

DATA REPOSITORY ITEM 2002127

The SHRIMP analytical methods follow those described by McNaughton et al. (1999) and Fletcher et al. (2000). Sample mounts (A-43 and A-49) were made from chips of polished thin sections set inside epoxy resin. Mount A-43 contains xenotime from 908 m and Mount A-49 has xenotime from 902 m. Analyses were referenced to the xtc standard in mount 98-13, which was analysed concurrently with the unknown xenotime overgrowths.

The SHRIMP analysis data from the xenotime overgrowths in Mounts A-49 and A-43 are presented in Table DR1, DR2 and DR3. Errors in data tables and single spot analyses are quoted at $\pm 1\sigma$, whereas ages from pooled data have errors quoted at $\pm 2\sigma$.

Mount A-49

Two coarse-grained xenotime overgrowths were analysed with a total of 21 sample analysis points labeled in Figure DR1 and DR2. Analysis data for points 3 and 15 are not included as the SHRIMP spot was not completely on the xenotime.

Having established that 14 analyses adhere to a Gaussian distribution at about 1700 Ma and six analyses at about 1650 Ma, a more accurate estimate of the ages for each population was calculated using the KRILL software for processing SHRIMP age data (see Fletcher et al., 2000). The older population has an age of 1696 ± 7 Ma (at 95% confidence level), with $n=14$ and $\chi^2=0.56$. The younger age population has an age of 1646 ± 8 Ma (95% confidence level) with $n=6$ and $\chi^2=0.13$. The third date was derived from one spot with an age of 1560 ± 8 Ma ($\pm 1\sigma$). The second set of SHRIMP data from Mount A-49 (Table DR3) (Figure DR1, DR2 and DR4A-F) shows at least two analyses which are compatible with this date.

Mount A-43

Five coarse-grained xenotime overgrowths were analysed resulting in 32 spot analyses labeled in Figure DR3A-E. The age populations are not as clearly defined as in Mount A-49, so more accurate age estimates using statistical analysis of the data have not been attempted.

However, the age data are compatible with Mount A-49, with data concentrations at ca 1700 Ma and ca 1650 Ma. Further, distinctly younger ages occur in different petrographic portions from the overgrowths. These ages do not cluster and are

possibly mixtures of at least two generations of xenotime at a scale smaller than the SHRIMP spot size of approximately 10 microns.

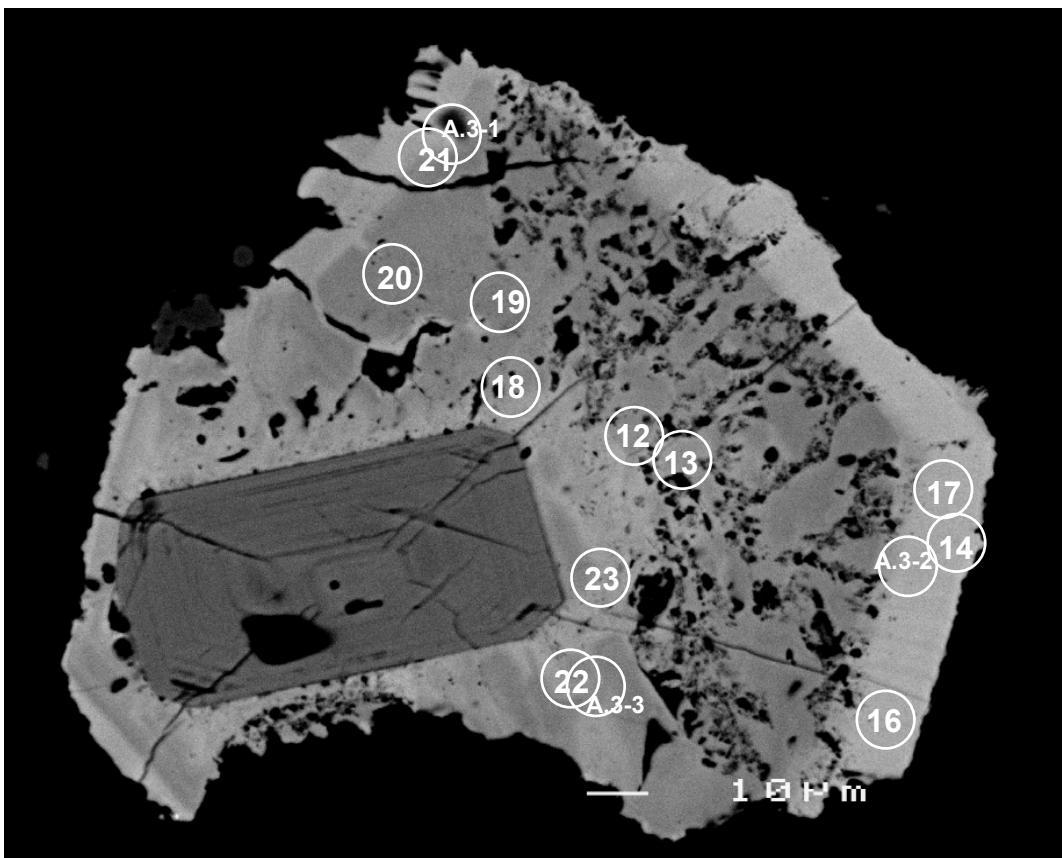


Figure DR1. Xenotime overgrowth from A-49 showing the location of SHRIMP analysis points (refer to Table DR1 & DR3).

