Table S2.1. Average chemical composition and atoms per formula unit (a.p.f.u) for the different zones of Federico sample (Catri, Sant' Ilario in Campo, Elba Island, Italy) with the relative empirical formula.

	Prismatic section	**Termination**
	Z1	**Z2**
	n =5	*n* = 19
SiO_2 wt%	38.77(34)	35.99(35)
TiO_2	0.03(2)	0.03(2)
B_2O_3	11.30[a]	10.32[a]
Al_2O_3	43.09(59)	34.66(59)
FeO_{tot}	0.01(1)	13.33(57)
MnO	0.44(32)	0.25(5)
CaO	0.03(2)	0.14(8)
Na_2O	1.85(9)	1.59(21)
Li_2O	1.88[b]	0.21[b]
F	0.51(17)	0.35(23)
H_2O	3.51[a]	3.00[a]
–O ≡ F	–0.22	–0.14
FeO	0.01[c]	13.33[c]
Fe_2O_3	-	-
Total	101.25	99.81
Atoms normalized to 31 anions		
Si apfu	6.004	6.059
Ti	0.003	0.004
B	3.000	3.000
Al	7.780	6.877
Fe^{3+}	-	-
Fe^{2+}	0.001	1.877
Mn^{2+}	0.057	0.035
Ca	0.004	0.025
Na	0.551	0.519
Li	1.163	0.142
F	0.250	0.184
OH	3.650	3.371
OH+F	3.851	3.555
Species	**Elbaite**	**Schorl**

[a] Calculated by stoichiometry (see text)
[b] Estimated with the procedure of Pesquera et al. (2016)
[c] Determined by Mössbauer spectroscopy
Errors for oxides and fluorine are standard deviations (in brackets)

Empirical chemical formulae

Z1 $^{X}(Na_{0.55}\square_{0.45})_{\Sigma 1.00}{}^{Y}(Al_{1.78}Li_{1.16}Mn^{2+}{}_{0.06}Ti_{0.003})_{\Sigma 3.00}{}^{Z}Al_6(^{T}Si_6O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.65}F_{0.25}O_{0.10})_{\Sigma 1.00}$

Z2 $^{X}(Na_{0.52}\square_{0.45}Ca_{0.03})_{\Sigma 1.00}{}^{Y}(Al_{0.88}Li_{0.14}Fe^{2+}{}_{1.88}Mn^{2+}{}_{0.04}Ti_{0.004})_{\Sigma 2.94}{}^{Z}Al_6(^{T}Si_{6.06}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.37}F_{0.18}O_{0.45})_{\Sigma 1.00}$

Table S2.2. Average chemical composition and atoms per formula unit (a.p.f.u) for the different zones of Giganti Storti sample (San Piero in Campo, Elba Island, Italy) with the relative empirical formula.

	Analogous		**Prismatic section**			**Termination**
	Z1	**Z2**	**Z3**	**Z4**	**Z5**	**Z6**
	n = 1	*n* = 3	*n* = 6	*n* = 11	*n* = 10	n = 4
SiO_2 wt%	38.42	37.95(15)	38.58(23)	38.55(29)	38.71(26)	38.17(71)
TiO_2	0.04	0.21(1)	0.06(4)	0.03(2)	0.03(2)	0.07(2)
B_2O_3	10.98[a]	10.83[a]	11.04[a]	11.24[a]	11.22[a]	11.08[a]
Al_2O_3	38.79	37.44(13)	39.46(61)	42.81(47)	42.25(15)	41.36(76)
FeO_{tot}	0.27	0.36(7)	0.22(5)	0.03(3)	0.06(3)	0.21(5)
MnO	3.73	4.97(14)	3.07(51)	0.51(40)	0.26(11)	1.36(40)
CaO	0.15	0.45(14)	0.15(4)	0.17(7)	0.26(6)	0.04(3)
Na_2O	2.36	2.51(4)	2.29(8)	1.83(6)	1.87(6)	2.23(7)
Li_2O	1.77[b]	1.66[b]	1.83[b]	1.87[b]	1.99[b]	1.83[b]
F	1.44	1.44(24)	0.97(11)	0.86(24)	1.06(9)	0.57(10)
H_2O	3.04[a]	2.87[a]	3.27[a]	3.30[a]	3.23[a]	3.37[a]
Total	100.50	100.16	100.62	100.95	100.61	100.11
Atomic fractions normalized to 31 anions						
Si apfu	6.083	6.091	6.072	5.958	5.996	5.986
Ti	0.004	0.026	0.008	0.004	0.004	0.008
B	3.000	3.000	3.000	3.000	3.000	3.000
Al	7.238	7.083	7.320	7.800	7.713	7.644
Fe^{2+}	0.035	0.049	0.028	0.004	0.007	0.027
Mn^{2+}	0.501	0.675	0.410	0.067	0.035	0.180
Ca	0.026	0.077	0.025	0.029	0.043	0.008
Na	0.724	0.781	0.697	0.549	0.561	0.678
Li	1.127	1.072	1.158	1.163	1.240	1.154
F	0.719	0.731	0.484	0.419	0.521	0.282
OH	3.213	3.078	3.438	3.400	3.341	3.530
OH+F	3.932	3.808	3.922	3.819	3.862	3.812
Species	**Fluor-elbaite**	**Fluor-elbaite**	**Fluor-elbaite**	**Fluor-elbaite**	**Fluor-elbaite**	**Elbaite**

[a] Calculated by stoichiometry (see text)

[b] Estimated with the procedure of Pesquera et al. (2016)

Errors for oxides and fluorine are standard deviations (in brackets)

Empirical chemical formulae

Z1
$$^{X}(Na_{0.72}\square_{0.25}Ca_{0.03})_{\Sigma 1.00}\,^{Y}(Al_{1.24}Li_{1.13}Fe^{2+}_{0.04}Mn^{2+}_{0.50}Ti_{0.004})_{\Sigma 2.92}\,^{Z}Al_6(^{T}Si_{6.08}O_{18})(BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.21}F_{0.72}O_{0.07})_{\Sigma 1.00}$$

Z2
$$^{X}(Na_{0.78}\square_{0.14}Ca_{0.08})_{\Sigma 1.00}\,^{Y}(Al_{1.08}Li_{1.07}Fe^{2+}_{0.05}Mn^{2+}_{0.68}Ti_{0.03})_{\Sigma 2.91}\,^{Z}Al_6(^{T}Si_{6.09}O_{18})(BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.08}F_{0.73}O_{0.19})_{\Sigma 1.00}$$

Z3
$$^{X}(Na_{0.70}\square_{0.27}Ca_{0.03})_{\Sigma 1.00}\,^{Y}(Al_{1.32}Li_{1.16}Fe^{2+}_{0.03}Mn^{2+}_{0.41}Ti_{0.01})_{\Sigma 2.93}\,^{Z}Al_6(^{T}Si_{6.07}O_{18})(BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.44}F_{0.48}O_{0.08})_{\Sigma 1.00}$$

Z4
$$^{X}(Na_{0.55}\square_{0.42}Ca_{0.03})_{\Sigma 1.00}\,^{Y}(Al_{1.76}Li_{1.16}Mn^{2+}_{0.07}Ti_{0.004})_{\Sigma 3.00}\,^{Z}Al_6[^{T}(Si_{5.96}Al_{0.04})O_{18}](BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.40}F_{0.42}O_{0.18})_{\Sigma 1.00}$$

Z5
$$^{X}(Na_{0.56}\square_{0.40}Ca_{0.04})_{\Sigma 1.00}\,^{Y}(Al_{1.71}Li_{1.24}Fe^{2+}_{0.01}Mn^{2+}_{0.04}Ti_{0.004})_{\Sigma 3.00}\,^{Z}Al_6(^{T}Si_{6.00}O_{18})(BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.34}F_{0.52}O_{0.14})_{\Sigma 1.00}$$

Z6
$$^{X}(Na_{0.56}\square_{0.40}Ca_{0.04})_{\Sigma 1.00}\,^{Y}(Al_{1.63}Li_{1.15}Fe^{2+}_{0.03}Mn^{2+}_{0.18}Ti_{0.01})_{\Sigma 3.00}\,^{Z}Al_6[^{T}(Si_{5.99}Al_{0.01})O_{18}](BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.53}F_{0.28}O_{0.05})_{\Sigma 1.00}$$

Table S2.3. Average chemical composition and atoms per formula unit (a.p.f.u) for the different zones of Pastori sample (Catri, Sant'Ilario in Campo, Elba Island, Italy)

