μm size fraction

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± 1σ_{40} (10^{-15} V)	^{39}Ar (10^{-15} V)	±1σ_{39} (10^{-15} V)	^{38}Ar (10^{-15} V)	± 1σ_{38} (10^{-15} V)	^{37}Ar (10^{-15} V)	± 1σ_{37} (10^{-15} V)	^{36}Ar (10^{-15} V)	± 1σ_{36} (10^{-15} V)	%^{40}Ar*	^{40}Ar*/^{39}Ar$_K$	± 1σ	Age (Ma)	± 2σ (Ma)	K/Ca
1	5.552E-15	0.953295	0.000332	0.370727	0.000306	0.004536	0.000037	0.000574	0.000025	0.000067	0.000014	98.5	2.514353	0.01757	93.63	± 1.28	62.5
2	6.969E-15	1.196464	0.000669	0.461152	0.000378	0.005581	0.000029	0.000608	0.000024	0.000104	0.000019	97.9	2.526568	0.01680	94.07	± 1.22	72.5
3	3.336E-15	0.583426	0.000481	0.223644	0.000227	0.002756	0.000029	0.000236	0.000022	0.000057	0.000017	98.8	2.549726	0.03204	94.91	± 2.32	94.8
4	7.590E-15	1.304074	0.000674	0.507427	0.000376	0.006193	0.000041	0.000645	0.000036	0.000082	0.000010	99.1	2.532833	0.01185	94.30	± 0.86	74.7
5	3.478E-15	0.606387	0.000204	0.235811	0.000383	0.002871	0.000040	0.000357	0.000043	0.000052	0.000013	99.9	2.541525	0.02747	94.62	± 1.99	64.6

6	4.776E-15	0.825520	0.000522	0.322195	0.000163	0.003849	0.000031	0.000474	0.000024	0.000080	0.000015	98.9	2.514389	0.02074	93.63	± 1.51	65.9
7	3.980E-15	0.689630	0.000216	0.266610	0.000095	0.003244	0.000055	0.000328	0.000035	0.000084	0.000006	98.3	2.518612	0.02026	93.79	± 1.47	81.5
8	6.507E-15	1.117460	0.000582	0.432233	0.000472	0.005316	0.000033	0.000758	0.000051	0.000089	0.000022	98.7	2.535718	0.01931	94.41	± 1.40	54.3
9	5.641E-15	0.970938	0.000533	0.377857	0.000277	0.004521	0.000083	0.000551	0.000026	0.000037	0.000014	99.6	2.541733	0.01723	94.62	± 1.25	66.4
10	5.641E-15	0.970938	0.000533	0.377857	0.000277	0.004521	0.000083	0.000551	0.000026	0.000058	0.000021	98.9	2.525522	0.02154	94.04	± 1.56	66.4
11	3.968E-15	0.687744	0.000221	0.268455	0.000222	0.003291	0.000028	0.000385	0.000017	0.000047	0.000009	98.5	2.501460	0.02158	93.16	± 1.57	70.4
12	4.422E-15	0.764160	0.000393	0.297475	0.000206	0.003510	0.000048	0.000414	0.000039	0.000051	0.000015	98.8	2.518594	0.02307	93.78	± 1.68	73.4
13	6.513E-15	1.118938	0.000177	0.436561	0.000642	0.005416	0.000075	0.000570	0.000032	0.000045	0.000015	99.8	2.544032	0.01722	94.71	± 1.25	74.5
14	4.594E-15	0.794731	0.000331	0.309632	0.000164	0.003705	0.000026	0.000388	0.000025	0.000046	0.000008	99.7	2.538840	0.02023	94.52	± 1.47	76.8
15	3.433E-15	0.597575	0.000394	0.215072	0.000216	0.002640	0.000017	0.000292	0.000019	0.000228	0.000014	90.2	2.483653	0.03324	92.52	± 2.41	68.2
16	6.690E-15	1.148736	0.000916	0.450080	0.000314	0.005314	0.000025	0.000642	0.000021	0.000066	0.000029	99.2	2.516872	0.02298	93.72	± 1.67	64.3
17	3.655E-15	0.632694	0.000291	0.245673	0.000147	0.002927	0.000038	0.002666	0.000011	0.000039	0.000016	99.8	2.544883	0.03072	94.74	± 2.23	8.4
18	2.267E-15	0.396803	0.000382	0.153695	0.000187	0.001901	0.000048	0.000218	0.000025	0.000033	0.000012	99.8	2.536924	0.04506	94.45	± 3.27	67.3
19	2.701E-15	0.469690	0.000589	0.181843	0.000174	0.002184	0.000039	0.000314	0.000042	0.000048	0.000020	98.8	2.518886	0.04642	93.80	± 3.37	56.9
20	3.476E-15	0.601278	0.000286	0.234892	0.000302	0.002892	0.000015	0.000334	0.000018	0.000053	0.000020	98.8	2.502536	0.03547	93.20	± 2.58	70.6
21	4.714E-15	0.812321	0.000424	0.318456	0.000286	0.003808	0.000043	0.000662	0.000025	0.000035	0.000024	99.8	2.524633	0.02868	94.00	± 2.08	46.9
22	5.753E-15	0.989227	0.000620	0.384714	0.000347	0.004634	0.000058	0.000397	0.000021	0.000068	0.000009	98.8	2.523772	0.01684	93.97	± 1.22	101.5
23	4.677E-15	0.808465	0.000481	0.305883	0.000267	0.003605	0.000043	0.000472	0.000013	0.000125	0.000017	96.3	2.526733	0.02517	94.08	± 1.83	67.3
24	3.751E-15	0.651976	0.000240	0.253877	0.000259	0.003083	0.000039	0.000390	0.000023	0.000049	0.000015	98.8	2.514929	0.02888	93.65	± 2.10	69.8
25	4.621E-15	0.797844	0.000403	0.313479	0.000133	0.003808	0.000037	0.000447	0.000021	0.000053	0.000024	98.7	2.494013	0.02918	92.89	± 2.12	72.6
26	3.421E-15	0.591356	0.000258	0.230983	0.000153	0.002768	0.000047	0.000200	0.000012	0.000054	0.000006	98.7	2.498948	0.02087	93.07	± 1.52	69.0
27	3.809E-15	0.657196	0.000158	0.257819	0.000315	0.003051	0.000037	0.000230	0.000029	0.000038	0.000013	99.2	2.504845	0.02286	93.29	± 1.66	65.9
28	3.513E-15	0.607196	0.000224	0.237164	0.000226	0.002827	0.000031	0.000185	0.000012	0.000021	0.000017	99.7	2.526223	0.02877	94.06	± 2.09	76.2
29	1.916E-15	0.336693	0.000532	0.128107	0.000282	0.001552	0.000020	0.000116	0.000018	0.000034	0.000010	98.3	2.536634	0.04245	94.44	± 3.08	68.0
30	1.104E-15	0.199334	0.000162	0.075919	0.000121	0.000894	0.000027	0.000053	0.000010	0.000035	0.000025	98.2	2.500198	0.11623	93.12	± 8.44	101.1
31	5.177E-15	0.889588	0.000416	0.347875	0.000646	0.004237	0.000041	0.000187	0.000020	0.000038	0.000015	99.8	2.532358	0.01859	94.28	± 1.35	108.7
32	5.650E-15	0.971859	0.000212	0.380110	0.000293	0.004508	0.000045	0.000297	0.000023	0.000047	0.000016	99.7	2.532444	0.01487	94.29	± 1.08	72.9
33	3.877E-15	0.671853	0.000457	0.263093	0.000316	0.003206	0.000029	0.000183	0.000015	0.000037	0.000010	100.0	2.528620	0.01689	94.15	± 1.23	83.6
34	5.868E-15	1.008212	0.000373	0.394463	0.000124	0.004745	0.000046	0.000609	0.000024	0.000037	0.000025	99.8	2.534846	0.02064	94.37	± 1.50	36.0
35	2.355E-15	0.411940	0.000235	0.159322	0.000297	0.001934	0.000028	0.000114	0.000023	0.000031	0.000007	99.8	2.540063	0.02411	94.56	± 1.75	84.4
36	1.950E-15	0.341099	0.000200	0.131793	0.000112	0.001617	0.000015	0.000119	0.000017	0.000039	0.000010	98.7	2.507587	0.03247	93.39	± 2.36	66.5
37	1.744E-15	0.305184	0.000304	0.117573	0.000181	0.001437	0.000032	0.000098	0.000012	0.000041	0.000011	98.2	2.497460	0.03856	93.02	± 2.80	72.9
38	1.152E-15	0.203631	0.000208	0.077659	0.000149	0.000960	0.000025	0.000075	0.000020	0.000032	0.000021	98.8	2.512442	0.08990	93.56	± 6.53	65.7
39	6.329E-16	0.115418	0.000149	0.042547	0.000066	0.000522	0.000014	0.000012	0.000017	0.000035	0.000007	97.4	2.502534	0.09031	93.20	± 6.56	1920.8
40	2.790E-15	0.481362	0.000252	0.187409	0.000272	0.002216	0.000028	0.000137	0.000017	0.000036	0.000002	99.7	2.526477	0.01729	94.07	± 1.26	80.5
41	1.759E-15	0.307432	0.001247	0.118341	0.000471	0.001381	0.000035	0.000072	0.000016	0.000040	0.000019	99.3	2.529372	0.05694	94.18	± 4.13	101.9
42	5.936E-15	1.016670	0.000481	0.398654	0.000442	0.004708	0.000024	0.000299	0.000019	0.000048	0.000028	99.7	2.525894	0.02221	94.05	± 1.61	74.9
43	3.017E-15	0.522789	0.000385	0.202702	0.000145	0.002487	0.000019	0.000194	0.000026	0.000055	0.000014	99.0	2.522904	0.02574	93.94	± 1.87	59.3
44	2.011E-15	0.352839	0.000383	0.135792	0.000263	0.001635	0.000036	0.000121	0.000014	0.000034	0.000004	99.9	2.549512	0.02550	94.91	± 1.85	64.6
Weighted Mean Age (40 of 44; 2, 15, 23, 39):															94.07	± 0.27	

Sample: NE-08-01 Lab #: UW76A6b J: 0.0208427 ±0.0000015 (1σ) D/amu: 1.00 ±0.0001 (1σ) MSWD = 0.22

Sanidine: 2-3 crystal aliquot of 125-150 μm size fraction

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± 1σ_{40} (10^{-15} V)	^{39}Ar (10^{-15} V)	±1σ_{39} (10^{-15} V)	^{38}Ar (10^{-15} V)	± 1σ_{38} (10^{-15} V)	^{37}Ar (10^{-15} V)	± 1σ_{37} (10^{-15} V)	^{36}Ar (10^{-15} V)	± 1σ_{36} (10^{-15} V)	%$^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	Age (Ma)	± 2σ (Ma)	K/Ca
1	1.418E-15	0.248204	0.000321	0.094933	0.000065	0.001065	0.000016	0.000143	0.000012	0.000043	0.000020	99.1	2.518799	0.08037	93.66	± 5.83	75.3
2	1.654E-15	0.288539	0.000138	0.110162	0.000132	0.001313	0.000031	0.000115	0.000014	0.000039	0.000013	99.7	2.548801	0.05652	94.75	± 4.10	121.1
3	1.074E-15	0.191005	0.000191	0.071903	0.000095	0.000882	0.000022	0.000613	0.000018	0.000041	0.000024	99.4	2.544733	0.12115	94.60	± 8.78	10.2
4	2.831E-15	0.488995	0.000229	0.188697	0.000127	0.002274	0.000025	0.000288	0.000016	0.000050	0.000014	99.2	2.534187	0.03445	94.22	± 2.50	62.5
5	1.465E-15	0.258210	0.000353	0.093443	0.000180	0.001591	0.000040	0.000836	0.000042	0.000152	0.000034	86.5	2.326427	0.12171	86.67	± 8.86	9.5
6	2.076E-15	0.362100	0.000252	0.138189	0.000192	0.001736	0.000031	0.000645	0.000027	0.000049	0.000014	99.1	2.545939	0.04645	94.64	± 3.37	18.7
7	1.754E-15	0.308166	0.000163	0.117379	0.000211	0.001434	0.000041	0.001024	0.000010	0.000050	0.000019	98.9	2.537550	0.06391	94.34	± 4.63	9.7
8	1.981E-15	0.347065	0.000467	0.131034	0.000074	0.001562	0.000030	0.003319	0.000029	0.000072	0.000010	97.4	2.528855	0.04388	94.03	± 3.18	3.2
9	1.184E-15	0.212647	0.000301	0.080468	0.000110	0.000959	0.000023	0.000207	0.000028	0.000049	0.000026	98.4	2.515895	0.11516	93.56	± 8.35	39.6
10	2.279E-15	0.398474	0.007123	0.146494	0.002405	0.002243	0.000063	0.000730	0.000069	0.000113	0.000015	94.4	2.524014	0.07906	93.85	± 5.73	17.3
11	3.957E-15	0.683641	0.000482	0.262618	0.000339	0.004509	0.000065	0.000685	0.000062	0.000214	0.000049	92.3	2.378108	0.05823	88.55	± 4.23	33.4
12	3.361E-15	0.582962	0.001083	0.226235	0.000258	0.002674	0.000022	0.000707	0.000022	0.000064	0.000021	98.8	2.513075	0.03526	93.45	± 2.56	27.7
13	3.301E-15	0.573502	0.000360	0.220419	0.000128	0.002736	0.000024	0.000483	0.000021	0.000074	0.000017	98.2	2.523799	0.03173	93.84	± 2.30	40.8
14	3.734E-15	0.647267	0.000232	0.250315	0.000285	0.003125	0.000030	0.000306	0.000013	0.000055	0.000011	99.3	2.538781	0.02349	94.39	± 1.70	78.2
15	3.898E-15	0.675775	0.000315	0.263005	0.000262	0.003267	0.000039	0.000292	0.000027	0.000050	0.000034	99.6	2.531161	0.04274	94.11	± 3.10	87.0
16	2.520E-15	0.442623	0.000275	0.171132	0.000120	0.002077	0.000033	0.000161	0.000023	0.000042	0.000014	99.9	2.541299	0.03837	94.48	± 2.78	121.9
17	5.157E-15	0.890162	0.000734	0.347094	0.000126	0.004175	0.000031	0.000377	0.000013	0.000064	0.000020	99.2	2.523244	0.02241	93.82	± 1.62	85.6
18	6.946E-15	1.193509	0.000768	0.465639	0.000178	0.005638	0.000031	0.000857	0.000031	0.000080	0.000011	99.1	2.522780	0.01265	93.81	± 0.92	46.7
19	8.836E-15	1.514429	0.000682	0.592903	0.000498	0.007185	0.000043	0.000760	0.000039	0.000058	0.000021	99.7	2.533173	0.01346	94.18	± 0.98	67.7
20	5.135E-15	0.887747	0.000259	0.346358	0.000333	0.004060	0.000030	0.000425	0.000032	0.000064	0.000015	99.2	2.522162	0.01947	93.78	± 1.41	74.5
21	6.096E-15	1.051264	0.000516	0.409353	0.000200	0.004840	0.000027	0.000396	0.000021	0.000056	0.000016	99.6	2.539431	0.01671	94.41	± 1.21	96.0
22	5.520E-15	0.954039	0.000571	0.370193	0.000369	0.004384	0.000045	0.000425	0.000018	0.000096	0.000017	98.3	2.514075	0.01908	93.49	± 1.38	79.9
23	5.642E-15	0.975444	0.000251	0.377969	0.000305	0.004553	0.000037	0.000440	0.000015	0.000047	0.000020	99.9	2.557561	0.02041	95.07	± 1.48	78.4
24	7.096E-15	1.222175	0.000704	0.476155	0.000330	0.005810	0.000022	0.000502	0.000031	0.000071	0.000012	99.3	2.533447	0.01285	94.19	± 0.93	85.5
Weighted Mean Age (21 of 24; 5, 10, 11):															94.10	± 0.37	

