AISRF Sample: IA11-124

SHRIMP titanite data summary

Sample Description

Granite

SHRIMP Mount

ID:	11-30, Pop. C
Type:	grain mount
Pb/U standard:	Khan
Standard in:	11-30

Procedures

Titanite analyses followed established procedures (e.g. Kinny, 1997).

Analysis date:	14/11/2011
Instrument:	B
Primary ion current:	2.0 nA
Kohler aperture:	100 μm
Spot diameter:	~25μm
M/ΔM (1%):	5250
Scans/spot:	7
Notes:	Analysed in conjunction with several other mounts.

Results

No. of Stds:	13/14
External precision:	1.4 %; 1-D calibration of $^{206}Pb^+/^{270}[UO_2]^+$
Notes:	OrbA $^{207}Pb/^{206}Pb$ data were as expected, with no excess scatter

(retardation lens not activated).

Nineteen analyses were collected from separate grains (Table 1). Two have >2% common ^{206}Pb but there is no correlation between common Pb and corrected ages, and exclusion of these points would change the final age by <1 Ma, so all data are retained. There is a tendency to reverse discordance (Table 1, Fig. 1) but all concordance values lie within a 7% range so the apparent discordance is attributed to a matrix effect on $^{206}Pb^+/^{270}[UO_2]^+$.

Although the data appear to be well grouped on the Concordia plot (Fig. 1) three of the results have approximately two orders of magnitude less Th than the others (Table 1) and they define a distinctly younger population (Fig. 2). The weighted mean $^{207}Pb/^{206}Pb$ age for the 16 analyses in the main group is 2562 ± 6 Ma (MSWD = 1.0) and the younger three give 2513 ± 17 Ma (MSWD = 0.5).
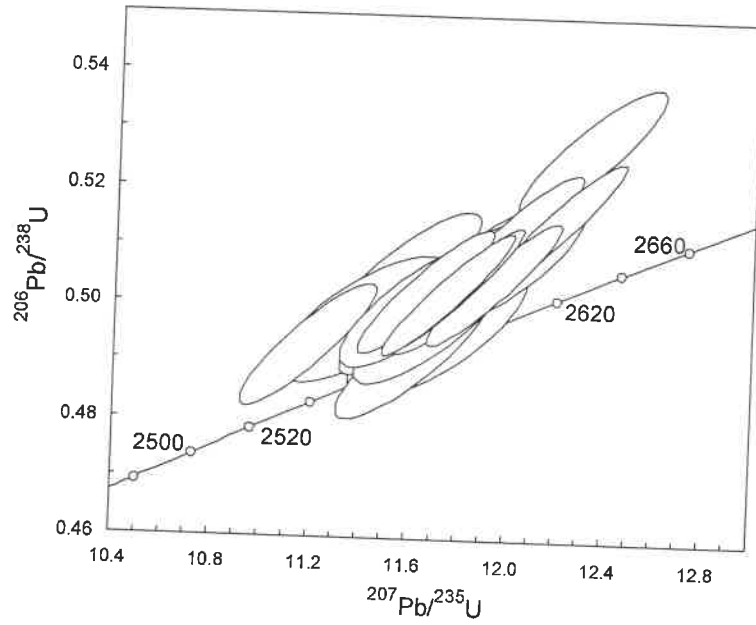
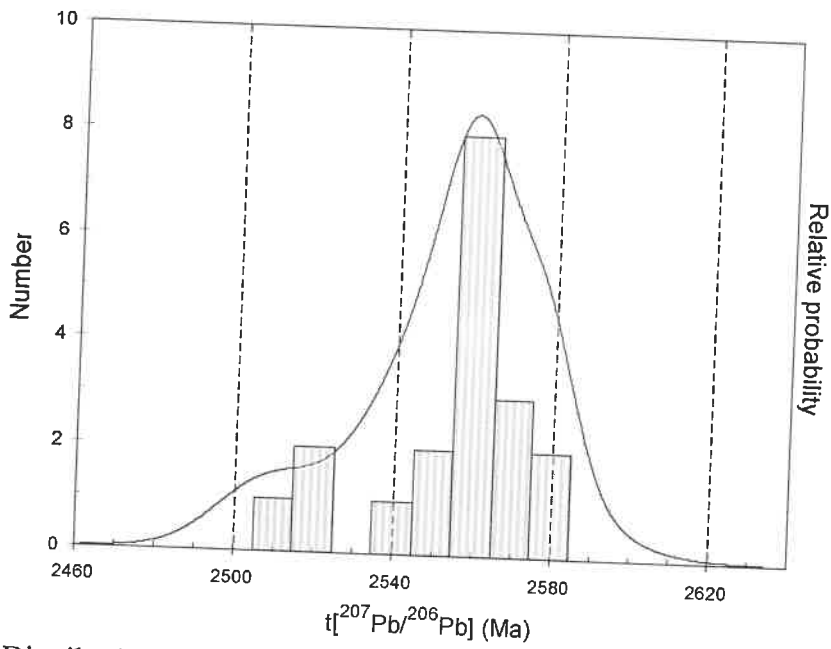Figure 1: SHRIMP U–Pb data for titanite in IA11-124. Precision ellipses are 1σ.

