DR2003075

Appendix DR1. Analytical Methods

Zircon U-Th-Pb analyses were carried out on the SHRIMP-RG (Sensitive High Resolution Ion MicroProbe – Reverse Geometry) ion microprobe at Stanford University. Individual zircons from conventional mineral separates were mounted in epoxy, polished and coated with gold prior to analysis. Zircons from granitic rocks were imaged with cathodoluminescence (CL) prior to analysis to guide selection of analysis points in zoned grains. Interiors of zircons from the schists were initially analyzed randomly, and imaged with cathodoluminescence after analysis. These images revealed the presence of very thin rims on many of the grains, and were used to guide further analyses of these rims after repolishing and recoating of the grain mounts. A ~30 μm diameter, 8-12 nA O_2^- primary beam was used to sputter the zircon samples for analysis, following 90 seconds of rastering to remove potential surface contamination. Resulting analyses show ^{204}Pb is generally <0.01% of total Pb, except where noted. Pb/U ratios were corrected for common Pb using the model Pb evolution curve of Stacey and Kramers (1975). Concentrations were standardized against Sri Lankan zircon standards SL-13 and CZ3, and isotope ratios were calibrated against Duluth Gabbro zircon AS57 (1099 Ma; Paces and Miller, 1993) and Braintree Complex zircon R33 (419 Ma; R. Mundil, personal communication, 1999; S.L. Kamo, personal communication, 2001). Data reduction procedures followed methods described by Williams (1997), using the SQUID program of K. R. Ludwig (2002). In samples of granitic rocks with significant measured common Pb, ages were calculated from concordia intercepts using uncorrected $^{238}U/^{206}Pb$ ratios. Errors on spot ages within individual grains are reported at 1 sigma; weighted mean ages and concordia intercept ages were calculated at the 95% confidence level.

$^{40}Ar/^{39}Ar$ ages were determined by conventional step-heating experiments utilizing the same procedures as Grove et al. (2003). As discussed in that work, we consider that total-gas ages provide the best estimate of the time of bulk closure of argon diffusion in muscovite and biotite.

References

Grove, M., Jacobson, C.E., Barth, A.P., and Vucic, A., 2003, Temporal and spatial trends of Late Cretaceous – Early Tertiary underplating of Pelona and related schist beneath southern California and southwestern Arizona: Geological Society of America Special Paper (in press).

Ludwig, K.R., 2002, Squid: Berkeley Geochronology Center Special Publication 2, (kludwig@bgc.org); and Isoplot/Ex, a geochronology toolkit for Microsoft Excel: Berkeley Geochronology Center Special Publication 1 (kludwig@bgc.org).

Paces, J.B., and Miller, J.D., 1993, U-Pb ages of the Duluth complex and related mafic intrusions, northeastern Minnesota: Geochronologic insights into physical petrogenetic, paleomagnetic and tectonomagmatic processes associated with the 1.1 Ga mid-continent rift system: Journal of Geophysical Research 98, 13997-14013.

Stacey, J.S., and Kramers, J.D., 1975, Approximation of terrestrial lead isotope evolution by a two-stage model: Earth and Planetary Science Letters 26, 207-221.

Williams, I.S., 1997, U-Th-Pb geochronology by ion microprobe: Not just ages but histories: Society of Economic Geology Reviews in Economic Geology 7, 1-35.

Table DR1. SHRIMP-RG Ion Microprobe U-Pb zircon data for Salinian granitic rocks

	U ppm	Th ppm	%common 206Pb	238U/206Pb		207Pb/206Pb		206Pb*/238U age, Ma	
granodiorite of Johnson Canyon	0656649	4046603							
02339-1	879	202	-0.06	68.0062	1.2	0.0474	2.5	94.2	1.1
02339-2	734	332	0.23	67.1023	1.3	0.0498	3.1	95.1	1.2
02339-3	764	163	0.23	68.0229	1.3	0.0497	2.3	93.9	1.2
02339-4	454	60	0.34	70.5064	1.3	0.0505	3.1	90.5	1.2
02339-5	1022	399	0.30	72.6777	0.6	0.0501	2.4	87.8	0.5
02339-6	490	96	0.71	71.1951	0.9	0.0534	3.3	89.3	0.8
02339-7	1161	513	0.11	74.3689	0.5	0.0486	2.4	86.0	0.5
02339-8	984	450	0.41	71.9842	0.9	0.0510	2.2	88.6	0.8
02339-9	1029	381	0.20	73.2841	0.6	0.0493	2.2	87.2	0.5
02339-10	291	159	1.29	72.1154	1.1	0.0580	3.8	87.6	1.0
02339-11	591	264	0.48	70.0570	1.0	0.0517	2.9	90.9	1.0
02339-12	592	211	1.04	70.8480	0.9	0.0560	2.8	89.4	0.8
02339-13	851	107	1.64	73.6368	0.7	0.0607	4.0	85.5	0.6
02339-14	453	183	1.22	70.1172	0.9	0.0575	3.8	90.2	0.9
quartz diorite of Paraiso - Paloma	0629662	4025267							
02340-1	771	345	0.01	73.5798	1.2	0.0478	2.8	87.0	1.1
02340-2	246	72	0.23	75.2659	1.5	0.0495	4.4	84.9	1.3
02340-3	555	195	0.58	73.9462	1.3	0.0524	4.0	86.1	1.2
02340-4	319	153	0.42	72.4750	1.4	0.0511	3.7	88.0	1.3
02340-5	357	104	5.65	72.6764	1.1	0.0925	8.1	83.1	1.4
02340-6	341	64	3.71	73.6106	1.1	0.0771	10.5	83.8	1.3
02340-7	231	79	2.83	74.9262	1.4	0.0701	6.3	83.1	1.3
02340-8	325	118	0.92	73.6671	1.0	0.0550	3.8	86.1	0.9
02340-9	343	112	1.50	74.8635	1.0	0.0596	3.8	84.3	0.9
02340-10	364	138	8.75	3.4212	0.5	0.1700	0.5	1524.1	17.9
02340-11	513	314	0.54	74.9356	0.8	0.0520	3.3	85.0	0.7
02340-12	261	135	3.86	6.4188	0.6	0.1011	1.0	899.7	6.5

