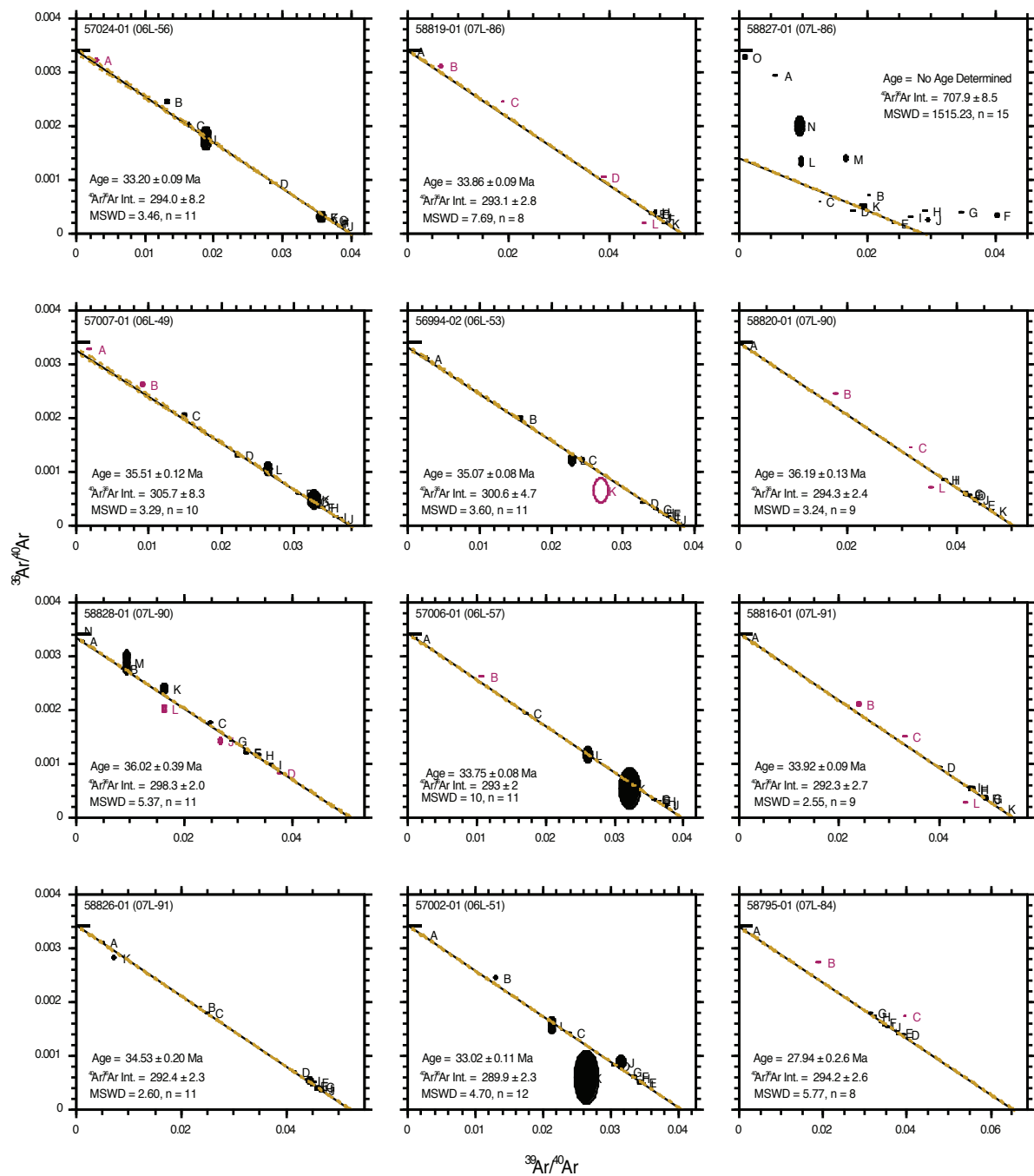
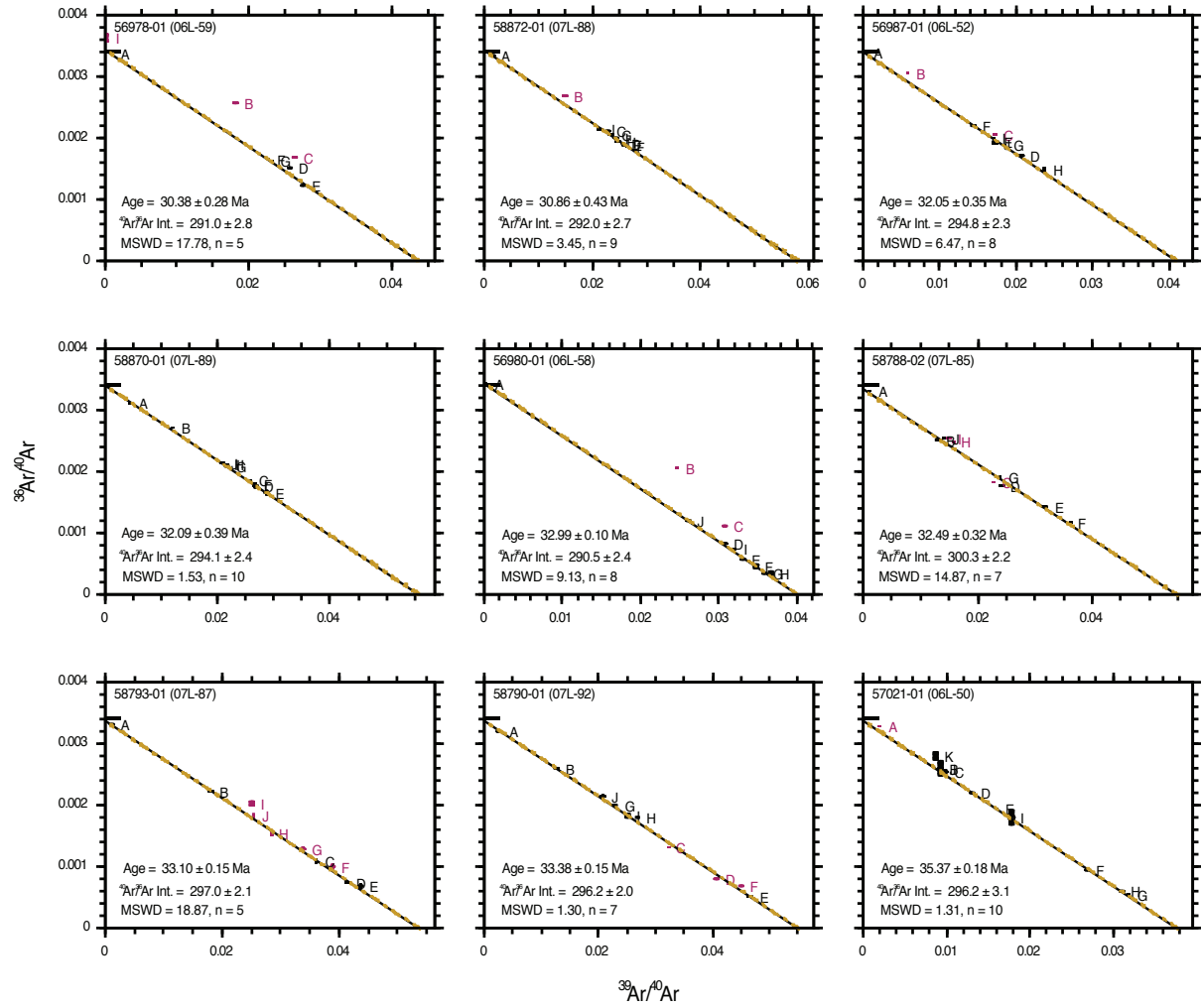