Sample: 90-0-31 Lab #: UW76C4b J: 0.0208596 ±0.000029 (1σ) D/amu: 1.00 ±0.0001 (1σ) MSWD = 0.40

Sanidine: 1 crystal aliquot of 150-180 μm size fraction

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± 1σ_{40} (10^{-15} V)	^{39}Ar (10^{-15} V)	±1σ_{39} (10^{-15} V)	^{38}Ar (10^{-15} V)	± 1σ_{38} (10^{-15} V)	^{37}Ar (10^{-15} V)	± 1σ_{37} (10^{-15} V)	^{36}Ar (10^{-15} V)	± 1σ_{36} (10^{-15} V)	%$^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	Age (Ma)	± 2σ (Ma)	K/Ca
1	1.094E-14	1.875305	0.001204	0.736884	0.000377	0.008899	0.000071	0.000890	0.000022	0.000063	0.000014	99.6	2.525373	0.01552	93.97	± 1.13	69.9
2	1.405E-14	2.404230	0.000806	0.943326	0.000715	0.011419	0.000067	0.001132	0.000029	0.000040	0.000019	100.0	2.540225	0.01291	94.51	± 0.94	70.6
3	1.166E-14	2.001904	0.000919	0.782627	0.000326	0.009513	0.000062	0.000904	0.000038	0.000063	0.000007	99.6	2.539064	0.01393	94.47	± 1.01	74.9
4	1.332E-14	2.283399	0.000651	0.898422	0.000330	0.010935	0.000060	0.001010	0.000027	0.000047	0.000003	99.9	2.530377	0.01188	94.15	± 0.86	77.4
5	1.141E-14	1.962517	0.000874	0.746760	0.000328	0.008921	0.000049	0.000806	0.000023	0.000241	0.000012	96.9	2.537700	0.01506	94.42	± 1.09	82.1
6	1.246E-14	2.141294	0.001231	0.833201	0.000320	0.010073	0.000050	0.000564	0.000042	0.000064	0.000015	99.6	2.551631	0.01391	94.93	± 1.01	135.2
7	1.072E-14	1.847370	0.000408	0.724691	0.000259	0.008765	0.000034	0.000696	0.000027	0.000042	0.000014	99.9	2.537255	0.01585	94.40	± 1.15	93.8
8	1.483E-14	2.544864	0.000848	1.003020	0.000490	0.011879	0.000058	0.001103	0.000025	0.000054	0.000021	99.8	2.524496	0.01232	93.94	± 0.89	79.9

9	9.068E-15	1.569386	0.000540	0.615302	0.000279	0.007517	0.000036	0.000736	0.000014	0.000066	0.000011	99.4	2.524678	0.01815	93.95	± 1.32	74.5
10	9.163E-15	1.585806	0.000732	0.622545	0.000214	0.007696	0.000051	0.000664	0.000031	0.000076	0.000028	99.2	2.516477	0.02181	93.65	± 1.58	83.9
11	1.286E-14	2.212027	0.000510	0.867469	0.000624	0.010395	0.000057	0.000782	0.000016	0.000076	0.000017	99.4	2.527447	0.01367	94.05	± 0.99	97.9
12	1.620E-14	2.778917	0.000422	1.090174	0.000561	0.013360	0.000041	0.001347	0.000031	0.000044	0.000013	99.9	2.539963	0.01049	94.50	± 0.76	69.8
13	2.346E-14	4.008654	0.000918	1.573052	0.000521	0.018797	0.000067	0.002085	0.000014	0.000123	0.000009	99.4	2.526725	0.00699	94.02	± 0.51	64.3
14	2.427E-14	4.145610	0.000816	1.626594	0.000359	0.019239	0.000063	0.001568	0.000035	0.000140	0.000004	99.2	2.524409	0.00657	93.94	± 0.48	88.7
15	9.274E-15	1.604178	0.000737	0.626861	0.000298	0.007508	0.000028	0.000797	0.000024	0.000091	0.000015	98.9	2.520874	0.01849	93.81	± 1.34	67.2
16	1.619E-14	2.775652	0.001095	1.090620	0.000367	0.013149	0.000047	0.001193	0.000030	0.000062	0.000012	99.7	2.530579	0.01031	94.16	± 0.75	77.7
17	1.098E-14	1.891096	0.000473	0.742777	0.000255	0.008910	0.000042	0.001069	0.000033	0.000051	0.000010	99.7	2.529513	0.01490	94.12	± 1.08	58.6
18	1.082E-14	1.864375	0.000841	0.732077	0.000245	0.008893	0.000062	0.000871	0.000030	0.000081	0.000012	99.2	2.517824	0.01532	93.70	± 1.11	70.9
19	1.727E-14	2.955646	0.000455	1.160727	0.000370	0.013841	0.000093	0.001480	0.000030	0.000036	0.000022	100.0	2.539328	0.01069	94.48	± 0.78	66.1
20	5.057E-15	0.884708	0.000566	0.341509	0.000213	0.004178	0.000051	0.000416	0.000020	0.000083	0.000014	98.2	2.527592	0.03376	94.05	± 2.45	69.0
21	1.135E-14	1.949355	0.000789	0.763200	0.000431	0.009126	0.000057	0.000924	0.000038	0.000055	0.000008	99.6	2.536182	0.01434	94.37	± 1.04	69.8
22	1.034E-14	1.776462	0.000492	0.697071	0.000257	0.008274	0.000042	0.000813	0.000037	0.000043	0.000016	99.8	2.534032	0.01679	94.29	± 1.22	72.8
23	9.250E-15	1.589109	0.000594	0.623096	0.000442	0.007577	0.000034	0.000769	0.000033	0.000042	0.000022	99.8	2.534349	0.02003	94.30	± 1.45	69.5
24	1.590E-14	2.722782	0.001247	1.068402	0.000451	0.012803	0.000045	0.000693	0.000010	0.000070	0.000011	99.6	2.530514	0.00695	94.16	± 0.50	86.5
25	6.793E-15	1.176600	0.000857	0.460100	0.000338	0.005427	0.000021	0.000347	0.000016	0.000036	0.000009	100.0	2.542091	0.01555	94.58	± 1.13	73.8
26	4.068E-15	0.711351	0.000218	0.276590	0.000218	0.003283	0.000033	0.000230	0.000018	0.000038	0.000011	99.9	2.549272	0.02660	94.84	± 1.93	66.5
27	6.221E-15	1.075235	0.000542	0.416880	0.000377	0.005006	0.000044	0.000238	0.000022	0.000097	0.000011	98.2	2.520565	0.01759	93.80	± 1.28	97.7
28	1.203E-14	2.059536	0.000585	0.794276	0.000357	0.009434	0.000034	0.000579	0.000021	0.000142	0.000014	98.4	2.543413	0.00979	94.63	± 0.71	76.8
29	8.283E-15	1.423872	0.000942	0.557159	0.000199	0.006701	0.000048	0.000328	0.000032	0.000057	0.000022	99.5	2.528709	0.01638	94.09	± 1.19	96.4
30	1.068E-14	1.831001	0.000582	0.682108	0.000321	0.008167	0.000051	0.000572	0.000019	0.000328	0.000018	95.2	2.542693	0.01224	94.60	± 0.89	68.3
31	6.629E-15	1.144238	0.000558	0.442962	0.000118	0.005250	0.000027	0.000364	0.000020	0.000073	0.000008	98.9	2.534118	0.01563	94.29	± 1.13	71.5
32	4.841E-15	0.841922	0.000392	0.327448	0.000359	0.004051	0.000015	0.000227	0.000017	0.000045	0.000012	99.5	2.526923	0.02273	94.03	± 1.65	90.4
33	1.109E-14	1.900710	0.000908	0.479077	0.000110	0.006217	0.000017	0.000312	0.000023	0.002313	0.000008	64.1	2.537360	0.01450	94.41	± 1.05	94.0
34	7.751E-15	1.335258	0.000576	0.496229	0.000351	0.005941	0.000032	0.000360	0.000010	0.000277	0.000007	94.5	2.522697	0.01381	93.88	± 1.00	83.6
35	9.873E-15	1.694802	0.000750	0.637427	0.000413	0.007746	0.000070	0.000413	0.000028	0.000266	0.000013	95.8	2.533044	0.01200	94.25	± 0.87	92.5
36	5.784E-15	1.001665	0.000620	0.390817	0.000232	0.004641	0.000046	0.000273	0.000016	0.000046	0.000012	99.5	2.528199	0.01912	94.08	± 1.39	87.7
37	6.243E-15	1.079442	0.000563	0.421097	0.000250	0.004999	0.000032	0.000326	0.000024	0.000037	0.000016	99.8	2.539009	0.01933	94.47	± 1.40	77.0
38	4.803E-15	0.835555	0.000372	0.324601	0.000351	0.003889	0.000017	0.000139	0.000028	0.000038	0.000017	99.7	2.546862	0.02564	94.75	± 1.86	144.8
39	7.912E-15	1.362701	0.000476	0.532914	0.000519	0.006305	0.000022	0.000448	0.000025	0.000067	0.000019	99.2	2.525203	0.01616	93.97	± 1.17	67.7
40	1.353E-14	2.315555	0.000892	0.905782	0.001017	0.010838	0.000052	0.000770	0.000018	0.000065	0.000012	99.5	2.538419	0.00869	94.45	± 0.63	65.8
41	1.534E-14	2.625191	0.000718	1.029465	0.001154	0.012275	0.000066	0.000884	0.000029	0.000047	0.000014	99.8	2.539196	0.00796	94.47	± 0.58	64.9
42	1.520E-14	2.606124	0.000752	1.021403	0.001116	0.012052	0.000064	0.000757	0.000012	0.000033	0.000018	99.9	2.542736	0.00873	94.60	± 0.63	75.1
43	1.649E-14	2.827515	0.000676	1.055983	0.000816	0.012945	0.000027	0.000798	0.000030	0.000480	0.000020	95.2	2.542170	0.00864	94.58	± 0.63	73.9
Weighted Mean Age (37 of 43; 5, 30, 33, 34, 35, 43):															94.25	± 0.19	

Sample: AZLP-08-02 Lab #: UW76A3b J: 0.0208688 ±0.000031 (1σ) D/amu: 1.00 ±0.0001 (1σ) MSWD = 0.48

