



New Mexico Bureau of Geology and Mineral Resources
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*$^{40}\text{Ar}/^{39}\text{Ar}$ Data Repository for Refinement
of the late Pleistocene to Holocene geologic
history of Erebus volcano, Antarctica using
 $^{40}\text{Ar}/^{39}\text{Ar}$ and ^{36}Cl age determinations*

Prepared By:

Peter Kelly^a, Nelia W. Dunbar^b, Philip R. Kyle^a, William C. McIntosh^b

^aDept. of Earth & Environmental Science, New Mexico Institute of
Mining and Technology, Socorro, NM 87801-4796

^bNew Mexico Bureau of Geology and Mineral Resources, New Mexico
Institute of Mining and Technology, Socorro, NM 87801-4796

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Plus research associates, graduate students, and undergraduate assistants.

Table 1. 40Ar/39Ar analytical data.

ID	Power (Watts)	⁴⁰ Ar/ ³⁹ Ar	³⁸ Ar/ ³⁹ Ar	³⁷ Ar/ ³⁹ Ar	³⁶ Ar/ ³⁹ Ar (x 10 ⁻³)	³⁹ Ar _K (x 10 ⁻¹⁵ mol)	K/Ca	Cl/K	⁴⁰ Ar* (%)	³⁹ Ar (%)	Age (Ma)	±1s (Ma)	
Bomb (Laser), Anorthoclase, J=0.0001187±0.25%, D=1.0055±0.001, NM-180x, Lab#=55348-01													
xi	A	2	5.926		0.2475	20.46	6.45	2.1	0.003	-1.8	7.3	-0.023	0.019
	B	4	1.418		0.2101	4.388	71.7	2.4	0.000	9.0	88.6	0.027	0.002
	C	6	1.903		0.1956	5.672	6.47	2.6	0.000	12.2	95.9	0.049	0.009
	D	8	3.636		0.1931	11.77	1.61	2.6	0.000	4.5	97.7	0.035	0.030
	E	10	6.213		0.1970	21.78	0.856	2.6	0.000	-3.5	98.7	-0.047	0.047
Xi	F	12	9.820		0.1972	31.19	0.623	2.6	0.000	6.2	99.4	0.130	0.069
Xi	G	16	18.48		0.1965	61.75	0.546	2.6	0.000	1.3	100.0	0.05	0.10
	Integrated age ± 2s				n=7		88.2	2.4 ±0.0				0.025	0.006
	Plateau ± 2s		steps B-E		n=4	MSWD=2.70	80.6	2.4 ±0.2			91.4	0.028	0.007
	Isochron±2s		steps B-E		n=4	MSWD=4.03		⁴⁰ Ar/ ³⁶ Ar=	293.7±20.3			0.030	0.014
Bomb (Furnace), Anorthoclase, 309.8 mg, J=0.0001183±0.25%, D=1.0055±0.001, NM-180x, Lab#=55352-01													
Xi	A	500	146.4		0.2616	489.9	0.830	2.0	0.002	1.1	0.2	0.35	0.20
