TABLE 1. REPRESENTATIVE MINERAL ANALYSES IN OXIDE WT%

Sample	DC 8-2-6	DC 8-2-6	CNH-1	CNH-1	Kil-1	Kil-1		DC 8-2-6	Kil-1	DC 4-8-3	DP-9		CNH-1	CNH-1	DC 4-8-3	DP-9	DP-9
Position	amp 6	amp 7	amp 1	amp 10	amp 1	amp 8		fsp 4	fsp 5	fsp 9	fsp		grt 1	grt 11	grt 1	grt 2-1	grt 2-2
SiO_2	43.55	44.17	44.72	44.74	45.66	45.91		66.88	68.36	68.44	69.08		37.80	38.13	37.12	37.54	37.78
TiO_2	0.77	0.75	1.67	1.62	0.99	0.89		20.61	20.16	0.00	19.69		0.03	0.06	0.03	0.05	0.05
Al_2O_3	13.02	12.37	11.78	11.99	11.52	11.59		0.00	0.00	19.45	0.00		21.35	21.56	20.63	20.83	20.77
Cr_2O_3	0.04	0.02	0.00	0.00	0.02	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.02	0.00
FeO*	17.34	17.38	12.85	12.75	16.77	16.63		0.33	0.10	0.00	0.14		25.01	25.82	32.12	28.42	27.36
MgO	9.76	9.29	12.14	12.08	10.15	10.07		0.00	0.00	0.00	0.00		5.48	5.21	2.70	3.55	3.41
MnO	0.16	0.20	0.06	0.02	0.27	0.26		0.00	0.00	0.00	0.00		0.61	0.53	1.37	5.18	4.84
CaO	11.21	11.30	11.17	11.21	11.60	11.38		0.98	0.92	0.04	0.12		9.02	8.76	5.82	4.05	5.43
Na_2O	2.83	2.59	1.98	1.74	1.73	1.85		10.64	11.36	11.64	12.02		0.00	0.00	0.00	0.00	0.00
K_2O	0.29	0.25	0.92	0.89	0.12	0.11		0.76	0.08	0.06	0.09		0.01	0.00	0.00	0.00	0.00
Total	98.96	98.32	97.29	97.04	98.82	98.69		100.22	101.00	0.00	101.15		99.31	100.07	99.79	99.64	99.64
Si	6.444	6.568	6.587	6.593	6.700	6.733		2.935	2.964	2.998	2.989		2.972	2.978	2.989	3.008	3.018
Al	2.270	2.167	2.045	2.082	1.992	2.002		1.066	1.030	1.004	1.004		1.978	1.985	1.957	1.966	1.955
Ti	0.085	0.084	0.185	0.179	0.109	0.098		0.000	0.000	0.000	0.000		0.002	0.004	0.002	0.003	0.003
Cr	0.004	0.002	0.000	0.000	0.002	0.000		0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.001	0.000
Fe^{2+}	2.146	2.161	1.583	1.571	2.058	2.040		0.012	0.004	0.000	0.005		1.644	1.686	2.163	1.904	1.828
Mg	2.154	2.059	2.666	2.655	2.219	2.202		0.000	0.000	0.000	0.000		0.642	0.607	0.324	0.424	0.406
Mn	0.020	0.025	0.007	0.003	0.033	0.032		0.000	0.000	0.000	0.000		0.041	0.035	0.094	0.352	0.327
Ca	1.777	1.801	1.763	1.771	1.824	1.787		0.046	0.043	0.002	0.006		0.760	0.733	0.502	0.348	0.465
Na	0.811	0.747	0.565	0.498	0.493	0.526		0.905	0.955	0.989	1.008		0.000	0.000	0.000	0.000	0.000
K	0.056	0.047	0.172	0.167	0.022	0.021		0.043	0.005	0.003	0.005		0.001	0.000	0.000	0.000	0.000
$X_{Fe^{2+}}$	0.499	0.512	0.373	0.372	0.481	0.481		–	–		–		0.719	0.735	0.870	0.818	0.818
Type	Pargasite	Edenite	Magnesio-hornblende	Magnesio-hornblende	Magnesio-hornblende	Magnesio-hornblende	X_{ab}	0.911	0.953	0.995	0.990	X_{alm}	0.533	0.551	0.702	0.629	0.604
							X_{an}	0.047	0.043	0.003	0.005	X_{prp}	0.208	0.198	0.105	0.115	0.154
							X_{Kfs}	0.043	0.005	0.000	0.005	X_{sps}	0.013	0.011	0.030	0.140	0.134
												X_{grs}	0.246	0.239	0.163	0.116	0.108

*Total Fe as FeO.

†All iron is assumed to be Fe^{3+} for an epidote analysis. Structural formulae were normalized to 23 oxygens for amphibole (amp), 14 oxygens for chlorite (chl), 12.5 oxygens for epidote (ep), 12 oxygens for garnet (grt), 11 oxygens for muscovite (ms), and 8 for feldspar (fsp).

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TABLE 1. REPRESENTATIVE MINERAL ANALYSES IN OXIDE WT% (continued)

Sample	DC 8-1-24	Arran 116	DC 4-8-3	DP-9	DC 4-8-3	DP-9	DP-9
Position	ms 2-2	ms 2	ms 3	ms	chl 6	chl	ep
SiO_2	47.12	51.40	45.83	49.93	27.54	28.30	39.16
TiO_2	0.92	0.00	1.59	0.22	0.10	0.03	0.03
Al_2O_3	29.82	25.01	31.65	26.76	18.84	16.66	23.24
Cr_2O_3	0.00	0.08	0.00	0.06	0.00	0.00	0.00
FeO*	5.31	2.01	1.92	4.53	25.26	26.31	11.90
MgO	1.26	6.00	1.67	3.38	13.09	13.69	0.00
MnO	0.04	0.04	0	0.05	0.48	0.50	0.12
CaO	0.02	0.03	0.00	0.09	0.17	0.09	23.69
Na_2O	0.30	0.05	0.35	0.15	0.00	0.03	0.00
K_2O	11.26	10.98	11.37	11.00	0.20	0.05	0.00
Total	96.05	95.60	94.38	96.18	85.69	85.67	98.13
Si	3.196	3.430	3.118	3.355	2.968	3.069	3.062
Al	2.384	1.967	0.081	2.119	0.008	2.130	2.142
Ti	0.047	0.000	2.538	0.011	2.393	0.002	0.002
Cr	0.000	0.004	0.000	0.003	0.000	0.000	0.000
Fe^{2+}	0.301	0.112	0.109	0.255	2.277	2.386	0.778†
Mg	0.127	0.597	0.169	0.339	2.103	2.213	0.000
Mn	0.002	0.002	0	0.003	0.044	0.046	0.008
Ca	0.001	0.002	0.000	0.006	0.020	0.010	1.985
Na	0.039	0.006	0.046	0.020	0.000	0.006	0.000
K	0.974	0.935	0.987	0.943	0.028	0.007	0.000
$X_{Fe^{2+}}$	0.700	0.160	0.393	0.430	0.231	0.520	–

TABLE 2. ION PROBE U-Th-Pb DATA

DC 8-2-6 [NS 0544 5845]													
Sample/ spot no.	[U] (ppm)	[Th] (ppm)	[Pb] (ppm)	Th/U meas	f_{206}%	$^{238}U/^{206}Pb$	±σ (%)	$^{207}Pb/^{206}Pb$	±σ (%)	$^{207}Pb/^{206}Pb$	±σ (Ma)	$^{238}U/^{206}Pb$	±σ (Ma)
1	79	1	7	0.016	0.29	12.3330	1.31	0.0556	2.04	437.6	44.8	502.6	6.4
2	53	1	4	0.023	0.94	12.5340	1.19	0.0533	4.18	342.5	91.9	494.8	5.7
3	28	0	2	0.012	2.94	12.6580	1.19	0.0516	7.90	268.4	171.7	490.2	5.6
4	18	0	1	0.007	4.6	12.3040	1.20	0.0536	11.64	354.9	243.5	503.7	5.8
5	19	0	1	0.007	1.7	12.1760	1.19	0.0508	7.29	230.1	160.2	508.8	5.8
6*	12	0	1	0.006	{0.72}	13.3320	1.24	0.0612	4.62	647.0	96.3	466.3	5.6
DC 8-2-8 [NS 0544 5852]													
Sample/ spot no.	[U] (ppm)	[Th] (ppm)	[Pb] (ppm)	Th/U meas	f_{206}%	$^{238}U/^{206}Pb$	±σ (%)	$^{207}Pb/^{206}Pb$	±σ (%)	$^{207}Pb/^{206}Pb$	±σ (Ma)	$^{238}U/^{206}Pb$	±σ (Ma)
1	119	6	11	0.05	{0.00}	11.9787	1.68	0.0547	3.73	398.1	81.5	516.9	8.3
2	229	18	19	0.08	{0.00}	12.7602	1.71	0.0592	2.87	575.0	61.2	486.4	8.0
3	237	10	20	0.04	0.73	12.5349	1.61	0.0549	4.36	408.8	94.6	494.8	7.7
4	28	1	3	0.03	{0.00}	12.3590	1.76	0.0652	7.13	781.5	143.1	501.6	8.5
9	194	12	16	0.06	0.16	12.8487	1.61	0.0553	2.26	422.5	49.7	483.2	7.5
10	344	11	29	0.03	{0.05}	12.8750	1.59	0.0573	1.46	502.5	31.8	482.2	7.4
11	115	2	10	0.01	{0.18}	12.7612	1.59	0.0592	2.54	575.3	54.2	486.3	7.4
12*	259	15	21	0.06	{0.06}	13.2050	1.60	0.0591	1.64	570.8	35.2	470.6	7.3
13	1240	31	105	0.02	0.09	12.6224	1.59	0.0568	1.05	484.3	23.0	491.5	7.5
14*	866	496	108	0.57	2.4	9.2110	3.15	0.0911	4.48	1449.7	82.9	664.4	19.9
15	1035	8	88	0.01	{0.01}	12.4376	1.80	0.0562	0.80	461.2	17.7	498.5	8.6
16*	49	2	4	0.04	{0.21}	13.7486	1.80	0.0545	4.22	391.5	92.1	452.6	7.9
17	303	26	25	0.09	0.29	13.0678	1.69	0.0561	2.13	456.7	46.6	475.3	7.8
18	236	5	19	0.02	{0.09}	12.9435	1.59	0.0570	1.99	492.1	43.4	479.7	7.4
19	627	35	54	0.06	2.67	12.5677	1.63	0.0600	3.53	603.3	74.6	493.6	7.8
21	921	4	74	0.00	0.26	13.1571	1.66	0.0569	0.96	488.3	21.1	472.2	7.6
22*	107	7	10	0.07	{0.00}	11.8452	1.79	0.0617	2.69	662.3	56.6	522.5	9.0
23	391	116	37	0.30	{0.02}	12.3248	1.83	0.0582	1.20	538.3	26.0	502.9	8.9
24	242	12	20	0.05	{0.17}	12.8967	1.59	0.0580	2.20	528.7	47.5	481.4	7.4
25	62	6	6	0.09	{0.00}	12.2898	2.13	0.0590	4.60	566.7	97.1	504.3	10.3
26	128	8	11	0.06	{0.38}	12.6981	1.59	0.0592	3.06	574.4	65.1	488.7	7.5
27	357	71	29	0.20	9.94	12.8833	1.59	0.0590	9.51	567.9	194.5	481.9	7.4
28	383	12	37	0.03	10.31	12.6960	1.62	0.0467	13.37	35.9	292.4	488.7	7.6
29	790	16	66	0.02	0.59	12.6793	1.63	0.0574	2.08	506.0	45.2	489.4	7.7
30	3947	211	327	0.05	0.74	12.7901	1.59	0.0569	0.88	487.8	19.2	485.3	7.4
31	1499	49	124	0.03	0.36	12.7971	1.60	0.0578	1.34	521.3	29.2	485.0	7.5
32	24	2	2	0.07	{0.00}	12.3185	1.73	0.0612	6.63	646.4	136.3	503.2	8.4

Note: All errors are at the 1σ level. f_{206} % is the percentage of common ^{206}Pb, estimated from the measured ^{204}Pb. Figures are given in parentheses when no correction has been applied owing to insignificant levels of ^{204}Pb, based on statistical significance of ^{204}Pb counts assuming a yield of 15 cps/nA/ppm and 120 s total count time. Age calculations use the routines of Ludwig (2003) and follow the decay constant recommendations of Steiger and Jäger (1977). Sample numbers followed by an asterisk were not used in the concordia calculation.

TABLE 3. ^{40}Ar-^{39}Ar DATA

Power (Watts) proxy for *T*	Ca/K	$^{36}Ar/^{39}Ar$	$^{40}Ar/^{39}Ar$	Mol ^{39}Ar ($\times10^{-14}$)	% ^{39}Ar in step	Cumulative % ^{39}Ar	% rad. ^{40}Ar	Age (Ma)	± 1σ
DC 8-2-6 hornblende (NS 0544 5845), J = 0.01068 ± 0.00003									
1.9	8.386	0.1095	64.918	0.0174	2.2	2.2	66.9	950.19	5.08
2	4.322	0.0169	34.093	0.0224	2.9	5.1	87.6	560.17	3.10
•2.1	4.376	0.0068	28.859	0.0249	3.2	8.3	94.1	484.69	3.63
•2.2	11.251	0.0050	29.202	0.0538	6.9	15.2	96.5	489.74	4.19
•2.3	13.934	0.0043	29.324	0.1175	15	30.2	97.7	491.52	2.71
•2.4	13.964	0.0037	29.362	0.1385	17.7	48	98.2	492.08	2.52
2.5	13.682	0.0034	31.499	0.14	17.9	65.9	98.6	523.16	1.92
2.6	14.798	0.0034	31.898	0.0791	10.1	76	98.7	528.90	1.88
2.8	17.047	0.0036	31.054	0.1873	24	100	98.7	516.73	0.86
Integrated age								520.00	3.00
Plateau age					42.9			490.00	4.00
DC 8-2-8 muscovite (NS 0544 5852), J = 0.018375 ± 0.000012									
•*1.9*	0.011	0.0018	16.934	0.2799	30.3	30.3	97	488.75	0.75
•*2.0*	0.002	0.0005	16.908	0.3031	32.8	63	99.2	488.09	0.61
•2.1	0.026	–0.0002	16.923	0.0658	7.1	70.1	100.4	488.47	0.93
•2.1	0.027	0.0010	16.751	0.0286	3.1	73.2	98.3	484.12	1.89
•2.2	0.002	0.0004	16.857	0.0261	2.8	76.1	99.2	486.81	1.67
•2.3	0.003	0.0009	16.784	0.0203	2.2	78.3	98.3	484.96	2.12
•2.5	0.005	0.0003	16.895	0.0197	2.1	80.4	99.5	487.77	2.48
•2.9	0.073	0.0005	16.929	0.0704	7.6	88	99.1	488.62	1.03
•4.0	0.034	0.0000	16.853	0.111	12	100	100	486.71	0.76
Integrated age								488.00	1.10
Plateau age					100			487.80	0.90
Arran 116 muscovite (NR 9937 4934), J = 0.0183 ± 0.000012									
1.9	0.148	0.0007	11.818	0.0728	14.6	14.6	98.4	353.21	0.83
2	0.191	0.0002	15.352	0.0621	12.5	27.1	99.6	446.68	0.93
2.1	0.140	0.0000	15.934	0.0889	17.8	44.9	100	461.61	0.78
•2.2	0.426	0.0000	16.557	0.1238	24.8	69.7	100.1	477.46	0.69
•2.3	0.457	0.0001	16.470	0.0463	9.3	79	100	475.28	1.20
•2.5	1.885	0.0009	16.453	0.0675	13.5	92.6	98.8	474.83	0.96
•3.5	1.767	0.0015	16.447	0.0371	7.4	100	97.9	474.69	1.73
2.8	0.001	0.0000	16.242	0.0656	11.6	94	99.9	469.07	1.55
3.3	0.001	0.0000	16.228	0.0341	6	100	99.9	468.72	2.49
Integrated age								452.40	1.10
Plateau age					55.1			476.20	1.10
Kil-1 hornblende, (L84178121), J = 0.01069 ± 0.00003									
1.8	9.470	0.2451	82.639	0.0045	1	1	53.3	1142.13	25.07
1.9	6.134	0.0870	32.994	0.0035	0.8	1.8	56.4	545.02	28.19
2	5.675	0.0600	30.065	0.0047	1	2.8	63.2	502.77	22.43
2.2	13.746	0.0466	28.556	0.0162	3.6	6.5	68.3	480.62	6.34
2.4	40.854	0.0242	28.183	0.0371	8.3	14.8	83.4	475.10	3.52
•2.6	58.489	0.0221	30.840	0.0408	9.2	23.9	87.8	514.04	3.75
•2.8	61.211	0.0207	30.916	0.0408	9.2	33.1	89.2	515.15	3.10
•3.0	60.883	0.0181	31.028	0.0757	17	50.1	91.2	516.77	1.96
•3.2	61.233	0.0166	30.705	0.0285	6.4	56.5	92.4	512.10	3.43
•5.0	61.312	0.0159	30.785	0.1939	43.5	100	93	513.25	1.07
Integrated age								517.00	3.00
Plateau age					85.2			514.00	3.00
DC 8-1-24 muscovite (L83918127), J = 0.018314 ± 0.000012									
2	0.419	0.0155	13.310	0.0065	0.8	0.8	74.4	393.53	8.18
•2.2	0.006	0.0009	16.615	0.2669	32.9	33.7	98.6	479.26	1.76
•2.2	0.012	0.0003	16.758	0.0381	4.7	38.4	99.5	482.89	2.52
•2.2	0.005	0.0007	16.720	0.1433	17.7	56.1	98.8	481.92	0.95
•2.5	0.051	0.0005	16.620	0.0325	4	60.1	99.2	479.39	1.56
•2.7	0.007	0.0005	16.732	0.2906	35.9	96	99	482.22	0.86
•2.9	0.004	0.0002	16.867	0.0135	1.7	97.7	99.6	485.63	4.13
4	0.010	0.0000	17.229	0.019	2.3	100	99.9	494.76	2.77
Integrated age								480.80	1.60
Plateau age					96.9			481.60	1.70
AB-70 muscovite (L71219251), J = 0.01838 ± 0.000012									
•1.9	0.008	0.0004	15.882	0.1764	48	48	99.3	462.06	0.61
•2.0	0.056	0.0005	15.807	0.0176	4.8	52.8	99	460.14	2.46
•2.2	0.061	0.0003	15.830	0.0534	14.5	67.4	99.4	460.72	0.98
•2.4	0.201	0.0018	15.789	0.0245	6.7	74	96.7	459.66	1.76
•2.6	0.023	0.0016	15.940	0.0159	4.3	78.4	97.2	463.56	3.28
•2.9	0.194	0.0013	15.789	0.0169	4.6	83	97.6	459.69	2.45
•4.0	0.235	0.0011	15.898	0.0626	17	100	98.1	462.48	0.88
Integrated age								461.60	1.10
Plateau age					100			461.70	1.00
AB-69 muscovite (L71219251), J = 0.0183785 ± 0.000012									
1.6	0.049	0.0053	13.902	0.0386	1.8	1.8	90	410.45	1.25
1.7	0.006	0.0010	15.985	0.1849	8.7	10.5	98.1	464.63	0.64
1.8	0.007	0.0007	15.817	0.1066	5	15.5	98.6	460.34	0.58