SUPPLEMENTAL FILE S3-C. S3-D. PLATEAU AND ISOCHRON PLOTS FOR SUMMER COON AND DEL NORTE VOLCANOES





⁴⁰Ar/³⁹Ar analytical data for Summer Coon and Del Norte volcanoes

ID	Temp (°C)	⁴⁰ Ar/ ³⁹ Ar	³⁷ Ar/ ³⁹ Ar	³⁶ Ar/ ³⁹ Ar (x 10 ⁻³)	³⁹ Ar _K (x 10 ⁻¹⁵ mol)	K/Ca	⁴⁰ Ar* (%)	³⁹ Ar (%)	Age (Ma)	±1σ (Ma)
06L-56 , Biotite, 11.4 mg, J=0.0007311±0.04%, NM-205P, Lab#=57024-01										
Xi A	650.0	327.7	0.0950	1057.3	0.470	5.4	4.7	0.4	20.31	2.95
X B	750.0	75.49	0.0930	183.6	0.372	5.5	28.2	0.6	28.24	2.04
X C	850.0	60.97	0.0559	122.7	1.03	9.1	40.6	1.4	32.79	0.85
X D	920.0	34.79	0.0319	32.46	2.49	16.0	72.4	3.3	33.42	0.34
E	1000.0	27.82	0.0203	8.629	10.0	25.1	90.8	11.1	33.51	0.10
F	1075.0	26.60	0.0183	5.045	20.2	27.9	94.4	26.6	33.30	0.07
G	1110.0	26.86	0.0596	6.846	12.1	8.6	92.5	35.9	32.94	0.09
H	1180.0	26.74	0.0828	5.959	35.1	6.2	93.4	62.9	33.14	0.05
I	1210.0	26.47	0.0381	4.977	32.2	13.4	94.5	87.7	33.15	0.06
J	1250.0	25.92	0.0082	3.444	15.2	62.0	96.1	99.4	33.03	0.08
K	1300.0	27.88	0.0270	8.717	0.674	18.9	90.8	99.9	33.56	1.07
X L	1650.0	52.60	0.1395	92.07	0.140	3.7	48.3	100.0	33.69	5.10
Integrated age ± 2σ			n=12		130.1	11.4	K2O=5.99%		33.13	0.12
Plateau ± 2σ		steps E-K	n=7	MSWD=4.19	125.6	20.1	±37.9	96.5	33.17	0.12
Isochron±2σ		steps B-L	n=11	MSWD=3.46	⁴⁰ Ar/ ³⁶ Ar=		294.0±8.2		33.20	0.09
07L-86 , Biotite, 7.11 mg, J=0.0010172±0.07%, NM-222I, Lab#=58819-01										
X A	650.0	2549.0	0.1933	8614.5	0.404	2.6	0.1	0.3	6.36	22.54
Xi B	750.0	146.1	0.0865	453.8	1.22	5.9	8.2	1.1	22.18	1.80
Xi C	850.0	52.84	0.0466	128.4	3.88	11.0	28.2	3.8	27.54	0.52
Xi D	920.0	25.58	0.0222	26.81	8.76	22.9	69.0	9.7	32.59	0.18
X E	1000.0	20.61	0.0111	7.474	16.0	46.1	89.3	20.7	33.95	0.09
X F	1075.0	19.91	0.0145	5.623	15.3	35.2	91.7	31.1	33.66	0.09
X G	1110.0	20.39	0.0183	7.046	11.2	27.9	89.8	38.8	33.77	0.10
X H	1180.0	20.31	0.1199	7.581	14.7	4.3	89.0	48.8	33.36	0.10
X I	1210.0	20.34	0.5867	7.310	8.50	0.87	89.6	54.6	33.64	0.11
X J	1250.0	20.06	0.3722	6.234	11.6	1.4	91.0	62.6	33.68	0.10
X K	1300.0	19.55	0.0816	3.679	41.5	6.3	94.5	90.9	34.08	0.06
Xi L	1680.0	21.28	0.0371	4.190	13.3	13.7	94.2	100.0	36.94	0.10
Integrated age ± 2σ			n=12		146.4	4.6	K2O=7.77%		33.71	0.25
Plateau ± 2σ		no plateau	n=0	MSWD=0.00	0.000	0.000±0.000		0.0	0.00	0.00
Isochron±2σ		steps A-K	n=8	MSWD=7.69	⁴⁰ Ar/ ³⁶ Ar=		293.1±2.8		33.86	0.09
07L-86 , Hornblende, 15.21 mg, J=0.0010001±0.13%, NM-222I, Lab#=58827-01										
X A	1000.0	171.8	0.4315	504.1	3.96	1.2	13.3	8.5	41.52	1.47
X B	1100.0	49.21	1.509	34.40	3.11	0.34	79.6	15.1	70.40	0.39
X C	1150.0	79.08	4.484	48.24	10.4	0.11	82.4	37.3	115.96	0.31
X D	1175.0	55.51	4.511	24.15	11.5	0.11	87.8	61.9	87.41	0.20
X E	1190.0	41.36	4.503	9.446	7.01	0.11	94.2	76.9	70.15	0.21
X F	1200.0	24.74	4.716	9.600	1.62	0.11	90.1	80.4	40.49	0.41
X G	1210.0	28.62	4.752	12.29	1.19	0.11	88.7	82.9	46.04	0.51
X H	1220.0	34.29	4.674	15.66	1.17	0.11	87.6	85.4	54.36	0.50
X I	1235.0	37.04	5.003	12.58	2.18	0.10	91.1	90.1	60.94	0.38
X J	1250.0	33.67	5.130	9.184	3.70	0.099	93.2	98.0	56.76	0.24
X K	1265.0	50.90	5.748	27.12	0.382	0.089	85.2	98.8	78.00	1.54
X L	1280.0	102.6	6.733	138.0	0.100	0.076	60.8	99.0	111.31	5.80
X M	1350.0	59.55	5.471	84.33	0.356	0.093	58.9	99.8	63.35	1.86
X N	1450.0	102.9	7.691	207.4	0.055	0.066	41.1	99.9	76.21	10.90
X O	1750.0	999.2	10.81	3270.6	0.033	0.047	3.4	100.0	60.96	25.46
Integrated age ± 2σ			n=15		46.8	0.13	K2O=1.18%		78.95	0.54
Plateau ± 2σ		no plateau	n=0	MSWD=0.00	0.000	0.000±0.000		0.0	0.00	0.00
Isochron±2σ		steps A-O	n=15	ISWD=1515.23	⁴⁰ Ar/ ³⁶ Ar=		707.9±8.5		62.69	0.37
06L-49 , Biotite, 11.1 mg, J=0.0007416±0.07%, NM-205M, Lab#=57007-01										
Xi A	650.0	511.0	0.1413	1668.6	0.577	3.6	3.5	0.6	24.22	3.47
Xi B	750.0	108.2	0.1320	282.6	0.544	3.9	22.8	1.1	33.18	1.58
X C	850.0	66.80	0.1264	136.5	0.778	4.0	39.6	1.8	35.58	1.10

