Data Repository: Complete $^{40}Ar/^{39}Ar$ step-heating data and location coordinates of sampling sites

Step	$^{40}Ar_{Atm.}$ (%)	$^{39}Ar_K$ (%)	$^{37}Ar_{Ca}/^{39}Ar_K$	$^{40}Ar^*/^{39}Ar_K$	Age (Ma)		
SUT2 Muscovite	J=0.0342681 (UTM NAD27 zone 18 ; 697100, 5020150)						
1	7.4	5.9	0.0060	6.92	383.8	±	3.6
2	1.1	14.6	0.0020	7.50	413.0	±	1.4
3	0.4	26.7	0.0010	7.65	420.3	±	1.0
4	0.7	14.6	0.0010	7.71	423.1	±	0.9
5	0.6	17.7	0.0020	7.70	422.4	±	1.4
6	0.7	16.6	0.0030	7.68	421.8	±	2.1
7	0.0	3.0	0.0170	7.76	425.6	±	2.9
8	0.0	0.7	0.0240	7.97	435.9	±	18.8
9	0.0	0.4	0.0610	8.22	447.7	±	19.8
			Integrated age		418.5	±	0.6
SUT4 Muscovite	J=0.03429852 (UTM NAD27 zone 18 ; 701078, 5025528)						
1	5.9	4.3	0.0010	6.47	361.9	±	2.8
2	0.6	6.2	0.0010	7.34	405.3	±	1.9
3	0.5	22.5	0.0020	7.44	410.2	±	0.9
4	0.8	29.5	0.0000	7.60	418.1	±	0.7
5	1.0	16.7	0.0020	7.64	419.8	±	1.3
6	1.3	7.7	0.0050	7.59	417.7	±	1.9
7	0.9	4.5	0.0080	7.61	418.5	±	3.5
8	1.1	8.8	0.0080	7.66	420.8	±	3.3
			Integrated age		413.7	±	0.5
SUT6 Muscovite	J=0.034329 (UTM NAD27 zone 18 ; 699260, 5019305)						
1	5.0	11.4	0.0650	7.38	407.6	±	1.7
2	2.5	15.4	0.0130	7.36	406.4	±	1.6
3	1.5	17.9	0.0080	7.36	406.6	±	1.3
4	0.9	23.0	0.0080	7.27	402.0	±	1.0
5	1.1	14.1	0.0080	7.12	394.5	±	1.8
6	1.0	10.9	0.0140	7.07	391.9	±	1.9
7	1.3	4.8	0.0070	7.02	389.9	±	3.6
8	4.6	2.6	0.0280	6.95	386.3	±	7.9
			Integrated age		400.1	±	0.6
SUT8 Muscovite	J=0.03434353 (UTM NAD27 zone 18 ; 702555, 5021588)						
1	0.0	0.7	0.4350	4.67	268.6	±	141.6
2	1.7	5.0	0.1680	7.38	407.7	±	17.3
3	0.0	18.4	0.0820	7.78	427.2	±	4.2
4	0.0	43.6	0.0730	7.68	422.5	±	2.2
5	0.2	23.4	0.3080	7.52	414.7	±	2.8
6	0.0	8.0	0.7930	7.46	411.6	±	9.0
7	0.0	1.0	31.1400	8.11	443.5	±	66.0
			Integrated age		419.2	±	2.1