Sanidine: 1 crystal aliquot of 150-180 μm size fraction

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	$\pm 1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	$\pm 1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	$\pm 1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	$\pm 1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	$\pm 1\sigma_{36}$ (10^{-15} V)	$\%^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	Age (Ma)	± 2σ (Ma)	K/Ca
1	4.996E-15	0.860503	0.000314	0.335397	0.000381	0.004023	0.000035	0.000402	0.000034	0.000062	0.000011	98.9	2.518368	0.01650	93.76	± 1.20	76.0
2	4.518E-15	0.780028	0.000257	0.304735	0.000246	0.003714	0.000020	0.000247	0.000019	0.000040	0.000013	99.5	2.527315	0.01963	94.08	± 1.42	112.2
3	5.032E-15	0.867480	0.000384	0.337331	0.000262	0.004069	0.000035	0.002153	0.000047	0.000066	0.000024	98.7	2.520292	0.02470	93.83	± 1.79	13.6
4	5.062E-15	0.872263	0.000598	0.340706	0.000244	0.004147	0.000036	0.000539	0.000016	0.000047	0.000009	99.3	2.523190	0.01520	93.93	± 1.10	54.9
5	3.899E-15	0.674073	0.000275	0.263302	0.000299	0.003193	0.000033	0.000370	0.000036	0.000029	0.000014	99.8	2.531435	0.02369	94.23	± 1.72	61.7
6	6.142E-15	1.053219	0.000721	0.412073	0.000367	0.005071	0.000052	0.000500	0.000025	0.000030	0.000014	99.8	2.535762	0.01480	94.39	± 1.07	72.2
7	4.826E-15	0.828039	0.000582	0.322872	0.000126	0.003898	0.000026	0.000445	0.000021	0.000050	0.000008	99.1	2.522119	0.01681	93.90	± 1.22	66.1
8	6.230E-15	1.066661	0.000734	0.416274	0.000330	0.004988	0.000036	0.000505	0.000025	0.000042	0.000003	99.6	2.537762	0.01216	94.46	± 0.88	75.7
9	5.530E-15	0.950089	0.000317	0.372313	0.000187	0.004449	0.000034	0.000494	0.000010	0.000046	0.000012	99.6	2.525900	0.01644	94.03	± 1.19	69.6
10	4.249E-15	0.735679	0.000494	0.285791	0.000237	0.003417	0.000054	0.000401	0.000022	0.000051	0.000009	99.9	2.550690	0.02132	94.93	± 1.55	68.3
11	4.834E-15	0.834106	0.000603	0.318946	0.000230	0.003820	0.000021	0.000393	0.000037	0.000109	0.000007	97.9	2.540194	0.01821	94.55	± 1.32	79.0
12	3.844E-15	0.665864	0.000439	0.259575	0.000335	0.003235	0.000050	0.000315	0.000016	0.000049	0.000010	99.9	2.537084	0.02392	94.44	± 1.74	82.3
13	3.584E-15	0.621630	0.000605	0.241767	0.000189	0.002849	0.000036	0.000380	0.000024	0.000043	0.000015	99.8	2.536298	0.02957	94.41	± 2.15	60.0
14	4.369E-15	0.754850	0.000533	0.294269	0.000276	0.003500	0.000020	0.000427	0.000022	0.000038	0.000018	99.8	2.535482	0.02597	94.38	± 1.88	63.3
15	3.937E-15	0.682178	0.000320	0.265553	0.000183	0.003169	0.000051	0.000374	0.000030	0.000063	0.000011	98.4	2.502611	0.02392	93.19	± 1.74	64.3
16	9.171E-15	1.570824	0.000888	0.613877	0.000329	0.007391	0.000037	0.000822	0.000035	0.000086	0.000019	98.8	2.515940	0.01277	93.67	± 0.93	65.4
17	1.033E-14	1.769874	0.000494	0.694634	0.000394	0.008326	0.000038	0.000841	0.000031	0.000041	0.000011	99.6	2.529476	0.00915	94.16	± 0.66	72.3
18	9.360E-15	1.607511	0.000461	0.629761	0.000394	0.007754	0.000050	0.000783	0.000034	0.000043	0.000018	99.6	2.532886	0.01209	94.29	± 0.88	70.8
19	8.252E-15	1.424228	0.000833	0.558811	0.000379	0.006712	0.000067	0.000823	0.000025	0.000056	0.000022	99.4	2.523264	0.01552	93.94	± 1.13	60.7
20	1.406E-14	2.411411	0.000649	0.946751	0.000491	0.011406	0.000047	0.001100	0.000040	0.000038	0.000022	99.9	2.537923	0.00910	94.47	± 0.66	77.1
21	4.687E-15	0.822035	0.000408	0.321326	0.000167	0.003888	0.000023	0.000316	0.000021	0.000044	0.000019	99.3	2.515972	0.02220	93.67	± 1.61	56.4
22	4.853E-15	0.843647	0.000454	0.329622	0.000239	0.004048	0.000039	0.000252	0.000030	0.000048	0.000011	99.2	2.516144	0.01675	93.68	± 1.22	74.1
23	2.890E-15	0.503778	0.000320	0.195834	0.000358	0.002402	0.000017	0.000185	0.000034	0.000048	0.000014	98.6	2.503525	0.03141	93.22	± 2.28	62.0
24	3.834E-15	0.661977	0.000532	0.258218	0.000314	0.003146	0.000025	0.000203	0.000016	0.000029	0.000012	99.8	2.531676	0.02204	94.24	± 1.60	75.6
25	4.425E-15	0.761805	0.000649	0.250382	0.000167	0.003125	0.000036	0.000158	0.000012	0.000412	0.000020	84.7	2.556056	0.02958	95.13	± 2.15	98.9
26	2.572E-15	0.448380	0.000538	0.172939	0.000187	0.002086	0.000026	0.000161	0.000019	0.000028	0.000015	99.7	2.543996	0.03594	94.69	± 2.61	67.6
27	2.734E-15	0.477428	0.000567	0.185164	0.000165	0.002239	0.000044	0.000170	0.000005	0.000040	0.000012	99.0	2.512227	0.03032	93.54	± 2.20	69.8
28	4.746E-15	0.818818	0.000533	0.318958	0.000201	0.003901	0.000021	0.000242	0.000016	0.000031	0.000016	99.7	2.536910	0.02055	94.43	± 1.49	81.7
29	4.148E-15	0.724739	0.000598	0.280977	0.000368	0.003580	0.000034	0.000219	0.000014	0.000067	0.000012	98.6	2.500360	0.02580	93.11	± 1.87	76.7
30	5.710E-15	0.992860	0.000337	0.388135	0.000363	0.004690	0.000023	0.000324	0.000017	0.000068	0.000008	99.2	2.495946	0.01731	92.95	± 1.26	69.1
31	4.398E-15	0.769060	0.000355	0.293480	0.000379	0.003661	0.000012	0.000127	0.000026	0.000078	0.000016	98.8	2.540390	0.02687	94.56	± 1.95	137.8
32	7.335E-15	1.263932	0.000598	0.492820	0.000331	0.005878	0.000037	0.000416	0.000012	0.000056	0.000010	99.8	2.535005	0.01412	94.36	± 1.02	66.9
33	3.346E-15	0.582161	0.000527	0.218897	0.000195	0.002678	0.000028	0.000200	0.000011	0.000084	0.000017	97.9	2.579298	0.03718	95.97	± 2.70	62.9
34	3.295E-15	0.571577	0.000290	0.221839	0.000345	0.002655	0.000025	0.000212	0.000021	0.000055	0.000011	99.2	2.540048	0.03211	94.55	± 2.33	60.4
35	7.127E-15	1.219668	0.000511	0.475886	0.000518	0.005667	0.000047	0.000361	0.000013	0.000048	0.000007	99.6	2.546686	0.01424	94.79	± 1.03	76.0
36	2.745E-15	0.478303	0.000333	0.184914	0.000144	0.002175	0.000019	0.000177	0.000023	0.000046	0.000006	98.9	2.537937	0.03555	94.47	± 2.58	63.6
37	4.709E-15	0.815359	0.000253	0.317008	0.000401	0.003897	0.000046	0.000260	0.000032	0.000055	0.000009	98.9	2.516765	0.02151	93.70	± 1.56	74.9
38	1.028E-14	1.762251	0.000632	0.689859	0.000311	0.008340	0.000069	0.000546	0.000027	0.000043	0.000012	99.7	2.529612	0.01053	94.17	± 0.76	74.2
39	3.900E-15	0.682185	0.000645	0.265928	0.000213	0.003238	0.000036	0.000202	0.000011	0.000044	0.000009	99.2	2.499531	0.02564	93.08	± 1.86	94.0
40	2.585E-15	0.456698	0.000404	0.176635	0.000263	0.002159	0.000036	0.000156	0.000027	0.000039	0.000016	99.4	2.519202	0.04536	93.79	± 3.29	94.9
Weighted Mean Age (37 of 40; 11, 25, 33):															94.11	± 0.24	

Sample: 90-O-30 Lab #: UW76C5b J: 0.0208524 ±0.000027 (1σ) D/amu: 1.00 ±0.0001 (1σ); 1.0016 ± 0.0002 (1σ) MSWD = 0.22
Sanidine: 3-6 crystal aliquot of 125-150 µm size fraction

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	%$^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	Age (Ma)	± 2σ (Ma)	K/Ca
1	3.847E-15	0.668540	0.000424	0.258923	0.000234	0.003171	0.000028	0.000203	0.000027	0.000057	0.000007	99.8	2.533577	0.02337	94.24	± 1.69	122.4
2	2.633E-15	0.461025	0.000245	0.177357	0.000202	0.001973	0.000194	0.000179	0.000015	0.000058	0.000012	99.9	2.540611	0.03802	94.49	± 2.76	103.0
3	2.066E-15	0.363735	0.000253	0.139311	0.000196	0.001696	0.000019	0.000152	0.000031	0.000065	0.000019	99.2	2.525348	0.05799	93.94	± 4.21	104.1
4	2.580E-15	0.449672	0.000380	0.171214	0.000163	0.002049	0.000048	0.000319	0.000030	0.000085	0.000015	97.4	2.512999	0.04212	93.49	± 3.06	51.0
5	3.619E-15	0.625682	0.000371	0.243421	0.000172	0.002972	0.000038	0.000308	0.000019	0.000057	0.000005	99.2	2.517940	0.02375	93.67	± 1.72	74.9
6	2.394E-15	0.418513	0.000300	0.161139	0.000131	0.001973	0.000037	0.000242	0.000025	0.000057	0.000019	98.4	2.508674	0.04909	93.34	± 3.56	64.0
7	2.070E-15	0.364572	0.000328	0.140064	0.000224	0.001682	0.000039	0.000126	0.000027	0.000035	0.000011	99.2	2.527852	0.04735	94.03	± 3.43	114.6
8	2.504E-15	0.438794	0.000510	0.167588	0.000203	0.001976	0.000028	0.000183	0.000020	0.000034	0.000020	99.2	2.552882	0.04879	94.94	± 3.54	85.1
9	6.088E-15	1.046746	0.000626	0.408666	0.000182	0.004880	0.000042	0.000309	0.000019	0.000040	0.000011	99.5	2.529529	0.01598	94.09	± 1.16	116.1
10	4.085E-15	0.708760	0.000265	0.270667	0.000190	0.003199	0.000053	0.000211	0.000022	0.000037	0.000020	99.6	2.579916	0.03010	95.92	± 2.18	113.3
11	3.866E-15	0.672152	0.000440	0.260965	0.000213	0.003130	0.000034	0.000242	0.000023	0.000039	0.000012	99.7	2.539376	0.02566	94.45	± 1.86	94.3
12	4.564E-15	0.790804	0.000457	0.308374	0.000231	0.003702	0.000008	0.000339	0.000030	0.000078	0.000010	98.5	2.501412	0.02085	93.07	± 1.51	78.3
13	5.869E-15	1.012153	0.000431	0.395870	0.000302	0.004901	0.000030	0.000374	0.000030	0.000066	0.000029	99.5	2.525081	0.02625	93.93	± 1.90	92.0
14	5.019E-15	0.868123	0.000433	0.337706	0.000207	0.004082	0.000065	0.000250	0.000025	0.000061	0.000017	99.7	2.541834	0.02221	94.54	± 1.61	121.3
15	5.792E-15	0.999042	0.000509	0.389841	0.000192	0.004598	0.000034	0.000306	0.000022	0.000060	0.000030	99.8	2.538240	0.02706	94.41	± 1.96	113.1
16	5.173E-15	0.893524	0.000184	0.347125	0.000349	0.004139	0.000058	0.000321	0.000033	0.000041	0.000014	99.8	2.548772	0.02029	94.79	± 1.47	94.2
17	1.777E-14	3.028038	0.000720	1.187596	0.000529	0.014379	0.000059	0.000139	0.000010	0.000055	0.000008	99.8	2.539835	0.00976	94.47	± 0.71	91.3
18	1.216E-14	2.080719	0.000856	0.816729	0.000484	0.009863	0.000043	0.000095	0.000010	0.000039	0.000008	99.9	2.538405	0.01420	94.41	± 1.03	93.8
19	2.072E-14	3.538580	0.001295	1.390730	0.001270	0.016829	0.000057	0.000149	0.000013	0.000043	0.000006	99.9	2.538582	0.00857	94.42	± 0.62	100.5
20	1.752E-14	2.997746	0.000787	1.177551	0.000989	0.014102	0.000060	0.000131	0.000014	0.000034	0.000010	100.0	2.541007	0.01015	94.51	± 0.74	98.0
21	1.618E-14	2.774888	0.001185	1.088077	0.000531	0.013174	0.000069	0.000160	0.000020	0.000047	0.000009	99.8	2.541581	0.01083	94.53	± 0.78	74.0
22	1.816E-14	3.112391	0.000713	1.223089	0.000538	0.014846	0.000025	0.000130	0.000011	0.000045	0.000006	99.9	2.537672	0.00945	94.39	± 0.69	104.9
23	1.031E-14	1.784234	0.000670	0.699140	0.000661	0.008294	0.000038	0.000082	0.000015	0.000052	0.000011	99.7	2.536039	0.01718	94.33	± 1.25	101.3
24	1.945E-14	3.333039	0.001242	1.307638	0.000613	0.015829	0.000074	0.000184	0.000017	0.000041	0.000007	99.9	2.543565	0.00894	94.60	± 0.65	77.9
25	1.235E-14	2.131188	0.000666	0.825132	0.000354	0.009944	0.000067	0.000067	0.000012	0.000139	0.000007	98.5	2.538883	0.01406	94.43	± 1.02	155.0
26	7.951E-15	1.386750	0.000863	0.543044	0.000724	0.006547	0.000062	0.000076	0.000015	0.000041	0.000007	99.9	2.539834	0.02183	94.47	± 1.58	88.0
27	1.611E-14	2.769524	0.000808	1.078480	0.000574	0.012906	0.000053	0.000122	0.000005	0.000115	0.000010	99.2	2.541335	0.01100	94.52	± 0.80	101.7
28	1.594E-14	2.741063	0.000777	1.073076	0.000653	0.012776	0.000066	0.000109	0.000010	0.000083	0.000004	99.5	2.536356	0.01075	94.34	± 0.78	115.8
29	2.184E-14	3.740557	0.000797	1.470579	0.000756	0.017814	0.000057	0.000179	0.000014	0.000051	0.000015	99.9	2.537223	0.00841	94.37	± 0.61	91.6
30	2.130E-14	3.648953	0.000899	1.431448	0.000611	0.017284	0.000040	0.000175	0.000010	0.000071	0.000011	99.7	2.538415	0.00830	94.41	± 0.60	91.3
31	1.478E-14	2.544835	0.000817	0.992886	0.001159	0.011839	0.000039	0.000096	0.000008	0.000077	0.000011	99.5	2.545074	0.01227	94.66	± 0.89	124.8
32	2.577E-14	4.406214	0.001657	1.658726	0.000927	0.020185	0.000070	0.000216	0.000008	0.000710	0.000017	95.5	2.533892	0.00766	94.25	± 0.56	84.7
33	1.771E-14	3.041718	0.001219	1.189106	0.000288	0.014089	0.000020	0.000137	0.000011	0.000107	0.000012	99.3	2.535255	0.01002	94.30	± 0.73	99.3
34	2.263E-14	3.875081	0.000690	1.484156	0.000686	0.017914	0.000088	0.000221	0.000006	0.000393	0.000010	97.3	2.536177	0.00796	94.33	± 0.58	73.6
35	2.122E-14	3.635716	0.000804	1.424637	0.001247	0.017304	0.000080	0.000160	0.000013	0.000078	0.000005	99.6	2.538590	0.00834	94.42	± 0.60	100.3
36	2.235E-14	3.828495	0.000522	1.484036	0.000569	0.017706	0.000091	0.000143	0.000015	0.000208	0.000007	98.6	2.541128	0.00782	94.51	± 0.57	118.5
37	1.947E-14	3.340651	0.000694	1.310649	0.001212	0.015867	0.000018	0.000162	0.000007	0.000052	0.000005	99.8	2.539557	0.00903	94.46	± 0.65	90.1
38	1.780E-14	3.057640	0.000844	1.190855	0.001070	0.014283	0.000051	0.000165	0.000011	0.000116	0.000006	99.1	2.541356	0.00994	94.52	± 0.72	80.3
39	1.620E-14	2.787484	0.000833	1.094236	0.000778	0.013240	0.000080	0.000163	0.000010	0.000063	0.000013	99.6	2.532489	0.01111	94.20	± 0.81	74.2
40	1.423E-14	2.453779	0.000945	0.962623	0.000329	0.011539	0.000020	0.000140	0.000014	0.000046	0.000007	99.7	2.536856	0.01206	94.36	± 0.87	76.9
41	1.416E-14	2.442743	0.000469	0.960777	0.000437	0.011600	0.000037	0.000082	0.000020	0.000026	0.000007	100.0	2.536009	0.01208	94.33	± 0.88	138.4
42	2.043E-14	3.503650	0.000758	1.368298	0.001166	0.016413	0.000022	0.000174	0.000010	0.000095	0.000009	99.4	2.541806	0.00879	94.54	± 0.64	85.4
43	3.436E-14	5.864741	0.001247	2.301007	0.000722	0.027723	0.000118	0.000240	0.000010	0.000090	0.000008	99.7	2.538653	0.00511	94.42	± 0.37	101.9
44	2.019E-14	3.464012	0.000682	1.359505	0.000766	0.016523	0.000075	0.000184	0.000008	0.000048	0.000009	99.8	2.539607	0.00872	94.46	± 0.63	78.9
45	2.048E-14	3.512038	0.001313	1.286796	0.000604	0.015629	0.000039	0.000169	0.000011	0.000852	0.000007	93.0	2.537377	0.00909	94.38	± 0.66	81.1
46	1.684E-14	2.893697	0.000574	1.134993	0.000627	0.013667	0.000038	0.000102	0.000013	0.000039	0.000004	99.9	2.542530	0.01016	94.56	± 0.74	120.9
Weighted Mean Age (42 of 46; 4, 32, 34, 45):															94.43	± 0.17	