Xi	B	600	6.864		0.2258	22.67	11.3	2.3	0.000	2.5	3.4	0.036	0.009
Xi	C	650	2.454		0.2254	7.661	21.8	2.3	0.000	8.0	9.7	0.042	0.004
Xi	D	700	1.727		0.2223	5.256	23.2	2.3	0.000	10.5	16.3	0.038	0.003
	E	750	1.372		0.2199	4.329	47.6	2.3	0.000	7.3	29.8	0.021	0.002
	F	800	1.171		0.2187	3.652	53.6	2.3	0.000	8.5	45.1	0.021	0.002
	G	900	1.326		0.2146	4.103	96.2	2.4	0.000	9.1	72.6	0.025	0.002
Xi	H	1000	2.087		0.2097	6.550	61.9	2.4	0.000	7.5	90.2	0.033	0.003
Xi	I	1100	5.188		0.2107	16.53	21.9	2.4	0.001	5.9	96.4	0.066	0.006
Xi	J	1200	10.21		0.2184	33.04	6.59	2.3	0.024	4.9	98.3	0.107	0.017
Xi	K	1300	7.612		0.2565	23.46	5.09	2.0	0.002	9.1	99.8	0.148	0.014
Xi	O	1700	12.98		0.4919	39.46	0.789	1.0	0.002	10.5	100.0	0.290	0.055
	Integrated age ± 2s				n=12		350.8	2.3 ±0.0			K2O=3.68%	0.035	0.005
	Plateau ± 2s		steps E-G		n=3	MSWD=2.43	197.4	2.4 ±0.1			56.3	0.023	0.003
	Isochron±2s		steps E-G		n=3	MSWD=4.05		⁴⁰ Ar/ ³⁶ Ar=	310.7±35.8			0.010	0.009
E87040, Anorthoclase, 265.36 mg, J=0.000126±0.25%, D=1.0055±0.001, NM-180z, Lab#=55363-01													
Xi	A	600	7.714		0.3801	27.10	13.0	1.3	0.000	-3.6	6.6	-0.063	0.025
xi	B	650	1.424		0.3543	4.802	21.5	1.4	0.000	1.6	17.5	0.005	0.007
xi	C	700	1.110		0.3512	3.697	20.1	1.5	0.000	3.1	27.7	0.008	0.009
xi	D	750	1.099		0.3441	4.348	12.1	1.5	0.000	-15.7	33.8	-0.039	0.010
	E	800	1.152		0.3513	3.937	30.0	1.5	0.000	0.4	49.0	0.001	0.008
	F	900	1.238		0.3589	4.335	40.1	1.4	0.000	-2.1	69.4	-0.006	0.005
	G	1000	1.328		0.3479	4.595	33.2	1.5	0.000	-1.0	86.2	-0.003	0.007
	H	1100	2.452		0.3283	8.340	13.3	1.6	0.000	0.1	93.0	0.001	0.016
Xi	I	1200	6.334		0.3267	19.83	7.08	1.6	0.014	8.2	96.6	0.117	0.029
Xi	J	1700	4.678		0.3659	13.35	6.69	1.4	0.002	16.2	100.0	0.172	0.025
	Integrated age ± 2s				n=10		197.1	1.4 ±0.0			K2O=2.26%	0.003	0.008
	Plateau ± 2s		steps E-H		n=4	MSWD=0.19	116.7	1.5 ±0.1			59.2	-0.003	0.007
	Isochron±2s		steps E-H		n=4	MSWD=0.28		⁴⁰ Ar/ ³⁶ Ar=	298.3±34.2			-0.006	0.015