	Prismatic section									Termination	
	Z1	**Z2**	**Z3**	**Z4**	**Z5**	**Z6**	**Z7**	**Z8**	**Z9**	**Z10**	**Z11**
	n = 21	*n* = 1	*n* = 1	*n* = 1	*n* = 2	*n* = 2	*n* = 1	*n* = 1	*n* = 3	*n* = 3	*n* = 16
SiO_2 wt%	37.63(30)	37.45	37.13	35.92	37.68(29)	36.48(1)	37.37	37.49	38.20(15)	36.04(72)	36.85(32)
TiO_2	0.30(4)	0.22	0.26	0.35	0.26(1)	0.30(1)	0.26	0.25	0.25(2)	0.40(5)	0.29(13)
B_2O_3	10.83[a]	10.67[a]	10.57[a]	10.27[a]	10.71[a]	10.43[a]	10.69[a]	10.69[a]	10.89[a]	10.25[a]	10.55[a]
Al_2O_3	38.65(95)	36.78	35.87	33.87	36.55(32)	35.10(1)	37.23	36.30	38.10(52)	33.44(78)	33.30(66)
FeO_{tot}	1.59(88)	4.24	5.91	11.59	4.37(97)	8.29(18)	3.28	6.26	2.64(80)	11.50(87)	10.41(88)
MnO	2.07(37)	1.40	1.61	0.96	1.83(44)	1.09(12)	1.80	1.23	1.46(20)	0.65(5)	0.06(3)
ZnO	0.04(4)	-	0.06	0.12	0.10	0.19(11)	0.06	0.13	0.05(4)	0.06(2)	0.03(3)
MgO	-	0.03	-	-	-	-	-	0.11	0.01(1)	-	3.13(68)
CaO	0.51(7)	0.24	0.13	0.04	0.17(2)	0.09(3)	0.18	0.17	0.21(6)	0.07(3)	0.09(12)
Na_2O	2.01(10)	2.30	2.26	1.65	2.23(7)	2.04(1)	2.22	2.17	2.08(10)	1.64(15)	1.49(16)
Li_2O	1.73[b]	1.57[b]	1.31[b]	0.49[b]	1.53[b]	0.98[b]	1.61[b]	1.30[b]	1.78[b]	0.63[b]	0.33[b]
F	1.17(20)	1.59	1.24	1.05	1.38(10)	1.03(18)	1.17	1.01	0.83(7)	0.51(10)	0.29(12)
H_2O	3.04	2.83	2.94	2.85	2.99	2.96	3.07[a]	3.11[a]	3.36[a]	3.12[a]	3.50[a]
$-O \equiv F$	−0.49	−0.67	−0.52	−0.44	−0.58	−0.43	−0.49	−0.43	−0.35	−0.21	−0.12
FeO	1.59	4.24	5.91	11.59	4.37	8.29	3.28	6.26	2.64	11.09[c]	10.41
Fe_2O_3	-	-	-	-	-	-	-	-	-	0.41[c]	-
Total	99.15	98.66	98.76	98.72	99.23	98.55	98.45	99.80	99.52	98.10	100.33
Atomic fractions normalized to 31 anions											
Si apfu	6.038	6.102	6.115	6.097	6.116	6.080	6.078	6.098	6.099	6.112	6.068
Ti	0.036	0.027	0.032	0.044	0.031	0.037	0.031	0.030	0.030	0.051	0.036
B	3.000	3.000	3.000	3.000	3.000	3.000	2.990	3.000	3.000	3.000	3.000
Al	7.309	7.064	6.952	6.753	6.993	6.894	7.131	6.958	7.170	6.682	6.463
Fe^{3+}	-	-	-	-	-	-	-	-	-	0.052	-
Fe^{2+}	0.213	0.578	0.813	1.640	0.593	1.155	0.446	0.852	0.353	1.572	1.434
Mn^{2+}	0.282	0.193	0.224	0.138	0.251	0.154	0.248	0.169	0.198	0.093	0.008
Zn	0.004	-	0.007	0.015	0.012	0.023	0.007	0.016	0.006	0.008	0.000
Mg	-	0.007	-	-	-	-	-	0.027	0.002	-	0.768
Ca	0.087	0.042	0.023	0.007	0.030	0.016	0.031	0.029	0.036	0.012	0.016
Na	0.627	0.727	0.721	0.541	0.701	0.659	0.700	0.685	0.643	0.539	0.475
Li	1.116	1.029	0.867	0.333	0.999	0.657	1.053	0.850	1.143	0.429	0.219
F	0.594	0.817	0.645	0.562	0.710	0.543	0.602	0.522	0.420	0.274	0.150
OH	3.250	3.076	3.229	3.220	3.238	3.295	3.334	3.369	3.578	3.529	3.844
OH+F	3.844	3.893	3.874	3.782	3.948	3.838	3.936	3.891	3.998	3.803	3.994
Species	**Fluor-elbaite**	**Fluor-elbaite**	**Fluor-elbaite**	**Fluor-schorl**	**Fluor-elbaite**	**Fluor-elbaite**	**Fluor-elbaite**	**Fluor-elbaite**	**Elbaite**	**Schorl**	**Foitite**

[a] Calculated by stoichiometry (see text);
[b] Estimated with the procedure of Pesquera et al. (2016);
[c] Determined by Mössbauer spectroscopy
Errors for oxides and fluorine are standard deviations (in brackets)

Empirical chemical formulae

Z1 $^{X}(Na_{0.63}\square_{0.28}Ca_{0.09})_{\Sigma1.00}{}^{Y}(Al_{1.31}Li_{1.12}Fe^{2+}_{0.21}Mn^{2+}_{0.28}Ti_{0.04})_{\Sigma2.96}{}^{Z}Al_6(^{T}Si_{6.04}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.25}F_{0.59}O_{0.16})_{\Sigma1.00}$

Z2 $^{X}(Na_{0.73}\square_{0.23}Ca_{0.04})_{\Sigma1.00}{}^{Y}(Al_{1.06}Li_{1.03}Fe^{2+}_{0.58}Mg_{0.01}Mn^{2+}_{0.19}Ti_{0.03})_{\Sigma2.90}{}^{Z}Al_6(^{T}Si_{6.10}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.08}F_{0.82}O_{0.10})_{\Sigma1.00}$

Z3 $^{X}(Na_{0.72}\square_{0.26}Ca_{0.02})_{\Sigma1.00}{}^{Y}(Al_{0.95}Li_{0.87}Fe^{2+}_{0.81}Mn^{2+}_{0.22}Ti_{0.03})_{\Sigma2.88}{}^{Z}Al_6(^{T}Si_{6.12}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.23}F_{0.65}O_{0.12})_{\Sigma1.00}$

Z4 $^{X}(Na_{0.54}\square_{0.45}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{0.75}Li_{0.33}Fe^{2+}_{1.64}Mn^{2+}_{0.14}Ti_{0.04})_{\Sigma2.90}{}^{Z}Al_6(^{T}Si_{6.10}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.20}F_{0.56}O_{0.24})_{\Sigma1.00}$

Z5 $^{X}(Na_{0.70}\square_{0.27}Ca_{0.03})_{\Sigma1.00}{}^{Y}(Al_{0.99}Li_{1.00}Fe^{2+}_{0.59}Mn^{2+}_{0.25}Ti_{0.03})_{\Sigma2.88}{}^{Z}Al_6(^{T}Si_{6.12}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.24}F_{0.71}O_{0.05})_{\Sigma1.00}$

Z6 $^{X}(Na_{0.66}\square_{0.32}Ca_{0.02})_{\Sigma1.00}{}^{Y}(Al_{0.89}Li_{0.66}Fe^{2+}_{1.15}Mn^{2+}_{0.15}Ti_{0.03})_{\Sigma2.92}{}^{Z}Al_6(^{T}Si_{6.08}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.30}F_{0.54}O_{0.16})_{\Sigma1.00}$

Z7 $^{X}(Na_{0.70}\square_{0.27}Ca_{0.03})_{\Sigma1.00}{}^{Y}(Al_{1.31}Li_{1.05}Fe^{2+}_{0.45}Mn^{2+}_{0.25}Ti_{0.03})_{\Sigma2.92}{}^{Z}Al_6(^{T}Si_{6.08}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.33}F_{0.60}O_{0.07})_{\Sigma1.00}$

