TABLE DR1. Summary of SHRIMP U-Pb zircon results for migmatitic rocks at Stowe Mountain

Grain Spot	U (ppm)	Th (ppm)	Th/U	Pb* (ppm)	$^{204}Pb/^{206}Pb$	f_{206} %	Total $^{238}U/^{206}Pb$	±	Total $^{207}Pb/^{206}Pb$	±	Radiogenic ratios $^{206}Pb/^{238}U$	±	Ages (in Ma) $^{206}Pb/^{238}U$	±
Sample 03OK80b - *wispy granodiorite diatexite (Location: N48º36.20', W119º25.06')*														
Rims														
1.1	300	0.30	0.001	2.0	0.000652	0.14	127.74	1.89	0.0481	0.0017	0.0078	0.0001	50.2	0.7
2.1	256	0.36	0.001	1.8	0.001420	0.88	124.78	1.92	0.0540	0.0025	0.0079	0.0001	51.0	0.8
3.1	1	0.03	0.026	0.0	0.088749	42.34	70.83	10.41	0.3824	0.0900	0.0081	0.0021	52.3	13.7
4.2	465	1.36	0.003	3.2	0.000391	0.64	125.39	1.63	0.0521	0.0016	0.0079	0.0001	50.9	0.7
5.2	626	1.29	0.002	4.1	0.000196	0.01	131.54	1.62	0.0471	0.0014	0.0076	0.0001	48.8	0.6
6.1	83	0.44	0.005	0.8	0.004189	1.32	86.14	1.68	0.0580	0.0031	0.0115	0.0002	73.4	1.5
7.1	1593	2.11	0.001	11.1	0.000045	0.00	122.77	1.34	0.0471	0.0008	0.0081	0.0001	52.3	0.6
8.1	246	6.26	0.025	2.7	-	0.23	78.28	1.08	0.0495	0.0016	0.0127	0.0002	81.6	1.1
9.1	221	4.81	0.022	1.7	0.002210	0.60	113.25	1.80	0.0519	0.0043	0.0088	0.0001	56.3	0.9
10.1	179	0.52	0.003	1.8	0.000553	0.48	86.61	1.35	0.0513	0.0022	0.0115	0.0002	73.7	1.2
11.1	372	17	0.045	4.2	0.000243	0.08	75.28	0.99	0.0484	0.0014	0.0133	0.0002	85.0	1.1
11.2	333	10	0.032	3.7	0.003940	0.70	77.73	0.98	0.0532	0.0013	0.0128	0.0002	81.8	1.0
12.1	108	0.15	0.001	1.2	-	1.12	79.70	1.51	0.0565	0.0030	0.0124	0.0002	79.5	1.5
13.1	272	0.32	0.001	3.0	0.000149	0.32	77.82	1.11	0.0502	0.0017	0.0128	0.0002	82.0	1.2
15.1	149	3.72	0.025	1.1	0.003558	0.32	114.50	2.11	0.0497	0.0027	0.0087	0.0002	55.9	1.0
16.1	304	30	0.098	3.0	0.000418	0.59	87.68	1.20	0.0521	0.0016	0.0113	0.0002	72.7	1.0
17.1	33	0.05	0.002	0.4	-	2.76	78.45	3.03	0.0695	0.0078	0.0124	0.0005	79.4	3.2
17.2	63	0.13	0.002	0.6	0.006877	0.86	90.29	1.96	0.0542	0.0034	0.0110	0.0002	70.4	1.6
18.1	316	0.71	0.002	2.2	-	0.24	124.17	1.82	0.0490	0.0018	0.0080	0.0001	51.6	0.8
19.1	93	1.78	0.019	0.7	0.001563	1.11	111.25	2.35	0.0559	0.0036	0.0089	0.0002	57.0	1.2
20.1	1097	32	0.029	12.5	0.000155	<0.01	75.61	0.83	0.0465	0.0008	0.0132	0.0001	84.8	0.9
22.1	1015	34	0.033	11.4	0.000727	<0.01	76.21	0.83	0.0476	0.0008	0.0131	0.0001	84.0	0.9
23.1	182	0.29	0.002	1.7	0.001903	0.79	91.38	1.39	0.0536	0.0022	0.0109	0.0002	69.6	1.1
24.1	81	0.48	0.006	0.8	-	1.26	85.31	1.65	0.0575	0.0034	0.0116	0.0002	74.2	1.5
25.1	1353	58	0.043	15.3	-	0.12	75.83	0.83	0.0487	0.0008	0.0132	0.0001	84.4	0.9
27.1	686	5.32	0.008	7.7	0.000064	0.24	76.36	0.89	0.0496	0.0011	0.0131	0.0002	83.7	1.0
28.1	2711	21	0.008	28.8	0.000315	0.38	80.73	0.87	0.0506	0.0006	0.0123	0.0001	79.1	0.9
Cores														
1.2	437	0.01	<0.001	3.2	0.001012	0.27	117.50	1.61	0.0492	0.0017	0.0085	0.0001	54.5	0.8
2.2	448	0.10	<0.001	3.0	0.001139	0.29	127.43	1.67	0.0493	0.0017	0.0078	0.0001	50.2	0.7
4.1	2368	0.96	<0.001	17.3	0.000118	<0.01	117.61	1.25	0.0468	0.0006	0.0085	0.0001	54.6	0.6

5.1	257	9.69	0.038	2.7	0.001065	0.45	81.01	1.12	0.0512	0.0016	0.0123	0.0002	78.7	1.1
8.2	178	3.60	0.020	1.9	0.000662	0.40	79.77	1.91	0.0508	0.0018	0.0125	0.0003	80.0	1.9
13.2	138	3.08	0.022	1.4	0.001260	0.11	86.80	1.39	0.0484	0.0020	0.0115	0.0002	73.8	1.2
14.1	849	35	0.041	9.6	0.000206	0.07	75.82	0.85	0.0482	0.0008	0.0132	0.0001	84.4	0.9
20.2	834	16	0.019	9.1	0.000455	0.20	78.98	0.89	0.0492	0.0009	0.0126	0.0001	80.9	0.9
21.1	149	2.20	0.015	1.6	0.002362	0.60	81.55	1.25	0.0523	0.0022	0.0122	0.0002	78.1	1.2
26.1	1055	92	0.087	11.4	0.000094	0.17	79.25	0.87	0.0490	0.0009	0.0126	0.0001	80.7	0.9

