

Appendix D EPMA Raw Data

Thin Section No.	P24B_TurW	P24B_TurW	P24B_TurW	P24B_TurW	P24B_TurW
Sample No.	145	146	147	148	149
Zone	Border	Border	Border	Border	Border
SiO2	35.55	35.93	36.19	36.31	35.46
TiO2	0.39	1.00	0.61	0.60	0.97
Al2O3	32.85	32.67	34.23	34.02	34.00
Sc2O3	BDL	BDL	BDL	0.01	0.01
Cr2O3	0.04	0.02	BDL	0.01	BDL
FeO	7.61	7.51	5.32	5.29	6.90
MgO	6.54	6.18	6.86	6.83	5.84
CaO	0.81	0.62	0.63	0.58	0.71
MnO	0.04	0.06	0.07	0.06	0.13
Na2O	2.04	2.06	2.04	2.03	1.92
K2O	0.06	0.05	0.04	0.04	0.07
Rb2O	BDL	0.01	0.01	BDL	0.03
Cs2O	BDL	0.01	BDL	0.01	BDL
F	0.28	0.32	0.37	0.26	0.36
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.53	3.54	3.56	3.60	3.53
B2O3*	10.62	10.69	10.83	10.80	10.72
Li2O*	0.23	0.37	0.44	0.41	0.42
Total	100.59	101.03	101.21	100.87	101.07
T: Si	5.82	5.84	5.81	5.84	5.75
Al	0.18	0.16	0.19	0.16	0.25
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.15	0.11	0.28	0.30	0.24
Ti	0.05	0.12	0.07	0.07	0.12
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	1.60	1.50	1.64	1.64	1.41
Mn	0.01	0.01	0.01	0.01	0.02
Fe2+	1.04	1.02	0.71	0.71	0.93
Li*	0.15	0.24	0.28	0.27	0.28
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.14	0.11	0.11	0.10	0.12
Na	0.65	0.65	0.64	0.63	0.60
K	0.01	0.01	0.01	0.01	0.01
r	0.20	0.23	0.25	0.26	0.26
OH	3.86	3.84	3.81	3.87	3.82
F	0.14	0.16	0.19	0.13	0.18
F content					
Mineral Name	Dravite	Dravite	Dravite	Dravite	Dravite

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Thin Section No.	P24B_TurW	P24B_TurX	P24B_TurX	P24B_TurX	P24B_TurX
Sample No.	150	151	152	153	154
Zone	Border	Border	Border	Border	Border
SiO2	35.37	35.52	35.94	36.12	35.30
TiO2	1.01	0.44	0.67	0.70	0.90
Al2O3	33.31	32.76	33.59	33.70	33.19
Sc2O3	0.02	BDL	BDL	0.01	0.01
Cr2O3	BDL	0.03	0.01	0.03	0.01
FeO	7.83	7.67	7.19	5.81	9.96
MgO	5.45	6.29	5.86	6.57	3.99
CaO	0.53	0.80	0.37	0.50	0.34
MnO	0.09	0.03	0.08	0.07	0.16
Na2O	2.10	2.04	2.03	2.03	1.97
K2O	0.07	0.05	0.04	0.04	0.03
Rb2O	0.02	0.01	0.01	0.01	0.02
Cs2O	BDL	0.01	0.02	BDL	BDL
F	0.29	0.38	0.36	0.40	0.38
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.53	3.48	3.52	3.52	3.46
B2O3*	10.63	10.61	10.70	10.76	10.55
Li2O*	0.39	0.32	0.37	0.43	0.38
Total	100.63	100.45	100.73	100.71	100.65
T: Si	5.78	5.82	5.84	5.83	5.82
Al	0.22	0.18	0.16	0.17	0.18
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.20	0.14	0.27	0.25	0.26
Ti	0.12	0.05	0.08	0.09	0.11
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	1.33	1.54	1.42	1.58	0.98
Mn	0.01	BDL	0.01	0.01	0.02
Fe2+	1.07	1.05	0.98	0.79	1.37
Li*	0.26	0.21	0.24	0.28	0.25
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.09	0.14	0.07	0.09	0.06
Na	0.67	0.65	0.64	0.64	0.63
K	0.02	0.01	0.01	0.01	0.01
r	0.23	0.20	0.28	0.27	0.30
OH	3.85	3.81	3.82	3.79	3.80
F	0.15	0.20	0.19	0.20	0.20
F content					
Mineral Name	Dravite	Dravite	Dravite	Dravite	Schorl

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Thin Section No.	P24B_TurX	P24B_TurY	P24B_TurY	P24B_TurY	P24B_TurY
Sample No.	155	156	157	158	159
Zone	Border	Border	Border	Border	Border
SiO2	36.51	35.71	35.29	35.69	36.22
TiO2	0.59	0.52	0.54	0.83	0.79
Al2O3	33.47	33.52	33.01	33.45	33.63
Sc2O3	0.01	BDL	BDL	0.01	0.01
Cr2O3	0.07	0.03	0.01	BDL	0.04
FeO	5.42	6.96	8.13	7.12	5.71
MgO	7.09	6.55	6.03	6.09	6.89
CaO	0.68	1.06	0.84	0.61	0.57
MnO	0.08	0.06	0.06	0.10	0.06
Na2O	2.06	1.89	2.03	2.12	2.09
K2O	0.04	0.07	0.06	0.05	0.04
Rb2O	0.01	0.01	0.01	BDL	BDL
Cs2O	BDL	BDL	BDL	BDL	0.01
F	0.45	0.20	0.34	0.33	0.22
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.52	3.60	3.50	3.54	3.62
B2O3*	10.83	10.72	10.61	10.70	10.78
Li2O*	0.47	0.31	0.29	0.38	0.37
Total	101.29	101.21	100.76	101.01	101.02
T: Si	5.86	5.79	5.78	5.79	5.84
Al	0.14	0.21	0.22	0.21	0.16
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.18	0.20	0.15	0.19	0.23
Ti	0.07	0.06	0.07	0.10	0.10
Sc	BDL	BDL	BDL	BDL	BDL
Cr	0.01	BDL	BDL	BDL	BDL
Mg	1.69	1.58	1.47	1.47	1.66
Mn	0.01	0.01	0.01	0.01	0.01
Fe2+	0.73	0.94	1.11	0.97	0.77
Li*	0.30	0.20	0.19	0.25	0.24
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.12	0.18	0.15	0.11	0.10
Na	0.64	0.59	0.64	0.67	0.65
K	0.01	0.01	0.01	0.01	0.01
r	0.24	0.21	0.20	0.22	0.24
OH	3.77	3.90	3.82	3.83	3.89
F	0.23	0.10	0.18	0.17	0.11
F content					
Mineral Name	Dravite	Dravite	Dravite	Dravite	Dravite

Appendix D EPMA Raw Data

Thin Section No.	P24B_TurY	P24B_TurY	P24B_TurY	P24A_TurAD1	P24A_TurAD1
Sample No.	160	161	162	147	148
Zone	Border	Border	Border	Border	Border
SiO2	35.55	35.90	35.11	35.63	36.15
TiO2	1.06	0.84	0.84	0.79	0.64
Al2O3	33.48	32.94	33.09	32.92	33.20
Sc2O3	0.01	0.01	BDL	0.01	0.01
Cr2O3	0.03	0.01	BDL	0.01	0.01
FeO	7.02	7.30	9.78	8.96	6.94
MgO	5.92	6.07	4.19	5.02	6.15
CaO	0.56	0.60	0.35	0.43	0.57
MnO	0.12	0.07	0.17	0.14	0.10
Na2O	2.09	2.05	1.98	2.03	2.05
K2O	0.04	0.04	0.06	0.04	0.03
Rb2O	BDL	0.01	0.01	0.02	0.02
Cs2O	0.01	BDL	BDL	BDL	BDL
F	0.39	0.30	0.38	0.39	0.45
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.51	3.54	3.45	3.48	3.49
B2O3*	10.70	10.67	10.51	10.61	10.73
Li2O*	0.43	0.38	0.35	0.36	0.44
Total	100.92	100.72	100.26	100.83	100.95
T: Si	5.77	5.85	5.80	5.84	5.86
Al	0.23	0.15	0.20	0.16	0.14
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.18	0.17	0.25	0.19	0.19
Ti	0.13	0.10	0.10	0.10	0.08
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	1.43	1.47	1.03	1.23	1.49
Mn	0.02	0.01	0.02	0.02	0.01
Fe2+	0.95	0.99	1.35	1.23	0.94
Li*	0.28	0.25	0.24	0.24	0.29
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.10	0.10	0.06	0.08	0.10
Na	0.66	0.65	0.63	0.64	0.64
K	0.01	0.01	0.01	0.01	0.01
r	0.23	0.24	0.29	0.27	0.25
OH	3.80	3.85	3.80	3.80	3.77
F	0.20	0.15	0.20	0.20	0.23
F content					
Mineral Name	Dravite	Dravite	Schorl	Schorl	Dravite

Appendix D EPMA Raw Data

Thin Section No.	P24A_TurAD1	P24A_TurAD1	P24A_TurAD1	P24A_TurAD1
Sample No.	149	150	151	152
Zone	Border	Border	Border	Border
SiO2	36.30	36.19	36.14	35.56
TiO2	0.38	0.34	0.34	0.80
Al2O3	34.37	34.44	34.47	32.94
Sc2O3	0.02	0.01	0.01	0.01
Cr2O3	0.01	BDL	BDL	BDL
FeO	9.01	9.14	9.22	9.10
MgO	3.95	3.93	3.94	4.69
CaO	0.18	0.19	0.19	0.41
MnO	0.11	0.10	0.09	0.13
Na2O	1.63	1.61	1.65	1.99
K2O	0.03	0.03	0.03	0.04
Rb2O	0.02	BDL	0.01	0.01
Cs2O	BDL	0.01	0.01	0.01
F	0.19	0.19	0.21	0.42
Cl	BDL	BDL	BDL	BDL
H2O*	3.59	3.58	3.58	3.45
B2O3*	10.66	10.65	10.66	10.58
Li2O*	0.34	0.32	0.31	0.40
Total	100.78	100.74	100.87	100.56
T: Si	5.92	5.91	5.89	5.84
Al	0.08	0.09	0.11	0.16
B	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Y: Al	0.52	0.53	0.52	0.22
Ti	0.05	0.04	0.04	0.10
Sc	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Mg	0.96	0.96	0.96	1.15
Mn	0.02	0.01	0.01	0.02
Fe2+	1.23	1.25	1.26	1.25
Li*	0.22	0.21	0.21	0.27
totalY	3.00	3.00	3.00	3.00
X: Ca	0.03	0.03	0.03	0.07
Na	0.52	0.51	0.52	0.64
K	0.01	0.01	0.01	0.01
r	0.45	0.45	0.44	0.28
OH	3.90	3.90	3.89	3.78
F	0.10	0.10	0.11	0.22
F content				
Mineral Name	Schorl	Schorl	Schorl	Schorl

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Thin Section No.	P24A_TurAD1	P24A_TurAD1	P24A_TurAD1	P24A_TurAD1
Sample No.	153	154	155	156
Zone	Border	Border	Border	Border
SiO2	35.61	35.81	35.80	35.82
TiO2	0.90	0.96	0.93	0.89
Al2O3	32.93	32.75	33.12	32.97
Sc2O3	BDL	0.01	BDL	0.01
Cr2O3	BDL	BDL	0.01	BDL
FeO	8.89	8.52	8.43	8.95
MgO	4.97	5.23	5.02	4.81
CaO	0.46	0.41	0.41	0.40
MnO	0.12	0.13	0.11	0.15
Na2O	2.03	2.07	2.01	2.05
K2O	0.03	0.04	0.04	0.04
Rb2O	0.01	BDL	0.02	0.01
Cs2O	0.01	0.02	BDL	0.01
F	0.36	0.37	0.36	0.42
Cl	BDL	BDL	BDL	0.01
H2O*	3.49	3.49	3.50	3.47
B2O3*	10.61	10.63	10.64	10.64
Li2O*	0.38	0.40	0.41	0.43
Total	100.80	100.83	100.82	101.08
T: Si	5.83	5.85	5.85	5.85
Al	0.17	0.15	0.15	0.15
B	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Y: Al	0.19	0.16	0.22	0.19
Ti	0.11	0.12	0.11	0.11
Sc	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Mg	1.21	1.27	1.22	1.17
Mn	0.02	0.02	0.02	0.02
Fe2+	1.22	1.16	1.15	1.22
Li*	0.25	0.26	0.27	0.28
totalY	3.00	3.00	3.00	3.00
X: Ca	0.08	0.07	0.07	0.07
Na	0.65	0.66	0.64	0.65
K	0.01	0.01	0.01	0.01
r	0.27	0.26	0.28	0.27
OH	3.81	3.81	3.82	3.78
F	0.19	0.19	0.18	0.22
F content				
Mineral Name	Schorl	Dravite	Dravite	Schorl

