DR2011350

Methods

Zircons were separated from 2-5 kg samples by standard hydraulic, density, and magnetic methods. Individual grains were mounted in epoxy, ground to expose central sections, and imaged by optical and cathodoluminescense methods prior to analysis (Fig. S1 provides a representative CL image of zircons from each sample analyzed). U-Th-Pb analyses were conducted using the SHRIMP RG ion microprobe following methods outlined in Compston et al. (1984) and Compston and Williams (1992). Data reduction and plotting used the ISOPLOT and SQUID modules of Ludwig (2002, 2003) and model common Pb values of Stacey and Kramers (1975). All ages discussed in the text are derived from $^{207}Pb/^{206}Pb$ ratios and reported at the 95% confidence level. Sm-Nd isotopic data were acquired following methods in Heatherington and Mueller (1991) with constants for CHUR and the depleted mantle from Bouvier et al. (2008) and DePaolo (1981) respectively. Major element analyses were done by wavelength dispersive XRF methods on fused beads at Geoscience Laboratories (Ontario); errors are ~2% based on duplicate analyses.

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Table S1: U-Pb Isotopic Data

Sample	% common 206	ppm U	ppm Th	232Th /238U	204corr 206Pb /238U Age	1s err	204corr 207Pb /206Pb Age	1s error	% Dis- cor- dant	238U/ 206Pbr	% error	207Pbr /206Pbr	% error	207Pbr /235U	% error	error correlation	Latitude	Longitude
Quartzite																		
FCC5-2	0.02	341	112	0.34	2701	13	2714	7	0%	1.9212	0.58	0.1867	0.43	13.402	0.72	0.807	40.52.22	111.50.12
FCC5-3	0.20	141	179	1.31	2698	23	2664	15	-1%	1.9242	1.05	0.1812	0.88	12.988	1.37	0.768		
FCC5-4	0.12	130	95	0.76	2705	25	2704	14	0%	1.9179	1.11	0.1856	0.87	13.344	1.42	0.787		
FCC5-5	0.17	165	112	0.70	2577	21	2616	14	2%	2.0346	0.98	0.1761	0.82	11.934	1.28	0.766		
FCC5-6	0.30	163	103	0.65	1638	15	2550	20	36%	3.4560	1.03	0.1692	1.19	6.750	1.57	0.653		
FCC5-7	0.11	244	192	0.81	2576	17	2645	12	3%	2.0354	0.81	0.1792	0.72	12.137	1.08	0.746		
FCC5-8	0.16	119	36	0.32	2681	25	2676	15	0%	1.9394	1.14	0.1825	0.92	12.978	1.46	0.778		
FCC5-10	0.04	146	47	0.33	2666	22	2680	13	1%	1.9525	1.02	0.1830	0.78	12.923	1.28	0.793		
FCC5-11	0.05	253	163	0.67	2474	16	2650	10	7%	2.1371	0.77	0.1797	0.62	11.591	0.99	0.780		
FCC5-13	0.11	69	29	0.43	2439	31	2702	22	10%	2.1745	1.52	0.1854	1.31	11.754	2.01	0.756		
FCC5-14	0.29	125	141	1.17	2686	24	2668	16	-1%	1.9346	1.11	0.1816	0.96	12.946	1.47	0.756		
FCC5-16	0.58	39	30	0.79	2768	46	2742	30	-1%	1.8644	2.04	0.1900	1.85	14.048	2.75	0.741		
FCC5-1T	*0.66*	*1229*	*101*	*0.09*	*1703*	*6*	*1814*	*12*	*6%*	*3.3066*	*0.39*	*0.1109*	*0.64*	*4.623*	*0.74*	*0.520*		
FCC5-9T	*0.02*	*1374*	*33*	*0.02*	*1658*	*5*	*1642*	*8*	*-1%*	*3.4106*	*0.37*	*0.1010*	*0.44*	*4.081*	*0.57*	*0.646*		
FCC5-12R	*0.02*	*1231*	*5*	*0.00*	*1620*	*5*	*1681*	*9*	*4%*	*3.4995*	*0.37*	*0.1031*	*0.47*	*4.062*	*0.60*	*0.616*		
FCC5-15T	*0.04*	*1455*	*18*	*0.01*	*1584*	*5*	*1662*	*8*	*5%*	*3.5906*	*0.34*	*0.1021*	*0.44*	*3.919*	*0.56*	*0.608*		
FCC5-17T	*0.01*	*1750*	*10*	*0.01*	*1623*	*5*	*1629*	*8*	*0%*	*3.4926*	*0.32*	*0.1003*	*0.41*	*3.959*	*0.52*	*0.618*		
FCC5-18R	*0.03*	*1381*	*13*	*0.01*	*1595*	*5*	*1631*	*8*	*2%*	*3.5623*	*0.35*	*0.1004*	*0.41*	*3.886*	*0.54*	*0.647*		
Metasedimentary																		
FCC8-1	0.08	241	128	0.55	2716	15	2719	10	0%	1.9082	0.69	0.1873	0.60	13.533	0.91	0.757	40.55.04	111.48.20
FCC8-1R	0.27	908	209	0.24	1721	6	2392	8	28%	3.2674	0.37	0.1541	0.44	6.505	0.58	0.644		
FCC8-2	0.84	332	219	0.68	2708	13	2725	10	1%	1.9150	0.59	0.1880	0.59	13.537	0.83	0.703		
FCC8-3R	0.07	998	366	0.38	2481	7	2629	6	6%	2.1304	0.34	0.1774	0.34	11.483	0.49	0.706		
FCC8-4	0.18	166	73	0.46	2303	16	2424	14	5%	2.3290	0.85	0.1570	0.81	9.297	1.18	0.722		
FCC8-5	0.13	166	89	0.55	2742	19	2718	11	-1%	1.8865	0.85	0.1872	0.66	13.684	1.07	0.790		
FCC8-6	0.26	254	97	0.39	2284	14	2501	12	9%	2.3519	0.73	0.1643	0.74	9.633	1.04	0.705		
FCC8-7	0.07	663	230	0.36	1854	7	2311	8	20%	3.0017	0.44	0.1470	0.45	6.752	0.63	0.693		
FCC8-9	0.29	287	202	0.73	2473	13	2604	10	5%	2.1385	0.65	0.1748	0.60	11.268	0.88	0.734		
FCC8-10	0.19	211	126	0.62	2514	15	2598	11	3%	2.0968	0.74	0.1742	0.65	11.455	0.99	0.753		
FCC8-11	0.58	330	124	0.39	2237	13	2596	13	14%	2.4111	0.69	0.1739	0.75	9.947	1.02	0.678		
FCC8-12	0.86	186	71	0.39	2493	19	2681	18	7%	2.1179	0.91	0.1830	1.10	11.916	1.42	0.638		
FCC8-13.2	0.08	178	59	0.34	2720	21	2693	19	-1%	1.9050	0.94	0.1844	1.14	13.348	1.48	0.638		
FCC8-14	0.31	584	288	0.51	2693	12	2711	7	1%	1.9284	0.53	0.1864	0.45	13.328	0.69	0.764		
FCC8-17	0.14	149	58	0.40	2730	23	2724	13	0%	1.8963	1.01	0.1879	0.81	13.664	1.30	0.781		
FCC8-20T	0.31	330	37	0.11	1669	12	2054	22	19%	3.3838	0.82	0.1268	1.26	5.166	1.51	0.546		
FCC8-16	2.47	338	165	0.50	2663	15	2681	16	1%	1.9550	0.70	0.1830	0.97	12.910	1.20	0.582		
FCC8-8T	*0.51*	*387*	*14*	*0.04*	*1952*	*15*	*2052*	*25*	*5%*	*2.8273*	*0.88*	*0.1266*	*1.40*	*6.175*	*1.65*	*0.531*		

FCC8-15T	0.54	329	6	0.02	1232	10	1641	32	25%	4.7480	0.89	0.1009	1.71	2.931	1.93	0.461		
FCC8-18T	0.38	305	12	0.04	1405	12	1746	38	20%	4.1067	0.98	0.1068	2.07	3.586	2.29	0.426		
FCC8-19T	0.34	794	10	0.01	1123	9	1604	30	30%	5.2534	0.85	0.0989	1.59	2.596	1.80	0.471		
Metaigneous																		
FCC10-1	0.37	1398	196	0.15	1204	3	1895	14	36%	4.8713	0.29	0.1160	0.75	3.282	0.81	0.362	40.56.13	111.48.22
FCC10-3.1	0.07	157	119	0.79	2442	14	2433	10	0%	2.1710	0.68	0.1579	0.56	10.026	0.88	0.769		
FCC10-4.1	0.05	56	23	0.42	2518	24	2452	15	-3%	2.0929	1.14	0.1596	0.91	10.516	1.46	0.781		
FCC10-6.1	0.22	108	65	0.62	2432	17	2459	12	1%	2.1823	0.86	0.1603	0.68	10.131	1.10	0.784		
FCC10-7	0.16	80	49	0.63	2301	19	2454	14	6%	2.3308	0.96	0.1599	0.83	9.458	1.27	0.755		
FCC10-8	0.94	273	216	0.82	2425	10	2445	16	1%	2.1892	0.51	0.1590	0.93	10.014	1.07	0.482		
FCC10-11	0.07	95	62	0.68	2479	16	2461	10	-1%	2.1322	0.78	0.1605	0.62	10.381	1.00	0.784		
FCC10-2	1.79	139	71	0.52	2431	15	2433	21	0%	2.1834	0.76	0.1579	1.22	9.971	1.44	0.531		
FCC10-5	1.03	88	52	0.61	2334	18	2448	20	5%	2.2926	0.93	0.1592	1.16	9.576	1.49	0.625		
FCC10-10	1.27	103	53	0.53	2331	15	2441	24	4%	2.2950	0.74	0.1586	1.42	9.528	1.61	0.463		
FCC10-9.1	4.94	48	27	0.59	2574	28	2330	56	-10%	2.0373	1.32	0.1486	3.30	10.060	3.55	0.372		
FCC10-3.2	0.07	950	4	0.00	1615	4	1710	7	6%	3.5132	0.30	0.1047	0.35	4.111	0.47	0.650		
FCC10-4.2	0.05	547	2	0.00	1726	6	1706	10	-1%	3.2579	0.40	0.1045	0.53	4.425	0.67	0.602		
FCC10-6.2	0.06	1212	11	0.01	1324	4	1631	7	19%	4.3861	0.32	0.1004	0.38	3.155	0.50	0.648		
FCC10-9.2	0.13	748	3	0.00	1431	4	1666	9	14%	4.0239	0.34	0.1023	0.46	3.505	0.58	0.592		
FCC10-12	0.41	877	11	0.01	1246	3	1652	11	25%	4.6891	0.28	0.1015	0.57	2.985	0.64	0.437		
FCC10-13	0.67	1096	30	0.03	1073	3	1564	26	31%	5.5195	0.30	0.0968	1.38	2.419	1.41	0.210		
FCC10-14	0.23	1552	24	0.02	1060	2	1536	7	31%	5.5957	0.21	0.0954	0.39	2.351	0.44	0.474		
Gray Migmatite																		
FCC11-3C	0.48	136	76	0.58	2120	15	2394	21	11%	2.5682	0.84	0.1543	1.21	8.284	1.48	0.572	41.08.22	111.51.38
FCC11-5C	0.27	528	351	0.69	2374	8	2372	10	0%	2.2464	0.42	0.1523	0.59	9.350	0.73	0.579		
FCC11-7C	0.12	1033	516	0.52	2204	7	2314	6	5%	2.4539	0.39	0.1472	0.34	8.273	0.51	0.750		
FCC11-9	0.17	1755	1428	0.84	1678	4	2181	7	23%	3.3639	0.26	0.1364	0.38	5.589	0.46	0.565		
FCC11-11C	0.09	352	115	0.34	1944	12	1904	14	-2%	2.8407	0.70	0.1166	0.79	5.658	1.05	0.661		
FCC11-12C	0.49	163	75	0.48	2049	15	2247	22	9%	2.6731	0.85	0.1416	1.24	7.305	1.51	0.563		
FCC11-14C	0.10	94	40	0.44	2047	20	2223	21	8%	2.6757	1.13	0.1396	1.21	7.196	1.66	0.680		
FCC11-16C	0.07	1008	543	0.56	2121	6	2347	6	10%	2.5670	0.34	0.1501	0.33	8.063	0.48	0.721		
FCC11-17C	0.07	616	497	0.83	2519	9	2458	6	-2%	2.0921	0.44	0.1602	0.37	10.561	0.57	0.762		
FCC11-18C	0.46	238	131	0.57	2053	12	2362	16	13%	2.6664	0.70	0.1514	0.96	7.830	1.19	0.588		
FCC11-20C	0.37	1254	372	0.31	1588	5	2132	10	26%	3.5797	0.32	0.1326	0.55	5.106	0.64	0.505		
FCC11-1	0.05	1254	66	0.05	1668	4	1679	8	1%	3.3853	0.29	0.1030	0.43	4.196	0.52	0.557		
FCC11-2R	0.19	1070	61	0.06	1651	5	1620	12	-2%	3.4262	0.31	0.0998	0.66	4.015	0.73	0.431		
FCC11-4C	0.08	1132	61	0.06	1711	5	1681	9	-2%	3.2897	0.31	0.1031	0.46	4.323	0.56	0.555		
FCC11-6C	0.07	1193	60	0.05	1761	5	1755	7	0%	3.1842	0.32	0.1073	0.40	4.648	0.51	0.630		
FCC11-8T	0.11	1665	52	0.03	1568	4	1667	9	6%	3.6324	0.28	0.1024	0.49	3.885	0.57	0.499		
FCC11-10C	0.24	1471	46	0.03	1549	4	1708	9	9%	3.6820	0.29	0.1046	0.51	3.918	0.59	0.499		
FCC11-13R	0.09	942	47	0.05	1615	5	1607	11	0%	3.5132	0.37	0.0991	0.56	3.889	0.67	0.546		
FCC11-15R	0.09	1180	55	0.05	1663	6	1676	9	1%	3.3967	0.38	0.1028	0.46	4.174	0.60	0.635		
FCC11-19R	0.06	1075	59	0.06	1614	5	1635	8	1%	3.5158	0.34	0.1006	0.44	3.945	0.56	0.610		

