Data Repository Table 1: $^{40}Ar/^{39}Ar$ analytical data

File (# crystals analyzed)	$^{40}Ar/^{39}Ar$†	$^{37}Ar/^{39}Ar$§	$^{36}Ar/^{39}Ar$†	^{39}Ar mols	$^{40}Ar^*$ (%)	$^{40}Ar^*/^{39}Ar_K$	Age (Ma)	±1 σ (Ma)
ALS-00-102 sanidine (J=8.81060 E-5)								
02G1201 (2)	8.14311E+01	7.0957E-01	1.7682E-02	9.01711E-18	93.58	7.6290E+01	12.09	0.35
02G1202 (2)	7.58692E+01	4.0697E-01	2.0181E-02	1.17241E-17	92.13	6.9938E+01	11.08[a]	0.45
02G1203 (2)	7.85377E+01	1.2043E+00	6.9103E-03	6.49811E-18	97.40	7.6659E+01	12.14	0.49
02G1204 (3)	7.20019E+01	5.5634E-01	1.0009E-06	7.65666E-18	100.00	7.2058E+01	11.42[a]	0.31
02G1205 (3)	7.80957E+01	1.2949E+00	9.8796E-03	5.44328E-18	96.26	7.5353E+01	11.94	0.46
02G1206 (4)	8.39599E+01	8.8994E-01	1.1661E-02	7.05041E-18	95.89	8.0630E+01	12.77	0.28
						Weighted mean age	**12.37 Ma**	**0.66 Ma**
ALS-00-145-B sanidine (J=8.83184 E-5)								
02G1401 (1)	6.11676E+02	1.5955E+01	4.8773E-01	1.69224E-19	76.41	4.7564E+02	74.24[a]	30.19
02G1402 (2)	9.44292E+01	5.7735E-01	2.3049E-03	2.69840E-18	99.28	9.3819E+01	14.89	0.66
02G1403 (3)	9.05521E+01	1.7471E-01	6.5743E-03	6.68607E-18	97.85	8.8609E+01	14.06	0.52
02G1404 (3)	9.52799E+01	1.1362E+00	2.1590E-02	4.82503E-18	93.30	8.9065E+01	14.14	0.86
02G1405 (3)	9.47239E+01	4.7910E-01	2.2017E-02	5.00318E-18	93.12	8.8269E+01	14.01	0.35
02G1406 (3)	1.17752E+02	1.4526E-01	3.2550E-02	5.77582E-18	91.82	1.0813E+02	17.15[a]	0.29
02G1407 (2)	9.70939E+01	8.7868E-01	1.1349E-02	8.03777E-18	96.54	9.3864E+01	14.89	0.42
						Weighted mean age	**14.36 Ma**	**0.43 Ma**

$\lambda = 5.543 \times 10^{-10}$/yr; † Corrected for line blank; § Corrected for line blank and ^{37}Ar decay; [a] not used in calculating weighted mean. Ages are shown with 1 ʃ analytical errors. Weighted mean ages were calculated using Isoplot 3.0 (Ludwig, 2003). Errors shown with weighted mean ages are at the 95% confidence interval.

DATA REPOSITIORY: $^{40}Ar/^{39}Ar$ ANALYTICAL PROCEDURES

Sanidine crystals were handpicked from ashfall tephras. They were wrapped individually in Sn foil, along with along with biotite standard GA1550 (97.9 Ma, McDougall and Harrison, 1999) and Fish Canyon sanidine standard (27.9 Ma, Steven et al., 1967; Cebula et al., 1986), used to monitor the neutron dose. Samples were vacuum-sealed in super silica quartz tubes and irradiated for 0.5 hours in position L-67 of the Ford Reactor at the University of Michigan.

Argon analyses were performed in the Syracuse University Noble Gas Isotopic Research Laboratory. Extraction of gas was accomplished with 40% output power of a Synrad 48-2 CO_2 laser, tunable from 0 to 25 W. Two SAES getters were used for purification of the extracted gas. Pumping is through either a turbomolecular pump or a Varian ion pump. Isotopic analyses were performed using a VG5400 mass spectrometer with an ion-counting electron multiplier. Machine mass discrimination and sensitivity were determined from repeated analysis of atmospheric argon. Data reduction was completed on a PC using in-house programs**.** Samples were corrected for blanks, neutron-induced interfering isotopes, decay of ^{37}Ar and ^{39}Ar, mass discrimination, and atmospheric argon. Correction factors used to account for interfering nuclear reactions were determined by analyzing argon extracted from irradiated CaF_2 and K glass and are $(^{36}Ar/^{37}Ar)_{Ca}$= 0.00032; $(^{39}Ar/^{37}Ar)_{Ca}$ = 0.0009; $(^{40}Ar/^{39}Ar)_{K}$= 0.030. All ages are calculated using the decay constants recommended by Steiger and Jager (1977). Stated precisions for $^{40}Ar/^{39}Ar$ ages include all uncertainties in the measurement of isotope ratios and are quoted at the 1□ level. The errors do not include a 0.52% error associated with the J parameter.

References Cited

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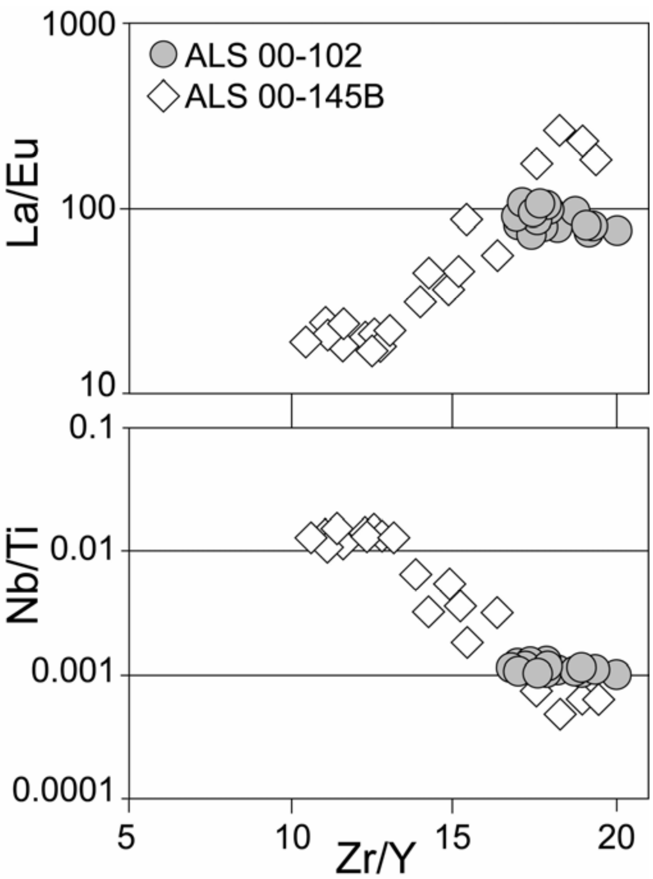

Fig DR1. Results from trace-element geochemistry (TEG) of dated ash samples. Each symbol represents laser ablation (Nd:YAG, λ= 213) and isotopic analyses of a single glass shard (50–500 μm) utilizing a PQ Excell quadrupole MS at Boston University. Estimated error is smaller than symbols, based on replicate analyses (n = 26) of BHVO glass standard. Shards from the in situ ashfall deposit, ALS 00–102, show near-identical TEG signatures, whereas shards from a reworked volcanic-ash layer on the intermediate surface, ALS 00–145B, show a range of chemical signatures.