Appendix D EPMA Raw Data

Thin Section No.	P24A_TurAD2	P24A_TurAD2	P24A_TurAD2	P24A_TurAD2
Sample No.	157	158	159	160
Zone	Border	Border	Border	Border
SiO2	35.95	35.99	34.72	36.05
TiO2	0.33	0.35	0.78	0.98
Al2O3	34.63	34.68	33.32	32.78
Sc2O3	BDL	0.01	BDL	0.02
Cr2O3	BDL	BDL	BDL	BDL
FeO	9.12	9.07	9.68	7.29
MgO	3.96	3.96	4.18	6.27
CaO	0.22	0.23	1.69	0.66
MnO	0.09	0.08	0.25	0.10
Na2O	1.66	1.64	1.37	2.05
K2O	0.02	0.03	0.05	0.04
Rb2O	BDL	BDL	BDL	BDL
Cs2O	BDL	BDL	0.03	0.01
F	0.20	0.25	0.26	0.38
Cl	BDL	BDL	BDL	BDL
H2O*	3.57	3.56	3.51	3.52
B2O3*	10.64	10.66	10.54	10.73
Li2O*	0.31	0.33	0.46	0.40
Total	100.71	100.82	100.85	101.27
T: Si	5.87	5.87	5.73	5.84
Al	0.13	0.13	0.27	0.16
B	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Y: Al	0.54	0.53	0.20	0.10
Ti	0.04	0.04	0.10	0.12
Sc	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Mg	0.96	0.96	1.03	1.51
Mn	0.01	0.01	0.04	0.01
Fe2+	1.25	1.24	1.33	0.99
Li*	0.20	0.22	0.30	0.26
totalY	3.00	3.00	3.00	3.00
X: Ca	0.04	0.04	0.30	0.11
Na	0.53	0.52	0.44	0.64
K	BDL	0.01	0.01	0.01
r	0.43	0.44	0.25	0.23
OH	3.89	3.87	3.86	3.81
F	0.11	0.13	0.14	0.19
F content				
Mineral Name	Schorl	Schorl	Schorl	Dravite

Appendix D EPMA Raw Data

Thin Section No.	P24A_TurAD2	P24A_TurAD2	P24A_TurAD2	P24A_TurAD2
Sample No.	161	162	163	164
Zone	Border	Border	Border	Border
SiO2	34.53	35.81	35.59	35.39
TiO2	0.87	0.76	1.06	0.86
Al2O3	30.08	32.85	32.82	33.15
Sc2O3	BDL	0.01	BDL	BDL
Cr2O3	BDL	BDL	BDL	BDL
FeO	11.56	8.56	9.19	10.47
MgO	5.11	5.33	4.71	3.79
CaO	2.57	0.48	0.42	0.32
MnO	0.12	0.14	0.17	0.14
Na2O	1.19	2.03	1.94	1.91
K2O	0.08	0.03	0.04	0.04
Rb2O	0.01	BDL	0.02	0.02
Cs2O	0.01	0.01	0.02	0.01
F	0.51	0.44	0.33	0.37
Cl	BDL	BDL	BDL	BDL
H2O*	3.35	3.46	3.49	3.47
B2O3*	10.40	10.64	10.59	10.55
Li2O*	0.42	0.38	0.37	0.35
Total	100.81	100.92	100.74	100.83
T: Si	5.77	5.85	5.84	5.83
Al	0.23	0.15	0.16	0.17
B	3.00	3.00	3.00	3.00
Z: Al	5.70	6.00	6.00	6.00
Mg	0.30	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Y: Al	BDL	0.17	0.19	0.27
Ti	0.11	0.09	0.13	0.11
Sc	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Mg	0.97	1.30	1.15	0.93
Mn	0.02	0.02	0.02	0.02
Fe2+	1.62	1.17	1.26	1.44
Li*	0.28	0.25	0.24	0.23
totalY	3.00	3.00	3.00	3.00
X: Ca	0.46	0.08	0.07	0.06
Na	0.39	0.64	0.62	0.61
K	0.02	0.01	0.01	0.01
r	0.14	0.27	0.30	0.32
OH	3.73	3.77	3.83	3.81
F	0.27	0.23	0.17	0.19
F content				
Mineral Name	Feruvite	Dravite	Schorl	Schorl

Appendix D EPMA Raw Data

Thin Section No.	P24A_TurAD2	P24A_TurAD3	P24A_TurAD3	P24A_TurAD3	PFS1-A_A1
Sample No.	165	166	167	168	48
Zone	Border	Border	Border	Border	Int Aplite
SiO2	35.29	35.86	35.93	35.92	34.41
TiO2	0.89	0.35	0.36	0.40	0.65
Al2O3	33.04	34.70	34.64	34.56	32.56
Sc2O3	BDL	0.01	0.01	BDL	0.02
Cr2O3	0.01	BDL	BDL	BDL	BDL
FeO	10.23	8.92	9.00	9.17	8.60
MgO	3.78	3.89	3.90	3.99	5.60
CaO	0.32	0.23	0.22	0.21	0.79
MnO	0.15	0.09	0.10	0.08	0.06
Na2O	1.96	1.65	1.63	1.65	2.03
K2O	0.03	0.03	0.02	0.03	0.08
Rb2O	0.01	0.02	0.01	0.01	0.05
Cs2O	BDL	0.02	0.01	0.01	BDL
F	0.40	0.25	0.26	0.27	0.88
Cl	BDL	BDL	BDL	0.01	BDL
H2O*	3.44	3.55	3.55	3.55	3.21
B2O3*	10.53	10.64	10.64	10.65	10.51
Li2O*	0.40	0.35	0.34	0.32	0.46
Total	100.49	100.57	100.62	100.81	99.91
T: Si	5.83	5.86	5.87	5.86	5.69
Al	0.17	0.14	0.13	0.14	0.31
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.26	0.54	0.54	0.51	0.03
Ti	0.11	0.04	0.04	0.05	0.08
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	0.93	0.95	0.95	0.97	1.38
Mn	0.02	0.01	0.01	0.01	0.01
Fe2+	1.41	1.22	1.23	1.25	1.19
Li*	0.27	0.23	0.23	0.21	0.30
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.06	0.04	0.04	0.04	0.14
Na	0.63	0.52	0.52	0.52	0.65
K	0.01	0.01	0.01	0.01	0.02
r	0.31	0.43	0.44	0.44	0.19
OH	3.79	3.87	3.87	3.86	3.54
F	0.21	0.13	0.13	0.14	0.46
F content					
Mineral Name	Schorl	Schorl	Schorl	Schorl	Dravite

Appendix D EPMA Raw Data

Thin Section No.	PFS1-A_A1	PFS1-A_A1	PFS1-A_A1	PFS1-A_A1	PFS1-A_A2
Sample No.	49	50	51	52	53
Zone	Int Aplite	Int Aplite	Int Aplite	Int Aplite	Int Aplite
SiO2	34.42	34.36	34.04	34.18	34.06
TiO2	0.46	0.71	0.80	0.63	0.43
Al2O3	32.73	33.26	33.18	34.76	32.47
Sc2O3	0.01	0.03	0.02	0.01	0.01
Cr2O3	BDL	BDL	BDL	0.01	0.01
FeO	7.87	9.80	10.69	7.58	8.22
MgO	6.19	4.38	3.52	2.33	6.23
CaO	0.85	0.50	0.42	0.59	0.98
MnO	0.05	0.10	0.13	0.63	0.03
Na2O	2.09	2.04	1.99	2.34	2.00
K2O	0.08	0.07	0.07	0.06	0.09
Rb2O	0.07	0.05	0.05	0.05	0.03
Cs2O	0.01	0.01	BDL	BDL	BDL
F	0.54	0.41	0.44	1.42	0.80
Cl	0.01	0.01	BDL	BDL	0.01
H2O*	3.36	3.41	3.37	2.97	3.23
B2O3*	10.48	10.45	10.36	10.57	10.46
Li2O*	0.31	0.31	0.34	1.29	0.35
Total	99.52	99.91	99.43	99.43	99.41
T: Si	5.71	5.71	5.71	5.62	5.66
Al	0.29	0.29	0.29	0.38	0.34
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.10	0.24	0.27	0.36	0.02
Ti	0.06	0.09	0.10	0.08	0.05
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	1.53	1.08	0.88	0.57	1.54
Mn	0.01	0.01	0.02	0.09	BDL
Fe2+	1.09	1.36	1.50	1.04	1.14
Li*	0.21	0.21	0.23	0.86	0.23
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.15	0.09	0.08	0.10	0.18
Na	0.67	0.66	0.65	0.75	0.65
K	0.02	0.02	0.01	0.01	0.02
r	0.16	0.23	0.26	0.13	0.16
OH	3.71	3.78	3.77	3.26	3.58
F	0.28	0.22	0.23	0.74	0.42
F content				Fluor-	
Mineral Name	Dravite	Schorl	Schorl	Elbaite	Dravite

Appendix D EPMA Raw Data

Thin Section No.	PFS1-A_A2	PFS1-A_A2	PFS1-A_A2	PFS1-A_A2	PFS1-A_A2
Sample No.	54	55	56	57	58
Zone	Int Aplite	Int Aplite	Int Aplite	Int Aplite	Int Aplite
SiO2	34.07	33.50	33.74	33.43	34.08
TiO2	0.64	0.72	0.72	0.76	0.44
Al2O3	33.12	32.73	33.19	33.21	34.76
Sc2O3	0.02	0.02	0.02	0.02	0.01
Cr2O3	BDL	0.01	BDL	BDL	0.01
FeO	8.62	11.35	9.78	10.78	8.62
MgO	5.20	3.18	4.23	3.54	2.13
CaO	0.62	0.24	0.48	0.43	0.29
MnO	0.07	0.34	0.09	0.12	0.91
Na2O	2.01	2.16	1.96	1.98	2.32
K2O	0.05	0.05	0.05	0.04	0.05
Rb2O	0.04	0.08	0.06	0.06	0.06
Cs2O	BDL	0.01	BDL	BDL	BDL
F	0.38	0.71	0.31	0.42	1.25
Cl	BDL	0.01	BDL	0.01	BDL
H2O*	3.41	3.21	3.41	3.34	3.03
B2O3*	10.39	10.27	10.30	10.27	10.50
Li2O*	0.26	0.37	0.24	0.27	1.02
Total	98.92	98.95	98.58	98.68	99.48
T: Si	5.70	5.67	5.69	5.66	5.64
Al	0.30	0.33	0.31	0.34	0.36
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.23	0.20	0.29	0.28	0.42
Ti	0.08	0.09	0.09	0.10	0.05
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	1.30	0.80	1.06	0.89	0.52
Mn	0.01	0.05	0.01	0.02	0.13
Fe2+	1.21	1.61	1.38	1.53	1.19
Li*	0.18	0.25	0.16	0.18	0.68
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.11	0.04	0.09	0.08	0.05
Na	0.65	0.71	0.64	0.65	0.74
K	0.01	0.01	0.01	0.01	0.01
r	0.22	0.23	0.26	0.26	0.19
OH	3.80	3.62	3.83	3.78	3.35
F	0.20	0.38	0.17	0.22	0.65
F content					Fluor-
Mineral Name	Dravite	Schorl	Schorl	Schorl	Schorl