FC SANIDINE STANDARD COMPLETE $^{40}AR/^{39}AR$ RESULTS
Lab #: UW76B7s D/amu: 1.00 ±0.0001 (1σ)
Sample: 90-O-34

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	%$^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	J-value	± 2σ	K/Ca
1	3.008E-14	5.124635	0.000946	6.665199	0.001661	0.079995	0.000077	0.019919	0.000124	0.000551	0.000013	97.2	0.745404	0.00106	0.02082829	± 0.000059	45.3
2	1.711E-14	2.929187	0.000555	3.905496	0.000620	0.046952	0.000146	0.008164	0.000072	0.000093	0.000009	99.7	0.744333	0.00162	0.02085826	± 0.000091	64.9
3	1.791E-14	3.064204	0.000715	3.893332	0.002806	0.047319	0.000161	0.017585	0.000081	0.000559	0.000010	95.3	0.746978	0.00174	0.02078441	± 0.000097	29.9
4	2.296E-14	3.918470	0.000435	5.126792	0.003960	0.061453	0.000140	0.011565	0.000052	0.000359	0.000007	97.9	0.745211	0.00133	0.02083369	± 0.000074	60.0
5	3.622E-14	6.162709	0.001749	8.195392	0.003011	0.099160	0.000164	0.018351	0.000084	0.000215	0.000017	99.3	0.745381	0.00100	0.02082894	± 0.000056	60.3
6	2.178E-14	3.714872	0.001028	4.918192	0.000829	0.059233	0.000156	0.011649	0.000095	0.000192	0.000010	99.0	0.745542	0.00134	0.02082443	± 0.000075	57.0
7	1.446E-14	2.470109	0.001220	3.293037	0.002135	0.039414	0.000129	0.007746	0.000035	0.000106	0.000007	99.3	0.742662	0.00195	0.02090518	± 0.000110	57.3
8	1.120E-14	1.916563	0.000559	2.570305	0.000709	0.031117	0.000092	0.005660	0.000043	0.000040	0.000003	100.0	0.743205	0.00217	0.02088991	± 0.000122	61.2
9	1.722E-14	2.936057	0.001151	3.892347	0.001451	0.046490	0.000117	0.009316	0.000045	0.000163	0.000011	98.8	0.743443	0.00172	0.02088324	± 0.000097	56.1
10	1.766E-14	3.010313	0.001299	3.990063	0.001557	0.047993	0.000139	0.008119	0.000068	0.000136	0.000011	99.1	0.745938	0.00171	0.02081339	± 0.000095	66.0
Weighted Mean Age (10 of 10):															0.0208375	± 0.000026	

FC Lab #: UW76C1s D/amu: 1.00 ±0.0001 (1σ)
Sample: 90-O-33

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	$\%^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	J-value	± 2σ	K/Ca
1	4.402E-14	7.479605	0.001740	9.827142	0.002515	0.117468	0.000149	0.028893	0.000072	0.000605	0.000014	97.9	0.744098	0.00055	0.02086484	± 0.000031	45.6
2	1.751E-14	2.989458	0.001058	3.958921	0.002814	0.047894	0.000042	0.008889	0.000041	0.000178	0.000007	98.8	0.743597	0.00102	0.02087890	± 0.000057	59.7
3	2.106E-14	3.589545	0.000753	4.757282	0.000672	0.056840	0.000127	0.010520	0.000047	0.000183	0.000008	98.9	0.744310	0.00073	0.02085890	± 0.000041	60.6
4	2.377E-14	4.049736	0.001219	5.415621	0.003310	0.065327	0.000092	0.011815	0.000055	0.000082	0.000006	99.8	0.744131	0.00074	0.02086392	± 0.000042	61.4
5	1.452E-14	2.511992	0.000587	3.337028	0.000802	0.039936	0.000102	0.007401	0.000060	0.000107	0.000007	99.4	0.744498	0.00325	0.02085364	± 0.000182	60.5
6	3.056E-14	5.219987	0.001605	6.891119	0.001944	0.083129	0.000099	0.017718	0.000059	0.000322	0.000012	98.5	0.745008	0.00165	0.02083936	± 0.000092	52.0
7	2.161E-14	3.691117	0.001121	4.884247	0.002517	0.058714	0.000097	0.009877	0.000080	0.000201	0.000008	98.8	0.745535	0.00226	0.02082463	± 0.000126	65.9
8	1.095E-14	1.879230	0.001378	2.485895	0.001136	0.029766	0.000089	0.005363	0.000038	0.000125	0.000009	98.7	0.744492	0.00444	0.02085381	± 0.000249	61.6
9	9.699E-15	1.661891	0.000854	2.191545	0.001431	0.026396	0.000047	0.004264	0.000050	0.000112	0.000008	98.6	0.743043	0.00162	0.02089447	± 0.000091	68.9
10	1.262E-14	2.155267	0.001392	2.822308	0.000868	0.033953	0.000046	0.006494	0.000070	0.000197	0.000009	97.7	0.742939	0.00135	0.02089741	± 0.000076	58.1
Weighted Mean Age (10 of 10):															0.0208660	± 0.000019	

FC Lab #: UW76B1s D/amu: 1.00 ±0.0001 (1σ)
Sample: AZLP-08-04

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	$\%^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	J-value	± 2σ	K/Ca
1	4.611E-14	7.843950	0.002544	10.477947	0.002023	0.125978	0.000085	0.024493	0.000118	0.000206	0.000009	99.5	0.743254	0.00094	0.02088853	± 0.000053	61.2
2	2.946E-14	5.025773	0.002339	6.449067	0.001320	0.078066	0.000123	0.050712	0.000175	0.000837	0.000019	95.5	0.742760	0.00169	0.02090243	± 0.000095	18.1
3	1.884E-14	3.223586	0.001131	4.276351	0.000947	0.051731	0.000160	0.012668	0.000058	0.000143	0.000012	99.1	0.744636	0.00231	0.02084977	± 0.000129	48.3
4	2.973E-14	5.066165	0.001284	6.727819	0.001340	0.081572	0.000181	0.015777	0.000080	0.000194	0.000016	99.1	0.744963	0.00153	0.02084063	± 0.000086	60.8
5	1.902E-14	3.245845	0.001903	4.318902	0.000853	0.052144	0.000050	0.009322	0.000103	0.000171	0.000015	98.8	0.740410	0.00237	0.02096878	± 0.000134	65.8
6	7.727E-15	1.328891	0.000573	1.745472	0.000540	0.020842	0.000094	0.005649	0.000059	0.000105	0.000009	98.4	0.744988	0.00546	0.02083994	± 0.000305	43.5
7	8.106E-15	1.389399	0.000797	1.815370	0.001083	0.021996	0.000038	0.004186	0.000047	0.000162	0.000012	97.3	0.740387	0.00538	0.02096943	± 0.000305	61.2
8	1.363E-14	2.324726	0.000716	3.030664	0.000582	0.036413	0.000077	0.006876	0.000027	0.000262	0.000007	97.2	0.742509	0.00306	0.02090950	± 0.000173	62.5
9	4.136E-14	7.024757	0.001711	9.330132	0.001696	0.111739	0.000236	0.021231	0.000090	0.000278	0.000007	99.1	0.744728	0.00101	0.02084719	± 0.000057	62.3
10	1.923E-14	3.278618	0.000747	4.338740	0.001095	0.052371	0.000091	0.009591	0.000027	0.000194	0.000015	98.7	0.743780	0.00232	0.02087378	± 0.000130	64.3
Weighted Mean Age (10 of 10):															0.0208751	± 0.000030	

FC Lab #: UW84A4s D/amu: 1.001 ±0.0002 (1σ)
Sample: K-07-01C

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	$\%^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	J-value	± 2σ	K/Ca
1	1.780E-14	3.056469	0.001640	3.939270	0.001061	0.047991	0.000176	0.013294	0.000029	0.000379	0.000011	97.6	0.750142	0.00166	0.02069675	± 0.000092	49.5
2	1.869E-14	3.209865	0.000738	4.145507	0.001304	0.050522	0.000141	0.011672	0.000056	0.000366	0.000007	97.8	0.750702	0.00144	0.02068130	± 0.000079	59.3
3	4.409E-14	7.517711	0.005509	9.931373	0.002274	0.120129	0.000121	0.026880	0.000118	0.000258	0.000008	99.5	0.750704	0.00084	0.02068123	± 0.000046	61.7
4	2.208E-14	3.788673	0.001660	4.968594	0.004603	0.060125	0.000142	0.014560	0.000070	0.000282	0.000008	98.8	0.747265	0.00142	0.02077642	± 0.000079	57.0
5	2.447E-14	4.192065	0.001152	5.496982	0.002275	0.066779	0.000086	0.015178	0.000089	0.000298	0.000010	98.7	0.747545	0.00118	0.02076865	± 0.000065	60.5
6	1.999E-14	3.433475	0.002239	4.414289	0.001018	0.053548	0.000200	0.028185	0.000035	0.000416	0.000013	97.4	0.751453	0.00161	0.02066062	± 0.000088	26.1
7	4.736E-14	8.068484	0.005097	10.673594	0.001617	0.128902	0.000209	0.027435	0.000088	0.000251	0.000010	99.5	0.749772	0.00077	0.02070696	± 0.000042	64.9
8	2.177E-14	3.731953	0.001736	4.881898	0.000966	0.059174	0.000115	0.012363	0.000107	0.000288	0.000010	98.5	0.747582	0.00132	0.02076761	± 0.000073	66.0
9	1.626E-14	2.798183	0.002141	3.486734	0.001548	0.042197	0.000070	0.007809	0.000044	0.000628	0.000005	94.3	0.749879	0.00175	0.02070398	± 0.000097	74.7
10	2.675E-14	4.575652	0.000935	5.819556	0.003716	0.070484	0.000063	0.017023	0.000047	0.000785	0.000005	95.5	0.747266	0.00110	0.02077639	± 0.000061	56.8
Weighted Mean Age (10 of 10):															0.0207206	± 0.000027	

FC Lab #: UW76C2s D/amu: 1.00 ±0.0001 (1σ)
Sample: 90-O-19

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	$\%^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	J-value	± 2σ	K/Ca
1	2.744E-14	4.666548	0.002127	6.174859	0.001565	0.074247	0.000097	0.012618	0.000093	0.000212	0.000014	98.9	0.745582	0.00084	0.02082332	± 0.000047	65.4
2	1.459E-14	2.488533	0.000969	3.245539	0.000751	0.039119	0.000069	0.009733	0.000022	0.000235	0.000009	97.6	0.745459	0.00107	0.02082676	± 0.000060	44.5
3	1.557E-14	2.657217	0.000938	3.530288	0.000775	0.042144	0.000085	0.008013	0.000061	0.000090	0.000011	99.2	0.744463	0.00115	0.02085461	± 0.000064	58.8
4	1.896E-14	3.232160	0.001128	4.315504	0.000432	0.051366	0.000124	0.009591	0.000063	0.000059	0.000011	99.7	0.744378	0.00093	0.02085700	± 0.000052	60.0
5	9.433E-15	1.619860	0.000650	2.147760	0.000983	0.025791	0.000108	0.004433	0.000030	0.000096	0.000013	98.9	0.742098	0.00200	0.02092109	± 0.000113	63.9
6	2.461E-14	4.191508	0.001440	5.549586	0.000724	0.067040	0.000132	0.011346	0.000105	0.000243	0.000014	98.6	0.742897	0.00081	0.02089858	± 0.000046	64.7
7	3.370E-14	5.735105	0.001954	7.618095	0.001553	0.091233	0.000150	0.018840	0.000142	0.000220	0.000014	99.1	0.744332	0.00063	0.02085829	± 0.000035	53.6
8	1.101E-14	1.890332	0.000449	2.489591	0.001074	0.029922	0.000084	0.006933	0.000040	0.000143	0.000007	98.2	0.741770	0.00108	0.02093033	± 0.000061	47.6
9	1.531E-14	2.610710	0.000573	3.450363	0.000825	0.041364	0.000082	0.018885	0.000032	0.000183	0.000014	98.6	0.743472	0.00125	0.02088241	± 0.000070	24.1
10	1.511E-14	2.577399	0.000835	3.443985	0.000791	0.041590	0.000066	0.007369	0.000017	0.000065	0.000014	99.8	0.744496	0.00126	0.02085370	± 0.000071	61.7
11	4.052E-14	6.885082	0.001533	8.954657	0.006445	0.107921	0.000076	0.048305	0.000087	0.000786	0.000017	96.9	0.744058	0.00089	0.02086597	± 0.000050	24.5
Weighted Mean Age (11 of 11):															0.0208649	± 0.000019	

FC Lab #: UW76C3s D/amu: 1.00 ±0.0001 (1σ)
Sample: 90-O-49

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	%$^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	J-value	± 2σ	K/Ca
1	4.051E-14	6.885082	0.001533	8.974384	0.003222	0.107921	0.000076	0.048305	0.000087	0.000786	0.000017	96.9	0.742415	0.00071	0.02091215	± 0.000040	24.5
2	2.629E-14	4.479641	0.001166	5.968083	0.000791	0.071836	0.000131	0.013783	0.000028	0.000161	0.000013	99.3	0.743393	0.00082	0.02088465	± 0.000046	57.2
3	2.082E-14	3.557774	0.001201	4.734623	0.001247	0.056696	0.000160	0.010009	0.000041	0.000138	0.000008	99.3	0.744527	0.00083	0.02085284	± 0.000046	62.4
4	4.042E-14	6.882904	0.002039	9.190833	0.002494	0.110057	0.000224	0.018513	0.000039	0.000151	0.000017	99.7	0.745272	0.00071	0.02083198	± 0.000039	65.4
5	1.671E-14	2.862091	0.001005	3.797709	0.002629	0.045802	0.000115	0.009844	0.000045	0.000175	0.000015	98.9	0.742837	0.00141	0.02090027	± 0.000080	50.7
6	1.788E-14	3.051788	0.000582	4.053777	0.000886	0.048899	0.000063	0.008868	0.000080	0.000149	0.000010	99.0	0.743007	0.00087	0.02089548	± 0.000049	60.2
7	2.185E-14	3.726547	0.000828	4.971788	0.002535	0.060264	0.000073	0.009804	0.000045	0.000120	0.000011	99.3	0.742642	0.00085	0.02090577	± 0.000048	66.6
8	3.410E-14	5.805708	0.001349	7.769643	0.000852	0.093346	0.000098	0.016521	0.000053	0.000082	0.000009	99.8	0.744387	0.00046	0.02085674	± 0.000026	61.7
9	2.169E-14	3.707292	0.001026	4.918169	0.003146	0.058565	0.000087	0.009835	0.000073	0.000175	0.000006	98.9	0.743916	0.00074	0.02086995	± 0.000042	65.5
10	1.332E-14	2.286568	0.001199	3.020662	0.000727	0.036447	0.000116	0.006397	0.000054	0.000148	0.000009	98.6	0.743807	0.00115	0.02087301	± 0.000065	61.8
Weighted Mean Age (10 of 10):															0.0208724	± 0.000017	