X D	920.0	44.68	0.0730	58.42	1.35	7.0	61.4	3.1	36.86	0.58
X E	1000.0	32.59	0.0572	19.25	4.54	8.9	82.6	7.4	36.16	0.20
X F	1075.0	29.71	0.0576	10.18	10.9	8.9	89.9	17.8	35.91	0.10
G	1110.0	30.64	0.1089	13.89	8.42	4.7	86.6	25.8	35.68	0.11
H	1180.0	29.25	0.1249	10.04	16.6	4.1	89.9	41.7	35.35	0.08
I	1210.0	27.82	0.0415	4.585	49.2	12.3	95.1	88.6	35.58	0.06
J	1250.0	27.42	0.0196	3.403	11.2	26.0	96.3	99.3	35.52	0.09
K	1300.0	30.36	0.4777	14.09	0.304	1.1	86.4	99.6	35.28	2.38
L	1650.0	37.64	0.3787	39.60	0.388	1.3	69.0	100.0	34.93	1.87
Integrated age $\pm 2\sigma$			n=12		104.9	7.9	K2O=4.89%		35.56	0.16
Plateau $\pm 2\sigma$		steps G-L	n=6	MSWD=1.57	86.2	11.7	± 19.2	82.2	35.53	0.11
Isochron $\pm 2\sigma$		steps C-L	n=10	MSWD=3.29	$^{40}\text{Ar}/^{36}\text{Ar}= 305.7\pm 8.3$				35.51	0.12

06L-53, Biotite, 10.3 mg, J=0.0007394 \pm 0.06%, NM-205L, Lab#=56994-02

X A	650.0	369.5	0.1194	1149.2	0.325	4.3	8.1	0.3	40.06	3.92	
X B	750.0	63.10	0.0837	126.0	0.802	6.1	41.0	1.0	34.69	1.01	
X C	850.0	41.14	0.0636	50.26	1.29	8.0	63.9	2.1	35.25	0.61	
X D	920.0	30.40	0.0280	12.26	5.16	18.2	88.1	6.7	35.90	0.17	
E	1000.0	27.73	0.0140	5.076	15.8	36.5	94.6	20.6	35.16	0.07	
F	1075.0	27.81	0.0232	5.928	18.7	22.0	93.7	37.1	34.94	0.08	
G	1110.0	28.81	0.0880	8.747	6.87	5.8	91.1	43.2	35.17	0.13	
H	1180.0	28.45	0.1256	7.303	11.0	4.1	92.5	53.0	35.26	0.09	
I	1210.0	27.46	0.0889	4.581	20.0	5.7	95.1	70.7	35.01	0.07	
J	1250.0	26.95	0.0296	2.856	32.6	17.2	96.9	99.5	35.00	0.06	
i K	1300.0	36.95	0.2234	23.39	0.183	2.3	81.3	99.7	40.25	3.92	
L	1650.0	43.47	0.2531	53.42	0.389	2.0	63.7	100.0	37.12	1.88	
Integrated age ± 2σ			n=12		113.1	9.8	K2O=5.70%		35.14	0.12	
Plateau ± 2σ			steps E-L	n=8	MSWD=1.99	105.5	16.6	±24.7	93.3	35.06	0.10
Isochron±2σ			steps A-L	n=11	MSWD=3.60	⁴⁰ Ar/ ³⁶ Ar=		300.6±4.7	35.07	0.08	