Z8 $^{X}(Na_{0.69}\square_{0.28}Ca_{0.03})_{\Sigma1.00}{}^{Y}(Al_{0.96}Li_{0.85}Fe^{2+}_{0.85}Mn^{2+}_{0.17}Ti_{0.03})_{\Sigma2.90}{}^{Z}Al_6(^{T}Si_{6.10}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.37}F_{0.52}O_{0.11})_{\Sigma1.00}$

Z9 $^{X}(Na_{0.64}\square_{0.32}Ca_{0.04})_{\Sigma1.00}{}^{Y}(Al_{1.17}Li_{1.14}Fe^{2+}_{0.35}Mn^{2+}_{0.20}Ti_{0.03})_{\Sigma2.90}{}^{Z}Al_6(^{T}Si_{6.10}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.58}F_{0.42})_{\Sigma1.00}$

Z10 $^{X}(Na_{0.54}\square_{0.45}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{0.68}Li_{0.43}Fe^{2+}_{1.57}Fe^{3+}_{0.05}Mn^{2+}_{0.09}Ti_{0.05})_{\Sigma2.89}{}^{Z}Al_6(^{T}Si_{6.11}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.53}F_{0.27}O_{0.20})_{\Sigma1.00}$

Z11 $^{X}(Na_{0.48}\square_{0.50}Ca_{0.02})_{\Sigma1.00}{}^{Y}(Al_{0.46}Li_{0.22}Fe^{2+}_{1.43}Mn^{2+}_{0.01}Mg_{0.77}Ti_{0.04})_{\Sigma2.93}{}^{Z}Al_6(^{T}Si_{6.07}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.84}F_{0.15}O_{0.01})_{\Sigma1.00}$

Table S2.4. Average chemical composition and atoms per formula unit (a.p.f.u) for the different zones of Rosina 2 sample (San Piero in Campo, Elba Island, Italy) with the relative empirical formula.

	Prismatic section		**Termination**					
	Z1	**Z2**	**Z3**	**Z4**	**Z5**	**Z6**	**Z7**	**Z8**
	n = 17	*n* = 1	*n* = 5	*n* = 1	*n* = 1	*n* = 1	*n* = 1	*n* = 2
SiO_2 wt%	37.65(32)	36.91	36.43(30)	37.77	36.98	37.62	37.09	37.48(4)
TiO_2	0.12(3)	0.24	0.13(3)	0.09	0.05	0.06	0.09	0.05(1)
B_2O_3	11.04[a]	10.76[a]	10.61[a]	10.95[a]	10.74[a]	10.89[a]	10.68[a]	10.83[a]
Al_2O_3	41.30(35)	38.46	35.96(40)	38.46	38.47	39.03	35.78	37.02(49)
FeO_{tot}	0.09(10)	1.50	1.83(81)	0.59	0.41	0.63	2.36	1.39(8)
MnO	3.54(22)	5.48	11.55(40)	8.49	5.51	4.87	9.85	9.69(35)
MgO	-	0.02	0.02(1)	0.01	-	0.05	0.03	0.05(1)
CaO	0.06(3)	0.07	0.01(1)	0.03	0.01	0.02	-	-
Na_2O	1.87(7)	2.25	1.33(3)	1.56	1.48	1.49	1.33	1.19(13)
K_2O	0.01(1)	0.00	0.01(1)	0.03	0.00	0.04	0.01	0.02(2)
Li_2O [b]	1.44[b]	1.12[b]	0.33[b]	0.91[b]	1.32[b]	1.40[b]	0.61[b]	0.71[b]
F	0.63(16)	1.07	0.32(10)	0.32	0.18	0.12	0.18	0.10(14)
H_2O	3.28[a]	2.92[a]	3.39[a]	3.51[a]	3.68[a]	3.75[a]	3.59[a]	3.71[a]
–O ≡ F	–0.27	–0.45	–0.13	–0.13	–0.07	–0.05	–0.08	–0.04
FeO	0.09	-	1.83	0.59	0.41	0.63	2.27[c]	1.39
Fe_2O_3	-	-	-	-	-	-	0.09[c]	-
Total	100.80	100.35	101.82	102.60	98.77	99.97	101.56	102.23
Atoms normalized to 31 anions								
Si apfu	5.927	5.963	5.976	5.994	5.986	6.001	6.038	6.016
Ti	0.014	0.029	0.016	0.011	0.006	0.007	0.011	0.006
B	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Al	7.663	7.322	6.942	7.193	7.338	7.339	6.864	7.003
Fe^{3+}	-	-	-	-	-	-	0.012	-
Fe^{2+}	0.012	0.203	0.251	0.078	0.055	0.084	0.309	0.187
Mn^{2+}	0.472	0.750	1.602	1.141	0.755	0.658	1.358	1.317
Mg	0.000	0.000	0.005	0.002	0.000	0.012	0.007	0.012
Ca	0.010	0.012	0.002	0.005	0.002	0.007	0.000	0.001
Na	0.572	0.704	0.422	0.480	0.407	0.459	0.419	0.369
K	0.002	0.000	0.002	0.005	0.000	0.008	0.001	0.003
Li	0.912	0.728	0.217	0.581	0.859	0.898	0.399	0.458
F	0.316	0.545	0.167	0.161	0.092	0.062	0.093	0.058
OH	3.449	3.144	3.704	3.714	3.975	3.985	3.900	3.975
OH+F	3.765	3.689	3.871	3.875	4.067	4.048	3.992	4.026
Species	**Elbaite**	**Fluor-elbaite**	**Celleriite**	**Celleriite**	**Rossmanite**	**Rossmanite**	**Celleriite**	**Celleriite**

[a] Calculated by stoichiometry (see text);
[b] Estimated with the procedure of Pesquera et al. (2016);
[c] Determined by Mössbauer spectroscopy
Errors for oxides and fluorine are standard deviations (in brackets)

Empirical chemical formulae

Z1 $^{X}(Na_{0.57}\square_{0.42}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{1.59}Li_{0.91}Fe^{2+}_{0.01}Mn^{2+}_{0.47}Ti_{0.01})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.93}Al_{0.07})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.45}F_{0.32}O_{0.23})_{\Sigma1.00}$

Z2 $^{X}(Na_{0.70}\square_{0.29}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{1.28}Li_{0.73}Fe^{2+}_{0.20}Mn^{2+}_{0.75}Ti_{0.03})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.96}Al_{0.04})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.14}F_{0.54}O_{0.32})_{\Sigma1.00}$

Z3 $^{X}(Na_{0.42}\square_{0.58})_{\Sigma1.00}{}^{Y}(Al_{0.92}Li_{0.22}Fe^{2+}_{0.25}Mn^{2+}_{1.60}Ti_{0.02})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.98}Al_{0.02})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.70}F_{0.17}O_{0.13})_{\Sigma1.00}$

Z4 $^{X}(Na_{0.48}\square_{0.51}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{1.18}Li_{0.58}Fe^{2+}_{0.08}Mn^{2+}_{1.14}Ti_{0.01})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.99}Al_{0.01})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.71}F_{0.16}O_{0.13})_{\Sigma1.00}$

Z5 $^{X}(Na_{0.41}\square_{0.59})_{\Sigma1.00}{}^{Y}(Al_{1.33}Li_{0.86}Fe^{2+}_{0.06}Mn^{2+}_{0.76}Ti_{0.01})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.99}Al_{0.01})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.97}F_{0.03})_{\Sigma1.00}$

Z6 $^{X}(Na_{0.46}\square_{0.53}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{1.34}Li_{0.90}Fe^{2+}_{0.08}Mn^{2+}_{0.66}Ti_{0.01})_{\Sigma3.00}{}^{Z}Al_6({}^{T}Si_{6.00}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.98}F_{0.02})_{\Sigma1.00}$

Z7 $^{X}(Na_{0.42}\square_{0.58})_{\Sigma1.00}{}^{Y}(Al_{0.86}Li_{0.40}Fe^{2+}_{0.31}Mn^{2+}_{1.36}Ti_{0.01})_{\Sigma2.96}{}^{Z}Al_6({}^{T}Si_{6.04}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.90}F_{0.09}O_{0.01})_{\Sigma1.00}$

Z8 $^{X}(Na_{0.37}\square_{0.63})_{\Sigma1.00}{}^{Y}(Al_{1.00}Li_{0.46}Fe^{2+}_{0.19}Mn^{2+}_{1.32}Ti_{0.01})_{\Sigma2.98}{}^{Z}Al_6({}^{T}Si_{6.02}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.98}F_{0.02})_{\Sigma1.00}$

Table S2.5. Average chemical composition and atoms per formula unit (a.p.f.u) for the different zones of San Silvestro sample (San Piero in Campo, Elba Island, Italy) with the relative empirical formula.