•1.9	**0.032**	**0.0004**	**15.882**	**0.5689**	**26.8**	**42.3**	**99.3**	**461.99**	**0.49**
•2.1	**0.067**	**0.0003**	**15.880**	**0.2307**	**10.9**	**53.2**	**99.5**	**461.95**	**0.68**
•2.3	**0.008**	**0.0003**	**15.899**	**0.1889**	**8.9**	**62.1**	**99.4**	**462.43**	**0.53**
•2.6	**0.153**	**0.0002**	**15.887**	**0.1597**	**7.5**	**69.6**	**99.6**	**462.13**	**0.53**
•3.3	**0.050**	**0.0002**	**15.912**	**0.3417**	**16.1**	**85.7**	**99.6**	**462.76**	**0.59**
4	0.083	0.0003	15.900	0.3034	14.3	100	99.5	462.46	0.46
Integrated age								461.50	0.80
Plateau age					**70.2**			**462.20**	**0.70**
DC 27 fuchsite (L69679485), J = 0.0106 ± 0.000025									
1.9	0.001	0.0007	29.333	0.4345	37	37	99.3	488.44	2.92
•2.0	**0.004**	**0.0006**	**27.768**	**0.2435**	**20.7**	**57.7**	**99.4**	**465.46**	**3.89**
•2.1	**0.003**	**0.0003**	**27.639**	**0.2192**	**18.7**	**76.4**	**99.7**	**463.55**	**1.32**
•2.2	**0.002**	**0.0001**	**27.725**	**0.1353**	**11.5**	**87.9**	**99.9**	**464.81**	**1.58**
•2.3	**0.003**	**0.0002**	**27.646**	**0.0757**	**6.4**	**94.4**	**99.8**	**463.65**	**1.43**
•2.5	**0.001**	**0.0003**	**27.720**	**0.0663**	**5.6**	**100**	**99.7**	**464.74**	**1.13**
Integrated age								473.00	3.00
Plateau age					**63**			**464.00**	**2.00**
DC 73 fuchsite (L69679485), J = 0.01058 ± 0.00003									
1.8	1.603	0.0120	27.206	0.0101	1.6	1.6	88.7	456.38	4.16
•2.0	**0.006**	**0.0001**	**28.398**	**0.2783**	**43.8**	**45.4**	**99.9**	**473.95**	**0.83**
•2.1	**0.109**	**0.0008**	**28.594**	**0.0535**	**8.4**	**53.8**	**99.1**	**476.83**	**1.45**
•2.3	**0.044**	**0.0005**	**28.457**	**0.1171**	**18.4**	**72.3**	**99.5**	**474.81**	**1.15**
•2.5	**0.022**	**0.0001**	**28.633**	**0.1331**	**21**	**93.2**	**99.9**	**477.40**	**0.99**
•2.7	**0.065**	**0.0006**	**28.650**	**0.0234**	**3.7**	**96.9**	**99.4**	**477.64**	**2.05**
•3.0	**0.035**	**−0.0001**	**28.705**	**0.0198**	**3.1**	**100**	**100.1**	**478.45**	**2.27**
Integrated age								475.00	3.00
Plateau age					**98.4**			**476.00**	**3.00**
DC 106 muscovite (L69719485), J = 0.0183785 ± 0.000012									
1.6	0.006	0.0028	16.677	0.0666	4.4	4.4	95.2	482.32	0.79
•1.8	**0.006**	**0.0005**	**16.231**	**0.3331**	**22.1**	**26.5**	**99.2**	**470.96**	**0.54**
•1.9	**0.013**	**0.0006**	**16.313**	**0.4439**	**29.5**	**56**	**98.9**	**473.05**	**0.56**
•2.0	**0.002**	**0.0007**	**16.256**	**0.1985**	**13.2**	**69.1**	**98.8**	**471.62**	**0.59**
•2.2	**0.003**	**0.0007**	**16.263**	**0.2389**	**15.9**	**85**	**98.7**	**471.80**	**0.60**
•2.4	**0.118**	**0.0011**	**16.196**	**0.0728**	**4.8**	**89.8**	**98.1**	**470.06**	**0.96**
•2.6	**0.335**	**0.0003**	**16.295**	**0.0399**	**2.6**	**92.5**	**99.5**	**472.60**	**1.18**
•4.0	**0.082**	**0.0009**	**16.236**	**0.1134**	**7.5**	**100**	**98.4**	**471.08**	**0.78**
Integrated age								472.30	0.80
Plateau age					**95.6**			**471.70**	**0.70**
DC223 hornblende (F73650320), J = 0.01065 ± 0.00003									
1.9	1.438	0.0352	37.083	0.007	1.1	1.1	78.2	600.49	7.01
2.1	1.997	0.0178	24.776	0.0093	1.5	2.7	82.7	422.47	5.10
•2.3	**3.078**	**0.0036**	**27.562**	**0.078**	**12.8**	**15.4**	**96.7**	**464.33**	**1.16**
•2.4	**3.123**	**0.0026**	**27.709**	**0.0683**	**11.2**	**26.6**	**97.8**	**466.51**	**1.25**
•2.5	**2.202**	**0.0022**	**27.759**	**0.0579**	**9.5**	**36.1**	**98**	**467.26**	**1.67**
•2.6	**2.716**	**0.0019**	**27.809**	**0.0743**	**12.1**	**48.2**	**98.4**	**467.99**	**1.05**
•2.8	**1.739**	**0.0024**	**27.725**	**0.101**	**16.5**	**64.7**	**97.7**	**466.75**	**1.06**
•3.0	**2.289**	**0.0023**	**27.753**	**0.2158**	**35.3**	**100**	**98**	**467.16**	**0.81**
Integrated age								468.00	3.00
Plateau age					**97.3**			**467.00**	**2.00**
DC-223 biotite (F73650320), J = 0.018354 ± 0.000012									
1.9	0.009	0.0101	12.129	0.0082	2.9	2.9	80.2	362.60	4.78
2	0.123	0.0058	14.254	0.0174	6.2	9.1	89.3	419.26	2.31
•2.1	**0.181**	**0.0029**	**15.708**	**0.0413**	**14.7**	**23.9**	**94.9**	**457.03**	**1.64**
•2.2	**0.117**	**0.0028**	**15.806**	**0.0171**	**6.1**	**30**	**95.1**	**459.54**	**2.50**
•2.2	**0.080**	**0.0017**	**15.727**	**0.0173**	**6.2**	**36.2**	**97**	**457.51**	**2.44**
•2.3	**0.133**	**0.0013**	**15.836**	**0.0163**	**5.8**	**42**	**97.6**	**460.31**	**2.82**
•2.5	**0.005**	**0.0011**	**15.776**	**0.0394**	**14.1**	**56.1**	**98**	**458.78**	**1.23**
•2.7	**0.016**	**0.0006**	**15.772**	**0.0287**	**10.2**	**66.3**	**98.9**	**458.67**	**2.13**
•2.9	**0.001**	**0.0013**	**15.709**	**0.0272**	**9.7**	**76.1**	**97.7**	**457.04**	**1.75**
•3.3	**0.040**	**0.0015**	**15.768**	**0.067**	**23.9**	**100**	**97.2**	**458.56**	**0.94**
Integrated age								453.20	1.40
Plateau age					**90.9**			**458.30**	**1.40**

Note: British or Irish National Grid references are given in parentheses after the sample number. Steps used in calculation of plateau ages are in bold. Data are corrected for machine blank, correction factors, and $^{37}Ar/^{36}Ar$ postirradiation decay.

TABLE 4. LASER-ABLATION INDUCTIVELY COUPLED PLASMA–MASS SPECTROMETRY Lu-Hf ANALYSES OF ZIRCON IN SAMPLE DC 8-2-8 [NS 0544 5852]

Sample	$^{176}Lu/^{177}Hf$	±1SE (%)	$^{176}Hf/^{177}Hf$	±1SE (%)	Age	ε_{Hf} (t)	±1σ	t_{DM}
DC828-3	0.00002	3.8	0.282369	0.006	490	–3.50	1.2	1218
DC828-15	0.00058	5.0	0.282373	0.009	490	–3.51	1.9	1229
DC828-24	0.00001	4.4	0.282393	0.005	490	–2.62	1.0	1184
DC828-2	0.00019	5.1	0.282419	0.006	490	–1.76	1.4	1153
DC828-21	0.00195	2.0	0.282450	0.008	490	–1.25	1.8	1164
DC828-1	0.00011	8.3	0.282498	0.006	490	1.04	1.3	1043
DC828-26	0.00033	8.9	0.282511	0.008	490	1.45	1.7	1030
DC828-B	0.00013	7.4	0.282516	0.006	490	1.67	1.3	1019
DC828-8	0.00175	3.8	0.282533	0.007	490	1.76	1.5	1039
DC828-20	0.00124	5.5	0.282548	0.012	490	2.47	2.6	1003
DC828-29	0.00037	4.1	0.282569	0.007	490	3.49	1.6	951
DC828-4	0.00062	5.0	0.282584	0.009	490	3.93	1.9	937
DC828-32	0.00120	3.2	0.282598	0.009	490	4.25	1.9	931
DC828-A	0.00064	11.5	0.282600	0.008	490	4.50	1.6	915
DC828-16	0.00126	5.7	0.282647	0.007	490	5.97	1.6	863

Note: Quoted errors on isotopic ratios are percentage standard errors of the mean and one standard deviation (absolute) on ε_{Hf} values.

Table 5. Sm-Nd whole rock isotopic data

Sample	Type	Sm (ppm)	Nd (ppm)	$^{147}Sm/^{144}Nd$	$^{143}Nd/^{144}Nd$	$\pm 2\sigma$	T_{DM} (Ma)	$\varepsilon_{Nd(490Ma)}$
DC 8-1-24	mica schist	7.05	37.3	0.1142	0.511600	0.000004	2199	-15.1
DC 8-1-25	mica schist	6.40	30.6	0.1264	0.512030	0.000006	1752	-7.5
DC 8-1-26	metabasite	2.41	5.8	0.2495	0.513132	0.000007	-	6.3
DP-11	metabasite	2.01	5.0	0.2450	0.513091	0.000006	-	5.8
ACB-1	metabasite	7.74	34.1	0.1371	0.512748	0.000004	602	5.9
Arran 107	psammite	6.90	39.5	0.1057	0.511568	0.000005	2069	-15.2
Arran 117	psammite	3.48	20.6	0.1022	0.511576	0.000005	1993	-14.8
Arran 119	psammite	3.55	20.0	0.1075	0.511620	0.000004	2028	-14.3
Arran 120	psammite	2.77	15.2	0.1097	0.511592	0.000006	2115	-15.0
Arran 122	psammite	2.64	13.5	0.1187	0.511355	0.000004	2709	-20.2

Data for samples DC 8-1-24, DC 8-1-25, DC 8-1-26 and DP-11 are taken from Chew *et al.* (2007)

TABLE 6. LASER-ABLATION INDUCTIVELY COUPLED PLASMA–MASS SPECTROMETRY U-Pb ZIRCON DATA

Arran 119 (215 grains)