granodiorite of Carmel Valley 0615367 4036133

02341-1	293	158	1.67	77.5298	2.0	0.0609	3.6	81.2	1.7
02341-2	182	41	6.00	74.5392	2.0	0.0952	8.1	80.8	1.9
02341-3	445	336	2.37	76.3101	1.4	0.0665	3.2	81.9	1.2
02341-4	836	754	0.42	77.5009	1.3	0.0510	3.4	82.3	1.1
02341-5	592	174	0.39	76.6045	1.3	0.0508	2.9	83.3	1.1
02341-6	480	172	41.82	45.1521	0.8	0.3795	7.4	82.5	9.0
02341-7	384	279	8.43	72.6155	1.3	0.1145	3.5	80.8	1.5
02341-8	210	105	24.74	61.5978	1.3	0.2438	11.9	78.3	5.1
02341-9	569	113	6.87	13.4058	0.5	0.1111	2.7	433.0	4.7
02341-10	350	116	7.91	66.0914	1.3	0.1106	3.4	89.2	1.6
02341-11	522	73	2.73	28.8372	0.9	0.0723	3.1	213.8	2.2
02341-12	161	46	17.08	57.9318	1.4	0.1834	16.9	91.6	5.1

Table DR3. SHRIMP-RG Ion Microprobe U-Pb zircon data for schist of Sierra de Salinas

	U ppm	Th ppm	Th/U	238U/206Pb		207Pb/206Pb		206Pb*/238U age, Ma	
biotite schist	0640833	4027773							
02345-10B	485	26	0.055						
02345-14	404	136	0.336	73.1615	1.6	0.0620	3.9	85.9	1.5
02345-24	268	66	0.246	72.1024	1.6	0.0502	4.1	88.5	1.5
02345-13	396	122	0.309	69.5508	1.5	0.0502	3.9	91.7	1.5
02345-12	424	179	0.421	68.0672	1.4	0.0641	3.7	92.2	1.5
02345-18	894	237	0.266	68.5504	1.3	0.0466	2.3	93.6	1.2
02345-25	625	208	0.333	67.6054	1.3	0.0474	2.7	94.3	1.3
02345-7	897	226	0.252	66.4683	1.2	0.0478	2.8	96.2	1.2
02345-21	337	112	0.331	63.2182	1.5	0.0812	2.8	97.0	1.7
02345-1	367	108	0.295	65.6921	1.4	0.0490	3.4	97.2	1.5
02345-20	412	145	0.352	63.9841	1.4	0.0480	3.2	99.8	1.5
02345-22	415	101	0.243	63.8793	1.5	0.0484	3.1	99.8	1.5
02345-17	636	198	0.312	63.6669	1.3	0.0478	2.6	100.5	1.4
02345-23	674	315	0.467	63.6090	1.3	0.0463	3.5	100.5	1.4
02345-9	469	142	0.303	63.2363	1.4	0.0493	3.1	100.8	1.5
02345-5	2107	640	0.304	63.2520	1.2	0.0474	1.5	100.8	1.3
02345-8	1590	610	0.383	61.9265	1.2	0.0479	1.6	103.0	1.3
02345-19	140	45	0.322	61.7433	1.8	0.0453	5.7	103.5	2.0
02345-16	322	118	0.365	61.4751	1.6	0.0486	3.7	103.8	1.7
02345-2	469	144	0.308	60.7096	1.4	0.0494	3.0	105.1	1.5
02345-6	437	109	0.250	59.8002	1.4	0.0483	3.2	107.1	1.5
02345-15	553	248	0.449	56.8327	1.3	0.0505	2.6	112.2	1.6
02345-4	560	388	0.692	55.1989	1.3	0.0523	2.5	114.3	1.7
02345-3	4462	902	0.202	54.6319	1.1	0.0492	0.9	116.8	1.4
biotite schist	0640964	4028026							
02342-11	207	77	0.372	74.2416	1.7	0.0479	5.2	85.9	1.6
02342-29	730	226	0.310	73.0903	1.3	0.0511	2.7	86.8	1.2
02342-33	1420	335	0.236	73.0942	1.2	0.0474	1.9	87.4	1.1
02342-26	301	140	0.466	60.4003	1.5	0.1859	5.4	87.3	2.9