	Prismatic section				Termination				
	Z1	**Z2**	**Z3**	**Z4**	**Z5**	**Z6**	**Z7**	**Z8**	**Z9**
	n = 6	*n* = 23	*n* = 3	*n* = 1	*n* = 1	*n* = 1	*n* = 1	*n* = 1	*n* = 2
SiO_2 wt%	37.88(31)	37.22(48)	38.11(9)	37.54	36.48	36.83	37.58	37.08	36.46(22)
TiO_2	0.05(3)	0.14(6)	0.05(2)	0.07	0.07	0.09	0.04	0.09	0.11(2)
B_2O_3	11.06[a]	10.86[a]	11.09[a]	10.88[a]	10.57[a]	10.63[a]	10.69[a]	10.79[a]	10.63[a]
Al_2O_3	41.45(90)	39.96(98)	41.59(17)	39.23	35.76	35.96	35.20	37.84	35.92(33)
FeO_{tot}	0.17(19)	0.85(38)	0.24(13)	1.08	4.04	5.27	7.08	2.98	4.94(98)
MnO	2.44(51)	2.93(86)	1.30(64)	4.43	8.91	6.69	5.44	6.30	7.25(70)
MgO	0.01(1)	0.01	0.01(1)	-	0.06	0.11	0.11	0.18	0.44(18)
CaO	0.06(2)	0.13(8)	0.04(2)	0.06	0.02	0.03	0.02	0.12	0.04(2)
Na_2O	1.89(9)	1.99(24)	1.98(8)	1.89	1.03	1.30	1.06	1.47	1.23(8)
K_2O	0.02(2)	0.03(2)	0.01	0.01	0.00	0.03	0.02	0.02	0.03
Li_2O	1.61[b]	1.51[b]	1.80[b]	1.35[b]	0.39[b]	0.55[b]	0.61[b]	0.82[b]	0.48[b]
F	0.73(15)	0.62(22)	0.22(15)	0.29	0.03	0.00	0.20	0.23	0.10(3)
H_2O	3.29[a]	3.27[a]	3.60[a]	3.47[a]	3.62[a]	3.61[a]	3.62[a]	3.50[a]	3.64[a]
–O ≡ F	–0.31	–0.26	–0.09	–0.12	–0.01	-	–0.08	–0.10	–0.04
FeO	0.17	0.85	0.24	1.08	4.04	5.27	6.72[c]	2.98	4.94
Fe_2O_3	-	-	-	-	-	-	0.35[c]	-	-
Total	100.40	99.28	99.97	100.23	100.99	101.08	101.57	101.33	101.26
Atoms normalized to 31 anions									
Si apfu	5.952	5.958	5.972	5.996	5.996	6.023	6.113	5.972	5.962
Ti	0.006	0.017	0.006	0.008	0.009	0.011	0.005	0.011	0.013
B	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Al	7.674	7.538	7.681	7.385	6.927	6.932	6.749	7.182	6.922
Fe^{3+}	-	-	-	-	-	-	0.043	-	-
Fe^{2+}	0.023	0.114	0.031	0.145	0.555	0.720	0.915	0.401	0.676
Mn^{2+}	0.325	0.398	0.173	0.599	1.241	0.927	0.749	0.860	1.003
Mg	0.001	0.001	0.001	-	0.015	0.027	0.027	0.043	0.107
Ca	0.009	0.022	0.007	0.011	0.004	0.005	0.003	0.021	0.007
Na	0.575	0.619	0.602	0.585	0.329	0.362	0.335	0.458	0.391
K	0.005	0.005	0.002	0.001	0.000	0.006	0.003	0.005	0.005
Li	1.017	0.972	1.135	0.867	0.258	0.362	0.399	0.531	0.316
F	0.362	0.313	0.109	0.147	0.016	0.000	0.102	0.119	0.050
OH	3.452	3.496	3.764	3.699	3.965	3.938	3.952	3.760	3.974
OH+F	3.814	3.809	3.873	3.846	3.980	3.938	4.027	3.879	4.024
Species	**Elbaite**	**Elbaite**	**Elbaite**	**Elbaite**	**Celleriite**	**Celleriite**	**Foitite**	**Celleriite**	**Celleriite**

[a] Calculated by stoichiometry (see text);
[b] Estimated with the procedure of Pesquera et al. (2016);
[c] Determined by Mössbauer spectroscopy.
Errors for oxides and fluorine are standard deviations (in brackets)

Empirical chemical formulae

Z1 $^{X}(Na_{0.58}\square_{0.41}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{1.62}Li_{1.02}Fe^{2+}_{0.02}Mn^{2+}_{0.32}Ti_{0.01})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.95}Al_{0.05})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.45}F_{0.36}O_{0.19})_{\Sigma1.00}$

Z2 $^{X}(Na_{0.62}\square_{0.36}Ca_{0.02})_{\Sigma1.00}{}^{Y}(Al_{1.50}Li_{0.97}Fe^{2+}_{0.11}Mn^{2+}_{0.40}Ti_{0.02})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.96}Al_{0.04})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.50}F_{0.31}O_{0.19})_{\Sigma1.00}$

Z3 $^{X}(Na_{0.60}\square_{0.39}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{1.65}Li_{1.14}Fe^{2+}_{0.31}Mn^{2+}_{0.17}Ti_{0.01})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.97}Al_{0.03})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.76}F_{0.11}O_{0.13})_{\Sigma1.00}$

Z4 $^{X}(Na_{0.59}\square_{0.40}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{1.65}Li_{1.14}Fe^{2+}_{0.31}Mn^{2+}_{0.17}Ti_{0.01})_{\Sigma3.00}{}^{Z}Al_6({}^{T}Si_{6.00}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.70}F_{0.15}O_{0.15})_{\Sigma1.00}$

Z5 $^{X}(Na_{0.33}\square_{0.67})_{\Sigma1.00}{}^{Y}(Al_{0.93}Li_{0.26}Fe^{2+}_{0.56}Mn^{2+}_{1.24}Ti_{0.01})_{\Sigma3.00}{}^{Z}Al_6({}^{T}Si_{6.00}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.97}F_{0.02}O_{0.01})_{\Sigma1.00}$

Z6 $^{X}(Na_{0.36}\square_{0.64})_{\Sigma1.00}{}^{Y}(Al_{0.93}Li_{0.36}Fe^{2+}_{0.72}Mn^{2+}_{0.93}Ti_{0.01})_{\Sigma2.98}{}^{Z}Al_6({}^{T}Si_{6.02}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.94}O_{0.06})_{\Sigma1.00}$

Z7 $^{X}(Na_{0.34}\square_{0.66})_{\Sigma1.00}{}^{Y}(Al_{0.75}Li_{0.40}Fe^{2+}_{0.92}Fe^{3+}_{0.04}Mn^{2+}_{0.75}Ti_{0.01})_{\Sigma2.89}{}^{Z}Al_6({}^{T}Si_{6.11}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.95}F_{0.05})_{\Sigma1.00}$

Z8 $^{X}(Na_{0.46}\square_{0.52}Ca_{0.02})_{\Sigma1.00}{}^{Y}(Al_{1.15}Li_{0.53}Fe^{2+}_{0.40}Mn^{2+}_{0.86}Ti_{0.01})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.97}Al_{0.03})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.76}F_{0.12}O_{0.12})_{\Sigma1.00}$

Z9 $^{X}(Na_{0.39}\square_{0.60}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{0.88}Li_{0.32}Fe^{2+}_{0.68}Mn^{2+}_{1.00}Ti_{0.01})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.96}Al_{0.04})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.97}F_{0.03})_{\Sigma1.00}$

Table S2.6. Average chemical composition and atoms per formula unit (a.p.f.u) for the different zones of Testa Rossa sample (San Piero in Campo, Elba Island, Italy) with the relative empirical formula.

