Data Repository. Laser-Ablation ICP-MS analysis of U-Pb and Pb-Pb ages in zircon, mineral compositions, and CL images showing spots analyzed. In each table of isotopic data, errors are reported at 1σ level for final one or two digits, and include calibration errors (c. 1-2%, 2σ, based on analysis of FC-1), but not interstandard errors (c. 1-2%, 2σ). Ages assume that decay constants are $^{235}U = 9.8485x10^{-10}$ yr^{-1} and $^{238}U = 1.55125x10^{-10}$ yr^{-1}, and that $^{238}U/^{235}U = 137.88$. Data in bold type were used for calculating concordant age, indicated at the bottom of the table as the mean age (with error at 95% confidence). "rho" is the correlation coefficient between $^{207}Pb/^{235}U$ and $^{206}Pb/^{238}U$; Th/U ratios were calculated from raw counts assuming Th-U-Pb concordance on standards. $^{206}Pb^*$ refers to ^{206}Pb corrected for common Pb using an inverse isochron method and assuming the common Pb composition measured on feldspar and tourmaline (calculated for young ages only).

Sample 90a

Spot	$^{207}Pb/^{235}U$	$^{206}Pb/^{238}U$	rho	$^{207}Pb/^{206}Pb$	Th/U	$^{207}Pb/^{235}U$ age (Ma)	$^{206}Pb/^{238}U$ age (Ma)	$^{207}Pb/^{206}Pb$ age (Ma)	$^{206}Pb^*/^{238}U$	$^{206}Pb^*/^{238}U$ age (Ma)
S_15a	**0.0189±7**	**0.00288±6**	**0.000**	**0.0478±13**	0.004	**19.1±0.7**	**18.5±0.4**	**87±62**	**0.00287±6**	**18.5±0.4**
M_12a	**0.0186±4**	**0.00289±6**	**0.061**	**0.0466±5**	0.007	**18.7±0.4**	**18.6±0.4**	**32±25**	**0.00289±6**	**18.6±0.4**
S_10a	**0.0191±6**	**0.00291±5**	**0.216**	**0.0475±10**	0.005	**19.2±0.5**	**18.8±0.3**	**75±49**	**0.00291±5**	**18.7±0.3**
M_1b	**0.0189±7**	**0.00297±11**	**0.745**	**0.0460±5**	0.004	**19.0±0.7**	**19.1±0.7**	**2±26**	**0.00297±11**	**19.1±0.7**
M_6a	**0.0212±7**	**0.00303±7**	**0.282**	**0.0508±9**	0.006	**21.3±0.7**	**19.5±0.5**	**233±41**	**0.00301±7**	**19.4±0.5**
S_6b	0.0208±5	0.00310±6	0.636	0.0488±5	0.009	20.9±0.5	20.0±0.4	136±25	0.00309±6	19.9±0.4
M_1a	**0.0211±7**	**0.00315±10**	**0.688**	**0.0485±6**	0.004	**21.2±0.7**	**20.3±0.6**	**124±28**	**0.00314±10**	**20.2±0.6**
S_13a	0.0210±5	0.00321±5	0.227	0.0474±7	0.003	21.1±0.5	20.7±0.3	70±37	0.00321±5	20.7±0.3
S_3a	0.0207±5	0.00323±6	0.252	0.0466±7	0.003	20.8±0.5	20.8±0.4	28±36	0.00323±6	20.8±0.4
M_7a	0.0214±5	0.00324±6	0.386	0.0478±5	0.005	21.5±0.5	20.9±0.4	91±23	0.00324±6	20.8±0.4
M_14a	0.0218±5	0.00335±7	0.609	0.0472±3	0.008	21.9±0.5	21.6±0.4	60±17	0.00335±7	21.6±0.4
S_11a	0.0233±5	0.00349±5	0.297	0.0485±6	0.005	23.4±0.5	22.5±0.3	122±26	0.00348±5	22.4±0.3
S_9a	0.0237±5	0.00351±5	0.187	0.0489±7	0.005	23.8±0.5	22.6±0.3	145±32	0.00350±5	22.5±0.3
M_11a	0.0230±5	0.00355±7	0.312	0.0471±4	0.005	23.1±0.5	22.8±0.5	54±20	0.00354±7	22.8±0.5
M_3a	0.0238±6	0.00359±8	0.674	0.0481±4	0.004	23.9±0.6	23.1±0.5	103±20	0.00358±8	23.0±0.5
M_5a	0.477±9	0.0610±11	0.532	0.0567±3	0.27	396±6	382±6	480±12		
S_6a	0.731±18	0.0642±14	0.992	0.0826±9	0.09	557±11	401±8	1259±21		
S_14a	1.17±3	0.0934±24	0.735	0.0907±9	0.35	786±16	576±14	1440±20		
S_8a	1.30±2	0.139±2	0.663	0.0679±5	0.48	846±10	838±12	866±16		
Fsp	0.00	0.00	N.A.	0.825±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Fsp	0.00	0.00	N.A.	0.832±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Fsp	0.00	0.00	N.A.	0.834±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Fsp	0.00	0.00	N.A.	0.829±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.