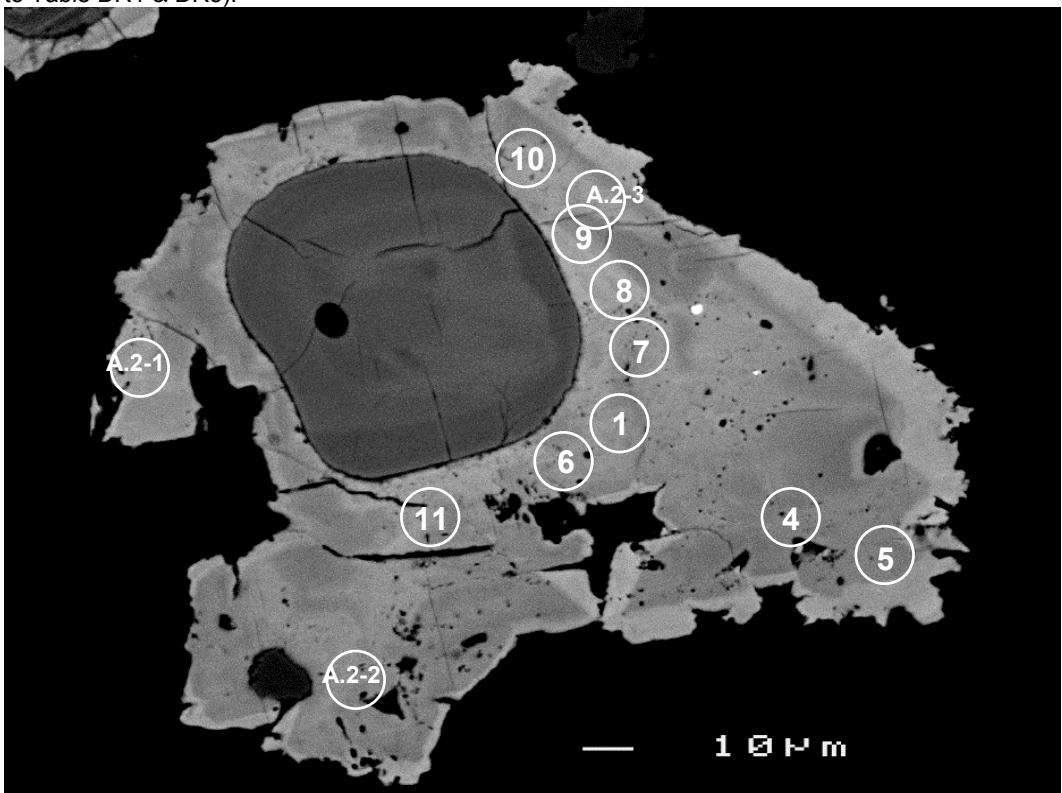


Figure DR2. Xenotime overgrowth from A-49 showing the location of SHRIMP analysis points (refer to Table DR1 & DR3).

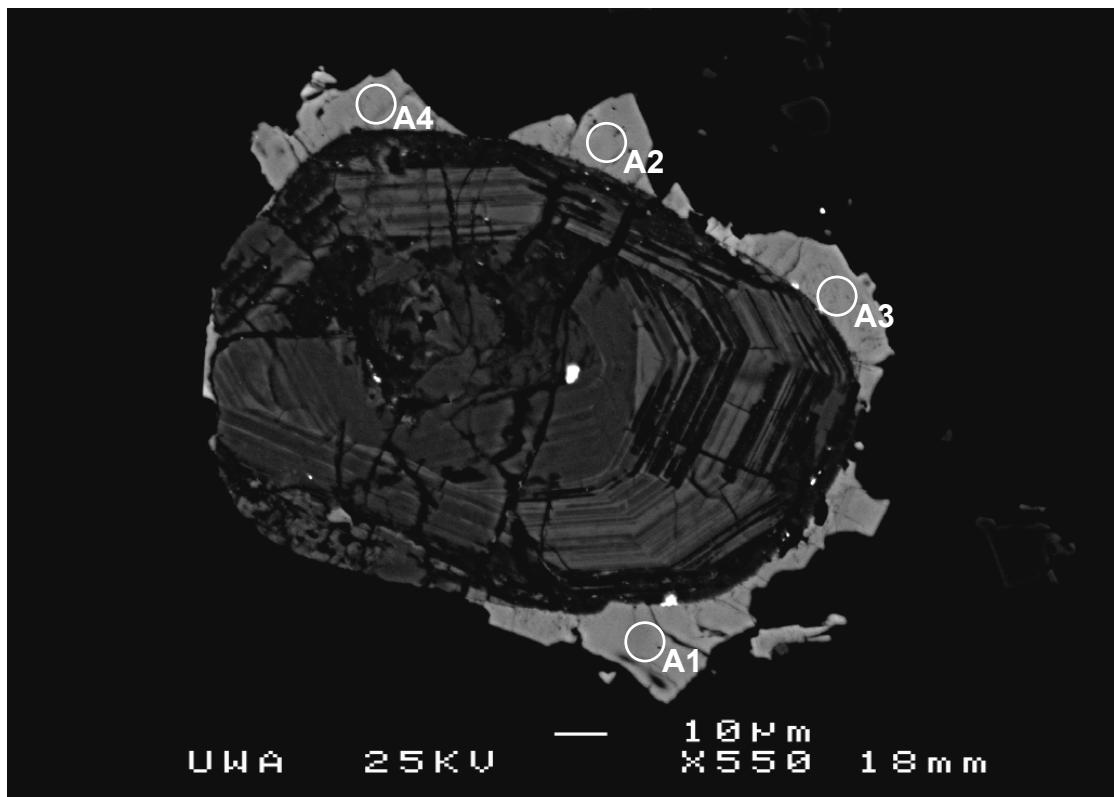


Figure DR3A. Xenotime overgrowth from A-43 showing the location of SHRIMP analysis points (refer to Table DR2).

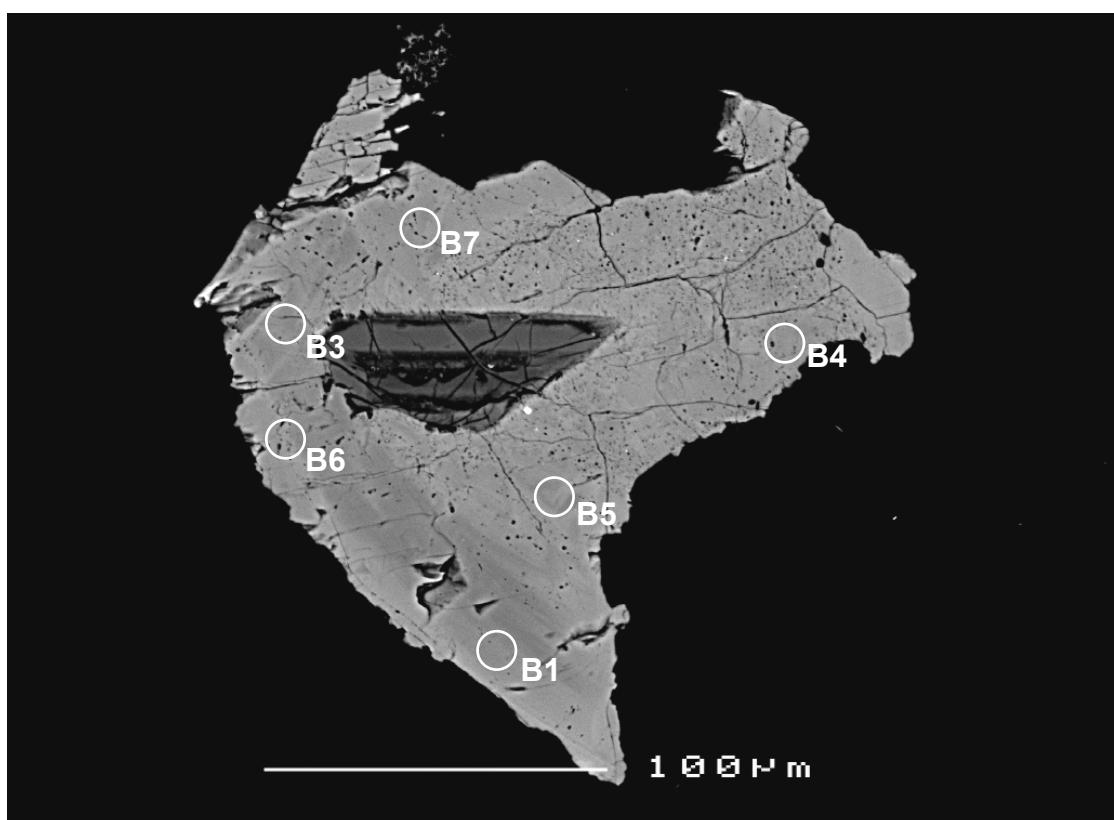


Figure DR3B. Xenotime overgrowth from A-43 showing the location of SHRIMP analysis points (refer to Table DR2).

