

**Appendix 2.  $^{40}\text{Ar}/^{39}\text{Ar}$  analytical data for northern Abiquiu Embayment groundmass samples.**

ID	Power (Watts)	$^{40}\text{Ar}/^{39}\text{Ar}$	$^{37}\text{Ar}/^{39}\text{Ar}$	$^{36}\text{Ar}/^{39}\text{Ar}$ ( $\times 10^{-3}$ )	$^{39}\text{Ar}_K$ ( $\times 10^{-15}$ mol)	K/Ca	$^{40}\text{Ar}^*$ (%)	$^{39}\text{Ar}$ (%)	Age (Ma)	$\pm 1\sigma$ (Ma)
<b>VGP-2</b> , wr, 28.27 mg, J=0.0023013 $\pm$ 0.48%, D=1.005 $\pm$ 0.001, NM-231C, Lab#=59490-02										
Xi A	3	90.16	8.813	272.3	0.393	0.058	11.5	1.9	43.0	3.8
Xi B	4	24.59	11.82	57.42	1.10	0.043	35.0	7.1	35.61	0.99
C	5	10.60	13.48	18.58	1.70	0.038	58.7	15.1	25.86	0.62
D	6	9.884	15.23	16.65	2.71	0.033	62.9	27.9	25.89	0.54
E	8	8.840	18.93	13.71	3.08	0.027	71.9	42.4	26.51	0.70
F	10	9.018	18.13	15.42	3.31	0.028	66.1	58.0	24.86	0.74
G	13	17.70	19.15	44.76	3.84	0.027	34.2	76.1	25.29	0.77
H	16	16.53	21.50	41.55	2.31	0.024	36.5	87.0	25.21	0.71
I	18	14.08	21.75	33.59	1.29	0.023	42.3	93.1	24.90	0.88
J	30	13.34	59.46	42.10	1.47	0.009	43.6	100.0	25.0	2.0
<b>Integrated age <math>\pm 2\sigma</math></b>		n=10			21.2	0.025	K2O=0.13%		26.3	1.2
<b>Plateau <math>\pm 2\sigma</math></b>		steps C-J	n=8	MSWD=0.62	19.7	0.027 $\pm$ 0.017		92.9	<b>25.59</b>	<b>0.57</b>
<b>Isochron<math>\pm 2\sigma</math></b>		steps C-J	n=8	MSWD=0.91		$^{40}\text{Ar}/^{36}\text{Ar} =$	289.3 $\pm$ 8.0		26.10	0.80
<b>ER-43-djk</b> , wr, 38.17 mg, J=0.0007841 $\pm$ 0.07%, D=1.0014 $\pm$ 0.001, NM-217F, Lab#=57815-01										
B	625	440.0	0.9587	1442.0	2.74	0.53	3.2	8.0	19.69	2.83
C	700	122.9	1.276	380.0	3.67	0.40	8.7	18.7	15.07	0.84
D	750	65.44	1.626	190.8	3.57	0.31	14.1	29.2	12.99	0.50
E	800	52.25	1.668	141.6	3.48	0.31	20.2	39.4	14.86	0.39
F	875	69.11	1.402	199.5	4.45	0.36	14.9	52.4	14.50	0.54
G	975	81.02	1.550	235.4	4.09	0.33	14.3	64.3	16.34	0.67
H	1075	62.94	3.640	175.2	1.94	0.14	18.2	70.0	16.20	0.55
I	1250	79.37	22.06	235.3	8.7	0.023	14.7	95.6	16.67	0.56
J	1700	160.7	21.90	508.2	1.51	0.023	7.7	100.0	17.59	1.50
<b>Integrated age <math>\pm 2\sigma</math></b>		n=9			34.2	0.065	K2O=0.44		15.86	1.22
<b>Plateau <math>\pm 2\sigma</math></b>		steps B-J	n=9	MSWD=5.00	34.2	0.25 $\pm$ 0.35		100.0	15.14	0.90
<b>Isochron<math>\pm 2\sigma</math></b>		steps B-J	n=9	MSWD=4.74		$^{40}\text{Ar}/^{36}\text{Ar} =$	98.9 $\pm$ 5.7		<b>14.2</b>	<b>1.9</b>
<b>ER-76</b> , wr, 42.82 mg, J=0.0007825 $\pm$ 0.08%, D=1.0014 $\pm$ 0.001, NM-217F, Lab#=57814-01										
Xi B	625	1236.6	1.121	4087.1	2.24	0.46	2.3	7.3	40.48	7.35
C	700	376.9	-0.1576	1216.6	2.19	-	4.6	14.5	24.33	2.59
D	750	368.5	0.6771	1189.1	1.44	0.75	4.7	19.3	24.11	2.68
E	800	995.4	0.8257	3301.9	1.75	0.62	2.0	25.0	27.69	5.97
F	875	795.6	0.7307	2620.2	2.83	0.70	2.7	34.3	29.98	4.78
G	975	344.2	0.7200	1115.1	5.80	0.71	4.3	53.3	20.71	2.04
H	1075	229.4	2.116	725.7	3.22	0.24	6.6	63.9	21.25	1.48
I	1250	97.84	19.48	286.2	10.0	0.026	15.2	96.8	21.19	0.59
Xi J	1700	320.2	72.56	1032.9	0.99	0.007	6.6	100.0	30.91	2.96
<b>Integrated age <math>\pm 2\sigma</math></b>		n=9			30.5	0.054	K2O=0.35		24.4	4.4
<b>Plateau <math>\pm 2\sigma</math></b>		steps C-I	n=7	MSWD=1.14	27.3	0.37 $\pm$ 0.56		89.4	<b>21.5</b>	<b>1.1</b>
<b>Isochron<math>\pm 2\sigma</math></b>		steps C-I	n=7	MSWD=0.48		$^{40}\text{Ar}/^{36}\text{Ar} =$	297.2 $\pm$ 1.6		20.4	1.5