	Prismatic section	**Termination**		
	Z1	**Z2**	**Z3**	**Z4**
	n = 11	*n* = 6	*n* = 1	*n* = 2
SiO_2 wt%	39.35(52)	38.97(36)	35.65	38.03(31)
TiO_2	-	0.03(3)	0.01	-
B_2O_3	11.40[a]	11.26[a]	10.63[a]	11.10[a]
Al_2O_3	43.22(29)	41.59(45)	40.92	42.13(20)
FeO_{tot}	0.03(2)	0.08(9)	0.02	0.06(2)
MnO	0.06(3)	1.64(91)	2.66	0.78(10)
ZnO	-	0.06(4)	-	-
MgO	-	0.05(10)	-	0.01
CaO	0.01(1)	0.01(3)	0.01	0.01
Na_2O	1.89(9)	2.21(4)	2.26	2.30(1)
Li_2O	1.99[b]	1.88[b]	1.39[b]	1.84[b]
F	0.20(8)	0.20(9)	0.28	0.21(11)
–O ≡ F	–0.08	–0.08	–0.12	–0.09
H_2O	3.74[a]	3.68[a]	3.22[a]	3.52[a]
Total	101.78	101.58	96.88	99.92
Atoms normalized to 31 anions				
Si apfu	6.000	6.017	5.830	5.955
Ti	-	0.003	0.001	-
B	3.000	3.000	3.000	3.000
Al	7.767	7.569	7.887	7.775
Fe^{2+}	0.004	0.010	0.003	0.008
Mn^{2+}	0.008	0.214	0.369	0.103
Zn	-	0.007	-	-
Mg	-	0.012	-	0.001
Ca	0.001	0.001	0.001	0.001
Na	0.558	0.661	0.715	0.697
Li	1.221	1.168	0.914	1.159
F	0.095	0.096	0.143	0.102
OH	3.801	3.792	3.509	3.673
OH+F	3.895	3.888	3.652	3.775
Species	**Elbaite**	**Elbaite**	**Elbaite**	**Elbaite**

[a] Calculated by stoichiometry (see text)
[b] Estimated with the procedure of Pesquera et al. (2016)
Errors for oxides and fluorine are standard deviations (in brackets)

Empirical chemical formulae

Z1
$$^{X}(Na_{0.56}\square_{0.44})_{\Sigma 1.00}\,^{Y}(Al_{1.77}Li_{1.22}\,Mn^{2+}_{0.01})_{\Sigma 3.00}\,^{Z}Al_6(^{T}Si_{6.00}O_{18})(BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.80}F_{0.10}O_{0.10})_{\Sigma 1.00}$$

Z2
$$^{X}(Na_{0.66}\square_{0.34})_{\Sigma 1.00}\,^{Y}(Al_{1.57}Li_{1.17}\,Fe^{2+}_{0.01}Mn^{2+}_{0.21})_{\Sigma 2.98}\,^{Z}Al_6(^{T}Si_{6.02}O_{18})(BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.79}F_{0.10}O_{0.11})_{\Sigma 1.00}$$

Z3
$$^{X}(Na_{0.72}\square_{0.28})_{\Sigma 1.00}\,^{Y}(Al_{1.72}Li_{0.91}Mn^{2+}_{0.37})_{\Sigma 3.00}\,^{Z}Al_6[^{T}(Si_{5.83}Al_{0.17}O_{18})(BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.51}F_{0.14}O_{0.35})_{\Sigma 1.00}$$

Z4
$$^{X}(Na_{0.70}\square_{0.30})_{\Sigma 1.00}\,^{Y}(Al_{1.72}Li_{1.16}\,Fe^{2+}_{0.01}Mn^{2+}_{0.10})_{\Sigma 3.00}\,^{Z}Al_6[^{T}(Si_{5.96}Al_{0.04}O_{18})(BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.67}F_{0.10}O_{0.23})_{\Sigma 1.00}$$

Table S2.7. Average chemical composition and atoms per formula unit (a.p.f.u) for the different zones of Testa Scura sample (San Piero in Campo, Elba Island, Italy) with the relative empirical formula.

	Prismatic section			**Termination**					
	Z1	**Z2**	**Z3**	**Z4**	**Z5**	**Z6**	**Z7**	**Z8**	**Z9**
	n = 10	*n* = 2	*n* = 1	*n* = 7	*n* = 3	*n* = 2	*n* = 1	*n* = 3	n = 1
SiO_2 wt%	37.89(54)	37.53(5)	36.95	36.80(11)	37.58(25)	37.10(23)	37.51	36.99(27)	36.29
TiO_2	0.15(3)	0.26(1)	0.24	0.13(3)	0.0682)	0.10(1)	0.04	0.03(1)	0.07
B_2O_3	11.05[a]	10.82[a]	10.67[a]	10.69[a]	10.88[a]	10.76[a]	10.96[a]	10.76[a]	10.63[a]
Al_2O_3	40.83(79)	37.50(32)	36.16	36.19(23)	38.84(56)	36.90(72)	39.06	37.14(66)	35.95
FeO_{tot}	0.28(31)	2.35(42)	3.41	2.08(83)	0.72(14)	2.27(48)	0.98	1.62(74)	2.30
MnO	3.65(82)	6.04(73)	8.02	11.08(68)	6.80(78)	9.20(20)	8.49	10.01(10)	11.12
ZnO	0.02(4)	0.06(4)	-	0.05(5)	0.07(5)	0.05(2)	-	-	0.13
MgO	-	0.01(1)	0.01	0.03(1)	0.03(1)	0.07(2)	0.03	0.07(3)	0.30
CaO	0.08(2)	0.08(1)	0.05	0.02(1)	0.01(1)	0.03(3)	-	-	-
Na_2O	1.89(11)	2.13(6)	1.93	1.32(6)	1.06(88)	1.30(5)	1.17	1.10(7)	1.31
K_2O	-	0.01(1)	0.02	0.02(1)	0.02(1)	0.03(1)	0.03	0.02	0.00
Li_2O	1.47[b]	1.08[b]	0.66[b]	0.38[b]	1.01[b]	0.60[b]	0.73[b]	0.54[b]	0.29[b]
F	0.76(32)	1.16(13)	0.72	0.34(14)	0.22(4)	0.10(1)	0.00	0.03(3)	0.00
$-O \equiv F$	–0.32	–0.49	–0.30	–0.14	–0.09	–0.04	–0.00	–0.01	–0.00
H_2O	3.26[a]	2.99[a]	3.11[a]	3.43[a]	3.76[a]	3.61[a]	3.66[a]	3.68[a]	3.63[a]
Total	100.99	101.51	101.65	102.39	100.82	102.07	102.68	102.00	102.05
Atoms normalized to 31 anions									
Si apfu	5.960	6.028	6.021	5.982	6.003	5.990	5.950	5.973	5.932
Ti	0.018	0.031	0.030	0.016	0.008	0.012	0.005	0.004	0.008
B	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Al	7.569	7.099	6.944	6.933	7.310	7.022	7.302	7.067	6.926
Fe^{2+}	0.036	0.316	0.465	0.282	0.096	0.307	0.130	0.219	0.314
Mn^{2+}	0.486	0.821	1.107	1.525	0.919	1.258	1.140	1.369	1.540
Zn	0.002	0.007	-	0.006	0.008	0.006	-	-	0.016
Mg	-	0.001	0.000	0.007	0.007	0.017	0.007	0.017	0.073
Ca	0.014	0.014	0.009	0.000	0.000	0.005	-	-	-
Na	0.577	0.665	0.609	0.415	0.329	0.408	0.360	0.344	0.415
K	0.000	0.001	0.003	0.003	0.000	0.005	0.005	0.002	-
Li	0.930	0.698	0.433	0.248	0.649	0.390	0.466	0.351	0.191
F	0.376	0.590	0.370	0.175	0.110	0.051	0.000	0.017	-
OH	3.423	3.198	3.377	3.722	3.879	3.890	3.878	3.959	3.963
OH+F	3.799	3.788	3.747	3.897	3.989	3.941	3.878	3.976	3.963
Species	**Elbaite**	**Fluor-elbaite**	**Tsilaisite**	**Celleriite**	**Rossmanite**	**Celleriite**	**Celleriite**	**Celleriite**	**Celleriite**

[a] Calculated by stoichiometry (see text);
[b] Estimated with the procedure of Pesquera et al. (2016)
Errors for oxides and fluorine are standard deviations (in brackets)

Empirical chemical formulae

Z1 $^{X}(Na_{0.58}\square_{0.41}Ca_{0.01})_{\Sigma 1.00}{}^{Y}(Al_{1.53}Li_{0.93}Mn^{2+}_{0.49}Fe^{2+}_{0.04}Ti_{0.02})_{\Sigma 3.00}{}^{Z}Al_6[{}^{T}(Si_{5.96}Al_{0.04}O_{18})](BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.42}F_{0.38}O_{0.20})_{\Sigma 1.00}$