FC Lab #: UW76A4s D/amu: 1.00 ±0.0001 (1σ)
Sample: K-07-01B

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	%$^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	J-value	± 2σ	K/Ca
1	3.086E-14	5.262434	0.001276	6.842790	0.001368	0.082741	0.000144	0.015692	0.000096	0.000585	0.000013	97.0	0.744325	0.00067	0.02085849	± 0.000038	65.0
2	3.366E-14	5.736765	0.001099	7.597990	0.002012	0.092061	0.000169	0.019744	0.000069	0.000322	0.000020	98.6	0.743022	0.00088	0.02089507	± 0.000050	57.3
3	1.636E-14	2.804750	0.000528	3.711386	0.001191	0.044479	0.000075	0.008073	0.000035	0.000155	0.000008	98.9	0.744626	0.00091	0.02085006	± 0.000051	68.5
4	2.704E-14	4.612857	0.001226	6.102873	0.001796	0.073070	0.000091	0.018275	0.000096	0.000281	0.000005	98.6	0.743687	0.00052	0.02087637	± 0.000029	49.6
5	1.184E-14	2.033121	0.000706	2.658518	0.000617	0.032303	0.000070	0.006637	0.000038	0.000225	0.000010	97.7	0.743477	0.00143	0.02088227	± 0.000080	59.5
6	1.625E-14	2.775777	0.000825	3.688580	0.001542	0.045054	0.000151	0.008547	0.000028	0.000159	0.000018	99.0	0.742677	0.00162	0.02090478	± 0.000091	64.1
7	3.076E-14	5.230260	0.001163	6.962758	0.000819	0.083944	0.000120	0.016318	0.000063	0.000192	0.000014	99.3	0.744503	0.00069	0.02085351	± 0.000038	63.3
8	1.083E-14	1.851531	0.001219	2.421782	0.000790	0.028898	0.000104	0.006011	0.000041	0.000202	0.000010	97.6	0.742876	0.00163	0.02089916	± 0.000092	59.9
9	3.138E-14	5.336128	0.000666	7.045797	0.002070	0.084555	0.000175	0.016360	0.000063	0.000259	0.000013	98.8	0.747201	0.00065	0.02077820	± 0.000036	63.8
10	5.768E-14	3.062899	0.000571	4.058455	0.000883	0.048715	0.000128	0.009666	0.000069	0.000162	0.000009	98.6	0.743298	0.00068	0.02088732	± 0.000038	62.1
Weighted Mean Age (9 of 10; 9):															0.0208727	± 0.000016	

FC Lab #: UW76A6s D/amu: 1.00 ±0.0001 (1σ)
Sample: NE-08-01

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	%$^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	J-value	± 2σ	K/Ca
1	3.502E-14	5.964326	0.001063	7.938102	0.001696	0.095221	0.000227	0.018823	0.000137	0.000184	0.000009	99.3	0.745108	0.00052	0.02083657	± 0.000029	61.8
2	3.858E-14	6.570010	0.001028	8.638145	0.006123	0.104610	0.000201	0.024485	0.000112	0.000506	0.000014	98.0	0.744179	0.00079	0.02086257	± 0.000045	51.6
3	3.829E-14	6.522983	0.001366	8.616040	0.002649	0.103711	0.000182	0.028782	0.000079	0.000414	0.000009	98.4	0.744013	0.00052	0.02086723	± 0.000029	43.7
4	2.577E-14	4.403271	0.001125	5.772645	0.001527	0.069222	0.000185	0.019173	0.000110	0.000345	0.000015	98.1	0.746682	0.00097	0.02079265	± 0.000054	43.9
5	3.710E-14	6.323496	0.001005	8.427254	0.001522	0.101461	0.000266	0.019919	0.000076	0.000164	0.000006	99.5	0.745620	0.00043	0.02082227	± 0.000024	61.8
6	1.873E-14	3.208957	0.000948	4.269032	0.000775	0.051571	0.000135	0.010066	0.000070	0.000128	0.000017	99.4	0.744482	0.00137	0.02085408	± 0.000077	61.9
7	3.158E-14	5.383534	0.001226	7.170188	0.001086	0.086126	0.000150	0.017494	0.000065	0.000173	0.000009	99.4	0.744754	0.00056	0.02084648	± 0.000031	59.7
8	2.219E-14	3.789227	0.001351	4.812975	0.001062	0.058075	0.000135	0.017060	0.000107	0.000704	0.000017	94.9	0.745562	0.00121	0.02082388	± 0.000067	41.0
9	1.846E-14	3.153372	0.000940	4.153639	0.000410	0.050372	0.000112	0.009634	0.000072	0.000237	0.000009	98.2	0.743505	0.00094	0.02088150	± 0.000053	62.8
10	1.739E-14	2.968273	0.000839	3.933653	0.000697	0.047181	0.000133	0.009301	0.000063	0.000150	0.000011	98.9	0.744228	0.00113	0.02086121	± 0.000063	61.5
Weighted Mean Age (10 of 10):															0.0208427	± 0.000015	

FC Lab #: UW76C4s D/amu: 1.00 ±0.0001 (1σ)
Sample: 90-O-31

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	%$^{40}Ar^*$	$^{40}Ar^*/^{39}Ar_K$	± 1σ	J-value	± 2σ	K/Ca
1	3.323E-14	5.657742	0.000423	7.508585	0.001474	0.089869	0.000157	0.015247	0.000079	0.000270	0.000016	98.8	0.743420	0.00124	0.02088389	± 0.000070	64.5
2	3.642E-14	6.207387	0.000869	8.268845	0.001729	0.098553	0.000133	0.018077	0.000090	0.000147	0.000007	99.5	0.745974	0.00100	0.02081238	± 0.000056	59.8
3	1.769E-14	3.028592	0.001326	4.044846	0.001058	0.048483	0.000135	0.008513	0.000060	0.000075	0.000004	99.7	0.744102	0.00201	0.02086474	± 0.000113	62.1
4	5.347E-15	0.928869	0.000345	1.210813	0.000517	0.014651	0.000027	0.003009	0.000026	0.000112	0.000006	97.6	0.742358	0.00675	0.02091376	± 0.000380	52.5
5	1.125E-14	1.919099	0.001279	2.557052	0.000812	0.030656	0.000093	0.004820	0.000046	0.000077	0.000005	99.4	0.742944	0.00315	0.02089726	± 0.000177	69.3
6	9.791E-15	1.669218	0.000480	2.203004	0.000493	0.026320	0.000056	0.005685	0.000046	0.000088	0.000011	99.2	0.747656	0.00386	0.02076555	± 0.000214	50.5
7	2.891E-14	4.912731	0.001362	6.569718	0.001827	0.078811	0.000090	0.015187	0.000077	0.000125	0.000013	99.5	0.742860	0.00136	0.02089961	± 0.000076	56.4
8	2.279E-14	3.881057	0.001509	5.159476	0.001038	0.062077	0.000102	0.017314	0.000118	0.000142	0.000011	99.3	0.745107	0.00168	0.02083661	± 0.000094	38.8
9	3.157E-14	5.378263	0.001467	7.187957	0.001586	0.086033	0.000144	0.015980	0.000071	0.000129	0.000015	99.6	0.743437	0.00129	0.02088340	± 0.000072	58.5
10	1.729E-14	2.961011	0.000943	3.951121	0.001124	0.047047	0.000095	0.007535	0.000062	0.000078	0.000006	99.6	0.744152	0.00207	0.02086334	± 0.000116	68.3
11	1.282E-14	2.184805	0.000241	2.916822	0.000802	0.034487	0.000099	0.005755	0.000040	0.000064	0.000010	99.6	0.743532	0.00286	0.02088075	± 0.000160	66.0
Weighted Mean Age (11 of 11):															0.0208596	± 0.000029	

FC Lab #: UW76A3s D/amu: 1.00 ±0.0001 (1σ)
Sample: **AZLP-08-02**

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	%^{40}Ar*	^{40}Ar*/^{39}Ar$_K$	± 1σ	J-value	± 2σ	K/Ca
1	2.818E-14	4.800413	0.001180	6.372771	0.002197	0.076392	0.000178	0.015691	0.000112	0.000193	0.000013	99.1	0.745008	0.00170	0.02083938	± 0.000095	61.0
2	1.483E-14	2.537783	0.000653	3.332769	0.001045	0.040239	0.000085	0.008700	0.000050	0.000211	0.000015	98.0	0.743497	0.00328	0.02088172	± 0.000184	57.5
3	1.957E-14	3.342913	0.001947	4.359159	0.002905	0.052927	0.000171	0.011083	0.000055	0.000362	0.000006	97.1	0.742560	0.00242	0.02090805	± 0.000136	59.0
4	3.822E-14	6.503098	0.000612	8.563710	0.000573	0.103401	0.000084	0.021553	0.000065	0.000478	0.000008	98.0	0.743056	0.00119	0.02089412	± 0.000067	59.6
5	2.195E-14	3.748294	0.000314	4.876709	0.000388	0.058791	0.000072	0.012027	0.000074	0.000418	0.000012	97.0	0.743251	0.00217	0.02088863	± 0.000122	60.7
6	2.200E-14	3.757220	0.000851	4.950353	0.001488	0.059406	0.000078	0.011878	0.000067	0.000264	0.000015	98.2	0.743166	0.00222	0.02089102	± 0.000125	62.4
7	2.315E-14	3.954525	0.000869	5.263854	0.001147	0.063696	0.000157	0.011270	0.000052	0.000123	0.000008	99.3	0.744365	0.00196	0.02085738	± 0.000110	69.9
8	4.095E-14	6.970730	0.001766	9.203583	0.001337	0.111173	0.000147	0.022494	0.000115	0.000395	0.000013	98.5	0.744955	0.00119	0.02084085	± 0.000066	61.1
9	2.842E-14	4.849381	0.001028	6.500470	0.001750	0.077887	0.000187	0.016363	0.000059	0.000177	0.000008	99.2	0.738389	0.00159	0.02102617	± 0.000091	59.3
10	3.574E-14	6.090120	0.001714	8.139417	0.001283	0.097778	0.000165	0.022722	0.000109	0.000133	0.000005	99.6	0.744038	0.00126	0.02086654	± 0.000071	53.4
Weighted Mean Age (9 of 10; 9):															**0.0208688**	**± 0.000031**	

FC Lab #: UW76C5s D/amu: 1.00 ±0.0001 (1σ)
Sample: **90-O-30**

N	^{40}Ar (moles)	^{40}Ar (10^{-15} V)	± $1\sigma_{40}$ (10^{-15} V)	^{39}Ar (10^{-15} V)	±$1\sigma_{39}$ (10^{-15} V)	^{38}Ar (10^{-15} V)	± $1\sigma_{38}$ (10^{-15} V)	^{37}Ar (10^{-15} V)	± $1\sigma_{37}$ (10^{-15} V)	^{36}Ar (10^{-15} V)	± $1\sigma_{36}$ (10^{-15} V)	%^{40}Ar*	^{40}Ar*/^{39}Ar$_K$	± 1σ	J-value	± 2σ	K/Ca
1	1.825E-14	3.108392	0.000284	3.937928	0.001231	0.047624	0.000120	0.006990	0.000074	0.000640	0.000019	94.1	0.741130	0.00237	0.02094841	± 0.000134	59.3
2	1.887E-14	3.220021	0.001092	4.190712	0.000641	0.050483	0.000115	0.014212	0.000038	0.000360	0.000010	97.0	0.743472	0.00191	0.02088243	± 0.000107	30.8
3	3.404E-14	5.800858	0.001662	7.663725	0.001315	0.092295	0.000180	0.016151	0.000068	0.000331	0.000015	98.6	0.744633	0.00115	0.02084986	± 0.000064	49.6
4	2.344E-14	4.007425	0.001737	5.242449	0.003319	0.063167	0.000104	0.008956	0.000057	0.000340	0.000024	97.8	0.745978	0.00205	0.02081227	± 0.000114	61.4
5	1.540E-14	2.644721	0.001209	3.466603	0.001034	0.041830	0.000125	0.006509	0.000022	0.000254	0.000010	97.7	0.743078	0.00233	0.02089349	± 0.000131	55.7
6	2.721E-14	4.645842	0.001201	6.190993	0.001751	0.074082	0.000129	0.011557	0.000086	0.000167	0.000014	99.3	0.743819	0.00138	0.02087269	± 0.000078	55.9
7	4.782E-14	8.139719	0.001574	10.869162	0.001087	0.131173	0.000182	0.017086	0.000107	0.000180	0.000026	99.6	0.745000	0.00100	0.02083958	± 0.000056	66.2
8	3.367E-14	5.745512	0.001840	7.635553	0.001509	0.091635	0.000158	0.014194	0.000076	0.000231	0.000011	99.2	0.745148	0.00109	0.02083545	± 0.000061	55.8
9	1.184E-14	2.053991	0.000679	2.717995	0.000856	0.032595	0.000066	0.004354	0.000044	0.000098	0.000017	99.5	0.748631	0.00394	0.02073851	± 0.000218	64.3
10	3.148E-14	5.380641	0.001786	7.168224	0.001821	0.086410	0.000246	0.011047	0.000084	0.000173	0.000017	99.3	0.744350	0.00150	0.02085780	± 0.000084	67.1
Weighted Mean Age (10 of 10):															**0.0208524**	**± 0.000027**	

Atmospheric argon ratios

$(^{40}Ar/^{36}Ar)_A$	295.5	Steiger & Jäger (1977)

Interfering isotope production ratios

$(^{40}Ar/^{39}Ar)_K$	0.00000	UW-Madison
$(^{38}Ar/^{39}Ar)_K$	0.01206	UW-Madison
$(^{39}Ar/^{37}Ar)_{Ca}$	0.00067	Koppers (2002)
$(^{38}Ar/^{37}Ar)_{Ca}$	0	Koppers (2002)
$(^{36}Ar/^{37}Ar)_{Ca}$	0.00026	Koppers (2002)
$(^{36}Cl/^{38}Cl)_{Cl}$	0	Koppers (2002)

Decay constants

$^{40}K\lambda_e$	(0.580±0.00)E-10 a^{-1}	Min et al. (2000)
$^{40}K\lambda_\beta$	(4.884±0.000)E-10 a^{-1}	Min et al. (2000)
^{39}Ar	(2.58±0.03)E-03 a^{-1}	Stoenner et al. (1965)
^{37}Ar	(5.4300±0.0063)E-02 a^{-1}	Renne & Norman (2001)
$^{36}Cl\ \lambda_\beta$	(2.35±0.02)E-06 a^{-1}	Endt (1998)