Isotopic ratios						Ages							
$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	Concordia	±2σ
0.1913	0.0050	2.0753	0.0578	0.0787	0.0163	1128	30	1141	32	1165	19	1138	18
0.1910	0.0061	2.0828	0.1147	0.0807	0.0707	1127	36	1143	63	1214	86	1133	28
0.1900	0.0092	2.2179	0.3507	0.0846	0.2235	1122	54	1187	188	1308	292	1129	48
0.1804	0.0033	1.8835	0.0435	0.0773	0.0229	1069	20	1075	25	1128	26	1073	14
0.1833	0.0085	1.8937	0.1049	0.0749	0.0576	1085	50	1079	60	1066	61	1081	34
0.1883	0.0061	2.0001	0.1479	0.0770	0.1182	1112	36	1116	82	1122	133	1113	30
0.1784	0.0057	2.2504	0.1190	0.0934	0.0517	1058	34	1197	63	1495	77	1102	28
0.4850	0.0115	11.5452	0.3802	0.1762	0.0139	2549	61	2568	85	2617	36	2565	30
0.4924	0.0047	11.8026	0.1567	0.1738	0.0059	2581	25	2589	34	2595	15	2588	12
0.1849	0.0063	1.9732	0.1360	0.0774	0.1052	1094	38	1106	76	1132	*119*	1098	31
0.2404	0.0147	2.9517	0.4253	0.0890	0.1779	1389	85	1395	201	1405	250	1391	68
0.1927	0.0159	2.0801	0.1945	0.0799	0.0656	1136	94	1142	107	1194	78	1141	61
0.5076	0.0196	13.4996	0.5939	0.1968	0.0113	2646	102	2715	119	2800	32	2712	42
0.2896	0.0089	4.0679	0.1570	0.1039	0.0238	1640	51	1648	64	1696	40	1646	30
0.2908	0.0354	4.2061	0.6071	0.1049	0.0836	1646	200	1675	242	1712	143	1669	115
0.2881	0.0135	4.0039	0.2501	0.1008	0.0468	1632	76	1635	102	1639	77	1634	47
0.1781	0.0015	2.2692	0.0457	0.0924	0.0234	1057	9	1203	24	1476	35	1080	8
0.1828	0.0112	1.9487	0.1840	0.0773	0.1269	1082	66	1098	104	1129	143	1090	51
0.1811	0.0053	1.8924	0.1216	0.0758	0.1054	1073	31	1078	69	1089	115	1075	26
0.3449	0.0232	6.6807	0.5655	0.1405	0.0397	1910	129	2070	175	2233	89	2033	73
0.1952	0.0023	2.1231	0.0335	0.0789	0.0181	1150	13	1156	18	1169	21	1154	10
0.4827	0.0069	12.2318	0.2267	0.1838	0.0072	2539	37	2622	49	2687	19	2611	17
0.5153	0.0501	12.3493	1.6356	0.1738	0.0578	2679	261	2631	348	2595	150	2638	121
0.2610	0.0104	3.3598	0.1824	0.0934	0.0469	1495	59	1495	81	1495	70	1495	38
0.2619	0.0124	3.4152	0.2146	0.0946	0.0512	1500	71	1508	95	1520	78	1505	45
0.2370	0.0066	2.8538	0.0943	0.0900	0.0213	1371	38	1370	45	1426	30	1370	24
0.2495	0.0165	3.0941	0.2683	0.0900	0.0752	1436	95	1431	124	1425	107	1433	61
0.2489	0.0135	3.0283	0.2648	0.0882	0.0948	1433	78	1415	124	1388	132	1423	55
0.2002	0.0064	2.1871	0.1028	0.0817	0.0512	1177	38	1177	55	1237	63	1177	28
0.3027	0.0100	4.3901	0.1837	0.1052	0.0275	1705	56	1710	72	1717	47	1709	33
0.2479	0.0412	3.3093	0.6495	0.0968	0.1251	1428	237	1483	291	1563	196	1470	147
0.1943	0.0071	2.1669	0.1907	0.0830	0.1194	1145	42	1170	103	1268	151	1150	35
0.5077	0.0046	12.4683	0.1406	0.1827	0.0038	2647	24	2640	30	2677	10	2641	10
0.4942	0.0173	12.3340	0.5069	0.1857	0.0119	2589	91	2630	108	2704	32	2628	38
0.3351	0.0228	8.0065	0.5646	0.1777	0.0060	1863	127	2232	157	2632	16	2189	65
0.1715	0.0035	1.7548	0.0527	0.0761	0.0383	1020	21	1029	31	1099	42	1024	16
0.1719	0.0102	1.7430	0.1391	0.0735	0.1049	1023	61	1025	82	1029	108	1024	44
0.1890	0.0127	2.0061	0.2422	0.0770	0.1782	1116	75	1118	135	1121	200	1117	60
0.1866	0.0105	2.1159	0.3567	0.0822	0.2486	1103	62	1154	195	1251	311	1110	55
0.2033	0.0080	2.2458	0.1565	0.0801	0.0942	1193	47	1195	83	1200	113	1194	37
0.1914	0.0111	2.0056	0.2260	0.0760	0.1766	1129	66	1117	126	1095	193	1125	53
0.5198	0.0100	13.2291	0.3036	0.1893	0.0068	2698	52	2696	62	2736	19	2696	22
0.5303	0.0092	13.9206	0.2828	0.1904	0.0063	2743	48	2744	56	2745	17	2744	19
0.1833	0.0077	1.9053	0.1101	0.0754	0.0735	1085	46	1083	63	1079	79	1084	33
0.5117	0.0240	16.3722	0.7867	0.2321	0.0055	2664	125	2899	139	3066	17	2902	46
0.3856	0.0271	11.7254	0.8548	0.2205	0.0102	2102	148	2583	188	2985	31	2540	70
0.1909	0.0187	2.0377	0.3188	0.0774	0.2143	1126	110	1128	176	1132	243	1127	84
0.1737	0.0099	1.8013	0.1652	0.0752	0.1344	1033	59	1046	96	1074	144	1038	46
0.1779	0.0093	1.8407	0.1284	0.0750	0.0864	1056	55	1060	74	1069	92	1058	40
0.2019	0.0042	2.2359	0.0559	0.0803	0.0227	1186	25	1192	30	1205	27	1190	16
0.1760	0.0067	1.8882	0.1006	0.0798	0.0587	1045	40	1077	57	1192	70	1061	30
0.1942	0.0067	2.1018	0.0901	0.0805	0.0383	1144	40	1149	49	1209	46	1148	27
0.1884	0.0060	1.9873	0.0942	0.0765	0.0632	1113	36	1111	53	1108	70	1112	26
0.1809	0.0063	1.9323	0.0932	0.0794	0.0530	1072	37	1092	53	1183	63	1083	27
0.2556	0.0166	3.2890	0.2992	0.0933	0.0808	1467	95	1478	135	1494	121	1474	63
0.2595	0.0186	3.2414	0.2936	0.0906	0.0733	1487	107	1467	133	1438	105	1472	66
0.1752	0.0042	2.0973	0.0999	0.0868	0.0584	1040	25	1148	55	1357	79	1067	21
0.1760	0.0056	2.0743	0.1048	0.0855	0.0572	1045	33	1140	58	1326	76	1081	27
0.1830	0.0147	2.0119	0.1746	0.0805	0.0491	1084	87	1120	97	1210	59	1111	57
0.2447	0.0130	3.0127	0.2021	0.0893	0.0557	1411	75	1411	95	1411	79	1411	48
0.1876	0.0131	1.9484	0.4132	0.0753	0.3732	1109	78	1098	233	1077	402	1107	67
0.2060	0.0096	2.2908	0.2429	0.0806	0.1545	1208	56	1209	128	1213	187	1208	46
0.1953	0.0204	2.0785	0.3232	0.0772	0.2037	1150	120	1142	178	1126	229	1146	88
0.2490	0.0090	3.4148	0.2400	0.0995	0.0696	1433	52	1508	106	1614	112	1460	40
0.2489	0.0059	3.4821	0.1517	0.1015	0.0409	1433	34	1523	66	1651	68	1468	26
0.1606	0.0060	1.8083	0.1150	0.0817	0.0815	960	36	1048	67	1238	101	988	30
0.1728	0.0086	1.7747	0.1469	0.0745	0.1262	1027	51	1036	86	1055	133	1031	40
0.1781	0.0052	1.8113	0.0975	0.0737	0.0884	1057	31	1050	56	1035	91	1054	25
0.1776	0.0086	1.8226	0.1359	0.0744	0.1081	1054	51	1054	79	1053	114	1054	39
0.1801	0.0061	1.8460	0.1111	0.0743	0.0958	1068	36	1062	64	1050	101	1066	29
0.1798	0.0084	1.8373	0.1380	0.0741	0.1138	1066	50	1059	80	1045	119	1063	38
0.1666	0.0052	1.7089	0.0953	0.0752	0.0852	993	31	1012	56	1073	91	1000	25
0.1675	0.0036	1.7252	0.0598	0.0754	0.0493	998	22	1018	35	1080	53	1007	17
0.1789	0.0015	1.8360	0.0266	0.0744	0.0227	1061	9	1058	15	1053	24	1060	7
0.5129	0.0133	13.9147	0.3976	0.1988	0.0065	2669	69	2744	78	2816	18	2743	27
0.5611	0.0156	15.8166	0.5491	0.2044	0.0119	2871	80	2866	99	2862	34	2866	33
0.1792	0.0036	1.8748	0.0479	0.0767	0.0282	1062	21	1072	27	1112	31	1068	15
0.1768	0.0012	1.8159	0.0171	0.0745	0.0122	1049	7	1051	10	1055	13	1050	5
0.1993	0.0060	2.1773	0.1463	0.0792	0.1009	1172	35	1174	79	1178	119	1172	29
0.1964	0.0159	2.1337	0.2937	0.0788	0.1888	1156	94	1160	160	1167	220	1157	72
0.1890	0.0093	1.9811	0.2080	0.0760	0.1693	1116	55	1109	116	1095	185	1114	45
0.1870	0.0141	1.9660	0.2135	0.0762	0.1422	1105	83	1104	120	1101	157	1105	61
0.3430	0.0029	5.5883	0.0765	0.1194	0.0097	1901	16	1914	26	1947	19	1909	10

(*Continued*)

TABLE 6. LASER-ABLATION INDUCTIVELY COUPLED PLASMA–MASS SPECTROMETRY U-Pb ZIRCON DATA (*Continued*)

Arran 119 (215 grains)

Isotopic ratios						Ages							
$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	Concordia	±2σ
0.2036	0.0156	2.8107	0.5942	0.1001	0.2252	1194	92	1358	287	1627	366	1216	80
0.1938	0.0115	2.0145	0.2253	0.0754	0.1766	1142	68	1120	125	1079	190	1134	54
0.1987	0.0103	2.1571	0.3637	0.0788	0.2725	1168	61	1167	197	1166	318	1168	53
0.1908	0.0058	2.0253	0.1116	0.0770	0.0814	1125	35	1124	62	1121	91	1125	27
0.2839	0.0126	4.4632	0.2407	0.1140	0.0298	1611	71	1724	93	1865	56	1695	43
0.3366	0.0225	5.3968	0.4439	0.1163	0.0453	1870	125	1884	155	1900	86	1882	68
0.1863	0.0059	1.9789	0.0752	0.0771	0.0375	1101	35	1108	42	1123	42	1106	24
0.1830	0.0045	2.1582	0.1646	0.0855	0.1052	1083	27	1168	89	1328	140	1093	24
0.2049	0.0115	2.3128	0.4529	0.0819	0.2959	1202	67	1216	238	1242	368	1203	59
0.2006	0.0062	2.1871	0.1453	0.0791	0.0993	1179	36	1177	78	1174	117	1178	30
0.1864	0.0071	1.9531	0.0901	0.0760	0.0473	1102	42	1100	51	1095	52	1100	29
0.1853	0.0132	1.9416	0.1529	0.0760	0.0622	1096	78	1096	86	1095	68	1096	50
0.2402	0.0045	2.9334	0.0734	0.0886	0.0230	1388	26	1391	35	1395	32	1390	17
0.2408	0.0098	2.9466	0.1618	0.0888	0.0505	1391	57	1394	77	1399	71	1393	38
0.1903	0.0116	2.0220	0.2648	0.0771	0.2060	1123	68	1123	147	1123	231	1123	56
0.2421	0.0173	2.9735	0.2378	0.0891	0.0495	1398	100	1401	112	1406	70	1400	59
0.2104	0.0018	2.3702	0.0336	0.0817	0.0181	1231	10	1234	17	1238	22	1232	8
0.1847	0.0090	1.9162	0.1863	0.0752	0.1574	1093	53	1087	106	1075	169	1091	43
0.1872	0.0058	1.9674	0.0995	0.0762	0.0729	1106	34	1104	56	1101	80	1105	26
0.1958	0.0050	2.0733	0.0936	0.0768	0.0665	1153	29	1140	51	1116	74	1147	23
0.1965	0.0068	2.1215	0.1210	0.0783	0.0777	1156	40	1156	66	1155	90	1156	31
0.1827	0.0134	1.8796	0.2535	0.0746	0.2156	1082	79	1074	145	1058	228	1079	63
0.1730	0.0188	1.9883	0.3746	0.0834	0.2346	1028	112	1112	209	1278	300	1055	92
0.1805	0.0066	1.8655	0.0843	0.0749	0.0494	1070	39	1069	48	1067	53	1069	27
0.1819	0.0059	2.0171	0.0987	0.0813	0.0578	1077	35	1121	55	1228	71	1097	27
0.1776	0.0041	1.8452	0.1025	0.0753	0.0942	1054	24	1062	59	1077	101	1056	21
0.1991	0.0092	2.1019	0.1319	0.0766	0.0767	1171	54	1149	72	1110	85	1158	38
0.1991	0.0040	2.2120	0.0674	0.0822	0.0343	1170	24	1185	36	1251	43	1178	18
0.2016	0.0069	2.2148	0.1037	0.0797	0.0531	1184	41	1186	56	1189	63	1185	29
0.2022	0.0031	2.2293	0.0516	0.0800	0.0285	1187	18	1190	28	1196	34	1189	13
0.2013	0.0049	2.3112	0.0899	0.0850	0.0432	1182	29	1216	47	1315	57	1198	22
0.2000	0.0045	2.1899	0.0731	0.0794	0.0410	1175	27	1178	39	1182	48	1177	19
0.1988	0.0136	2.1638	0.2833	0.0789	0.1887	1169	80	1169	153	1171	221	1169	64
0.2022	0.0022	2.1951	0.0324	0.0803	0.0158	1187	13	1179	17	1205	19	1183	9
0.1960	0.0071	2.0275	0.1472	0.0750	0.1185	1154	42	1125	82	1069	127	1144	33
0.1857	0.0029	1.9376	0.0412	0.0772	0.0246	1098	17	1094	23	1127	28	1096	12
0.1841	0.0083	1.9268	0.0962	0.0759	0.0385	1089	49	1090	54	1092	42	1090	32
0.1916	0.0015	2.0250	0.0351	0.0767	0.0275	1130	9	1124	19	1113	31	1128	8
0.2045	0.0049	2.2603	0.0626	0.0802	0.0232	1200	29	1200	33	1201	28	1200	18
0.1884	0.0153	2.0534	0.2425	0.0798	0.1389	1113	91	1133	134	1193	166	1123	67
0.1879	0.0174	1.9840	0.2029	0.0766	0.0774	1110	103	1110	114	1110	86	1110	66
0.1793	0.0032	1.8574	0.0701	0.0751	0.0621	1063	19	1066	40	1072	67	1064	16
0.1730	0.0094	1.9966	0.1540	0.0837	0.0827	1029	56	1114	86	1286	106	1068	44
0.1823	0.0092	2.0781	0.2043	0.0827	0.1308	1079	54	1142	112	1262	165	1097	45
0.4722	0.0296	12.0824	0.7858	0.1856	0.0105	2493	156	2611	170	2703	28	2611	61
0.4248	0.0302	10.7324	0.7806	0.1833	0.0093	2282	162	2500	182	2683	25	2497	68
0.2224	0.0129	2.6451	0.2009	0.0880	0.0645	1295	75	1313	100	1383	89	1307	51
0.5252	0.0130	13.5514	0.3768	0.1871	0.0077	2721	67	2719	76	2717	21	2719	26
0.5268	0.0041	13.6458	0.1384	0.1879	0.0040	2728	21	2725	28	2724	11	2726	9
0.1828	0.0072	2.0048	0.1612	0.0811	0.1095	1082	43	1117	90	1225	134	1092	35
0.1971	0.0052	2.2036	0.1606	0.0828	0.1025	1160	31	1182	86	1263	130	1164	26
0.1754	0.0099	1.8126	0.1264	0.0749	0.0766	1042	59	1050	73	1067	82	1047	41
0.1921	0.0032	2.0168	0.0786	0.0761	0.0642	1133	19	1121	44	1099	71	1130	16
0.1928	0.0030	2.0684	0.0597	0.0778	0.0424	1136	18	1138	33	1142	48	1137	14
0.1907	0.0038	2.0273	0.0549	0.0771	0.0329	1125	22	1125	30	1123	37	1125	16
0.1901	0.0018	2.0465	0.0330	0.0781	0.0228	1122	10	1131	18	1149	26	1126	8
0.1717	0.0078	1.7560	0.3792	0.0742	0.4069	1021	46	1029	222	1046	426	1022	42
0.1912	0.0017	2.0265	0.0353	0.0769	0.0269	1128	10	1124	20	1118	30	1127	8
0.2013	0.0211	2.2113	0.4029	0.0797	0.2476	1183	124	1185	216	1188	294	1183	96
0.1917	0.0081	2.0544	0.1407	0.0777	0.0943	1130	48	1134	78	1140	108	1132	36
0.3323	0.0030	5.1708	0.0606	0.1129	0.0073	1849	17	1848	22	1846	13	1848	9
0.3218	0.0109	5.0291	0.2025	0.1157	0.0192	1798	61	1824	73	1890	36	1820	33
0.3296	0.0021	5.2252	0.0544	0.1150	0.0079	1836	12	1857	19	1880	15	1849	8
0.1916	0.0022	2.0526	0.0440	0.0777	0.0313	1130	13	1133	24	1140	36	1131	11
0.1896	0.0026	1.9525	0.0368	0.0747	0.0243	1119	15	1099	21	1061	26	1107	11
0.5509	0.0423	15.2019	1.2691	0.2001	0.0190	2829	217	2828	236	2827	54	2828	80
0.5116	0.0090	13.0684	0.2624	0.1891	0.0052	2663	47	2685	54	2734	14	2684	19
0.1796	0.0063	1.8551	0.0897	0.0749	0.0630	1065	37	1065	52	1066	67	1065	27
0.1709	0.0102	1.7265	0.1169	0.0733	0.0633	1017	61	1018	69	1021	65	1018	41
0.3200	0.0110	4.8148	0.2395	0.1091	0.0368	1790	61	1787	89	1785	66	1788	38
0.2543	0.0020	3.1986	0.0458	0.0912	0.0157	1461	12	1457	21	1451	23	1459	9
0.2476	0.0125	3.1266	0.1985	0.0916	0.0502	1426	72	1439	91	1459	73	1436	46
0.1830	0.0227	1.9211	0.3400	0.0761	0.2295	1083	135	1088	193	1099	252	1086	99
0.1817	0.0120	1.8814	0.2308	0.0751	0.1941	1076	71	1075	132	1071	208	1076	57
0.2069	0.0020	2.4315	0.0885	0.0874	0.0479	1212	12	1252	46	1370	66	1216	11
0.2005	0.0066	2.1836	0.1497	0.0790	0.1017	1178	38	1176	81	1172	119	1177	31
0.2107	0.0019	2.3686	0.0492	0.0815	0.0298	1233	11	1233	26	1234	37	1233	9
0.2051	0.0193	2.2635	0.3330	0.0800	0.1862	1203	113	1201	177	1198	223	1202	84
0.1848	0.0067	1.9291	0.1388	0.0757	0.1145	1093	40	1091	78	1087	125	1093	32
0.1851	0.0016	1.9400	0.0388	0.0760	0.0329	1095	10	1095	22	1095	36	1095	8
0.1934	0.0117	2.0745	0.1858	0.0778	0.1153	1140	69	1140	102	1142	132	1140	51
0.2051	0.0182	2.2743	0.3631	0.0804	0.2166	1203	107	1204	192	1207	262	1203	83
0.2282	0.0023	2.7119	0.0393	0.0862	0.0149	1325	13	1332	19	1342	20	1329	9