Z2 $^{X}(Na_{0.67}\square_{0.32}Ca_{0.01})_{\Sigma 1.00}{}^{Y}(Al_{1.10}Li_{0.70}Mn^{2+}_{0.82}Fe^{2+}_{0.32}Ti_{0.03})_{\Sigma 2.97}{}^{Z}Al_6{}^{T}(Si_{6.03}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.20}F_{0.59}O_{0.21})_{\Sigma 1.00}$

Z3 $^{X}(Na_{0.61}\square_{0.38}Ca_{0.01})_{\Sigma 1.00}{}^{Y}(Al_{0.94}Li_{0.43}Mn^{2+}_{1.11}Fe^{2+}_{0.47}Ti_{0.03})_{\Sigma 2.98}{}^{Z}Al_6{}^{T}(Si_{6.02}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.38}F_{0.59}O_{0.03})_{\Sigma 1.00}$

Z4 $^{X}(Na_{0.42}\square_{0.58})_{\Sigma 1.00}{}^{Y}(Al_{0.91}Li_{0.25}Mn^{2+}_{1.53}Fe^{2+}_{0.28}Ti_{0.02})_{\Sigma 3.00}{}^{Z}Al_6[{}^{T}(Si_{5.98}Al_{0.02}O_{18})](BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.72}F_{0.18}O_{0.10})_{\Sigma 1.00}$

Z5 $^{X}(Na_{0.33}\square_{0.67})_{\Sigma 1.00}{}^{Y}(Al_{1.31}Li_{0.65}Mn^{2+}_{0.92}Fe^{2+}_{0.10}Ti_{0.01})_{\Sigma 3.00}{}^{Z}Al_6{}^{T}(Si_{6.00}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.88}F_{0.11}O_{0.01})_{\Sigma 1.00}$

Z6 $^{X}(Na_{0.41}\square_{0.59})_{\Sigma 1.00}{}^{Y}(Al_{1.01}Li_{0.39}Mn^{2+}_{1.26}Fe^{2+}_{0.31}Ti_{0.01})_{\Sigma 3.00}{}^{Z}Al_6[{}^{T}(Si_{5.99}Al_{0.01}O_{18})](BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.89}F_{0.05}O_{0.06})_{\Sigma 1.00}$

Z7 $^{X}(Na_{0.36}\square_{0.64})_{\Sigma 1.00}{}^{Y}(Al_{1.25}Li_{0.47}Mn^{2+}_{1.14}Fe^{2+}_{0.13}Ti_{0.01})_{\Sigma 3.00}{}^{Z}Al_6[{}^{T}(Si_{5.95}Al_{0.05}O_{18})](BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.88}O_{0.12})_{\Sigma 1.00}$

Z8 $^{X}(Na_{0.34}\square_{0.66})_{\Sigma 1.00}{}^{Y}(Al_{1.05}Li_{0.35}Mn^{2+}_{1.38}Fe^{2+}_{0.22})_{\Sigma 3.00}{}^{Z}Al_6[{}^{T}(Si_{5.97}Al_{0.03}O_{18})](BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.96}F_{0.02}O_{0.02})_{\Sigma 1.00}$

Z9 $^{X}(Na_{0.41}\square_{0.59})_{\Sigma 1.00}{}^{Y}(Al_{0.86}Li_{0.19}Mn^{2+}_{1.54}Fe^{2+}_{0.31}Ti_{0.01})_{\Sigma 3.00}{}^{Z}Al_6[{}^{T}(Si_{5.93}Al_{0.07}O_{18})](BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.96}O_{0.04})_{\Sigma 1.00}$

Table S2.8. Average chemical composition and atoms per formula unit (a.p.f.u) for the different zones of Testa Viola sample (San Piero in Campo, Elba Island, Italy) with the relative empirical formula.

	Prismatic section			Termination	
	Z1	**Z2**	**Z3**	**Z4**	**Z5**
	n = 4	*n* = 1	*n* = 1	*n* = 4	*n* = 12
SiO_2 wt%	38.08(91)	39.46	37.01	38.78(29)	37.80(40)
TiO_2	0.02(2)	0.02	-	0.03(1)	0.04(2)
B_2O_3	11.11[a]	11.40[a]	10.94[a]	11.16[a]	10.99[a]
Al_2O_3	42.42(72)	42.97	42.55	40.83(55)	40.39(92)
FeO_{tot}	0.04(3)	0.01	0.04	0.32(13)	0.52(28)
MnO	0.10(10)	0.04	0.03	1.87(76)	3.28(87)
ZnO	0.01(1)	0.03	0.01	0.05	0.04(4)
CaO	0.12(13)	0.02	0.01	0.01(1)	0.03(2)
Na_2O	1.96(6)	2.07	2.07	2.24(3)	2.21(12)
Li_2O	1.92[b]	2.04[b]	1.78[b]	1.86[b]	1.53[b]
F	0.43(32)	0.22	0.12	0.13(7)	0.20(12)
$-O \equiv F$	–0.18	–0.09	–0.05	–0.05	–0.08
H_2O	3.47[a]	3.69[a]	3.48[a]	3.69[a]	3.49[a]
Total	99.52	101.86	98.01	100.93	100.44
Atoms normalized to 31 anions					
Si apfu	5.956	6.018	5.882	6.041	5.980
Ti	0.002	0.002	-	0.003	0.005
B	3.000	3.000	3.000	3.000	3.000
Al	7.818	7.723	7.970	7.497	7.530
Fe^{2+}	0.005	0.001	0.006	0.042	0.069
Mn^{2+}	0.013	0.005	0.004	0.246	0.439
Zn	0.002	0.003	0.001	0.005	0.004
Ca	0.020	0.003	0.001	-	0.006
Na	0.594	0.612	0.639	0.677	0.677
Li	1.208	1.251	1.138	1.165	0.973
F	0.210	0.104	0.061	0.062	0.100
OH	3.622	3.759	3.695	3.834	3.687
OH+F	3.832	3.863	3.755	3.895	3.787
Species	**Elbaite**	**Elbaite**	**Elbaite**	**Elbaite**	**Elbaite**

[a] Calculated by stoichiometry (see text)
[b] Estimated with the procedure of Pesquera et al. (2016)
Errors for oxides and fluorine are standard deviations (in brackets)

Empirical chemical formulae

Z1
$$^{X}(Na_{0.59}\square_{0.39}Ca_{0.02})_{\Sigma 1.00}\,^{Y}(Al_{1.78}Li_{1.21}Mn^{2+}_{0.01})_{\Sigma 3.00}\,^{Z}Al_6[T(Si_{5.96}Al_{0.04}O_{18})](BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.62}F_{0.21}O_{0.27})_{\Sigma 1.00}$$

Z2
$$^{X}(Na_{0.61}\square_{0.39})_{\Sigma 1.00}\,^{Y}(Al_{1.72}Li_{1.25}Mn^{2+}_{0.01})_{\Sigma 2.98}\,^{Z}Al_6(^{T}Si_{6.02}O_{18})(BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.76}F_{0.10}O_{0.14})_{\Sigma 1.00}$$

Z3
$$^{X}(Na_{0.64}\square_{0.36})_{\Sigma 1.00}\,^{Y}(Al_{1.85}Li_{1.14}Fe^{2+}_{0.01})_{\Sigma 3.00}\,^{Z}Al_6[^{T}(Si_{5.88}Al_{0.12}O_{18})(BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.70}F_{0.07}O_{0.23})_{\Sigma 1.00}$$

Z4
$$^{X}(Na_{0.68}\square_{0.32})_{\Sigma 1.00}\,^{Y}(Al_{1.50}Li_{1.17}Fe^{2+}_{0.04}Mn^{2+}_{0.25})_{\Sigma 2.96}\,^{Z}Al_6(^{T}Si_{6.04}O_{18})(BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.83}F_{0.06}O_{0.11})_{\Sigma 1.00}$$

Z5
$$^{X}(Na_{0.68}\square_{0.30}Ca_{0.02})_{\Sigma 1.00}\,^{Y}(Al_{1.51}Li_{0.97}Fe^{2+}_{0.07}Mn^{2+}_{0.44})_{\Sigma 3.00}\,^{Z}Al_6[^{T}(Si_{5.98}Al_{0.02}O_{18})(BO_3)_3\,^{V}(OH)_{\Sigma 3.00}\,^{W}(OH_{0.69}F_{0.10}O_{0.21})_{\Sigma 1.00}$$

Table S2.9. Average chemical composition and atoms per formula unit (a.p.f.u) for the different zones of the prismatic section of fragment I and OGX of Violet Cap sample (San Piero in Campo, Elba Island, Italy) with the relative empirical formula.