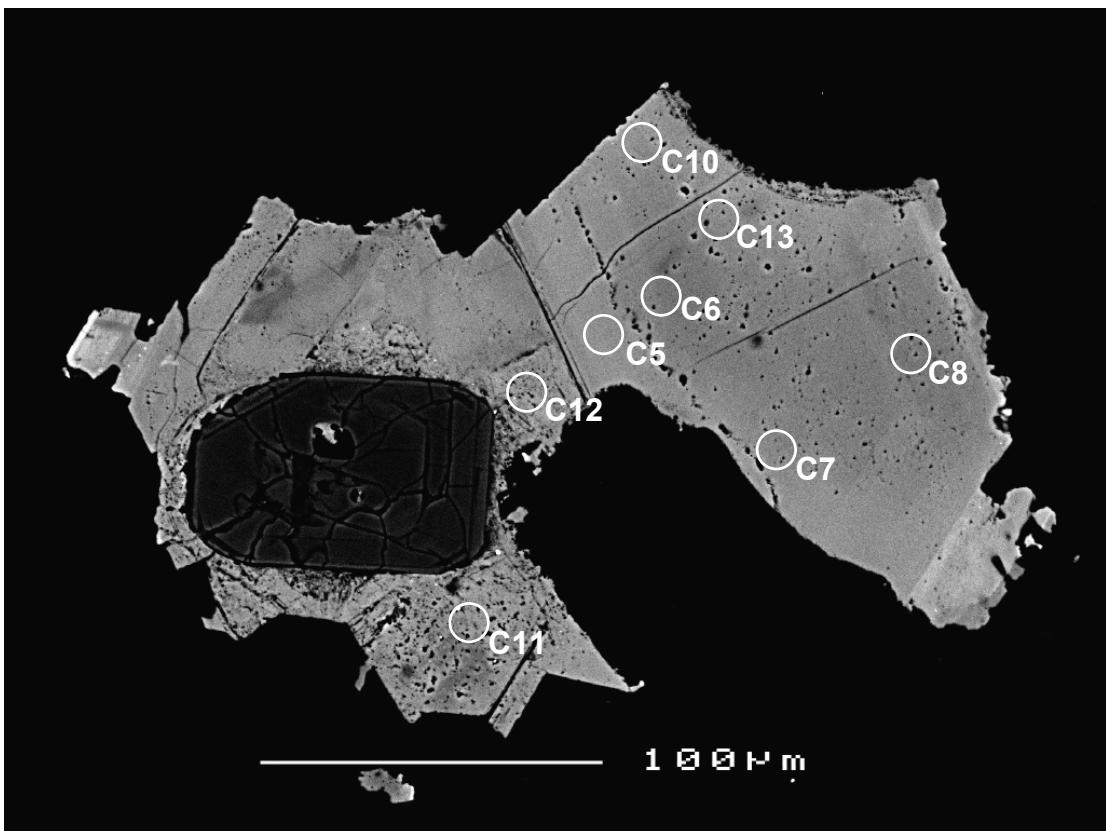


Figure DR3C. Xenotime overgrowth from A-43 showing the location of SHRIMP analysis points (refer to Table DR2).

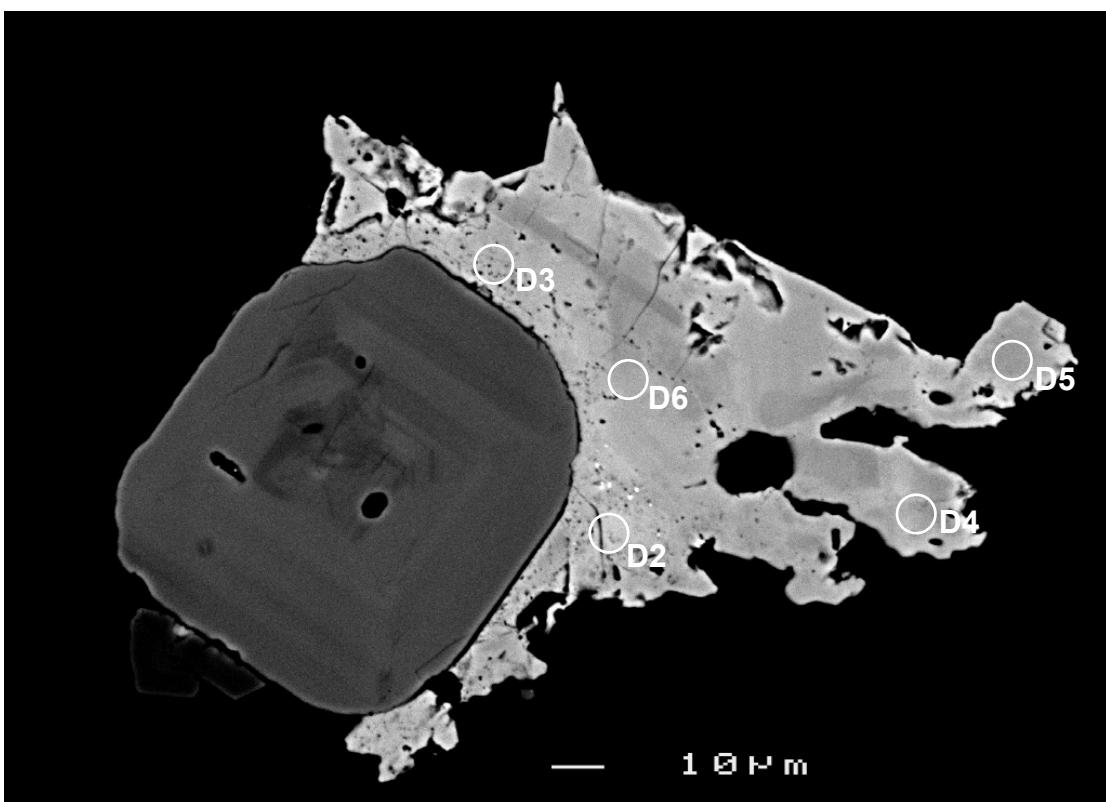


Figure DR3D. Xenotime overgrowth from A-43 showing the location of SHRIMP analysis points (refer to Table DR2).