FCC11-21R	*0.07*	*974*	*68*	*0.07*	*1723*	*6*	*1654*	*9*	*-4%*	*3.2644*	*0.37*	*0.1016*	*0.50*	*4.291*	*0.63*	*0.597*			
FCC11-22C	*0.09*	*954*	*8*	*0.01*	*2061*	*6*	*2069*	*8*	*0%*	*2.6543*	*0.36*	*0.1279*	*0.48*	*6.644*	*0.60*	*0.599*			
Pink Migmatite																			
FCC12-1	0.00	85	54	0.65	2424	17	2455	11	1%	2.1907	0.85	0.1599	0.67	10.065	1.08	0.786		41.08.22	111.51.38
FCC12-4	1.17	101	63	0.64	2217	15	2336	23	5%	2.4368	0.80	0.1491	1.34	8.436	1.56	0.512			
FCC12-5	0.04	182	124	0.70	2300	11	2377	8	3%	2.3328	0.57	0.1528	0.47	9.031	0.74	0.771			
FCC12-6.1	0.42	67	34	0.53	2065	20	2256	34	8%	2.6483	1.12	0.1423	2.00	7.410	2.29	0.489			
FCC12-7C	6.53	108	41	0.39	2048	15	2231	61	8%	2.6748	0.87	0.1403	3.55	7.233	3.65	0.239			
FCC12-9	1.75	93	49	0.55	2218	15	2402	27	8%	2.4351	0.82	0.1551	1.59	8.780	1.79	0.457			
FCC12-10	0.06	150	100	0.69	2265	12	2412	10	6%	2.3752	0.64	0.1559	0.56	9.049	0.85	0.753			
FCC12-11	0.00	641	66	0.11	1665	5	1669	7	0%	3.3937	0.32	0.1025	0.36	4.163	0.49	0.668			
FCC12-2	*0.02*	*1084*	*17*	*0.02*	*1756*	*4*	*1703*	*5*	*-3%*	*3.1939*	*0.24*	*0.1044*	*0.26*	*4.505*	*0.36*	*0.675*			
FCC12-3	*-0.01*	*891*	*74*	*0.09*	*1658*	*4*	*1640*	*6*	*-1%*	*3.4093*	*0.27*	*0.1009*	*0.30*	*4.079*	*0.40*	*0.667*			
FCC12-6.2R	*0.17*	*718*	*48*	*0.07*	*1644*	*4*	*1651*	*8*	*0%*	*3.4432*	*0.30*	*0.1015*	*0.41*	*4.063*	*0.51*	*0.591*			
FCC12-8	*0.03*	*952*	*72*	*0.08*	*1570*	*4*	*1619*	*6*	*3%*	*3.6263*	*0.27*	*0.0997*	*0.31*	*3.792*	*0.41*	*0.652*			
FCC12-12	*0.01*	*840*	*61*	*0.07*	*1674*	*5*	*1670*	*7*	*0%*	*3.3733*	*0.33*	*0.1025*	*0.40*	*4.189*	*0.52*	*0.627*			
Little Willow quartzite																			
LWF1-1	0.16	143	172	1.24	2670	18	2619	12	-2%	1.9485	0.83	0.1763	0.69	12.477	1.09	0.769		35.34.22	111.47.01
LWF1-2	0.12	166	124	0.77	2675	20	2693	12	1%	1.9447	0.90	0.1844	0.73	13.075	1.16	0.778			
LWF1-3	0.08	58	21	0.37	2742	34	2658	20	-3%	1.8864	1.53	0.1806	1.20	13.201	1.94	0.788			
LWF1-4	0.07	193	133	0.71	2691	19	2708	11	1%	1.9306	0.86	0.1861	0.66	13.292	1.08	0.790			
LWF1-5	0.09	316	395	1.29	2631	14	2668	9	1%	1.9845	0.65	0.1816	0.52	12.618	0.83	0.780			
LWF1-6	0.01	198	126	0.66	2542	17	2633	11	3%	2.0684	0.82	0.1779	0.65	11.858	1.05	0.786			
LWF1-8	0.37	25	9	0.39	2622	51	2692	34	3%	1.9926	2.39	0.1843	2.03	12.751	3.14	0.761			
LWF1-9	0.02	275	148	0.55	2518	15	2668	9	6%	2.0929	0.71	0.1817	0.56	11.971	0.90	0.785			
LWF1-10	0.03	95	34	0.37	2532	25	2663	16	5%	2.0786	1.21	0.1811	0.95	12.014	1.54	0.785			
LWF1-11	0.05	205	255	1.28	2628	18	2674	11	2%	1.9870	0.82	0.1823	0.69	12.651	1.07	0.768			
LWF1-15	0.13	99	46	0.48	2676	26	2708	15	1%	1.9439	1.20	0.1861	0.94	13.201	1.53	0.788			
LWF1-16	0.17	93	106	1.18	2454	26	2604	19	6%	2.1586	1.26	0.1748	1.15	11.164	1.70	0.740			
LWF1-17	0.00	392	219	0.58	2625	13	2669	8	2%	1.9892	0.60	0.1817	0.46	12.597	0.75	0.794			
LWF1-7	0.03	395	173	0.45	2347	12	2886	7	19%	2.2775	0.59	0.2074	0.46	12.559	0.75	0.789			
LWF1-18	0.05	520	217	0.43	2132	10	2608	8	18%	2.5509	0.53	0.1752	0.47	9.471	0.71	0.752			
LWF1-12R	0.68	888	267	0.31	1093	5	2302	15	52%	5.4095	0.50	0.1462	0.88	3.726	1.02	0.493			
LWF1-13C	0.60	234	180	0.79	1673	13	2656	16	37%	3.3741	0.85	0.1804	0.99	7.371	1.30	0.652			
LWF1-14	0.14	109	31	0.29	1501	16	2644	21	43%	3.8133	1.22	0.1790	1.25	6.473	1.75	0.698			
							2666	18											
Owiyukuts quartz-rich metasedimentary rock																			
OWK2-1	0.08	291	477	1.70	2408	13	2676	10	10%	2.2077	0.66	0.1826	0.59	11.402	0.88	0.745		40.54.42	109.03.11
OWK2-2	-0.03	393	132	0.35	2429	12	2591	8	6%	2.1858	0.61	0.1734	0.50	10.940	0.78	0.775			
OWK2-4	0.19	73	39	0.55	2771	31	2844	18	3%	1.8620	1.40	0.2022	1.08	14.972	1.77	0.791			
OWK2-5R	0.22	352	101	0.30	2216	12	2688	10	18%	2.4372	0.63	0.1839	0.60	10.401	0.87	0.724			
OWK2-6	0.00	190	131	0.71	3470	23	3475	7	0%	1.4024	0.85	0.3009	0.47	29.584	0.97	0.877			
OWK2-7	-0.01	97	80	0.85	2716	23	2749	13	1%	1.9085	1.03	0.1908	0.76	13.783	1.28	0.803			