Fragment I					
	Prismatic section I	**OGX**			
	Z1	**Z2**	**Z3**	**Z4**	**Z5**
	n = 12	*n* = 3	*n* = 2	*n* = 3	*n* = 1
SiO_2 wt%	37.95(20)	37.75(41)	38.12(12)	38.01(3)	35.93
TiO_2	0.05(2)	0.14(7)	0.06(4)	0.06(4)	0.01
B_2O_3	11.06[a]	10.89[a]	11.06[a]	10.97[a]	10.77[a]
Al_2O_3	41.77(33)	39.11(39)	41.30(61)	39.98(21)	42.60
FeO_{tot}	0.03(3)	0.13(6)	0.05(2)	0.07(2)	-
MnO_{tot}	0.62(51)	4.00(40)	0.93(26)	2.72(52)	0.72
CaO	0.34(7)	0.06(4)	0.03	0.07(1)	0.06
Na_2O	1.85(4)	2.36(3)	2.18(16)	2.31(11)	2.25
K_2O	0.01(1)	0.01(1)	0.02(1)	0.01(2)	-
Li_2O	1.90[b]	1.63[b]	1.93[b]	1.78[b]	1.54[b]
F	0.99(9)	0.73(17)	0.49(28)	0.41(14)	0.13
$–O \equiv F$	–0.42	–0.31	–0.21	–0.17	–0.05
H_2O	3.18[a]	3.10[a]	3.43[a]	3.34[a]	3.22[a]
MnO[d]	0.62	2.85	0.60	1.75	0.458
Mn_2O_3[d]	-	1.28	0.37	1.08	0.290
Total	99.35	99.66	99.41	99.59	97.19
Atoms normalized to 31 anions					
Si apfu	5.967	6.024	5.992	6.021	5.799
Ti	0.006	0.017	0.007	0.007	0.001
B	3.000	3.000	3.000	3.000	3.000
Al	7.740	7.355	7.651	7.464	8.102
Fe^{3+}	-	0.017	0.006	0.009	-
Fe^{2+}	0.003	-	-	-	-
Mn^{3+}	-	0.155	0.044	0.130	0.036
Mn^{2+}	0.083	0.385	0.080	0.235	0.063
Ca	0.057	0.010	0.005	0.013	0.011
Na	0.563	0.732	0.664	0.708	0.704
K	0.002	0.003	0.005	0.003	-
Li	1.201	1.046	1.220	1.134	1.000
F	0.494	0.370	0.243	0.205	0.067
OH	3.334	3.301	3.595	3.529	3.505
OH+F	3.828	3.671	3.838	3.734	3.572
Species	**Fluor-elbaite**	**Elbaite**	**Elbaite**	**Elbaite**	**Elbaite**

[a] Calculated by stoichiometry (see text);
[b] Estimated with the procedure of Pesquera et al. (2016);
[c] Determined by Mössbauer spectroscopy
[d] Determined by OAS (Altieri et al., 2022b)
Errors for oxides and fluorine are standard deviations (in brackets)

Empirical chemical formulae

Z1 $^{X}(Na_{0.56}\square_{0.38}Ca_{0.06})_{\Sigma1.00}{}^{Y}(Al_{1.71}Li_{1.20}\,Mn^{2+}{}_{0.08}Ti_{0.01})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.97}Al_{0.03})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.33}F_{0.49}O_{0.18})_{\Sigma1.00}$

Z2 $^{X}(Na_{0.73}\square_{0.26}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{1.36}Li_{1.05}\,Mn^{2+}{}_{0.38}Mn^{3+}{}_{0.16}Fe^{3+}{}_{0.02}Ti_{0.01})_{\Sigma2.98}{}^{Z}Al_6({}^{T}Si_{6.02}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.30}F_{0.37}O_{0.33})_{\Sigma1.00}$

Z3 $^{X}(Na_{0.66}\square_{0.33}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{1.64}Li_{1.22}Mn^{2+}{}_{0.08}Mn^{3+}{}_{0.04}Fe^{3+}{}_{0.01}Ti_{0.01})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.99}Al_{0.01})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.59}F_{0.24}O_{0.16})_{\Sigma1.00}$

Z4 $^{X}(Na_{0.71}\square_{0.28}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{1.36}Li_{1.13}\,Mn^{2+}{}_{0.24}Mn^{3+}{}_{0.13}Fe^{3+}{}_{0.01}Ti_{0.01})_{\Sigma2.98}{}^{Z}Al_6({}^{T}Si_{6.02}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.53}F_{0.21}O_{0.26})_{\Sigma1.00}$

Z5 $^{X}(Na_{0.70}\square_{0.29}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{1.90}Li_{1.00}\,Mn^{2+}{}_{0.06}\,Mn^{3+}{}_{0.04})_{\Sigma3.00}{}^{Z}Al_6[{}^{T}(Si_{5.80}Al_{0.20})O_{18}]\,(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.51}F_{0.07}O_{0.42})_{\Sigma1.00}$

Table S2.10. Average chemical composition and atoms per formula unit (a.p.f.u) for the different zones of OGR and the prismatic section of fragment II of Violet Cap sample (San Piero in Campo, Elba Island, Italy) with the relative empirical formula.

	Fragment II						
	OGR		**Prismatic section II**		**OGZ**		
	Z6	**Z7**	**Z8**	**Z9**	**Z10**	**Z11**	**Z12**
	n = 3	*n* = 1	*n* = 17	*n* = 30	*n* = 1	*n* = 1	*n* = 1
SiO_2 wt%	37.14(31)	36.77	36.81(20)	38.23(95)	37.29	37.68	35.79
TiO_2	0.26(11)	0.20	0.03	0.01	0.12	0.02	-
B_2O_3	10.67[a]	10.76[a]	10.85[a]	11.16[a]	10.79[a]	10.95[a]	10.74[a]
Al_2O_3	36.66(39)	39.93	41.79(45)	42.64(58)	38.25	40.42	42.52
FeO_{tot}	0.23(25)	0.08	0.02	0.02(2)	0.37	0.23	0.03
MnO	6.77(47)	2.47	0.29(11)	0.08(5)	5.86	2.76	0.68
CaO	0.24(10)	0.11	0.19(13)	0.02(3)	0.02	0.01	0.06
Na_2O	2.73(13)	2.27	1.87	1.86(11)	2.42	2.55	2.18
K_2O	0.02(1)	0.02	0.01	0.01(1)	0.03	0.05	-
Li_2O	1.39[b]	1.67[b]	1.81[b]	1.92[b]	1.34[b]	1.65[b]	1.53[b]
F	1.30(17)	0.80	0.75(18)	0.31(16)	-	-	-
$–O \equiv F$	–0.55	–0.34	–0.31	–0.13	–0.00	–0.00	–0.00
H_2O	2.84[a]	3.15[a]	3.22[a]	3.60[a]	3.29[a]	3.40[a]	3.30[a]
MnO[d]	6.77	2.47	0.29	0.08	4.27	2.01	0.49
Mn_2O_3[d]	-	-	-	-	1.77	0.83	0.21
Total	99.69	97.88	97.33	99.72	99.81	99.84	96.85
Atoms normalized to 31 anions							
Si apfu	6.052	5.939	5.897	5.955	6.007	5.981	5.794
Ti	0.032	0.025	0.004	0.001	0.015	0.003	-
B	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Al	7.040	7.602	7.891	7.828	7.261	7.561	8.113
Fe^{3+}	-	-			0.049	0.031	0.004
Fe^{2+}	0.031	0.010	0.003	0.002	-	-	-
Mn^{3+}	-	-			0.217	0.100	0.026
Mn^{2+}	0.934	0.339	0.039	0.010	0.583	0.271	0.068
Ca	0.041	0.018	0.033	0.003	0.003	0.002	0.011
Na	0.862	0.711	0.582	0.563	0.755	0.786	0.683
K	0.003	0.004	0.002	0.003	0.006	0.010	-
Li	0.911	1.085	1.166	1.203	0.868	1.053	0.996
F	0.669	0.408	0.378	0.154	-	-	-
OH	3.086	3.396	3.445	3.736	3.531	3.595	3.521
OH+F	3.755	3.804	3.823	3.890	3.531	3.595	3.521
Species	**Fluor-elbaite**	**Fluor-elbaite**	**Elbaite**	**Elbaite**	**Elbaite**	**Elbaite**	**Elbaite**

[a] Calculated by stoichiometry (see text);
[b] Estimated with the procedure of Pesquera et al. (2016);
[c] Determined by Mössbauer spectroscopy
[d] Determined by OAS (Altieri et al., 2022b)
Errors for oxides and fluorine are standard deviations (in brackets)