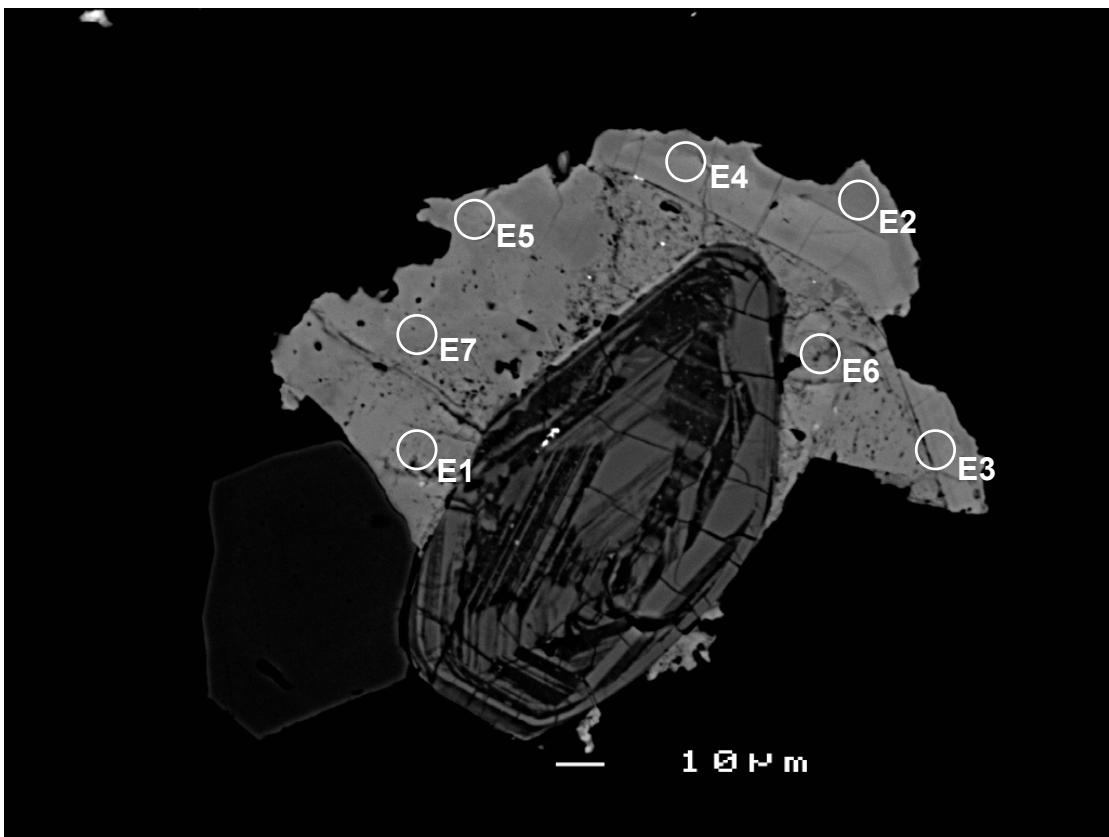


Figure DR3E. Xenotime overgrowth from A-43 showing the location of SHRIMP analysis points (refer to Table DR2).

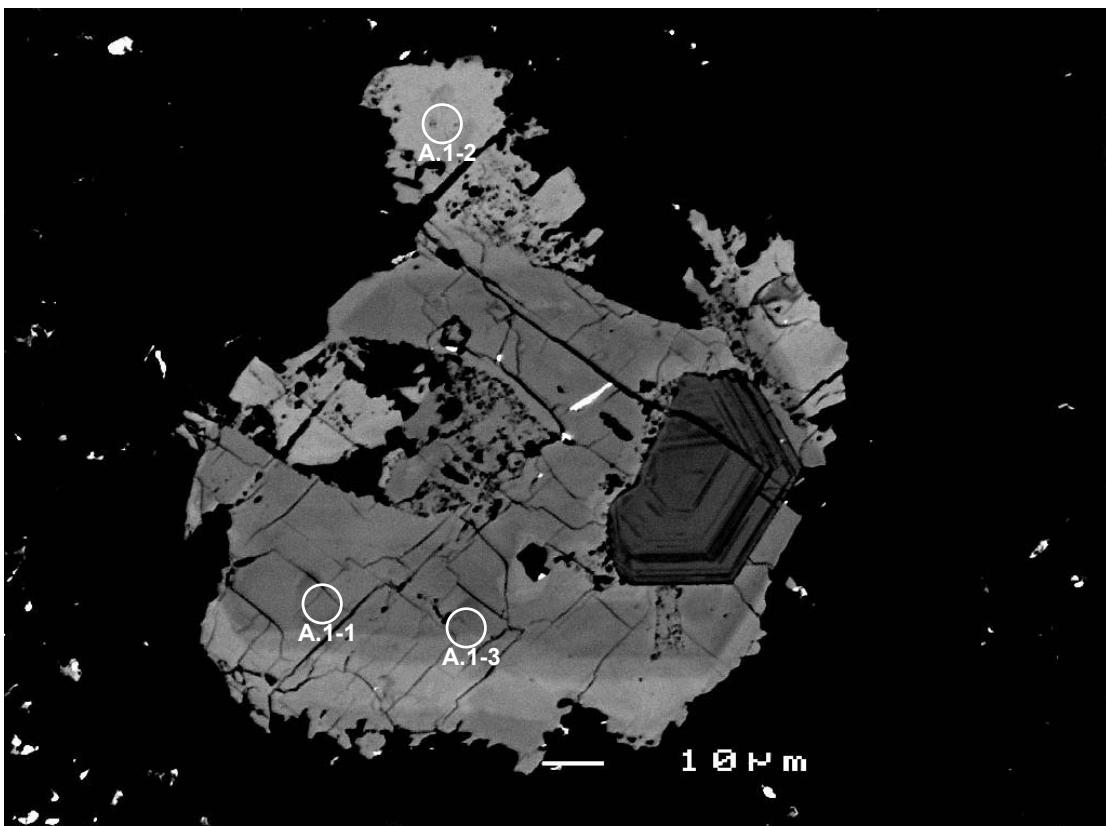


Figure DR4A. Xenotime overgrowth from A-49 showing the location of SHRIMP analysis points (refer to Table DR3).