OWK2-9	0.04	343	323	0.97	2467	13	2686	7	8%	2.1450	0.64	0.1837	0.44	11.806	0.77	0.824			
OWK2-10	0.08	131	123	0.97	2672	23	2716	13	2%	1.9469	1.05	0.1870	0.81	13.245	1.33	0.793			
OWK2-11	0.14	239	67	0.29	2212	14	2417	12	8%	2.4426	0.76	0.1564	0.73	8.827	1.06	0.723			
OWK2-12	0.19	47	41	0.91	2774	39	2746	22	-1%	1.8595	1.71	0.1904	1.34	14.120	2.17	0.787			
OWK2-19T	0.49	1366	154	0.12	593	2	1205	25	51%	10.3771	0.42	0.0803	1.25	1.067	1.31	0.316			
OWK2-20	0.16	95	37	0.41	2657	27	2722	16	2%	1.9608	1.22	0.1877	0.97	13.200	1.56	0.783			
OWK2-21	0.16	103	66	0.66	2783	25	2840	15	2%	1.8525	1.13	0.2017	0.90	15.015	1.44	0.782			
OWK2-3R	0.04	1159	11	0.01	1814	6	1751	11	-4%	3.0777	0.36	0.1071	0.59	4.799	0.70	0.525			
OWK2-15T	0.17	808	15	0.02	1471	7	1788	15	18%	3.9004	0.54	0.1093	0.82	3.863	0.98	0.549			
OWK2-16T	0.56	1064	5	0.01	1257	5	1579	19	20%	4.6454	0.44	0.0976	1.00	2.898	1.09	0.407			
OWK2-17R	0.02	819	78	0.10	2175	9	2511	8	13%	2.4920	0.50	0.1653	0.46	9.145	0.68	0.739			
OWK2-8R	0.52	1316	5	0.00	671	2	1169	23	43%	9.1089	0.35	0.0789	1.17	1.194	1.22	0.284			
OWK2-13	0.67	685	17	0.03	1295	6	1909	16	32%	4.4952	0.50	0.1169	0.87	3.585	1.00	0.497			
OWK2-14T	0.22	1201	43	0.04	1169	4	1667	12	30%	5.0303	0.40	0.1023	0.67	2.805	0.78	0.508			
OWK2-18T	0.21	1304	10	0.01	453	2	1154	24	61%	13.7413	0.43	0.0783	1.21	0.785	1.28	0.335			
OWK2-22T	0.12	1358	18	0.01	935	3	1499	14	38%	6.4093	0.40	0.0936	0.74	2.013	0.84	0.472			
Owiyukuts leucosome																			
OWK3-2	0.39	603	106	0.18	1430	6	1630	15	12%	4.0263	0.46	0.1003	0.82	3.435	0.95	0.490		40.54.29	109.03.13
OWK3-13	0.32	471	374	0.82	2246	10	2625	8	14%	2.3988	0.50	0.1770	0.49	10.172	0.70	0.714			
OWK3-14	1.32	662	382	0.60	1303	6	1680	40	22%	4.4658	0.51	0.1030	2.19	3.182	2.25	0.228			
OWK3-16	0.18	499	71	0.15	1703	7	1903	12	11%	3.3079	0.49	0.1165	0.64	4.856	0.81	0.609			
OWK3-17	1.76	594	392	0.68	1526	7	2085	19	27%	3.7439	0.49	0.1291	1.07	4.753	1.18	0.416			
OWK3-21	2.26	520	78	0.15	1594	7	1725	27	8%	3.5653	0.53	0.1056	1.46	4.085	1.55	0.339			
OWK3-22	0.08	556	339	0.63	2298	9	2565	7	10%	2.3348	0.45	0.1708	0.40	10.085	0.60	0.752			
OWK3-1	0.39	444	16	0.04	1522	7	1676	17	9%	3.7562	0.51	0.1028	0.89	3.775	1.03	0.499			
OWK3-3	0.02	475	5	0.01	1659	7	1693	11	2%	3.4076	0.50	0.1038	0.61	4.200	0.79	0.639			
OWK3-4	0.18	517	7	0.01	1661	7	1694	14	2%	3.4036	0.48	0.1039	0.73	4.207	0.88	0.550			
OWK3-5	0.16	678	14	0.02	1555	6	1653	13	6%	3.6661	0.44	0.1016	0.70	3.819	0.83	0.537			
OWK3-6	0.06	371	9	0.02	1685	9	1664	14	-1%	3.3480	0.59	0.1022	0.75	4.208	0.95	0.618			
OWK3-7	0.09	385	8	0.02	1717	9	1673	15	-3%	3.2773	0.58	0.1027	0.81	4.319	0.99	0.586			
OWK3-8	0.03	495	7	0.01	1690	8	1687	12	0%	3.3365	0.51	0.1035	0.63	4.275	0.81	0.628			
OWK3-9	-0.02	722	7	0.01	1674	6	1696	9	1%	3.3719	0.43	0.1039	0.51	4.251	0.67	0.641			
OWK3-10	0.54	898	32	0.04	1741	10	1759	33	1%	3.2255	0.65	0.1076	1.79	4.598	1.90	0.340			
OWK3-11	0.25	798	28	0.04	1747	6	2007	10	13%	3.2122	0.40	0.1234	0.55	5.299	0.68	0.590			
OWK3-12C	0.36	665	31	0.05	1368	6	1675	14	18%	4.2295	0.45	0.1028	0.77	3.351	0.89	0.503			
OWK3-19	0.29	496	5	0.01	1495	7	1694	16	12%	3.8327	0.52	0.1039	0.87	3.736	1.01	0.516			
OWK3-20	0.17	390	7	0.02	1576	8	1689	17	7%	3.6116	0.57	0.1036	0.90	3.953	1.07	0.536			
OWK3-18	1.05	403	7	0.02	1606	8	1685	25	5%	3.5351	0.58	0.1033	1.37	4.030	1.49	0.389			
OWK3-15	2.10	4813	50	0.01	651	1	1010	33	36%	9.4074	0.23	0.0729	1.65	1.068	1.67	0.137			
Owiyukuts leucomsome																			
OWK4-9C	0.19	245	141	0.59	1953	12	2277	15	14%	2.8252	0.71	0.1441	0.84	7.034	1.10	0.641		40.54.28	109.03.14
OWK4-10	0.20	513	169	0.34	1499	7	1889	13	21%	3.8204	0.52	0.1156	0.72	4.172	0.89	0.584			
OWK4-2T	0.16	1061	10	0.01	1497	5	1668	10	10%	3.8255	0.36	0.1024	0.53	3.691	0.64	0.569			
OWK4-4	0.06	968	3	0.00	1599	5	1642	9	3%	3.5533	0.38	0.1010	0.51	3.918	0.64	0.602			
OWK4-5T	0.05	1090	2	0.00	1306	4	1661	9	21%	4.4533	0.35	0.1020	0.50	3.158	0.61	0.573			
OWK4-8	0.15	1132	78	0.07	1299	4	1655	10	22%	4.4776	0.36	0.1017	0.53	3.132	0.63	0.561			
OWK4-11	0.25	1460	71	0.05	1264	4	1659	10	24%	4.6174	0.33	0.1019	0.52	3.043	0.62	0.540			

OWK4-12	*0.13*	*955*	*4*	*0.00*	*1469*	*5*	*1680*	*10*	*13%*	*3.9083*	*0.38*	*0.1030*	*0.54*	*3.635*	*0.66*	*0.574*		
OWK4-1T	*0.60*	*1174*	*93*	*0.08*	*1198*	*4*	*1617*	*14*	*26%*	*4.8951*	*0.36*	*0.0996*	*0.76*	*2.806*	*0.84*	*0.430*		
OWK4-3	*1.26*	*420*	*208*	*0.51*	*1741*	*9*	*2450*	*14*	*29%*	*3.2257*	*0.57*	*0.1595*	*0.84*	*6.818*	*1.01*	*0.559*		
OWK4-6R	*0.18*	*1358*	*4*	*0.00*	*950*	*3*	*1449*	*13*	*34%*	*6.2959*	*0.34*	*0.0911*	*0.67*	*1.995*	*0.75*	*0.452*		
OWK4-7T	*0.29*	*1244*	*22*	*0.02*	*1067*	*3*	*1494*	*13*	*29%*	*5.5561*	*0.36*	*0.0933*	*0.69*	*2.316*	*0.78*	*0.456*		
Red Creek Metasedimentary rock																		
URC2-1	0.24	626	365	0.60	1903	8	2444	8	22%	2.9123	0.46	0.1589	0.50	7.522	0.68	0.683	40.26.4	109.09.32
URC2-2	0.27	625	521	0.86	1389	6	2246	11	38%	4.1585	0.50	0.1415	0.62	4.692	0.79	0.628		
URC2-3	0.09	174	127	0.76	2480	17	2669	12	7%	2.1318	0.83	0.1817	0.72	11.753	1.10	0.754		
URC2-4	0.13	181	95	0.54	2114	15	2379	15	11%	2.5773	0.83	0.1529	0.87	8.179	1.20	0.689		
URC2-5	0.07	164	165	1.04	2596	18	2685	11	3%	2.0163	0.85	0.1835	0.67	12.549	1.08	0.785		
URC2-6	0.00	155	142	0.95	2414	17	2469	12	2%	2.2020	0.85	0.1613	0.71	10.100	1.11	0.769		
URC2-7	0.05	267	115	0.44	2237	12	2367	10	5%	2.4105	0.65	0.1519	0.61	8.686	0.89	0.729		
URC2-8	0.01	289	202	0.72	2467	13	2555	9	3%	2.1445	0.64	0.1697	0.52	10.911	0.82	0.775		
URC2-9	0.03	189	115	0.63	2356	15	2567	12	8%	2.2671	0.78	0.1709	0.71	10.395	1.05	0.739		
URC2-10	0.10	320	330	1.07	1786	10	2264	14	21%	3.1324	0.62	0.1430	0.81	6.294	1.02	0.610		
URC2-11	0.82	1121	668	0.62	748	3	2261	13	67%	8.1289	0.42	0.1428	0.78	2.421	0.88	0.470		
URC2-12	0.00	80	29	0.38	2338	24	2424	18	4%	2.2870	1.22	0.1570	1.06	9.468	1.62	0.755		
URC2-13	0.00	136	39	0.30	2392	20	2390	14	0%	2.2257	0.98	0.1540	0.84	9.537	1.29	0.761		
URC2-14	0.00	178	217	1.26	2332	16	2296	13	-2%	2.2941	0.82	0.1457	0.73	8.758	1.10	0.747		
URC2-15	0.26	68	109	1.66	2920	31	2917	16	0%	1.7453	1.34	0.2115	1.00	16.709	1.67	0.800		
Red Creek Quartzite																		
URC5-1	-0.06	178	24	0.14	2654	17	2709	10	2%	1.9630	0.79	0.1863	0.63	13.082	1.01	0.784	40.28.3	109.08.22
URC5-2	0.17	423	325	0.80	1600	8	2205	12	27%	3.5486	0.58	0.1382	0.70	5.371	0.91	0.643		
URC5-3	0.02	180	130	0.75	2442	17	2540	11	4%	2.1714	0.82	0.1682	0.68	10.683	1.07	0.769		
URC5-4	0.09	355	225	0.65	2015	10	2312	10	13%	2.7258	0.60	0.1471	0.59	7.438	0.85	0.713		
URC5-5.1	0.04	292	91	0.32	2441	13	2465	9	1%	2.1721	0.62	0.1609	0.54	10.213	0.82	0.754		
URC5-6	0.33	531	542	1.06	1660	7	2363	10	30%	3.4046	0.49	0.1515	0.59	6.135	0.76	0.636		
URC5-7	0.08	264	132	0.52	2982	15	3418	6	13%	1.7001	0.64	0.2900	0.40	23.522	0.75	0.845		
URC5-8	0.00	164	50	0.31	2366	17	2387	12	1%	2.2546	0.83	0.1537	0.73	9.399	1.11	0.752		
URC5-9	0.00	69	84	1.25	2505	26	2514	18	0%	2.1054	1.27	0.1656	1.06	10.848	1.65	0.770		
URC5-10	0.00	110	76	0.72	2419	21	2477	14	2%	2.1963	1.02	0.1620	0.86	10.171	1.33	0.765		
URC5-11	0.07	182	70	0.40	2573	16	2682	10	4%	2.0385	0.76	0.1832	0.62	12.392	0.97	0.775		
URC5-12	0.11	282	297	1.09	2198	12	2485	11	12%	2.4617	0.64	0.1628	0.62	9.118	0.89	0.714		
URC5-13	0.04	95	45	0.49	2522	23	2529	15	0%	2.0883	1.08	0.1672	0.90	11.036	1.40	0.770		
URC5-14	0.13	282	159	0.58	2128	12	2275	12	6%	2.5569	0.65	0.1439	0.67	7.760	0.93	0.696		
URC5-15	0.32	784	740	0.97	1699	6	2686	7	37%	3.3169	0.40	0.1836	0.42	7.634	0.58	0.693		

Notes:

Col A: C=core, R=rim, T=tip; FCC = Farmington Complex

Row 2: r=radiogenic

All Rows: Italics = Low Th/U samples (< 0.1)

All errors = 1 sigma

Discordance calculated by comparing 206/238 and 207/206 ages

All common Pb corrections made using observed 204 counts and the Stacey and Kramers (1975) model Pb corresponding to the calculated 207/206 age of each zircon

Corr = corrected for common Pb

Error correlation refers to the extent to which 206Pb/238U and 207Pb/235U are not independent variables

Table S2.