02342-9	8	22	2.756	71.3845	8.6	0.0550	26.9	83.9	17.8
02342-8	91	44	0.477	71.1906	2.2	0.0561	7.2	88.8	2.2
02342-12	504	64	0.126	70.9670	1.4	0.0554	3.1	89.3	1.3
02342-6	323	220	0.681	69.6800	1.5	0.0477	4.2	91.7	1.6
02342-23	583	261	0.448	68.3154	1.3	0.0458	3.1	93.2	1.4
02342-31	349	133	0.382	63.5520	1.7	0.0476	3.5	100.3	1.8
02342-19	179	134	0.745	45.5879	1.6	0.2670	3.9	103.1	5.0
02342-4	222	56	0.254	59.0795	1.6	0.0504	4.5	108.3	1.8
02342-16	587	139	0.238	56.9199	1.3	0.0472	2.6	112.2	1.5
02342-28	472	81	0.171	47.8334	1.3	0.0480	2.6	132.4	1.8
02342-18	114	49	0.433	40.9865	1.8	0.0519	5.0	155.3	3.0
02342-22	883	498	0.564	40.9796	1.4	0.0482	2.0	155.0	2.3
02342-1	880	543	0.617	39.9267	1.2	0.0500	1.8	159.2	2.2
02342-17	196	82	0.420	39.7148	1.5	0.0524	3.6	160.0	2.6
02342-27	165	71	0.427	39.5218	1.6	0.0502	4.1	160.6	2.7
02342-21	327	117	0.359	36.5785	1.3	0.0491	2.8	173.5	2.5
02342-7	200	61	0.305	34.9746	1.5	0.0516	3.8	181.5	2.9
02342-5	305	122	0.400	34.3443	1.4	0.0523	2.9	184.0	2.7
02342-34	115	74	0.643	33.1274	1.7	0.0495	4.6	190.6	3.6
02342-15	727	1393	1.915	29.8661	1.2	0.0493	1.6	214.0	4.1
02342-2	534	341	0.639	10.9868	1.2	0.0614	1.4	561.0	7.3
02342-3	365	147	0.402	9.8663	1.2	0.0626	1.3	620.6	7.8
02342-35	1468	22	0.015	6.1034	1.1	0.0727	0.4	978.1	10.5
02342-25	2547	107	0.042	4.6559	1.1	0.0874	0.5	1254.0	13.0
02342-30	893	171	0.191	4.3428	1.2	0.0880	0.4	1333.8	14.3
02342-20	712	92	0.129	4.3207	1.2	0.0882	0.5	1341.4	14.3
02342-24	842	165	0.195	4.2172	1.2	0.1062	0.4	1368.3	14.7
02342-14	288	66	0.230	4.3011	1.2	0.0872	0.8	1346.5	15.3
02342-10	170	61	0.357	4.1650	1.3	0.0880	1.4	1385.0	16.8
02342-13	344	128	0.373	3.7359	1.2	0.0965	0.6	1527.3	17.2
02342-32	246	187	0.763	3.1552	1.2	0.1218	0.6	1749.7	21.3
biotite schist	0637827	4030154							

02358-12	128	64	0.502	79.2347	2.2	0.0530	7.3	80.5	2.0
02358-19	298	169	0.567	76.0653	1.7	0.0459	5.0	83.7	1.6
02358-24	175	97	0.553	73.5313	1.9	0.0551	5.7	87.2	1.8
02358-2	464	180	0.388	73.0631	1.5	0.0484	3.9	87.2	1.4
02358-22	444	190	0.428	72.8478	1.4	0.0505	3.6	87.8	1.4
02358-25	125	55	0.443	71.8652	2.0	0.0493	6.7	88.7	2.0
02358-8	385	152	0.394	70.9804	1.5	0.0483	4.1	90.3	1.5
02358-32	262	55	0.208	70.1540	1.6	0.0457	4.8	90.7	1.5
02358-18	755	207	0.274	66.7834	1.3	0.0557	2.7	96.4	1.3
02358-11	130	50	0.384	67.0441	2.1	0.0490	7.2	95.2	2.2
02358-35	118	50	0.424	65.8122	2.0	0.0471	6.7	97.0	2.2
02358-23	74	38	0.517	64.0277	2.5	0.0514	8.5	99.1	2.8
02358-10	715	279	0.390	60.2327	1.4	0.0489	2.8	105.9	1.6
02358-34	596	303	0.509	57.5963	1.3	0.0497	2.7	110.7	1.6
02358-17	218	80	0.367	56.6727	1.7	0.0477	5.0	112.8	2.1
02358-28	859	301	0.350	47.4498	1.3	0.0515	2.1	134.1	1.8
02358-31	239	142	0.594	43.7957	1.5	0.0464	4.1	145.5	2.7
02358-14	275	154	0.559	39.7959	1.5	0.0502	3.6	159.7	2.6
02358-1	126	54	0.430	38.8597	2.0	0.0476	5.6	163.7	3.6
02358-16	322	160	0.498	33.1407	1.4	0.0496	3.0	190.5	2.9
02358-33	282	101	0.357	32.2884	1.4	0.0487	2.9	196.1	2.8
02358-21	157	26	0.165	29.1934	1.6	0.0515	3.9	216.7	3.5
02358-15	142	80	0.565	19.4328	1.5	0.0580	3.7	321.3	5.4
02358-5	337	235	0.697	4.8914	1.3	0.0864	0.9	1194.5	15.4
02358-13	394	54	0.137	4.6339	1.2	0.0871	0.8	1258.1	14.3
02358-20	197	154	0.781	4.3065	1.3	0.0878	1.1	1343.7	17.6
02358-7	738	143	0.193	4.2839	1.2	0.0873	0.6	1351.7	15.5
02358-4	409	68	0.167	4.2737	1.2	0.0872	0.7	1355.3	15.1
02358-27	509	97	0.190	4.2666	1.2	0.0875	0.7	1357.3	14.9
02358-29	240	64	0.269	4.2413	1.2	0.0867	0.9	1363.6	15.9
02358-3	1516	239	0.158	4.1700	1.2	0.0877	0.5	1384.5	14.7
02358-26	509	80	0.157	4.1410	1.2	0.0882	0.6	1393.9	15.1

02358-30	135	19	0.143	4.0176	1.3	0.1035	1.1	1430.2	17.6
02358-9	353	84	0.238	3.8074	1.3	0.1043	0.8	1496.2	17.5
02358-6	184	32	0.173	3.2975	1.3	0.1040	0.9	1707.8	19.9