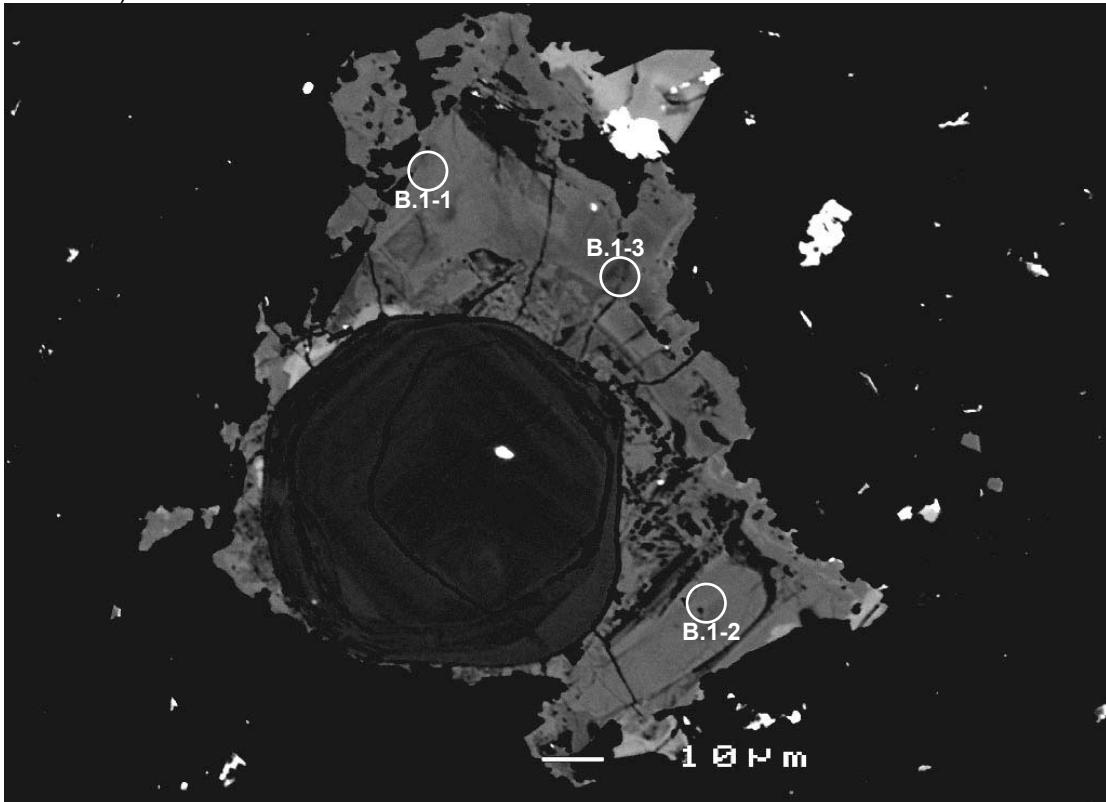


Figure DR4B. Xenotime overgrowth from A-49 showing the location of SHRIMP analysis points (refer to Table DR3).

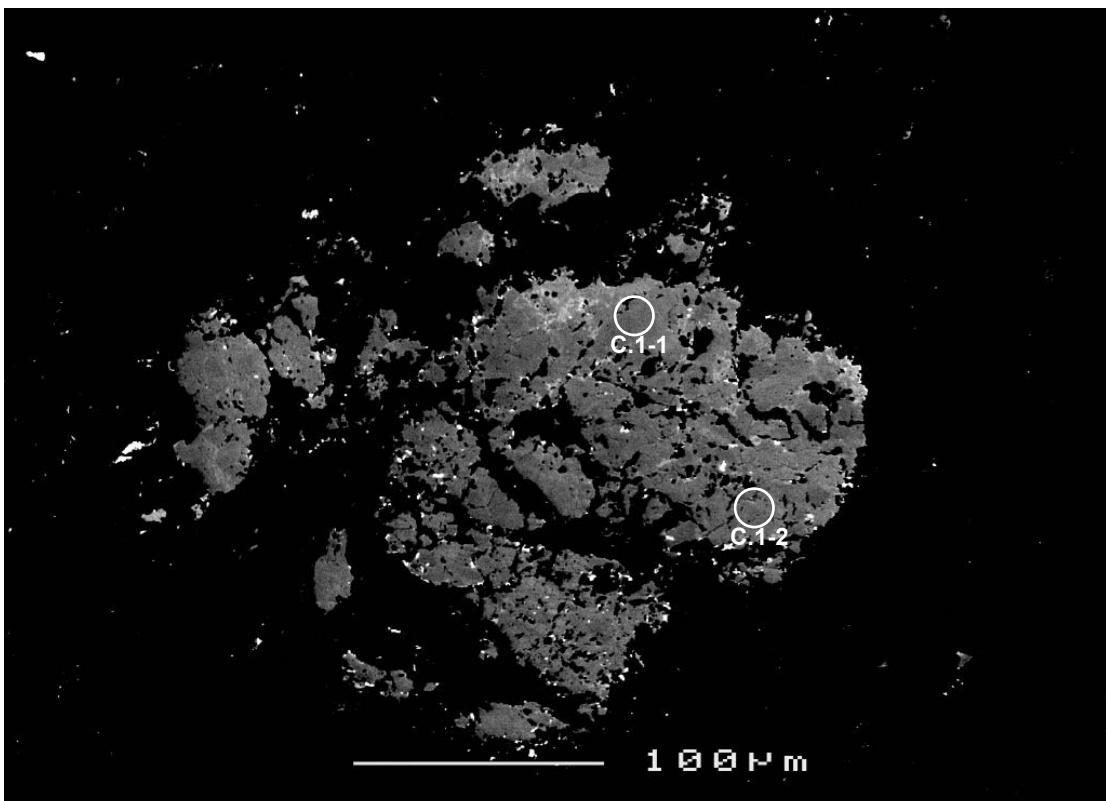


Figure DR4C. Xenotime overgrowth from A-49 showing the location of SHRIMP analysis points (refer to Table DR3).