Fsp	0.00	0.00	N.A.	0.826±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Tur	0.00	0.00	N.A.	0.824±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Tur	0.00	0.00	N.A.	0.823±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Tur	0.00	0.00	N.A.	0.821±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Tur	0.00	0.00	N.A.	0.830±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Mean							**19.0±0.5**			

N.A. = not applicable

Sample 90b

Spot	$^{207}Pb/^{235}U$	$^{206}Pb/^{238}U$	rho	$^{207}Pb/^{206}Pb$	Th/U	$^{207}Pb/^{235}U$ age (Ma)	$^{206}Pb/^{238}U$ age (Ma)	$^{207}Pb/^{206}Pb$ age (Ma)	$^{206}Pb^*/^{238}U$	$^{206}Pb^*/^{238}U$ age (Ma)
M_20a	**0.0183±4**	**0.00280±5**	**0.133**	**0.0475±5**	0.005	**18.4±0.4**	**18.0±03**	**73±26**	**0.00279±5**	**18.0±03**
M_16a	**0.0186±4**	**0.00280±4**	**0.569**	**0.0480±5**	0.006	**18.7±0.4**	**18.0±0.3**	**100±23**	**0.00280±4**	**18.0±0.3**
M_3a	**0.0191±6**	**0.00291±9**	**0.793**	**0.0476±5**	0.009	**19.2±0.6**	**18.7±0.6**	**81±26**	**0.00291±9**	**18.7±0.6**
M_18a	**0.0202±4**	**0.00293±5**	**0.366**	**0.0501±5**	0.005	**20.3±0.4**	**18.8±0.3**	**201±24**	**0.00291±5**	**18.7±0.3**
M_9a	**0.0189±4**	**0.00294±5**	**0.271**	**0.0467±5**	0.005	**19.0±0.4**	**18.9±0.3**	**35±25**	**0.00292±5**	**18.8±0.3**
M_19b	0.0208±5	0.00294±5	0.285	0.0514±7	0.005	20.9±0.5	18.9±0.3	260±31	0.00294±5	18.9±0.3
XL_2a	**0.0190±6**	**0.00294±8**	**0.150**	**0.0469±7**	0.005	**19.1±0.6**	**18.9±0.5**	**44±34**	**0.00294±8**	**18.9±0.5**
XL_2b	**0.0191±6**	**0.00300±8**	**0.216**	**0.0461±5**	0.006	**19.2±0.6**	**19.3±0.5**	**0±30**	**0.00299±8**	**19.2±0.5**
M_13a	0.0205±4	0.00300±5	0.347	0.0495±6	0.005	20.6±0.4	19.3±0.3	171±26	0.00300±5	19.3±0.3
M_8a	**0.0191±4**	**0.00300±5**	**0.502**	**0.0460±5**	0.005	**19.2±0.4**	**19.3±0.3**	**1±23**	**0.00300±5**	**19.3±0.3**
L_2a	0.0203±7	0.00308±10	0.463	0.0478±7	0.008	20.4±0.7	19.8±0.6	91±33	0.00308±10	19.8±0.6
M_5a	0.0220±5	0.00323±7	0.712	0.0493±4	0.010	22.1±0.5	20.8±0.5	161±21	0.00322±7	20.8±0.5
M_15a	0.0212±5	0.00323±6	0.281	0.0475±6	0.004	21.3±0.5	20.8±0.4	74±31	0.00323±6	20.8±0.4
L_4a	0.0217±5	0.00341±7	0.304	0.0462±5	0.005	21.8±0.5	22.0±0.5	7±24	0.00341±7	22.0±0.5
XL_1b	0.0245±7	0.00375±10	0.467	0.0474±5	0.003	24.6±0.7	24.1±0.6	72±23	0.00374±10	24.1±0.6
XL_1c	0.0279±9	0.00392±11	0.000	0.0516±6	0.003	27.9±0.9	25.2±0.7	268±28	0.00389±11	25.2±0.7
XL_1a	1.44±4	0.1477±39	0.728	0.0708±6	1.67	907±17	888±22	953±17		
M_7a	1.64±3	0.1666±29	0.875	0.0714±5	0.08	986±12	993±16	970±13		
Fsp	0.00	0.00	N.A.	0.826±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Fsp	0.00	0.00	N.A.	0.832±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Fsp	0.00	0.00	N.A.	0.828±3	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Fsp	0.00	0.00	N.A.	0.830±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Fsp	0.00	0.00	N.A.	0.827±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Fsp	0.00	0.00	N.A.	0.836±3	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Tur	0.00	0.00	N.A.	0.832±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Tur	0.00	0.00	N.A.	0.828±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Tur	0.00	0.00	N.A.	0.822±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Tur	0.00	0.00	N.A.	0.824±4	N.A.	N.A.	N.A.	N.A.	0.00	N.A.
Mean							**18.8±0.4**			**18.8±0.4**