02-358 biotite (4.3 mg)

Step	Temp. (°C)	Time (min.)	$^{40}Ar/^{39}Ar$ † x 1	$^{38}Ar/^{39}Ar$ † x 1000	$^{37}Ar/^{39}Ar$ † x 1000	$^{36}Ar/^{39}Ar$ † x 1000	^{39}Ar †§ (mol) x 10^{-15}	Cumulative ^{39}Ar (%)	Radiogenic ^{40}Ar # (%)	Apparent Age ¥ (Ma)
1	600	13	16.66	22.37	19.85	24.60	15.82	5.177	56.17	60.85 ± 0.72
2	700	13	12.30	13.84	7.500	4.423	58.06	24.18	89.12	71.09 ± 0.24
3	770	13	11.77	12.98	5.576	2.302	52.68	41.42	93.95	71.71 ± 0.22
4	840	13	12.19	13.80	12.11	3.971	19.57	47.82	90.09	71.20 ± 0.38
5	900	13	12.52	14.29	15.06	5.569	14.67	52.62	86.58	70.33 ± 0.51
6	960	13	12.41	14.18	11.47	5.294	24.38	60.60	87.12	70.12 ± 0.31
7	1020	13	11.90	13.20	5.385	3.300	42.74	74.59	91.54	70.64 ± 0.25
8	1080	13	11.92	13.07	4.665	3.073	48.79	90.56	92.11	71.16 ± 0.21
9	1150	13	12.91	13.57	12.92	5.934	27.05	99.41	86.16	72.08 ± 0.31
10	1350	13	40.33	33.62	31.00	101.1	1.810	99.99	25.81	67.64 ± 5.50

† Corrected for backgrounds (mean values in mol: m/e40 = 6.3X10^{-17}; m/e39 = 4.1X10^{-17}; m/e38 = 1.7X10^{-17}; m/e37 = 2.5X10^{-17}, m/e36 = 2.4X10^{-17}),
mass discrimination (measured $^{40}Ar/^{36}Ar$ = 293.5±0.5), abundance sensitivity (5 ppm), and radioactive decay (irradiated: 07-13-2002; analyzed: 08-16-2002)

§ Normalized to 100% delivery to mass spectrometer

Includes static blank

¥ Corrected for atmospheric argon and nucleogenic interferences $^{40}Ar/^{39}ArK$ = 0.0306; $^{36}Ar/^{37}ArCa$ = 0.00027; $^{39}Ar/^{37}ArCa$ = 0.00077), J-factor = 0.003665
(assumes Fish Canyon sanidine = 27.8 Ma)

Table DR2. $^{40}Ar/^{39}Ar$ Mica Total Gas Ages.

Sample	Biotite	Muscovite	Description
02-339	75.2 ± 0.4	-	Granodiorite of Johnson Canyon
02-340	75.5 ± 0.4	-	Quartz diorite of Paraiso-Paloma
02-341	76.1 ± 0.6	-	Granodiorite of Carmel Valley
02-342	70.4 ± 0.3	71.5 ± 1.9	Schist of Sierra de Salinas
02-345	69.8 ± 0.3	-	Schist of Sierra de Salinas
02-348	70.6 ± 0.3	-	Schist of Sierra de Salinas
02-354	69.8 ± 0.9	68.1 ± 0.6	Schist of Sierra de Salinas

02-345 biotite (7.6 mg)

Step	Temp. (°C)	Time (min.)	$^{40}Ar/^{39}Ar$ † x 1	$^{38}Ar/^{39}Ar$ † x 1000	$^{37}Ar/^{39}Ar$ † x 1000	$^{36}Ar/^{39}Ar$ † x 1000	^{39}Ar †§ (mol)x10^{-15}	Cumulative ^{39}Ar (%)	Radiogenic ^{40}Ar# (%)	Apparent Age¥ (Ma)
1	600	13	32.13	62.45	61.10	83.90	22.20	5.277	22.76	47.74 ± 1.24
2	700	13	13.70	15.62	10.31	10.90	64.39	20.58	76.25	67.79 ± 0.32
3	770	13	12.30	13.36	7.629	4.523	65.48	36.15	88.88	70.90 ± 0.28
4	840	13	12.64	14.01	12.71	5.084	34.90	44.44	87.85	71.98 ± 0.29
5	900	13	12.85	14.35	18.78	6.192	29.10	51.36	85.50	71.27 ± 0.31
6	960	13	12.76	13.88	15.63	5.482	46.47	62.41	87.05	72.00 ± 0.26
7	1020	13	12.23	13.03	14.29	3.740	53.43	75.10	90.71	71.94 ± 0.23
8	1080	13	12.16	13.05	25.85	3.586	57.83	88.85	91.03	71.78 ± 0.25
9	1150	13	12.60	13.29	70.45	5.042	39.14	98.15	87.95	71.84 ± 0.30
10	1350	13	17.68	15.91	37.15	21.54	7.766	99.99	63.78	73.17 ± 1.21

† Corrected for backgrounds (mean values in mol: m/e40 = $9.0X10^{-17}$; m/e39 = $4.5X10^{-17}$; m/e38 = $1.8X10^{-17}$; m/e37 = $3.1X10^{-17}$; m/e36 = $2.8X10^{-17}$), mass discrimination (measured $^{40}Ar/^{36}Ar$ = 293.5±0.5), abundance sensitivity (5 ppm), and radioactive decay (irradiated: 07-13-2002; analyzed: 08-16-2002)

§ Normalized to 100% delivery to mass spectrometer

Includes static blank

¥ Corrected for atmospheric argon and nucleogenic interferences $^{40}Ar/^{39}ArK$ = 0.0306; $^{36}Ar/^{37}ArCa$ = 0.00027; $^{39}Ar/^{37}ArCa$ = 0.00077)
J-factor = 0.003666 (assumes Fish Canyon sanidine = 27.8 Ma)