Sample 03OK80c - *foliated discordant granitic leucosome in diatexite, locally pegmatitic and folded (Location: N48º36.20', W119º25.06')*

Rims														
1.2	161	0.45	0.003	1.1	0.001574	0.01	122.22	2.11	0.0471	0.0024	0.0082	0.0001	52.5	0.9
6.1	1359	1.50	0.001	10.0	0.000298	0.07	116.73	1.30	0.0476	0.0008	0.0086	0.0001	55.0	0.6
10.1	795	0.02	<0.001	5.5	0.000123	0.05	123.15	1.47	0.0475	0.0011	0.0081	0.0001	52.1	0.6
11.1	1897	0.82	<0.001	13.8	-	0.13	117.92	1.34	0.0481	0.0007	0.0085	0.0001	54.4	0.6
13.1	241	0.10	<0.001	1.7	0.000468	0.53	122.27	1.84	0.0513	0.0020	0.0081	0.0001	52.2	0.8
16.1	977	44	0.045	7.4	0.002201	2.31	113.50	1.30	0.0654	0.0014	0.0086	0.0001	55.2	0.7
17.1	722	0.17	<0.001	5.1	0.000214	0.66	121.15	1.46	0.0523	0.0012	0.0082	0.0001	52.6	0.6
19.1	341	0.01	<0.001	2.4	0.001795	0.04	120.88	2.09	0.0474	0.0016	0.0083	0.0001	53.1	0.9
Cores														
1.1	837	0.24	<0.001	6.0	0.000096	0.08	118.90	1.41	0.0477	0.0010	0.0084	0.0001	53.9	0.6
2.1	1249	0.03	<0.001	8.9	0.000108	0.21	121.21	1.36	0.0487	0.0009	0.0082	0.0001	52.9	0.6
3.1	861	0.10	<0.001	6.2	0.000364	0.25	119.60	1.40	0.0491	0.0010	0.0083	0.0001	53.5	0.6
4.1	952	0.01	<0.001	6.8	0.000457	0.07	120.38	1.57	0.0477	0.0009	0.0083	0.0001	53.3	0.7
5.1	614	0.04	<0.001	4.5	0.000845	0.50	118.40	1.46	0.0511	0.0012	0.0084	0.0001	53.9	0.7
7.1	3	0.03	0.009	0.0	0.012878	10.21	76.23	6.67	0.1285	0.0303	0.0118	0.0012	75.5	7.4
8.1	505	0.01	<0.001	3.6	0.000487	0.32	119.04	1.53	0.0496	0.0015	0.0084	0.0001	53.8	0.7
9.1	97	27	0.279	0.7	0.004820	1.05	114.65	2.29	0.0555	0.0038	0.0086	0.0002	55.4	1.1
12.1	659	0.08	<0.001	4.8	0.000837	0.14	118.15	1.71	0.0482	0.0011	0.0085	0.0001	54.3	0.8
14.1	1318	0.02	<0.001	9.7	0.000269	0.18	117.07	1.31	0.0486	0.0009	0.0085	0.0001	54.7	0.6
15.1	214	0.05	<0.001	1.5	0.001595	0.64	119.17	1.85	0.0522	0.0022	0.0083	0.0001	53.5	0.8
18.1	100	22	0.217	0.7	-	1.72	120.54	2.55	0.0607	0.0037	0.0082	0.0002	52.3	1.1

Sample 04OK300a - *foliated discordant granitic leucosome in metatexite, locally pegmatitic and folded (Location: N48º36.11', W119º25.06')*

Rims														
3.1	2274	0	<0.001	19.6	0.000182	0.16	105.54	1.13	0.0485	0.0006	0.0095	0.0001	60.7	0.6
9.1	2681	0	<0.001	23.2	0.000073	0.46	105.14	1.18	0.0508	0.0006	0.0095	0.0001	60.7	0.7
13.1	827	2	0.003	6.7	0.000020	0.22	112.77	1.40	0.0489	0.0010	0.0088	0.0001	56.8	0.7

15.1	4529	1	<0.001	38.7	0.000040	0.88	106.36	1.10	0.0542	0.0005	0.0093	0.0001	59.8	0.6
16.1	1831	0	<0.001	14.1	0.000071	0.01	117.74	1.28	0.0472	0.0010	0.0085	0.0001	54.5	0.6
17.1	227	0	0.001	1.8	0.001152	1.48	113.11	1.66	0.0588	0.0029	0.0087	0.0001	55.9	0.9
18.1	508	4	0.009	3.8	0.000414	0.22	120.38	1.52	0.0488	0.0013	0.0083	0.0001	53.2	0.7
19.1	316	1	0.004	2.6	-	0.32	109.40	1.52	0.0497	0.0016	0.0091	0.0001	58.5	0.8
20.1	2363	0	<0.001	20.1	-	0.12	106.87	1.14	0.0482	0.0006	0.0093	0.0001	60.0	0.6
Cores														
1.1	107	0	<0.001	0.9	0.002820	2.24	105.39	3.01	0.0650	0.0037	0.0093	0.0003	59.5	1.7
2.1	53	1	0.013	0.5	0.005866	4.24	106.17	2.65	0.0808	0.0053	0.0090	0.0002	57.9	1.5
4.1	3058	0	<0.001	26.1	0.000064	0.09	106.36	1.12	0.0479	0.0005	0.0094	0.0001	60.3	0.6
5.1	2002	0	<0.001	16.8	0.000119	0.20	108.08	1.16	0.0488	0.0006	0.0092	0.0001	59.3	0.6
6.1	1522	0	<0.001	12.8	-	<0.01	107.78	1.18	0.0467	0.0008	0.0093	0.0001	59.6	0.7
7.1	243	14	0.057	2.1	-	0.24	105.72	1.55	0.0491	0.0018	0.0094	0.0001	60.5	0.9
8.1	1999	0	<0.001	16.8	0.000170	0.20	108.25	1.23	0.0488	0.0006	0.0092	0.0001	59.2	0.7
10.1	513	0	<0.001	4.3	-	0.45	108.99	1.36	0.0508	0.0013	0.0091	0.0001	58.6	0.7
11.1	2374	0	<0.001	20.2	0.000381	0.18	107.13	1.14	0.0487	0.0006	0.0093	0.0001	59.8	0.6
12.1	607	0	<0.001	5.3	0.000147	1.19	103.88	1.29	0.0566	0.0013	0.0095	0.0001	61.0	0.8
14.1	1301	0	<0.001	10.9	0.000320	0.12	109.06	1.48	0.0482	0.0008	0.0092	0.0001	58.8	0.8