Appendix D EPMA Raw Data

Thin Section No.	PFS1-A_A3	PFS1-A_A3	PFS1-A_A3	PFS1-A_A3	PFS1-A_A3
Sample No.	59	60	61	62	63
Zone	Int Aplite	Int Aplite	Int Aplite	Int Aplite	Int Aplite
SiO2	34.56	34.50	34.48	34.35	34.49
TiO2	0.59	0.47	0.69	0.67	0.67
Al2O3	32.68	32.75	33.35	33.24	33.44
Sc2O3	0.01	0.01	0.01	0.02	0.01
Cr2O3	0.01	BDL	0.01	BDL	BDL
FeO	8.56	8.19	7.99	11.15	9.58
MgO	5.73	6.13	5.48	3.22	4.50
CaO	0.79	0.90	0.67	0.34	0.49
MnO	0.05	0.03	0.08	0.13	0.12
Na2O	2.10	2.03	2.05	1.97	2.00
K2O	0.09	0.09	0.08	0.06	0.05
Rb2O	0.06	0.05	0.05	0.06	0.05
Cs2O	BDL	BDL	0.02	BDL	BDL
F	0.32	0.65	0.33	0.69	0.36
Cl	BDL	0.01	0.02	0.01	BDL
H2O*	3.46	3.32	3.46	3.27	3.44
B2O3*	10.46	10.52	10.49	10.43	10.47
Li2O*	0.26	0.33	0.32	0.43	0.28
Total	99.72	100.00	99.57	100.04	99.95
T: Si	5.74	5.70	5.71	5.72	5.73
Al	0.26	0.30	0.29	0.28	0.27
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.14	0.07	0.23	0.25	0.27
Ti	0.07	0.06	0.09	0.08	0.08
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	1.42	1.51	1.35	0.80	1.11
Mn	0.01	BDL	0.01	0.02	0.02
Fe2+	1.19	1.13	1.11	1.55	1.33
Li*	0.17	0.22	0.21	0.29	0.19
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.14	0.16	0.12	0.06	0.09
Na	0.68	0.65	0.66	0.64	0.64
K	0.02	0.02	0.02	0.01	0.01
r	0.16	0.17	0.20	0.29	0.25
OH	3.83	3.66	3.82	3.63	3.81
F	0.17	0.34	0.17	0.36	0.19
F content					
Mineral Name	Dravite	Dravite	Dravite	Schorl	Schorl

Appendix D EPMA Raw Data

Thin Section No.	PFS1-A_A3	PFS1-A_A3	PFS1-A_A4	PFS1-A_A4	PFS1-A_A4
Sample No.	64	65	66	67	68
Zone	Int Aplite	Int Aplite	Int Aplite	Int Aplite	Int Aplite
SiO2	33.84	34.26	34.46	33.90	34.21
TiO2	0.79	0.49	0.51	0.46	0.40
Al2O3	33.70	34.78	33.23	32.79	32.86
Sc2O3	0.04	0.02	0.02	0.01	0.01
Cr2O3	BDL	BDL	BDL	BDL	BDL
FeO	10.72	8.74	8.68	11.80	7.94
MgO	3.53	2.48	5.26	3.08	6.16
CaO	0.44	0.36	0.62	0.25	0.92
MnO	0.13	0.84	0.05	0.29	0.06
Na2O	1.93	2.33	2.18	2.08	2.02
K2O	0.05	0.07	0.08	0.06	0.09
Rb2O	0.06	0.05	0.06	0.05	0.06
Cs2O	BDL	BDL	BDL	BDL	BDL
F	0.38	1.36	0.19	0.57	0.79
Cl	0.01	0.01	BDL	0.01	0.01
H2O*	3.40	3.01	3.51	3.28	3.25
B2O3*	10.38	10.60	10.44	10.29	10.50
Li2O*	0.27	1.02	0.24	0.29	0.37
Total	99.69	100.43	99.53	99.22	99.66
T: Si	5.66	5.62	5.73	5.73	5.66
Al	0.34	0.38	0.27	0.27	0.34
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.31	0.34	0.25	0.26	0.07
Ti	0.10	0.06	0.06	0.06	0.05
Sc	0.01	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	0.88	0.61	1.31	0.78	1.52
Mn	0.02	0.12	0.01	0.04	0.01
Fe2+	1.50	1.20	1.21	1.67	1.10
Li*	0.18	0.68	0.16	0.20	0.25
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.08	0.06	0.11	0.04	0.16
Na	0.63	0.74	0.70	0.68	0.65
K	0.01	0.01	0.02	0.01	0.02
r	0.28	0.18	0.17	0.26	0.16
OH	3.80	3.29	3.90	3.69	3.59
F	0.20	0.71	0.10	0.30	0.41
F content		Fluor-			
Mineral Name	Schorl	Schorl	Dravite	Schorl	Dravite

Appendix D EPMA Raw Data

Thin Section No.	PFS1-A_A4	PFS1-A_A4	PFS1-A_A4	PFS1-A_B	PFS1-A_B	PFS1-A_B
Sample No.	69	70	71	72	73	74
Zone	Int Aplite	Int Aplite	Int Aplite	Int Aplite	Int Aplite	Int Aplite
SiO2	33.81	34.32	33.93	35.23	34.76	34.72
TiO2	0.38	0.49	0.43	0.46	0.47	0.67
Al2O3	32.68	35.07	33.14	34.02	33.08	33.29
Sc2O3	0.02	0.02	0.02	0.02	0.01	0.01
Cr2O3	BDL	0.01	BDL	BDL	0.01	BDL
FeO	11.76	7.87	11.70	8.32	8.54	8.63
MgO	2.92	2.43	2.94	4.99	5.68	5.24
CaO	0.23	0.61	0.26	0.45	0.72	0.77
MnO	0.28	0.78	0.22	0.05	0.06	0.06
Na2O	2.08	2.34	2.08	1.93	2.06	2.01
K2O	0.05	0.07	0.05	0.05	0.06	0.07
Rb2O	0.05	0.07	0.08	0.04	0.06	0.05
Cs2O	BDL	BDL	BDL	BDL	BDL	BDL
F	0.90	1.43	0.77	0.17	0.41	0.22
Cl	BDL	BDL	0.01	BDL	BDL	BDL
H2O*	3.12	2.99	3.20	3.57	3.44	3.52
B2O3*	10.29	10.64	10.35	10.57	10.53	10.51
Li2O*	0.43	1.22	0.40	0.27	0.27	0.29
Total	99.02	100.35	99.57	100.14	100.16	100.05
T: Si	5.71	5.61	5.70	5.79	5.74	5.74
Al	0.29	0.39	0.30	0.21	0.26	0.26
B	3.00	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Y: Al	0.22	0.36	0.26	0.39	0.17	0.23
Ti	0.05	0.06	0.05	0.06	0.06	0.08
Sc	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Mg	0.73	0.59	0.74	1.22	1.40	1.29
Mn	0.04	0.11	0.03	0.01	0.01	0.01
Fe2+	1.66	1.07	1.64	1.14	1.18	1.19
Li*	0.29	0.80	0.27	0.18	0.18	0.19
totalY	3.00	3.00	3.00	3.00	3.00	3.00
X: Ca	0.04	0.11	0.05	0.08	0.13	0.14
Na	0.68	0.74	0.68	0.62	0.66	0.65
K	0.01	0.01	0.01	0.01	0.01	0.02
r	0.26	0.13	0.26	0.29	0.20	0.20
OH	3.52	3.26	3.59	3.91	3.78	3.89
F	0.48	0.74	0.41	0.09	0.22	0.11
F content		Fluor-				
Mineral Name	Schorl	Elbaite	Schorl	Dravite	Dravite	Dravite

Appendix D EPMA Raw Data

Thin Section No.	PFS1-A_B	PFS1-A_B	PFS1-A_B	PFS1-A_B	PFS1-A_B	PFS1-C C
Sample No.	75	76	77	78	79	51
Zone	Int Aplite	Int Aplite	Int Aplite	Int Aplite	Int Aplite	Int Aplite
SiO2	34.70	34.65	34.61	34.36	34.66	34.77
TiO2	0.56	0.53	0.86	0.81	0.69	0.45
Al2O3	33.12	32.84	33.12	33.08	34.25	34.36
Sc2O3	0.01	BDL	0.02	0.02	0.02	BDL
Cr2O3	BDL	BDL	0.01	0.01	BDL	0.01
FeO	8.68	7.94	10.07	10.97	8.01	10.18
MgO	5.50	6.21	4.16	3.47	3.04	3.09
CaO	0.72	0.95	0.49	0.41	0.50	0.21
MnO	0.05	0.04	0.11	0.11	0.79	0.13
Na2O	2.07	2.02	1.95	1.95	2.36	1.65
K2O	0.07	0.07	0.05	0.05	0.03	0.03
Rb2O	0.05	0.04	0.06	0.06	0.07	0.04
Cs2O	BDL	0.01	BDL	BDL	BDL	BDL
F	0.24	0.31	0.29	0.40	1.38	0.22
Cl	BDL	BDL	BDL	0.01	BDL	BDL
H2O*	3.51	3.48	3.47	3.40	3.02	3.49
B2O3*	10.50	10.51	10.45	10.40	10.65	10.43
Li2O*	0.23	0.24	0.29	0.33	1.10	0.29
Total	100.02	99.84	100.03	99.85	100.57	99.36
T: Si	5.74	5.73	5.75	5.74	5.66	5.80
Al	0.26	0.27	0.25	0.26	0.34	0.20
B	3.00	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Y: Al	0.21	0.13	0.25	0.26	0.25	0.54
Ti	0.07	0.07	0.11	0.10	0.08	0.06
Sc	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Mg	1.36	1.53	1.03	0.86	0.74	0.77
Mn	0.01	0.01	0.02	0.02	0.11	0.02
Fe2+	1.20	1.10	1.40	1.53	1.09	1.42
Li*	0.16	0.16	0.19	0.22	0.72	0.19
totalY	3.00	3.00	3.00	3.00	3.00	3.00
X: Ca	0.13	0.17	0.09	0.07	0.09	0.04
Na	0.66	0.65	0.63	0.63	0.75	0.53
K	0.02	0.01	0.01	0.01	0.01	0.01
r	0.19	0.17	0.27	0.28	0.15	0.42
OH	3.87	3.84	3.85	3.79	3.29	3.88
F	0.13	0.16	0.15	0.21	0.71	0.12
F content					Fluor-	
Mineral Name	Dravite	Dravite	Schorl	Schorl	Schorl	Schorl

Appendix D EPMA Raw Data

Thin Section No.	PFG2A_TurR	PFG2A_TurS	PFG2A_TurS	PFG2A_TurS	PFG2A_TurS2
Sample No.	111	114	115	116	117
Zone	Int Over	Int Over	Int Over	Int Over	Int Over
SiO2	36.34	35.38	35.38	34.90	34.47
TiO2	0.06	0.13	0.16	0.14	0.40
Al2O3	37.31	34.72	34.79	34.68	34.05
Sc2O3	BDL	BDL	0.01	BDL	BDL
Cr2O3	BDL	BDL	BDL	BDL	BDL
FeO	6.28	13.86	13.88	14.00	14.09
MgO	BDL	0.07	0.06	0.08	0.11
CaO	0.13	0.01	0.01	0.01	0.06
MnO	1.80	0.58	0.58	0.60	0.59
Na2O	2.54	1.37	1.37	1.33	1.83
K2O	0.02	0.01	0.03	0.02	0.03
Rb2O	0.01	0.01	0.01	0.01	0.01
Cs2O	0.01	BDL	BDL	BDL	BDL
F	1.21	0.30	0.29	0.30	0.47
Cl	0.01	BDL	BDL	BDL	BDL
H2O*	3.18	3.46	3.47	3.43	3.34
B2O3*	10.89	10.43	10.44	10.36	10.34
Li2O*	1.70	0.36	0.36	0.30	0.46
Total	101.48	100.68	100.82	100.17	100.25
T: Si	5.80	5.89	5.89	5.85	5.80
Al	0.20	0.11	0.11	0.15	0.20
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.82	0.71	0.71	0.71	0.54
Ti	0.01	0.02	0.02	0.02	0.05
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	0.02	0.01	0.02	0.03
Mn	0.24	0.08	0.08	0.08	0.08
Fe2+	0.84	1.93	1.93	1.96	1.98
Li*	1.09	0.24	0.24	0.20	0.31
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.02	BDL	BDL	BDL	0.01
Na	0.79	0.44	0.44	0.43	0.60
K	BDL	BDL	0.01	0.01	0.01
r	0.19	0.55	0.55	0.56	0.39
OH	3.39	3.84	3.85	3.84	3.75
F	0.61	0.16	0.15	0.16	0.25
F content	Fluor-				
Mineral Name	Elbaite	Foiteite	Foiteite	Foiteite	Schorl