02-342 biotite (7.87 mg)

Step	Temp. (°C)	Time (min.)	$^{40}Ar/^{39}Ar$[†] x 1	$^{38}Ar/^{39}Ar$[†] x 1000	$^{37}Ar/^{39}Ar$[†] x 1000	$^{36}Ar/^{39}Ar$[†] x 1000	^{39}Ar[†§] (mol)x10^{-15}	Cumulative ^{39}Ar (%)	Radiogenic ^{40}Ar[#] (%)	Apparent Age[¥] (Ma)
1	600	13	28.37	104.4	57.64	67.53	17.79	4.014	29.55	54.65 ± 1.03
2	700	13	12.19	14.18	9.134	4.566	80.47	22.17	88.68	70.17 ± 0.27
3	770	13	11.69	12.98	5.586	1.920	78.66	39.92	94.88	71.93 ± 0.23
4	840	13	11.98	13.83	12.36	3.342	26.39	45.88	91.49	71.16 ± 0.35
5	900	13	12.16	14.55	14.24	4.341	21.48	50.73	89.18	70.39 ± 0.41
6	960	13	12.19	14.05	13.47	4.543	35.76	58.80	88.73	70.18 ± 0.27
7	1020	13	11.78	13.21	7.347	2.783	59.05	72.12	92.75	70.89 ± 0.22
8	1080	13	11.63	12.90	4.326	1.825	71.88	88.34	95.09	71.74 ± 0.23
9	1150	13	11.58	12.86	8.206	1.595	48.44	99.27	95.66	71.85 ± 0.20
10	1350	13	13.06	16.19	21.35	11.92	3.221	99.99	72.67	61.85 ± 2.04

[†] Corrected for backgrounds (mean values in mol: m/e40 = $5.3X10^{-17}$; m/e39 = $3.4X10^{-17}$; m/e38 = $1.3X10^{-17}$; m/e37 = $2.3X10^{-17}$; m/e36 = $2.2X10^{-17}$), mass discrimination (measured 40Ar/36Ar = 293.5±0.5), abundance sensitivity (5 ppm), and radioactive decay (irradiated: 07-13-2002; analyzed: 08-18-2002)

[§] Normalized to 100% delivery to mass spectrometer

[#] Includes static blank

[¥] Corrected for atmospheric argon and nucleogenic interferences ($^{40}Ar/^{39}Ar_K$ = 0.0306; $^{36}Ar/^{37}Ar_{Ca}$ = 0.00027; $^{39}Ar/^{37}Ar_{Ca}$ = 0.00077)
J-factor = 0.003668 (assumes Fish Canyon sanidine = 27.8 Ma)

02-341 biotite (3.1 mg)

Step	Temp. (°C)	Time (min.)	$^{40}Ar/^{39}Ar$[1] x 1	$^{38}Ar/^{39}Ar$[1] x 1000	$^{37}Ar/^{39}Ar$[1] x 1000	$^{36}Ar/^{39}Ar$[1] x 1000	^{39}Ar[1,§] (mol)x10^{-15}	Cumulative ^{39}Ar (%)	Radiogenic ^{40}Ar[#] (%)	Apparent Age[¥] (Ma)
1	600	13	45.93	116.5	54.90	122.9	6.818	4.197	20.89	62.47 ± 2.68
2	700	13	14.81	44.13	13.75	11.17	19.96	16.49	77.48	74.43 ± 0.53
3	770	13	12.81	44.16	2.933	3.333	31.31	35.76	92.04	76.45 ± 0.29
4	840	13	13.00	44.45	3.737	3.815	20.87	48.61	91.05	76.75 ± 0.41
5	900	13	13.54	43.31	4.032	5.448	10.84	55.28	87.80	77.09 ± 0.74
6	960	13	13.34	42.65	4.484	4.112	12.81	63.17	90.59	78.36 ± 0.63
7	1020	13	13.05	42.69	6.162	3.712	13.45	71.45	91.29	77.25 ± 0.61
8	1080	13	12.66	43.09	3.348	2.714	25.03	86.86	93.39	76.67 ± 0.34
9	1150	13	13.78	44.69	27.97	6.054	18.88	98.48	86.76	77.50 ± 0.57
10	600	13	31.58	50.40	36.10	64.58	2.474	99.99	39.41	80.71 ± 3.54

1 Corrected for backgrounds (mean values in mol: m/e40 = 9.6E-17; m/e39 = 4.3E-17; m/e38 = 1.9E-17; m/e37 = 2.9E-17; m/e36 = 2.8E-17), mass discrimination (measured 40Ar/36Ar = 293.5±0.5), abundance sensitivity (5 ppm), and radioactive decay (irradiated: 07-13-2002; analyzed: 08-16-2002)
2 Normalized to 100% delivery to mass spectrometer
3 Includes static blank
4 Corrected for atmospheric argon and nucleogenic interferences 40Ar/39ArK = 0.0306; 36Ar/37ArCa = 0.00027; 39Ar/37ArCa = 0.00077)
5 J-factor = 0.003670 (assumes Fish Canyon sanidine = 27.8 Ma)
6 Corrected for static line blank and nucleognic interferences

02-340 biotite (5.5 mg)