07L-90, Biotite, 8.22 mg, J=0.001007 \pm 0.13%, NM-222I, Lab#=58820-01

X A	650.0	1672.8	0.0470	5607.5	1.58	10.9	0.9	0.9	28.94	12.74	
Xi B	750.0	55.65	0.0845	135.4	4.38	6.0	28.1	3.4	28.62	0.53	
Xi C	850.0	31.68	0.0351	45.98	12.9	14.5	57.1	10.7	33.06	0.21	
X D	920.0	23.54	0.0172	13.14	22.6	29.7	83.5	23.5	35.88	0.10	
X E	1000.0	22.57	0.0147	8.877	31.6	34.7	88.4	41.4	36.41	0.08	
F	1075.0	23.78	0.0218	13.31	21.7	23.4	83.5	53.7	36.22	0.11	
G	1110.0	23.90	0.0236	13.72	14.5	21.6	83.0	61.9	36.23	0.12	
H	1180.0	26.45	0.0629	22.57	13.4	8.1	74.8	69.5	36.11	0.14	
I	1210.0	26.21	0.0919	22.36	10.3	5.6	74.8	75.3	35.81	0.15	
J	1250.0	22.92	0.1118	10.59	14.5	4.6	86.4	83.5	36.14	0.10	
K	1300.0	21.53	0.1670	6.075	23.8	3.1	91.7	97.0	36.04	0.09	
Xi L	1680.0	28.25	0.3034	19.82	5.31	1.7	79.4	100.0	40.88	0.23	
Integrated age $\pm 2\sigma$			n=12		176.4	7.8	K2O=8.19%		35.82	0.39	
Plateau $\pm 2\sigma$			steps F-K	n=6	MSWD=1.35	98.1	11.5	± 18.1	55.6	36.11	0.14
Isochron $\pm 2\sigma$			steps A-K	n=9	MSWD=3.24	$^{40}\text{Ar}/^{36}\text{Ar}= 294.3\pm 2.4$			36.19	0.13	

07L-90, Homblende, 14.19 mg, J=0.0010103 \pm 0.07%, NM-222I, Lab#=58828-01

X A	1000.0	809.1	0.1840	2649.6	6.10	2.8	3.2	13.5	47.75	5.95
X B	1100.0	116.1	1.304	319.4	4.24	0.39	18.8	22.9	39.92	0.89
X C	1150.0	39.83	4.349	70.78	12.0	0.12	48.4	49.5	35.40	0.26
Xi D	1190.0	26.41	4.765	22.82	11.5	0.11	76.0	74.9	36.85	0.17
X E	1200.0	31.51	4.466	38.51	3.11	0.11	65.1	81.8	37.64	0.36
X F	1210.0	31.45	4.636	39.71	1.74	0.11	63.9	85.6	36.92	0.57
X G	1220.0	34.87	4.945	50.36	1.30	0.10	58.5	88.5	37.46	0.72
X H	1235.0	29.36	5.533	35.40	1.92	0.092	65.9	92.7	35.59	0.50
X I	1250.0	27.56	5.434	28.79	2.23	0.094	70.8	97.7	35.85	0.38
Xi J	1265.0	37.31	4.707	54.14	0.542	0.11	58.2	98.9	39.83	1.36
X K	1280.0	60.32	4.805	144.8	0.183	0.11	29.7	99.3	32.98	3.90
Xi L	1350.0	60.46	11.07	124.8	0.271	0.046	40.5	99.9	45.09	2.83
X M	1450.0	105.2	7.482	304.7	0.053	0.068	15.0	100.0	29.02	13.17
X N	1750.0	15003.9	83.55	52049.6	0.002	0.006	-2.5	100.0	-923.83	1533.93
Integrated age $\pm 2\sigma$			n=14		45.2	0.13	K2O=1.21%		38.25	1.97
Plateau $\pm 2\sigma$			no plateau	n=0	MSWD=0.00	0.0	0.00 ± 0.00		0.00	0.00
Isochron $\pm 2\sigma$			steps A-N	n=11	MSWD=5.37	$^{40}\text{Ar}/^{36}\text{Ar}= 298.3\pm 2.0$			36.02	0.39

06L-57, Biotite, 11.2 mg, J=0.0007401±0.07%, NM-205M, Lab#=#57006-01

X A	650.0	851.8	0.0768	2844.1	1.26	6.6	1.3	1.0	15.32	4.98	
Xi B	750.0	92.06	0.0447	240.1	1.31	11.4	22.9	2.0	28.39	0.88	
X C	850.0	57.85	0.0210	112.0	3.99	24.3	42.8	5.2	33.23	0.36	
X D	920.0	31.83	0.0140	20.91	8.36	36.4	80.6	11.8	34.43	0.13	
X E	1000.0	27.81	0.0113	8.380	19.5	45.3	91.1	27.1	34.00	0.08	
F	1075.0	27.98	0.0149	9.469	22.1	34.3	90.0	44.5	33.80	0.07	
G	1110.0	27.85	0.0292	9.070	16.7	17.5	90.4	57.6	33.79	0.08	
H	1180.0	27.32	0.0382	8.322	20.0	13.4	91.0	73.4	33.38	0.07	
I	1210.0	26.66	0.0174	5.907	30.9	29.3	93.5	97.7	33.45	0.06	
J	1250.0	26.72	0.0096	6.113	2.47	52.9	93.2	99.7	33.44	0.31	
K	1300.0	31.04	0.0370	16.42	0.143	13.8	84.4	99.8	35.15	5.08	
L	1650.0	38.19	0.1306	44.18	0.296	3.9	65.8	100.0	33.75	2.46	
Integrated age ± 2σ			n=12		126.9	23.5	K2O=5.88%		33.48	0.22	
Plateau ± 2σ			steps F-L	n=7	MSWD=4.91	92.5	25.4	±33.0	72.9	33.58	0.16
Isochron±2σ			steps A-L	n=11	MSWD=10.29	⁴⁰ Ar/ ³⁶ Ar= 292.5±2.3			33.75	0.08	