Step	$^{40}Ar_{Atm.}$ (%)	$^{39}Ar_K$ (%)	$^{37}Ar_{Ca}/^{39}Ar_K$	$^{40}Ar^*/^{39}Ar_K$	Age (Ma)
SUT9 Muscovite J=0.03436244 (UTM NAD27 zone 18 ; 699702, 5016795)					
1	8.2	0.7	0.0680	7.94	435.6 ± 4.5
2	2.6	8.2	0.0070	7.79	428.1 ± 0.9
3	0.7	17.3	0.0020	7.77	427.1 ± 0.6
4	0.1	6.0	0.0030	7.76	426.5 ± 0.8
5	0.4	13.6	0.0020	7.76	426.5 ± 0.6
6	0.3	4.3	0.0030	7.77	427.2 ± 0.8
7	0.4	13.4	0.0030	7.73	425.3 ± 0.7
8	0.6	17.0	0.0080	7.73	425.0 ± 0.6
9	0.4	19.7	0.0520	7.79	427.8 ± 0.6
			Integrated age		426.7 ± 0.3
SUT12 Muscovite J=0.03436972 (UTM NAD27 zone 18; 699935, 5016534)					
1	5.1	2.9	0.0000	6.40	358.6 ± 6.2
2	2.7	3.3	0.0220	6.96	387.2 ± 5.0
3	0.2	32.4	0.0000	7.56	416.8 ± 0.8
4	0.6	12.2	0.0150	7.64	420.8 ± 1.5
5	0.2	12.4	0.0000	7.68	422.8 ± 1.2
6	0.5	9.8	0.0030	7.52	414.7 ± 1.8
7	0.4	7.1	0.0000	7.48	412.9 ± 2.0
8	0.2	20.0	0.0000	7.62	419.9 ± 1.3
			Integrated age		415.3 ± 0.5
SUT19 Muscovite J=0.0343770 (UTM NAD27 zone 18 ; 709658, 5019648)					
1	33.7	1.1	0.0080	4.75	272.8 ± 8.4
2	2.5	6.2	0.0040	6.96	386.9 ± 1.6
3	0.9	8.3	0.0020	7.09	393.7 ± 1.3
4	1.0	10.8	0.0020	7.18	398.3 ± 1.1
5	0.0	34.1	0.0010	7.52	415.2 ± 0.7
6	0.0	8.7	0.0010	7.57	417.3 ± 1.4
7	0.5	11.5	0.0020	7.62	419.9 ± 1.2
8	0.3	10.8	0.0010	7.55	416.6 ± 1.0
9	0.4	8.6	0.0040	7.58	417.6 ± 1.5
			Integrated age		409.4 ± 0.4
SUT21 Muscovite J=0.01704477 (UTM NAD27 zone 18; 707928, 5020091)					
1	4.3	1.6	0.0260	15.77	429.6 ± 4.7
2	3.5	21.1	0.0020	15.79	430.1 ± 0.8
3	0.0	15.1	0.0000	15.86	431.8 ± 0.8
4	0.6	16.9	0.0010	15.79	430.2 ± 0.8
5	0.6	14.4	0.0030	15.83	431.2 ± 0.9
6	0.8	13.5	0.0060	15.54	424.0 ± 0.9
7	1.2	9.1	0.0130	15.57	424.7 ± 1.3
8	0.9	8.3	0.0480	15.74	428.9 ± 1.4
			Integrated age		429.1 ± 0.4