Step	Temp. (°C)	Time (min.)	$^{40}Ar/^{39}Ar$[1] x 1	$^{38}Ar/^{39}Ar$[1] x 1000	$^{37}Ar/^{39}Ar$[1] x 1000	$^{36}Ar/^{39}Ar$[1] x 1000	^{39}Ar[1§] (mol)x10^{-15}	Cumulative ^{39}Ar (%)	Radiogenic ^{40}Ar[#] (%)	Apparent Age[¥] (Ma)
1	600	13	30.95	14.20	19.77	64.59	12.55	3.518	38.22	76.74 ± 1.10
2	700	13	13.61	9.786	5.791	6.787	54.25	18.72	85.03	75.10 ± 0.28
3	770	13	12.20	9.772	3.084	1.757	80.50	41.28	95.48	75.60 ± 0.24
4	840	13	12.25	9.784	4.339	2.098	39.48	52.34	94.67	75.28 ± 1.25
5	900	13	12.59	9.675	6.070	3.230	18.45	57.51	92.13	75.32 ± 0.42
6	960	13	12.39	9.715	5.239	2.529	26.45	64.92	93.68	75.33 ± 0.30
7	1020	13	12.28	9.644	4.785	2.142	34.07	74.47	94.57	75.40 ± 0.28
8	1080	13	12.38	9.695	6.680	2.616	40.91	85.93	93.49	75.11 ± 0.25
9	1150	13	12.78	9.837	35.04	3.669	45.15	98.58	91.28	75.70 ± 0.27
10	600	13	24.50	10.30	83.69	41.96	5.055	99.99	49.24	78.30 ± 2.16

1 Corrected for backgrounds (mean values in mol: m/e40 = 9.2E-17; m/e39 = 4.0E-17; m/e38 = 1.8E-17; m/e37 = 3.1E-17; m/e36 = 2.7E-17), mass discrimination (measured 40Ar/36Ar = 293.5±0.5), abundance sensitivity (5 ppm), and radioactive decay (irradiated: 07-13-2002; analyzed: 08-15-2002)
2 Normalized to 100% delivery to mass spectrometer
3 Includes static blank
4 Corrected for atmospheric argon and nucleogenic interferences 40Ar/39ArK = 0.0306; 36Ar/37ArCa = 0.00027; 39Ar/37ArCa = 0.00077)
5 J-factor = 0.003673 (assumes Fish Canyon sanidine = 27.8 Ma)
6 Corrected for static line blank and nucleognic interferences

02-339 biotite (6.3 mg)

Step	Temp. (°C)	Time (min.)	$^{40}Ar/^{39}Ar$[1] x 1	$^{38}Ar/^{39}Ar$[1] x 1000	$^{37}Ar/^{39}Ar$[1] x 1000	$^{36}Ar/^{39}Ar$[1] x 1000	^{39}Ar[1§] (mol)x10^{-15}	Cumulative ^{39}Ar (%)	Radiogenic ^{40}Ar[#] (%)	Apparent Age[¥] (Ma)
1	600	13	23.74	77.64	32.03	54.46	21.89	6.192	32.08	49.80 ± 0.92
2	700	13	13.99	46.49	7.118	8.037	52.97	21.17	82.80	75.20 ± 0.32
3	770	13	12.82	45.46	4.546	3.027	62.17	38.76	92.77	77.16 ± 0.27
4	840	13	12.94	45.65	6.532	3.608	31.93	47.79	91.50	76.84 ± 0.31
5	900	13	13.34	46.26	13.48	5.308	20.96	53.71	87.98	76.18 ± 0.44
6	960	13	12.92	46.55	17.83	3.686	36.02	63.90	91.32	76.55 ± 0.25
7	1020	13	12.80	49.19	39.56	3.034	37.97	74.64	92.76	77.05 ± 0.29
8	1080	13	13.03	52.42	64.59	3.658	47.99	88.21	91.49	77.33 ± 0.26
9	1150	13	14.56	47.78	52.94	8.358	35.95	98.38	82.84	78.26 ± 0.36
10	1350	13	26.18	55.08	40.20	47.20	5.735	99.99	46.59	79.16 ± 1.90

1 Corrected for backgrounds (mean values in mol: m/e40 = 7.6E-17; m/e39 = 4.1E-17; m/e38 = 1.7E-17; m/e37 = 3.0E-17; m/e36 = 2.8E-17), mass discrimination (measured 40Ar/36Ar = 293.5±0.5), abundance sensitivity (5 ppm), and radioactive decay (irradiated: 07-13-2002; analyzed: 08-16-2002)
2 Normalized to 100% delivery to mass spectrometer
3 Includes static blank
4 Corrected for atmospheric argon and nucleogenic interferences 40Ar/39ArK = 0.0306; 36Ar/37ArCa = 0.00027; 39Ar/37ArCa = 0.00077)
5 J-factor = 0.003674 (assumes Fish Canyon sanidine = 27.8 Ma)
6 Corrected for static line blank and nucleognic interferences

02-354 biotite (3.0 mg)

Step	Temp. (°C)	Time (min.)	$^{40}Ar/^{39}Ar$[1] x1	$^{38}Ar/^{39}Ar$[1] x1000	$^{37}Ar/^{39}Ar$[1] x1000	$^{36}Ar/^{39}Ar$[1] x1000	^{39}Ar[1§] (mol)x10^{-15}	Cumulative ^{39}Ar (%)	Radiogenic ^{40}Ar[#] (%)	Apparent Age[¥] (Ma)
1	1	1	1	1000	1000	100	1E+15	1	1	1
1	500	13	206.0	222.0	181.8	68.45	1.701	0.5392	1.815	23.98 ± 29.06
2	700	16	16.43	17.20	26.71	1.929	54.23	17.73	65.12	67.74 ± 0.57
3	770	13	14.72	14.91	7.286	1.185	51.57	34.07	75.99	70.76 ± 0.47
4	840	13	19.35	18.70	15.83	2.783	20.85	40.68	57.33	70.22 ± 1.05
5	900	13	20.25	19.17	16.11	3.094	18.46	46.53	54.69	70.09 ± 1.27
6	960	13	18.43	17.38	24.54	2.432	25.83	54.71	60.84	70.96 ± 1.00
7	1020	13	14.85	15.03	14.27	1.236	48.68	70.14	75.19	70.65 ± 0.47
8	1080	13	14.20	14.53	39.18	1.048	55.59	87.76	77.99	70.06 ± 0.72
9	1150	13	15.51	15.58	119.2	1.444	37.66	99.70	72.35	71.02 ± 0.63
10	1350	13	189.2	131.8	162.4	61.43	0.9619	99.99	4.062	48.97 ± 30.80