Uncertainties given at the 1σ level.

Error in Temora reference zircon calibration was 0.56% for the analytical session.

(not included in above errors but required when comparing data from different mounts).

f_{206} % denotes the percentage of ^{206}Pb that is common Pb.

Correction for common Pb made using the measured ^{238}U/^{206}Pb and ^{207}Pb/^{206}Pb ratios

following Tera and Wasserburg (1972) as outlined in Williams (1998).

TABLE DR2. Summary of SHRIMP U-Pb monazite results for migmatitic rocks at Stowe Mountain

Grain Spot	U (ppm)	Th (ppm)	Th/U	Pb* (ppm)	$^{204}Pb/^{206}Pb$	±	f_{206} %	Total $^{238}U/^{206}Pb$	±	Total $^{207}Pb/^{206}Pb$	±	Radiogenic ratios $^{206}Pb/^{238}U$	±	Ages (in Ma) $^{206}Pb/^{238}U$	±
Sample 03OK80a - *disrupted, boudinaged, and foliated biotite granodiorite layering in diatexite (Location: N48º36.20', W119º25.06')*															
1.1	521	13,813	26.5	3.6	0.000998	0.000496	0.63	123.0	2.1	0.0521	0.0016	0.0081	0.0001	51.9	0.9
1.2	788	21,100	26.8	5.4	0.001934	0.000555	0.28	125.3	2.0	0.0493	0.0013	0.0080	0.0001	51.1	0.8
2.1	768	19,634	25.6	5.3	0.000838	0.000453	0.65	124.9	2.1	0.0522	0.0018	0.0080	0.0001	51.1	0.9
2.2	634	25,888	40.8	4.5	0.000736	0.000563	0.13	121.6	2.0	0.0481	0.0015	0.0082	0.0001	52.7	0.9
3.1	675	24,668	36.6	4.8	0.001337	0.000552	0.28	120.6	2.0	0.0493	0.0015	0.0083	0.0001	53.1	0.9
4.1	541	22,115	40.9	3.8	0.002146	0.000861	0.69	122.0	2.1	0.0525	0.0022	0.0081	0.0001	52.3	0.9
5.1	578	24,533	42.4	4.2	0.002519	0.000733	0.80	117.5	2.0	0.0534	0.0016	0.0084	0.0001	54.2	0.9
6.1	1068	31,755	29.7	7.3	0.001386	0.000372	0.17	124.9	2.0	0.0483	0.0012	0.0080	0.0001	51.3	0.8
7.1	552	24,928	45.1	4.1	0.002444	0.000641	0.30	116.9	2.0	0.0495	0.0016	0.0085	0.0001	54.7	0.9
8.1	648	26,637	41.1	4.6	0.001742	0.000540	0.51	122.0	2.6	0.0511	0.0014	0.0082	0.0002	52.3	1.1
9.1	634	26,573	41.9	4.6	0.001590	0.000785	0.27	117.3	2.0	0.0492	0.0015	0.0085	0.0001	54.6	0.9
10.1	670	23,454	35.0	4.7	0.001502	0.000512	0.65	123.4	2.0	0.0522	0.0019	0.0081	0.0001	51.7	0.8
10.2	673	20,038	29.8	4.5	0.001284	0.000698	0.89	127.9	2.3	0.0540	0.0018	0.0078	0.0001	49.8	0.9
11.1	518	25,617	49.4	3.7	0.000696	0.000471	0.39	121.9	2.1	0.0501	0.0017	0.0082	0.0001	52.5	0.9
12.1	812	25,962	32.0	5.5	0.002013	0.000562	0.58	126.0	2.1	0.0516	0.0014	0.0079	0.0001	50.7	0.8
13.1	570	29,829	52.4	4.0	0.002113	0.000632	0.33	121.4	2.0	0.0497	0.0015	0.0082	0.0001	52.7	0.9
14.1	678	25,732	37.9	5.1	0.001646	0.000622	<0.01	113.6	1.8	0.0457	0.0013	0.0088	0.0001	56.6	0.9
15.1	574	16,098	28.0	4.0	0.001910	0.000671	0.31	123.1	2.0	0.0495	0.0014	0.0081	0.0001	52.0	0.9
16.1	500	19,330	38.7	3.7	0.001227	0.000486	1.05	117.5	2.0	0.0554	0.0016	0.0084	0.0001	54.1	0.9
17.1	517	21,769	42.1	3.9	0.001819	0.000597	<0.01	115.2	1.9	0.0441	0.0014	0.0087	0.0001	55.9	0.9
18.1	921	30,961	33.6	6.5	0.000244	0.000195	0.32	121.2	1.9	0.0496	0.0015	0.0082	0.0001	52.8	0.8
Sample 03OK80b - *wispy granodiorite diatexite (Location: N48º36.20', W119º25.06')*															
1.2	619	16,497	26.6	4.4	0.000262	0.000260	0.38	121.5	2.1	0.0501	0.0019	0.0082	0.0001	52.6	0.9
2.1	616	20,926	34.0	4.6	0.001806	0.000704	<0.01	115.4	1.9	0.0447	0.0015	0.0087	0.0001	55.8	0.9
3.1	758	23,611	31.1	5.3	0.001257	0.000522	0.62	123.0	2.0	0.0520	0.0019	0.0081	0.0001	51.9	0.9
4.1	657	24,237	36.9	4.7	0.002342	0.000729	0.19	120.2	2.0	0.0486	0.0015	0.0083	0.0001	53.3	0.9
5.1	609	17,955	29.5	4.4	0.002099	0.000623	0.20	118.8	2.0	0.0487	0.0015	0.0084	0.0001	53.9	0.9
6.1	851	17,410	20.5	5.8	0.001372	0.000483	0.35	126.8	2.1	0.0498	0.0013	0.0079	0.0001	50.5	0.8
7.1	737	18,975	25.7	5.3	0.001272	0.000493	0.33	120.5	2.0	0.0497	0.0014	0.0083	0.0001	53.1	0.9
8.1	618	23,116	37.4	4.4	0.002146	0.000760	0.30	120.6	2.0	0.0494	0.0015	0.0083	0.0001	53.1	0.9