(*Continued*)

TABLE 6. LASER-ABLATION INDUCTIVELY COUPLED PLASMA–MASS SPECTROMETRY U-Pb ZIRCON DATA (*Continued*)

Isotopic ratios						Ages							
$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	Concordia	±2σ
Arran 119 (215 grains)													
0.2580	0.0185	3.2912	0.2927	0.0925	0.0674	1480	106	1479	132	1478	100	1479	65
0.1922	0.0086	2.0516	0.1313	0.0774	0.0805	1133	51	1133	72	1132	91	1133	37
0.1858	0.0045	1.9468	0.0957	0.0760	0.0782	1098	27	1097	54	1095	86	1098	22
0.1875	0.0144	1.9945	0.2053	0.0771	0.1213	1108	85	1114	115	1125	136	1111	61
0.1825	0.0066	1.8957	0.1376	0.0753	0.1172	1081	39	1080	78	1077	126	1080	32
0.2567	0.0221	3.2602	0.5158	0.0921	0.1716	1473	127	1472	233	1470	252	1472	94
0.1935	0.0040	2.0304	0.0682	0.0761	0.0485	1140	23	1126	38	1098	53	1134	18
0.1832	0.0011	1.9203	0.0212	0.0760	0.0169	1084	7	1088	12	1096	19	1086	5
0.3390	0.0237	7.7377	0.5743	0.1655	0.0166	1882	132	2201	163	2513	42	2161	68
0.1740	0.0068	2.0587	0.3137	0.0871	0.2049	1034	40	1135	173	1363	279	1041	36
0.1992	0.0058	2.1725	0.1350	0.0791	0.0923	1171	34	1172	73	1175	108	1171	28
0.2037	0.0133	2.2701	0.2173	0.0808	0.1130	1195	78	1203	115	1218	138	1199	57
0.1975	0.0025	2.1410	0.0572	0.0811	0.0362	1162	15	1162	31	1223	44	1162	12
0.1939	0.0084	2.0844	0.1245	0.0780	0.0710	1142	50	1144	68	1146	81	1143	36
0.1978	0.0018	2.1475	0.0405	0.0812	0.0255	1163	11	1164	22	1226	31	1164	9
0.1886	0.0017	1.9687	0.0316	0.0757	0.0244	1114	10	1105	18	1087	27	1110	8
0.1841	0.0092	1.9222	0.1174	0.0757	0.0649	1089	54	1089	66	1088	71	1089	37
0.2055	0.0018	2.2828	0.0333	0.0818	0.0181	1205	10	1207	18	1241	22	1206	8
0.2003	0.0022	2.2171	0.0350	0.0803	0.0186	1177	13	1186	19	1203	22	1182	9
0.2080	0.0106	3.0064	0.3978	0.1049	0.1312	1218	62	1409	186	1712	225	1244	54
0.1984	0.0101	2.1646	0.1726	0.0791	0.1032	1167	59	1170	93	1176	121	1168	45
0.2030	0.0062	2.2292	0.1482	0.0797	0.0982	1191	36	1190	79	1189	117	1191	30
0.2265	0.0119	2.7681	0.2115	0.0900	0.0720	1316	69	1347	103	1426	103	1333	49
0.2355	0.0028	2.8370	0.0509	0.0874	0.0188	1363	16	1365	24	1369	26	1364	11
0.2591	0.0116	3.3587	0.2885	0.0940	0.0917	1485	67	1495	128	1508	138	1489	50
0.2007	0.0067	2.1904	0.2081	0.0791	0.1496	1179	39	1178	112	1176	176	1179	34
0.2006	0.0132	2.3031	1.0646	0.0845	0.6705	1179	78	1213	561	1305	875	1180	70
0.1889	0.0022	2.0116	0.0538	0.0772	0.0427	1116	13	1119	30	1127	48	1116	11
0.1850	0.0095	1.9442	0.2219	0.0762	0.1853	1094	56	1096	125	1101	204	1095	47
0.2055	0.0064	2.2535	0.1469	0.0795	0.0956	1205	37	1198	78	1185	113	1203	30
0.2030	0.0089	2.2387	0.1373	0.0800	0.0704	1191	52	1193	73	1197	84	1193	37
0.5193	0.0489	13.1900	1.2881	0.1842	0.0159	2696	254	2693	263	2691	43	2693	92
0.5648	0.0142	13.7483	0.6686	0.1766	0.0264	2886	73	2733	133	2621	69	2780	39
0.3387	0.0127	5.4147	0.2265	0.1159	0.0178	1881	70	1887	79	1895	34	1887	35
0.1916	0.0014	2.0304	0.0214	0.0769	0.0139	1130	8	1126	12	1118	16	1128	6
0.3373	0.0088	5.3151	0.2001	0.1143	0.0262	1873	49	1871	70	1869	49	1872	29
0.3394	0.0108	5.4139	0.2345	0.1157	0.0280	1884	60	1887	82	1891	53	1886	35
0.5435	0.0193	15.2202	0.7256	0.2062	0.0173	2798	100	2829	135	2876	50	2825	45
0.1880	0.0118	1.9865	0.1899	0.0766	0.1297	1110	70	1111	106	1112	144	1111	52
0.1908	0.0187	2.0293	0.2683	0.0771	0.1576	1126	110	1125	149	1125	177	1126	78
0.1916	0.0247	2.0485	0.3056	0.0787	0.1203	1130	146	1132	169	1166	140	1131	96
0.1995	0.0042	2.1676	0.0595	0.0788	0.0301	1173	25	1171	32	1167	35	1171	17
0.2014	0.0014	2.2147	0.0235	0.0798	0.0131	1183	8	1186	13	1191	16	1184	6
0.1812	0.0016	1.8752	0.0245	0.0751	0.0182	1073	9	1072	14	1070	19	1073	7
0.1807	0.0014	1.8707	0.0214	0.0751	0.0159	1071	8	1071	12	1070	17	1071	6
0.1811	0.0089	1.8933	0.1410	0.0758	0.1027	1073	53	1079	80	1090	112	1076	40
0.2006	0.0053	2.1904	0.1169	0.0792	0.0778	1178	31	1178	63	1177	92	1178	25
0.2580	0.0065	3.2927	0.1160	0.0926	0.0317	1480	37	1479	52	1479	47	1479	25
0.2187	0.0020	2.5025	0.0383	0.0830	0.0189	1275	12	1273	20	1269	24	1274	9
DC 8-1-24 (136 grains)													(L83918127)
0.1844	0.0163	2.0006	0.2719	0.0811	0.1571	1091	96	1116	152	1224	192	1102	74
0.1847	0.0043	1.9432	0.0931	0.0787	0.0685	1092	25	1096	52	1164	80	1094	21
0.2420	0.0127	2.9189	0.1820	0.0902	0.0400	1397	73	1387	86	1429	57	1389	45
0.7363	0.1517	33.8257	7.6234	0.3435	0.0303	3557	733	3605	812	3678	111	3607	221
0.1864	0.0078	2.0925	0.1725	0.0839	0.1029	1102	46	1146	95	1291	133	1115	38
0.3285	0.0377	5.1090	0.7302	0.1163	0.0738	1831	210	1838	263	1900	140	1836	117
0.5086	0.0447	12.8616	1.2274	0.1891	0.0174	2651	233	2670	255	2734	48	2670	90
0.1853	0.0120	2.1712	0.3170	0.0876	0.1763	1096	71	1172	171	1374	242	1112	61
0.1956	0.0091	2.1526	0.1795	0.0823	0.1035	1152	53	1166	97	1252	130	1157	42
0.1862	0.0100	1.9448	0.1267	0.0781	0.0579	1101	59	1097	71	1149	67	1098	40
0.3226	0.0213	5.0122	0.3761	0.1127	0.0348	1803	119	1821	137	1843	64	1819	63
0.1856	0.0080	1.8748	0.0906	0.0733	0.0437	1097	47	1072	52	1022	45	1078	30
0.1624	0.0172	1.5907	0.1867	0.0710	0.1086	970	103	967	113	958	104	968	69
0.1676	0.0118	1.7805	0.1635	0.0770	0.1043	999	71	1038	95	1122	117	1021	52
0.1665	0.0182	1.7294	0.1958	0.0754	0.0560	993	108	1020	115	1078	60	1014	70
0.2098	0.0073	2.2199	0.1305	0.0767	0.0850	1228	43	1187	70	1114	95	1209	32
0.2083	0.0076	2.3180	0.2113	0.0807	0.1352	1220	45	1218	111	1214	164	1219	37
0.4948	0.0529	13.0894	5.3813	0.1918	0.2364	2592	277	2686	1104	2758	652	2611	210
0.1742	0.0193	1.7485	0.2731	0.0728	0.2214	1035	115	1027	160	1009	223	1030	85
0.1748	0.0081	1.7239	0.2365	0.0715	0.2707	1038	48	1017	140	973	263	1035	42
0.1859	0.0100	1.9512	0.1265	0.0781	0.0579	1099	59	1099	71	1149	67	1099	40
0.1819	0.0113	1.9092	0.1324	0.0761	0.0562	1077	67	1084	75	1098	62	1082	44
0.1822	0.0098	1.9190	0.1312	0.0764	0.0761	1079	58	1088	74	1105	84	1084	41
0.1810	0.0064	2.0784	0.1160	0.0854	0.0606	1073	38	1142	64	1325	80	1100	30
0.5934	0.0298	18.4585	1.0840	0.2256	0.0162	3003	151	3014	177	3021	49	3014	57
0.5505	0.1272	15.0867	3.8095	0.1987	0.0592	2827	653	2821	712	2816	167	2821	240
0.2394	0.0067	2.9337	0.0963	0.0889	0.0234	1384	39	1391	46	1402	33	1389	24
0.1840	0.0070	2.0834	0.1791	0.0842	0.1116	1089	42	1143	98	1298	145	1101	35
0.1781	0.0056	1.8386	0.0858	0.0768	0.0583	1057	34	1059	49	1116	65	1058	25
0.2602	0.0075	3.3074	0.1137	0.0922	0.0244	1491	43	1483	51	1471	36	1485	26
0.2385	0.0291	3.1278	0.4978	0.0976	0.1134	1379	168	1440	229	1578	179	1418	113
0.1939	0.0119	2.0743	0.2134	0.0776	0.1446	1142	70	1140	117	1136	164	1142	54
0.1716	0.0051	1.8006	0.2626	0.0761	0.2601	1021	30	1046	153	1098	286	1022	28
0.1848	0.0063	1.9395	0.1221	0.0761	0.0967	1093	37	1095	69	1098	106	1094	30

(*Continued*)

TABLE 6. LASER-ABLATION INDUCTIVELY COUPLED PLASMA–MASS SPECTROMETRY U-Pb ZIRCON DATA (*Continued*)

DC 8-1-24 (136 grains)

Isotopic ratios						Ages							
$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	Concordia	±2σ
0.1981	0.0116	1.9510	0.1514	0.0714	0.1072	1165	68	1099	85	970	104	1121	46
0.1831	0.0091	2.0131	0.1603	0.0797	0.1034	1084	54	1120	89	1190	123	1099	42
0.1855	0.0235	2.1369	0.3249	0.0835	0.1276	1097	139	1161	176	1282	164	1138	97
0.1839	0.0089	1.9286	0.1114	0.0761	0.0580	1088	53	1091	63	1097	64	1090	36
0.5709	0.0308	16.5367	1.0746	0.2101	0.0203	2912	157	2908	189	2906	59	2909	62
0.1881	0.0112	1.9925	0.1528	0.0768	0.0869	1111	66	1113	85	1116	97	1112	46
0.2030	0.0060	2.4490	0.1499	0.0897	0.0696	1191	36	1257	77	1420	99	1210	29
0.3588	0.0368	6.0386	0.8883	0.1252	0.0874	1976	203	1981	291	2032	177	1980	119
0.4979	0.0209	12.2573	0.5429	0.1831	0.0060	2605	110	2624	116	2681	16	2625	42
0.2829	0.0148	4.5238	0.3322	0.1189	0.0452	1606	84	1735	127	1940	88	1685	56
0.5179	0.0603	13.2320	1.7609	0.1901	0.0342	2690	313	2696	359	2743	94	2696	126
0.1827	0.0073	1.9805	0.1070	0.0806	0.0557	1082	43	1109	60	1212	68	1097	32
0.2074	0.0085	2.3068	0.1112	0.0807	0.0409	1215	50	1214	59	1214	50	1215	32
0.1814	0.0075	1.9617	0.1294	0.0804	0.0801	1075	45	1102	73	1207	97	1087	35
0.1831	0.0063	1.9499	0.1000	0.0792	0.0606	1084	37	1098	56	1178	71	1091	28
0.3269	0.0238	5.1106	0.4145	0.1134	0.0347	1824	133	1838	149	1854	64	1836	68
0.1782	0.0051	1.9360	0.1098	0.0808	0.0763	1057	30	1094	62	1217	93	1068	25
0.3578	0.0214	5.9415	0.4757	0.1235	0.0444	1972	118	1967	158	2008	89	1968	66
0.4272	0.0420	9.9008	2.9453	0.1724	0.1765	2293	225	2426	722	2581	456	2326	171
0.3269	0.0426	5.0597	0.8112	0.1151	0.0824	1823	238	1829	293	1882	155	1828	132
0.2068	0.0134	2.1767	0.2667	0.0763	0.1883	1212	79	1174	144	1104	208	1197	61
0.2106	0.0108	2.3289	0.1430	0.0802	0.0549	1232	63	1221	75	1202	66	1224	41
0.5436	0.0477	14.7732	1.3971	0.2021	0.0161	2799	246	2801	265	2844	46	2801	90
0.2343	0.0304	2.8484	0.4462	0.0905	0.1072	1357	176	1368	214	1435	154	1365	111
0.2479	0.0129	3.0845	0.2728	0.0925	0.0881	1428	74	1429	126	1479	130	1428	54
0.1815	0.0167	1.8410	0.2029	0.0736	0.1189	1075	99	1060	117	1029	122	1065	67
0.1888	0.0215	2.0105	0.2946	0.0792	0.1454	1115	127	1119	164	1177	171	1117	89
0.3065	0.0296	4.5522	0.9836	0.1105	0.1882	1723	167	1741	376	1807	340	1730	126
0.3682	0.0678	6.2593	1.2603	0.1265	0.0587	2021	372	2013	405	2049	120	2013	175
0.4505	0.0336	10.2984	0.8510	0.1701	0.0201	2397	179	2462	203	2558	51	2460	77
0.3409	0.0123	5.5596	0.2174	0.1213	0.0112	1891	68	1910	75	1975	22	1909	33
0.1930	0.0072	2.0054	0.1119	0.0754	0.0771	1137	42	1117	62	1079	83	1127	31
0.1789	0.0111	1.9104	0.1669	0.0794	0.0979	1061	66	1085	95	1182	116	1073	49
0.4541	0.0358	10.0431	0.8808	0.1645	0.0224	2413	190	2439	214	2503	56	2438	81
0.3237	0.0235	5.0056	0.3790	0.1122	0.0209	1808	131	1820	138	1835	38	1820	64
0.1772	0.0101	1.8477	0.1537	0.0756	0.1121	1052	60	1063	88	1085	122	1057	45
0.4079	0.0172	8.2787	0.6341	0.1510	0.0446	2205	93	2262	173	2357	105	2238	60
0.2266	0.0324	2.7525	0.4838	0.0903	0.1258	1317	188	1343	236	1433	180	1335	123
0.2049	0.0225	2.3931	0.3050	0.0869	0.0825	1201	132	1241	158	1358	112	1230	87
0.2643	0.0131	4.2863	0.5090	0.1207	0.0950	1512	75	1691	201	1966	187	1550	62
0.5988	0.0409	19.0445	1.5475	0.2378	0.0202	3025	207	3044	247	3105	63	3044	78
0.5685	0.0204	16.3712	1.0504	0.2088	0.0298	2902	104	2899	186	2897	86	2900	55
0.5138	0.0340	11.2916	1.0243	0.1594	0.0429	2673	177	2548	231	2449	105	2564	81
0.5125	0.0275	12.9579	0.7440	0.1834	0.0125	2667	143	2677	154	2684	34	2677	54
0.2550	0.0078	3.2400	0.1385	0.0950	0.0343	1464	45	1467	63	1528	52	1466	30
0.2463	0.0071	3.0492	0.1151	0.0925	0.0290	1420	41	1420	54	1479	43	1420	27
0.1953	0.0107	2.2819	0.2930	0.0873	0.1573	1150	63	1207	155	1368	215	1163	54
0.2065	0.0168	2.3390	0.2230	0.0821	0.0780	1210	98	1224	117	1249	97	1220	64
0.2242	0.0241	2.6287	0.3825	0.0876	0.1277	1304	140	1309	190	1375	176	1307	96
0.1953	0.0134	2.1040	0.1851	0.0806	0.0827	1150	79	1150	101	1211	100	1150	55
0.1712	0.0070	1.8327	0.1376	0.0801	0.0994	1019	41	1057	79	1198	119	1031	34
0.1925	0.0214	2.1505	0.2997	0.0840	0.1139	1135	126	1165	162	1292	147	1154	88
0.2071	0.0122	2.3135	0.1943	0.0840	0.0838	1213	71	1216	102	1292	108	1215	51
0.2506	0.0301	3.2133	0.4702	0.0964	0.0896	1441	173	1460	214	1555	139	1456	108
0.4855	0.0615	11.3003	1.5684	0.1749	0.0276	2551	323	2548	354	2605	72	2548	129
0.1934	0.0169	2.0585	0.2422	0.0800	0.1198	1140	99	1135	134	1197	143	1137	71
0.3449	0.0387	5.6276	0.7478	0.1183	0.0661	1910	214	1920	255	1931	128	1919	112
0.6857	0.0159	25.9541	0.6440	0.2745	0.0041	3366	78	3345	83	3332	14	3344	24
0.5947	0.0288	21.1505	1.0925	0.2673	0.0055	3008	146	3146	162	3290	18	3149	50
0.4987	0.0126	11.8457	0.3484	0.1785	0.0080	2608	66	2592	76	2639	21	2593	27
0.4790	0.0185	11.2604	0.4876	0.1767	0.0101	2523	97	2545	110	2622	27	2544	40
0.5543	0.0924	14.8411	2.5524	0.1942	0.0248	2843	474	2805	482	2778	69	2804	163
0.2083	0.0052	2.3446	0.0931	0.0816	0.0493	1220	30	1226	49	1236	61	1223	23
0.2105	0.0075	2.5808	0.1325	0.0921	0.0447	1232	44	1295	67	1470	66	1265	32
0.1882	0.0128	2.0133	0.1509	0.0776	0.0555	1112	75	1120	84	1136	63	1118	49
0.2428	0.0028	2.9628	0.0429	0.0885	0.0120	1401	16	1398	20	1394	17	1399	10
0.2109	0.0076	2.3966	0.1026	0.0854	0.0289	1234	45	1242	53	1325	38	1239	29
0.2790	0.0027	3.7362	0.0532	0.1007	0.0110	1586	16	1579	22	1636	18	1582	10
0.2782	0.0035	3.7879	0.0635	0.1023	0.0111	1582	20	1590	27	1667	19	1588	13
0.1918	0.0174	1.9950	0.4662	0.0755	0.4000	1131	102	1114	260	1081	432	1127	87
0.2347	0.0134	3.3445	0.4103	0.1071	0.1085	1359	78	1492	183	1751	190	1393	64
0.2337	0.0109	2.8043	0.1652	0.0870	0.0506	1354	63	1357	80	1361	69	1356	41
0.3087	0.0306	4.5573	0.5297	0.1071	0.0636	1734	172	1741	202	1750	111	1740	94
0.2259	0.0067	2.7877	0.1239	0.0932	0.0388	1313	39	1352	60	1492	58	1334	28
0.5269	0.0398	13.6112	1.1256	0.1874	0.0204	2728	206	2723	225	2719	55	2723	78
0.4997	0.1029	12.1489	2.5416	0.1763	0.0237	2613	538	2616	547	2619	62	2616	196
0.2859	0.0298	3.9471	0.6588	0.1043	0.1315	1621	169	1623	271	1702	224	1622	115
0.5168	0.0310	13.1176	0.8604	0.1841	0.0163	2686	161	2688	176	2690	44	2688	62
0.1911	0.0045	2.0910	0.0939	0.0827	0.0560	1127	26	1146	51	1261	71	1133	21
0.1844	0.0104	2.1741	0.3260	0.0855	0.2025	1091	62	1173	176	1327	269	1104	54
0.5101	0.0718	12.8530	2.0016	0.1828	0.0411	2657	374	2669	416	2678	110	2669	147
0.1901	0.0146	2.0974	0.2089	0.0833	0.0871	1122	86	1148	114	1277	111	1138	61
0.2013	0.0061	2.2622	0.1148	0.0849	0.0564	1182	36	1201	61	1314	74	1190	28
0.1894	0.0077	2.0915	0.1336	0.0834	0.0700	1118	45	1146	73	1279	90	1131	35