07L-91, Biotite, 8.08 mg, J=0.0010251±0.08%, NM-222I, Lab#=#58816-01

X A	650.0	1043.3	0.1789	3492.0	0.718	2.9	1.1	0.4	21.40	9.17	
Xi B	750.0	41.64	0.1202	87.72	1.62	4.2	37.8	1.4	29.28	0.68	
Xi C	850.0	30.16	0.1373	45.09	2.49	3.7	55.9	2.8	31.35	0.40	
X D	920.0	24.83	0.0682	23.04	3.80	7.5	72.6	5.0	33.52	0.27	
E	1000.0	21.44	0.0349	10.68	10.5	14.6	85.3	11.1	34.00	0.12	
F	1075.0	20.31	0.0284	7.206	17.5	18.0	89.5	21.1	33.80	0.10	
G	1110.0	20.27	0.0205	6.969	16.9	24.9	89.8	30.9	33.85	0.08	
H	1180.0	21.35	0.0359	11.08	26.3	14.2	84.7	46.0	33.61	0.10	
I	1210.0	21.68	0.0699	12.19	13.3	7.3	83.4	53.7	33.62	0.11	
J	1250.0	20.17	0.0982	6.747	17.5	5.2	90.2	63.8	33.81	0.09	
X K	1300.0	19.19	0.0559	3.011	52.6	9.1	95.4	94.1	34.03	0.06	
Xi L	1680.0	22.08	0.0797	6.215	10.1	6.4	91.7	100.0	37.60	0.12	
Integrated age ± 2σ			n=12		173.4	9.3	K2O=8.04%		33.95	0.19	
Plateau ± 2σ			steps E-J	n=6	MSWD=1.81	102.0	14.2	±14.4	58.8	33.79	0.12
Isochron±2σ			steps A-K	n=9	MSWD=2.55	⁴⁰ Ar/ ³⁶ Ar= 292.3±2.7			33.92	0.09	

07L-91, Hornblende, 15.7 mg, J=0.0009954±0.17%, NM-222I, Lab#=#58826-01

X A	1000.0	196.6	0.2947	607.4	5.80	1.7	8.7	11.9	30.92	1.51		
X B	1100.0	42.31	0.8343	80.97	4.37	0.61	43.6	20.9	33.34	0.43		
C	1150.0	39.55	3.001	71.57	6.26	0.17	47.2	33.8	33.74	0.31		
D	1190.0	24.00	4.598	18.12	11.8	0.11	79.3	58.1	34.45	0.13		
E	1200.0	22.08	4.434	11.25	5.82	0.12	86.6	70.1	34.63	0.18		
F	1205.0	21.95	4.107	12.10	2.68	0.12	85.3	75.6	33.88	0.28		
G	1210.0	21.59	3.782	9.814	1.84	0.13	88.0	79.4	34.39	0.36		
H	1215.0	21.74	3.163	9.249	1.14	0.16	88.6	81.7	34.86	0.53		
I	1220.0	22.37	2.879	12.86	0.821	0.18	84.1	83.4	34.02	0.66		
J	1280.0	21.26	4.900	8.712	7.60	0.10	89.8	99.1	34.57	0.14		
X K	1700.0	131.0	44.89	380.6	0.452	0.011	17.0	100.0	41.35	2.59		
Integrated age ± 2σ					n=11	48.6	0.13	K2O=1.19%	33.93	0.56		
Plateau ± 2σ					steps C-J	n=8	MSWD=1.70	38.0	0.12 ±0.06	78.1	34.43	0.23
Isochron±2σ					steps A-K	n=11	MSWD=2.60	⁴⁰ Ar/ ³⁶ Ar= 292.4±2.3		34.53	0.20	

06L-51, Biotite, 11.6 mg, J=0.0007382±0.08%, NM-205M, Lab#=#57002-01

X A	650.0	453.2	0.3117	1466.3	1.62	1.6	4.4	1.6	26.68	2.53
X B	750.0	76.29	0.3543	187.0	1.48	1.4	27.6	3.1	28.26	0.71
X C	850.0	41.63	0.1739	58.67	4.80	2.9	58.4	7.9	32.56	0.23
XI D	920.0	32.66	0.0889	26.58	4.59	5.7	76.0	12.6	33.23	0.21
X E	1000.0	28.96	0.0491	14.11	9.74	10.4	85.6	22.3	33.21	0.11
F	1075.0	29.75	0.0642	18.26	19.4	7.9	81.9	41.8	32.63	0.09
G	1110.0	31.00	0.1303	21.98	10.0	3.9	79.1	51.8	32.83	0.12
H	1180.0	29.76	0.1307	17.70	32.2	3.9	82.5	84.2	32.87	0.07
I	1210.0	28.62	0.0396	13.71	15.0	12.9	85.9	99.2	32.90	0.09
J	1250.0	31.46	0.2761	27.74	0.486	1.8	74.0	99.7	31.20	1.51
K	1300.0	37.57	0.6289	22.40	0.090	0.81	82.5	99.8	41.43	7.96
X L	1650.0	46.67	0.3682	72.82	0.229	1.4	54.0	100.0	33.73	3.19
Integrated age ± 2σ			n=12		99.6	4.9	K2O=4.47%		32.71	0.23
Plateau ± 2σ		steps F-K	n=6	MSWD=1.63	77.1	6.6	±9.0	77.4	32.81	0.13

Isochron±2σ	steps A-L	n=12	MSWD=4.70	⁴⁰ Ar/ ³⁶ Ar=	289.9±2.3	33.02	0.11
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07L-84, Groundmass Concentrate, 21.24 mg, J=0.0010064±0.06%, NM-222F, Lab#=58795-01

X A	3.0	723.2	0.2769	2408.7	1.53	1.8	1.6	1.7	21.06	5.83
Xi B	4.0	51.99	0.3665	142.6	7.46	1.4	19.0	10.1	18.15	0.40
Xi C	4.5	25.27	0.4430	43.92	9.18	1.2	48.8	20.4	22.58	0.17
X D	6.0	25.40	0.7263	35.75	20.0	0.70	58.6	42.8	27.25	0.14
E	8.0	26.36	1.555	37.34	15.1	0.33	58.6	59.7	28.28	0.15
F	10.0	29.18	0.4924	47.14	9.97	1.0	52.4	70.9	27.96	0.19
G	13.0	31.76	2.139	57.18	12.1	0.24	47.4	84.6	27.54	0.22
H	16.0	30.74	4.243	54.02	8.27	0.12	49.2	93.8	27.74	0.24
I	18.0	28.99	1.961	45.89	2.98	0.26	53.8	97.2	28.54	0.32
J	25.0	27.97	1.893	43.07	2.51	0.27	55.1	100.0	28.19	0.29
Integrated age ± 2σ				n=10	89.1	0.37	K2O=1.60%		26.33	0.47
Plateau ± 2σ				steps E-J	n=6	MSWD=2.49	51.0	0.40 ±0.66	57.2	28.04
Isochron±2σ				steps A-J	n=8	MSWD=5.77	⁴⁰ Ar/ ³⁶ Ar=	294.2±2.6	27.94	0.26