E86003, Anorthoclase, 357 mg, J=0.0001364±0.25%, D=1.0055±0.001, NM-180y, Lab#=55374-01													
xi	A	600	2.733		0.2254	9.281	36.2	2.3	0.000	-0.1	11.6	-0.001	0.010
	B	650	1.359		0.2163	4.485	31.4	2.4	0.000	2.9	21.7	0.010	0.007
	C	700	1.325		0.2138	4.359	32.8	2.4	0.000	3.2	32.2	0.010	0.008
	D	750	1.463		0.2075	4.599	19.4	2.5	0.000	7.5	38.4	0.027	0.011
	E	800	1.558		0.2162	5.024	40.8	2.4	0.000	5.1	51.6	0.020	0.006
	F	900	1.638		0.2190	4.977	52.1	2.3	0.000	10.7	68.3	0.043	0.006
	G	1000	1.890		0.2172	6.191	25.7	2.3	0.000	3.5	76.5	0.016	0.009
Xi	H	1100	2.004		0.2306	6.453	35.0	2.2	0.000	5.2	87.8	0.026	0.009
Xi	I	1200	4.526		0.2230	13.17	13.5	2.3	0.012	14.7	92.1	0.163	0.017
Xi	J	1700	1.678		0.2315	4.991	24.6	2.2	0.000	12.6	100.0	0.052	0.008
	Integrated age ± 2s				n=10		311.5	2.3 ±0.0			K2O=2.46%	0.028	0.006
	Plateau ± 2s		steps B-G		n=6	MSWD=3.70	202.2	2.4 ±0.1			64.9	0.023	0.012
	Isochron±2s		steps B-G		n=6	MSWD=3.69		⁴⁰ Ar/ ³⁶ Ar=	341.9±55.4			-0.033	0.018
E86031, Anorthoclase, 272.8 mg, J=0.0001184±0.25%, D=1.0055±0.001, NM-180y, Lab#=55370-01													
xi	A	600	21.66		1.013	71.54	9.38	0.50	0.000	2.7	7.9	0.127	0.023
	B	650	3.670		0.9086	10.01	22.2	0.56	0.000	21.2	26.7	0.166	0.004
	C	700	3.403		0.8533	8.744	11.0	0.60	0.000	25.9	36.0	0.188	0.006
	D	750	2.569		0.8204	6.699	4.33	0.62	0.000	25.2	39.6	0.138	0.010
	E	800	2.862		0.8288	7.290	12.8	0.62	0.000	26.8	50.5	0.163	0.005
	F	900	2.900		0.8300	7.138	16.6	0.61	0.000	29.3	64.5	0.181	0.004
	G	1000	2.960		0.9302	7.529	9.24	0.55	0.001	27.2	72.3	0.171	0.007
xi	H	1100	2.462		1.017	5.615	17.0	0.50	0.000	35.7	86.6	0.187	0.004
xi	I	1200	7.253		0.9834	19.98	4.00	0.52	0.023	20.2	90.0	0.313	0.014
xi	J	1700	4.398		0.9791	7.827	11.8	0.52	0.001	49.1	100.0	0.461	0.005
	Integrated age ± 2s				n=10		118.3	0.56 ±0.00			K2O=1.41%	0.203	0.008
	Plateau ± 2s		steps B-G		n=6	MSWD=5.63	76.125	0.589±0.062			64.4	0.17	0.010
	Isochron±2s		steps B-G		n=6	MSWD=6.76		⁴⁰ Ar/ ³⁶ Ar=	302.2±17.8			0.160	0.026