**Notes:**

Isotopic ratios corrected for blank, radioactive decay, and mass discrimination, not corrected for interfering reactions.

Errors quoted for individual analyses include analytical error only, without interfering reaction or J uncertainties.

Integrated age calculated by summing isotopic measurements of all steps.

Integrated age error calculated by quadratically combining errors of isotopic measurements of all steps.

Plateau age is inverse-variance-weighted mean of selected steps.

Plateau age error is inverse-variance-weighted mean error (Taylor, 1982) times root MSWD where MSWD>1.

Plateau error is weighted error of Taylor (1982).

Decay constants and isotopic abundances after Steiger and Jäger (1977).

X symbol preceding sample ID denotes analyses excluded from plateau age calculations.

i symbol preceding sample ID denotes analyses excluded from isochron age calculations.

Weight percent  $K_2O$  calculated from  $^{39}Ar$  signal, sample weight, and instrument sensitivity.

Ages calculated relative to FC-2 Fish Canyon Tuff sanidine interlaboratory standard at 28.02 Ma

Decay Constant (LambdaK (total)) =  $5.543e-10/a$

Correction factors for irradiation NM-231:

$$(^{39}Ar/^{37}Ar)_{Ca} = 0.0007 \pm 5e-05$$

$$(^{36}Ar/^{37}Ar)_{Ca} = 0.00028 \pm 2e-05$$

$$(^{38}Ar/^{39}Ar)_K = 0.013$$

$$(^{40}Ar/^{39}Ar)_K = 0.01 \pm 0.002$$

Correction factors for irradiation NM-217:

$$(^{39}Ar/^{37}Ar)_{Ca} = 0.00068 \pm 2e-05$$

$$(^{36}Ar/^{37}Ar)_{Ca} = 0.00028 \pm 1e-05$$

$$(^{38}Ar/^{39}Ar)_K = 0.0125$$

$$(^{40}Ar/^{39}Ar)_K = 0 \pm 0.0004$$

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