1 Corrected for backgrounds (mean values in mol: m/e40 = 8.9E-17; m/e39 = 5.1E-17; m/e38 = 2.2E-17; m/e37 = 4.7E-17; m/e36 = 3.3E-17), mass discrimination (measured 40Ar/36Ar = 293.5±0.5), abundance sensitivity (5 ppm), and radioactive decay (irradiated: 10-18-2002; analyzed: 12-30-2002)
2 Normalized to 100% delivery to mass spectrometer
3 Includes static blank
4 Corrected for atmospheric argon and nucleogenic interferences 40Ar/39ArK = 0.0306; 36Ar/37ArCa = 0.00027; 39Ar/37ArCa = 0.00079)
5 J-factor = 0.003576 (assumes Fish Canyon sanidine = 27.8 Ma)
6 Corrected for static line blank and nucleognic interferences

02-354 muscovite (4.4 mg)

Step	Temp. (°C)	Time (min.)	$^{40}Ar/^{39}Ar$[1] x1	$^{38}Ar/^{39}Ar$[1] x1000	$^{37}Ar/^{39}Ar$[1] x1000	$^{36}Ar/^{39}Ar$[1] x1000	^{39}Ar[1,§] (mol)x10^{-15}	Cumulative ^{39}Ar (%)	Radiogenic ^{40}Ar[#] (%)	Apparent Age[¥] (Ma)
1	500	13	14.16	48.54	121.9	21.48	60.26	13.28	55.03	49.56 ± 1.47
2	600	13	18.32	46.66	80.66	32.91	3.400	14.03	46.67	54.41 ± 4.34
3	700	13	13.86	16.77	36.37	8.788	11.38	16.54	80.99	71.02 ± 1.22
4	770	13	13.03	14.39	17.99	5.731	19.68	20.87	86.73	71.42 ± 0.64
5	840	13	12.44	13.52	5.493	3.799	55.73	33.16	90.71	71.30 ± 0.34
6	880	13	11.67	12.70	2.473	1.334	73.34	49.32	96.35	71.08 ± 0.26
7	920	13	11.84	13.03	4.836	2.216	35.43	57.13	94.18	70.48 ± 0.38
8	960	13	12.02	13.36	5.522	2.837	23.73	62.36	92.73	70.49 ± 0.55
9	1000	13	12.04	13.54	7.141	3.129	22.27	67.26	92.02	70.05 ± 0.61
10	1070	13	11.94	13.11	6.432	2.393	41.25	76.35	93.80	70.77 ± 0.37
11	1150	13	11.73	12.58	6.324	1.266	90.55	96.31	96.54	71.53 ± 0.23
12	1350	13	13.70	15.04	20.96	8.518	16.74	100.0	81.36	70.47 ± 0.86

1 Corrected for backgrounds (mean values in mol: m/e40 = 9.9E-17; m/e39 = 5.0E-17; m/e38 = 1.8E-17; m/e37 = 4.3E-17; m/e36 = 3.1E-17), mass discrimination (measured 40Ar/36Ar = 293.5±0.5), abundance sensitivity (5 ppm), and radioactive decay (irradiated: 10-18-2002; analyzed: 12-31-2002)
2 Normalized to 100% delivery to mass spectrometer
3 Includes static blank
4 Corrected for atmospheric argon and nucleogenic interferences 40Ar/39ArK = 0.0306; 36Ar/37ArCa = 0.00027; 39Ar/37ArCa = 0.00079)
5 J-factor = 0.003572 (assumes Fish Canyon sanidine = 27.8 Ma)
6 Corrected for static line blank and nucleognic interferences

02-342 muscovite (1.0 mg)

Step	Temp. (°C)	Time (min.)	$^{40}Ar/^{39}Ar$[1] x 1	$^{38}Ar/^{39}Ar$[1] x 1000	$^{37}Ar/^{39}Ar$[1] x 1000	$^{39}Ar/^{39}Ar$[1] x 1000	^{39}Ar[1,§] (mol) x 10^{-15}	Cumulative ^{39}Ar (%)	Radiogenic ^{40}Ar[#] (%)	Apparent Age[¥] (Ma)
1	1	1	1	1000	1000	1000	1E+15	1	1	1
1	500	13	86.75	151.7	273.7	275.3	0.4680	0.534	6.175	34.40 ± 34.96
2	600	13	28.74	34.73	206.9	58.24	0.9853	1.657	39.68	72.65 ± 12.77
3	700	13	17.39	18.84	228.0	19.85	2.873	4.933	65.83	72.61 ± 4.39
4	770	13	14.31	14.56	184.3	8.971	4.526	10.09	81.01	73.42 ± 2.81
5	840	13	13.29	13.62	84.69	6.076	8.376	19.64	86.09	72.36 ± 1.77
6	880	13	12.51	13.36	24.67	3.708	12.41	33.80	90.85	71.82 ± 1.14
7	920	13	12.48	12.38	18.49	3.449	9.419	44.54	91.38	72.11 ± 1.36
8	960	13	12.78	13.47	19.53	4.274	6.250	51.66	89.58	72.48 ± 2.16
9	1000	13	13.04	14.88	19.91	4.652	5.547	57.99	88.89	73.37 ± 2.17
10	1070	13	12.40	13.78	22.40	3.701	13.02	72.83	90.79	71.17 ± 1.14
11	1150	13	12.22	13.32	69.90	3.229	18.55	93.99	91.88	70.98 ± 0.78
12	1350	13	17.28	18.40	254.8	21.63	5.273	99.99	62.76	68.71 ± 2.47