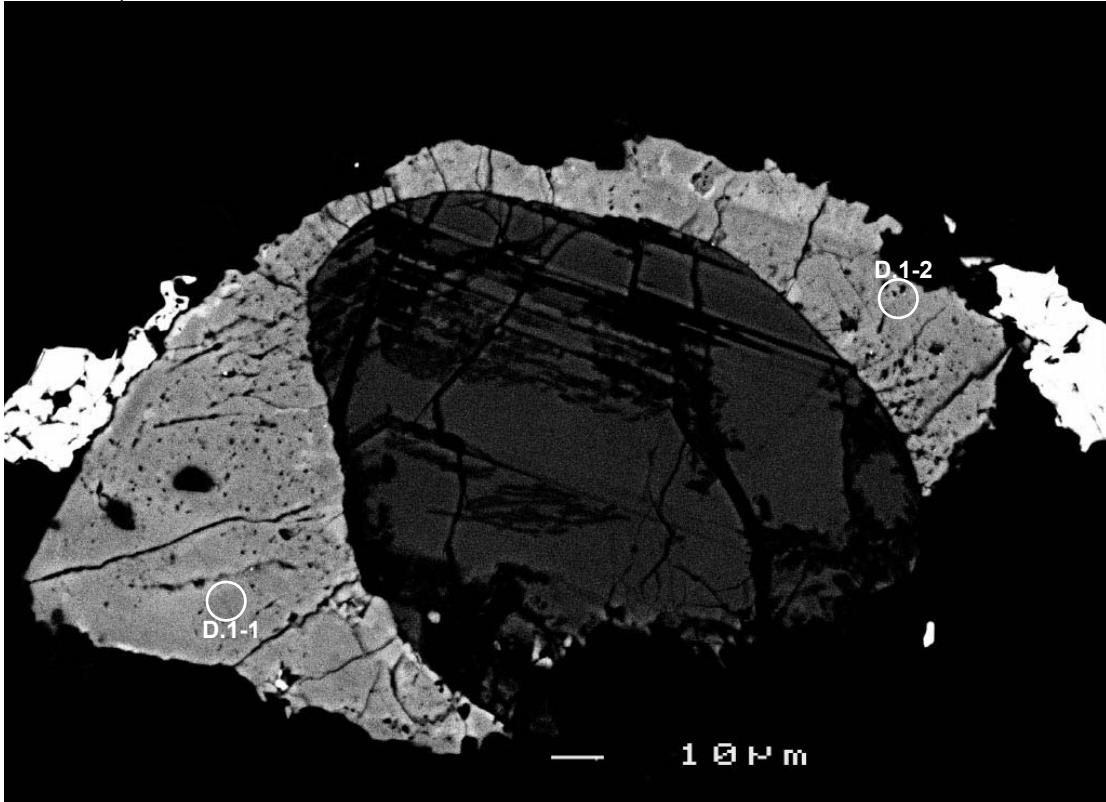


Figure DR4D. Xenotime overgrowth from A-49 showing the location of SHRIMP analysis points (refer to Table DR3).

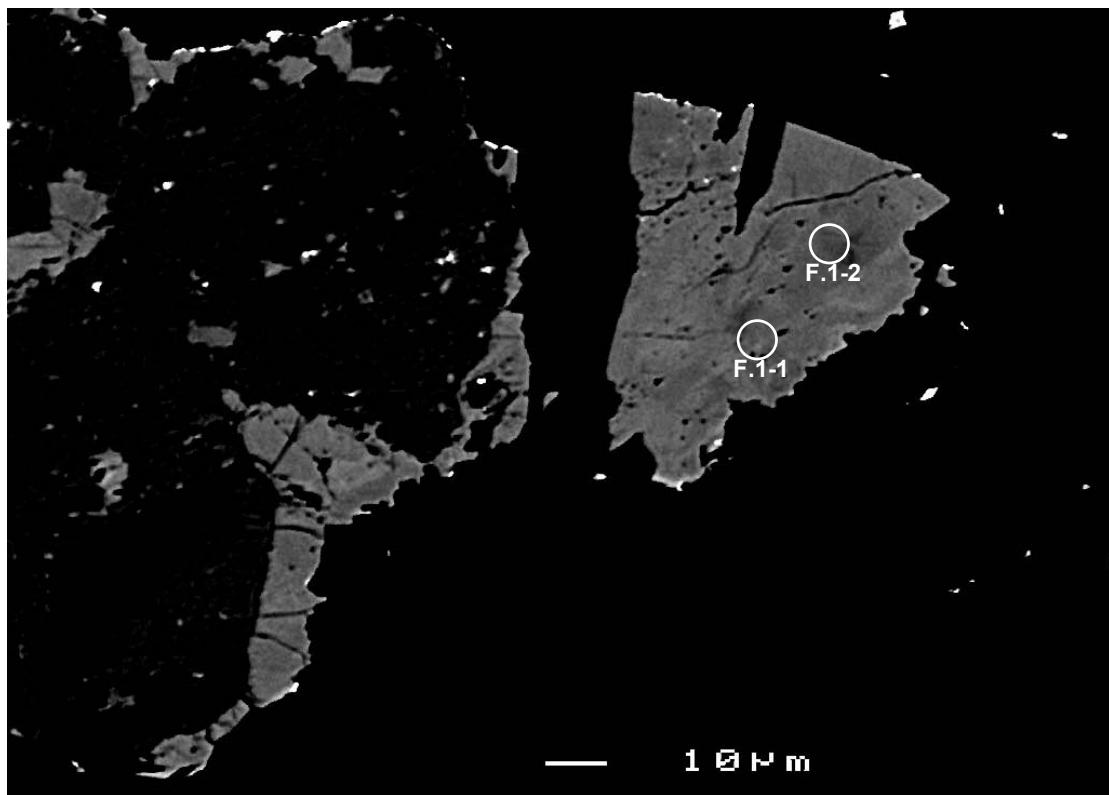


Figure DR4E. Xenotime overgrowth from A-49 showing the location of SHRIMP analysis points (refer to Table DR3).

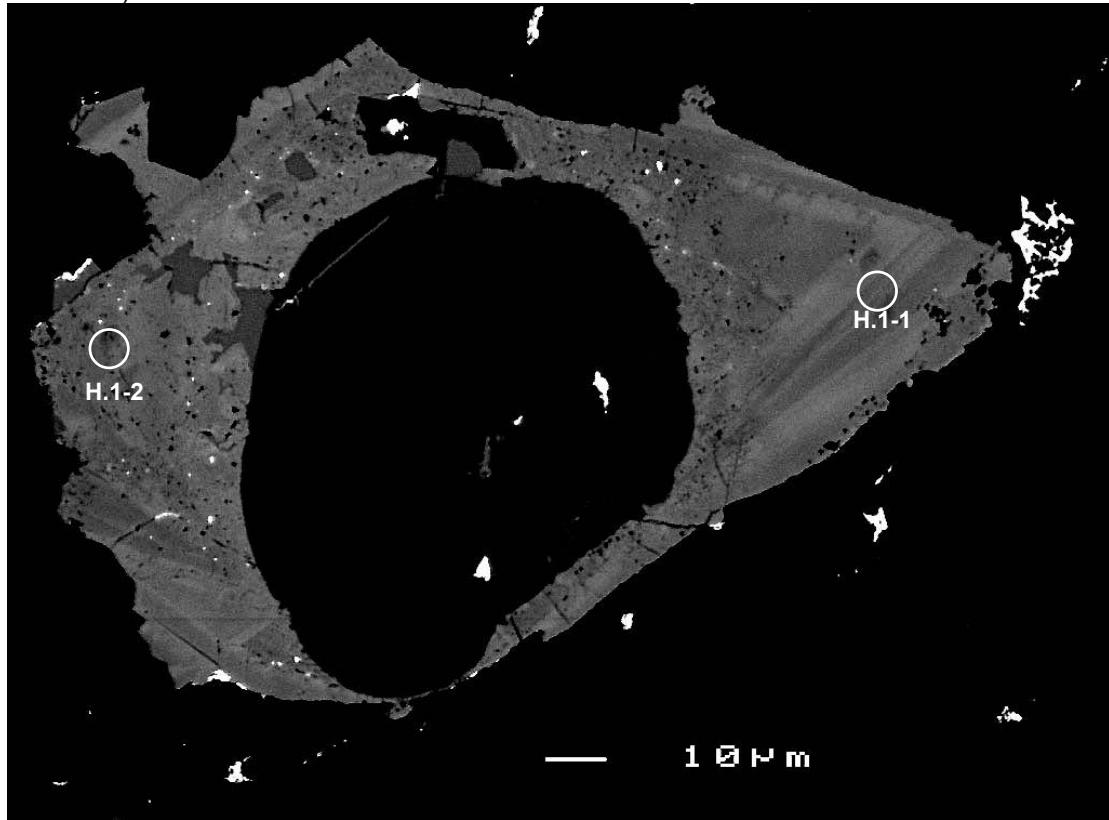


Figure DR4F. Xenotime overgrowth from A-49 showing the location of SHRIMP analysis points (refer to Table DR3).