N.A. = not applicable.

Sample AS36b

Spot	$^{207}Pb/^{235}U$	$^{206}Pb/^{238}U$	rho	$^{207}Pb/^{206}Pb$	Th/U	$^{207}Pb/^{235}U$ age (Ma)	$^{206}Pb/^{238}U$ age (Ma)	$^{207}Pb/^{206}Pb$ age (Ma)
XL_3b	0.0239±9	0.00365±10	0.160	0.0475±11	0.006	24.0±0.9	23.5±0.7	74.7±54
L_3a	0.0276±8	0.00439±10	0.338	0.0455±6	0.018	27.6±0.7	28.2±0.7	<0
XXL_1b	0.0297±15	0.00448±17	0.477	0.0482±13	0.015	29.8±1.5	28.8±1.1	107±64
L_2a	0.316±8	0.0403±10	0.941	0.0568±5	0.010	279±6	255±6	486±18
XXL_5a	0.663±21	0.0824±23	0.727	0.0584±6	0.22	516±13	510±14	543±22
L_12a	1.211±29	0.1306±29	0.744	0.0673±4	0.52	806±13	791±16	846±14
XXL_3a	1.446±45	0.1486±41	0.749	0.0706±7	0.26	908±19	893±23	946±20
L_17a	1.459±33	0.1494±31	0.986	0.0708±5	0.37	914±14	898±18	952±14
XL_5a	3.01±7	0.1919±45	0.736	0.1138±4	0.25	1410±18	1132±24	1861±7
XXL_2c	0.866±27	0.0464±12	0.974	0.1354±16	0.02	634±14	292±8	2170±21
XXL_4a	9.01±29	0.408±12	0.841	0.1602±15	0.06	2339±29	2206±52	2458±16
XL_3a	9.60±25	0.433±11	0.817	0.1608±7	0.82	2398±23	2319±49	2465±7
L_10a	10.62±27	0.435±10	0.866	0.1769±12	0.54	2490±23	2330±46	2624±11
XXL_2a	27.76±87	0.685±19	0.867	0.2938±29	0.38	3410±30	3364±72	3438±15
XXL_2b	21.25±76	0.519±17	0.853	0.2971±31	0.52	3150±34	2694±71	3455±16

Compositions of Feldspar and Muscovite.

