

G&G Data Depository: Average chemical composition of tourmaline by electron microprobe, to accompany R. Befi, W. B. Simmons, and A. U. Falster, "Gem News International: New tourmaline production from Keffi, Nigeria," Fall 2009 G&G, pp. 227–228.^a

Property/ chemical composition	Crystal		Nodule	
Color (no. analyses)	Yellowish green (3)	Pink (7)	Yellowish green (2)	Pink (5)
Oxides (wt.%)				
SiO ₂	36.85	36.89	36.81	36.80
TiO ₂	0.01	nd	0.02	0.02
B ₂ O ₃ calc.	11.07	11.08	11.13	11.08
Al ₂ O ₃	42.49	42.86	42.62	42.67
FeO	0.38	0.01	0.14	0.03
MnO	0.58	0.20	0.58	0.50
MgO	nd	nd	0.03	nd
CaO	0.57	0.06	0.51	0.80
PbO	nd	nd	nd	0.01
ZnO	0.02	0.02	0.07	0.02
Li ₂ O calc.	1.95	2.00	2.06	2.01
Na ₂ O	2.02	2.44	1.99	1.87
K ₂ O	0.03	0.03	0.02	0.02
H ₂ O calc.	3.42	3.40	3.39	3.37
F	0.85	0.89	0.95	0.95
Subtotal	100.23	99.88	100.30	100.16
-O=F	0.36	0.38	0.40	0.40
Total	99.87	99.50	99.90	99.75
Ions per 31 (O,OH,F)				
Si	5.782	5.786	5.750	5.769
Ti	0.001	nd	0.003	0.002
B	3.000	3.000	3.000	3.000
Al	7.857	7.924	7.846	7.886
Fe ²⁺	0.050	0.001	0.018	0.003
Mn	0.077	0.026	0.077	0.067
Mg	0.000	nd	0.003	0.001
Ca	0.095	0.010	0.084	nd
Pb	0.000	0.000	nd	0.000
Zn	0.002	0.002	0.008	0.002
Li	1.231	1.261	1.295	1.269
Na	0.614	0.741	0.604	0.569
K	0.006	0.007	0.003	0.005
H	3.577	3.558	3.530	3.528
F	0.423	0.442	0.469	0.472
X-site vacancy	0.285	0.242	0.308	0.291
Ca/Ca+Na	0.134	0.014	0.123	0.191

^a Cr, Bi, V, Mg, Cu, Ba, Pb and Cl were below or near the detection limits of the microprobe (i.e., 0.01–0.02 wt.% oxide). Abbreviation: nd = not detected.