Average procedure blanks and 1σ for $^{40}Ar/^{39}Ar$ samples

Sample	^{36}Ar	1σ	^{37}Ar	1σ	^{38}Ar	1σ	^{39}Ar	1σ	^{40}Ar	1σ
90-O-34	3.317E-05	1.426E-05	5.669E-05	4.042E-05	6.843E-05	2.933E-05	0.0050392	0.0008653	0.0195068	0.0021418
90-O-33	3.011E-05	1.285E-05	2.379E-05	3.65E-05	8.208E-05	2.747E-05	0.005614	0.001393	0.02102	0.0036874
AZLP-08-04	3.062E-05	1.473E-05	2.61E-05	2.124E-05	4.924E-05	2.821E-05	0.0027151	0.0004626	0.0128971	0.0011031
K-07-01C	2.628E-05	4.106E-06	9.538E-06	6.551E-06	1.895E-05	8.315E-06	0.000731	0.0003153	0.0078943	0.0010468
90-O-19	3.279E-05	1.512E-05	2.164E-05	2.224E-05	4.927E-05	1.793E-05	0.0035452	0.000128	0.015872	0.0004436
90-O-49	3.24E-05	1.484E-05	9.841E-06	2.199E-05	7.215E-05	2.188E-05	0.0049599	0.0009771	0.0203858	0.002086
K-07-01B	2.937E-05	1.25E-05	2.329E-05	1.892E-05	2.908E-05	2.431E-05	0.0029922	0.0006911	0.0135405	0.0018408
NE-08-01	3.937E-05	1.427E-05	4.636E-05	2.904E-05	3.66E-05	2.753E-05	0.0027408	0.0006391	0.0138783	0.0017203
90-O-31	3.192E-05	1.323E-05	2.025E-05	2.939E-05	0.0001028	2.842E-05	0.0080226	0.002106	0.0266678	0.0053722
AZLP-08-02	3.022E-05	1.354E-05	2.105E-05	2.514E-05	5.434E-05	2.598E-05	0.0039136	0.0009584	0.0168663	0.0018651
90-O-30	3.405E-05	1.123E-05	1.707E-05	1.382E-05	0.0001163	3.898E-05	0.0092354	0.0022079	0.0302811	0.0056953

Data Repository item DR 3. U-PB methodology

Zircons were extracted using methods outlined in Data Repository item DR 1. Samples NE-08-01 and K-07-01B were mounted and imaged using back-scatter electron and cathodluminescence mode on a Hitachi S3400 SEM at the University Wisconsin-Madison. Broken fragments and/or single zircon crystals were extracted for analysis from mounts or separates using a fine-tipped steel tool, and were selected based on least amount of cracks, inclusions and surface contamination. Fragments/single zircons were placed in a muffle furnace at ~900 ºC for ~60 hours in quartz dishes before being photographed. Crystals were then transferred to 300 µl Teflon FEP microcapsules and 120 µl of 29 M HF and ~25 µl of 30% HNO_3 were added. Microcapsules were placed in a Parr vessel, and leached at 180 ºC for 12-14 hours. The fractions were then removed and rinsed in ultrapure H_2O, fluxed at ~80 ºC on a hotplate for an hour in 6 M HCL, ultrasonically cleaned for another hour and then put back on a hot plate for ~30 minutes. HCl solutions were then removed, the zircons were rinsed again with ultrapure acetone and H_2O, and spiked with the ET535 tracer solution. Zircons with an average weight of 0.010 mg were dissolved using Parr vessels in 120 µl of 29 M HF with ~25 µl of 30% HNO_3 at 220 ºC for 48 hours and were then dried to fluorides on a 120 ºC hotplate. Salts were re-dissolved in 6 µl of 3.1 M HCl and ready for column chemistry. Zirconium, Hafnium, and rare earth element washes were saved for future work. U and Pb were loaded as one on a single Re filament using a silica-gel/phosphoric acid combination (Gerstenberger and Haase, 1997). Isotope ratio measurements were performed at the Natural Environment Research Council Isotope Geology Laboratory (NIGL) on a Thermo-Electron Triton TIMS instrument equipped with a modified MassCom SEM that is effectively stable with a linear response effect, up to 106 counts/second, and thus allows for measurement of small Pb loads using a low noise amplifier for UO_2^+ analysis in static mode.

Analytical procedures and calibrations outlined in Charles et al. (2011) for the ^{238}U-^{206}Pb analyses (at NIGL) allowed for ~1 permil analytical precision for individual U-Pb ages (Table DR3). U-Pb ages and uncertainties were calculated using the algorithms of Schmitz and Schoene (2007), combined with a $^{235}U/^{205}Pb$ ratio of 100.18 and $^{233}U/^{235}U$ double spike ratio of 0.99464 for the ET535 tracer. All common Pb in the analyses was attributed to the blank and subtracted based on the isotopic composition and associated uncertainties analyzed over time. Quadratic addition of both the tracer calibration error (using a conservative estimate of the 2σ standard deviation of 0.1% for the Pb/U ratio in the tracer) and additional ^{238}U decay constant error (~0.11%) of Jaffey et al. (1971) results in <2 permil for full uncertainties. These $^{238}U/^{206}Pb$ ages are traceable back to SI units via the gravimetric calibration of the EARTHTIME U-Pb tracer and the determination of the ^{238}U decay constant (Jaffey et al., 1971; Condon et al., 2007).

Table DR 3. U-Pb Results

DR. 3 cont'd. Complete U-Pb Isotopic Data

							Radiogenic Isotope Ratios								Isotopic Ages					
Fraction (a)	$\frac{Th}{U}$ (b)	$^{206}Pb^*$ $x10^{-13}$ mol (c)	mol % $^{206}Pb^*$ (c)	$\frac{Pb^*}{Pb_c}$ (c)	Pb_c (pg) (c)	$\frac{^{206}Pb}{^{204}Pb}$ (d)	$\frac{^{208}Pb}{^{206}Pb}$ (e)	$\frac{^{207}Pb}{^{206}Pb}$ (e)	% err (f)	$\frac{^{207}Pb}{^{235}U}$ (e)	% err (f)	$\frac{^{206}Pb}{^{238}U}$ (e)	% err (f)	corr. coef.	$\frac{^{207}Pb}{^{206}Pb}$ (g)	± (f)	$\frac{^{207}Pb}{^{235}U}$ (g)	± (f)	$\frac{^{206}Pb}{^{238}U}$ (g)	± (f)
AZLP-08-05 *(P. flexuosum)*																				
z1	0.398	1.9531	97.28%	10	4.51	676	0.128	0.048072	0.314	0.097562	0.389	0.014719	0.126	0.700	100.45	7.43	94.52	0.35	94.29	0.12
z2	0.475	1.0481	99.55%	66	0.39	4056	0.152	0.048020	0.149	0.097560	0.219	0.014735	0.093	0.841	97.99	3.52	94.52	0.20	94.38	0.09
z3	0.574	1.0600	99.40%	51	0.53	3020	0.184	0.047951	0.339	0.097457	0.373	0.014741	0.115	0.440	94.67	8.01	94.43	0.34	94.42	0.11
z4	0.558	0.4840	99.09%	33	0.37	1999	0.179	0.048043	0.219	0.098012	0.297	0.014796	0.132	0.735	99.21	5.18	94.94	0.27	94.77	0.12
z5	0.489	0.9068	98.98%	29	0.78	1779	0.157	0.048067	0.259	0.097737	0.322	0.014747	0.111	0.683	100.28	6.14	94.69	0.29	94.46	0.10
z6	0.366	1.0954	99.52%	60	0.44	3768	0.117	0.048029	0.142	0.098281	0.212	0.014841	0.088	0.877	98.32	3.36	95.19	0.19	95.06	0.08
z7	0.515	1.5255	99.40%	50	0.76	3035	0.165	0.048029	0.139	0.097312	0.261	0.014695	0.170	0.877	98.46	3.28	94.29	0.24	**94.13**	**0.16**
z8	0.474	1.2081	96.07%	7	4.09	467	0.152	0.047896	0.468	0.097236	0.536	0.014724	0.107	0.689	91.88	11.09	94.22	0.48	94.31	0.10
z9	0.518	0.9460	97.62%	12	1.91	765	0.166	0.047931	0.476	0.097470	0.534	0.014749	0.102	0.641	93.64	11.26	94.44	0.48	94.47	0.10
z10	0.351	0.7797	97.07%	10	1.95	621	0.113	0.048193	0.864	0.097517	0.939	0.014676	0.248	0.424	106.33	20.39	94.48	0.85	**94.01**	**0.23**
z11	0.495	0.7003	96.06%	7	2.38	464	0.159	0.048108	0.659	0.097971	0.726	0.014770	0.107	0.666	102.33	15.58	94.90	0.66	94.61	0.10
AZLP-08-04 (*W. devonense*)																				
z1	0.360	0.5402	95.67%	6	2.03	421	0.115	0.048002	0.914	0.097835	0.990	0.014782	0.150	0.559	97.00	21.63	94.78	0.90	94.69	0.14
z3	0.443	0.8127	97.24%	10	1.91	659	0.142	0.048008	0.601	0.097468	0.663	0.014725	0.113	0.611	97.36	14.21	94.44	0.60	**94.32**	**0.11**
z6	0.388	1.0033	99.02%	29	0.82	1855	0.124	0.047857	0.319	0.097302	0.362	0.014746	0.102	0.534	89.85	7.56	94.28	0.33	**94.46**	**0.10**
z9	0.379	0.6385	98.36%	17	0.88	1113	0.121	0.047979	0.391	0.097402	0.449	0.014724	0.105	0.635	95.87	9.24	94.37	0.40	**94.32**	**0.10**
z11	0.393	0.8147	95.06%	6	3.50	371	0.126	0.048020	0.610	0.097556	0.680	0.014734	0.113	0.669	97.91	14.44	94.52	0.61	**94.38**	**0.11**
z13	0.408	0.9405	99.04%	30	0.75	1900	0.131	0.047989	0.226	0.097477	0.291	0.014732	0.097	0.761	96.37	5.35	94.44	0.26	**94.37**	**0.09**
z16	0.380	1.5318	99.07%	31	1.19	1963	0.122	0.047998	0.214	0.097744	0.278	0.014770	0.096	0.762	96.80	5.05	94.69	0.25	94.61	0.09
K-07-1 (bed 80, GSSP section, *N. juddii*)																				
z13a	0.446	1.9589	99.40%	49	0.99	3021	0.143	0.048057	0.165	0.097625	0.233	0.014733	0.095	0.819	99.80	3.89	94.58	0.21	**94.38**	**0.09**
z13b	0.467	1.4690	96.04%	7	5.00	465	0.161	0.051817	0.427	0.105340	0.497	0.014744	0.121	0.662	275.18	9.77	101.69	0.48	94.44	**0.11**
z20b	0.459	0.7301	94.59%	5	3.45	339	0.147	0.047972	0.956	0.097075	1.050	0.014676	0.178	0.587	95.58	22.63	94.07	0.94	94.01	0.17
z10b	0.372	0.4866	98.85%	25	0.47	1588	0.119	0.048111	0.261	0.098239	0.329	0.014809	0.117	0.697	102.37	6.17	95.15	0.30	94.86	0.11
z16b	0.465	1.0457	95.78%	7	3.80	436	0.149	0.047913	0.533	0.097449	0.600	0.014751	0.109	0.669	92.68	12.63	94.42	0.54	**94.49**	**0.10**
z19a	0.329	0.3477	95.21%	6	1.45	380	0.105	0.047878	1.263	0.097520	1.362	0.014773	0.293	0.433	90.84	29.92	94.48	1.23	**94.63**	**0.28**
z19b	0.301	0.4031	98.79%	23	0.41	1508	0.097	0.048185	0.724	0.098359	0.796	0.014805	0.161	0.531	105.96	17.09	95.26	0.72	94.83	0.15
z34a	0.368	0.1014	95.52%	6	0.39	406	0.118	0.048306	0.988	0.098717	1.074	0.014821	0.182	0.538	111.95	23.31	95.59	0.98	94.94	0.17
z34b	0.286	0.5580	98.54%	19	0.69	1248	0.092	0.048013	0.338	0.097819	0.405	0.014776	0.131	0.629	97.45	8.00	94.76	0.37	94.65	0.12
z37b	0.437	0.2845	98.59%	21	0.34	1287	0.140	0.048022	0.334	0.097795	0.392	0.014770	0.097	0.672	98.03	7.91	94.74	0.35	94.61	0.09
NE-08-1 *(N. juddii)*																				
z2	0.434	1.0293	97.10%	10	2.55	627	0.139	0.048049	0.560	0.097593	0.622	0.014731	0.106	0.639	99.39	13.24	94.55	0.56	94.36	0.10
z3	0.590	0.7717	96.73%	9	2.16	557	0.189	0.048095	0.630	0.097432	0.693	0.014692	0.106	0.650	101.79	14.88	94.40	0.62	**94.11**	**0.10**
z4	0.516	0.5365	94.06%	5	2.81	307	0.165	0.047991	1.151	0.097324	1.236	0.014708	0.135	0.661	96.60	27.23	94.30	1.11	94.21	0.13
z5	0.475	1.3824	98.31%	17	1.97	1077	0.152	0.047817	0.378	0.096785	0.441	0.014680	0.104	0.679	87.93	8.95	93.80	0.39	**94.04**	**0.10**
z6	0.583	0.7907	96.86%	9	2.13	580	0.187	0.048045	0.620	0.097384	0.683	0.014701	0.105	0.647	99.29	14.67	94.36	0.62	94.16	0.10
z7	0.617	1.3957	98.05%	16	2.30	934	0.197	0.047933	0.394	0.097488	0.452	0.014751	0.097	0.666	93.80	9.33	94.46	0.41	94.48	0.09
z8	0.513	0.9330	97.17%	10	2.26	643	0.164	0.047963	0.549	0.097066	0.610	0.014678	0.103	0.647	95.18	12.99	94.06	0.55	**94.02**	**0.10**
z10	0.674	1.5310	99.55%	69	0.58	4031	0.216	0.048008	0.149	0.097165	0.216	0.014679	0.089	0.844	97.56	3.53	94.16	0.19	**94.02**	**0.08**
z9	0.632	0.6002	98.24%	17	0.89	1034	0.202	0.047823	0.416	0.096669	0.473	0.014660	0.101	0.638	88.38	9.86	93.70	0.42	**93.91**	**0.09**
z11	0.512	0.6962	97.67%	13	1.38	782	0.164	0.048067	0.474	0.097249	0.533	0.014674	0.104	0.636	100.33	11.20	94.23	0.48	**93.99**	**0.10**
z12	0.520	0.8981	97.92%	14	1.58	877	0.167	0.048102	0.455	0.096986	0.512	0.014623	0.107	0.612	102.04	10.75	93.99	0.46	93.67	0.10
AZLP-08-01 (*V. diartianum)*																				
z2	0.559	0.5771	92.92%	4	3.62	261	0.179	0.048095	0.702	0.098037	0.775	0.014784	0.147	0.571	101.78	16.58	94.96	0.70	94.69	0.14
z5	0.444	1.5223	98.63%	21	1.74	1343	0.142	0.048056	0.214	0.098108	0.281	0.014807	0.092	0.808	99.74	5.07	95.03	0.26	94.84	0.09
z6	0.767	0.7384	96.88%	10	1.96	590	0.245	0.047788	0.420	0.096963	0.488	0.014716	0.109	0.692	86.76	9.95	93.97	0.44	**94.25**	**0.10**
z2.2	0.406	0.4189	96.80%	9	1.15	571	0.130	0.047888	0.608	0.098277	0.673	0.014884	0.126	0.586	91.41	14.41	95.18	0.61	95.34	0.12
z3.2	0.887	0.2094	89.11%	3	2.11	169	0.284	0.048044	2.612	0.099657	2.808	0.015044	0.478	0.479	99.57	61.78	96.46	2.58	96.33	0.46
z5.2	0.845	0.0919	93.35%	5	0.54	273	0.269	0.047940	1.997	0.105304	2.108	0.015931	0.235	0.513	94.49	47.28	101.66	2.04	101.97	0.24
z6.2	0.987	0.4736	98.22%	19	0.71	1022	0.316	0.048061	0.522	0.097605	0.563	0.014729	0.129	0.419	100.47	12.34	94.56	0.51	**94.33**	**0.12**
z7.2	0.426	0.2766	93.64%	4	1.55	288	0.136	0.047846	1.042	0.097419	1.128	0.014767	0.143	0.641	89.36	24.69	94.39	1.02	94.59	0.13

(a) z1, z2 etc. are labels for fractions composed of single zircon grains or fragments; all fractions annealed and chemically abraded after *Mattinson* [2005].