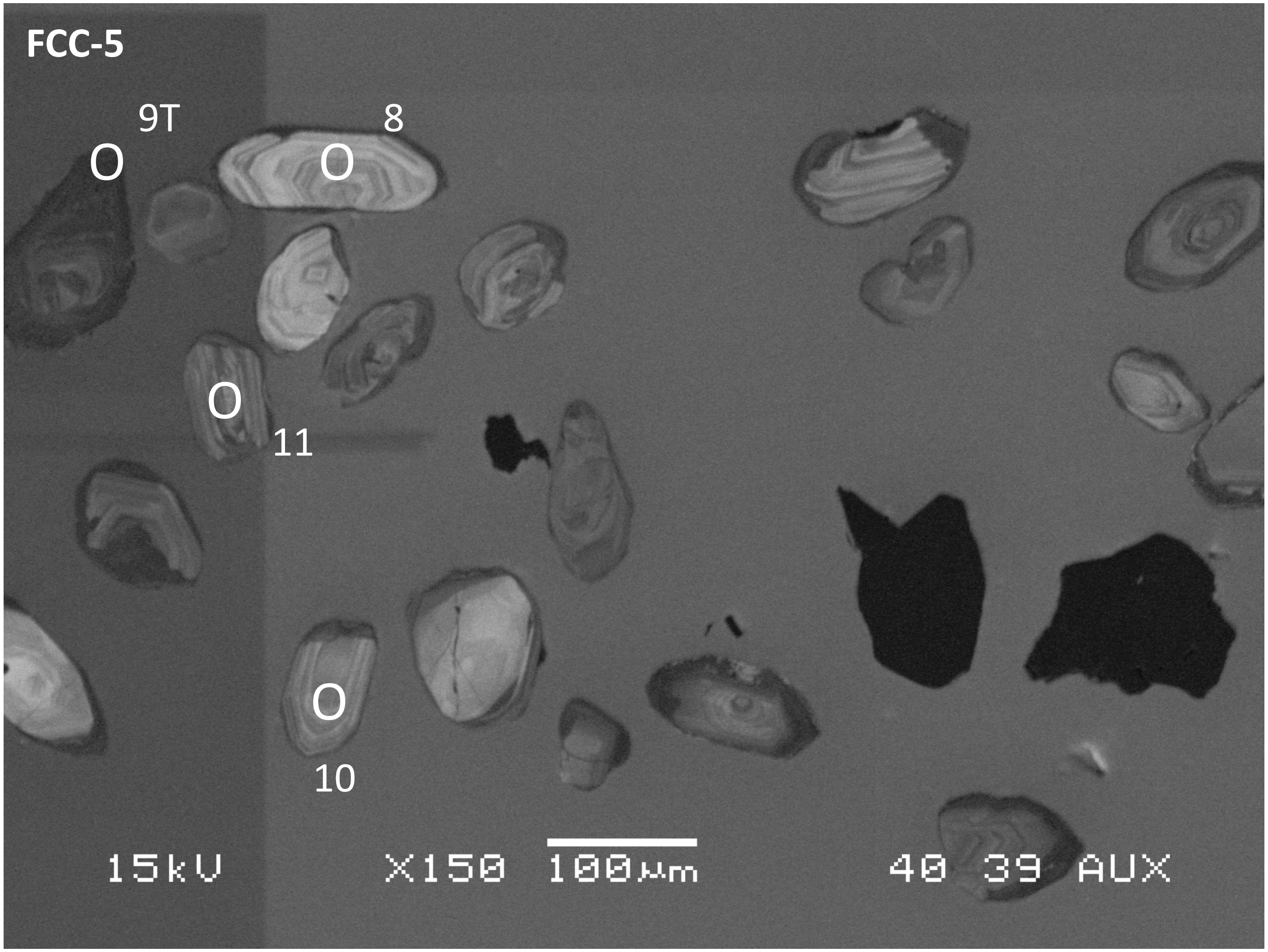
Sample	**$^{147}Sm/^{144}Nd$**	**$^{143}Nd/^{144}Nd$**	**ε(0)**	**T_{CHUR}**	**T_{DM}**	**t(Ga)**	**ε(t)**	**SiO_2 wt%**	**TiO_2 wt%**	**Al_2O_3 wt%**	**Fe_2O_3* wt%**	**CaO wt%**	**MgO wt%**	**K_2O wt%**	**Na_2O wt%**	**MnO wt%**	**P_2O_5 wt%**	**LOI wt%**	**Total wt%**
FCC-2	0.11633	0.51121	-27.6	2.7	2.9	na	na	80.20	0.17	9.67	1.26	0.53	0.42	3.57	2.03	0.02	0.04	1.18	99.09
FCC-7	0.14518	0.51169	-18.3	2.8	3.1	na	na	47.10	1.51	15.57	13.85	10.81	7.13	1.06	1.72	0.20	0.20	1.37	100.52
FCC-10	0.12813	0.51134	-25.2	2.9	3.1	2.45	-3.8	74.08	0.40	12.25	4.96	1.34	0.11	3.89	2.86	0.10	0.05	0.45	100.49
FCC-11	0.12688	0.51142	-23.5	2.6	2.9	na	na	71.83	0.38	12.63	5.37	1.91	0.32	4.89	3.13	0.13	0.12	0.06	100.77
FCC-12	0.09625	0.51082	-35.4	2.8	2.9	na	na	71.10	0.42	12.91	6.24	2.23	0.24	3.30	3.79	0.08	0.14	0.42	100.87
URC-1	0.16917	0.51206	-11.2	3.2	3.5	na	na	51.98	1.68	12.75	16.55	6.37	4.41	0.71	3.62	0.25	0.10	2.44	100.86
URC-4	0.09377	0.51101	-31.6	2.4	2.6	na	na	90.18	0.18	4.86	0.76	0.07	0.67	1.19	0.16	0.01	0.04	1.12	99.24
URC-6	0.16622	0.51203	-11.7	3.0	3.4	na	na	54.36	1.03	13.63	14.17	7.89	4.91	0.70	3.33	0.25	0.10	0.54	100.91
URC-8	0.11382	0.51130	-25.8	2.4	2.7	na	an	70.86	0.45	13.84	4.04	0.66	1.41	3.04	1.46	0.07	0.18	2.50	98.51

T_{DM} = depleted mantle model age calculated per DePaolo (1981); n.a.= not applicable

T_{CHUR} =chondritic uniform reservoir model age

* denotes total Fe

Figure S1: CL images of representative zircons from each sample. In these images, darker shades of gray correlate with zones of high U and low Th/U indicative of secondary or metamorphic growth. White circles indicate analytical spots with numbers keyed to Table S1. In some cases primary ion beams were larger than the preferred analytical area, and these cases are evident for grains in which the white circles lap on to the adjacent epoxy (e.g., FCC-12/6.2). The epoxy has no Pb, and therefore, does not affect the analysis. The mixed ages mentioned in the text are associated with cases in which the primary beam apparently sampled primary as well as overgrowth material (e.g., FCC-10/4.2).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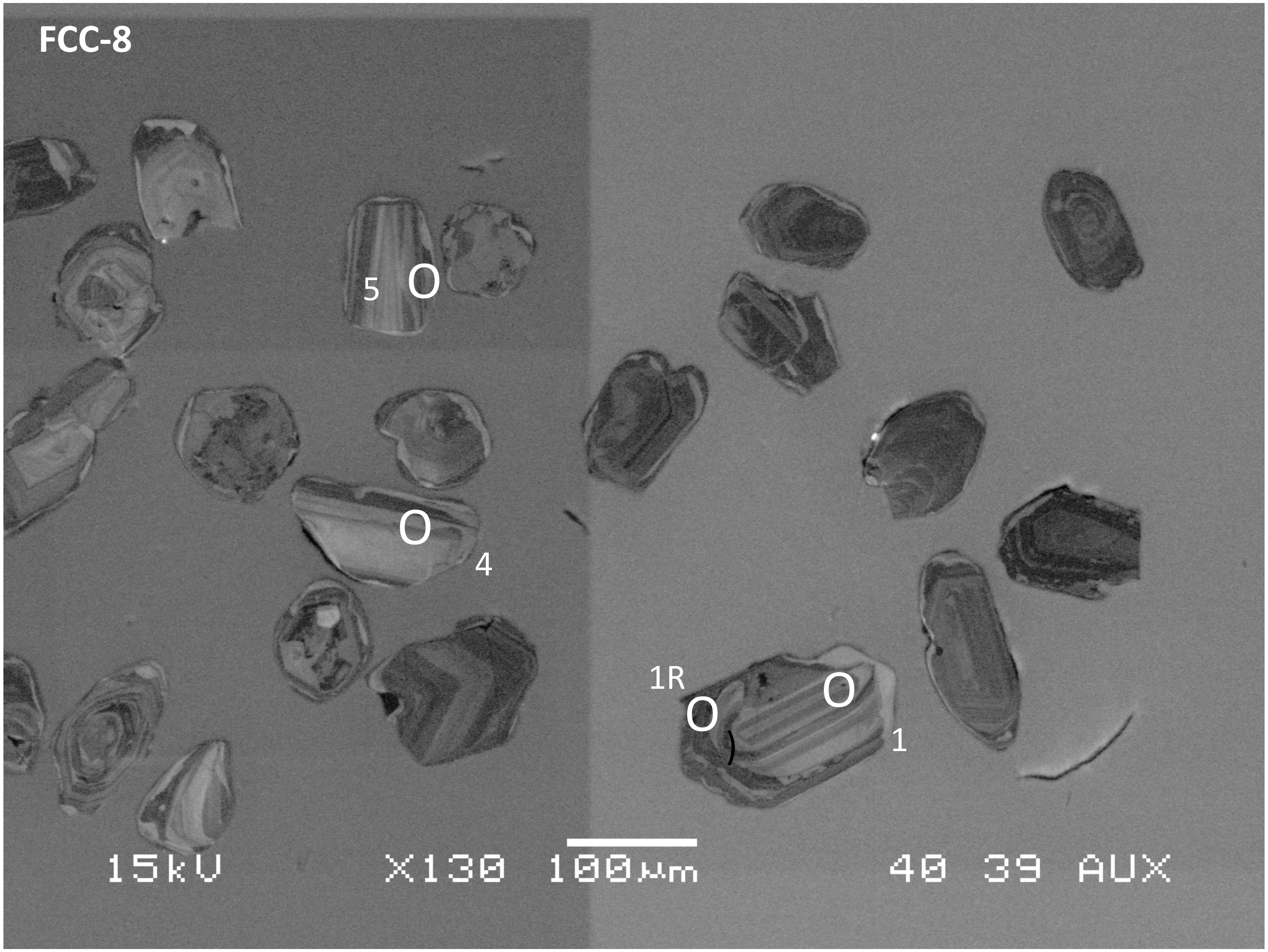
8
11
10
15kV
X150 100µm
40 39 AUX