Step	$^{40}Ar_{Atm.}$ (%)	$^{39}Ar_K$ (%)	$^{37}Ar_{Ca}/^{39}Ar_K$	$^{40}Ar^*/^{39}Ar_K$	Age (Ma)
SUT23 Muscovite J=0.03438428 (UTM NAD27 zone 18; 705348, 5019711)					
1	4.3	9.0	0.0040	7.25	401.9 ± 3.4
2	1.1	13.3	0.0020	7.53	415.3 ± 2.4
3	0.9	17.0	0.0020	7.73	425.1 ± 2.0
4	0.5	42.3	0.0020	7.88	432.8 ± 1.0
5	0.7	7.4	0.0030	7.83	430.1 ± 3.1
6	1.2	2.4	0.0090	8.06	441.6 ± 8.0
7	0.6	8.6	0.0290	8.28	451.9 ± 2.8
			Integrated age		428.1 ± 0.8
SUT24 Muscovite J=0.01704298 (UTM NAD27 zone 18; 706657, 5020024)					
1	0.0	0.9	0.1270	14.72	403.9 ± 11.8
2	12.1	2.6	0.0120	14.97	410.0 ± 4.2
3	2.1	9.4	0.0020	15.22	416.2 ± 1.8
4	0.5	11.8	0.0000	15.32	418.7 ± 1.3
5	0.6	13.4	0.0070	15.23	416.4 ± 1.4
6	0.0	12.3	0.0000	15.30	418.2 ± 1.5
7	0.2	9.7	0.0030	15.24	416.8 ± 1.9
8	0.3	39.8	0.0010	15.27	417.4 ± 0.8
			Integrated age		417.0 ± 0.5
SUT25 Muscovite J=0.03438866 (UTM NAD27 zone 18; 706733, 5014625)					
1	4.8	0.5	0.0040	6.72	374.9 ± 7.4
2	0.9	2.2	0.0110	7.05	391.8 ± 1.7
3	0.0	5.0	0.0060	6.98	388.2 ± 1.0
4	0.1	5.5	0.0060	7.13	395.5 ± 0.7
5	0.1	2.6	0.0080	7.19	398.6 ± 1.5
6	0.2	16.7	0.0010	7.36	407.2 ± 0.6
7	0.2	16.6	0.0020	7.30	404.1 ± 0.7
8	0.1	9.9	0.0020	7.31	404.5 ± 0.8
9	0.0	30.7	0.0020	7.32	405.1 ± 0.6
10	0.0	5.7	0.0160	7.37	407.8 ± 1.0
11	0.0	4.7	0.0860	7.39	408.7 ± 1.0
			Integrated age		403.6 ± 0.3
SUT26 Muscovite J=0.01704191 (UTM NAD27 zone 18; 706947, 5013998)					
1	1.0	2.2	0.0290	14.26	392.7 ± 12.4
2	2.1	4.2	0.0090	14.47	397.7 ± 5.1
3	3.9	2.3	0.0450	14.35	394.8 ± 12.2
4	2.7	4.0	0.0100	14.26	392.7 ± 5.0
5	1.4	9.9	0.0140	14.40	396.1 ± 2.2
6	0.2	38.9	0.0030	14.83	406.8 ± 0.9
7	0.0	7.8	0.0120	14.88	407.8 ± 2.6
8	0.0	6.8	0.0100	14.95	409.5 ± 3.7
9	0.2	24.0	0.0050	14.99	410.6 ± 1.4
			Integrated age		405.4 ± 0.8

Step	$^{40}Ar_{Atm.}$ (%)	$^{39}Ar_K$ (%)	$^{37}Ar_{Ca}/^{39}Ar_K$	$^{40}Ar^*/^{39}Ar_K$	Age (Ma)
SUT29 Muscovite J=0.01704083 (UTM NAD27 zone 18; 711359, 5019275)					
1	1.3	4.9	0.0120	15.83	431.0 ± 5.3
2	0.6	3.4	0.0070	18.78	501.2 ± 5.1
3	0.0	2.4	0.0010	26.69	676.5 ± 5.3
4	0.0	3.6	0.0020	34.20	828.7 ± 4.2
5	0.1	8.4	0.0020	37.25	887.0 ± 2.3
6	0.2	9.1	0.0000	38.29	906.5 ± 2.5
7	0.1	45.3	0.0000	40.20	941.7 ± 1.2
8	0.1	6.2	0.0000	38.85	916.8 ± 2.3
9	0.1	16.7	0.0000	40.36	944.5 ± 1.5
			Integrated age		887.1 ± 0.7
SUT30 Muscovite J=0.03439157 (UTM NAD27 zone 18; 712667, 5018817)					
1	16.5	0.2	0.1290	5.39	306.9 ± 21.6
2	1.7	6.0	0.0100	7.00	389.0 ± 1.1
3	0.6	3.9	0.0100	7.27	402.9 ± 1.7
4	0.6	6.0	0.0120	7.50	414.0 ± 1.1
5	0.2	9.1	0.0000	7.83	430.2 ± 0.8
6	0.2	8.6	0.0010	7.87	432.3 ± 0.8
7	0.1	12.1	0.0010	7.98	437.6 ± 0.7
8	0.1	8.0	0.0020	8.10	443.6 ± 0.9
9	0.3	21.5	0.0030	8.31	453.4 ± 0.8
10	0.1	9.0	0.0140	8.37	456.7 ± 0.9
11	0.0	8.4	0.0230	8.38	456.9 ± 0.9
12	0.4	4.0	0.0330	8.33	454.8 ± 1.5
13	1.0	3.1	0.0310	8.33	454.8 ± 2.3
			Integrated age		439.0 ± 0.3
SUT35 Muscovite J=0.01703976 (UTM NAD27 zone 18; 704528, 4990809)					
1	2.1	11.3	0.0020	24.30	625.3 ± 2.2
2	0.3	14.7	0.0040	48.32	1083.9 ± 1.9
3	0.3	36.6	0.0030	47.27	1066.2 ± 1.7
4	0.2	26.3	0.0040	52.75	1157.1 ± 1.8
5	0.5	11.1	0.0150	50.09	1113.6 ± 4.4
			Integrated age		1054.4 ± 1.0
SUT36 Muscovite J=0.03439157 (UTM NAD27 zone 18; 700613, 4990317)					
1	0.0	0.5	0.0000	7.66	421.9 ± 43.0
2	2.8	2.6	0.0280	7.22	400.5 ± 7.0
3	0.0	2.3	0.0000	7.66	421.8 ± 8.3
4	0.0	11.7	0.0030	7.91	434.3 ± 1.9
5	0.0	25.8	0.0050	7.90	433.8 ± 1.3
6	0.3	16.7	0.0070	7.83	430.2 ± 1.5
7	0.0	19.4	0.0040	7.60	419.2 ± 1.4
8	0.0	14.9	0.0040	7.62	419.9 ± 1.8
9	0.0	6.2	0.0050	7.66	421.9 ± 3.8
			Integrated age		426.4 ± 0.7