1 Corrected for backgrounds (mean values in mol: m/e40 = 9.6E-17; m/e39 = 4.3E-17; m/e38 = 1.9E-17; m/e37 = 2.9E-17; m/e36 = 2.8E-17), mass discrimination (measured 40Ar/36Ar = 293.5±0.5), abundance sensitivity (5 ppm), and radioactive decay (irradiated: 07-13-2002; analyzed: 08-16-2002)
2 Normalized to 100% delivery to mass spectrometer
3 Includes static blank
4 Corrected for atmospheric argon and nucleogenic interferences 40Ar/39ArK = 0.0306; 36Ar/37ArCa = 0.00027; 39Ar/37ArCa = 0.00077)
5 J-factor = 0.003670 (assumes Fish Canyon sanidine = 27.8 Ma)
6 Corrected for static line blank and nucleognic interferences

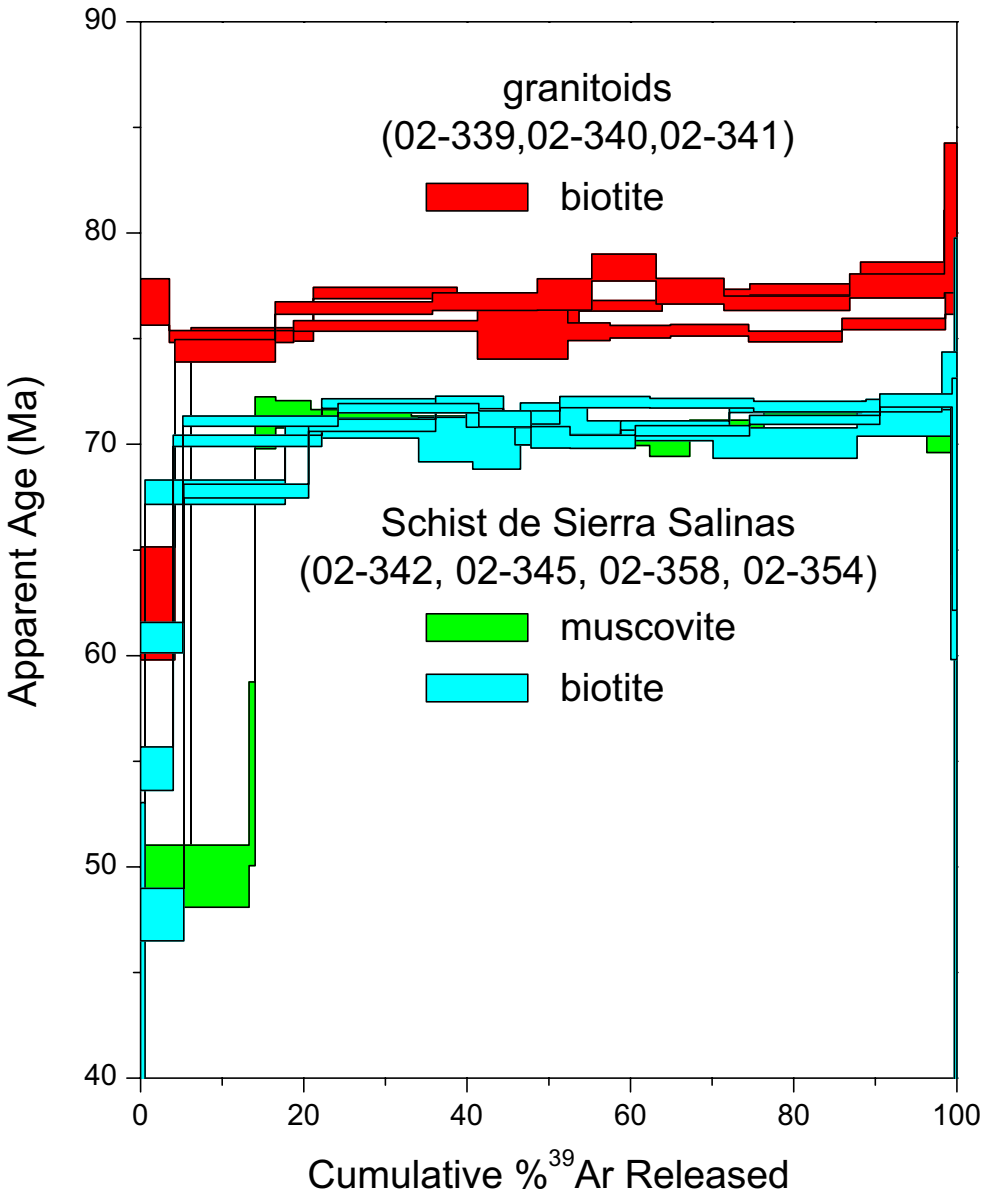
granitoids
(02-339,02-340,02-341)
biotite
Schist de Sierra Salinas
(02-342, 02-345, 02-358, 02-354)
muscovite
biotite
Apparent Age (Ma)
Cumulative %39Ar Released
90
80
70
60
50
40
0
20
40
60
80
100

Figure DR1