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4
1R
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15kV
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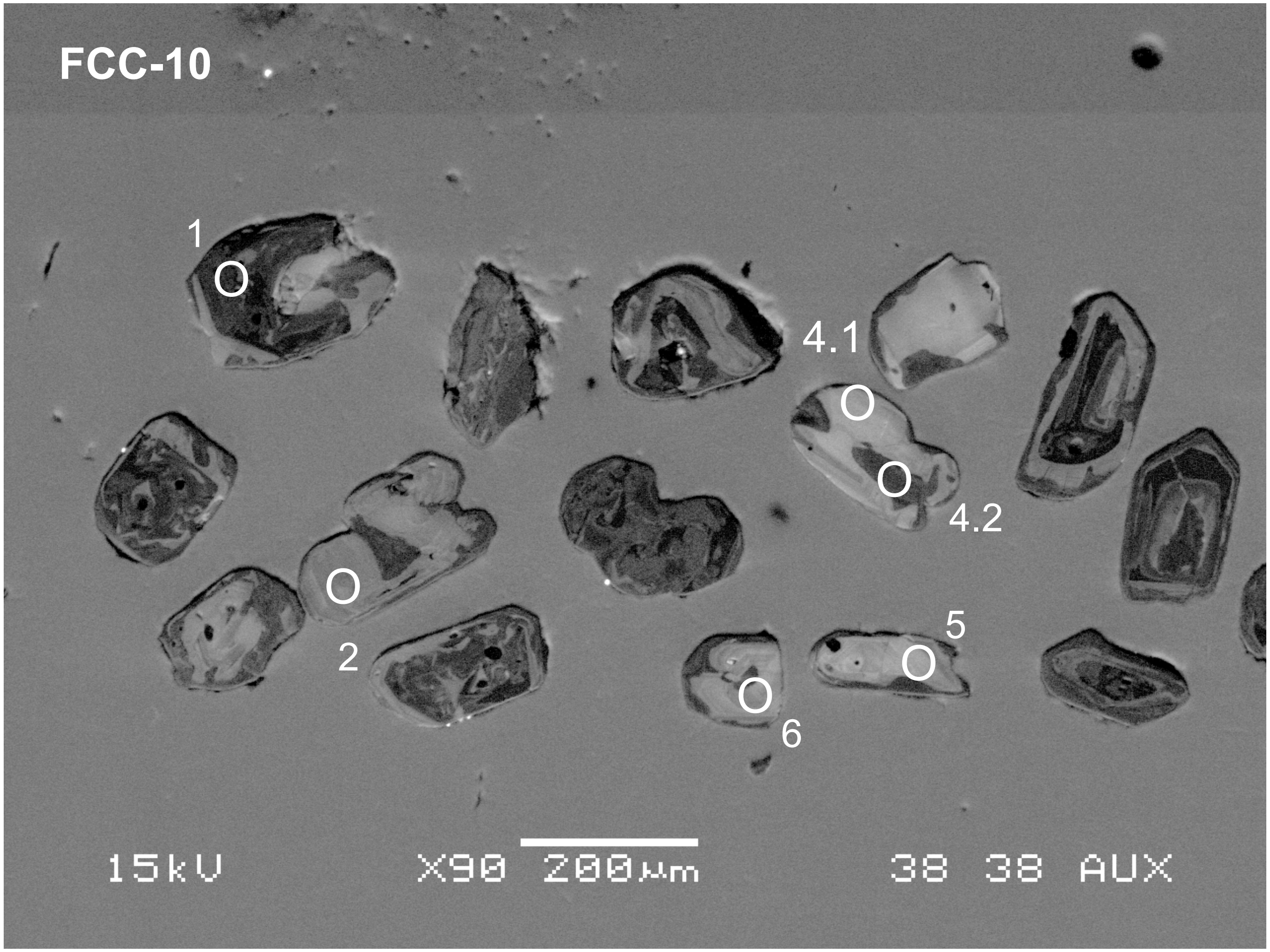
100µm
40 39 AUX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2