06L-59, Groundmass Concentrate, 23.7 mg, J=0.0007326±0.06%, NM-205J, Lab#=56978-01

X A	550.0	1079.8	2.764	3628.5	0.275	0.18	0.7	1.0	10.44	6.93
Xi B	625.0	54.47	0.4508	139.8	3.71	1.1	24.2	13.9	17.62	0.30
Xi C	700.0	37.65	0.8739	62.77	4.27	0.58	50.9	28.8	25.55	0.20
X D	750.0	38.67	1.306	58.03	3.36	0.39	55.9	40.5	28.81	0.19
E	800.0	35.96	1.326	44.25	3.86	0.38	63.9	54.0	30.61	0.14
F	875.0	43.83	1.224	71.97	5.90	0.42	51.7	74.5	30.17	0.19
G	975.0	42.95	2.003	69.57	5.35	0.25	52.5	93.2	30.05	0.18
Xi I	1250.0	3202.2	0.1093	11601.5	1.96	4.7	-7.1	100.0	-331.45	89.02
Integrated age ± 2σ				n=8	28.7	0.43	K2O=0.63%		4.99	10.18
Plateau ± 2σ				steps E-G	n=3	MSWD=3.41	15.1	0.35 ±0.17	52.7	30.34
Isochron±2σ				steps A-G	n=5	MSWD=17.78	⁴⁰ Ar/ ³⁶ Ar=	291.0±2.8	30.38	0.28

07L-88, Groundmass Concentrate, 16.4 mg, J=0.0009851±0.06%, NM-222E, Lab#=58872-01

X A	3.0	579.6	0.4550	1922.5	1.37	1.1	2.0	1.9	20.73	4.55
Xi B	4.0	66.12	0.6684	176.6	4.13	0.76	21.2	7.7	25.08	0.50
X C	4.5	43.33	0.7511	91.81	4.11	0.68	37.5	13.5	29.10	0.32
D	6.0	39.03	0.6754	74.22	6.53	0.76	44.0	22.7	30.70	0.27
E	8.0	38.41	0.7332	72.23	20.0	0.70	44.6	50.9	30.65	0.21
F	10.0	37.60	1.133	70.14	10.7	0.45	45.1	65.9	30.37	0.22
G	13.0	42.12	1.482	86.31	12.5	0.34	39.7	83.5	29.96	0.25
H	16.0	40.17	1.671	77.91	6.47	0.31	43.0	92.6	30.94	0.27
I	18.0	40.61	1.552	81.21	3.22	0.33	41.2	97.1	29.98	0.35
J	25.0	46.40	1.805	99.39	2.04	0.28	37.0	100.0	30.76	0.47
Integrated age ± 2σ				n=10	71.0	0.48	K2O=1.69%		29.90	0.58
Plateau ± 2σ				steps D-J	n=7	MSWD=1.86	61.4	0.51 ±0.39	86.5	30.48
Isochron±2σ				steps A-J	n=9	MSWD=3.45	⁴⁰ Ar/ ³⁶ Ar=	292.0±2.7	30.86	0.43

06L-52, Groundmass Concentrate, 24.4 mg, J=0.0007244±0.07%, NM-205K, Lab#=56987-01

X A	550.0	4320.0	1.177	14649.8	0.165	0.43	-0.2	0.4	-11.86	24.70
Xi B	625.0	169.8	0.3817	516.4	1.95	1.3	10.2	5.8	22.73	0.91
Xi C	700.0	57.74	0.6492	118.9	2.20	0.79	39.3	11.8	29.82	0.31
D	750.0	47.91	0.7732	81.48	1.47	0.66	49.9	15.8	31.43	0.28
E	800.0	57.68	0.8124	112.1	2.18	0.63	42.7	21.7	32.38	0.35
F	875.0	68.58	0.7526	150.6	6.08	0.68	35.2	38.3	31.77	0.29
G	975.0	53.90	0.8287	101.0	6.86	0.62	44.8	57.0	31.74	0.22
H	1075.0	42.11	1.126	61.68	3.80	0.45	56.9	67.4	31.55	0.19
I	1250.0	58.45	2.805	116.8	5.94	0.18	41.3	83.6	31.83	0.24
X J	1700.0	57.15	5.408	109.9	6.01	0.094	44.0	100.0	33.15	0.24
Integrated age ± 2σ				n=10	36.7	0.27	K2O=0.80%		31.23	0.68
Plateau ± 2σ				steps D-I	n=6	MSWD=1.15	26.3	0.51 ±0.38	71.8	31.72
Isochron±2σ				steps A-J	n=8	MSWD=6.47	⁴⁰ Ar/ ³⁶ Ar=	294.8±2.3	32.05	0.35

07L-89, Groundmass Concentrate, 14.6 mg, J=0.0009871±0.08%, NM-222E, Lab#=58870-01

X A	3.0	226.0	0.2112	702.5	2.62	2.4	8.2	2.5	33.10	1.75
X B	4.0	82.63	0.3316	222.4	4.28	1.5	20.5	6.5	30.37	0.61
C	4.5	38.64	0.3102	71.31	4.73	1.6	45.5	11.0	31.53	0.31
D	6.0	37.22	0.2870	64.99	9.48	1.8	48.5	19.9	32.31	0.24

E	8.0	34.63	0.2645	56.66	18.5	1.9	51.7	37.4	32.09	0.18
F	10.0	37.37	0.3847	66.60	39.6	1.3	47.4	74.7	31.76	0.19
G	13.0	45.73	0.5028	95.01	10.3	1.0	38.7	84.4	31.72	0.29
H	16.0	46.62	0.5096	97.51	6.99	1.0	38.3	90.9	31.98	0.32
I	18.0	46.03	0.4924	96.29	4.08	1.0	38.3	94.8	31.57	0.35
J	25.0	47.76	0.4623	101.5	5.53	1.1	37.3	100.0	31.91	0.32
Integrated age $\pm 2\sigma$			n=10		106.1	1.4	K2O=2.83%		31.86	0.47
Plateau $\pm 2\sigma$		steps C-J	n=8	MSWD=1.04	99.2	1.4	± 0.8	93.5	31.91	0.19
Isochron $\pm 2\sigma$		steps A-J	n=10	MSWD=1.53		$^{40}\text{Ar}/^{36}\text{Ar}=$	294.1 \pm 2.4		32.09	0.39