(b) Model Th/U ratio calculated from radiogenic $^{208}Pb/^{206}Pb$ ratio and $^{207}Pb/^{235}U$ age.

(c) Pb* and Pb_c represent radiogenic and common Pb, respectively; mol % $^{206}Pb^*$ with respect to radiogenic, blank and initial common Pb.

(d) Measured ratio corrected for spike and fractionation only.

(e) Corrected for fractionation, spike, and common Pb; up to 1 pg of common Pb was assumed to be procedural blank: $^{206}Pb/^{204}Pb = 18.20 \pm 0.50\%$; $^{207}Pb/^{204}Pb = 15.65 \pm 0.40\%$; $^{208}Pb/^{204}Pb = 38.20 \pm 0.75\%$ (all uncertainties 1-sigma). Excess over blank was assigned to initial common Pb.

(f) Errors are 2-sigma, propagated using the algorithms of *Schmitz and Schoene* [2007] and *Crowley et al*. [2007].

(g) Calculations are based on the decay constants of *Jaffey et al*. [1971]. $^{206}Pb/^{238}U$ and $^{207}Pb/^{206}Pb$ ages corrected for initial disequilibrium in $^{230}Th/^{238}U$ using Th/U [magma] = 4.

$^{206}Pb/^{238}U$ dates in bold are those used in the weighted mean zircon date calcuation.

DR. 3 cont'd. U-Pb data in Stratigraphic order

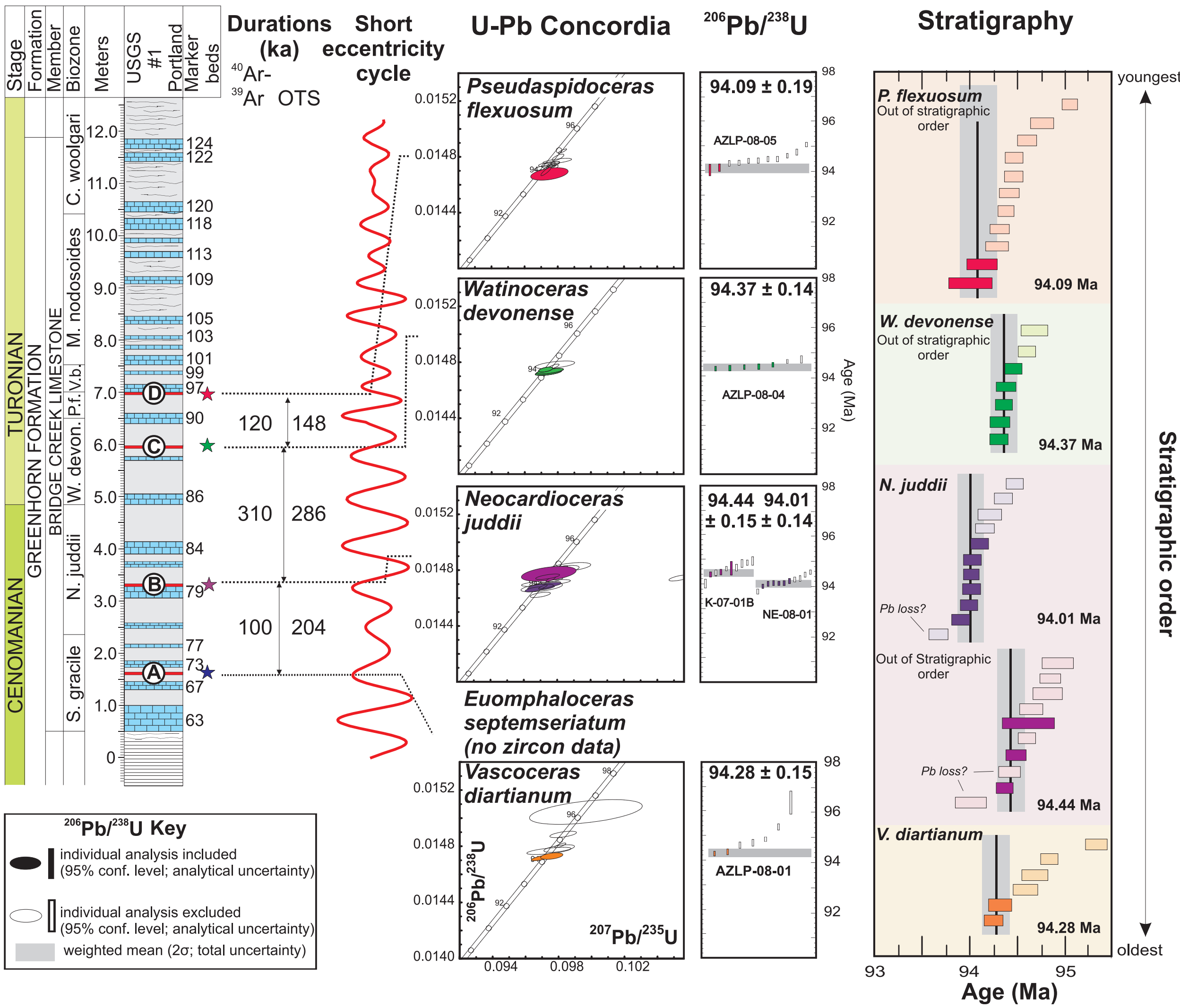


Figure DR 3. Lithostratigraphy and biostratigraphy of the Bridge Creek Limestone Member (Sageman et al., 2006) with the corresponding bandpass filtered short-eccentricity cycle (using grayscale data from Meyers et al., 2001) as preserved in USGS # 1 Portland Core. The bandpass filter utilizes a 10% cosine window, spanning 0.75-1.60 cycles/m for the lower portion of the section (< 6.46 m), and 1.00-1.20 cycles/m for the upper portion of the section (> 6.46 m). The bandpassed record is provided for schematic purposes only; the OTS was constructed via integration of a sedimentation rate curve, derived via Evolutive Harmonic Analysis (see DR5). U-Pb Concordia plots include decay constant band (to account for decay constant uncertainties), and $^{206}Pb/^{238}U$ weighted mean ages are reported with 2σ full uncertainties (no U-Pb analyses on AZLP-08-02). Analyses excluded from weighted mean calculations for $^{206}Pb/^{238}U$ ages (i.e. Pb loss; inheritance) are represented with light-colored filled symbols. $^{206}Pb/^{238}U$ individual analyses with corresponding weighted mean age, represented by a gray bar (reported with full uncertainty) are also plotted in stratigraphic order to clearly demonstrate sample sites that reflect inheritance.

Data Repository item DR 4. Comparison of $^{40}Ar/^{39}Ar$ and U-Pb results

Table DR4 provides a summary of the radioisotopic results, including $^{40}Ar/^{39}Ar$ ages calculated using three proposed ages for FCs: 28.02 Ma (Renne et al., 1998), 28.201 Ma (Kuiper et al., 2008), and 28.305 Ma (Renne et al., 2010). For the reasons outlined in the main manuscript, we interpret $^{40}Ar/^{39}Ar$ ages of the five bentonites calculated relative to 28.201 Ma FCs to represent the most accurate radioisotopic ages of these beds. A recent comparison of astronomically-dated geomagnetic reversals and excursions also recorded in lava flows by one of us (B. Singer) suggests that the $^{40}Ar/^{39}Ar$ system in the Quaternary is best calibrated using 28.02 Ma for FCs (Channell et al., 2010). The reasons for this discrepancy with our findings from the Cretaceous remain to be resolved.

Table DR4. Summary of $^{40}Ar/^{39}Ar$ and $^{206}Pb/^{238}U$ ages

Table DR4. Summary of $^{40}Ar/^{39}Ar$ and $^{206}Pb/^{238}U$ ages

			UW-Madison $^{40}Ar/^{39}Ar$ fusion analyses												NIGL $^{206}Pb/^{238}U$ isotope analyses				
Biozone	Obradovich (1993)$					Apparent Ages			Apparent Ages			Apparent Ages							
Sample	TCs 28.32 Maɣ		aliquot			FCs 28.02 Ma*			FCs 28.305 Ma**			FCs 28.201 Ma***							
	Age(Ma)	±95%+	size	N	MSWD	Age(Ma)	±95%+	±2σ†	Age(Ma)	±95%+	±2σα	Age(Ma)	±95%+	±2σ†	N	MSWD	Age(Ma)	±2σ‡	±2σ†
Pseudaspidoceras flexuosum																			
90-O-34L	93.40	±0.63	5	33 of 41	0.59	93.06	± 0.21	±1.58	94.01	± 0.21	0.24	93.67	± 0.21	± 0.31					
AZLP-08-05															2 of 11	0.67	94.09	± 0.13	± 0.19
Watinoceras devonense																			
AZLP-08-04			5	29 of 32	0.32	93.20	± 0.33	± 1.60	94.16	± 0.33	± 0.35	93.81	± 0.33	± 0.40	5 of 7	1.4	94.37	± 0.04	± 0.14
K-07-01C			7	33 of 39	0.15	93.22	± 0.30	± 1.61	94.17	± 0.30	± 0.33	93.83	± 0.30	± 0.38					
90-O-33L	93.25	±0.55	5	31 of 36	0.48	93.15	± 0.21	± 1.58	94.10	± 0.21	± 0.25	93.76	± 0.21	± 0.31					
	weighted mean age:			3	0.084	93.18	± 0.12	± 1.57	94.14	± 0.12	± 0.17	93.79	± 0.12	± 0.26					
Neocardioceras juddii																			
K-07-01B			1	40 of 44	0.35	93.45	± 0.27	± 1.60	94.41	± 0.27	± 0.29	94.07	± 0.27	± 0.36	3 of 10	2.4	94.44	± 0.07	± 0.15
NE-08-01			2 to 3	21 of 24	0.22	93.48	± 0.37	± 1.62	94.44	± 0.37	± 0.40	94.10	± 0.37	± 0.44	6 of 11	1.9	94.01	± 0.04	± 0.14
90-O-19L	93.30	±0.40	2 to 3	21 of 24	0.29	93.45	± 0.31	± 1.60	94.41	± 0.31	± 0.33	94.07	± 0.31	± 0.39					
90-O-49L	93.59	±0.58	1	21 of 24	0.35	93.53	± 0.23	± 1.59	94.49	± 0.23	± 0.27	94.15	± 0.23	± 0.33					
	weighted mean age:			4	0.09	93.48	± 0.14	± 1.58	94.44	± 0.14	± 0.18	94.10	± 0.14	± 0.27					
Euomphaloceras septemseriatum																			
AZLP-08-02			1	37 of 40	0.48	93.49	± 0.24	± 1.59	94.45	± 0.24	± 0.27	94.11	± 0.24	± 0.34					
90-O-31L	93.49	±0.89	1	37 of 43	0.40	93.63	± 0.19	± 1.59	94.59	± 0.19	± 0.23	94.25	± 0.19	± 0.30					
	weighted mean age:			2	0.84	93.58	± 0.15	± 1.58	94.54	± 0.15	± 0.20	94.20	± 0.15	± 0.28					
Vascoceras diartianum																			
90-O-30L	93.90	±0.72	3 to 6	42 of 46	0.22	93.81	± 0.17	± 1.59	94.77	± 0.17	± 0.21	94.43	± 0.17	± 0.29					
AZLP-08-01															2 of 5		94.28	± 0.08	± 0.15

Notes: Summary of 394 fusion analyses. Samples were correlated with biozones using Cobban et al. (2006).

Weighted mean ages for Ar-Ar and U-Pb systems were determined using Isoplot (Ludwig, 2008).