(*Continued*)

TABLE 6. LASER-ABLATION INDUCTIVELY COUPLED PLASMA–MASS SPECTROMETRY U-Pb ZIRCON DATA (*Continued*)

Isotopic ratios							Ages							
$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ		$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	Concordia	±2σ
							DC 8-1-24 (136 grains)							
0.3416	0.0229	5.5185	0.4135	0.1172	0.0311		1894	127	1903	143	1913	60	1903	64
0.2094	0.0231	2.3529	0.2741	0.0815	0.0596		1225	135	1228	143	1234	73	1228	81
0.1996	0.0138	2.1860	0.1717	0.0794	0.0624		1173	81	1177	92	1183	74	1176	52
0.5242	0.0320	13.7059	0.9162	0.1896	0.0164		2717	166	2730	182	2739	45	2730	63
0.5116	0.0224	12.9844	0.6711	0.1841	0.0168		2663	117	2679	138	2690	45	2678	49
0.1849	0.0055	1.9996	0.2463	0.0817	0.1812		1094	33	1115	137	1238	224	1096	29
0.2226	0.0192	2.5560	0.2435	0.0833	0.0616		1296	112	1288	123	1276	79	1290	67
0.2569	0.0071	3.2486	0.1315	0.0917	0.0383		1474	41	1469	59	1461	56	1471	28
0.5245	0.0471	13.3745	1.2952	0.1849	0.0222		2718	244	2706	262	2698	60	2706	91
0.2892	0.0143	3.9993	0.2113	0.1003	0.0213		1637	81	1634	86	1630	35	1634	42
0.1966	0.0080	2.1112	0.1007	0.0803	0.0364		1157	47	1152	55	1204	44	1154	31
0.2005	0.0173	2.2214	0.2808	0.0828	0.1345		1178	102	1188	150	1266	170	1183	75
0.4989	0.0150	13.1968	0.4618	0.1978	0.0092		2609	78	2694	94	2808	26	2690	33
0.1884	0.0040	2.0661	0.0784	0.0820	0.0472		1113	24	1138	43	1246	59	1122	19
0.2053	0.0071	2.2953	0.0938	0.0811	0.0345		1204	42	1211	49	1224	42	1209	27
0.1920	0.0069	2.0814	0.0936	0.0811	0.0392		1132	41	1143	51	1223	48	1139	28
0.1838	0.0071	1.9328	0.1055	0.0786	0.0614		1088	42	1093	60	1163	71	1090	31
0.1889	0.0080	2.1955	0.1349	0.0843	0.0668		1115	47	1180	72	1299	87	1146	36
							AB-4 (156 grains)							(L72139214)
0.0369	8.3872	0.9291	0.1710	0.0255		155	203	2274	252	2568	65	2239	103	44
0.4001	0.0082	9.6670	0.2144	0.1752	0.0054		2169	44	2404	53	2608	14	2386	21
0.2858	0.0027	4.1105	0.0681	0.1043	0.0146		1621	15	1656	27	1702	25	1638	11
0.1914	0.0086	2.0869	0.1690	0.0791	0.1135		1129	51	1144	93	1174	133	1135	40
0.3254	0.0085	5.0101	0.2711	0.1117	0.0470		1816	47	1821	99	1827	86	1818	34
0.3481	0.0034	5.6556	0.0740	0.1178	0.0082		1926	19	1925	25	1923	16	1925	11
0.3881	0.0396	7.5066	1.2029	0.1403	0.0960		2114	215	2174	348	2231	214	2153	130
0.3386	0.0085	5.7062	0.4200	0.1222	0.0619		1880	47	1932	142	1989	123	1892	37
0.5157	0.0113	15.7572	0.3560	0.2216	0.0029		2681	59	2862	65	2992	9	2865	22
0.5049	0.0050	12.5098	0.2243	0.1797	0.0094		2635	26	2643	47	2650	25	2641	15
0.3454	0.0028	5.5157	0.0714	0.1158	0.0095		1913	16	1903	25	1893	18	1906	10
0.1829	0.0021	1.8998	0.0364	0.0753	0.0284		1083	13	1081	21	1077	31	1082	10
0.2084	0.0073	3.1368	0.1967	0.1092	0.0531		1220	43	1442	90	1786	95	1280	36
0.1729	0.0036	2.0807	0.2185	0.0873	0.1450		1028	22	1142	120	1366	198	1033	20
0.1661	0.0033	1.6396	0.0995	0.0716	0.1198		990	20	986	60	975	117	990	18
0.4587	0.0243	11.2772	0.8164	0.1783	0.0310		2434	129	2546	184	2637	82	2525	66
0.2134	0.0213	2.6410	0.4773	0.0898	0.2026		1247	125	1312	237	1420	288	1271	99
0.2084	0.0023	2.2986	0.0533	0.0800	0.0335		1220	14	1212	28	1197	40	1218	11
0.2059	0.0143	2.9206	0.2598	0.1029	0.0613		1207	84	1387	123	1677	103	1304	62
0.2350	0.0235	3.7835	0.8798	0.1168	0.1976		1360	136	1589	370	1908	377	1402	115
0.3418	0.0148	5.4590	0.5637	0.1158	0.0891		1895	82	1894	196	1893	169	1895	61
0.2614	0.0053	3.3364	0.0928	0.0926	0.0243		1497	30	1490	41	1479	36	1492	20
0.2271	0.0282	2.7201	0.4141	0.0869	0.1249		1319	164	1334	203	1358	170	1330	106
0.4474	0.0394	19.3256	2.3831	0.3133	0.0376		2384	210	3058	377	3537	133	2775	133
0.2233	0.0033	2.7540	0.0626	0.0895	0.0233		1299	19	1343	31	1414	33	1322	14
0.1872	0.0053	1.9846	0.0797	0.0769	0.0509		1106	31	1110	45	1119	57	1108	23
0.4911	0.0320	12.8903	0.8629	0.1904	0.0091		2576	168	2672	179	2745	25	2673	63
0.2391	0.0101	3.1237	0.1494	0.0947	0.0282		1382	58	1439	69	1523	43	1426	36
0.2376	0.0232	3.0865	0.3175	0.0942	0.0408		1374	134	1429	147	1513	62	1421	78
0.1957	0.0064	2.1130	0.1174	0.0783	0.0775		1152	37	1153	64	1155	89	1153	29
0.3304	0.0237	5.0403	0.5968	0.1107	0.0947		1840	132	1826	216	1810	171	1832	86
0.2533	0.0027	3.1485	0.0511	0.0901	0.0162		1456	16	1445	23	1429	23	1449	11
0.1898	0.0080	2.2429	0.2749	0.0857	0.1674		1120	47	1195	146	1331	223	1130	41
0.1781	0.0154	1.8735	0.2233	0.0763	0.1486		1057	92	1072	128	1103	164	1065	67
0.5180	0.0495	13.5857	1.5557	0.1902	0.0377		2691	257	2721	312	2744	104	2719	108
0.2724	0.0257	3.5749	0.4046	0.0952	0.0766		1553	147	1544	175	1532	117	1546	86
0.1869	0.0128	1.9976	0.2243	0.0775	0.1561		1104	76	1115	125	1135	177	1109	59
0.1931	0.0080	2.1016	0.2385	0.0789	0.1787		1138	47	1149	130	1170	209	1140	41
0.1885	0.0019	1.9880	0.0295	0.0765	0.0196		1113	11	1111	17	1108	22	1112	8
0.1765	0.0083	1.8616	0.2032	0.0765	0.1778		1048	49	1068	117	1108	197	1052	42
0.2018	0.0031	2.3122	0.0913	0.0831	0.0559		1185	18	1216	48	1272	71	1191	15
0.1903	0.0032	2.2744	0.0818	0.0867	0.0452		1123	19	1204	43	1354	61	1143	16
0.1790	0.0109	1.8599	0.2170	0.0753	0.1853		1062	65	1067	124	1078	200	1063	53
0.5214	0.0183	13.3983	0.5107	0.1864	0.0091		2705	95	2708	103	2710	25	2708	36
0.2635	0.0038	3.4199	0.0688	0.0941	0.0175		1508	22	1509	30	1511	26	1509	14
0.1797	0.0067	1.8587	0.0984	0.0750	0.0704		1065	40	1067	56	1069	75	1066	29
0.2502	0.0149	3.2928	0.2177	0.0955	0.0355		1439	86	1479	98	1537	55	1472	50
0.3339	0.0057	5.2327	0.1074	0.1137	0.0110		1857	32	1858	38	1859	20	1858	17
0.1740	0.0073	1.7662	0.0846	0.0736	0.0447		1034	44	1033	49	1031	46	1033	29
0.2002	0.0085	2.1990	0.1216	0.0797	0.0591		1176	50	1181	65	1189	70	1179	34
0.2016	0.0014	2.2156	0.0253	0.0797	0.0150		1184	8	1186	14	1190	18	1185	6
0.2493	0.0083	3.2038	0.1705	0.0932	0.0525		1435	48	1458	78	1492	78	1447	34
0.2430	0.0024	2.9622	0.0449	0.0884	0.0159		1402	14	1398	21	1392	22	1400	10
0.2362	0.0134	2.8953	0.2444	0.0889	0.0852		1367	78	1381	117	1402	120	1375	55
0.2528	0.0152	3.1788	0.2667	0.0912	0.0769		1453	87	1452	122	1451	112	1452	58
0.5117	0.0076	12.6866	0.2384	0.1798	0.0072		2664	40	2657	50	2651	19	2657	17
0.1826	0.0021	1.8818	0.0320	0.0747	0.0236		1081	13	1075	18	1061	25	1078	9
0.2211	0.0114	2.5626	0.2863	0.0840	0.1489		1288	67	1290	144	1294	193	1289	53
0.5275	0.0172	13.6891	0.5295	0.1882	0.0125		2731	89	2728	106	2727	34	2729	36
0.2379	0.0075	2.9126	0.1336	0.0888	0.0458		1376	43	1385	64	1400	64	1381	30
0.2244	0.0107	3.6599	0.3707	0.1183	0.0830		1305	62	1563	158	1931	160	1354	53
0.4947	0.0224	11.8741	0.6248	0.1741	0.0173		2591	117	2595	137	2597	45	2594	49
0.3039	0.0086	7.7524	0.2240	0.1850	0.0040		1710	48	2203	64	2699	11	2109	28
0.2346	0.0090	3.1730	0.2672	0.0981	0.0884		1359	52	1451	122	1588	140	1383	42
0.3431	0.0034	5.3494	0.0797	0.1131	0.0109		1902	19	1877	28	1849	20	1885	11

(*Continued*)

TABLE 6. LASER-ABLATION INDUCTIVELY COUPLED PLASMA–MASS SPECTROMETRY U-Pb ZIRCON DATA (*Continued*)

AB-4 (156 grains)