06L-58, Groundmass Concentrate, 20.6 mg, J=0.0007301 \pm 0.05%, NM-205J, Lab#=56980-01

X A	550.0	3266.8	0.2978	11144.3	0.093	1.7	-0.8	0.3	-35.53	20.38
Xi B	625.0	40.48	0.2751	82.59	2.22	1.9	39.8	7.4	21.39	0.22
Xi C	700.0	32.40	0.4948	35.95	3.27	1.0	67.3	17.8	28.94	0.14
X D	750.0	32.26	0.7925	26.69	2.82	0.64	75.8	26.8	32.39	0.14
E	800.0	30.07	0.7803	17.15	3.49	0.65	83.4	38.0	33.21	0.11
F	875.0	28.57	0.6304	12.47	5.25	0.81	87.3	54.7	33.05	0.09
G	975.0	27.76	0.6664	9.563	6.19	0.77	90.0	74.5	33.11	0.07
H	1075.0	27.13	1.021	8.925	3.57	0.50	90.6	85.9	32.58	0.09
I	1250.0	31.06	5.910	24.69	1.51	0.086	78.1	90.7	32.25	0.18
J	1700.0	37.85	7.901	47.18	2.92	0.065	64.9	100.0	32.71	0.16
Integrated age $\pm 2\sigma$			n=10		31.3	0.32	K2O=0.80%		31.46	0.26
Plateau $\pm 2\sigma$		steps E-J	n=6	MSWD=9.33	22.9	0.58 ± 0.66	73.2		32.92	0.25
Isochron $\pm 2\sigma$		steps A-J	n=8	MSWD=9.13		$^{40}\text{Ar}/^{36}\text{Ar}=$	290.5 ± 2.4		32.99	0.10

07L-85, Groundmass Concentrate, 9.8 mg, J=0.0009802 \pm 0.08%, NM-222D, Lab#=58788-02

X A	3.0	865.8	0.7791	2856.8	0.893	0.65	2.5	2.1	38.53	7.01
X B	4.0	76.54	0.6063	190.6	3.32	0.84	26.5	9.7	36.02	0.59
Xi C	4.5	43.88	0.5683	80.06	3.37	0.90	46.2	17.5	36.02	0.38
X D	6.0	40.95	0.5383	72.29	11.4	0.95	47.9	43.9	34.90	0.28
X E	8.0	31.33	0.7117	44.20	10.7	0.72	58.5	68.5	32.60	0.18
X F	10.0	27.58	1.049	32.39	4.42	0.49	65.6	78.7	32.20	0.19
X G	13.0	41.72	1.596	79.61	2.99	0.32	43.9	85.6	32.64	0.44
Xi H	16.0	63.09	1.772	156.4	2.75	0.29	27.0	91.9	30.35	0.62
Xi I	18.0	66.26	1.947	167.4	1.57	0.26	25.6	95.5	30.23	0.82
X J	25.0	70.35	2.753	177.7	1.94	0.19	25.7	100.0	32.20	0.62
Integrated age $\pm 2\sigma$			n=10		43.4	0.54	K2O=1.74%		33.59	0.70
Plateau $\pm 2\sigma$			no plateau	n=0	MSWD=0.00	0.000	0.000 \pm 0.000		0.0	0.00
Isochron $\pm 2\sigma$			steps A-J	n=7	MSWD=14.87	$^{40}\text{Ar}/^{36}\text{Ar}= 300.3\pm 2.2$		32.49	0.32	

07L-87, Groundmass Concentrate, 17.2 mg, J=0.0009794 \pm 0.06%, NM-222F, Lab#=58793-01

A	3.0	778.4	0.5887	2571.3	2.97	0.87	2.4	3.0	33.19	5.82
B	4.0	54.82	0.6137	122.2	8.26	0.83	34.2	11.2	33.33	0.36
C	4.5	27.66	0.5222	29.45	9.14	0.98	68.7	20.3	33.76	0.14
D	6.0	23.96	0.3771	17.69	43.0	1.4	78.3	63.2	33.35	0.09
E	8.0	22.84	-0.1776	15.12	23.1	-	80.4	86.3	32.61	0.09
Xi F	10.0	25.63	0.6915	25.10	6.16	0.74	71.3	92.5	32.49	0.17
Xi G	13.0	29.45	1.049	38.09	2.85	0.49	62.1	95.3	32.52	0.30
Xi H	16.0	34.78	13.71	56.87	1.67	0.037	54.9	97.0	34.26	0.83
Xi I	18.0	39.81	-13.0978	76.12	0.867	-	40.8	97.8	28.62	1.41
Xi J	25.0	39.23	2.532	72.29	2.18	0.20	46.1	100.0	32.18	0.40
Integrated age $\pm 2\sigma$			n=10		100.2	1.1	K2O=2.28%		33.10	0.53
Plateau $\pm 2\sigma$			steps A-E	n=5	MSWD=15.01	86.5	0.88 \pm 0.43	86.3	33.14	0.44
Isochron $\pm 2\sigma$			steps A-E	n=5	MSWD=18.87		$^{40}\text{Ar}/^{36}\text{Ar}= 297.0\pm 2.2$		33.10	0.15

07L-92, Groundmass Concentrate, 16.5 mg, J=0.0010117 \pm 0.06%, NM-222F, Lab#=58790-01