8.2	454	14,715	32.4	3.2	0.002007	0.000859	1.10	121.8	2.2	0.0557	0.0019	0.0081	0.0001	52.1	0.9
9.1	754	15,306	20.3	5.1	0.002100	0.000641	0.65	126.9	2.1	0.0522	0.0015	0.0078	0.0001	50.3	0.8
10.1	573	19,037	33.2	4.1	0.000828	0.000796	0.59	121.4	2.5	0.0517	0.0017	0.0082	0.0002	52.6	1.1
11.1	683	24,288	35.5	4.9	0.002326	0.000634	0.42	119.8	2.0	0.0504	0.0015	0.0083	0.0001	53.4	0.9
12.1	833	20,535	24.7	5.9	0.001029	0.000522	0.68	121.8	2.0	0.0524	0.0014	0.0082	0.0001	52.3	0.9
13.1	446	20,469	45.9	3.4	0.000904	0.000453	<0.01	111.4	1.9	0.0422	0.0016	0.0090	0.0002	58.0	1.0
13.2	765	18,991	24.8	5.3	0.000316	0.000313	0.43	123.9	2.0	0.0505	0.0014	0.0080	0.0001	51.6	0.8
14.1	601	24,309	40.4	4.7	0.001766	0.000636	<0.01	110.5	1.9	0.0456	0.0015	0.0091	0.0002	58.2	1.0
15.1	1703	21,979	12.9	11.5	0.000970	0.000328	0.30	127.6	1.9	0.0494	0.0009	0.0078	0.0001	50.2	0.8
16.1	532	20,188	37.9	4.0	0.002363	0.000904	<0.01	113.8	1.9	0.0460	0.0016	0.0088	0.0002	56.5	1.0
17.1	724	19,619	27.1	5.1	0.001037	0.000473	<0.01	121.0	2.0	0.0470	0.0014	0.0083	0.0001	53.1	0.9
18.1	496	17,319	34.9	3.6	0.001712	0.000678	<0.01	118.5	2.0	0.0453	0.0016	0.0085	0.0001	54.3	0.9

Uncertainties given at the 1σ level.

Error in 44069 reference monazite calibration was 0.72% for the analytical session
(not included in above errors but required when comparing data from different mounts).

f_{206} % denotes the percentage of ^{206}Pb that is common Pb.

Correction for common Pb made using the measured ^{238}U/^{206}Pb and ^{207}Pb/^{206}Pb ratios
following Tera and Wasserburg (1972) as outlined in Williams (1998).

TABLE DR3. Summary of SHRIMP U-Pb titanite results for migmatitic rocks at Stowe Mountain

Grain Spot	U (ppm)	Th (ppm)	Th/U	Pb* (ppm)	$^{204}Pb/^{206}Pb$	±	f_{206} %	Total $^{238}U/^{206}Pb$	±	Total $^{207}Pb/^{206}Pb$	±	Radiogenic ratios $^{206}Pb/^{238}U$	±	Ages (in Ma) $^{206}Pb/^{238}U$	±
Sample 04OK300b - *folded, foliated granitic leucosome in metatexite (Location: N48º36.11', W119º25.06')*															
1.2	221	43	0.20	1.5	0.006205	0.000906	9.94	125.41	2.00	0.1256	0.0028	0.0072	0.0002	46.1	1.0
2.1	554	111	0.20	3.6	0.002242	0.000408	4.15	132.37	1.60	0.0798	0.0015	0.0072	0.0001	46.5	0.6
3.1	513	48	0.09	3.4	0.001798	0.000313	4.58	129.93	1.77	0.0832	0.0015	0.0073	0.0001	47.2	0.7
3.2	225	19	0.08	1.6	0.006485	0.001052	11.06	118.86	1.63	0.1345	0.0029	0.0075	0.0002	48.1	1.0
4.1	401	89	0.22	2.7	0.002510	0.000530	5.77	126.69	1.58	0.0926	0.0030	0.0074	0.0001	47.8	0.7
5.1	469	106	0.22	3.1	0.002498	0.000422	5.74	129.69	1.94	0.0924	0.0017	0.0073	0.0001	46.7	0.8
6.1	257	27	0.10	1.8	0.004265	0.000755	8.99	125.12	1.66	0.1181	0.0026	0.0073	0.0001	46.7	0.9
7.1	211	32	0.15	1.6	0.007186	0.001003	12.94	115.32	1.60	0.1495	0.0031	0.0075	0.0002	48.5	1.1
7.2	134	20	0.15	1.0	0.010014	0.001548	17.70	110.93	1.76	0.1871	0.0066	0.0074	0.0002	47.7	1.6
8.1	347	50	0.14	2.4	0.002697	0.000588	6.33	125.96	1.59	0.0971	0.0020	0.0074	0.0001	47.8	0.7
9.1	400	99	0.25	2.7	0.003325	0.000526	5.38	128.65	1.58	0.0896	0.0018	0.0074	0.0001	47.2	0.7
9.2	62	3	0.04	0.6	0.018986	0.003264	29.24	93.88	1.90	0.2785	0.0080	0.0075	0.0004	48.4	2.8
10.1	521	66	0.13	3.5	0.002526	0.000385	4.07	128.49	1.51	0.0792	0.0015	0.0075	0.0001	48.0	0.6
11.1	304	30	0.10	2.1	0.003991	0.000715	8.32	125.12	2.14	0.1129	0.0023	0.0073	0.0002	47.1	1.0
12.1	263	27	0.10	1.8	0.005737	0.000856	8.58	125.89	1.68	0.1149	0.0025	0.0073	0.0001	46.6	0.8
13.1	286	88	0.31	1.9	0.004016	0.000711	8.28	127.33	1.67	0.1125	0.0024	0.0072	0.0001	46.3	0.8
14.1	274	43	0.16	1.9	0.004571	0.000742	8.03	126.54	1.67	0.1105	0.0024	0.0073	0.0001	46.7	0.8
15.1	389	85	0.22	2.6	0.002719	0.000514	5.99	129.90	1.61	0.0943	0.0019	0.0072	0.0001	46.5	0.7