Figure 2: Distribution of SHRIMP ^{207}Pb/^{206}Pb dates from all U–Pb data for titanite in IA11-124.

Table 1: SHRIMP U–Pb data for titanite in IA11-124.

Analysis	U (ppm)	Th (ppm)	Th/U	f206 (%)	$^{207}Pb*/^{206}Pb*$	±	$^{206}Pb*/^{238}U$	±	$^{207}Pb*/^{235}U$	±	$^{208}Pb*/^{232}Th$	±	conc. (%)	$t[^{207}Pb*/^{206}Pb*]$ (Ma)	±
Main group, in $^{207}Pb/^{206}Pb$ sequence															
1130C.14-1	80	133	1.73	0.73	0.1685	0.0010	0.5022	0.0072	11.666	0.182	0.1395	0.0030	103	2542	10
1130C.10-1	51	137	2.74	2.19	0.1688	0.0017	0.4999	0.0074	11.636	0.209	0.1416	0.0024	103	2546	17
1130C.8-1	48	97	2.09	0.98	0.1690	0.0015	0.4995	0.0079	11.638	0.211	0.1410	0.0026	103	2547	15
1130C.2-1	155	99	0.66	1.26	0.1698	0.0012	0.5267	0.0075	12.331	0.197	0.1577	0.0038	107	2556	12
1130C.17-1	52	105	2.08	1.21	0.1698	0.0018	0.5035	0.0074	11.789	0.212	0.1453	0.0026	103	2556	17
1130C.16-1	147	104	0.73	0.90	0.1699	0.0008	0.5018	0.0071	11.757	0.175	0.1441	0.0025	103	2557	8
1130C.4-1	139	99	0.74	0.49	0.1701	0.0007	0.5029	0.0072	11.794	0.176	0.1434	0.0024	103	2559	7
1130C.18-1	75	162	2.25	0.68	0.1703	0.0010	0.5118	0.0074	12.017	0.186	0.1445	0.0023	104	2561	10
1130C.12-1	58	131	2.35	0.78	0.1705	0.0012	0.5025	0.0073	11.815	0.192	0.1416	0.0023	102	2563	12
1130C.18-2	51	129	2.61	2.07	0.1706	0.0017	0.4972	0.0073	11.692	0.210	0.1406	0.0024	101	2563	17
1130C.6-1	75	151	2.07	0.89	0.1707	0.0012	0.5047	0.0084	11.879	0.214	0.1440	0.0029	103	2564	11
1130C.9-1	44	86	2.01	1.13	0.1709	0.0021	0.5075	0.0076	11.963	0.229	0.1439	0.0026	103	2567	20
1130C.13-1	55	169	3.18	1.55	0.1715	0.0015	0.4915	0.0076	11.620	0.207	0.1392	0.0024	100	2572	15
1130C.5-1	26	162	6.51	1.62	0.1716	0.0023	0.4953	0.0077	11.717	0.241	0.1396	0.0027	101	2573	23
1130C.11-1	111	140	1.30	0.81	0.1720	0.0009	0.5037	0.0072	11.944	0.182	0.1450	0.0025	102	2577	9
1130C.15-1	125	91	0.75	0.67	0.1721	0.0008	0.5140	0.0073	12.199	0.182	0.1542	0.0026	104	2578	7
Low-Th, young group															
1130C.3-1	116	2	0.016	0.98	0.1648	0.0011	0.4925	0.0071	11.191	0.179	0.1908	0.0735	103	2505	11
1130C.7-1	51	1	0.023	0.80	0.1664	0.0016	0.5034	0.0084	11.547	0.221	0.3720	0.0696	104	2521	16
1130C.1-1	70	1	0.019	1.61	0.1666	0.0023	0.4972	0.0074	11.418	0.231	0.8374	0.1234	103	2524	23

Analysis labels: nnnA.p-q, where nnnn is the mount number, A is the sample identifier on the mount, p is grain number and q is the analysis sequence for the grain.

f206 is the proportion of common Pb in ^{206}Pb, determined using the measured ^{204}Pb and the Model III Pb isotopic composition at the approximate age of the sample (Stacey and Kramers, 1975).

All Pb isotope data and $t[^{207}Pb*/^{206}Pb*]$ have been corrected for common Pb.

Conc. is apparent concordance, as $100*t[^{206}Pb/^{238}U]/t[^{207}Pb/^{206}Pb]$.

Precisions are 1σ.