Weight Percent

	Orthoclase				Muscovite		Plagioclase			
	1	2	3	4	1	2	1	2	3	4
SiO_2	64.00	64.58	64.07	64.13	46.44	46.33	64.31	64.41	64.41	64.01
Al_2O_3	18.79	18.84	18.81	18.96	36.64	37.20	22.27	22.45	22.60	22.14
TiO_2	0.00	0.00	0.00	0.06	0.53	0.61	0.00	0.00	0.00	0.00
FeO	0.1	0.06	0.15	0.14	1.24	1.11	0.00	0.00	0.00	0.00
MnO	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
MgO	0.01	0.02	0.00	0.00	0.45	0.45	0.00	0.00	0.00	0.00
Cr_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	0.01	0.00	0.06	0.01	0.00	0.06	3.28	3.29	3.30	3.31
K_2O	14.89	15.25	15.71	14.62	9.80	10.38	0.12	0.13	0.10	0.11
Na_2O	1.20	0.79	0.34	1.23	0.63	0.65	9.78	9.80	9.89	9.88
Sum:	**99.00**	**99.54**	**99.14**	**99.15**	**95.74**	**96.79**	**99.76**	**100.08**	**100.30**	**99.45**

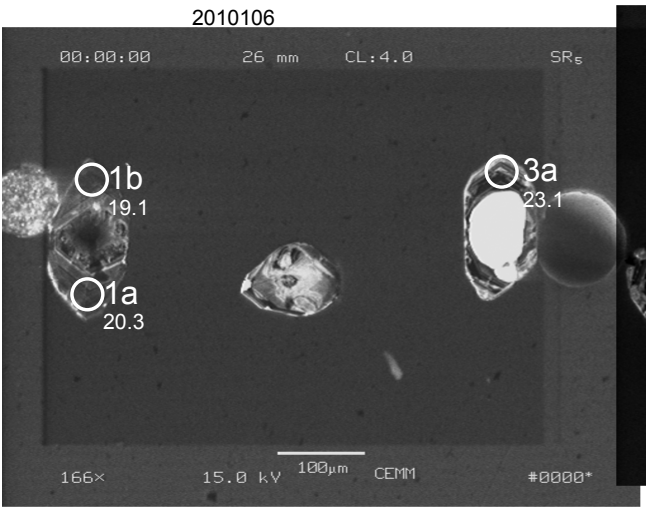
Cations

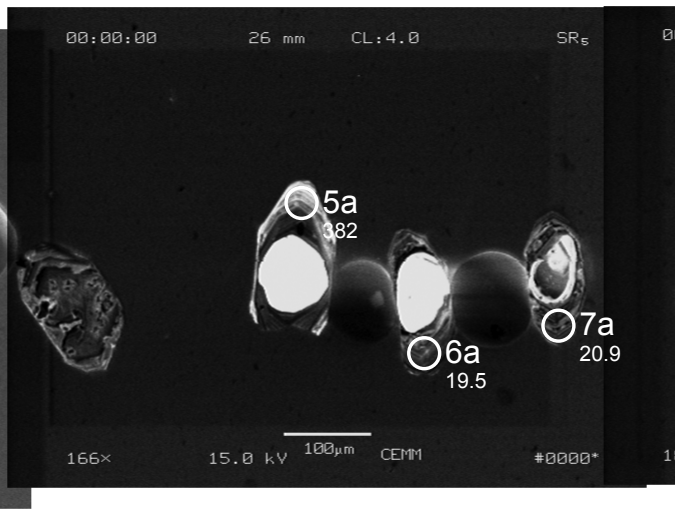
Si	2.977	2.986	2.981	2.974	6.117	6.058	2.841	2.837	2.832	2.839
Al	1.030	1.026	1.031	1.036	5.688	5.733	1.1.160	1.166	1.171	1.158
Ti	0.000	0.000	0.000	0.002	0.052	0.06	0.000	0.000	0.000	0.000
Fe^{2+}	0.004	0.002	0.006	0.005	0.137	0.121	0.000	0.000	0.000	0.000
Mn	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Mg	0.001	0.001	0.000	0.000	0.088	0.088	0.000	0.000	0.000	0.000
Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ca	0.000	0.000	0.003	0.000	0.000	0.008	0.155	0.155	0.155	0.157
K	0.883	0.899	0.932	0.865	1.646	1.731	0.007	0.007	0.006	0.006
Na	0.108	0.071	0.031	0.111	0.161	0.165	0.838	0.837	0.843	0.850