Uncertainties given at the 1σ level.

Error in BLR-1 reference sphene calibration was 0.55% for the analytical session (not included in above errors but required when comparing data from different mounts).

f_{206} % denotes the percentage of ^{206}Pb that is common Pb.

Correction for common Pb made using the measured $^{238}U/^{206}Pb$ and $^{207}Pb/^{206}Pb$ ratios following Tera and Wasserburg (1972) as outlined in Williams (1998).

TABLE DR4. Ar-Ar isotopic data

Temp. (°C)	^{36}Ar (mol)	^{37}Ar (mol)	^{38}Ar (mol)	^{39}Ar (mol)	^{40}Ar (mol)	$^{40}Ar^*$ %	$^{40}Ar^*/^{39}Ar_K$	Cumulative ^{39}Ar (%)	Calculated age (Ma)	Error in age (± 1σ)	Cl / K
Sample 04OK304 - *biotite, J=0.00218603 (Location: N48º36.30', W119º25.87')*											
600	3.88E-15	6.59E-16	4.88E-15	2.85E-14	1.27E-12	9.5	4.213	13.72	16.5	1.0	3.82E-03
630	1.98E-15	3.71E-16	3.56E-15	2.21E-14	7.18E-13	18.4	5.985	24.36	23.5	0.9	3.67E-03
660	1.43E-15	3.17E-16	3.12E-15	1.97E-14	5.66E-13	25.5	7.299	33.86	28.6	0.7	3.67E-03
690	9.55E-16	3.02E-16	2.83E-15	1.80E-14	4.38E-13	35.5	8.646	42.51	33.8	0.5	4.09E-03
720	6.63E-16	3.11E-16	2.46E-15	1.61E-14	3.45E-13	43	9.217	50.25	36.0	0.6	3.81E-03
750	4.63E-16	2.99E-16	1.98E-15	1.31E-14	2.66E-13	48.4	9.788	56.57	38.2	0.4	3.68E-03
790	4.54E-16	4.23E-16	1.76E-15	1.14E-14	2.38E-13	43.6	9.096	62.06	35.5	0.6	3.97E-03
830	3.88E-16	4.69E-16	1.18E-15	7.54E-15	1.81E-13	36.8	8.844	65.69	34.5	1.0	3.90E-03
860	4.46E-16	3.50E-16	1.06E-15	6.66E-15	1.81E-13	27	7.329	68.89	28.7	1.2	3.90E-03
900	6.44E-16	4.70E-16	1.48E-15	9.43E-15	2.56E-13	25.7	6.974	73.43	27.3	0.9	3.64E-03
940	7.02E-16	5.86E-16	1.75E-15	1.11E-14	2.88E-13	27.9	7.228	78.78	28.3	0.7	3.86E-03
980	8.99E-16	7.07E-16	2.25E-15	1.43E-14	3.66E-13	27.3	6.978	85.65	27.3	0.6	3.87E-03
1020	1.07E-15	1.22E-15	2.49E-15	1.54E-14	4.18E-13	24	6.505	93.08	25.5	0.6	4.12E-03
1060	7.30E-16	9.62E-16	1.62E-15	1.02E-14	2.78E-13	22.3	6.052	98	23.7	1.0	3.78E-03
1120	3.66E-16	5.71E-16	6.49E-16	4.16E-15	1.40E-13	22.6	7.571	100	29.6	1.2	3.04E-03
Total	1.51E-14	8.02E-15	3.31E-14	2.08E-13	5.94E-12		7.158		28.0	0.8	
Sample 04OK305 - *biotite, J=0.0021822 (Location: N48º36.31', W119º25.92')*											
570	1.24E-15	1.16E-16	1.45E-15	8.54E-15	4.24E-13	13.5	6.717	3.04	26.3	1.5	3.45E-03
600	1.02E-15	3.35E-17	1.46E-15	8.71E-15	3.79E-13	20.4	8.877	6.13	34.6	1.3	3.87E-03
640	1.18E-15	9.40E-17	2.75E-15	1.76E-14	5.31E-13	34.3	10.332	12.4	40.2	1.7	3.57E-03
680	7.65E-16	1.31E-16	4.32E-15	2.88E-14	5.54E-13	59.1	11.384	22.63	44.3	0.6	3.77E-03
720	4.51E-16	2.22E-16	7.39E-15	5.05E-14	7.37E-13	81.7	11.927	40.59	46.4	0.2	3.71E-03
760	2.44E-16	2.51E-16	9.30E-15	6.39E-14	8.49E-13	91.3	12.14	63.31	47.2	0.1	3.72E-03
800	1.55E-16	2.84E-16	6.52E-15	4.49E-14	5.99E-13	92.1	12.297	79.28	47.8	0.2	3.69E-03
830	1.37E-16	2.73E-16	2.17E-15	1.49E-14	2.24E-13	81.7	12.273	84.57	47.7	0.3	3.64E-03
870	1.64E-16	2.35E-16	1.06E-15	7.23E-15	1.33E-13	63.5	11.719	87.14	45.6	0.7	3.47E-03
910	2.13E-16	2.42E-16	8.93E-16	6.07E-15	1.28E-13	50.6	10.641	89.3	41.4	1.9	3.18E-03
950	2.37E-16	2.50E-16	1.12E-15	7.48E-15	1.52E-13	53.9	10.939	91.96	42.6	0.7	3.61E-03
1000	2.47E-16	5.65E-16	1.60E-15	1.07E-14	1.91E-13	61.7	10.99	95.77	42.8	0.9	3.75E-03
1050	2.17E-16	8.33E-15	1.20E-15	7.88E-15	1.47E-13	56.8	10.565	98.57	41.1	0.5	3.98E-03
1120	1.45E-16	4.75E-15	6.01E-16	4.02E-15	8.88E-14	52.4	11.584	100	45.0	1.3	3.50E-03
Total	6.41E-15	1.58E-14	4.18E-14	2.81E-13	5.14E-12		11.506		44.7	0.5	