X A	3.0	351.4	0.9691	1121.1	1.96	0.53	5.7	2.1	37.04	2.78
X B	4.0	77.21	0.7822	199.1	5.64	0.65	23.9	8.3	33.88	0.56
Xi C	4.5	30.88	0.7659	40.51	7.06	0.67	61.4	16.0	34.82	0.20
Xi D	6.0	24.42	0.6679	19.33	20.0	0.76	76.8	37.7	34.43	0.10
X E	8.0	21.38	0.4755	10.90	46.8	1.1	85.1	88.6	33.40	0.07
Xi F	10.0	22.15	0.6720	15.37	4.96	0.76	79.8	94.0	32.44	0.15
X G	13.0	43.31	1.096	85.85	2.61	0.47	41.6	96.9	33.11	0.40
X H	16.0	37.13	1.122	66.15	1.32	0.45	47.6	98.3	32.46	0.55
X I	18.0	39.62	1.149	72.48	0.731	0.44	46.2	99.1	33.61	0.79

X J	25.0	47.74	1.280	102.0	0.823	0.40	37.1	100.0	32.50	0.76
Integrated age $\pm 2\sigma$			n=10		91.8	0.82	K ₂ O=2.11%		33.78	0.32
Plateau $\pm 2\sigma$			no plateau	n=0	MSWD=0.00	0.0	0.00 \pm 0.00		0.00	0.00
Isochron$\pm 2\sigma$			steps A-J	n=7	MSWD=1.30	⁴⁰ Ar/ ³⁶ Ar= 296.2 \pm 2.0			33.38	0.15

06L-50, Homblende, 18.5 mg, J=0.0007351 \pm 0.05%, NM-205P, Lab#=#57021-01

Xi A	800.0	500.5	6.291	1643.3	0.456	0.081	3.1	2.6	20.78	3.06
B	900.0	106.3	1.612	274.6	0.154	0.32	23.8	3.5	33.74	1.48
C	1000.0	100.3	2.259	253.0	0.130	0.23	25.7	4.3	34.35	1.72
D	1100.0	75.85	3.951	165.9	0.882	0.13	35.8	9.3	36.28	0.54
E	1130.0	62.08	4.481	121.6	3.60	0.11	42.7	30.0	35.44	0.29
F	1160.0	36.78	4.386	35.72	3.96	0.12	72.3	52.8	35.54	0.15
G	1190.0	31.25	4.715	17.76	5.33	0.11	84.5	83.4	35.28	0.10
H	1220.0	31.97	4.948	19.99	2.79	0.10	82.8	99.4	35.39	0.12
I	1250.0	55.83	5.910	100.9	0.039	0.086	47.4	99.6	35.44	3.31
J	1300.0	106.1	6.431	275.4	0.024	0.079	23.8	99.8	33.81	5.78
X K	1650.0	113.2	11.88	317.7	0.042	0.043	17.9	100.0	27.33	3.87
Integrated age $\pm 2\sigma$			n=11		17.4	0.11	K ₂ O=0.49%		35.04	0.41
Plateau $\pm 2\sigma$			steps B-J	n=9	MSWD=0.81	16.9	0.11 \pm 0.16		97.1	35.38
Isochron$\pm 2\sigma$			steps B-K	n=10	MSWD=1.31	⁴⁰ Ar/ ³⁶ Ar= 296.2 \pm 3.1			35.37	0.18

Notes:

X preceding sample ID denotes analyses excluded from plateau or weighted mean age calculations.
i preceding sample ID denotes analyses excluded from isochron age calculations.
Isotopic ratios corrected for blank, radioactive decay, & mass discrimination
Errors quoted for individual analyses includes analytical errors, interfering reactions, and J uncertainties.

Age calculations:

Ages calculated relative to neutron flux monitor Fish Canyon Tuff Sanidine (FC-2). Assigned age = 28.201 Ma (Kuiper et al., 2008)

⁴⁰K Decay Constant (LambdaK total) = 5.463e-10/a (Min et al., 2000)

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).

Mean age is weighted mean age of Taylor (1982). Mean age error is weighted error of the mean multiplied by the root of the MSWD

where MSWD > 1, and also incorporates uncertainty in J factors and irradiation correction uncertainties.

MSWD values are calculated for n-1 degrees of freedom for plateau age.

Isochron ages, ⁴⁰Ar/³⁶Ar and MSWD values calculated from regression results obtained by the methods of York (1969).

Isotopic abundances after Steiger and Jäger (1977).

Weight percent K₂O calculated from ³⁹Ar signal, sample weight, and instrument sensitivity.

Mean age errors reported at 2-sigma. All other errors at 1-sigma.

Sample preparation and irradiation:

Concentrated groundmass and mineral separates prepared from bulk samples using crushing, grinding, Frantz magnetic separation, acid washing (7% HCl to remove CaCO₂ and 7% HF to remove glass, if present), heavy density liquid techniques, and hand-picking.

Samples were loaded into machined Al discs and irradiated in the NM-205 and 222

positions at the Nuclear Science Center, College Station, TX along with the neutron flux monitor Fish Canyon Tuff sanidine FC-2.

Instrumentation:

Isotopic ratios determined with MAP 215-50.

Single crystals of sanidine were fused using a focused CO₂ laser.

Groundmass, biotite, hornblende, and plagioclase were tep-heated using a Mo double-vacuum resistance furnace (heating duration ~10 minutes/step).

Reactive gases removed during furnace (laser) analysis by reaction with 3 (2) SAES GP-50 getters, 2 (1) operated

at ~450°C and 1 at 20°C. Gas also exposed to a W filament operated at ~2000°C.

Gas (except from sanidine) also exposed to cold finger operated at -140°C.

Analytical Parameters:

MAP 215-50 Mass Spectrometer sensitivity = 5E-17 mol/pA

J-factors determined to a precision of 0.01 to 0.03% by CO₂ laser fusion of typically 6 FC-2 crystals from multiple radial positions

Correction factors for interfering nuclear reactions were determined using K-glass and CaF₂.

$$(^{39}\text{Ar}/^{37}\text{Ar})\text{Ca} = 6.8\text{e-}4 \pm 5.0\text{e-}5$$

$$(^{36}\text{Ar}/^{37}\text{Ar})\text{Ca} = 2.8\text{e-}4 \pm 2.0\text{e-}5$$

$$(^{38}\text{Ar}/^{39}\text{Ar})\text{K} = 1.08\text{e-}2 \pm 0\text{e-}05$$

$$(^{40}\text{Ar}/^{39}\text{Ar})\text{Ca} = 0.0 \pm 4\text{e-}4$$