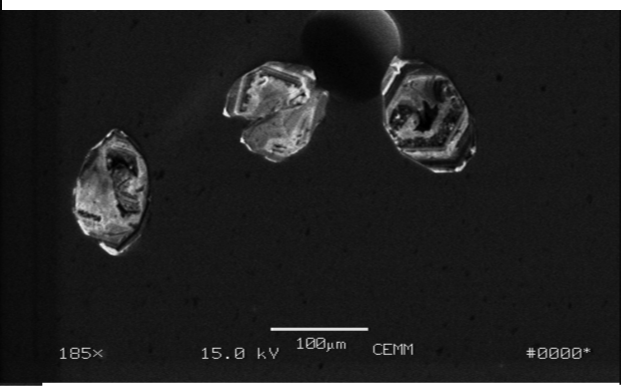
Supplemental figures. The following pages show cathodoluminescence images of analytical spots for which U-Th-Pb compositions are reported. Scale bars are all 100 μm. Small number with each analysis spot label is the uncorrected $^{206}Pb/^{238}U$ age. Note that this age is for general reference only, as some old ages are quite discordant.

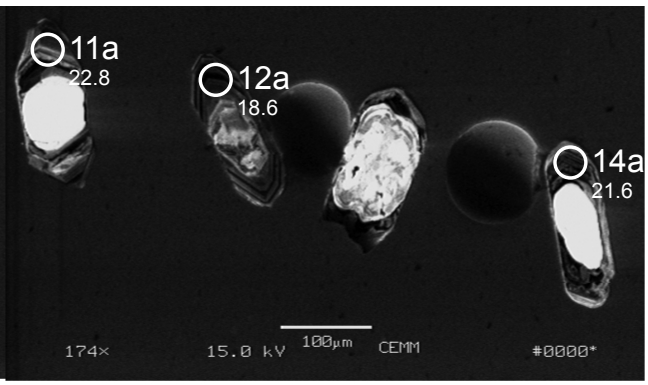
90a M_ samples

2010106

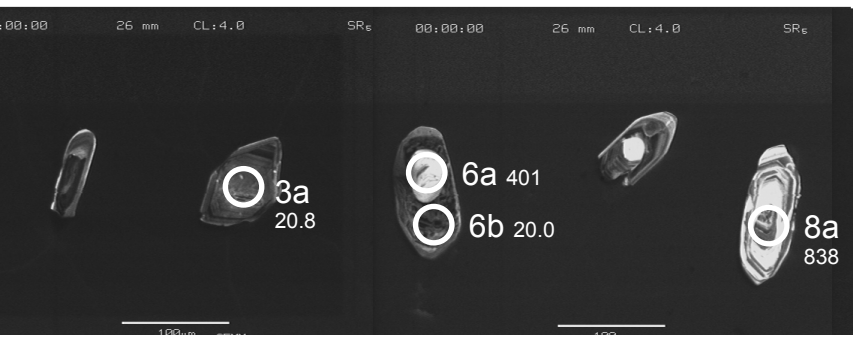


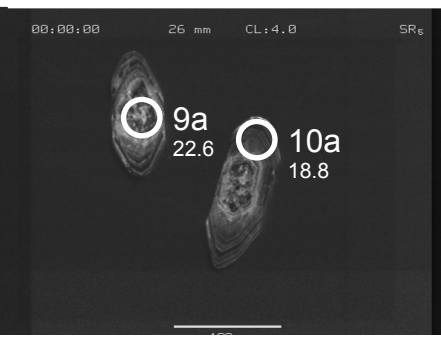


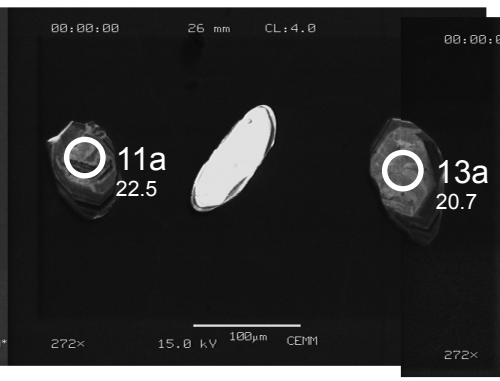




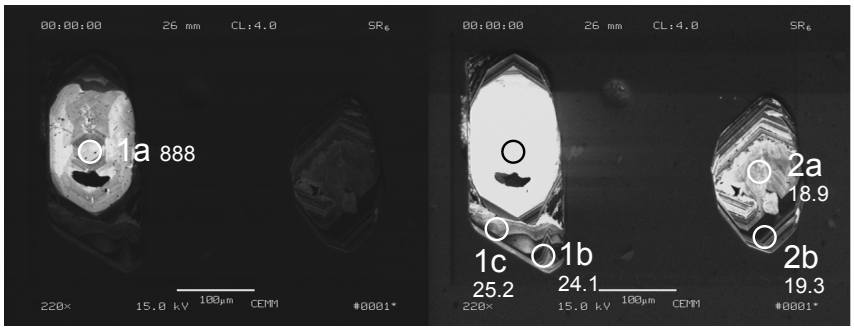
90a S_ samples