Sample 04OK307b - *biotite, J=0.0021863 (Location: N48º36.75', W119º26.48')*

570	7.52E-16	2.21E-17	8.78E-16	5.40E-15	2.82E-13	21.3	11.112	2.67	43.3	2.0	2.68E-03
600	4.24E-16	3.32E-18	1.20E-15	7.90E-15	2.18E-13	42.4	11.716	6.57	45.6	1.0	3.33E-03
620	2.18E-16	2.07E-17	1.55E-15	1.06E-14	1.92E-13	66.4	11.988	11.83	46.7	0.7	3.30E-03
650	1.16E-16	4.43E-18	2.60E-15	1.82E-14	2.58E-13	86.5	12.23	20.83	47.6	0.2	3.27E-03
680	5.69E-17	3.37E-17	4.56E-15	3.21E-14	4.13E-13	95.7	12.3	36.7	47.9	0.2	3.34E-03
720	2.89E-17	5.80E-17	8.21E-15	5.86E-14	7.31E-13	98.6	12.301	65.67	47.9	0.2	3.10E-03
760	2.93E-17	3.86E-17	6.54E-15	4.66E-14	5.84E-13	98.3	12.312	88.71	47.9	0.2	3.12E-03
800	3.83E-17	1.21E-17	1.71E-15	1.23E-14	1.63E-13	92.8	12.303	94.78	47.9	0.3	2.96E-03
830	2.93E-17	1.53E-17	3.95E-16	2.87E-15	4.66E-14	81.3	13.186	96.2	51.3	0.9	2.58E-03
870	3.31E-17	9.42E-18	2.63E-16	1.89E-15	3.47E-14	71.7	13.195	97.13	51.3	1.5	2.62E-03
910	3.04E-17	8.35E-18	2.31E-16	1.60E-15	2.98E-14	69.7	12.954	97.92	50.4	1.5	3.17E-03
960	2.99E-17	2.43E-17	2.64E-16	1.78E-15	3.20E-14	72.2	12.99	98.8	50.5	1.5	3.82E-03
1010	2.99E-17	4.58E-19	2.62E-16	1.80E-15	3.14E-14	71.7	12.5	99.69	48.6	1.3	3.38E-03
1060	3.10E-17	4.06E-17	8.39E-17	6.29E-16	1.74E-14	47.3	13.109	100	51.0	3.5	1.15E-03
Total	1.85E-15	2.91E-16	2.87E-14	2.02E-13	3.03E-12		12.262		47.7	0.4	

Sample 04OK311 - *biotite, J=0.0021802 (Location: N48º37.04', W119º27.04')*

540	1.09E-15	4.17E-17	6.89E-16	3.27E-15	3.38E-13	4.5	4.606	1.51	18.0	3.8	4.11E-03
570	6.76E-16	5.44E-17	7.10E-16	4.14E-15	2.20E-13	9.2	4.896	3.43	19.2	2.0	3.22E-03
600	8.85E-16	9.76E-17	1.14E-15	6.67E-15	3.03E-13	13.7	6.238	6.52	24.4	1.6	3.92E-03
620	9.43E-16	1.15E-16	1.35E-15	8.03E-15	3.43E-13	18.6	7.921	10.24	30.9	2.5	3.79E-03
650	1.13E-15	1.42E-16	2.07E-15	1.29E-14	4.45E-13	24.7	8.527	16.19	33.2	1.1	3.66E-03
680	8.43E-16	2.92E-16	2.51E-15	1.68E-14	4.09E-13	39	9.464	23.98	36.9	1.4	3.06E-03
710	5.11E-16	1.55E-16	3.13E-15	2.11E-14	3.76E-13	59.7	10.621	33.75	41.3	0.4	3.61E-03
740	3.16E-16	1.66E-16	3.47E-15	2.39E-14	3.65E-13	74.3	11.363	44.81	44.2	0.3	3.49E-03
770	2.42E-16	1.17E-16	3.56E-15	2.42E-14	3.51E-13	79.4	11.512	56.01	44.7	0.3	3.75E-03
800	1.55E-16	9.71E-17	2.34E-15	1.62E-14	2.36E-13	80.4	11.696	63.51	45.4	0.4	3.42E-03
830	1.26E-16	8.45E-17	1.39E-15	9.62E-15	1.52E-13	75.2	11.837	67.96	46.0	0.4	3.40E-03
870	2.32E-16	1.10E-16	1.46E-15	9.83E-15	1.70E-13	59.5	10.26	72.51	39.9	0.5	3.66E-03
920	3.89E-16	1.73E-16	1.88E-15	1.26E-14	2.29E-13	49.6	9.03	78.32	35.2	0.7	3.58E-03
980	5.29E-16	2.47E-16	3.11E-15	2.09E-14	3.61E-13	56.5	9.754	87.98	38.0	0.4	3.63E-03
1050	4.98E-16	1.90E-16	2.46E-15	1.64E-14	2.98E-13	50.5	9.195	95.56	35.8	0.5	3.69E-03
1120	2.75E-16	9.12E-17	1.40E-15	9.60E-15	1.75E-13	53.5	9.772	100	38.0	0.5	3.17E-03
Total	8.85E-15	2.17E-15	3.27E-14	2.16E-13	4.77E-12		9.948		38.7	0.7	