Appendix D EPMA Raw Data

Thin Section No.	PFG2A_TurS2	PFG2A_TurS2	PFG2A_TurS3	PFG2A_TurS3
Sample No.	118	120	121	122
Zone	Int Over	Int Over	Int Over	Int Over
SiO2	36.03	35.98	34.50	34.46
TiO2	0.21	0.38	0.44	0.44
Al2O3	36.58	36.03	34.11	34.13
Sc2O3	BDL	BDL	BDL	BDL
Cr2O3	BDL	BDL	BDL	BDL
FeO	8.13	8.48	14.28	14.28
MgO	0.05	0.07	0.13	0.11
CaO	0.13	0.05	0.06	0.05
MnO	0.86	0.50	0.58	0.60
Na2O	2.52	2.68	1.80	1.80
K2O	0.03	0.03	0.04	0.04
Rb2O	BDL	0.02	0.01	0.02
Cs2O	BDL	BDL	BDL	BDL
F	1.27	1.35	0.49	0.55
Cl	BDL	BDL	BDL	BDL
H2O*	3.13	3.08	3.34	3.32
B2O3*	10.82	10.78	10.36	10.37
Li2O*	1.61	1.67	0.44	0.46
Total	101.38	101.08	100.60	100.63
T: Si	5.79	5.80	5.79	5.78
Al	0.21	0.20	0.21	0.22
B	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Y: Al	0.72	0.64	0.53	0.52
Ti	0.03	0.05	0.06	0.06
Sc	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Mg	0.01	0.02	0.03	0.03
Mn	0.12	0.07	0.08	0.09
Fe2+	1.09	1.14	2.00	2.00
Li*	1.04	1.08	0.30	0.31
totalY	3.00	3.00	3.00	3.00
X: Ca	0.02	0.01	0.01	0.01
Na	0.78	0.84	0.58	0.58
K	0.01	0.01	0.01	0.01
r	0.19	0.15	0.39	0.40
OH	3.35	3.31	3.74	3.71
F	0.65	0.69	0.26	0.29
F content	Fluor-	Fluor-		
Mineral Name	Elbaite	Elbaite	Schorl	Schorl

Appendix D EPMA Raw Data

Thin Section No.	PFG2A_TurS3	PFG2A_TurT1	PFG2A_TurT1	PFG2A_TurT1
Sample No.	123	124	125	126
Zone	Int Over	Int Over	Int Over	Int Over
SiO2	36.53	36.01	35.16	34.38
TiO2	0.20	0.34	0.13	0.52
Al2O3	38.06	35.20	34.30	33.99
Sc2O3	0.01	0.01	BDL	BDL
Cr2O3	BDL	BDL	BDL	BDL
FeO	5.15	9.82	13.94	14.46
MgO	0.03	0.12	0.11	0.13
CaO	0.17	0.02	0.02	0.06
MnO	1.13	0.66	0.52	0.55
Na2O	2.56	2.53	1.55	1.85
K2O	0.02	0.02	0.03	0.03
Rb2O	0.02	0.02	0.02	0.03
Cs2O	BDL	BDL	0.01	BDL
F	1.47	1.19	0.51	0.50
Cl	BDL	BDL	BDL	BDL
H2O*	3.10	3.13	3.35	3.34
B2O3*	10.99	10.71	10.41	10.35
Li2O*	2.00	1.42	0.46	0.44
Total	101.43	101.19	100.51	100.61
T: Si	5.77	5.84	5.87	5.77
Al	0.23	0.16	0.13	0.23
B	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Y: Al	0.87	0.58	0.62	0.50
Ti	0.02	0.04	0.02	0.07
Sc	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Mg	0.01	0.03	0.03	0.03
Mn	0.15	0.09	0.07	0.08
Fe2+	0.68	1.33	1.95	2.03
Li*	1.27	0.93	0.31	0.30
totalY	3.00	3.00	3.00	3.00
X: Ca	0.03	BDL	BDL	0.01
Na	0.78	0.80	0.50	0.60
K	BDL	BDL	0.01	0.01
r	0.18	0.19	0.49	0.38
OH	3.27	3.39	3.73	3.74
F	0.73	0.61	0.27	0.26
F content	Fluor-	Fluor-		
Mineral Name	Elbaite	Elbaite	Schorl	Schorl

