

Table DR1.  $^{40}\text{Ar}/^{39}\text{Ar}$  analytical data for Eocene rhyolite ash-flow tuffs in the Panther Creek half graben and outflow of the tuff of Challis Creek.

<i>T</i> (°C)	Radiogenic $^{40}\text{Ar}^\dagger$	K-derived $^{39}\text{Ar}^\dagger$	$^{40}\text{Ar}_\text{K}/^{39}\text{Ar}_\text{K}^\ddagger$	Radiogenic yield (%)	% $^{39}\text{Ar}$ total	$^{39}\text{Ar}/^{37}\text{Ar}^\S$	Apparent age & error (Ma at 1 sigma)
<b>Sample 6-22-4: Tuffs of Castle Rock; 60.6 mg sanidine; Plateau date = 45.36 +/- .10 Ma; J-value = 0.007705 +/- 0.1%; 44°59'35" 114°21'34"</b>							
700 p	.41936	.12582	3.33	34.2	1.5	51	45.7 +/- .4
800 p	.75570	.22939	3.294	87.4	2.6	67	45.22 +/- .07
850 p	1.4777	.44960	3.287	95.8	5.2	55	45.1 +/- .3
900 p	1.9587	.59280	3.304	97.2	6.8	68	45.35 +/- .07
950 p	2.5000	.75780	3.299	97.8	8.7	61	45.28 +/- .08
1000 p	3.2068	.97169	3.300	98.2	11.2	81	45.30 +/- .07
1050 p	3.7578	1.1370	3.305	98.8	13.1	67	45.37 +/- .07
1100 p	4.1769	1.2618	3.310	99.0	14.6	65	45.44 +/- .07
1150 p	4.4875	1.3546	3.313	99.2	15.6	66	45.47 +/- .07
1200	3.9151	1.1826	3.311	98.7	13.6	64	45.44 +/- .07
1250	1.4078	.42316	3.327	96.5	4.9	51	45.66 +/- .10
1400	.61149	.18557	3.295	93.9	2.1	25	45.23 +/- .07
Total							
Gas			3.307				45.39 +/- .09

<i>T</i> (°C)	Radiogenic <sup>40</sup> Ar <sup>†</sup>	K-derived <sup>39</sup> Ar <sup>†</sup>	<sup>40</sup> Ar <sub>K</sub> / <sup>39</sup> Ar <sub>K</sub> <sup>‡</sup>	Radiogenic yield (%)	% <sup>39</sup> Ar total	<sup>39</sup> Ar/ <sup>37</sup> Ar <sup>§</sup>	Apparent age & error (Ma at 1 sigma)		
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<b>Sample 93-1: Tufts of Challis Creek, outflow; 48.3 mg sanidine; Plateau date = 45.70 +/- .08 Ma; J-value = 0.007820 +/- 0.1%; 44°30'28" 114°14'20"</b>									
700	.0219	.0038	5.8	11.9	.1	1.1	55	+/-	14
800	.2263	.0651	3.48	33.3	1.5	13	48.4	+/-	.7
900	.28337	.0815	3.48	90.4	1.9	9.4	48.4	+/-	.2
1000	.37158	.1089	3.41	87.6	2.5	12	47.5	+/-	.3
1100 p	1.8872	.57635	3.274	97.4	13.2	41	45.61	+/-	.07
1150 p	2.2674	.69257	3.274	98.0	15.9	50	45.60	+/-	.07
1200 p	2.5454	.77468	3.286	98.1	17.7	66	45.77	+/-	.07
1250 p	1.4723	.44834	3.284	98.2	10.3	39	45.74	+/-	.10
1350 p	1.9602	.59652	3.286	97.7	13.7	57	45.77	+/-	.09
1450	3.3630	1.0205	3.296	98.3	23.4	44	45.90	+/-	.07
Total									
Gas			3.296				45.91	+/-	.10

<i>T</i> (°C)	Radiogenic <sup>40</sup> Ar†	K-derived <sup>39</sup> Ar†	<sup>40</sup> Ar <sub>K</sub> / <sup>39</sup> Ar <sub>K</sub> <sup>‡</sup>	Radiogenic yield (%)	% <sup>39</sup> Ar total	<sup>39</sup> Ar/ <sup>37</sup> Ar <sup>§</sup>	Apparent age & error (Ma at 1 sigma)		
<b>Sample 6-18-10: Fractured ash flow tuff on ridge west of Moyer Creek; 55.8 mg sanidine; Plateau date = 45.73 +/- .10 Ma; J-value = 0.007768 +/- 0.1%; 44°58'41" 114°18'16"</b>									
700	.0278	.0095	2.92	16.6	.2	10	40	+/-	3.
800	.2447	.0741	3.30	36.1	1.4	122	45.7	+/-	1.0
850	.21840	.0673	3.24	82.9	1.2	32	44.9	+/-	.9
900	.26920	.08261	3.259	93.0	1.5	30	45.1	+/-	.5
950	.36232	.11208	3.233	93.1	2.1	30	44.7	+/-	.2
1000 p	.65443	.19797	3.306	97.5	3.6	41	45.74	+/-	.11
1050 p	1.1089	.33509	3.309	98.5	6.2	58	45.79	+/-	.11
1100 p	1.5320	.46438	3.299	98.2	8.6	51	45.65	+/-	.08
1150 p	1.6853	.51258	3.288	97.9	9.4	51	45.50	+/-	.10
1200 p	2.7621	.83860	3.294	98.6	15.4	56	45.58	+/-	.10
1250 p	2.9553	.89379	3.306	99.0	16.5	43	45.75	+/-	.07
1300 p	1.9164	.57926	3.308	96.5	10.7	49	45.78	+/-	.15
1450	4.1860	1.2612	3.319	98.2	23.2	24	45.92	+/-	.07
Total									
Gas			3.302				45.68	+/-	.13