Sample 04OK315 - *biotite, J=0.0021820 (Location: N48º37.35', W119º27.49')*

570	1.21E-15	6.23E-17	1.91E-15	1.21E-14	4.17E-13	13.8	4.742	5.64	18.6	1.3	2.94E-03
600	7.46E-16	1.98E-17	1.64E-15	1.05E-14	2.94E-13	24.9	6.983	10.52	27.3	1.1	3.47E-03
620	9.13E-16	2.05E-17	1.85E-15	1.22E-14	3.59E-13	24.8	7.258	16.22	28.4	0.9	2.81E-03
650	1.20E-15	6.29E-17	2.52E-15	1.62E-14	4.92E-13	28.1	8.55	23.75	33.4	0.7	3.37E-03
680	9.57E-16	5.24E-17	2.67E-15	1.75E-14	4.50E-13	37	9.508	31.91	37.1	0.6	3.39E-03
710	6.21E-16	9.65E-17	2.73E-15	1.86E-14	3.73E-13	50.6	10.155	40.56	39.5	0.6	3.23E-03
740	3.85E-16	9.04E-17	2.63E-15	1.82E-14	3.12E-13	63.3	10.866	49.02	42.3	0.3	3.23E-03
770	2.62E-16	9.09E-17	2.16E-15	1.49E-14	2.40E-13	67.5	10.834	55.97	42.2	0.3	3.29E-03
800	2.00E-16	7.12E-17	1.56E-15	1.08E-14	1.75E-13	66.1	10.721	61.01	41.7	0.4	3.26E-03
830	1.82E-16	5.64E-17	1.21E-15	8.29E-15	1.38E-13	60.8	10.13	64.86	39.4	0.6	3.35E-03
870	2.21E-16	5.28E-17	1.16E-15	7.98E-15	1.41E-13	53.5	9.443	68.58	36.8	0.6	3.19E-03
920	3.33E-16	8.29E-17	1.73E-15	1.17E-14	2.07E-13	52.3	9.214	74.05	35.9	0.5	3.39E-03
980	5.00E-16	1.49E-16	2.84E-15	1.95E-14	3.30E-13	55.1	9.312	83.13	36.3	0.4	3.20E-03
1050	8.22E-16	5.75E-16	3.35E-15	2.29E-14	4.21E-13	42.2	7.767	93.77	30.3	0.5	3.09E-03
1120	5.72E-16	1.52E-16	2.00E-15	1.34E-14	2.76E-13	38.6	7.954	100	31.0	0.5	3.30E-03
Total	9.12E-15	1.63E-15	3.20E-14	2.15E-13	4.62E-12		8.945		34.9	0.6	

Sample 04OK338 - *biotite, J=0.0021914 (Location: N48º38.19', W119º27.84')*

570	2.49E-16	9.67E-16	3.00E-16	1.85E-15	9.44E-14	22.1	11.278	2.87	44.0	2.8	2.75E-03
600	1.10E-16	6.64E-16	2.94E-16	1.94E-15	5.70E-14	43.1	12.671	5.89	49.4	2.4	3.22E-03
640	8.12E-17	8.43E-16	6.32E-16	4.39E-15	7.88E-14	69.5	12.497	12.71	48.7	0.6	3.20E-03
680	4.64E-17	1.10E-15	1.21E-15	8.59E-15	1.21E-13	88.6	12.497	26.07	48.7	0.5	3.09E-03
720	2.82E-17	1.25E-15	1.76E-15	1.21E-14	1.57E-13	94.6	12.256	44.88	47.8	0.2	3.71E-03
760	1.71E-17	1.11E-15	1.33E-15	9.36E-15	1.20E-13	95.7	12.229	59.43	47.7	0.3	3.38E-03
800	9.97E-18	1.09E-15	6.50E-16	4.69E-15	6.17E-14	95.2	12.534	66.71	48.9	0.6	2.92E-03
830	1.71E-17	1.05E-15	3.04E-16	2.16E-15	3.02E-14	83.4	11.674	70.07	45.6	1.3	3.04E-03
870	1.80E-17	1.27E-15	2.96E-16	2.07E-15	2.97E-14	82.4	11.852	73.28	46.3	1.2	3.35E-03
910	2.66E-17	1.13E-15	3.65E-16	2.53E-15	3.79E-14	79.4	11.937	77.21	46.6	1.4	3.45E-03
960	3.33E-17	1.46E-15	6.07E-16	4.22E-15	6.30E-14	84.5	12.608	83.77	49.2	0.8	3.43E-03
1010	4.10E-17	3.47E-15	7.68E-16	5.28E-15	7.72E-14	84.6	12.372	91.98	48.3	0.4	3.62E-03
1060	5.41E-17	3.54E-15	5.17E-16	3.63E-15	5.89E-14	73.3	11.917	97.61	46.5	1.0	3.12E-03
1120	5.84E-17	6.25E-15	2.23E-16	1.54E-15	3.58E-14	53.5	12.472	100	48.7	2.9	2.84E-03
Total	7.90E-16	2.52E-14	9.25E-15	6.43E-14	1.02E-12		12.279		47.9	0.7	

* Radiogenic.