$Re-dated legacy samples include ages published in Obradovich (1993)

ɣAges relative to 28.32 Ma Taylor Creek sanidine (Duffield and Dalrymple, 1990) using Steiger and Jäger (1977) decay constant

*Ages relative to 28.02 Ma Fish Canyon sanidine (Renne et al. 1998) using Steiger and Jäger (1977) decay constant

**Ages relative to 28.305 Ma Fish Canyon sanidine (Renne et al. 2010) using Renne et al (2010) decay constant

***Ages relative to 28.201 Ma for Fish Canyon sanidine (Kuiper et al. 2008) using Min et al. (2000) decay constant

+ 95% confidence interval, analytical uncertainty only

‡ 2σ analytical uncertainty

†Fully propagated uncertainty ($^{206}Pb/^{238}U$ includes decay constant, tracer solution, analytical uncertainties; $^{40}Ar/^{39}Ar$ includes decay constant and analytical uncertainties)

αFully propagated uncertainty $^{40}Ar/^{39}Ar$ includes decay constant and analytical uncertainties using Monte Carlo simulations

L Legacy sample from Obradovich (1993)

DR 4 cont'd. Corresponding U-Pb Concordia with $^{206}Pb/^{238}U$ ages and $^{40}Ar/^{39}Ar$ ages

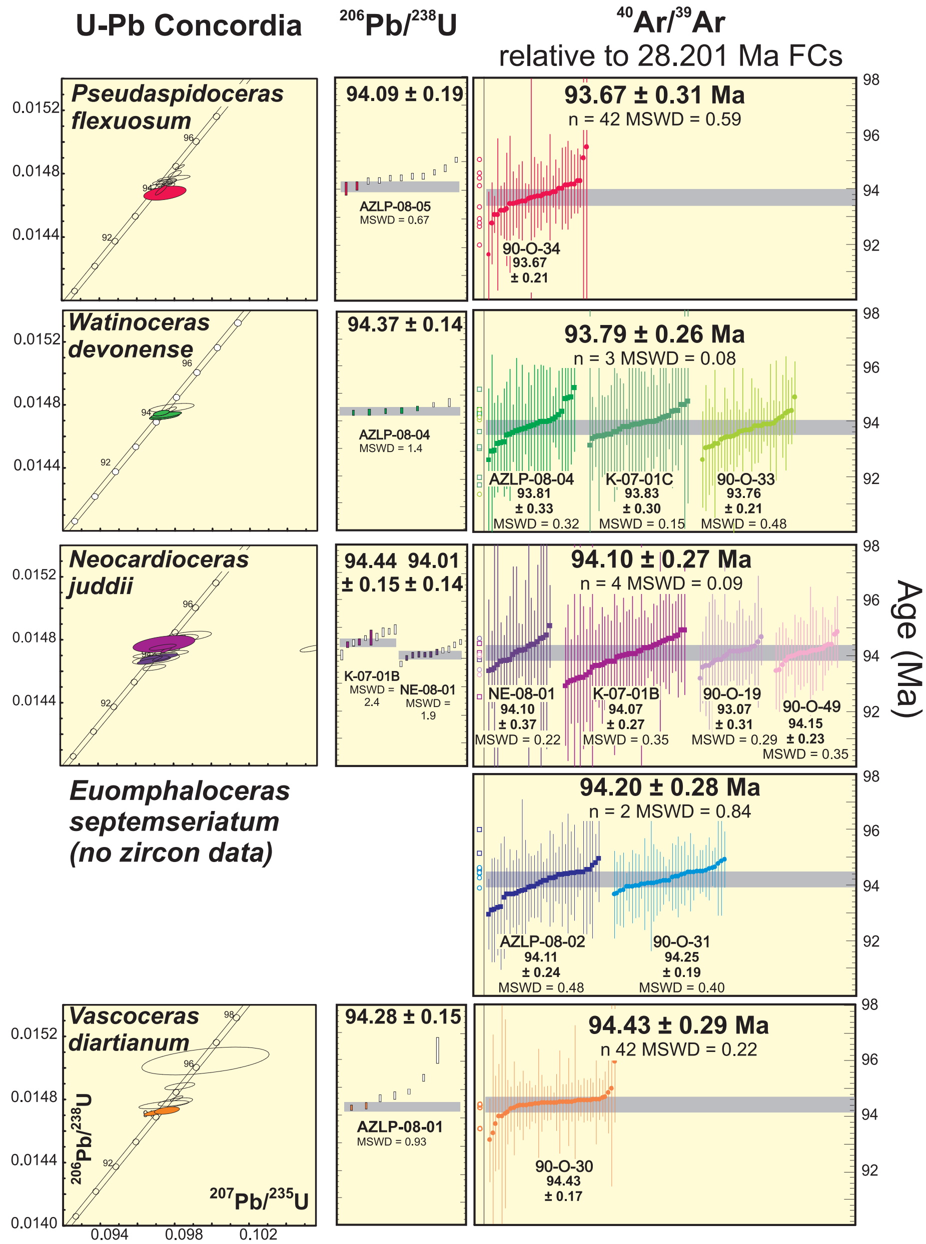


Figure DR 4. U-Pb Concordia with $^{206}Pb/^{238}U$ weighted average plots and $^{40}Ar/^{39}Ar$ probability density plots are shown with corresponding biozones and are in stratigraphic order. U-Pb and $^{40}Ar/^{39}Ar$ individual analyses for bentonites (no U-Pb analyses on AZLP-08-02) are reported at 2σ, and weighted mean ages, in bold, are reported with 2σ full uncertainties (also shown with gray bar). Circles indicate $^{40}Ar/^{39}Ar$ re-analyzed Obradovich (1993) samples, and recollected UW samples are shown with squares. Analyses excluded from weighted mean calculations for both $^{206}Pb/^{238}U$ (i.e. Pb loss; inheritance) and $^{40}Ar/^{39}Ar$ (i.e. <97% $^{40}Ar^*$, age outliers) are represented with white or light-colored filled symbols. $^{40}Ar/^{39}Ar$ MSWD values <1 reflect an overestimation of uncertainties, but given the current analytical precision limits of the method this cannot be resolved.

Data Repository item DR 5. Bayesian intercalibration of radioisotopic and astrochronologic time scales

The application of theoretical astronomical time series (e.g., Laskar et al., 2004) for cyclostratigraphic time scale calibration requires that such models contain accurate frequency, amplitude, and phase information for the orbital terms (precession, obliquity, and eccentricity). At present, the amplitude and phase of these orbital terms are unknown beyond ~50 Ma (Laskar et al., 2004), but theoretical estimates for the evolution of the periods during the past 500 Ma are constrained (Berger et al., 1992). The astronomical time scale for the C/T boundary interval was developed using multi-taper method spectral analysis techniques (Thomson, 1982) to evaluate the spatial bedding rhythms in the Bridge Creek Limestone Member, with the objective of identifying statistically-significant periodic terms that match the theoretically predicted orbital periods (Meyers et al., 2001).

More specifically, the orbital time scale of Meyers et al. (2001) was constructed via Evolutive Harmonic Analysis (EHA) of high-resolution (< 1 mm) grayscale data obtained from photographs of the U.S.G.S. #1 Portland core. Notable advantages of the EHA approach for astronomical time scale development include the identification and quantification of hiatus (Meyers and Sageman, 2004), and the ability of the technique to reliably interpolate sedimentation rate changes on time scales that are substantially shorter than the tuning period (Meyers et al., 2001). The short eccentricity term was selected for tuning in the C/T boundary interval, due to its high statistical significance and its persistence as a strong bedding signal throughout the entire stratigraphic section. Recognition of the spatial bedding period associated with the short eccentricity cycle was based upon calibration with available radioisotopic data (Meyers et al., 2001; see also Meyers and Sageman, 2004), and subsequent reevaluation of the

C/T boundary cyclostratigraphy using the Average Spectral Misfit technique for astrochronologic testing confirms the orbital model (Meyers and Sageman, 2007). The final C/T boundary astrochronology was developed by integrating the EHA sedimentation rate curve through the interval (Figure 8 in Meyers et al., 2001), which in turn was derived by evaluating changes in the spatial frequency expression of the short eccentricity cycle.

Our statistical approach for intercalibrating radioisotopic and astrochronologic time scales builds upon the foundation provided by Buck et al. (1992), using a methodology that was originally developed for archaeological investigations. These authors applied a Bayesian technique to calibrate radiocarbon results, incorporating information about archaeological context, that is, known ("prior") information about the temporal order of the archaeological events that have been radiocarbon dated. The approach of Buck et al. (1992) has been previously adapted to evaluate U/Pb ages (e.g., Mundil et al., 2004), and is known as the "stacked bed" algorithm (Ludwig, 2008).

An important distinction between the "stacked bed" algorithm, and the approach developed in the present study, is the explicit incorporation of the magnitude of elapsed time, based on astrochronology, between radioisotopically dated stratigraphic horizons (rather than the more simplistic constraint that an overlying bed must be younger than its underlying beds). The technique is implemented using Markov Chain Monte Carlo simulations (also known as the Gibbs Sampler; Spall, 2003); the radioisotopic ages of each bentonite are linked (Markov Chain) by the astronomical time scale, and random sampling of each $^{40}Ar/^{39}Ar$ probability density (Monte Carlo) is conducted, with the rejection of ages that violate the astrochronologic and radioisotopic constraints.

The product of the Markov Chain Monte Carlo simulation is a sampling of the astronomically calibrated $^{40}Ar/^{39}Ar$ age distributions (posterior marginal distributions) for each bentonite. We generate 10,000 candidate ages via simulation (preceded by a "burn-in" of 1000 simulations). The posterior marginal distributions are summarized using a Gaussian kernel density estimate (Silverman, 1982), and 95% credible intervals (Bayesian confidence intervals) are determined using the Highest Posterior Density (HPD) method.

Importantly, our implementation of this Bayesian approach also explicitly considers uncertainty in the astrochronologic estimates of duration between radioisotopically dated stratigraphic horizons. The most important sources of uncertainty in the astrochronology are uncertainty in the short eccentricity tuning frequency (Meyers et al., 2001), and potential hiatus (Meyers and Sageman, 2004). It should be noted that orbital time scale error due to hiatus is unlikely; quantitative hiatus detection methods (Meyers and Sageman, 2004) have been applied to the Bridge Creek Limestone Member, revealing one precession-scale gap in the late Cenomanian that is accounted for in the C/T astrochronology (Sageman et al., 2006).

As the precise value of the orbital timescale uncertainty is unknown, we evaluate potential uncertainties (or tolerances) ranging in magnitude from ± 10 ka to ± 50 ka for the duration between individual radioisotopically-dated bentonites. Bayesian intercalibration, when executed using the analytical uncertainties associated with the $^{40}Ar/^{39}Ar$ ages, is remarkably insensitive to the range of investigated orbital time scale tolerances (Figure DR 5). In contrast, intercalibration using the total $^{40}Ar/^{39}Ar$ age uncertainties demonstrates a degree of instability (with the ages of individual bentonites varying by up to 140 ka), particularly at low tolerances (<15 ka; Figure DR 5). The astronomically-recalibrated ages (Figure 1 of main text) utilize an intermediate tolerance of ± 20 ka. Ages recalibrated using the analytical uncertainties can achieve permil level of resolution, whereas those recalibrated using the total uncertainties can be constrained to better than two permil.

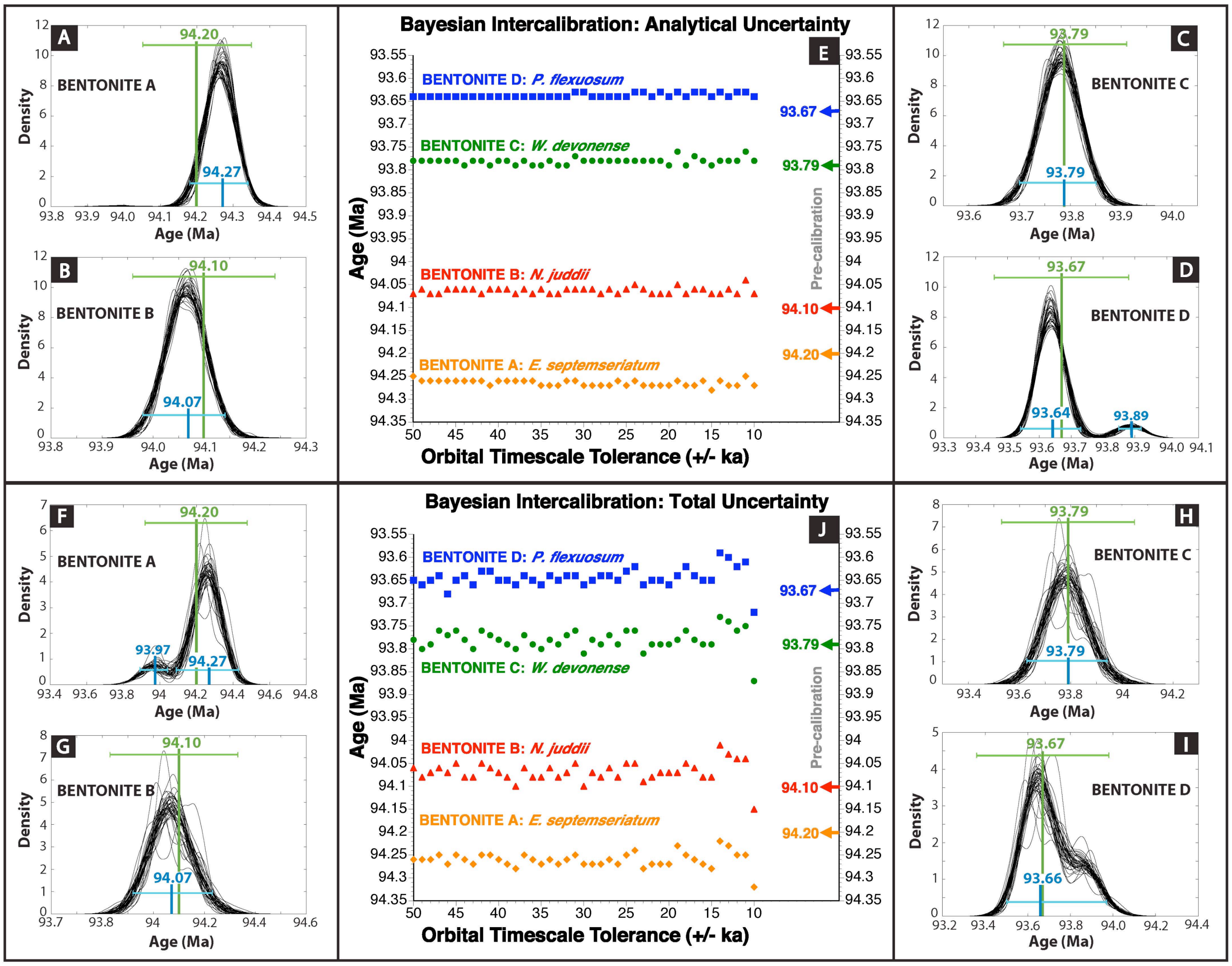


Figure DR 5. Summary of the Bayesian $^{40}Ar/^{39}Ar$ age solutions following intercalibration with the orbital time scale. Panels A-D display probability density plots (posterior marginal distributions) for each $^{40}Ar/^{39}Ar$ age following Bayesian intercalibration with the orbital time scale, utilizing the analytical uncertainty. Panels F-I display probability density plots (posterior marginal distributions) for each $^{40}Ar/^{39}Ar$ age following Bayesian intercalibration with the orbital time scale, utilizing the total radioisotopic uncertainty. Green lines indicate the pre-calibrated ages and 2σ uncertainty, while blue lines indicate the post-calibration ages and Bayesian 95% confidence intervals ("credible intervals") using an OTS tolerance of ± 20 ka. For each bentonite (A, B, C, D) we evaluate a range of potential orbital times scale errors from 10-50 ka (step of 1 ka; each result is indicated with one line in the density plots). The Bayesian $^{40}Ar/^{39}Ar$ age distributions are determined using 10,000 Markov Chain Monte Carlo simulations. Panels E and J illustrate the sensitivity of the Bayesian calibrated ages to the range of potential orbital timescale tolerances (uncertainties). The Bayesian intercalibration excludes the lower most bentonite corresponding to *V. diartianum* because it does not occur at the GSSP type locality or in the USGS # 1 Portland core, and was therefore not intercalibrated with the orbital time scale.

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