Isotopic ratios						Ages							
$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	Concordia	±2σ
0.2279	0.0067	2.9204	0.1193	0.0929	0.0362	1324	39	1387	57	1486	54	1360	27
0.1944	0.0030	2.5162	0.0532	0.0939	0.0178	1145	18	1277	27	1506	27	1211	14
0.2171	0.0048	2.4111	0.3131	0.0806	0.2080	1266	28	1246	162	1211	252	1265	25
0.2214	0.0173	2.4606	0.9310	0.0806	0.6014	1289	101	1261	477	1211	729	1287	89
0.2455	0.0204	3.7146	1.0545	0.1097	0.2754	1415	117	1575	447	1795	494	1432	102
0.2259	0.0243	2.6073	0.3402	0.0837	0.1119	1313	141	1303	170	1286	144	1305	90
0.2919	0.0191	4.0739	0.5544	0.1012	0.1343	1651	108	1649	224	1647	221	1650	80
0.2161	0.0118	3.2210	0.5962	0.1081	0.1827	1261	69	1462	271	1768	323	1278	61
0.3062	0.0147	4.4883	0.3398	0.1063	0.0618	1722	83	1729	131	1737	107	1726	55
0.5051	0.0286	13.1971	0.9311	0.1895	0.0252	2636	149	2694	190	2738	69	2688	66
0.4707	0.0139	11.1433	0.3587	0.1717	0.0083	2487	73	2535	82	2574	21	2534	30
0.1740	0.0162	2.1607	5.2039	0.0901	3.2198	1034	96	1168	2814	1427	4595	1034	89
0.2022	0.0056	2.2171	0.0723	0.0795	0.0293	1187	33	1186	39	1186	35	1187	21
0.1927	0.0033	2.7028	0.1667	0.1017	0.0663	1136	19	1329	82	1656	110	1149	17
0.1777	0.0142	1.8232	0.1846	0.0744	0.1185	1054	84	1054	107	1053	125	1054	59
0.5049	0.0042	12.5477	0.1413	0.1802	0.0047	2635	22	2646	30	2655	12	2645	10
0.1742	0.0047	1.7667	0.0610	0.0736	0.0429	1035	28	1033	36	1029	44	1034	20
0.2911	0.0418	4.4482	0.6861	0.1108	0.0561	1647	237	1721	266	1813	102	1712	127
0.5088	0.0409	13.3500	1.2842	0.1903	0.0317	2652	213	2705	260	2745	87	2701	91
0.2163	0.0128	2.4728	0.1801	0.0829	0.0652	1262	75	1264	92	1267	83	1264	49
0.2706	0.0272	3.6050	0.6068	0.0966	0.1622	1544	155	1551	261	1560	253	1547	110
0.2378	0.0025	3.4003	0.1335	0.1037	0.0413	1375	14	1504	59	1692	70	1387	12
0.4803	0.0682	11.2466	1.6485	0.1698	0.0239	2528	359	2544	373	2556	61	2544	137
0.3128	0.0438	5.4891	1.4025	0.1273	0.1830	1754	246	1899	485	2061	377	1817	179
0.4881	0.0414	11.5211	1.0357	0.1712	0.0193	2563	218	2566	231	2569	50	2566	84
1.9111	0.6972	173.8860	65.7625	0.6599	0.0310	6888	2513	5244	1983	4646	144	5121	411
0.1938	0.0061	2.1004	0.1009	0.0786	0.0621	1142	36	1149	55	1162	72	1145	27
0.2726	0.0032	4.5992	0.1414	0.1224	0.0253	1554	19	1749	54	1991	50	1591	15
0.2321	0.0086	3.3481	0.4199	0.1046	0.1291	1346	50	1492	187	1708	221	1361	43
0.2162	0.0132	2.7095	0.6418	0.0909	0.3017	1262	77	1331	315	1445	436	1268	68
0.3251	0.0410	4.9400	0.8105	0.1102	0.1057	1815	229	1809	297	1803	191	1810	131
0.1907	0.0030	2.5246	0.1102	0.0960	0.0495	1125	17	1279	56	1548	77	1143	15
0.3376	0.0064	5.2885	0.1991	0.1136	0.0316	1875	36	1867	70	1858	59	1871	25
0.2026	0.0102	2.3169	0.1386	0.0829	0.0500	1190	60	1217	73	1267	63	1209	40
0.2320	0.0193	2.7726	0.2923	0.0867	0.0925	1345	112	1348	142	1353	125	1347	73
0.3336	0.0035	5.1199	0.0619	0.1113	0.0060	1856	19	1839	22	1821	11	1841	10
0.1883	0.0150	1.9832	0.1946	0.0764	0.1041	1112	88	1110	109	1105	115	1111	60
0.3389	0.0067	5.2705	0.1347	0.1128	0.0158	1882	37	1864	48	1845	29	1868	21
0.3262	0.0086	5.0045	0.1519	0.1113	0.0147	1820	48	1820	55	1820	27	1820	25
0.2532	0.0204	3.4886	0.3115	0.0999	0.0441	1455	117	1525	136	1623	72	1512	69
0.5712	0.0225	16.6684	0.7145	0.2116	0.0094	2913	115	2916	125	2918	27	2916	41
0.2260	0.0108	2.8861	0.3573	0.0926	0.1464	1314	63	1378	171	1480	217	1327	53
0.2715	0.0199	4.0054	0.4803	0.1070	0.0993	1548	113	1635	196	1749	174	1591	82
0.1901	0.0119	2.0166	0.2524	0.0769	0.1934	1122	70	1121	140	1119	217	1122	57
0.2354	0.0083	3.1138	0.2842	0.0959	0.1023	1363	48	1436	131	1547	158	1378	40
0.1831	0.0118	1.8808	0.6141	0.0745	0.6111	1084	70	1074	351	1055	645	1083	63
0.2535	0.0189	3.1894	0.2899	0.0912	0.0684	1457	108	1455	132	1452	99	1455	66
0.1718	0.0084	1.7462	0.1038	0.0737	0.0664	1022	50	1026	61	1033	69	1025	35
0.2600	0.0097	3.3440	0.1767	0.0933	0.0475	1490	56	1491	79	1493	71	1491	37
0.2479	0.0143	3.0799	0.1892	0.0901	0.0281	1428	82	1428	88	1427	40	1428	46
0.2590	0.0033	3.2277	0.0614	0.0904	0.0190	1485	19	1464	28	1434	27	1472	13
0.1898	0.0060	2.0753	0.2468	0.0793	0.1921	1120	36	1141	136	1180	227	1122	32
0.5237	0.0280	13.4719	0.7743	0.1866	0.0127	2715	145	2713	156	2712	34	2713	54
0.4441	0.0345	10.6053	0.8512	0.1732	0.0131	2369	184	2489	200	2589	34	2488	75
0.5445	0.0244	14.8317	0.7263	0.1975	0.0116	2802	125	2804	137	2806	33	2804	47
0.3342	0.0124	5.2506	0.2431	0.1140	0.0268	1859	69	1861	86	1863	50	1860	38
0.3286	0.0099	5.0651	0.2138	0.1118	0.0293	1832	55	1830	77	1829	54	1831	33
0.1971	0.0108	2.1362	0.1568	0.0786	0.0831	1160	64	1161	85	1162	97	1160	45
0.3250	0.0095	5.3183	0.8779	0.1187	0.1501	1814	53	1872	309	1937	291	1818	45
0.2200	0.0236	2.5854	0.4628	0.0852	0.2102	1282	137	1297	232	1321	278	1289	103
0.3252	0.0099	4.9628	0.1917	0.1107	0.0239	1815	55	1813	70	1811	43	1813	31
0.5072	0.0149	12.6418	0.6411	0.1808	0.0258	2645	78	2653	135	2660	69	2651	43
0.2386	0.0037	2.8897	0.0697	0.0878	0.0260	1379	21	1379	33	1379	36	1379	15
0.1944	0.0033	2.1042	0.0672	0.0785	0.0461	1145	20	1150	37	1160	53	1147	16
0.2064	0.0189	2.2970	0.2885	0.0807	0.1390	1209	111	1211	152	1215	169	1211	78
0.2058	0.0115	2.4201	0.1604	0.0853	0.0520	1206	67	1249	83	1322	69	1236	45
0.4485	0.0175	11.2148	0.5499	0.1814	0.0185	2389	93	2541	125	2665	49	2519	45
0.4730	0.0161	12.4297	0.5162	0.1906	0.0141	2497	85	2637	110	2747	39	2623	39
0.2120	0.0025	2.3542	0.0660	0.0805	0.0414	1240	15	1229	34	1210	50	1237	12
0.2983	0.0182	4.2322	0.3616	0.1029	0.0659	1683	103	1680	144	1677	111	1681	64
0.2248	0.0184	2.6453	0.3557	0.0853	0.1560	1307	107	1313	177	1323	206	1310	79
0.2208	0.0112	2.7451	0.1648	0.0902	0.0425	1286	65	1341	81	1429	61	1325	42
0.3062	0.0041	4.7940	0.0771	0.1135	0.0086	1722	23	1784	29	1857	16	1772	13
0.5680	0.0180	16.1301	0.7208	0.2060	0.0178	2900	92	2885	129	2874	51	2887	42
0.3353	0.0071	5.3162	0.1448	0.1150	0.0165	1864	39	1871	51	1880	31	1870	22
0.3247	0.0112	4.9713	0.2264	0.1110	0.0298	1813	62	1814	83	1817	54	1814	36
0.1799	0.0020	1.8925	0.0430	0.0763	0.0358	1066	12	1078	25	1103	39	1070	10
0.2306	0.0144	3.0288	0.3606	0.0953	0.1245	1338	83	1415	168	1533	191	1364	66
0.5032	0.0172	12.3634	0.4429	0.1782	0.0066	2627	90	2632	94	2636	17	2632	34
0.2525	0.0040	3.2546	0.0926	0.0935	0.0299	1451	23	1470	42	1498	45	1460	17
0.3270	0.0084	5.1054	0.1744	0.1132	0.0220	1824	47	1837	63	1852	41	1834	27
0.1973	0.0049	2.2196	0.1430	0.0816	0.0944	1161	29	1187	77	1235	117	1166	25
0.1825	0.0166	1.9504	0.2693	0.0775	0.1828	1081	98	1099	152	1134	207	1089	75
0.2934	0.0055	4.6190	0.0991	0.1142	0.0102	1658	31	1753	38	1867	19	1735	18
0.3393	0.0189	5.3673	0.3480	0.1147	0.0321	1883	105	1880	122	1876	60	1880	54

(*Continued*)

TABLE 6. LASER-ABLATION INDUCTIVELY COUPLED PLASMA–MASS SPECTROMETRY U-Pb ZIRCON DATA (*Continued*)

Isotopic ratios						Ages							
$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	Concordia	±2σ
AB-4 (156 grains)													
0.5484	0.0249	14.9335	0.7642	0.1975	0.0137	2818	128	2811	144	2806	39	2811	49
0.2609	0.0142	3.3685	0.4001	0.0936	0.1330	1495	81	1497	178	1501	200	1495	63
0.2734	0.0180	3.6579	0.2584	0.0970	0.0306	1558	103	1562	110	1568	48	1562	56
0.2166	0.0174	2.8205	0.2375	0.0945	0.0311	1264	102	1361	115	1517	47	1342	62
0.2968	0.0040	4.1537	0.0806	0.1015	0.0158	1675	22	1665	32	1652	26	1668	14
0.3557	0.0369	8.3872	0.9291	0.1710	0.0255	1962	203	2274	252	2568	65	2239	103
DC-82 (168 grains)													(L69119515)
0.1810	0.0075	1.8841	0.3577	0.0755	0.3436	1072	44	1076	204	1082	372	1073	40
0.1717	0.0084	1.7365	0.3161	0.0733	0.3467	1021	50	1022	186	1023	355	1022	45
0.1892	0.0021	2.0267	0.0489	0.0777	0.0376	1117	12	1125	27	1139	43	1119	10
0.2520	0.0117	3.0248	0.4823	0.0871	0.2159	1449	67	1414	225	1362	294	1443	56
0.2103	0.0283	2.6037	0.4231	0.0898	0.1228	1230	166	1302	212	1421	175	1278	112
0.5310	0.0204	14.2665	0.8750	0.1949	0.0281	2746	105	2768	170	2784	78	2762	55
0.5333	0.0165	14.2238	0.5627	0.1934	0.0146	2755	85	2765	109	2772	40	2764	37
0.2389	0.0124	3.4228	0.6131	0.1039	0.1865	1381	72	1510	270	1695	316	1395	62
0.1702	0.0164	1.5433	0.6715	0.0657	1.1141	1013	98	948	412	798	889	1008	88
0.1696	0.0108	1.9144	0.2310	0.0819	0.1618	1010	64	1086	131	1242	201	1031	54
0.1692	0.0064	1.9440	0.1114	0.0833	0.0659	1008	38	1096	63	1277	84	1043	30
0.5220	0.0346	13.1775	0.9263	0.1831	0.0145	2708	179	2692	189	2681	39	2692	66
0.5181	0.1056	12.9565	2.6760	0.1814	0.0207	2691	549	2676	553	2666	55	2676	194
0.2365	0.0120	2.9170	0.1734	0.0895	0.0417	1368	69	1386	82	1414	59	1382	43
0.2532	0.0145	3.1894	0.2567	0.0914	0.0737	1455	83	1455	117	1454	107	1455	55
0.2505	0.0070	3.0257	0.2483	0.0876	0.1079	1441	40	1414	116	1374	148	1435	33
0.2539	0.0027	3.0804	0.0579	0.0880	0.0216	1459	16	1428	27	1383	30	1444	11
0.6098	0.2010	20.1139	6.6884	0.2392	0.0222	3069	1012	3097	1030	3115	69	3098	319
0.2052	0.0049	2.2653	0.1163	0.0800	0.0746	1203	29	1202	62	1198	89	1203	24
0.2378	0.0112	2.9459	0.1583	0.0898	0.0345	1375	65	1394	75	1422	49	1390	39
0.4984	0.0367	11.6567	0.9734	0.1696	0.0259	2607	192	2577	215	2554	66	2578	78
0.3037	0.0320	7.3796	1.0455	0.1762	0.0602	1710	180	2159	306	2618	158	1938	128
0.2272	0.0067	3.6960	1.2150	0.1180	0.3047	1320	39	1571	516	1926	587	1322	35
0.1814	0.0148	1.8683	0.1969	0.0747	0.1266	1075	88	1070	113	1060	134	1072	62
0.2753	0.0097	3.6778	0.2418	0.0969	0.0666	1568	55	1567	103	1565	104	1567	40
0.2188	0.0130	3.3268	1.1268	0.1103	0.3363	1276	76	1487	504	1804	607	1282	68
0.2443	0.0138	2.9488	0.6161	0.0876	0.2820	1409	80	1395	291	1373	387	1407	68
0.2204	0.0119	2.3701	2.0963	0.0780	1.5296	1284	69	1234	1091	1147	1754	1284	63
0.2283	0.0129	3.7648	0.6250	0.1196	0.1430	1326	75	1585	263	1950	279	1352	66
0.2282	0.0086	3.3220	0.3143	0.1056	0.0924	1325	50	1486	141	1725	159	1353	43
0.2367	0.0092	3.4416	0.3836	0.1054	0.1114	1370	53	1514	169	1722	192	1391	46
0.3616	0.0186	6.5634	0.9800	0.1316	0.1158	1990	102	2054	307	2120	246	2006	80
0.2078	0.0064	2.4175	0.1784	0.0844	0.1003	1217	37	1248	92	1301	131	1224	31
0.2025	0.0045	2.3036	0.0816	0.0825	0.0430	1189	26	1213	43	1257	54	1200	20
0.1654	0.0061	1.6398	0.0877	0.0719	0.0803	987	36	986	53	984	79	986	28
0.1597	0.0062	1.5689	0.0793	0.0713	0.0679	955	37	958	48	965	66	957	27
0.2564	0.0163	4.1900	0.2930	0.1185	0.0267	1471	94	1672	117	1934	52	1626	57
0.2546	0.0154	3.3814	0.3724	0.0963	0.1111	1462	88	1500	165	1554	173	1478	66
0.3324	0.0361	5.2392	0.6247	0.1143	0.0476	1850	201	1859	222	1869	89	1858	101
0.2872	0.0131	5.3357	0.4694	0.1347	0.0607	1628	74	1875	165	2160	131	1706	58
0.4996	0.0285	12.2425	0.7805	0.1777	0.0179	2612	149	2623	167	2632	47	2623	60
0.4994	0.0154	12.2549	0.6797	0.1780	0.0290	2611	81	2624	146	2634	77	2620	46
0.1708	0.0061	1.9356	0.3531	0.0822	0.2801	1017	36	1093	199	1250	350	1020	33
0.1744	0.0015	1.8644	0.0345	0.0776	0.0289	1036	9	1069	20	1135	33	1044	7
0.1729	0.0063	2.0939	0.2698	0.0878	0.1724	1028	37	1147	148	1378	238	1037	34
0.1929	0.0043	2.1191	0.2270	0.0797	0.1740	1137	25	1155	124	1189	207	1138	23
0.3390	0.0023	5.3463	0.0512	0.1144	0.0066	1882	13	1876	18	1870	12	1878	8
0.3346	0.0068	5.2804	0.1439	0.1145	0.0174	1861	38	1866	51	1871	33	1864	22
0.2289	0.0082	3.1072	0.2586	0.0985	0.0878	1329	48	1434	119	1595	140	1353	40
0.5173	0.0329	12.9919	1.1032	0.1822	0.0349	2688	171	2679	227	2673	93	2680	78
0.1626	0.0114	1.5725	1.2627	0.0702	1.7592	971	68	959	770	933	1641	971	63
0.2003	0.0074	2.7130	0.1853	0.0982	0.0676	1177	43	1332	91	1591	108	1220	36
0.1996	0.0072	2.5353	0.1894	0.0921	0.0846	1173	42	1282	96	1470	124	1200	35
0.2109	0.0068	2.4468	0.2581	0.0842	0.1506	1234	40	1256	133	1296	195	1237	35
0.5301	0.0254	13.8034	0.9605	0.1889	0.0304	2742	131	2736	190	2732	83	2737	63
0.5139	0.0293	14.3227	0.8342	0.2021	0.0067	2673	152	2771	161	2844	19	2774	55
0.1847	0.0042	2.1103	0.1265	0.0829	0.0855	1093	25	1152	69	1266	108	1103	22
0.4474	0.0316	11.7345	0.8543	0.1902	0.0105	2384	168	2583	188	2744	29	2582	68
0.3243	0.0033	5.1770	0.1008	0.1158	0.0157	1811	18	1849	36	1892	30	1829	13
0.2375	0.0026	2.9059	0.0527	0.0887	0.0199	1374	15	1383	25	1399	28	1378	11
0.2364	0.0104	2.8453	0.1958	0.0873	0.0748	1368	60	1368	94	1367	102	1368	43
0.3162	0.0235	5.6975	0.4644	0.1307	0.0279	1771	132	1931	157	2107	59	1909	70
0.1761	0.0126	1.8240	0.2503	0.0751	0.2197	1046	75	1054	145	1072	235	1048	61
0.1749	0.0078	1.7585	0.1891	0.0729	0.1962	1039	46	1030	111	1012	199	1037	39
0.5172	0.1642	14.4172	4.6400	0.2022	0.0305	2687	853	2778	894	2844	87	2780	304
0.1798	0.0108	2.3519	1.9834	0.0949	1.0392	1066	64	1228	1036	1525	1585	1067	59
0.1827	0.0015	1.8838	0.0279	0.0748	0.0234	1082	9	1075	16	1063	25	1079	7
0.2310	0.0065	2.7915	0.1507	0.0877	0.0644	1340	38	1353	73	1375	89	1345	29
0.2307	0.0070	2.7498	0.0954	0.0864	0.0237	1338	41	1342	47	1348	32	1341	25
0.1846	0.0184	2.4369	0.4431	0.0958	0.1855	1092	109	1254	228	1543	286	1134	92
0.2291	0.0066	2.7159	0.1194	0.0860	0.0481	1330	38	1333	59	1338	64	1331	27
0.2144	0.0074	2.4527	0.1114	0.0830	0.0456	1252	43	1258	57	1269	58	1256	29
0.2381	0.0098	2.8940	0.2802	0.0882	0.1213	1377	57	1380	134	1386	168	1378	46
0.2410	0.0024	2.8676	0.0902	0.0863	0.0429	1392	14	1373	43	1345	58	1389	12
0.2381	0.0054	3.1445	0.1511	0.0958	0.0517	1377	31	1444	69	1544	80	1397	25
0.4652	0.0206	11.4133	1.0651	0.1779	0.0518	2462	109	2558	239	2634	136	2510	71
0.3388	0.0452	6.1209	0.9920	0.1310	0.0766	1881	251	1993	323	2112	162	1971	139