E87025, Anorthoclase, 249.73 mg, J=0.0001182±0.25%, D=1.0055±0.001, NM-180x, Lab#=55347-01												
xi	A	600	8.759	0.9244	29.88	10.5	0.55	0.000	-0.1	10.6	-0.001	0.012
	B	650	2.347	0.8885	7.628	18.0	0.57	0.000	6.6	28.7	0.033	0.004
	C	700	3.207	0.8514	9.950	6.62	0.60	0.000	10.2	35.3	0.069	0.007
	D	750	3.317	0.8436	11.35	4.17	0.60	0.000	0.6	39.5	0.004	0.010
	E	800	3.305	0.8576	10.97	8.14	0.59	0.000	3.8	47.7	0.026	0.008
	F	900	3.668	0.8213	11.94	14.2	0.62	0.000	5.3	62.0	0.042	0.006
xi	G	1000	5.347	0.8519	17.37	5.47	0.60	0.001	5.1	67.5	0.058	0.011
xi	H	1100	2.442	0.8964	7.337	13.4	0.57	0.001	13.9	81.1	0.072	0.005
xi	I	1200	4.794	0.9017	14.77	5.05	0.57	0.021	11.2	86.2	0.114	0.011
xi	J	1700	2.324	0.9258	6.396	13.7	0.55	0.001	21.6	100.0	0.107	0.005
	Integrated age ± 2s			n=10		99.3	0.58 ±0.00			K2O=1.29%	0.052	0.007
	Plateau ± 2s	steps B-F		n=5	MSWD=8.66	51.099	0.596±0.034			51.5	0.04	0.016
	Isochron±2s	steps B-F		n=5	MSWD=11.11		^{40Ar/36Ar=}		303.7±14.6		0.022	0.007
E87037, Anorthoclase, 344.84 mg, J=0.0001205±0.25%, D=1.0055±0.001, NM-180z, Lab#=55367-01												
xi	A	600	14.25	0.3400	47.34	14.3	1.5	0.000	1.9	5.7	0.060	0.016
xi	B	650	2.272	0.3334	6.599	33.0	1.5	0.000	14.9	18.9	0.073	0.003
xi	C	700	2.020	0.3258	5.481	22.0	1.6	0.000	20.7	27.6	0.090	0.003
	D	750	1.754	0.3260	4.693	13.3	1.6	0.000	21.9	33.0	0.083	0.004
	E	800	1.654	0.3292	4.409	32.9	1.5	0.000	22.3	46.1	0.080	0.002
	F	900	1.572	0.3288	4.113	49.8	1.6	0.000	23.8	66.0	0.081	0.002
	G	1000	2.063	0.3299	5.782	20.6	1.5	0.000	18.0	74.2	0.080	0.004
Xi	H	1100	2.176	0.3414	5.908	30.4	1.5	0.000	20.6	86.3	0.097	0.003
Xi	I	1200	4.929	0.3333	12.50	18.1	1.5	0.010	25.9	93.5	0.276	0.005
Xi	J	1700	2.680	0.3542	6.785	16.2	1.4	0.001	26.0	100.0	0.151	0.004
	Integrated age ± 2s			n=10		250.5	1.5 ±0.0			K2O=2.32%	0.100	0.005
	Plateau ± 2s	steps D-G		n=4	MSWD=0.16	116.6	1.6 ±0.0			46.5	0.081	0.003
	Isochron±2s	steps D-G		n=4	MSWD=0.24		^{40Ar/36Ar=}		296.1±23.2		0.080	0.022
Ice Station, Sanidine, 326.9 mg, J=0.0001189±0.25%, D=1.0055±0.001, NM-180w, Lab#=55359-01												
Xi	A	600	127.1	0.2093	439.6	0.739	2.4	0.004	-2.2	0.1	-0.60	0.16
Xi	B	650	10.73	0.1191	33.98	4.05	4.3	0.001	6.4	0.9	0.147	0.018
Xi	C	700	4.939	0.0863	14.00	4.17	5.9	0.000	16.2	1.7	0.171	0.011
Xi	D	750	3.553	0.0606	9.365	4.23	8.4	0.000	22.0	2.5	0.167	0.009
	E	800	2.598	0.0358	6.386	18.4	14.3	0.000	27.1	5.9	0.151	0.004
	F	900	1.942	0.0286	4.044	51.5	17.8	0.000	38.2	15.5	0.158	0.002
	G	1000	1.665	0.0285	3.166	73.0	17.9	0.000	43.6	29.1	0.154	0.002
	H	1100	1.503	0.0298	2.517	141.7	17.1	0.000	50.3	55.6	0.161	0.001
	I	1200	1.583	0.0289	2.800	104.2	17.6	0.001	47.6	75.0	0.160	0.001
	J	1700	1.493	0.0489	2.496	134.1	10.4	0.000	50.5	100.0	0.160	0.001
	Integrated age ± 2s			n=10		536.2	14.2 ±0.0			K2O=5.30%	0.158	0.003
	Plateau ± 2s	steps E-J		n=6	MSWD=3.72	523.0	15.6 ±6.0			97.5	0.159	0.002
	Isochron±2s	steps E-J		n=6	MSWD=2.33		^{40Ar/36Ar=}		283.3±7.9		0.167	0.005

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" or "x" symbol preceding sample ID denotes analyses excluded from plateau age calculations.

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

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

Ages calculated relative to FC-1 Fish Canyon Tuff sanidine interlaboratory standard at 28.02 Ma (Renne et al., 1998)

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

Correction factors:

(39Ar/37Ar)Ca = 0.0007 ± 5e-05

(36Ar/37Ar)Ca = 0.00028 ± 1e-05

(38Ar/39Ar)K = 0.0125

(40Ar/39Ar)K = 0.0125 ± 0.0015