Mineral separates were prepared by magnetic separator and heavy-liquid methods and hand picked; grains from the tuff of Castle Rock were 80-120 mesh size whereas grains from the fractured rhyolite tuff and tuff of Challis Creek were crystals about 2 mm in size. Separates were then hand-picked to greater than 99% purity. Individual samples ranged in mass from 48-61 mg, and were cleaned with reagent-grade acetone and de-ionized water in an ultrasonic bath, air dried, wrapped in aluminum foil boats and sealed in silica vials along with monitor minerals prior to irradiation. Samples were irradiated for 30 hours at 1 MW at the TRIGA reactor at the U.S. Geological Survey in Denver, Colorado.

<sup>†</sup>Abundances of 'Radiogenic <sup>40</sup>Ar' and 'K-derived <sup>39</sup>Ar' are reported in volts. Conversion to moles can be made using  $9.736 \times 10^{-13}$  moles argon per volt of signal. Analytical data for 'Radiogenic <sup>40</sup>Ar' and 'K-derived <sup>39</sup>Ar' are calculated to five places; <sup>40</sup>Ar/<sup>39</sup>Ar is calculated to three decimal places. 'Radiogenic <sup>40</sup>Ar', 'K-derived <sup>39</sup>Ar' and '<sup>40</sup>Ar/<sup>39</sup>Ar<sub>K</sub>' are rounded to significant figures using analytical precisions. Apparent ages and associated errors were calculated from unrounded analytical data and then rounded using associated errors. All analyses were done in the Argon Laboratory, U.S. Geological Survey, Denver, Colorado. Decay constants are from Steiger and Jager (1977). The irradiation monitor MMhb-1 (1.555 wt% K), with an age of 520.4 Ma (Samson and Alexander, 1987) was used to calculate J values for the analyses.

<sup>‡</sup>A Mass Analyzer Products 215 Rare Gas mass spectrometer with a Faraday cup with a sensitivity of  $9.736 \times 10^{-13}$  moles/V and a detection limit of  $2 \times 10^{-17}$  moles Ar was used to measure argon isotope composition; corrections for volume, mass fractionation, trap current, radioactive decay of <sup>37</sup>Ar and <sup>39</sup>Ar and interfering Ar isotopes were made. Production ratios measured on pure K<sub>2</sub>SO<sub>4</sub> and CaF<sub>2</sub> salts irradiated with the samples were used to correct for irradiation-produced <sup>40</sup>Ar (from K) and <sup>39</sup>Ar (from Ca). Corrections for Cl-derived <sup>36</sup>Ar were determined using the method of Roddick (1983). Production ratios determined for the samples are: <sup>37</sup>Ar<sub>K</sub>/<sup>39</sup>Ar<sub>K</sub>,  $5.5 \times 10^{-5}$ ; <sup>38</sup>Ar<sub>K</sub>/<sup>39</sup>Ar<sub>K</sub>,  $1.313 \times 10^{-2}$ ; <sup>40</sup>Ar<sub>K</sub>/<sup>39</sup>Ar<sub>K</sub>,  $7.95 \times 10^{-3}$ ; <sup>39</sup>Ar<sub>Ca</sub>/<sup>37</sup>Ar<sub>Ca</sub>,  $6.60 \times 10^{-4}$ ; <sup>36</sup>Ar<sub>Ca</sub>/<sup>37</sup>Ar<sub>Ca</sub>,  $2.80 \times 10^{-4}$ ; <sup>38</sup>Ar<sub>Ca</sub>/<sup>37</sup>Ar<sub>Ca</sub>,  $5.6 \times 10^{-5}$ . The reproducibility of split gas fractions from each monitor (0.15-0.35%, 1 sigma) were used to calculate imprecisions in J.J values were interpolated from adjacent monitors and have similar uncertainties to the monitors. Uncertainties in calculations for the date of individual steps in a spectrum were calculated using the equations of Dalrymple and others (1981).

<sup>§</sup>To calculate apparent K/Ca ratios, divide the <sup>39</sup>Ar/<sup>37</sup>Ar value by 2.

<sup>¶</sup>Fraction included in plateau or preferred date.