Appendix D EPMA Raw Data

Thin Section No.	PFG2A_TurT1	PFG2A_TurT1	PFG2A_TurT1	PFL3A F	PFL3A F
Sample No.	127	128	129	80	81
Zone	Int Over	Int Over	Int Over	Core Main	Core Main
SiO2	36.53	36.58	36.32	36.74	36.48
TiO2	0.37	0.10	0.11	0.02	0.03
Al2O3	36.38	37.28	37.52	41.98	40.72
Sc2O3	BDL	BDL	BDL	0.01	0.01
Cr2O3	BDL	BDL	BDL	BDL	0.01
FeO	6.61	5.02	5.33	1.01	1.71
MgO	0.06	BDL	BDL	BDL	BDL
CaO	0.08	0.14	0.16	0.07	0.09
MnO	1.24	2.21	1.99	1.19	1.60
Na2O	2.78	2.64	2.67	2.01	2.21
K2O	0.02	0.02	0.02	0.02	0.02
Rb2O	0.03	0.03	0.02	0.03	0.02
Cs2O	BDL	0.01	BDL	BDL	BDL
F	1.46	1.43	1.42	1.01	1.19
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.07	3.10	3.10	3.37	3.26
B2O3*	10.89	10.93	10.93	11.16	11.07
Li2O*	1.90	1.92	1.88	2.05	2.05
Total	101.43	101.42	101.47	100.68	100.49
T: Si	5.83	5.81	5.77	5.72	5.73
Al	0.17	0.19	0.23	0.28	0.27
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.67	0.80	0.81	1.42	1.26
Ti	0.04	0.01	0.01	BDL	BDL
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	0.01	BDL	BDL	BDL	BDL
Mn	0.17	0.30	0.27	0.16	0.21
Fe2+	0.88	0.67	0.71	0.13	0.22
Li*	1.22	1.22	1.20	1.28	1.30
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.01	0.02	0.03	0.01	0.02
Na	0.86	0.81	0.82	0.61	0.67
K	BDL	BDL	BDL	BDL	BDL
r	0.12	0.15	0.14	0.37	0.31
OH	3.26	3.28	3.29	3.50	3.41
F	0.74	0.72	0.71	0.50	0.59
F content	Fluor-	Fluor-	Fluor-		Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	PFL3A F	PFL3A F	PFL3A F	PFL3A F	PFL3A G	PFL3A G
Sample No.	82	83	84	85	86	87
Zone	Core Main	Core Main	Core Main	Core Main	Core Main	Core Main
SiO2	35.68	36.21	36.79	37.23	35.56	36.12
TiO2	0.04	0.03	0.04	0.03	0.07	0.03
Al2O3	39.09	40.27	40.06	41.52	38.72	40.31
Sc2O3	0.01	0.01	0.01	0.01	0.02	0.01
Cr2O3	BDL	BDL	BDL	BDL	0.01	BDL
FeO	2.84	1.11	0.97	0.04	3.12	0.91
MgO	BDL	BDL	BDL	0.01	BDL	BDL
CaO	0.18	0.22	0.38	0.41	0.15	0.29
MnO	2.29	2.46	2.09	1.17	2.14	1.99
Na2O	2.60	2.35	2.25	1.99	2.52	2.26
K2O	0.03	0.03	0.04	0.04	0.02	0.03
Rb2O	0.04	0.06	0.04	0.03	0.04	0.03
Cs2O	BDL	BDL	BDL	BDL	BDL	BDL
F	1.63	1.26	1.56	1.28	1.41	1.32
Cl	BDL	BDL	BDL	BDL	0.01	BDL
H2O*	3.01	3.21	3.10	3.26	3.08	3.17
B2O3*	10.95	11.03	11.13	11.22	10.85	11.00
Li2O*	2.09	2.10	2.34	2.39	1.98	2.19
Total	100.47	100.33	100.79	100.65	99.70	99.65
T: Si	5.66	5.71	5.75	5.77	5.70	5.71
Al	0.34	0.29	0.25	0.23	0.30	0.29
B	3.00	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Y: Al	0.97	1.19	1.12	1.34	1.00	1.22
Ti	BDL	BDL	BDL	BDL	0.01	BDL
Sc	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Mn	0.31	0.33	0.28	0.15	0.29	0.27
Fe2+	0.38	0.15	0.13	BDL	0.42	0.12
Li*	1.33	1.33	1.47	1.49	1.27	1.39
totalY	3.00	3.00	3.00	3.00	3.00	3.00
X: Ca	0.03	0.04	0.06	0.07	0.03	0.05
Na	0.80	0.72	0.68	0.60	0.78	0.69
K	0.01	0.01	0.01	0.01	BDL	0.01
r	0.16	0.24	0.24	0.32	0.19	0.25
OH	3.18	3.37	3.23	3.37	3.29	3.34
F	0.82	0.63	0.77	0.63	0.71	0.66
F content	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	PFL3A G	PFL3A G	PFL3A G	P31A L	P31A L	P31A L
Sample No.	88	89	90	91	92	93
Zone	Core Main	Core Main	Core Main	Core Main	Core Main	Core Main
SiO2	36.59	35.99	36.23	37.04	37.58	37.38
TiO2	0.05	0.04	0.04	0.02	0.02	0.03
Al2O3	39.15	39.63	40.51	40.72	40.76	41.59
Sc2O3	0.02	0.01	BDL	BDL	BDL	BDL
Cr2O3	0.02	BDL	BDL	BDL	BDL	BDL
FeO	1.58	1.42	0.42	0.17	0.05	0.05
MgO	BDL	0.01	BDL	BDL	BDL	BDL
CaO	0.48	0.37	0.49	0.59	0.99	0.42
MnO	2.25	2.09	1.69	0.82	0.76	0.58
Na2O	2.34	2.29	2.18	2.02	1.91	1.97
K2O	0.02	0.01	0.02	0.03	0.01	0.02
Rb2O	0.04	0.04	0.02	0.03	0.03	0.02
Cs2O	BDL	BDL	BDL	BDL	BDL	BDL
F	1.53	1.44	1.38	1.43	1.43	1.16
Cl	BDL	BDL	BDL	0.01	BDL	BDL
H2O*	3.08	3.10	3.15	3.16	3.20	3.31
B2O3*	11.04	10.95	11.03	11.13	11.24	11.21
Li2O*	2.30	2.20	2.33	2.53	2.66	2.43
Total	100.49	99.58	99.50	99.71	100.65	100.17
T: Si	5.76	5.71	5.71	5.78	5.81	5.80
Al	0.24	0.29	0.29	0.22	0.19	0.20
B	3.00	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Y: Al	1.03	1.12	1.23	1.28	1.24	1.40
Ti	0.01	BDL	BDL	BDL	BDL	BDL
Sc	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Mn	0.30	0.28	0.23	0.11	0.10	0.08
Fe2+	0.21	0.19	0.06	0.02	0.01	0.01
Li*	1.45	1.40	1.48	1.59	1.66	1.51
totalY	3.00	3.00	3.00	3.00	3.00	3.00
X: Ca	0.08	0.06	0.08	0.10	0.16	0.07
Na	0.72	0.70	0.67	0.61	0.57	0.59
K	BDL	BDL	BDL	0.01	BDL	BDL
r	0.20	0.23	0.25	0.28	0.26	0.33
OH	3.24	3.28	3.31	3.29	3.30	3.43
F	0.76	0.72	0.69	0.70	0.70	0.57
F content	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	P31A L	P31A M	P31A M	P31A M	P31A N	P31A N
Sample No.	94	95	96	97	98	99
Zone	Core Main	Core Main	Core Main	Core Main	Core Main	Core Main
SiO2	37.16	37.78	37.30	37.55	37.27	37.33
TiO2	0.02	0.01	BDL	0.01	0.03	0.02
Al2O3	41.11	42.12	42.06	41.79	41.65	42.31
Sc2O3	0.03	BDL	0.02	0.01	0.01	0.01
Cr2O3	0.01	BDL	BDL	BDL	BDL	BDL
FeO	0.08	0.01	BDL	0.01	0.05	0.03
MgO	BDL	BDL	BDL	BDL	BDL	BDL
CaO	0.50	0.19	0.37	0.46	0.52	0.48
MnO	0.81	0.26	0.26	0.20	0.55	0.27
Na2O	2.01	2.00	1.96	1.92	1.94	1.90
K2O	0.02	0.02	0.01	0.02	0.02	0.02
Rb2O	0.01	0.03	0.03	0.04	0.02	0.02
Cs2O	BDL	BDL	BDL	BDL	BDL	BDL
F	1.47	0.99	1.09	0.95	1.36	1.12
Cl	0.01	BDL	BDL	BDL	BDL	BDL
H2O*	3.16	3.42	3.35	3.41	3.23	3.35
B2O3*	11.19	11.26	11.21	11.20	11.23	11.26
Li2O*	2.53	2.37	2.41	2.41	2.50	2.42
Total	100.13	100.46	100.08	99.98	100.37	100.55
T: Si	5.77	5.83	5.78	5.83	5.77	5.76
Al	0.23	0.17	0.22	0.17	0.23	0.24
B	3.00	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Y: Al	1.30	1.49	1.46	1.47	1.36	1.46
Ti	BDL	BDL	BDL	BDL	BDL	BDL
Sc	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Mn	0.11	0.03	0.03	0.03	0.07	0.03
Fe2+	0.01	BDL	BDL	BDL	0.01	BDL
Li*	1.58	1.47	1.50	1.50	1.56	1.50
totalY	3.00	3.00	3.00	3.00	3.00	3.00
X: Ca	0.08	0.03	0.06	0.08	0.09	0.08
Na	0.61	0.60	0.59	0.58	0.58	0.57
K	BDL	BDL	BDL	BDL	BDL	BDL
r	0.31	0.36	0.35	0.34	0.33	0.35
OH	3.27	3.52	3.46	3.53	3.34	3.45
F	0.72	0.48	0.54	0.47	0.66	0.55
F content	Fluor-		Fluor-		Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	P31A N	P31A N	P31A N	PFL3A G	PFL3A G	PFL3A G
Sample No.	100	101	102	103	104	106
Zone	Core Main	Core Main	Core Main	Core Main	Core Main	Core Main
SiO2	37.18	36.67	37.35	38.25	36.64	37.00
TiO2	0.02	0.03	0.03	0.05	0.04	0.05
Al2O3	41.41	42.64	40.74	37.24	40.30	40.52
Sc2O3	BDL	0.01	0.01	0.02	BDL	0.02
Cr2O3	BDL	BDL	BDL	BDL	0.01	BDL
FeO	0.05	BDL	0.02	3.05	2.52	1.23
MgO	BDL	BDL	BDL	BDL	BDL	BDL
CaO	0.59	0.26	0.98	0.16	0.09	0.28
MnO	0.71	0.54	0.41	2.05	1.62	1.81
Na2O	1.96	1.88	1.85	2.43	2.24	2.22
K2O	0.01	0.02	0.02	0.01	0.02	0.01
Rb2O	0.04	0.03	0.04	0.03	0.02	0.04
Cs2O	BDL	BDL	BDL	BDL	BDL	BDL
F	1.35	0.98	1.38	1.38	1.14	1.27
Cl	0.01	BDL	0.01	BDL	BDL	BDL
H2O*	3.23	3.39	3.20	3.16	3.28	3.25
B2O3*	11.21	11.17	11.18	11.07	11.07	11.15
Li2O*	2.50	2.22	2.66	2.26	1.97	2.21
Total	100.28	99.85	99.87	101.16	100.95	101.05
T: Si	5.77	5.71	5.81	6.01	5.75	5.77
Al	0.23	0.29	0.19	BDL	0.25	0.23
B	3.00	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Y: Al	1.34	1.53	1.28	0.89	1.20	1.21
Ti	BDL	BDL	BDL	0.01	BDL	0.01
Sc	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Mn	0.09	0.07	0.05	0.27	0.21	0.24
Fe2+	0.01	BDL	BDL	0.40	0.33	0.16
Li*	1.56	1.39	1.66	1.42	1.25	1.38
totalY	3.00	3.00	3.00	3.00	3.00	3.00
X: Ca	0.10	0.04	0.16	0.03	0.01	0.05
Na	0.59	0.57	0.56	0.74	0.68	0.67
K	BDL	BDL	BDL	BDL	BDL	BDL
r	0.31	0.38	0.27	0.23	0.30	0.28
OH	3.34	3.52	3.32	3.31	3.43	3.38
F	0.66	0.48	0.68	0.69	0.57	0.62
F content	Fluor-		Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	PFL3A G	PFL2A J	PFL2A J	PFL2A J	PFL2A J	PFL2A K1
Sample No.	107	51	52	53	54	55
Zone	Core Main	Core Main	Core Main	Core Main	Core Main	Core Main
SiO2	37.10	37.43	37.51	37.96	38.16	38.18
TiO2	0.07	0.02	0.04	0.04	0.03	BDL
Al2O3	40.58	41.23	41.07	40.46	40.56	41.57
Sc2O3	0.02	0.01	0.02	0.01	0.01	0.02
Cr2O3	BDL	BDL	BDL	BDL	BDL	BDL
FeO	0.63	0.02	0.02	BDL	0.01	0.01
MgO	BDL	BDL	BDL	BDL	BDL	BDL
CaO	0.50	0.36	0.29	0.16	0.15	0.64
MnO	1.91	1.44	1.44	1.74	1.64	0.24
Na2O	2.23	2.05	2.09	2.18	2.18	1.89
K2O	0.02	0.02	0.02	0.01	0.01	0.02
Rb2O	0.03	0.02	0.03	0.03	0.01	0.02
Cs2O	BDL	BDL	BDL	BDL	BDL	BDL
F	1.41	1.32	1.14	1.18	1.16	1.36
Cl	BDL	BDL	BDL	BDL	BDL	0.01
H2O*	3.19	3.25	3.32	3.31	3.33	3.27
B2O3*	11.21	11.23	11.19	11.20	11.24	11.35
Li2O*	2.38	2.40	2.34	2.37	2.38	2.64
Total	101.30	100.82	100.51	100.65	100.87	101.21
T: Si	5.75	5.79	5.82	5.89	5.90	5.84
Al	0.25	0.21	0.18	0.11	0.10	0.16
B	3.00	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Y: Al	1.17	1.31	1.34	1.29	1.30	1.34
Ti	0.01	BDL	BDL	BDL	BDL	BDL
Sc	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Mn	0.25	0.19	0.19	0.23	0.21	0.03
Fe2+	0.08	BDL	BDL	BDL	BDL	BDL
Li*	1.48	1.49	1.46	1.48	1.48	1.62
totalY	3.00	3.00	3.00	3.00	3.00	3.00
X: Ca	0.08	0.06	0.05	0.03	0.02	0.10
Na	0.67	0.62	0.63	0.66	0.65	0.56
K	BDL	BDL	BDL	BDL	BDL	BDL
r	0.24	0.32	0.32	0.31	0.32	0.33
OH	3.31	3.35	3.44	3.42	3.43	3.34
F	0.69	0.65	0.56	0.58	0.57	0.66
F content	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	PFL2A K1	PFL2A K1	PFL2A K1	PFL2A K1	PFL2A K2	PFL2A K2
Sample No.	56	57	58	59	60	61
Zone	Core Main	Core Main	Core Main	Core Main	Core Main	Core Main
SiO2	38.25	38.09	38.03	37.73	37.82	37.64
TiO2	BDL	0.02	BDL	BDL	BDL	0.02
Al2O3	41.55	41.50	41.56	41.65	41.09	41.31
Sc2O3	0.02	0.02	0.01	0.03	0.01	BDL
Cr2O3	BDL	BDL	BDL	BDL	BDL	BDL
FeO	BDL	BDL	0.02	BDL	BDL	BDL
MgO	0.01	BDL	BDL	BDL	BDL	BDL
CaO	0.61	0.40	0.61	0.60	0.47	0.56
MnO	0.32	0.24	0.41	0.38	0.40	0.50
Na2O	1.91	1.97	1.93	1.95	1.97	1.97
K2O	0.02	0.01	0.02	0.03	0.01	0.02
Rb2O	0.01	0.02	0.04	0.02	0.02	0.04
Cs2O	BDL	BDL	BDL	BDL	BDL	BDL
F	1.29	1.17	1.29	1.25	1.17	1.41
Cl	0.01	BDL	BDL	0.03	BDL	BDL
H2O*	3.30	3.34	3.30	3.29	3.31	3.22
B2O3*	11.35	11.29	11.33	11.29	11.21	11.26
Li2O*	2.60	2.53	2.58	2.56	2.52	2.59
Total	101.26	100.61	101.12	100.83	100.00	100.53
T: Si	5.85	5.87	5.83	5.81	5.87	5.81
Al	0.15	0.13	0.17	0.19	0.13	0.19
B	3.00	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Y: Al	1.35	1.40	1.35	1.36	1.37	1.32
Ti	BDL	BDL	BDL	BDL	BDL	BDL
Sc	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Mn	0.04	0.03	0.05	0.05	0.05	0.07
Fe2+	BDL	BDL	BDL	BDL	BDL	BDL
Li*	1.60	1.57	1.59	1.58	1.57	1.61
totalY	3.00	3.00	3.00	3.00	3.00	3.00
X: Ca	0.10	0.07	0.10	0.10	0.08	0.09
Na	0.57	0.59	0.57	0.58	0.59	0.59