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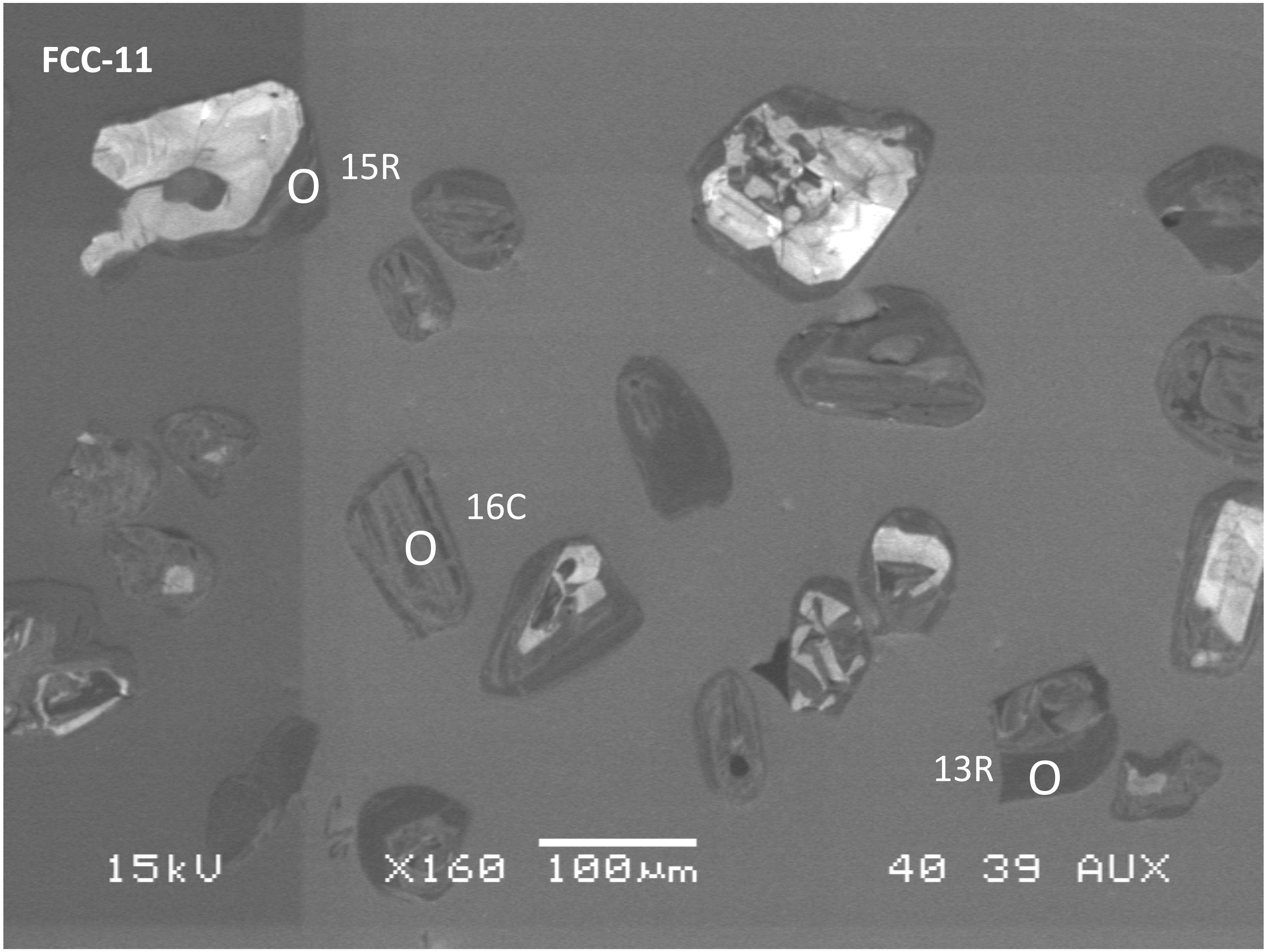
4.2
5
6
15kV
X90 200μm
38 38 AUX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16C
13R
15kV
X160
100µm
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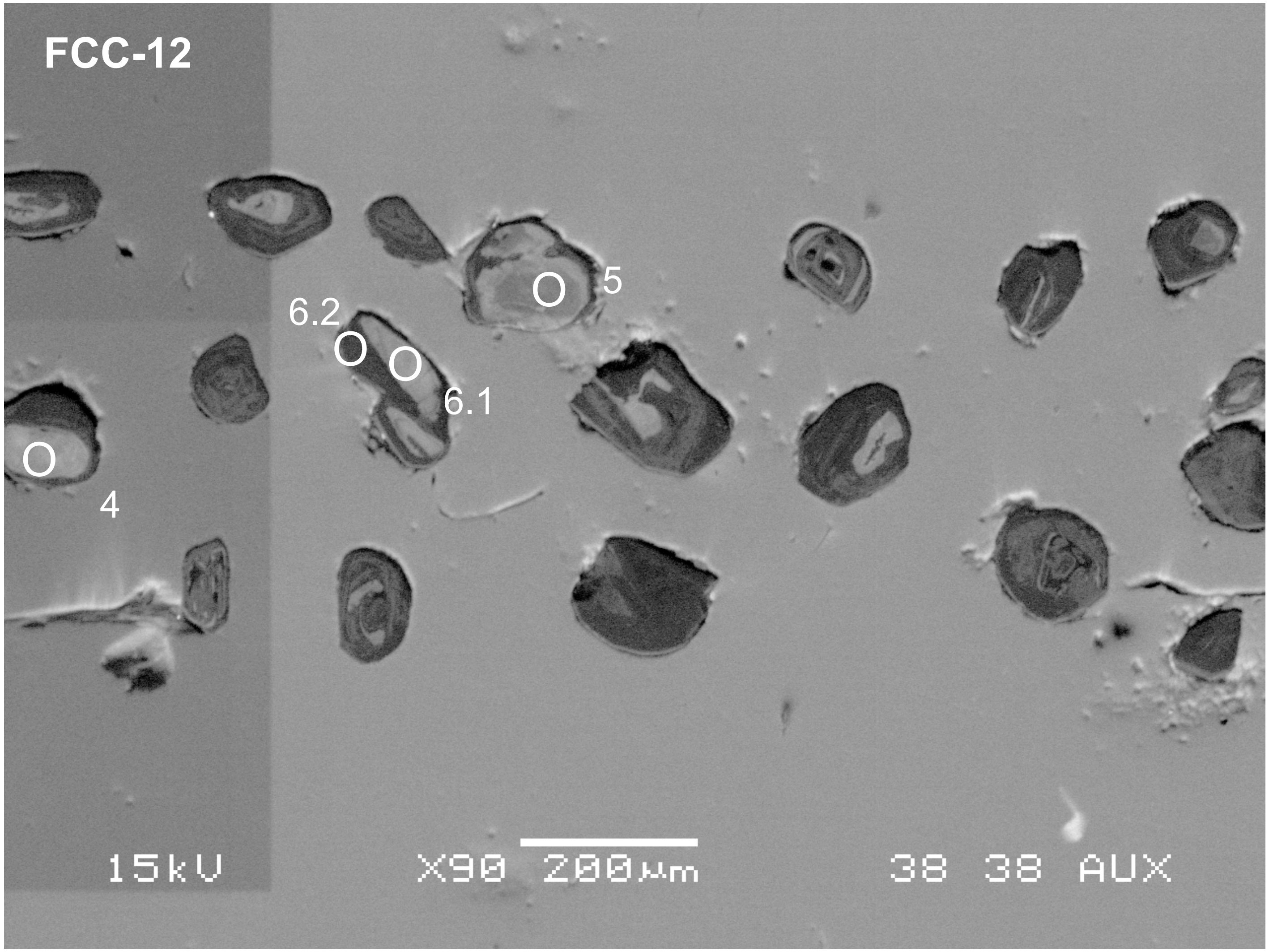
