

Appendix 2

Selected microprobe analyses of tourmalines from the Ropianka Formation (shown in Fig. 4), in representative analytical spots of traverse microprobe analyses (shown in Figs. 4 and 6)

Mineral label	R t12 rz1		R t10 rz1		R t2 rz1		R t13 rz3			R t12 rz4		R t1 rz6		R t5 rz5		R t7 rz2	
analytical spot	2	4	2	6	2	7	2	5	10	3	6	1	7	3	8	2	7
SiO ₂	37.72	36.96	36.92	37.27	37.02	37.40	36.69	37.83	36.24	36.76	37.07	37.08	36.86	35.89	37.57	37.54	36.52
TiO ₂	0.69	0.26	0.67	0.13	0.34	0.09	1.05	0.63	0.70	0.82	0.64	0.92	0.20	1.51	0.38	0.45	1.20
Al ₂ O ₃	29.97	30.22	30.87	31.03	35.15	35.40	32.50	31.63	34.04	30.73	32.04	32.46	34.48	25.53	32.38	30.21	26.91
Cr ₂ O ₃	0.15	0.01	0.04	0.02	b.d.l.	b.d.l.	0.06	0.06	0.04	0.02	0.02	0.01	b.d.l.	0.04	0.04	0.11	0.03
FeO	7.43	10.26	6.50	7.79	9.20	9.63	5.38	4.84	5.92	9.78	6.49	11.09	10.37	12.02	5.53	7.22	9.97
MgO	7.23	5.67	7.39	6.86	3.45	3.11	7.33	8.38	5.99	5.46	7.07	3.46	2.84	7.07	7.37	7.91	7.87
MnO	0.04	0.05	0.70	0.18	0.12	0.05	0.80	0.27	0.68	0.29	0.45	0.39	0.16	2.21	0.51	0.92	1.90
CaO	0.28	0.14	0.02	0.01	0.16	0.02	0.03	0.03	b.d.l.	0.08	0.03	b.d.l.	0.07	0.03	0.04	b.d.l.	0.05
Na ₂ O	2.42	2.39	2.11	2.30	1.69	1.35	2.04	2.55	1.75	2.11	2.14	1.69	1.44	1.42	1.99	2.09	1.68
K ₂ O	0.01	0.01	0.02	b.d.l.	0.03	0.01	0.03	0.01	0.01	0.01	b.d.l.	0.01	0.02	0.05	b.d.l.	0.02	0.04
F	0.02	0.05	0.01	0.06	0.04	0.01	0.06	0.02	0.06	0.05	0.09	0.17	0.02	0.03	0.09	0.02	0.07
H ₂ O*	3.67	3.60	3.66	3.63	3.71	3.72	3.68	3.73	3.67	3.61	3.65	3.60	3.67	3.52	3.68	3.69	3.56
B ₂ O ₃ *	10.67	10.50	10.61	10.61	10.80	10.81	10.75	10.84	10.70	10.54	10.70	10.67	10.66	10.23	10.78	10.71	10.42
Li ₂ O*	0.57	0.37	0.38	0.37	0.38	0.36	0.37	0.44	0.39	0.33	0.30	0.46	0.36	0.27	0.42	0.39	0.29
O=F	0.01	0.02	0.00	0.03	0.02	0.00	0.02	0.01	0.02	0.02	0.04	0.07	0.01	0.01	0.04	0.01	0.03
Total	100.88	100.48	99.88	100.23	102.06	101.95	100.73	101.25	100.16	100.57	100.64	101.93	101.12	99.78	100.73	101.26	100.48
Structural formula based on 31 anions (O, OH, F)																	
B	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
T Si	6.142	6.117	6.050	6.106	5.959	6.016	5.932	6.065	5.886	6.065	6.018	6.042	6.012	6.100	6.057	6.093	6.093
Al	0.000	0.000	0.000	0.000	0.041	0.000	0.068	0.000	0.114	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Z & Y Al	5.751	5.894	5.962	5.992	6.627	6.711	6.125	5.976	6.401	5.975	6.131	6.235	6.627	5.113	6.152	5.779	5.291
Ti	0.085	0.033	0.082	0.015	0.041	0.010	0.127	0.076	0.085	0.101	0.078	0.113	0.024	0.192	0.046	0.055	0.151
Cr	0.019	0.002	0.005	0.003	0.000	0.000	0.007	0.008	0.005	0.003	0.002	0.002	0.000	0.005	0.005	0.014	0.004
Mg	1.756	1.398	1.806	1.676	0.829	0.745	1.766	2.004	1.451	1.341	1.711	0.840	0.690	1.790	1.771	1.915	1.958
Mn	0.006	0.007	0.002	0.001	0.021	0.002	0.003	0.005	0.000	0.011	0.004	0.000	0.009	0.004	0.005	0.000	0.007
Fe ²⁺	1.012	1.420	0.891	1.068	1.238	1.295	0.728	0.648	0.804	1.350	0.881	1.512	1.414	1.708	0.745	0.980	1.391
Li*	0.372	0.247	0.252	0.246	0.244	0.236	0.243	0.283	0.254	0.219	0.193	0.300	0.236	0.187	0.275	0.257	0.197
X Ca	0.049	0.026	0.123	0.032	0.021	0.009	0.138	0.046	0.119	0.050	0.079	0.067	0.028	0.402	0.088	0.160	0.339
Na	0.763	0.767	0.670	0.732	0.528	0.422	0.641	0.792	0.550	0.676	0.673	0.535	0.455	0.468	0.622	0.657	0.542
K	0.002	0.001	0.004	0.000	0.007	0.002	0.006	0.003	0.002	0.003	0.000	0.003	0.003	0.011	0.000	0.003	0.008
X-site vacancy	0.186	0.206	0.203	0.236	0.444	0.567	0.215	0.159	0.328	0.271	0.248	0.395	0.514	0.119	0.290	0.179	0.111
Cation Sum	18.957	18.910	18.847	18.870	18.556	18.448	18.785	18.906	18.672	18.794	18.770	18.647	18.497	18.981	18.767	18.914	18.982
OH	3.988	3.974	3.997	3.967	3.979	3.995	3.971	3.990	3.971	3.974	3.953	3.912	3.988	3.985	3.955	3.990	3.962
F	0.012	0.026	0.003	0.033	0.021	0.005	0.029	0.010	0.029	0.026	0.047	0.088	0.012	0.015	0.045	0.010	0.038
Mg/(Mg + Fe)	0.634	0.496	0.670	0.611	0.401	0.365	0.708	0.756	0.643	0.499	0.660	0.357	0.328	0.512	0.704	0.661	0.585
Tourmaline species	dravite	schorl	dravite	dravite	schorl	foitite	dravite	dravite	dravite	schorl	dravite	schorl	foitite	schorl	dravite	dravite	schorl

*see "Analytical methods" for explanations of the calculation method; T. Z. Y. X – sites in the tourmaline structure; b.d.l. – below detection limit