(*Continued*)

TABLE 6. LASER-ABLATION INDUCTIVELY COUPLED PLASMA–MASS SPECTROMETRY U-Pb ZIRCON DATA (*Continued*)

DC-82 (168 grains)

Isotopic ratios						Ages							
$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	Concordia	±2σ
0.5549	0.0198	15.1758	0.7221	0.1983	0.0182	2846	102	2826	134	2813	51	2828	44
0.5463	0.0039	14.7831	0.1461	0.1963	0.0040	2810	20	2801	28	2795	11	2803	9
0.5251	0.0196	13.8161	1.1007	0.1908	0.0421	2721	102	2737	218	2749	116	2730	62
0.3219	0.0241	4.8402	0.4511	0.1091	0.0568	1799	135	1792	167	1784	101	1793	75
0.3563	0.0553	5.9333	1.1480	0.1208	0.1047	1965	305	1966	380	1968	206	1966	163
0.3404	0.0066	5.4399	0.1679	0.1159	0.0229	1889	37	1891	58	1894	43	1890	23
0.1988	0.0084	2.1777	1.0668	0.0794	0.8150	1169	49	1174	575	1183	964	1169	45
0.2436	0.0140	3.1405	0.4126	0.0935	0.1490	1405	81	1443	190	1498	223	1416	65
0.2451	0.0024	3.0455	0.0658	0.0901	0.0257	1413	14	1419	31	1428	37	1415	11
0.5268	0.0128	13.7073	0.3932	0.1887	0.0092	2728	66	2730	78	2731	25	2730	27
0.5303	0.0125	14.0021	0.3833	0.1915	0.0083	2743	65	2750	75	2755	23	2750	26
0.2278	0.0079	2.6898	0.1930	0.0857	0.0915	1323	46	1326	95	1330	122	1324	36
0.3151	0.0232	4.7645	0.7609	0.1097	0.1439	1766	130	1779	284	1794	258	1771	96
0.2392	0.0084	2.9071	0.1269	0.0882	0.0359	1383	49	1384	60	1386	50	1383	31
0.2161	0.0458	2.6412	0.5872	0.0886	0.0933	1261	267	1312	292	1396	130	1303	161
0.3953	0.0247	17.2353	1.3774	0.3163	0.0216	2147	134	2948	236	3552	77	2561	91
0.2296	0.0076	2.7190	0.7519	0.0859	0.3975	1332	44	1334	369	1336	531	1332	39
0.1890	0.0019	2.0312	0.0389	0.0779	0.0285	1116	11	1126	22	1145	33	1119	9
0.1819	0.0026	2.0748	0.0579	0.0827	0.0369	1077	15	1141	32	1263	47	1096	13
0.1805	0.0145	1.8665	0.2062	0.0750	0.1425	1070	86	1069	118	1069	152	1069	63
0.2278	0.0084	2.6614	0.4235	0.0847	0.2294	1323	49	1318	210	1310	300	1322	43
0.2878	0.0145	4.0454	0.3301	0.1019	0.0716	1631	82	1643	134	1660	119	1638	56
0.3295	0.0177	5.0879	0.3042	0.1120	0.0261	1836	99	1834	110	1832	48	1834	50
0.2671	0.0089	4.4744	0.2820	0.1215	0.0481	1526	51	1726	109	1978	95	1592	40
0.2688	0.0032	4.4055	0.1242	0.1189	0.0235	1535	18	1713	48	1939	46	1576	15
0.1871	0.0082	1.9060	0.1074	0.0739	0.0694	1106	48	1083	61	1038	72	1091	33
0.2706	0.0139	4.9363	0.4508	0.1323	0.0621	1544	79	1808	165	2129	132	1633	62
0.5154	0.0046	12.8818	0.1505	0.1813	0.0047	2680	24	2671	31	2665	13	2672	11
0.5076	0.0227	12.6844	0.6253	0.1813	0.0128	2646	118	2657	131	2664	34	2656	46
0.2010	0.0028	2.2658	0.0770	0.0818	0.0491	1181	16	1202	41	1240	61	1185	14
0.1879	0.0124	1.9971	0.1917	0.0771	0.1236	1110	73	1115	107	1124	139	1112	54
0.2341	0.0020	2.8112	0.0327	0.0871	0.0111	1356	12	1359	16	1362	15	1358	8
0.2252	0.0091	2.6297	0.1322	0.0847	0.0441	1309	53	1309	66	1308	58	1309	34
0.2100	0.0106	2.7363	0.4874	0.0945	0.2123	1229	62	1338	238	1518	322	1239	55
0.2323	0.0097	2.7800	0.2103	0.0868	0.0896	1347	56	1350	102	1356	122	1348	43
0.1787	0.0076	1.8418	0.2252	0.0747	0.2173	1060	45	1061	130	1061	231	1060	39
0.5243	0.0207	14.8011	0.6109	0.2047	0.0068	2717	107	2803	116	2864	19	2804	39
0.2920	0.0161	4.0702	0.2423	0.1011	0.0254	1652	91	1648	98	1645	42	1649	48
0.1877	0.0061	2.1497	0.2539	0.0831	0.1744	1109	36	1165	138	1271	222	1114	32
0.2086	0.0132	2.3187	0.1594	0.0806	0.0435	1221	77	1218	84	1213	53	1219	47
0.5202	0.0047	14.0298	0.1585	0.1956	0.0041	2700	24	2752	31	2790	11	2747	11
0.5378	0.0048	14.5793	0.1601	0.1966	0.0038	2774	25	2788	31	2798	11	2787	10
0.5260	0.0115	13.7355	0.3156	0.1894	0.0043	2725	60	2732	63	2737	12	2732	22
0.4941	0.0744	11.6176	3.6284	0.1705	0.1786	2588	390	2574	804	2563	458	2580	240
0.1867	0.0027	2.0251	0.0509	0.0787	0.0352	1103	16	1124	28	1164	41	1111	13
0.2218	0.0103	3.0738	0.1788	0.1005	0.0395	1291	60	1426	83	1634	65	1375	42
0.2266	0.0027	2.9455	0.0456	0.0943	0.0120	1317	16	1394	22	1514	18	1366	11
0.3388	0.0100	5.8007	0.2688	0.1242	0.0314	1881	56	1947	90	2017	63	1921	36
0.3369	0.0065	5.3169	0.1263	0.1145	0.0132	1872	36	1872	44	1872	25	1872	20
0.2522	0.0295	3.2806	0.6128	0.0943	0.1813	1450	170	1476	276	1515	275	1464	121
0.2375	0.0126	2.8841	0.2057	0.0881	0.0663	1374	73	1378	98	1384	92	1376	48
0.2998	0.0203	4.3596	0.8207	0.1055	0.1873	1690	114	1705	321	1723	323	1694	91
0.6291	0.0067	20.8598	0.2569	0.2405	0.0031	3146	34	3132	39	3123	10	3132	12
0.2172	0.0086	2.5814	0.5465	0.0862	0.2993	1267	50	1295	274	1342	402	1269	45
0.1705	0.0112	1.7740	0.6768	0.0755	0.6974	1015	67	1036	395	1081	754	1016	61
0.2362	0.0092	2.8170	0.4558	0.0865	0.2246	1367	53	1360	220	1349	303	1366	46
0.5342	0.0158	14.5176	0.4597	0.1971	0.0065	2759	82	2784	88	2802	18	2784	30
0.1959	0.0106	2.0915	0.6154	0.0774	0.5085	1153	62	1146	337	1133	576	1153	56
0.3274	0.0061	4.9944	0.1368	0.1106	0.0203	1826	34	1818	50	1810	37	1821	21
0.5026	0.0134	13.0009	0.4397	0.1876	0.0126	2625	70	2680	91	2721	34	2674	32
0.1937	0.0020	2.2080	0.0360	0.0827	0.0195	1141	12	1184	19	1261	25	1160	9
0.1785	0.0055	1.9692	0.2395	0.0800	0.1939	1059	33	1105	134	1197	232	1062	29
0.2405	0.0021	2.8895	0.0332	0.0871	0.0106	1389	12	1379	16	1364	14	1382	8
0.1815	0.0097	1.8325	0.7923	0.0732	0.8518	1075	57	1057	457	1020	869	1075	52
0.3190	0.0030	4.8306	0.0596	0.1098	0.0081	1785	17	1790	22	1797	15	1789	10
0.1780	0.0070	2.0358	0.1441	0.0829	0.0905	1056	42	1128	80	1268	115	1079	34
0.2594	0.0092	3.7653	0.1846	0.1053	0.0363	1487	53	1585	78	1719	63	1546	36
0.2464	0.0017	3.0622	0.0385	0.0901	0.0139	1420	10	1423	18	1428	20	1422	7
0.2473	0.0020	3.1316	0.0438	0.0918	0.0149	1425	12	1440	20	1464	22	1432	8
0.2498	0.0048	4.0550	0.1697	0.1177	0.0348	1437	28	1645	69	1922	67	1485	23
0.2906	0.0126	4.0905	0.2128	0.1021	0.0321	1645	71	1652	86	1662	53	1651	41
0.5004	0.0168	13.5081	0.5118	0.1958	0.0103	2616	88	2716	103	2791	29	2712	36
0.2958	0.0085	4.5458	0.4677	0.1115	0.0983	1670	48	1739	179	1824	179	1680	40
0.2811	0.0069	3.8337	0.2239	0.0989	0.0617	1597	39	1600	93	1604	99	1598	30
0.5168	0.0351	13.2025	1.1216	0.1853	0.0312	2686	182	2694	229	2701	84	2693	79
0.2870	0.0406	4.0485	0.6839	0.1023	0.1024	1627	230	1644	278	1666	171	1641	133
0.2461	0.0115	2.9434	0.8974	0.0867	0.4288	1418	66	1393	425	1355	581	1417	58
0.3255	0.0327	5.2577	0.7715	0.1171	0.1005	1817	182	1862	273	1913	192	1847	114
0.1773	0.0080	1.8331	0.3773	0.0750	0.3777	1052	47	1057	218	1069	404	1052	43
0.5148	0.0041	13.8857	0.1383	0.1956	0.0034	2677	21	2742	27	2790	10	2736	9
0.5133	0.0319	13.9794	0.8971	0.1975	0.0095	2671	166	2748	176	2806	27	2750	61
0.5159	0.0253	13.0349	0.8855	0.1833	0.0289	2682	132	2682	182	2683	78	2682	62
0.5105	0.0210	13.1549	0.6849	0.1869	0.0193	2659	109	2691	140	2715	53	2688	49
0.1900	0.0098	1.9962	0.8670	0.0762	0.7843	1121	58	1114	484	1100	863	1121	53

(*Continued*)

TABLE 6. LASER-ABLATION INDUCTIVELY COUPLED PLASMA–MASS SPECTROMETRY U-Pb ZIRCON DATA (*Continued*)

DC-82 (168 grains)													
Isotopic ratios						Ages							
$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	$^{206}Pb/^{238}U$	±2σ	$^{207}Pb/^{235}U$	±2σ	$^{207}Pb/^{206}Pb$	±2σ	Concordia	±2σ
0.1886	0.0114	1.9909	0.1451	0.0766	0.0728	1114	67	1112	81	1110	81	1113	45
0.5525	0.0355	14.7116	0.9752	0.1931	0.0099	2836	182	2797	185	2769	27	2796	63
0.2671	0.0046	4.7532	0.1140	0.1291	0.0141	1526	26	1777	43	2085	29	1658	19
0.2778	0.0052	4.3669	0.1203	0.1140	0.0197	1580	30	1706	47	1864	37	1651	20
0.5093	0.0101	12.5498	0.2888	0.1787	0.0073	2654	53	2646	61	2641	19	2647	22
0.2036	0.0020	2.4582	0.0669	0.0875	0.0356	1195	12	1260	34	1373	49	1205	10
0.3403	0.0068	5.4062	0.1272	0.1152	0.0118	1888	38	1886	44	1884	22	1886	20

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TABLE 7. Rb-Sr MUSCOVITE-FELDSPAR MINERAL AGE FROM THE DEERPARK COMPLEX

Sample	Type		Locality	Rb (ppm)	Sr (ppm)	$^{87}Rb/^{86}Sr$	$^{87}Sr/^{86}Sr$	$\pm 2\sigma$	Age (Ma)
DC 8-1-24	Muscovite	L8391 8127	Falduff	238.3	25.27	27.85	0.918035	0.000076	482.9 ± 7.1 Ma
"	Plagioclase	"	"	2.129	29.6	0.2087	0.727837	0.000106	($^{87}Sr/^{86}Sr_i$ = 0.72640)

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TABLE 8. THERMOCALC* AVERAGE PRESSURE-TEMPERATURE (*P-T*) RESULTS

Phase	DP-9 [L84238122]	DC 4-8-3 [NS05445852]
Garnet		
py	0.00520	0.00300
gr	0.00250	0.00560
alm	0.22000	0.29000
spss	0.00140	0.00003
Muscovite		
mu	0.44000	0.64000
cel	0.10300	0.05100
fcel	0.02300	0.03300
pa	0.10770	0.31100
Epidote		
cz	0.24000	–
ep	0.70000	–
Chlorite		
clin	0.02300	0.01900
daph	0.02300	0.02800
ames	0.01220	0.01240
Plagioclase		
ab	0.98000	0.99000
Other	quartz, H_2O	quartz, H_2O
Results		
aH_20	1.0	1.0
T (°C)	580	578
s.d. (*T*)	26	10
P (kbar)	3.3	5.3
s.d. (*P*)	1.8	0.7
Correlation	0.75	0.49
Fit	1.35	0.32
No. of reactions	4 (gr, clin excluded)	4 (clin excluded)

*Average *P-T* data calculated with THERMOCALC v3.26 using the 22 November 2003 version of the thermodynamic data set (Holland and Powell, 1998). Activities were calculated using the program AX at 5.0 kbar and 550 °C.

U-Pb zircon analytical technique

Zircons were separated from several kilograms of sample by conventional means. The sub-300 μm fraction was processed using a Wilfey table, and then the Wilfey heavy fraction was passed through a Frantz magnetic separator at 1 A. The non-paramagnetic portion was then placed in a filter funnel with di iodomethane. The resulting heavy fraction was then passed again through the Frantz magnetic separator at full current. All zircons were hand picked in ethanol using a binocular microscope.