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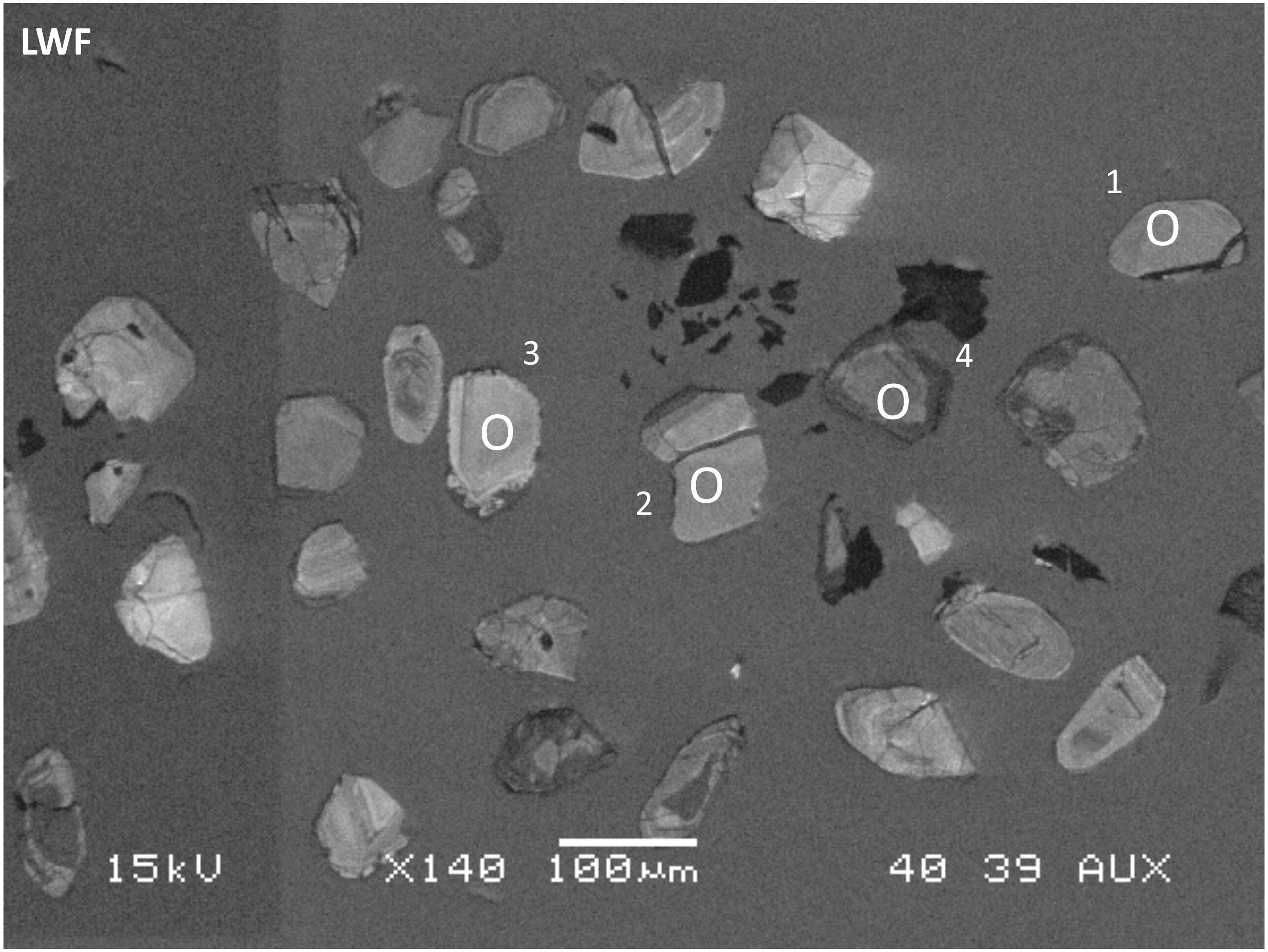
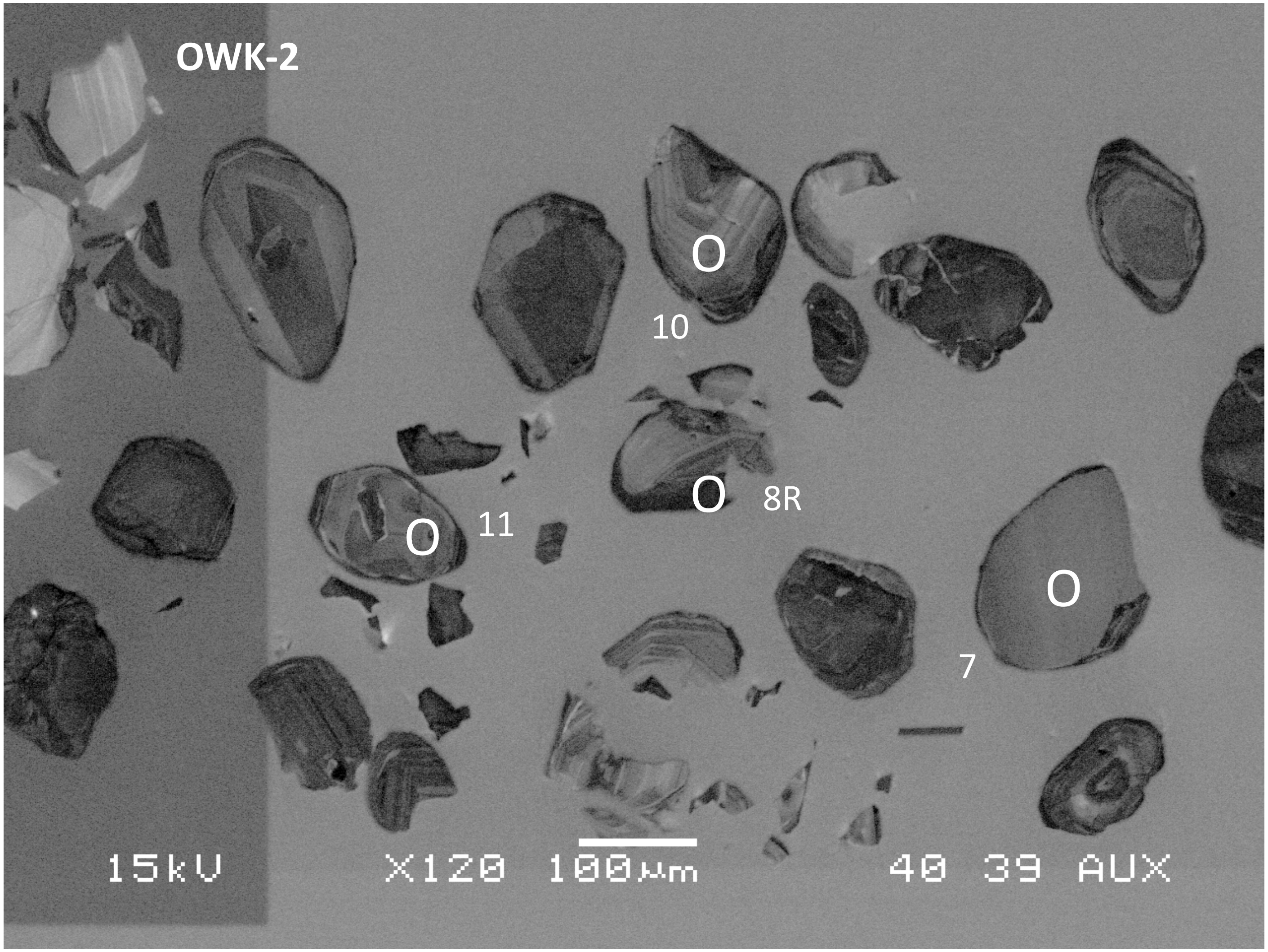
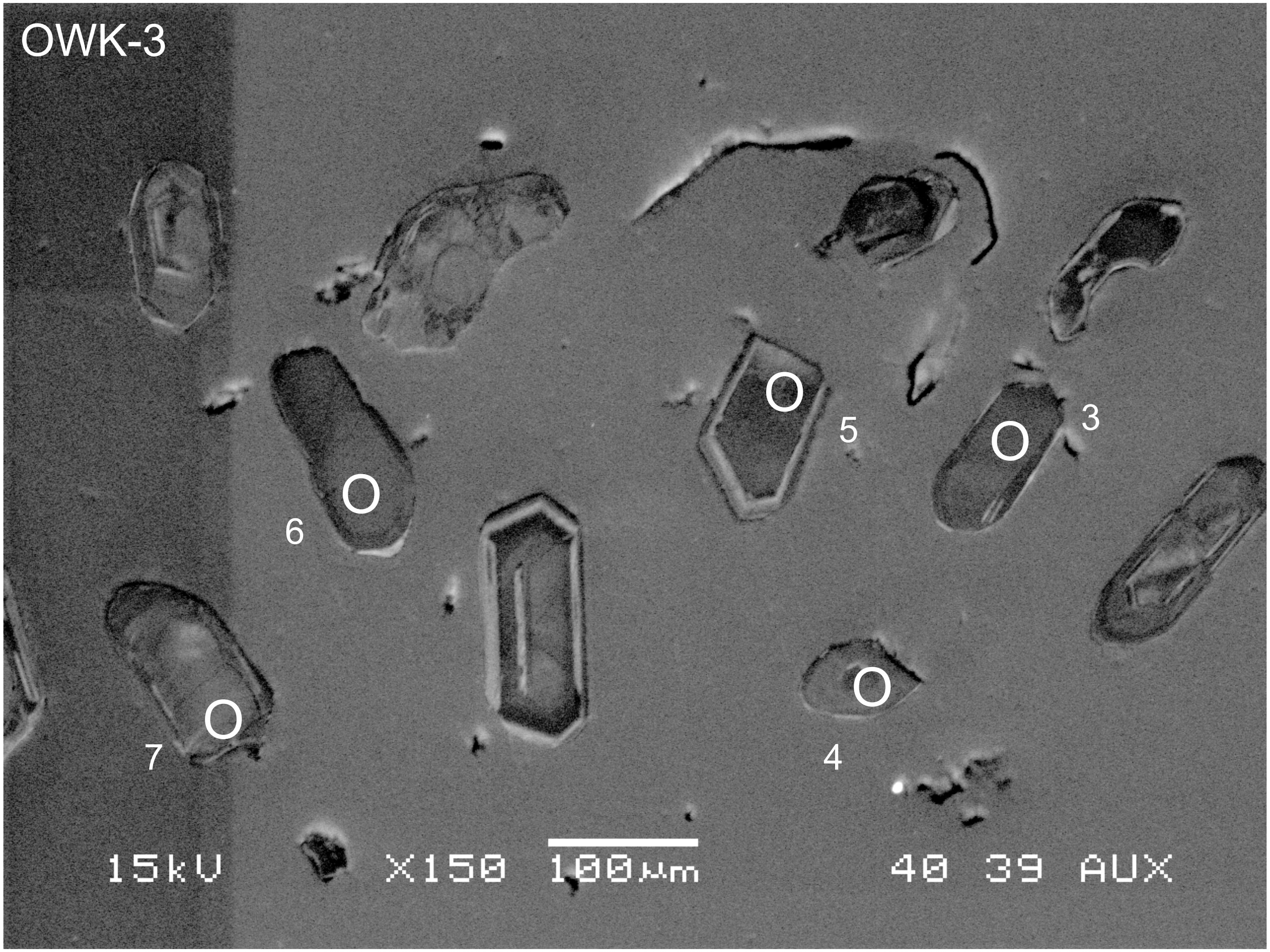
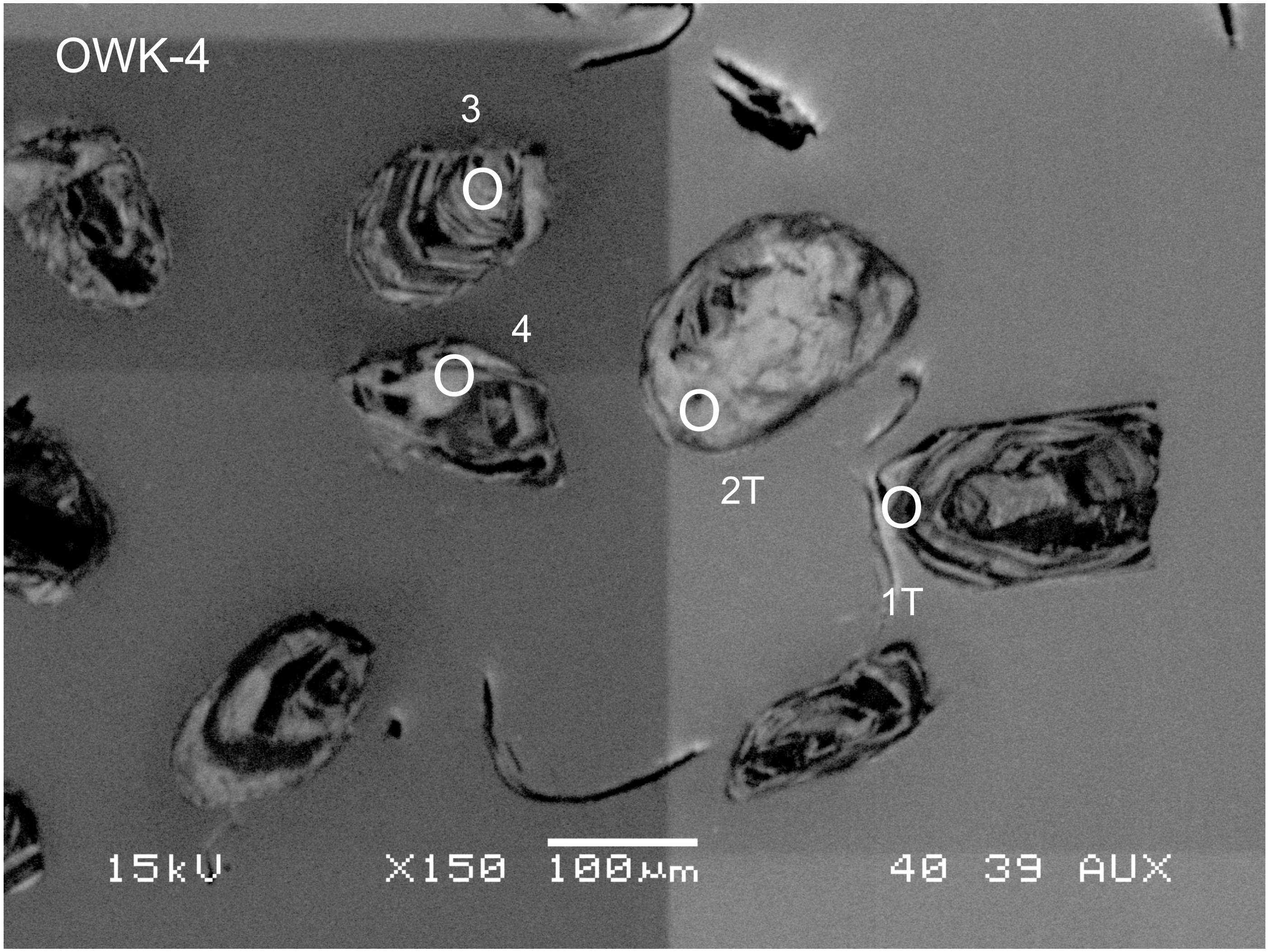
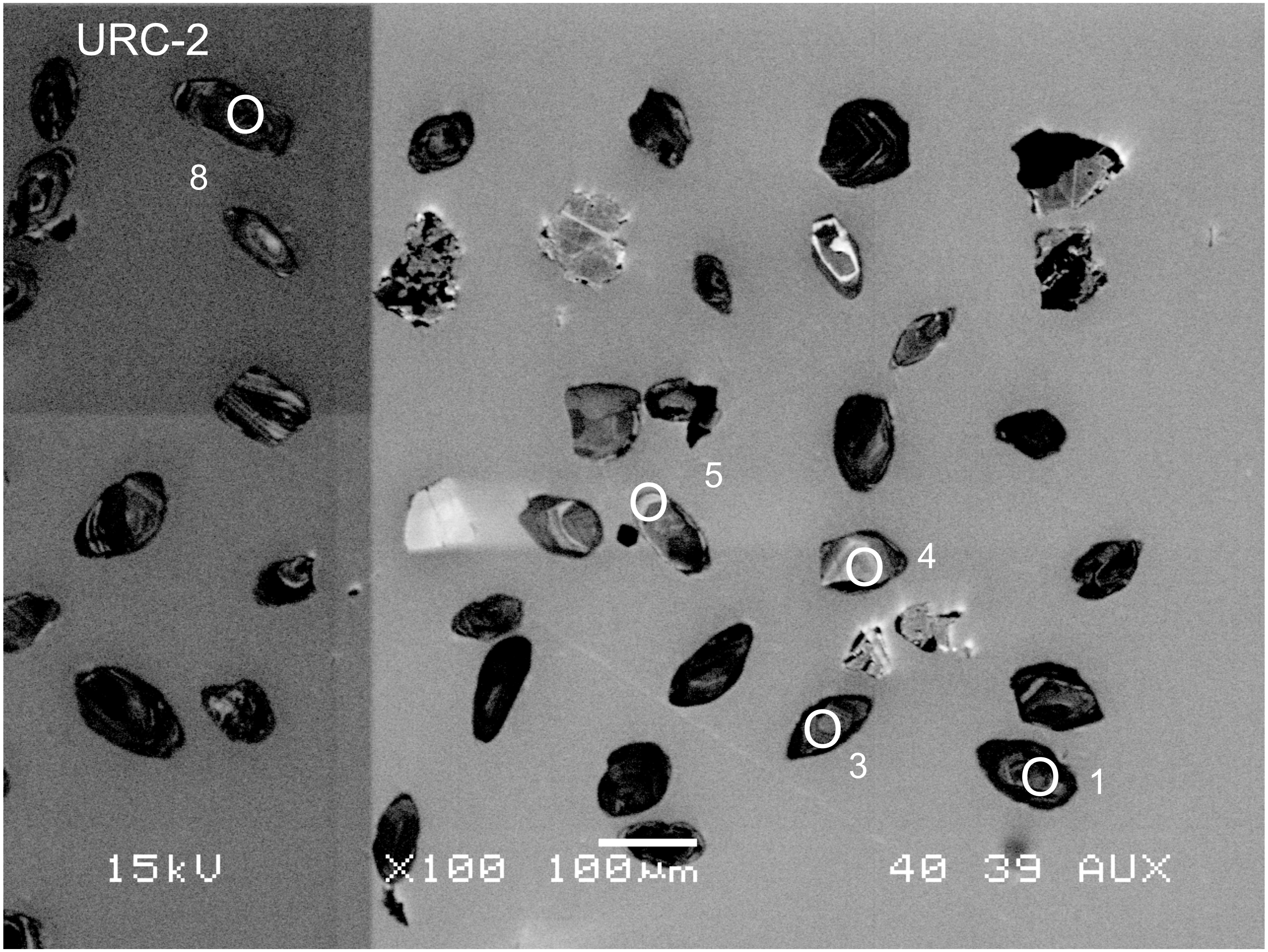
6.2
5
6.1
4
15kV
X90 200µm
38 38 AUX