Step	$^{40}Ar_{Atm.}$ (%)	$^{39}Ar_K$ (%)	$^{37}Ar_{Ca}/^{39}Ar_K$	$^{40}Ar^*/^{39}Ar_K$	Age (Ma)
SUT37 Muscovite J=0.01703869 (UTM NAD27 zone 18; 693857, 4990535)					
1	3.5	5.7	0.0020	15.08	412.7 ± 3.0
2	3.3	10.2	0.0030	15.52	423.5 ± 2.6
3	0.8	26.9	0.0010	15.80	430.1 ± 1.1
4	0.8	37.5	0.0000	15.73	428.4 ± 0.7
5	7.2	1.7	0.0000	13.85	382.3 ± 5.6
6	1.8	7.9	0.0000	15.06	412.1 ± 1.6
7	1.2	10.2	0.0010	15.14	414.2 ± 1.5
			Integrated age		424.0 ± 0.5
SUT38 Muscovite J=0.01703761 (UTM NAD27 zone 18; 688353, 4988430)					
1	7.3	3.6	0.0720	15.20	415.6 ± 3.3
2	6.6	10.6	0.0010	15.25	416.9 ± 1.3
3	1.6	13.0	0.0000	15.34	419.0 ± 1.3
4	1.5	12.6	0.0000	15.29	417.8 ± 1.2
5	1.3	12.6	0.0010	15.25	416.7 ± 1.5
6	1.8	13.5	0.0020	15.17	414.8 ± 0.9
7	1.1	25.5	0.0010	15.22	416.0 ± 0.7
8	1.1	5.9	0.0040	15.04	411.6 ± 1.2
9	1.4	2.7	0.0000	15.22	416.1 ± 3.1
			Integrated age		416.3 ± 0.4

$^{40}Ar/^{39}Ar$ analytical data. $^{40}Ar_{atm}$ = atmospheric ^{40}Ar. $^{40}Ar^*$ = radiogenic ^{40}Ar. Ca = produced by Ca-neutron interferences. K = produced by K-neutron interferences. Age (Ma) = the date is calculated using the decay constants recommended by Steiger and Jäger (1977). The errors are at the 1σ level and do not include the error in the value of the J parameter. Correction factors for interfering isotopes produced by neutron irradiation in the McMaster reactor were $(^{39}Ar/^{37}Ar)_{Ca} = 7.06\times10^{-4}$, $(^{36}Ar/^{37}Ar)_{Ca} = 2.79\times10^{-4}$, $(^{40}Ar/^{39}Ar)_K = 2.95\times10^{-2}$.

Additional Reference

Steiger, R.H., and Jäger, E. 1977. Subcommission on geochronology: convention on the use of decay constants in geo- and cosmochronology. Earth Planetary Science Letters, **36**: 359-362.