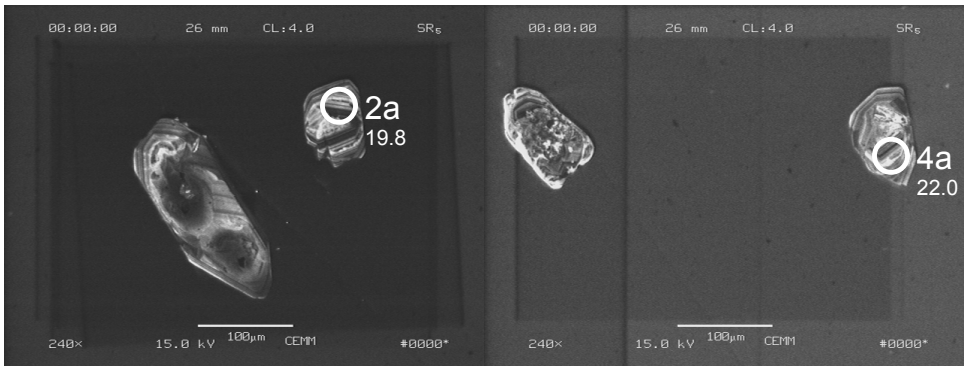




90b XL_ samples

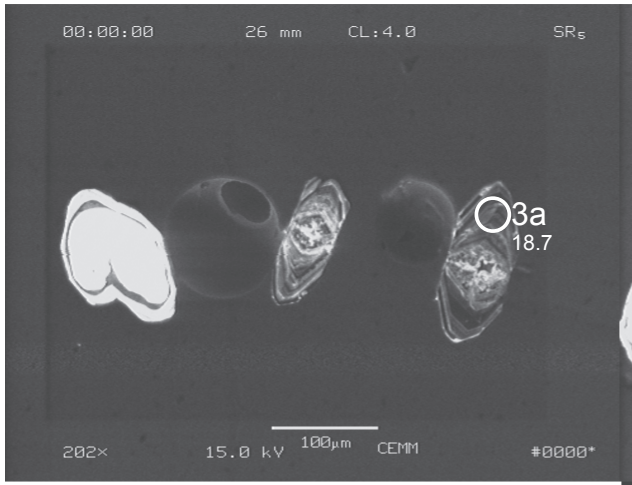


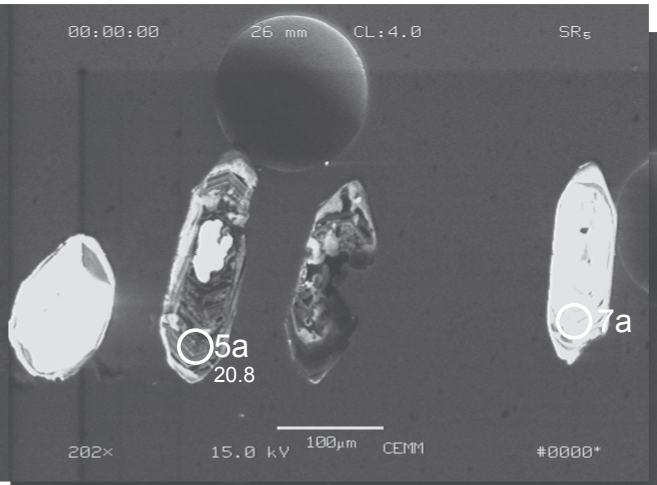
90b L_ samples

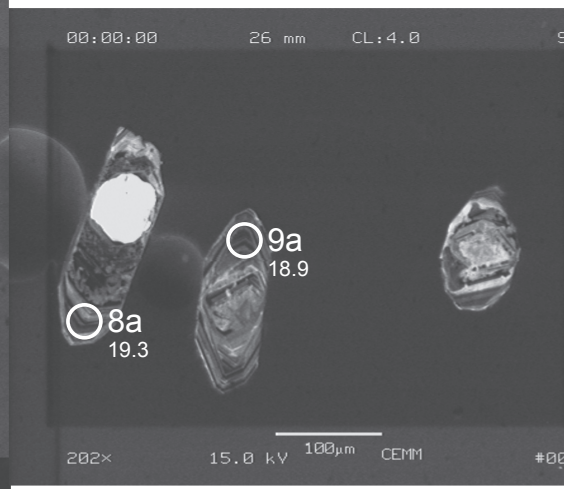


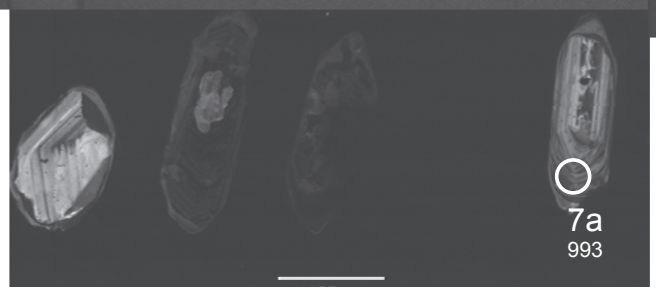
2010106

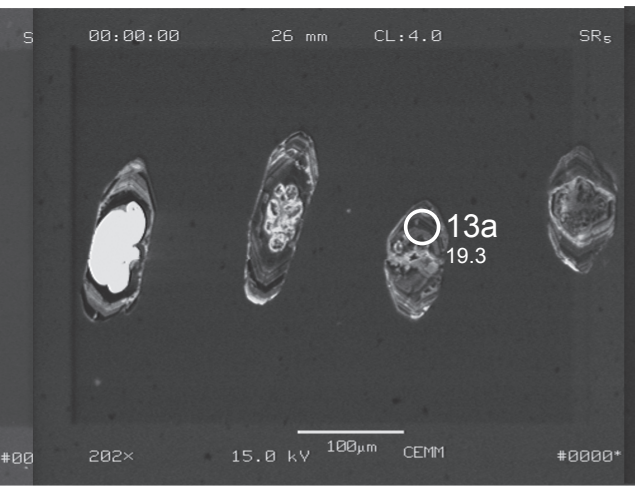
90b M_ samples