K	BDL	BDL	BDL	0.01	BDL	BDL
r	0.33	0.34	0.32	0.31	0.33	0.31
OH	3.37	3.43	3.37	3.38	3.42	3.31
F	0.63	0.57	0.63	0.61	0.58	0.69
F content	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	PFL2A K2	PFL2A K2	PFL1A D	PFL1A D	PFL1A D	PFL1A D
Sample No.	62	63	78	79	80	81
Zone	Core Main	Core Main	Core Main	Core Main	Core Main	Core Main
SiO2	37.95	37.72	37.58	37.11	37.35	37.41
TiO2	0.02	0.02	0.03	0.02	0.01	0.02
Al2O3	40.73	41.63	41.61	40.44	40.20	41.18
Sc2O3	0.01	0.01	0.01	0.02	0.01	0.01
Cr2O3	BDL	BDL	BDL	BDL	0.01	BDL
FeO	BDL	BDL	0.01	0.01	0.01	BDL
MgO	BDL	BDL	0.01	0.01	0.01	0.01
CaO	0.62	0.07	0.30	0.34	0.34	0.18
MnO	0.90	0.07	0.28	1.44	1.15	0.50
Na2O	1.97	2.09	1.88	2.06	2.01	1.99
K2O	0.02	0.01	BDL	0.01	0.02	0.01
Rb2O	0.02	0.02	0.03	0.01	0.03	0.02
Cs2O	BDL	BDL	BDL	BDL	BDL	BDL
F	1.46	0.70	1.02	1.22	1.20	0.92
Cl	BDL	BDL	BDL	BDL	BDL	BDL
H2O*	3.19	3.51	3.37	3.24	3.25	3.39
B2O3*	11.27	11.13	11.18	11.07	11.06	11.09
Li2O*	2.62	2.29	2.38	2.36	2.41	2.32
Total	100.79	99.27	99.69	99.37	99.05	99.07
T: Si	5.85	5.89	5.84	5.83	5.87	5.86
Al	0.15	0.11	0.16	0.17	0.13	0.14
B	3.00	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Y: Al	1.25	1.55	1.47	1.31	1.32	1.46
Ti	BDL	BDL	BDL	BDL	BDL	BDL
Sc	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Mn	0.12	0.01	0.04	0.19	0.15	0.07
Fe2+	BDL	BDL	BDL	BDL	BDL	BDL
Li*	1.63	1.44	1.49	1.49	1.52	1.46
totalY	3.00	3.00	3.00	3.00	3.00	3.00
X: Ca	0.10	0.01	0.05	0.06	0.06	0.03
Na	0.59	0.63	0.57	0.63	0.61	0.61
K	BDL	BDL	BDL	BDL	BDL	BDL
r	0.30	0.35	0.38	0.31	0.32	0.36
OH	3.29	3.66	3.50	3.39	3.40	3.54
F	0.71	0.34	0.50	0.60	0.60	0.46
F content	Fluor-		Fluor-	Fluor-	Fluor-	
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	PFL1A D	PFL1A D	PFL1A E	PFL1A E	PFL1A E	PFL1A E
Sample No.	82	83	84	85	86	87
Zone	Core Main	Core Main	Core Main	Core Main	Core Main	Core Main
SiO2	37.04	37.75	37.09	36.97	36.51	36.94
TiO2	0.01	0.01	0.04	0.01	0.05	0.06
Al2O3	40.74	40.54	41.90	40.81	38.96	39.78
Sc2O3	0.01	0.02	0.02	0.02	0.01	0.01
Cr2O3	BDL	BDL	BDL	BDL	BDL	BDL
FeO	BDL	0.01	0.01	BDL	0.07	0.06
MgO	0.01	0.01	0.01	0.01	0.01	0.01
CaO	0.26	0.26	0.19	0.33	0.33	0.23
MnO	1.27	0.95	0.38	1.57	3.32	2.68
Na2O	2.05	1.98	1.93	2.07	2.42	2.30
K2O	BDL	0.01	0.01	0.01	0.01	0.02
Rb2O	0.01	0.02	0.01	0.03	0.03	0.03
Cs2O	BDL	BDL	BDL	BDL	BDL	BDL
F	1.16	1.12	1.01	1.39	1.68	1.39
Cl	BDL	0.01	0.01	BDL	BDL	BDL
H2O*	3.27	3.31	3.36	3.18	3.00	3.16
B2O3*	11.07	11.13	11.14	11.13	11.00	11.07
Li2O*	2.33	2.40	2.30	2.39	2.37	2.31
Total	99.23	99.52	99.41	99.91	99.77	100.04
T: Si	5.82	5.90	5.79	5.78	5.77	5.80
Al	0.18	0.10	0.21	0.22	0.23	0.20
B	3.00	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Y: Al	1.36	1.36	1.49	1.29	1.03	1.17
Ti	BDL	BDL	BDL	BDL	0.01	0.01
Sc	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Mn	0.17	0.13	0.05	0.21	0.45	0.36
Fe2+	BDL	BDL	BDL	BDL	0.01	0.01
Li*	1.47	1.51	1.45	1.50	1.51	1.46
totalY	3.00	3.00	3.00	3.00	3.00	3.00
X: Ca	0.04	0.04	0.03	0.05	0.06	0.04
Na	0.63	0.60	0.58	0.63	0.74	0.70
K	BDL	BDL	BDL	BDL	BDL	BDL
r	0.33	0.35	0.38	0.31	0.20	0.26
OH	3.42	3.45	3.50	3.31	3.16	3.31
F	0.58	0.55	0.50	0.69	0.84	0.69
F content	Fluor-	Fluor-		Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	PFL1A E	P28B H	P28B H	P28B H	P28B H
Sample No.	88	64	65	66	67
Zone	Core Main	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	37.81	36.87	37.01	36.83	36.85
TiO2	0.03	0.05	0.11	0.10	0.05
Al2O3	40.31	39.51	40.58	40.01	39.85
Sc2O3	0.01	BDL	0.01	BDL	0.01
Cr2O3	BDL	BDL	BDL	BDL	0.01
FeO	0.04	1.76	0.72	1.52	1.25
MgO	BDL	BDL	BDL	BDL	BDL
CaO	0.25	0.31	0.17	0.25	0.34
MnO	1.90	1.43	1.12	1.26	1.46
Na2O	2.18	2.40	2.21	2.34	2.32
K2O	0.01	0.02	0.02	0.02	0.02
Rb2O	0.03	0.03	0.01	0.04	0.03
Cs2O	BDL	BDL	BDL	BDL	BDL
F	1.39	1.50	1.17	1.37	1.46
Cl	BDL	BDL	BDL	0.01	BDL
H2O*	3.21	3.11	3.27	3.17	3.13
B2O3*	11.21	11.08	11.09	11.08	11.08
Li2O*	2.43	2.34	2.29	2.30	2.36
Total	100.81	100.43	99.77	100.30	100.23
T: Si	5.86	5.79	5.80	5.78	5.78
Al	0.14	0.21	0.20	0.22	0.22
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	1.23	1.09	1.30	1.17	1.15
Ti	BDL	0.01	0.01	0.01	0.01
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL
Mn	0.25	0.19	0.15	0.17	0.19
Fe2+	0.01	0.23	0.09	0.20	0.16
Li*	1.52	1.48	1.44	1.45	1.49
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.04	0.05	0.03	0.04	0.06
Na	0.66	0.73	0.67	0.71	0.71
K	BDL	BDL	BDL	BDL	BDL
r	0.30	0.21	0.30	0.24	0.23
OH	3.32	3.26	3.42	3.32	3.28
F	0.68	0.74	0.58	0.68	0.72
F content	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	P28B H	P28B H	P28B H	P28B I	P28B I
Sample No.	68	69	70	71	74
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	36.93	37.38	37.73	37.13	37.40
TiO2	0.09	0.06	0.04	0.05	0.04
Al2O3	39.86	40.33	41.35	39.43	39.78
Sc2O3	BDL	0.01	0.01	BDL	0.02
Cr2O3	0.01	BDL	0.01	0.01	0.01
FeO	1.25	0.61	0.01	1.64	0.87
MgO	BDL	BDL	BDL	BDL	BDL
CaO	0.31	0.29	0.14	0.30	0.29
MnO	1.14	0.89	0.37	1.46	1.15
Na2O	2.29	2.18	2.02	2.39	2.26
K2O	0.02	0.03	0.01	0.02	0.02
Rb2O	0.04	0.02	0.03	0.03	0.03
Cs2O	BDL	BDL	BDL	BDL	BDL
F	1.28	1.24	1.24	1.39	1.34
Cl	0.01	BDL	BDL	BDL	BDL
H2O*	3.20	3.25	3.28	3.16	3.19
B2O3*	11.05	11.12	11.21	11.08	11.10
Li2O*	2.33	2.41	2.46	2.34	2.42
Total	99.82	99.83	99.93	100.42	99.92
T: Si	5.81	5.84	5.85	5.82	5.86
Al	0.19	0.16	0.15	0.18	0.14
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	1.20	1.28	1.41	1.11	1.20
Ti	0.01	0.01	BDL	0.01	BDL
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL
Mn	0.15	0.12	0.05	0.19	0.15
Fe2+	0.16	0.08	BDL	0.21	0.11
Li*	1.47	1.52	1.54	1.47	1.53
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.05	0.05	0.02	0.05	0.05
Na	0.70	0.66	0.61	0.73	0.69
K	BDL	0.01	BDL	BDL	BDL
r	0.24	0.28	0.36	0.22	0.26
OH	3.36	3.38	3.39	3.31	3.33
F	0.64	0.61	0.61	0.69	0.67
F content	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	P28B I	P28B I	PFL12A P	PFL12A P	PFL12A P
Sample No.	75	81	57	58	59
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	37.31	37.26	36.56	36.24	36.41
TiO2	0.05	0.06	0.13	0.15	0.11
Al2O3	39.40	38.76	39.99	38.31	39.38
Sc2O3	0.02	0.01	0.02	0.01	0.03
Cr2O3	BDL	BDL	0.01	BDL	BDL
FeO	1.23	1.93	2.28	4.97	2.85
MgO	BDL	BDL	BDL	0.02	0.01
CaO	0.39	0.54	0.13	0.06	0.12
MnO	1.49	1.64	1.03	0.93	1.44
Na2O	2.35	2.40	2.38	2.70	2.55
K2O	0.01	0.02	0.02	0.02	0.02
Rb2O	0.04	0.03	0.03	0.04	0.03
Cs2O	BDL	BDL	BDL	BDL	BDL
F	1.44	1.65	1.14	1.40	1.41
Cl	BDL	0.01	0.01	BDL	BDL
H2O*	3.15	3.05	3.26	3.11	3.13
B2O3*	11.10	11.11	11.02	10.95	11.03
Li2O*	2.42	2.46	2.12	1.99	2.14
Total	100.40	100.95	100.12	100.90	100.67
T: Si	5.84	5.83	5.76	5.75	5.74
Al	0.16	0.17	0.24	0.25	0.26
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	1.11	0.97	1.20	0.92	1.06
Ti	0.01	0.01	0.02	0.02	0.01
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL
Mn	0.20	0.22	0.14	0.12	0.19
Fe2+	0.16	0.25	0.30	0.66	0.38
Li*	1.52	1.55	1.35	1.27	1.36
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.06	0.09	0.02	0.01	0.02
Na	0.71	0.73	0.73	0.83	0.78
K	BDL	BDL	BDL	BDL	BDL
r	0.22	0.18	0.24	0.15	0.19
OH	3.29	3.18	3.43	3.30	3.29
F	0.71	0.82	0.57	0.70	0.71
F content	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	PFL12A P	PFL12A P	PFL12A P	PFL12A P	PFL12A P
Sample No.	60	61	62	63	64
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	36.89	36.83	36.17	37.01	36.34
TiO2	0.10	0.11	0.12	0.11	0.13
Al2O3	40.22	40.20	37.93	39.46	38.60
Sc2O3	BDL	BDL	0.01	BDL	0.02
Cr2O3	BDL	BDL	0.01	BDL	BDL
FeO	1.74	1.81	4.93	2.07	3.80
MgO	0.01	0.01	0.01	BDL	0.01
CaO	0.10	0.16	0.08	0.09	0.06
MnO	1.23	1.35	1.02	1.41	1.47
Na2O	2.33	2.34	2.69	2.48	2.73
K2O	0.02	0.03	0.02	0.02	0.02
Rb2O	0.02	0.04	0.02	0.03	0.03
Cs2O	BDL	BDL	BDL	BDL	BDL
F	1.31	1.36	1.60	1.49	1.65
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.21	3.19	3.01	3.12	3.02
B2O3*	11.10	11.11	10.92	11.09	11.01
Li2O*	2.21	2.22	2.06	2.29	2.15
Total	100.48	100.75	100.61	100.69	101.04
T: Si	5.78	5.76	5.76	5.80	5.74
Al	0.22	0.24	0.24	0.20	0.26
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	1.20	1.17	0.87	1.09	0.92
Ti	0.01	0.01	0.01	0.01	0.01
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL
Mn	0.16	0.18	0.14	0.19	0.20
Fe2+	0.23	0.24	0.66	0.27	0.50
Li*	1.39	1.40	1.32	1.44	1.37
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.02	0.03	0.01	0.02	0.01
Na	0.71	0.71	0.83	0.75	0.84
K	BDL	BDL	BDL	BDL	BDL
r	0.27	0.26	0.15	0.22	0.15
OH	3.35	3.33	3.19	3.26	3.18
F	0.65	0.67	0.81	0.74	0.82
F content	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	PFL12A P	PFL12A Q	PFL12A Q	PFL12A Q	PFL12A Q
Sample No.	65	66	67	68	69
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	37.15	36.61	36.23	36.67	37.19
TiO2	0.11	0.16	0.14	0.10	0.04
Al2O3	38.41	38.66	39.63	38.56	40.71
Sc2O3	0.01	0.01	0.02	BDL	0.02
Cr2O3	BDL	BDL	BDL	BDL	BDL
FeO	3.88	3.86	3.16	3.50	1.23
MgO	BDL	BDL	BDL	0.01	0.01
CaO	0.06	0.08	0.05	0.12	0.07
MnO	0.88	0.84	1.21	1.39	0.80
Na2O	2.54	2.71	2.51	2.63	2.11
K2O	0.04	0.02	0.02	0.02	0.03
Rb2O	0.03	0.04	0.03	0.02	0.02
Cs2O	BDL	BDL	BDL	BDL	BDL
F	1.35	1.55	1.37	1.58	0.99
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.16	3.07	3.15	3.05	3.36
B2O3*	11.02	11.02	11.02	11.02	11.08
Li2O*	2.15	2.21	2.07	2.19	2.17
Total	100.78	100.86	100.61	100.89	99.85
T: Si	5.86	5.77	5.72	5.78	5.83
Al	0.14	0.23	0.28	0.22	0.17
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	1.00	0.95	1.09	0.95	1.36
Ti	0.01	0.02	0.02	0.01	0.01
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL
Mn	0.12	0.11	0.16	0.19	0.11
Fe2+	0.51	0.51	0.42	0.46	0.16
Li*	1.36	1.40	1.32	1.39	1.37
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.01	0.01	0.01	0.02	0.01
Na	0.78	0.83	0.77	0.80	0.64
K	0.01	BDL	BDL	BDL	0.01
r	0.21	0.15	0.22	0.17	0.34
OH	3.32	3.22	3.31	3.21	3.51
F	0.68	0.77	0.69	0.79	0.49
F content	Fluor-	Fluor-	Fluor-	Fluor-	
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	PFL12A Q	PFL12A Q	PFL12A Q	PFL12A Q	PFL12A Q
Sample No.	70	71	72	73	74
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	36.66	36.89	36.37	36.14	36.52
TiO2	0.15	0.13	0.20	0.15	0.12
Al2O3	38.49	39.94	38.49	39.83	40.14
Sc2O3	0.03	BDL	BDL	0.02	BDL
Cr2O3	0.02	BDL	BDL	BDL	BDL
FeO	3.99	2.14	3.90	3.11	2.18
MgO	BDL	0.02	BDL	0.02	BDL
CaO	0.07	0.04	0.09	0.04	0.03