LWF
1
2
3
4
15kV
X140
100µm
40 39 AUX


OWK-2
O
10
O
8R
O
11
O
7
15kV
X120 100µm
40 39 AUX


OWK-3
O
O
O
O
O
5
3
6
7
4
15kV
X150
100µm
40 39 AUX


OWK-4
3
4
2T
1T
15kV
X150
100μm
40 39 AUX



URC-2
8
5
4
3
1
15kV
X100 100µm
40 39 AUX

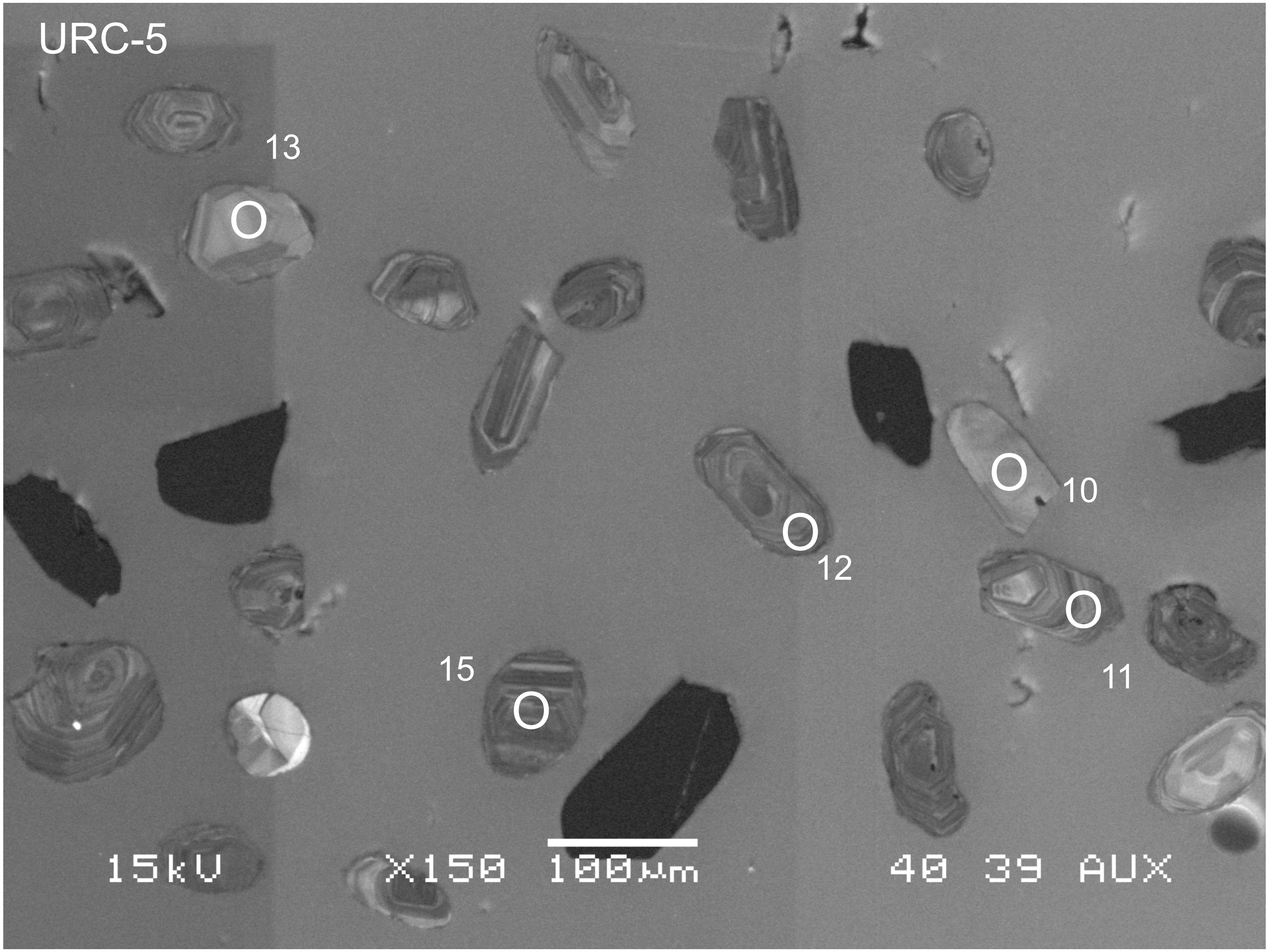

URC-5
13
10
12
11
15
15kV
X150
100µm
40 39 AUX

Figure S2

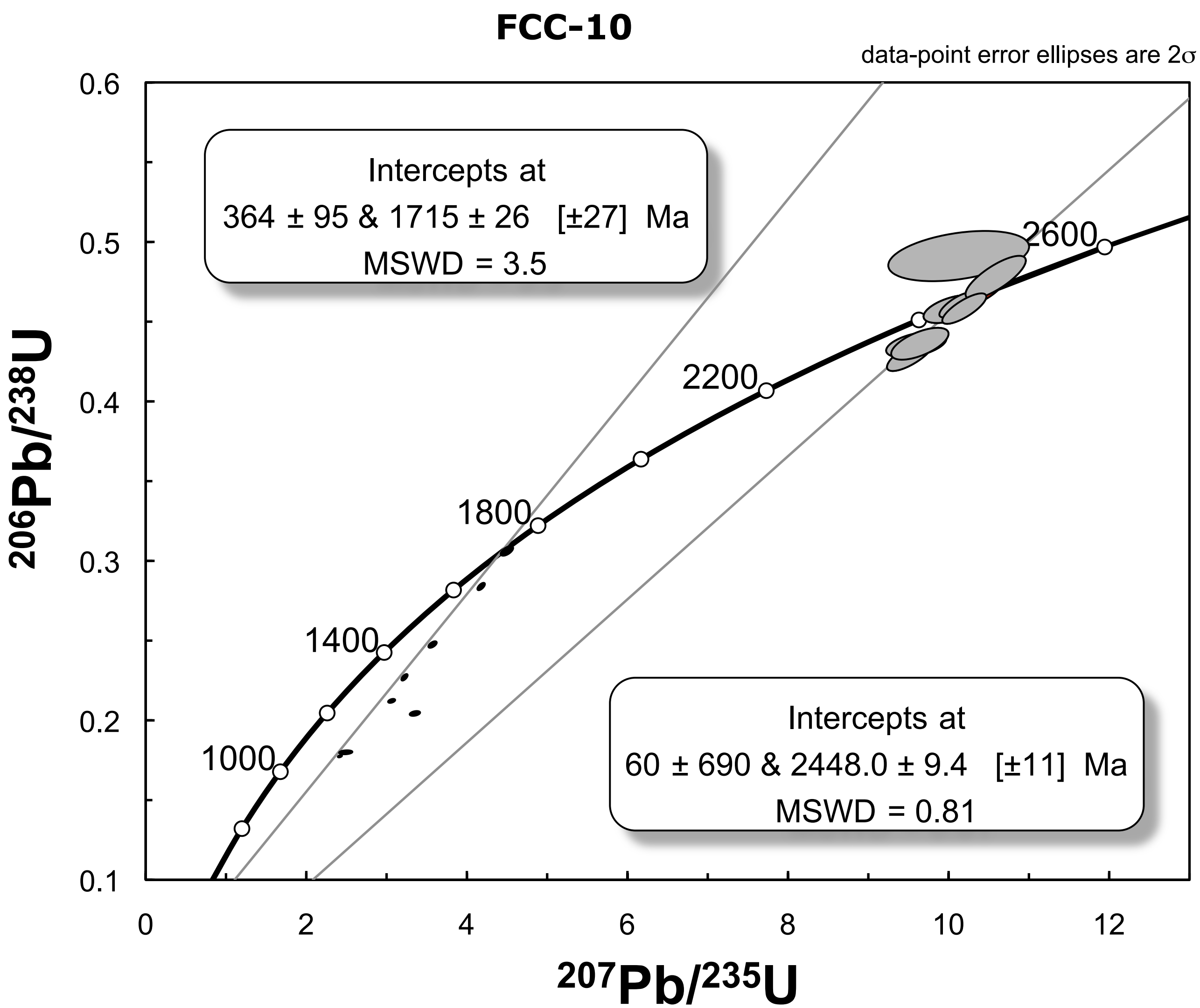
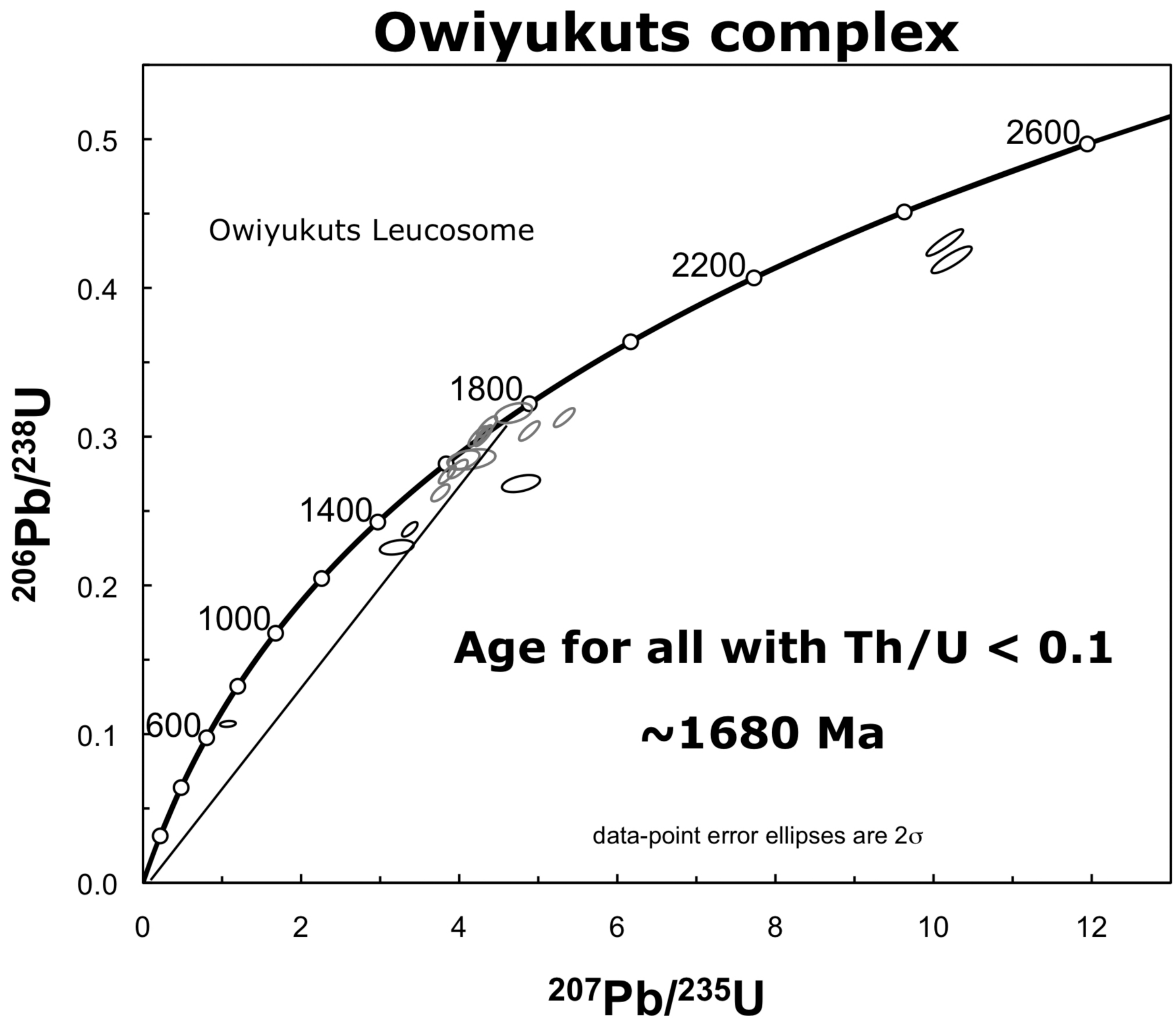

FCC-10
data-point error ellipses are 2σ
Intercepts at
364 ± 95 & 1715 ± 26 [±27] Ma
MSWD = 3.5
Intercepts at
60 ± 690 & 2448.0 ± 9.4 [±11] Ma
MSWD = 0.81
2600
2200
1800
1400
1000
0.6
0.5
0.4
0.3
0.2
0.1
0
2
4
6
8
10
12
206Pb/238U
207Pb/235U

Figure S3



Owiyukuts complex
Owiyukuts Leucosome
2600
2200
1800
1400
1000
600
Age for all with Th/U < 0.1
~1680 Ma
data-point error ellipses are 2σ
0.5
0.4
0.3
0.2
0.1
0.0
0
2
4
6
8
10
12
206Pb/238U
207Pb/235U

Figure S4: Photomicrograph of thin section of sample FCC-10 at 20x magnification in polarized plane light. Mineralogy is quartz, feldspar (some perthitic), biotite, garnet, and minor muscovite with accessory allanite and zircon.