LA-ICPMS

For LA-ICPMS analyses, zircon grains were mounted into epoxy resin blocks and polished to obtain flat surfaces. This was followed by cathodoluminescence imaging of individual zircon grains with an SEM microscope to image the internal structures of grains. Samples were analyzed using a 193-nm Excimer laser ablation attached to a Perkin Elmer 6100 ICPMS at the University of Lausanne. We applied both rastering and spot mode for data collection depending on the grain size. Rastering acquisition consisted of 1400 readings, comprising 350 blank readings and 1050 data readings, whereas spot analyses comprised 200 blank readings and 500 data readings. Output laser energy varied between 120 and 160 mJ/pulse for a 30-μm beam diameter. A repetition rate of 10 Hz and 4 Hz was used for rastering and spot analyses, respectively. Helium was used as a carrier gas (1.1 $L.min^{-1}$) for the ablated material from the ablation cell. External correction of laser-induced Pb/U fractionation was monitored by repeated measurements of two reference zircons with known ages, Plesovice (336.45 Ma ± 0.13 Ma, Slama et al. 2008) and 91500 (1065.4 ± 0.3 Ma, Wiedenbeck et al., 1995). For internal correction of mass bias during analysis, Tl-U tracer solution (natural Tl mixed with artificial ^{233}U-^{236}U; $^{236}U/^{233}U = 0.8450$ and $^{205}Tl/^{233}U = 1.2$) was aspirated through Apex desolvating nebuliser and mixed online with the sample aerosol before reaching the plasma (Horn et al., 2000; Košler et al., 2002). Data were processed through in-house Excel macros (LAMDATE, J. Košler). Rastering typically yielded a two-fold improvement in precision over spot analysis. During the course of this study, the Plesovice zircon yielded an age of 337.25 ± 0.76 Ma (2σ; n = 231), which is identical, within error, to the reported TIMS age of 337.13 ± 0.37 Ma (Sláma et al., 2008). The well-characterized 91500 zircon standard gave an age of 1064.5 ± 2.4 Ma (2σ; n = 109) which is also in excellent agreement with its accepted age (Wiedenbeck et al., 1995).

Ion microprobe

For ion microprobe analyses, zircons were mounted in a resin disk along with the zircon standard (91500) and polished to reveal the grain interiors. The mounts were gold-coated and imaged with a Hitachi S-4300 scanning electron microscope (SEM), using a cathodoluminescence probe (CL) to image internal structures, overgrowths and zonation. Secondary electron mode (SE) imaging was employed to detect fractures and inclusions within the grains. U–Th–Pb zircon analyses were performed on a Cameca IMS 1270 ion-microprobe following methods described by Whitehouse and Kamber (2005) modified from Whitehouse et al. (1999). U/Pb ratio calibration was based on repeat analyses of the Geostandards zircon 91500, which has an age of 1065.4 ± 0.3 Ma and U and Pb concentrations of 80 and 15 ppm, respectively (Wiedenbeck et al., 1995). Data reduction employed Excel macros developed by Whitehouse at the Swedish Natural History Museum, Stockholm. Age calculations were made using Isoplot version 3.02 (Ludwig, 2003). U–Pb data are plotted as 2σ error ellipses (Fig. 4b). All age errors quoted in the text are 2σ unless specifically stated otherwise. Common lead corrections were only applied to ion-microprobe results that exhibited significant levels of ^{204}Pb, and are indicated in Table 1. Common Pb correction uses a modern day average terrestrial common Pb composition (Stacey and Kramers, 1975; ^{207}Pb/^{206}Pb = 0.83) assuming that any common Pb detected was derived solely from surface contamination and cryptic micro-fractures, given that inclusions were avoided. The modern day Pb composition of Stacey and Kramers (1975) has been demonstrated as appropriate for the Nordsim Laboratory (Kirkland et al. 2008; ^{207}Pb/^{206}Pb = 0.834).

Whole rock isotope geochemistry

Whole-rock samples were analyzed for major oxides and trace elements by X-ray fluorescence (XRF) spectroscopy using a Phillips PW 1400 at the Centre d'Analyses Minérale, University of Lausanne, Switzerland. Rare-earth element and trace element concentrations were also determined by inductively coupled plasma mass spectrometry (ICP-MS) using a Hewlett Packard 4500 at the Institute F.- A. Forel, Versoix, Switzerland. Neodymium isotope analyses were carried out at the Department of Mineralogy, University of Geneva, Switzerland. Samarium and Nd concentrations for age-correcting the isotopic data used the values determined by ICP-MS. Repeated analyses of Sm/Nd ratios using the

Geological Survey of Japan JB-3 (basalt) standard yields a precision (2σ) of better than 2.75%.

Samples for isotopic and ICPMS analysis were digested in a 5 ml of *ca* 40% HF and 1 ml of *ca* 15M HNO_3. Samples were digested in closed PTFE beakers for one week at a temperature of 170 °C. When dry, the samples were treated with 2 x 2 ml additions of *ca* 15M HNO_3 followed by 1 ml of *ca* 6M HCl. 5 ml of *ca* 6M HCl was then added and left to stand overnight at 170 °C. Following digestion, samples for isotopic analysis were converted to nitrate by 3 x 1 ml additions of 4M HNO_3, dissolved in 2 ml of 1M HNO_3, centrifuged and then loaded onto the ion exchange columns. Teflon-distilled HCl and HF and Ultrex-II HNO3 were used throughout the dissolution and chemical separation procedures, and reagent and total procedure blanks are negligible. Neodymium separation employed Eichrom TRU-Spec Resin (50 - 100 μm) in disposable PP columns in series with Ln-Spec Resin (50 - 100 μm), using the methods described in Pin and Zalduegui (1997).

Neodymium isotope ratios were measured on a seven-collector Finnigan MAT 262 thermal ionization mass spectrometer with extended geometry and stigmatic focusing using double Re filaments. $^{143}Nd/^{144}Nd$ was measured in a semidynamic mode (quadruple collectors, measurement jumping mode), mass fractionation corrected to $^{146}Nd/^{144}Nd = 0.721903$, and normalized to the La Jolla standard = 0.511837. The mean of 101 replicated analyses of this standard is 0.511837 ± 2 (2σ). T_{DM} ages were calculated using the depleted mantle curve of DePaolo (1981).

Lu-Hf analyses

In situ measurements of Lu-Hf isotopes in zircon were performed at the MicroAnalysis Facility – Inco Innovation Centre at Memorial University of Newfoundland using a GeoLas laser ablation system coupled to a Thermo Finnigan Neptune multiple collector inductively coupled plasma mass spectrometer (MC-ICPMS). Laser-ablationwas carried out in spot mode using a Lambda Physik Complex Pro ArF excimer laser operating at a wavelength of 193nm, a fluence of 5 J cm^{-2}, a repetition rate of 10 Hz and a spot size of 49 μm.

Isotopic data were measured using Faraday cups for the following masses: ^{171}Yb, ^{173}Yb, ^{174}Hf, ^{175}Lu, $^{176}Hf+Yb+Lu$, ^{177}Hf, ^{178}Hf and ^{179}Hf using an integration time of 1 cycle s^{-1}. For each analysis, a gas blank was acquired for ~30 s followed by 60 s of laser ablation. After blank correction, data were calculated cycle by cycle from a user-selected interval from the ablation period (typically 30–50 cycles) and averaged.

^{176}Yb and ^{176}Lu were calculated from the mass 176 signal using ^{176}Yb/^{173}Yb = 0.7938 (Segal et al, 2003) and ^{176}Lu/^{175}Lu = 0.2656 (Chu *et al.*, 2002), with an exponential law mass bias correction using ^{173}Yb/^{171}Yb=1.1301 (Segal *et al.*, 2003). The interference corrected ^{176}Lu/^{177}Hf was normalized to ^{179}Hf/^{177}Hf = 0.7325 (Patchett and Tatsumoto, 1980) for mass bias correction. ^{176}Hf/^{177}Hf outliers were removed by 2SD rejection. ^{176}Lu/^{177}Hf and ^{176}Yb/^{177}Hf ratios were also corrected for mass bias using ^{179}Lu/^{177}Hf, but without outlier rejection.

The corrected ^{178}Hf/^{177}Hf ratio was calculated to monitor the accuracy of the mass bias correction and yielded an average value of 1.46721 ± 0.000006 (2SD, n=15), which is in the range of values reported by Thirwall and Anczkiewicz (2004). Plesovice zircon was analyzed as a standard and yielded an average ^{176}Lu/^{177}Hf ratio = 0.282474 ± 0.000035 (2SD, n=26), in agreement within error of the reported value of 0.282482 ± 0.000013 (Slama et al, 2008).

Rb-Sr dating

For Rb-Sr analyses, standard ion exchange methods were used for chemical separation of elements. Samples were loaded on tantalum filaments and were analyzed on a semi-automated single collector VG Micromass 30 mass spectrometer at the Department of Geology, University College Dublin. During the course of analysis, NBS SRM 987 gave ^{87}Sr/^{86}Sr ratios of 0.71027 ± 5 (n = 8, 2σ) and NBS SRM 607 yielded ^{87}Rb/^{86}Sr ratios of 8.005±13 (n=7, 2σ). Strontium blanks averaged 1.5 ng and were insignificant. 2σ analytical uncertainties of 1.5% for ^{87}Rb/^{86}Sr and tabulated values (Table 1) for ^{87}Sr/^{86}Sr ratios were used in age calculations, using a value of 0.0142 Ga $^{-1}$ for the ^{87}Rb decay constant (Steiger and Jäger, 1977).

Ar-Ar dating

The muscovite and biotite grains selected for ^{40}Ar–^{39}Ar geochronology were irradiated together with the FCT sanidine standard (28.02 Ma; Renne *et al.,* 1998), for 70 hours in the 1MW, Cd-lined CLICIT facility at the University of Oregon. J values were calculated with a precision of 0.05%. The biotites and monitors were analysed at the ^{40}Ar–^{39}Ar geochronology laboratory at the University of Lund. The lab consists of a Micromass 5400 mass spectrometer with a Faraday detector and an electron multiplier, a metal extraction line, containing two SAES C50-ST101 Zr–Al getters and a cold finger cooled to ca. -155 °C by a Polycold P100 cryogenic refrigeration unit. Single grains of biotite were step-heated using a defocused 50W CO_2 laser rastered over the samples to provide even heating of the grain. Ar isotope compositions were measured on the electron multiplier and time zero regressions were fitted to data collected from 10 scans over the mass range of 40–36. Peak heights and backgrounds were corrected for mass discrimination, isotopic decay and interfering nucleogenic Ca-, K-, and Cl-derived isotopes. ^{40}Ar blanks were calculated before every new sample and after every three unknown steps. ^{40}Ar blanks were between 4.0 and 2 x 10^{-16} moles. Blank values for masses 39–36 were all less than 7 x 10^{-18} moles. Blank values were subtracted for all incremental steps from the sample signal. Age plateaus were determined using the criteria of Dalrymple and Lanphere (1971), which specify the presence of at least three contiguous incremental heating steps with statistically indistinguishable ages that constitute >50% of the total ^{39}Ar released during the experiment.

Electron microprobe analyses

Quantitative microprobe analyses were carried out at the Institute of Mineralogy and Geochemistry at the University of Lausanne, using a Jeol 8200 superprobe and at the Department of Earth Sciences at Uppsala University using a Cameca SX50 electron microprobe. The operating conditions for the Jeol 8200 were an accelerating voltage of 15 kV, a beam current of 15 nA for feldspars and hydrous phases and a beam current of 20 nA for garnet. A spot size as low as 1 micron was used for anhydrous phases such as garnet, while for feldspars and anhydrous phases such as amphiboles and micas, a beam size of up to 10 microns was used to prevent the loss of volatile elements such as Na and K. The operating conditions for the Cameca SX 50 were an accelerating voltage of 20 kV and a beam current of 15 nA. A spot size as low as 1 micron was used for anhydrous phases such as garnet, while for feldspars and anhydrous phases such as amphiboles and micas, a beam size of up to 5 microns was used to prevent the loss of volatile elements such as Na and K. Data reduction was carried out using ZAF corrections on both microprobes and a set of natural standards and synthetic standards was used for calibration.

References

Chew, D.M., Graham, J.R., and Whitehouse, M.J., 2007, U-Pb zircon geochronology of plagiogranites from the Lough Nafooey (= Midland Valley) arc in western Ireland: constraints on the onset of the Grampian orogeny: Journal of the Geological Society, v. 164, p. 747-750.

Chu, N.-C., Taylor, R.N., Chavagnac, V., Nesbitt, R.W., Boella, R.M., Milton, J.A., German, C.R., Bayon G, and Burton, K., 2002, Hf isotope ratio analysis using multi-collector inductively coupled plasma mass spectrometry: an evaluation of isobaric interference corrections: Journal of Analytical Atomic Spectrometry, v. 17, p. 1567-1574.

Dalrymple, G.B., and Lanphere, M.A., 1971, $^{40}Ar/^{39}Ar$ technique of K/Ar dating: a comparison with the conventional techniques: Earth and Planetary Science Letters, v. 12, p. 300.

DePaolo, D.J., 1981, Neodymium isotopes in the Colorado Front Range and crust-mantle evolution in the Proterozoic: Nature, v. 291, p. 193-196.

Holland, T.J.B., and Powell, R., 1998, An internally consistent thermodynamic data set for phases of petrological interest: Journal of Metamorphic Geology, v. 16, p. 309-343.

Horn, I., Rudnick, R.L., and McDonough, W.F., 2000, Precise elemental and isotope ratio determination by simultaneous solution nebulization and laser ablation-ICP-MS: application to U-Pb geochronology: Chemical Geology, v. 164, p. 281-301.

Kirkland, C.L., Daly, J.S., and Whitehouse, M.J., 2008, Basement–cover relationships of the Kalak Nappe Complex, Arctic Norwegian Caledonides and constraints on Neoproterozoic terrane assembly in the North Atlantic region: Precambrian Research, v. 160, p. 245-276.

Košler, J., Fonneland, H., Sylvester, P., Tubrett, M., and Pedersen, R.B., 2002, U-Pb dating of detrital zircons for sediment provenance studies - a comparison of laser ablation ICPMS and SIMS techniques: Chemical Geology, v. 182, p. 605-618.

Ludwig, K.R., 2003, User's manual for Isoplot 3.00: a geochronological toolkit for Microsoft Excel: Berkeley Geochronology Center Special Publication, v. 4, p. 1–70.

Murakami, T., Chakoumakos, B.C., Ewing, R.C., Lumpkin, G.R., and Weber, W.J., 1991, Alpha-Decay Event Damage in Zircon: American Mineralogist, 76, 1510–1532.

Patchett, P.J. and Tatsumoto, M., 1980, A routine high-precision method for Lu-Hf isotope geochemistry and chronology: Contributions to Mineralogy and Petrology, v. 75, p. 263-267.

Pin, C., and Zalduegui, J.F.S., 1997, Sequential separation of light rare-earth elements, thorium and uranium by miniaturized extraction chromatography: Application to isotopic analyses of silicate rocks: Analytica Chimica Acta, v. 339, p. 79-89.

Renne, P.R., Swisher, C.C., Deino, A.L., Karner, D.B., Owens, T.L., and DePaolo, D.J., 1998, Intercalibration of standards, absolute ages and uncertainties in 40Ar39Ar dating: Chemical Geology, v. 145, p. 117-152.

Segal, I., Halicz, L., and Platzner, I.T., 2003, Accurate isotope ratio measurements of ytterbium by multiple collection inductively coupled plasma mass spectrometry applying erbium and hafnium in an improved double external normalization procedure: Journal of Analytical Atomic Spectrometry, v. 18, p. 1217-1223.

Slama, J., Košler, J., Condon, D.J., Crowley, J.L., Gerdes, A., Hanchar, J.M., Horstwood, S.A., M., Morris, G.A., Nasdala, L., Norberg, N., Schaltegger, U., Schoene, B., Tubrett, M.N., and Whitehouse, M.J., 2008, Plešovice zircon – a new natural reference material for U-Pb and Hf isotopic microanalysis: Chemical Geology, v. 249, p. 1-35.

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

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

Thirwall, M.F., Anczkiewicz, R., 2004, Multidynamic isotope ratio analysis using MC–ICP–MS and the causes of secular drift in Hf, Nd and Pb isotope ratios: International Journal of Mass Spectrometry, v. 235, p. 59-81.

Whitehouse, M.J., and Kamber, B.S., 2005, Assigning dates to thin gneissic veins in high-grade metamorphic terranes: A cautionary tale from Akilia, southwest Greenland: Journal of Petrology, v. 46, p. 291-318.

Whitehouse, M.J., Kamber, B.S., and Moorbath, S., 1999, Age significance of U-Th-Pb zircon data from early Archaean rocks of west Greenland-a reassessment based on combined ion-microprobe and imaging studies: Chemical Geology, v. 160, p. 201-224.

Wiedenbeck, M., Alle, P., Corfu, F., Griffin, W.L., Meier, M., Oberli, F., von Quadt, A., Roddick, J.C., and Spiegel, W., 1995, Three natural zircon standards for U-Th-Pb, Lu-Hf, trace element and REE analyses: Geostandards Newsletter, v. 19, p. 1-23.