ANALYTICAL METHODS

U-Pb methods

Zircon, monazite, and titanite grains were separated from bulk rock samples using conventional crushing, washing, heavy liquid (Sp. Gr. 2.96 and 3.3), and paramagnetic techniques. The zircon, monazite, and titanite-rich heavy mineral concentrates were hand picked under stereomicroscope, grains were poured onto double-sided tape, mounted in epoxy together with chips of the reference standard (zircon: Temora; monazite: 44069; titanite BLR-1), and polished half way through the grains. Reflected and transmitted light photomicrographs were prepared for all zircon, monazite, and titanite grains. Cathodoluminescence (CL) Scanning Electron Microscope (SEM) images were prepared for all zircon grains; back scattered SEM (BSE) images were prepared for the monazite and titanite grains. These CL and BSE images were used to decipher the internal structures and zoning domains of the sectioned grains and to ensure that the ~20µm sensitive high-resolution ion microprobe (SHRIMP) spot was wholly within a single age component within the sectioned grains.

The U-Th-Pb isotopic analyses were made using the SHRIMP II at the Research School of Earth Sciences, The Australian National University, Canberra, Australia, following procedures given in Williams (1998, and references therein). Each analysis consisted of 6 scans through the mass range, with a U-Pb reference grain analyzed for every three unknown analyses. For the monazite analyses, 50% energy filtering was employed to eliminate background noise, specifically in the mass range of the Pb isotopes. The data have been reduced using the SQUID Excel Macro of Ludwig (2001).

For the zircon analyses, the U/Pb ratios have been normalized relative to a value of 0.0668 for the Temora reference zircon, equivalent to an age of 417 Ma (Black et al., 2003).

Uncertainties in the U-Pb calibration were 0.46% and 0.56% respectively for two analytical sessions. The U-Pb ratios for the monazite have been calibrated relative to monazite 44069 (424 Ma, Aleinikoff, pers comm.), whilst those for the titanite are relative to titanite BLR-1 (1051 Ma, Aleinikoff et al., 2007). Uncertainties in the U-Pb calibrations were 0.72% for the monazite SHRIMP session and 0.55% for titanite SHRIMP session.

Uncertainties given for individual analyses (ratios and ages) are at the one sigma level (Tables DR1, DR2, and DR3). Tera and Wasserburg (1972) concordia plots, probability density plots with stacked histograms and weighted mean $^{206}Pb/^{238}U$ age calculations were carried out using ISOPLOT/EX (Ludwig, 2003). The "Mixture Modelling" algorithm of Sambridge and Compston (1994), via ISOPLOT/EX, was used to un-mix statistical age populations or groupings; from these groups weighted mean $^{206}Pb/^{238}U$ ages were calculated and the uncertainties are reported as 95% confidence limits.

$^{40}Ar/^{39}Ar$ method

Biotite grains for $^{40}Ar/^{39}Ar$ isotopic analysis were concentrated from rock samples using standard crushing and density settling techniques, followed by magnetic splitting, and hand picking under a stereomicroscope for purification. Biotite grains and the fluence monitor GA 1550 biotite (98.5 Ma, Spell and McDougall, 2003) were weighed, packed in Al foil and stacked in a quartz tube for irradiation. We utilized synthetic K-glass to monitor production ratios associated with interfering reactions and cadmium shielding to limit thermal neutrons. Irradiation was conducted at the HIFAR reactor, Lucas Heights, Australia, thanks to the Australian Science and Technology Organization and the Australian Institute of Nuclear Science and Engineering.

The step-heating procedure of $^{40}Ar/^{39}Ar$ isotopic analysis was performed in the thermochronology lab at the Research School of Earth Sciences, The Australian National University, Canberra, Australia. The step-heating schedule was varied to produce even gas release and the results are given in Table DR4 along with the corresponding analytical data. During the course of the step-heating experiments, temperatures of extraction were monitored by a thermocouple inserted into the base of a tantalum crucible. Temperatures were maintained through feedback to a furnace controller. Based on the signal from the thermocouple, the precision of the temperature reading is expected to be ±1 °C; however, the absolute temperature experienced by the samples may vary significantly (±30 °C) from the values quoted due to the use of a loosely fitted molybdenum liner inside the crucible.

Analysis of sample gas and treatment of the data are similar to that described by Dunlap and Wysoczanski (2002). Active gases were removed by two Zr-Al getters operating at ~700 °C and ~20 °C, respectively. Following concentration of argon and removal of reactive gases, all five isotopes of Ar were measured using a VG1200 mass spectrometer. Ion-beam measurement was through an electron multiplier, and a vibrating reed electrometer with a $1x10^{11}$ Ohm resistor was used to measure the signal. The sensitivity of measurement on ^{40}Ar was about 8×10^{-17} mol/mV.

Correction factors for Ar produced in the reactor from K and Ca were determined using the K-glass. Correction factors are as follows: $(36/37)_{Ca}=3.5x10^{-4}$, $(39/37)_{Ca}=7.86x10^{-4}$, $(40/39)_K=0.027 \pm 0.002$ (one sigma). J factors for sample aliquots were determined by curve fitting of the fluence monitor data for the linearly stacked sample array. Decay constants and abundance of ^{40}K were used as recommended by the IUGS Subcommission on Geochronology (Steiger and Jäger, 1977).

Ca/K ratios are not reported due to weak signal of ^{37}Ar resulting from low concentrations of Ca in the biotite.

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