TABLE DR1. SHRIMP DATA FOR TWO XENOTIME OVERGROWTHS FROM A-49.
ANALYSIS SPOT LOCALITIES ARE SHOWN IN FIGURE DR1 AND DR2

Analysis spot	U (ppm)	Th (ppm)	4f206 (%) [*]	<u>²⁰⁷Pb</u>		<u>²⁰⁸Pb</u>		<u>²⁰⁶Pb</u> ²³⁸ U	<u>²⁰⁷Pb</u> ²³⁵ U	<u>²⁰⁸Pb</u> ²³² Th	%conc. [§]	<u>²⁰⁷Pb</u>	
				206Pb	207Pb	206Pb	207Pb					206Pb	Age(Ma)
11	3574	114	0.015	0.1047	± 5	0.0099	± 3	0.3022	4.363	0.0935	100	1709	± 9
18	3365	191	0.048	0.1043	± 6	0.0165	± 6	0.3069	4.413	0.0894	101	1702	± 10
20	1340	47	0.000	0.1042	± 8	0.0114	± 5	0.2851	4.096	0.0932	95	1700	± 14
22	2980	101	0.026	0.1041	± 6	0.0100	± 5	0.3210	4.606	0.0948	106	1698	± 11
1	4632	212	0.050	0.1040	± 4	0.0135	± 4	0.3018	4.328	0.0889	100	1697	± 7
19	1284	99	0.051	0.1040	± 10	0.0216	± 13	0.2948	4.228	0.0831	98	1697	± 17
2	3009	61	0.001	0.1040	± 5	0.0068	± 5	0.3095	4.435	0.1039	102	1696	± 8
4	885	22	0.087	0.1038	± 8	0.0082	± 11	0.2887	4.135	0.0966	97	1694	± 15
7	3180	139	0.114	0.1038	± 11	0.0131	± 7	0.2892	4.138	0.0868	97	1692	± 20
8	3461	65	0.047	0.1037	± 6	0.0048	± 4	0.3047	4.357	0.0784	101	1691	± 11
9	3737	140	0.046	0.1036	± 6	0.0112	± 5	0.2835	4.048	0.0847	95	1689	± 10
6	1975	31	0.067	0.1033	± 7	0.0037	± 7	0.2868	4.084	0.0680	97	1684	± 13
23	2293	120	0.660	0.1025	± 17	0.0227	± 28	0.3135	4.431	0.1355	105	1670	± 31
10	1273	49	0.003	0.1022	± 11	0.0109	± 12	0.2734	3.853	0.0776	94	1665	± 20
17	7100	788	0.021	0.1014	± 4	0.0323	± 4	0.3020	4.222	0.0877	103	1650	± 7
5	1446	73	0.028	0.1012	± 6	0.0138	± 8	0.2903	4.051	0.0800	100	1646	± 12
16	6035	939	0.000	0.1011	± 3	0.0466	± 5	0.2967	4.133	0.0889	102	1644	± 6
13	2674	77	0.078	0.1010	± 9	0.0076	± 8	0.2741	3.819	0.0724	95	1643	± 16
12	3266	105	0.035	0.1009	± 6	0.0105	± 6	0.3000	4.176	0.0979	103	1642	± 11
21	729	54	0.074	0.1008	± 14	0.0215	± 25	0.2634	3.662	0.0761	92	1640	± 25
14	5370	1813	0.000	0.0966	± 4	0.0901	± 7	0.2908	3.875	0.0776	105	1560	± 8

Note: Precisions are 1σ and apply to the last digits listed; All Pb isotope data are corrected for common Pb, using measured 204 Pb and the composition of Broken Hill galena;

U/Pb reproducibility for concurrent analyses of xtc = 2.43% (1σ ; n = 10).

*4f206(%)= % of 206 Pb which is due to common Pb.

$\frac{\$}{\text{concordance, as } 100 \times [t(^{206}\text{Pb}/^{238}\text{Pb})/t(^{207}\text{Pb}/^{206}\text{Pb})]}.$

TABLE DR2. SHRIMP DATA FOR FIVE XENOTIME OVERGROWTHS IN A-43.
ANALYSIS SPOT LOCALITIES ARE SHOWN IN FIGURES DR3A-E

Analysis spot	U (ppm)	Th (ppm)	4f206 (%) [*]	207Pb		208Pb		206Pb 238U	207Pb 235U	208Pb 232Th	%conc. [§]	207Pb	
				206Pb	207Pb	206Pb	207Pb					206Pb	Age(Ma)
B5	5570	2	0.021	0.1049	± 4	N.D. [#]	0.2967	4.289	N.D. [#]	98	1712	± 8	
C6	2499	<1	0.039	0.1042	± 8	N.D. [#]	0.2892	4.156	N.D.	96	1701	± 13	
C10	3488	40	0.004	0.1041	± 6	0.0033	± 3	0.2862	4.108	0.0806	95	1699	± 10
B7	5759	36	0.017	0.1041	± 4	0.0010	± 3	0.3031	4.350	0.0495	100	1698	± 7
A3	6908	2066	0.018	0.1037	± 4	0.0937	± 8	0.2909	4.159	0.0912	97	1691	± 7
B1	690	1	0.193	0.1035	± 17	N.D. [#]	0.2677	3.819	N.D. [#]	91	1687	± 30	
C13	3252	72	0.038	0.1034	± 5	0.0072	± 6	0.2801	3.994	0.0910	94	1686	± 9
D3	5875	216	0.000	0.1034	± 4	0.0134	± 3	0.2942	4.194	0.1074	99	1686	± 8
C7	3652	203	0.000	0.1031	± 6	0.0173	± 4	0.2823	4.012	0.0880	95	1680	± 10
A1	8505	2223	0.024	0.1030	± 5	0.0824	± 7	0.2952	4.189	0.0930	99	1678	± 8
C5	4861	343	0.025	0.1025	± 5	0.0198	± 5	0.3028	4.280	0.0852	102	1670	± 9
C8	4204	14	0.024	0.1023	± 7	0.0010	± 3	0.2960	4.174	0.0856	100	1666	± 12
D6	6014	170	0.008	0.1022	± 6	0.0084	± 3	0.3013	4.245	0.0899	102	1665	± 10
A4	7587	2268	0.044	0.1019	± 6	0.0907	± 8	0.2825	3.969	0.0858	97	1658	± 11
B6	3855	3216	0.017	0.1017	± 7	0.2583	± 21	0.2896	4.060	0.0896	99	1655	± 13
D1	3913	13	0.010	0.1014	± 5	0.0008	± 3	0.2905	4.061	0.0691	100	1650	± 9
D4	5171	50	0.166	0.1011	± 9	0.0018	± 11	0.2783	3.879	0.0521	96	1644	± 17
E5	7664	461	0.011	0.1010	± 8	0.0178	± 3	0.2983	4.154	0.0880	102	1643	± 15
E7	6681	192	0.000	0.1010	± 4	0.0086	± 2	0.3041	4.238	0.0913	104	1643	± 7
B4	11182	794	0.216	0.1008	± 4	0.0201	± 6	0.2596	3.610	0.0736	91	1640	± 8
E2	5654	1251	0.035	0.1005	± 4	0.0528	± 9	0.3105	4.304	0.0740	107	1634	± 7
E4	5988	1498	0.151	0.1003	± 4	0.0651	± 8	0.2972	4.111	0.0773	103	1630	± 8
A2	7633	2059	0.097	0.0994	± 5	0.0847	± 9	0.2634	3.607	0.0827	93	1612	± 8
D5	2114	2	0.043	0.0991	± 7	N.D. [#]	0.2807	3.835	N.D. [#]	99	1608	± 14	
D2	15353	1217	0.053	0.0983	± 5	0.0233	± 3	0.2729	3.698	0.0803	98	1592	± 10
E1	8041	298	0.396	0.0969	± 9	0.0094	± 14	0.2654	3.544	0.0671	97	1565	± 18
C11	2559	6	0.462	0.0919	± 10	0.0004	± 18	0.2372	3.005	0.0361	94	1465	± 20
B2**	873	19	0.887	0.1015	± 22	0.0031	± 43	0.1982	2.773	0.0288	71	1651	± 39
B3**	4569	108	0.450	0.1014	± 7	0.0055	± 13	0.2284	3.193	0.0535	80	1649	± 14
E6**	5146	1011	4.053	0.0964	± 19	0.0938	± 42	0.2324	3.088	0.1109	87	1555	± 38
E3**	8589	353	0.481	0.0945	± 6	0.0138	± 11	0.2343	3.054	0.0788	89	1518	± 13
C12**	9091	335	1.134	0.0846	± 9	0.0115	± 20	0.1893	2.207	0.0593	86	1306	± 21