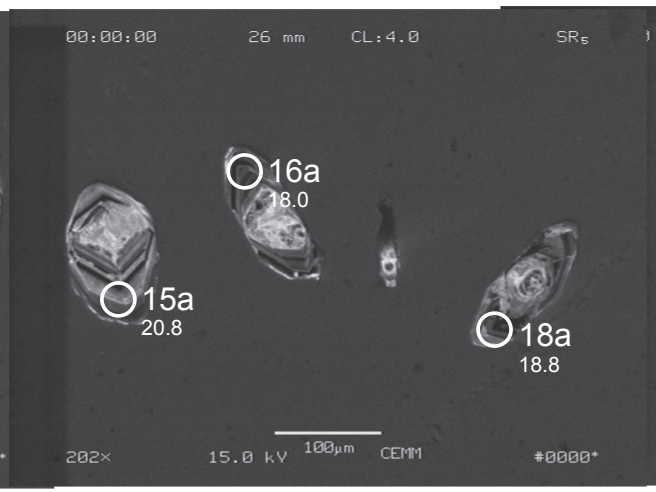


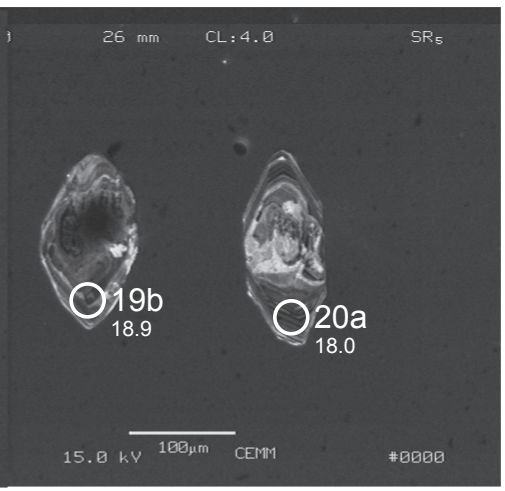






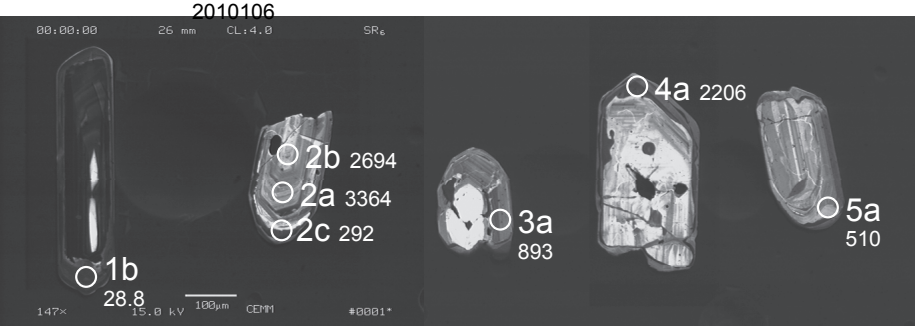




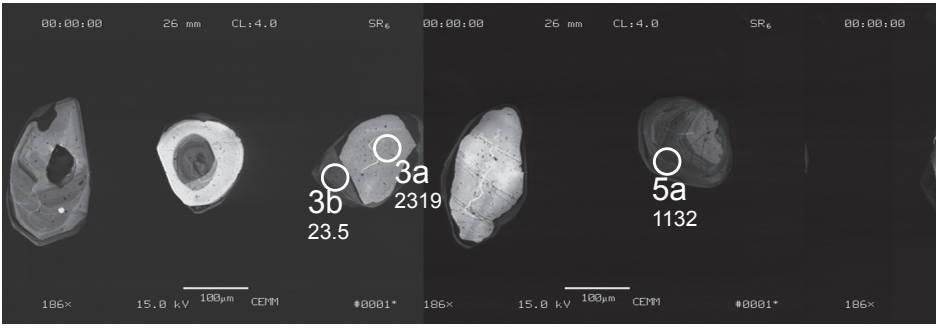
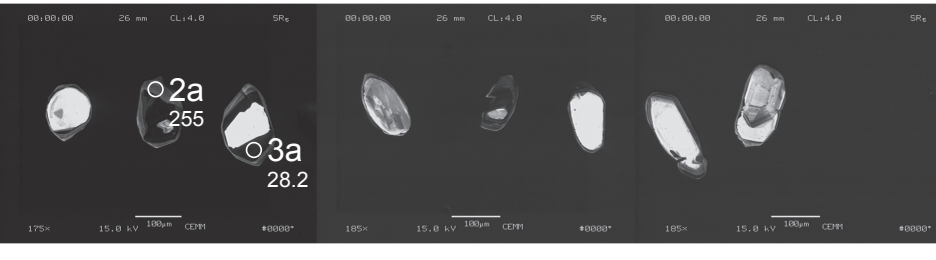
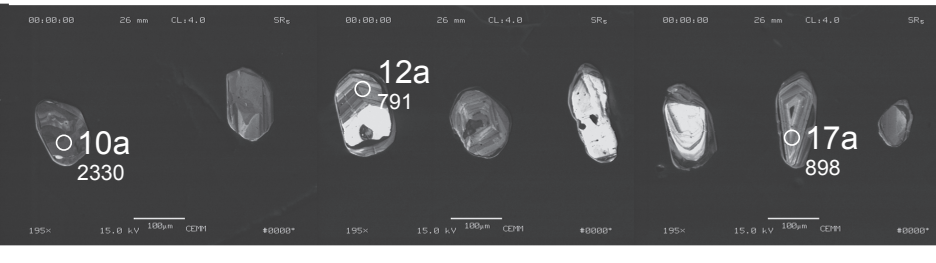


36 XXL_ samples

2010106



36 XL_ samples



36 L_ samples