MnO	0.84	1.09	0.94	1.00	0.89
Na2O	2.66	2.41	2.66	2.43	2.35
K2O	0.03	0.03	0.02	0.03	0.02
Rb2O	0.03	0.03	0.05	0.02	0.02
Cs2O	BDL	BDL	BDL	BDL	BDL
F	1.56	1.44	1.57	1.26	1.16
Cl	BDL	BDL	BDL	BDL	0.01
H2O*	3.06	3.15	3.04	3.19	3.25
B2O3*	11.01	11.10	10.98	10.99	11.01
Li2O*	2.20	2.25	2.19	2.03	2.12
Total	100.79	100.67	100.51	100.27	99.81
T: Si	5.79	5.77	5.76	5.72	5.77
Al	0.21	0.23	0.24	0.28	0.23
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.94	1.14	0.94	1.14	1.23
Ti	0.02	0.02	0.02	0.02	0.01
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL
Mn	0.11	0.14	0.13	0.13	0.12
Fe2+	0.53	0.28	0.52	0.41	0.29
Li*	1.39	1.41	1.39	1.29	1.34
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.01	0.01	0.02	0.01	0.01
Na	0.81	0.73	0.82	0.75	0.72
K	0.01	0.01	BDL	0.01	BDL
r	0.17	0.25	0.16	0.24	0.27
OH	3.22	3.29	3.21	3.37	3.42
F	0.78	0.71	0.79	0.63	0.58
F content	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	PFL12A Q	PFL12A Q	PFL12A Q	PFL12L_TurU	PFL12L_TurU
Sample No.	75	76	77	130	132
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	36.48	36.22	36.14	37.77	37.33
TiO2	0.16	0.16	0.14	BDL	BDL
Al2O3	39.61	39.78	38.16	40.12	41.92
Sc2O3	0.01	BDL	0.02	BDL	BDL
Cr2O3	BDL	BDL	BDL	BDL	0.01
FeO	3.50	3.24	4.13	0.71	0.38
MgO	BDL	0.01	0.01	0.01	BDL
CaO	0.04	0.07	0.08	0.71	0.41
MnO	0.75	0.84	0.86	1.51	1.02
Na2O	2.48	2.43	2.70	2.13	1.98
K2O	0.01	0.02	0.03	0.01	BDL
Rb2O	0.03	0.02	0.04	0.01	BDL
Cs2O	BDL	BDL	BDL	BDL	0.01
F	1.26	1.36	1.59	1.35	1.14
Cl	BDL	BDL	0.01	BDL	BDL
H2O*	3.21	3.15	3.01	3.24	3.35
B2O3*	11.03	11.01	10.91	11.23	11.26
Li2O*	2.06	2.08	2.17	2.48	2.30
Total	100.65	100.41	99.99	101.26	101.13
T: Si	5.75	5.72	5.76	5.85	5.76
Al	0.25	0.28	0.24	0.15	0.24
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	1.11	1.12	0.92	1.16	1.38
Ti	0.02	0.02	0.02	BDL	BDL
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL
Mn	0.10	0.11	0.12	0.20	0.13
Fe2+	0.46	0.43	0.55	0.09	0.05
Li*	1.31	1.32	1.39	1.55	1.43
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.01	0.01	0.01	0.12	0.07
Na	0.76	0.74	0.84	0.64	0.59
K	BDL	BDL	0.01	BDL	BDL
r	0.23	0.24	0.14	0.24	0.34
OH	3.37	3.32	3.20	3.34	3.44
F	0.63	0.68	0.80	0.66	0.56
F content	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	PFL12L_TurU	PFL12L_TurU	PFL12L_TurV	P28C_TurZ	P28C_TurZ
Sample No.	133	134	136	111	112
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	37.64	37.91	37.64	36.37	35.77
TiO2	0.01	0.01	0.09	0.16	0.15
Al2O3	42.76	41.81	39.32	36.66	37.07
Sc2O3	BDL	BDL	BDL	BDL	BDL
Cr2O3	BDL	0.01	BDL	BDL	BDL
FeO	0.20	0.12	1.99	8.05	7.64
MgO	BDL	BDL	BDL	BDL	BDL
CaO	0.28	0.21	0.07	0.09	0.14
MnO	0.64	0.70	2.02	0.78	0.93
Na2O	1.86	2.00	2.46	2.40	2.52
K2O	BDL	0.02	0.01	0.02	0.02
Rb2O	0.01	BDL	0.01	BDL	BDL
Cs2O	BDL	BDL	BDL	0.01	BDL
F	0.83	1.16	1.27	1.20	1.23
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.51	3.35	3.25	3.17	3.15
B2O3*	11.31	11.30	11.15	10.83	10.80
Li2O*	2.21	2.39	2.19	1.59	1.61
Total	101.25	101.00	101.46	101.33	101.05
T: Si	5.78	5.83	5.87	5.84	5.76
Al	0.22	0.17	0.13	0.16	0.24
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	1.53	1.41	1.09	0.77	0.78
Ti	BDL	BDL	0.01	0.02	0.02
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL
Mn	0.08	0.09	0.27	0.11	0.13
Fe2+	0.03	0.02	0.26	1.08	1.03
Li*	1.36	1.48	1.37	1.03	1.04
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.05	0.03	0.01	0.01	0.02
Na	0.56	0.60	0.74	0.75	0.79
K	BDL	BDL	BDL	BDL	BDL
r	0.40	0.36	0.24	0.23	0.18
OH	3.60	3.44	3.37	3.39	3.38
F	0.40	0.56	0.62	0.61	0.62
F content		Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	P28C_TurZ	P28C_TurZ	P28C_TurZ	P28C_TurZ	P28C_TurZ
Sample No.	113	114	115	116	118
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	35.87	35.88	36.27	38.00	38.47
TiO2	0.08	0.09	0.19	0.04	0.04
Al2O3	36.40	36.68	36.68	39.48	40.00
Sc2O3	BDL	BDL	BDL	BDL	BDL
Cr2O3	BDL	BDL	0.01	0.01	BDL
FeO	9.74	8.92	6.59	0.95	0.65
MgO	BDL	BDL	BDL	BDL	BDL
CaO	0.01	0.01	0.18	0.12	0.20
MnO	1.12	1.27	1.17	2.11	1.36
Na2O	1.74	1.85	2.62	2.42	2.24
K2O	0.02	0.02	0.03	0.01	0.02
Rb2O	0.02	0.02	0.01	BDL	BDL
Cs2O	0.01	BDL	0.01	0.01	0.03
F	0.66	0.65	1.26	1.39	1.35
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.36	3.37	3.14	3.20	3.25
B2O3*	10.64	10.66	10.82	11.20	11.27
Li2O*	0.98	1.07	1.80	2.37	2.48
Total	100.64	100.50	100.78	101.31	101.36
T: Si	5.86	5.85	5.82	5.90	5.93
Al	0.14	0.15	0.18	0.10	0.07
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.86	0.90	0.77	1.12	1.20
Ti	0.01	0.01	0.02	BDL	BDL
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL
Mn	0.16	0.17	0.16	0.28	0.18
Fe2+	1.33	1.22	0.89	0.12	0.08
Li*	0.64	0.70	1.16	1.48	1.54
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	BDL	BDL	0.03	0.02	0.03
Na	0.55	0.58	0.82	0.73	0.67
K	BDL	BDL	0.01	BDL	BDL
r	0.44	0.41	0.15	0.25	0.29
OH	3.66	3.66	3.36	3.32	3.34
F	0.34	0.34	0.64	0.68	0.66
F content			Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	P28C_TurAA	P28C_TurAA	P28C_TurAA	P28C_TurAA	P28C_TurAA
Sample No.	119	120	121	122	123
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	35.99	35.94	36.04	35.79	35.90
TiO2	0.14	0.19	0.15	0.14	0.13
Al2O3	36.36	36.56	37.26	37.19	37.58
Sc2O3	BDL	BDL	BDL	BDL	BDL
Cr2O3	BDL	BDL	BDL	BDL	BDL
FeO	8.46	8.12	7.43	7.23	6.75
MgO	BDL	BDL	BDL	BDL	BDL
CaO	0.10	0.11	0.17	0.17	0.20
MnO	0.73	0.78	0.88	0.97	1.01
Na2O	2.47	2.55	2.50	2.56	2.56
K2O	0.03	0.03	0.03	0.03	0.03
Rb2O	0.02	BDL	0.02	0.02	0.01
Cs2O	0.01	0.01	0.01	BDL	0.02
F	1.13	1.08	1.16	1.17	1.21
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.17	3.20	3.19	3.17	3.17
B2O3*	10.75	10.76	10.85	10.80	10.86
Li2O*	1.53	1.55	1.64	1.65	1.72
Total	100.90	100.89	101.32	100.90	101.14
T: Si	5.82	5.81	5.78	5.76	5.75
Al	0.18	0.19	0.22	0.24	0.25
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.75	0.76	0.81	0.81	0.84
Ti	0.02	0.02	0.02	0.02	0.02
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL
Mn	0.10	0.11	0.12	0.13	0.14
Fe2+	1.14	1.10	1.00	0.97	0.90
Li*	0.99	1.01	1.05	1.07	1.10
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.02	0.02	0.03	0.03	0.03
Na	0.77	0.80	0.78	0.80	0.79
K	0.01	0.01	0.01	0.01	0.01
r	0.20	0.18	0.19	0.16	0.16
OH	3.42	3.45	3.41	3.41	3.39
F	0.58	0.55	0.59	0.59	0.61
F content	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	P28C_TurAA	P28C_TurAA	P28C_TurAA	P28C_TurAA	P28C_TurAA
Sample No.	124	125	126	127	128
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	36.06	37.76	38.33	38.20	38.53
TiO2	0.16	0.03	0.07	0.10	0.08
Al2O3	37.71	40.23	40.39	40.44	40.98
Sc2O3	BDL	BDL	BDL	BDL	BDL
Cr2O3	BDL	BDL	0.01	BDL	BDL
FeO	6.03	1.28	0.70	0.75	0.46
MgO	BDL	BDL	BDL	BDL	BDL
CaO	0.20	0.20	0.13	0.13	0.04
MnO	1.19	1.54	1.33	1.22	0.61
Na2O	2.56	2.29	2.25	2.23	2.10
K2O	0.02	0.02	0.01	0.01	0.01
Rb2O	0.02	BDL	BDL	BDL	BDL
Cs2O	0.01	0.02	0.02	0.03	0.02
F	1.22	1.30	1.20	1.17	0.94
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.17	3.26	3.32	3.33	3.44
B2O3*	10.88	11.22	11.27	11.25	11.27
Li2O*	1.79	2.31	2.39	2.37	2.35
Total	101.01	101.45	101.41	101.22	100.84
T: Si	5.76	5.85	5.91	5.90	5.94
Al	0.24	0.15	0.09	0.10	0.06
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.86	1.19	1.25	1.26	1.39
Ti	0.02	BDL	0.01	0.01	0.01
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL
Mn	0.16	0.20	0.17	0.16	0.08
Fe2+	0.81	0.17	0.09	0.10	0.06
Li*	1.15	1.44	1.48	1.47	1.46
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.03	0.03	0.02	0.02	0.01
Na	0.79	0.69	0.67	0.67	0.63
K	BDL	BDL	BDL	BDL	BDL
r	0.17	0.27	0.30	0.31	0.36
OH	3.38	3.36	3.41	3.43	3.54
F	0.62	0.64	0.59	0.57	0.46
F content	Fluor-	Fluor-	Fluor-	Fluor-	
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	P28C_TurAB	P28C_TurAB	P28C_TurAB	P28C_TurAB	P28C_TurAB
Sample No.	129	130	131	132	133
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	35.84	36.14	36.03	35.74	36.32
TiO2	0.05	0.10	0.08	0.14	0.15
Al2O3	36.04	36.71	37.17	37.20	37.83
Sc2O3	BDL	BDL	BDL	BDL	BDL
Cr2O3	BDL	BDL	BDL	BDL	BDL
FeO	10.52	9.19	8.44	7.37	5.35
MgO	BDL	BDL	BDL	BDL	BDL
CaO	0.01	0.01	0.03	0.12	0.16
MnO	1.02	0.88	0.81	1.01	1.33
Na2O	1.62	1.78	2.06	2.51	2.62
K2O	0.01	0.02	0.03	0.03	0.02
Rb2O	0.01	0.02	BDL	0.02	0.01
Cs2O	0.02	0.02	0.01	0.01	0.02
F	0.47	0.48	0.75	1.15	1.44
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.43	3.45	3.35	3.18	3.09
B2O3*	10.58	10.67	10.74	10.79	10.95
Li2O*	0.81	1.03	1.25	1.59	1.95
Total	100.43	100.52	100.76	100.86	101.26
T: Si	5.89	5.89	5.83	5.76	5.77
Al	0.11	0.11	0.17	0.24	0.23
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.87	0.94	0.92	0.82	0.85
Ti	0.01	0.01	0.01	0.02	0.02
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL	BDL
Mn	0.14	0.12	0.11	0.14	0.18
Fe2+	1.45	1.25	1.14	0.99	0.71
Li*	0.54	0.68	0.82	1.03	1.25
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	BDL	BDL	0.01	0.02	0.03
Na	0.52	0.56	0.64	0.78	0.81
K	BDL	BDL	0.01	0.01	BDL
r	0.48	0.43	0.34	0.19	0.16
OH	3.76	3.75	3.62	3.42	3.27
F	0.24	0.25	0.38	0.58	0.73
F content				Fluor-	Fluor-
Mineral Name	Schorl	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	P28C_TurAB2	P28C_TurAB2	P28C_TurAB2	P28C_TurAB2
Sample No.	134	135	136	138
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Core Dist Tur
SiO2	36.33	36.05	37.56	38.01
TiO2	0.19	0.13	0.09	0.07
Al2O3	37.27	37.88	37.93	38.79
Sc2O3	BDL	BDL	BDL	BDL
Cr2O3	BDL	0.01	BDL	BDL
FeO	6.18	5.50	3.15	1.24
MgO	BDL	BDL	BDL	BDL
CaO	0.14	0.22	0.07	0.10
MnO	1.18	1.37	2.24	2.45
Na2O	2.63	2.55	2.65	2.59
K2O	0.03	0.03	0.04	0.03
Rb2O	0.01	0.02	BDL	BDL
Cs2O	0.01	0.01	BDL	0.03
F	1.25	1.20	1.30	1.27
Cl	BDL	BDL	BDL	BDL
H2O*	3.16	3.18	3.20	3.24
B2O3*	10.88	10.88	11.05	11.14
Li2O*	1.82	1.82	2.13	2.31
Total	101.08	100.84	101.40	101.27
T: Si	5.80	5.76	5.90	5.93
Al	0.20	0.24	0.10	0.07
B	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Y: Al	0.82	0.90	0.93	1.06
Ti	0.02	0.02	0.01	0.01
Sc	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	BDL
Mn	0.16	0.19	0.30	0.32
Fe2+	0.83	0.73	0.41	0.16
Li*	1.17	1.17	1.34	1.45
totalY	3.00	3.00	3.00	3.00
X: Ca	0.02	0.04	0.01	0.02
Na	0.81	0.79	0.81	0.78
K	0.01	0.01	0.01	0.01
r	0.16	0.16	0.17	0.19
OH	3.37	3.40	3.35	3.37
F	0.63	0.60	0.65	0.63
F content	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite

Appendix D EPMA Raw Data

Thin Section No.	P28C_TurAB2	P28C_TurAB2	P28C_TurAB2	P34A O	P34A O	P34A O
Sample No.	139	140	141	76	77	78
Zone	Core Dist Tur	Core Dist Tur	Core Dist Tur	Quartz	Quartz	Quartz
SiO2	37.61	37.57	38.27	35.49	34.64	34.08
TiO2	0.04	0.05	0.08	0.02	0.02	0.01
Al2O3	38.68	38.17	38.26	35.02	33.58	33.77
Sc2O3	BDL	BDL	BDL	BDL	BDL	BDL
Cr2O3	BDL	BDL	BDL	BDL	0.01	BDL
FeO	1.59	1.99	1.46	9.86	12.51	13.14
MgO	BDL	BDL	BDL	0.23	0.19	0.20
CaO	0.10	0.12	0.10	0.09	0.05	0.08
MnO	2.58	2.89	2.36	1.09	1.02	1.13
Na2O	2.61	2.68	2.56	2.46	2.27	2.18
K2O	0.02	0.04	0.04	0.02	0.02	0.04
Rb2O	0.01	0.01	0.02	0.05	0.05	0.06
Cs2O	0.02	0.01	0.01	BDL	BDL	BDL
F	1.36	1.45	1.31	1.42	1.31	1.01
Cl	BDL	BDL	BDL	BDL	BDL	BDL
H2O*	3.19	3.14	3.22	3.00	2.97	3.08
B2O3*	11.11	11.09	11.13	10.64	10.40	10.32
Li2O*	2.26	2.25	2.35	1.37	0.97	0.72
Total	101.19	101.46	101.16	100.74	100.00	99.82
T: Si	5.89	5.89	5.98	5.80	5.79	5.74
Al	0.11	0.11	0.02	0.20	0.21	0.26
B	3.00	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Y: Al	1.02	0.93	1.01	0.55	0.40	0.45
Ti	0.01	0.01	0.01	BDL	BDL	BDL
Sc	BDL	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL	BDL
Mg	BDL	BDL	BDL	0.06	0.05	0.05
Mn	0.34	0.38	0.31	0.15	0.14	0.16
Fe2+	0.21	0.26	0.19	1.35	1.75	1.85
Li*	1.42	1.41	1.47	0.90	0.65	0.49
totalY	3.00	3.00	3.00	3.00	3.00	3.00
X: Ca	0.02	0.02	0.02	0.01	0.01	0.01
Na	0.79	0.81	0.77	0.78	0.73	0.71
K	BDL	0.01	0.01	BDL	BDL	0.01
r	0.18	0.16	0.20	0.20	0.25	0.26
OH	3.33	3.28	3.35	3.27	3.31	3.46
F	0.67	0.72	0.65	0.73	0.69	0.54
F content	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-	Fluor-
Mineral Name	Elbaite	Elbaite	Elbaite	Elbaite	Schorl	Schorl

Appendix D EPMA Raw Data

Thin Section No.	P34A O	P34A O	P34B_TurAC	P34B_TurAC	P34B_TurAC
Sample No.	79	80	142	143	144
Zone	Quartz	Quartz	Quartz	Quartz	Quartz
SiO2	34.38	35.04	34.85	35.42	34.92
TiO2	BDL	0.01	0.02	BDL	BDL
Al2O3	33.21	35.09	32.55	34.01	33.27
Sc2O3	BDL	0.01	BDL	BDL	BDL
Cr2O3	0.01	0.02	BDL	BDL	BDL
FeO	13.20	10.44	14.94	14.06	14.68
MgO	0.20	0.22	0.29	0.21	0.31
CaO	0.09	0.08	0.02	BDL	0.01
MnO	1.20	1.20	0.79	0.75	0.77
Na2O	2.28	2.35	2.13	1.61	1.92
K2O	0.04	0.03	0.01	0.01	0.02
Rb2O	0.07	0.05	0.01	BDL	BDL
Cs2O	BDL	BDL	0.01	BDL	BDL
F	1.13	1.26	0.59	0.26	0.53
Cl	BDL	BDL	BDL	BDL	BDL
H2O*	3.03	3.05	3.26	3.46	3.31
B2O3*	10.33	10.57	10.27	10.38	10.33
Li2O*	0.81	1.17	0.46	0.35	0.40
Total	99.97	100.59	100.21	100.52	100.47
T: Si	5.78	5.76	5.90	5.93	5.88
Al	0.22	0.24	0.10	0.07	0.12
B	3.00	3.00	3.00	3.00	3.00
Z: Al	6.00	6.00	6.00	6.00	6.00
Mg	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Y: Al	0.37	0.56	0.38	0.64	0.48
Ti	BDL	BDL	BDL	BDL	BDL
Sc	BDL	BDL	BDL	BDL	BDL
Cr	BDL	BDL	BDL	BDL	BDL
Mg	0.05	0.05	0.07	0.05	0.08
Mn	0.17	0.17	0.11	0.11	0.11
Fe2+	1.86	1.44	2.11	1.97	2.07
Li*	0.55	0.77	0.31	0.23	0.27
totalY	3.00	3.00	3.00	3.00	3.00
X: Ca	0.02	0.01	BDL	BDL	BDL
Na	0.74	0.75	0.70	0.52	0.63
K	0.01	0.01	BDL	BDL	BDL
r	0.23	0.23	0.29	0.47	0.37
OH	3.40	3.35	3.68	3.86	3.72
F	0.60	0.65	0.32	0.14	0.28
F content	Fluor-	Fluor-			
Mineral Name	Schorl	Schorl	Schorl	Schorl	Schorl

Appendix D EPMA Raw Data

Thin Section No.	P34B_TurAC	P34B_TurAC
Sample No.	145	146
Zone	Quartz	Quartz
SiO2	35.19	35.32
TiO2	BDL	BDL
Al2O3	33.30	33.57
Sc2O3	BDL	BDL
Cr2O3	BDL	BDL
FeO	14.29	12.70
MgO	0.28	0.15
CaO	0.02	0.05
MnO	0.90	1.14
Na2O	1.89	2.20
K2O	0.02	0.02
Rb2O	0.02	0.02
Cs2O	BDL	BDL
F	0.54	1.04
Cl	BDL	BDL
H2O*	3.32	3.12
B2O3*	10.36	10.46
Li2O*	0.46	0.89
Total	100.58	100.66
T: Si	5.90	5.87
Al	0.10	0.13
B	3.00	3.00
Z: Al	6.00	6.00
Mg	BDL	BDL
Cr	BDL	BDL
Y: Al	0.49	0.45
Ti	BDL	BDL
Sc	BDL	BDL
Cr	BDL	BDL
Mg	0.07	0.04
Mn	0.13	0.16
Fe2+	2.01	1.77
Li*	0.31	0.59
totalY	3.00	3.00
X: Ca	BDL	0.01
Na	0.62	0.71
K	BDL	BDL
r	0.38	0.28
OH	3.71	3.46
F	0.29	0.54
F content		Fluor-
Mineral Name	Schorl	Schorl

EPMA Detection Limits

	Min	Max
SiO2 CDL99	0.01	0.01
TiO2 CDL99	0.02	0.02
Al2O3 CDL99	0.01	0.01
Cr2O3 CDL99	0.02	0.02
Sc2O3 CDL99	0.01	0.02
FeO CDL99	0.02	0.02
Cu2O CDL99	0.04	0.05
MnO CDL99	0.02	0.02
MgO CDL99	0.01	0.01
CaO CDL99	0.01	0.01
Na2O CDL99	0.01	0.01
K2O CDL99	0.01	0.01
Rb2O CDL99	0.01	0.02
Cs2O CDL99	0.02	0.02
Cl CDL99	0.01	0.01
F CDL99	0.03	0.04

CDL99 - Calculated Detection
Limit, 99% confidence level