Note: Precisions are 1σ and apply to the last digits listed; All Pb isotope data are corrected for common Pb, using measured ^{204}Pb and the composition of Broken Hill galena; U/Pb reproducibility for concurrent analyses of $\text{xtc} = 2.56\%$ (1σ ; $n = 10$);

*4f206(%) = % of ^{206}Pb which is due to common Pb.

[§]% concordance, as $100 \times [t(\text{xtc})^{206}\text{Pb}/^{238}\text{Pb} / t(\text{xtc})^{207}\text{Pb}/^{206}\text{Pb}]$.

[#]N.D.= not determined.

**>10% discordance.

TABLE DR3. SHRIMP DATA FOR SIX XENOTIME OVERGROWTHS IN A-49 AND EXTRA SHRIMP DATA FOR XENOTIME IN TABLE DR1. ANALYSIS SPOT LOCALITIES ARE SHOWN IN FIGURE DR1, DR2 AND DR4A-F

Analysis spot	U (ppm)	Th (ppm)	4f206 (%) [*]	<u>²⁰⁷Pb</u>		<u>²⁰⁸Pb</u>		<u>²⁰⁶Pb</u> 238U	<u>²⁰⁷Pb</u> 235U	<u>²⁰⁸Pb</u> 232Th	%conc. [§]	<u>²⁰⁷Pb</u>	
				206Pb	207Pb	206Pb	208Pb					206Pb	Age(Ma)
B.1-1	5996	193	0.009	0.1043	± 3	0.0089	± 2	0.2937	4.224	0.0814	98	1702	± 5
H.1-1	9228	925	0.015	0.1042	± 2	0.0278	± 2	0.3016	4.334	0.0836	100	1701	± 4
A.2-3	3020	234	0.176	0.1031	± 5	0.0228	± 10	0.2825	4.018	0.0831	95	1681	± 9
F.1-2	3595	876	0.053	0.1029	± 3	0.0722	± 6	0.2870	4.071	0.0850	97	1677	± 6
A.1-1	2223	538	0.004	0.1028	± 4	0.0726	± 8	0.2777	3.937	0.0834	94	1676	± 8
A.2-1	3003	147	0.054	0.1026	± 4	0.0133	± 5	0.2950	4.172	0.0805	100	1671	± 7
A.3-3	2727	169	0.164	0.1023	± 6	0.0206	± 8	0.2869	4.046	0.0949	98	1666	± 11
A.2-2	1790	50	0.086	0.1022	± 6	0.0079	± 6	0.2691	3.790	0.0746	92	1664	± 11
A.3-1	996	73	0.035	0.1019	± 6	0.0190	± 7	0.2622	3.685	0.0684	90	1660	± 11
A.1-3	1636	216	0.036	0.1019	± 5	0.0385	± 7	0.2763	3.881	0.0806	95	1659	± 9
B.1-2	4912	324	0.031	0.1017	± 3	0.0073	± 2	0.2945	4.129	0.0328	101	1655	± 5
A.1-2	5342	1260	0.018	0.1008	± 3	0.0700	± 5	0.2771	3.852	0.0823	96	1639	± 5
A.3-2	5445	357	0.007	0.1004	± 3	0.0190	± 2	0.2835	3.924	0.0822	99	1631	± 5
H.1-2	6781	124	0.026	0.0996	± 3	0.0050	± 2	0.2696	3.703	0.0744	95	1617	± 6
D.1-2	4396	959	0.549	0.0987	± 5	0.0663	± 10	0.2568	3.494	0.0781	92	1600	± 10
C.1-2	2132	110	0.451	0.0925	± 10	0.0102	± 19	0.2471	3.151	0.0489	96	1477	± 20
B.1-3 [#]	3944	105	0.297	0.1020	± 5	0.0067	± 11	0.2350	3.304	0.0595	82	1660	± 10
D.1-1 [#]	4053	3581	0.332	0.0975	± 5	0.2710	± 15	0.2306	3.099	0.0707	85	1576	± 9
F.1-1 [#]	3280	1523	0.171	0.0972	± 5	0.1287	± 11	0.2418	3.241	0.0670	89	1571	± 9
C.1-1 [#]	2182	242	0.236	0.0936	± 9	0.0334	± 11	0.2279	2.939	0.0686	88	1499	± 18

Note: Precisions are 1σ and apply to the last digits listed; All Pb isotope data are corrected for common Pb, using measured ^{204}Pb and the composition of Broken Hill galena; U/Pb reproducibility for concurrent analyses of xtc = 2.43% (1s; n = 10).

*4f206(%)= % of ^{206}Pb which is due to common Pb.

[§]% concordance, as $100 \times [t(^{206}\text{Pb}/^{238}\text{Pb})/t(^{207}\text{Pb}/^{206}\text{Pb})]$.

[#]> 10% discordance.