Empirical chemical formulae

Z6 $^{X}(Na_{0.86}\square_{0.38}Ca_{0.04})_{\Sigma1.00}{}^{Y}(Al_{1.04}Li_{0.91}Mn^{2+}_{0.93}Fe^{2+}_{0.03}Ti_{0.03})_{\Sigma2.95}{}^{Z}Al_6(^{T}Si_{6.05}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.09}F_{0.67}O_{0.24})_{\Sigma1.00}$

Z7 $^{X}(Na_{0.71}\square_{0.27}Ca_{0.02})_{\Sigma1.00}{}^{Y}(Al_{1.56}Li_{1.08}Mn^{2+}_{0.34}Fe^{2+}_{0.01}Ti_{0.03})_{\Sigma3.00}{}^{Z}Al_6[^{T}(Si_{5.94}Al_{0.06})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.40}F_{0.41}O_{0.19})_{\Sigma1.00}$

Z8 $^{X}(Na_{0.58}\square_{0.39}Ca_{0.03})_{\Sigma1.00}{}^{Y}(Al_{1.79}Li_{1.17}Mn^{2+}_{0.04})_{\Sigma3.00}{}^{Z}Al_6[^{T}(Si_{5.90}Al_{0.10})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.45}F_{0.38}O_{0.17})_{\Sigma1.00}$

Z9 $^{X}(Na_{0.56}\square_{0.44})_{\Sigma1.00}{}^{Y}(Al_{1.79}Li_{1.20}Mn^{2+}_{0.01})_{\Sigma3.00}{}^{Z}Al_6[^{T}(Si_{5.96}Al_{0.06})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.74}F_{0.15}O_{0.11})_{\Sigma1.00}$

Z10 $^{X}(Na_{0.76}\square_{0.24})_{\Sigma1.00}{}^{Y}(Al_{1.26}Li_{0.87}Mn^{2+}_{0.58}Mn^{3+}_{0.22}Fe^{3+}_{0.05}Ti_{0.02})_{\Sigma2.99}{}^{Z}Al_6(^{T}Si_{6.01}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.53}O_{0.47})_{\Sigma1.00}$

Z11 $^{X}(Na_{0.79}\square_{0.21})_{\Sigma1.00}{}^{Y}(Al_{1.54}Li_{1.05}Mn^{2+}_{0.27}Mn^{3+}_{0.10}Fe^{3+}_{0.03})_{\Sigma3.00}{}^{Z}Al_6[^{T}(Si_{5.98}Al_{0.02})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.56}O_{0.44})_{\Sigma1.00}$

Z12 $^{X}(Na_{0.68}\square_{0.31}Ca_{0.01})_{\Sigma1.00}{}^{Y}(Al_{1.90}Li_{1.00}Mn^{2+}_{0.07}Mn^{3+}_{0.03})_{\Sigma3.00}{}^{Z}Al_6[^{T}(Si_{5.79}Al_{0.21})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma3.00}{}^{W}(OH_{0.52}O_{0.48})_{\Sigma1.00}$

Table S2.11. Average chemical composition and atoms per formula unit (a.p.f.u) for the different zones of the lateral overgrowth (OGY) of Violet Cap sample (San Piero in Campo, Elba Island, Italy) with the relative empirical formula.

	Fragment II					
	OGY					
	Z13	**Z14**	**Z15**	**Z16**	**Z17**	**Z18**
	n = 1	*n* = 1	*n* = 1	*n* = 2	*n* = 2	*n* = 2
SiO_2 wt%	37.32	37.77	38.06	38.02(22)	37.03(93)	35.56(52)
TiO_2	0.07	0.07	-	0.01(1)	0.02(3)	0.01(2)
B_2O_3	10.78[a]	10.88[a]	11.00[a]	10.98[a]	10.87[a]	10.67[a]
Al_2O_3	37.78	38.91	40.59	39.85(15)	41.27(59)	42.21(59)
FeO_{tot}	0.48	0.11	0.09	0.11(2)	0.03(3)	0.03(1)
MnO	7.07	4.27	1.61	3.51(12)	1.22(66)	0.62(6)
CaO	0.05	0.02	-	0.01	0.02(2)	0.05(1)
Na_2O	2.31	2.48	2.49	2.48(1)	2.42(25)	2.29(2)
K_2O	0.01	0.02	0.02	-	0.01(1)	-
Li_2O	1.18[b]	1.62[b]	1.89[b]	1.66[b]	1.75[b]	1.55[b]
F	0.15	0.14	0.08	0.08(3)	0.03(2)	0.04(5)
–O ≡ F	–0.06	–0.06	–0.03	–0.03	–0.01	–0.02
MnO[d]	4.71	2.85	0.10	2.34	0.81	0.23
Mn_2O_3[d]	2.62	1.58	1.07	1.30	0.45	0.42
H_2O	3.38[a]	3.36[a]	3.54[a]	3.35	3.43[a]	3.26[a]
Total	100.58	99.78	99.33	99.41	98.14	96.31
	Atoms normalized to 31 anions					
Si apfu	6.017	6.033	6.013	6.020	5.923	5.791
Ti	0.008	0.008	-	0.001	0.003	0.002
B	3.000	3.000	3.000	3.000	3.000	3.000
Al	7.180	7.325	7.558	7.436	7.780	8.102
Fe^{3+}	0.065	0.015	0.011	0.014	0.004	0.005
Fe^{2+}	-	-	-	-	-	-
Mn^{3+}	0.322	0.192	0.072	0.158	0.055	0.029
Mn^{2+}	0.644	0.386	0.143	0.318	0.110	0.058
Ca	0.008	0.003	-	0.002	0.003	0.008
Na	0.721	0.768	0.762	0.762	0.751	0.723
K	0.002	0.004	0.005	0.001	0.002	-
Li	0.765	1.041	1.201	1.057	1.126	1.015
F	0.076	0.069	0.038	0.039	0.017	0.019
OH	3.521	3.581	3.727	3.673	3.659	3.537
OH+F	3.697	3.650	3.765	3.712	3.676	3.556
Species	**Elbaite**	**Elbaite**	**Elbaite**	**Elbaite**	**Elbaite**	**Elbaite**

[a] Calculated by stoichiometry (see text);
[b] Estimated with the procedure of Pesquera et al. (2016);
[c] Determined by Mössbauer spectroscopy
[d] Determined by OAS (Altieri et al., 20022b)
Errors for oxides and fluorine are standard deviations (in brackets)

Empirical chemical formulae

Z13 $^{X}(Na_{0.72}\square_{0.27}Ca_{0.01})_{\Sigma 1.00}{}^{Y}(Al_{1.18}Li_{0.77}Mn^{2+}_{0.64}Mn^{3+}_{0.32}Fe^{3+}_{0.07}Ti_{0.01})_{\Sigma 2.98}{}^{Z}Al_6(^{T}Si_{6.02}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.52}F_{0.08}O_{0.40})_{\Sigma 1.00}$

Z14 $^{X}(Na_{0.77}\square_{0.23})_{\Sigma 1.00}{}^{Y}(Al_{1.33}Li_{1.04}Mn^{2+}_{0.39}Mn^{3+}_{0.19}Fe^{3+}_{0.02}Ti_{0.01})_{\Sigma 2.97}{}^{Z}Al_6(^{T}Si_{6.03}O_{18})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.58}F_{0.07}O_{0.35})_{\Sigma 1.00}$

Z15 $^{X}(Na_{0.76}\square_{0.24})_{\Sigma 1.00}{}^{Y}(Al_{1.56}Li_{1.20}Mn^{2+}_{0..14}Mn^{3+}_{0.07}Fe^{3+}_{0.01})_{\Sigma 2.99}{}^{Z}Al_6(^{T}Si_{6.01}O_{18})(BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.73}F_{0.04}O_{0.23})_{\Sigma 1.00}$

Z16 $^{X}(Na_{0.76}\square_{0.24})_{\Sigma 1.00}{}^{Y}(Al_{1.44}Li_{1.06}Mn^{2+}_{0.32}Mn^{3+}_{0.16}Fe^{3+}_{0.01})_{\Sigma 2.98}{}^{Z}Al_6(^{T}Si_{6.02}O_{18})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.67}F_{0.04}O_{0.29})_{\Sigma 1.00}$

Z17 $^{X}(Na_{0.75}\square_{0.25})_{\Sigma 1.00}{}^{Y}(Al_{1.70}Li_{1.13}Mn^{2+}_{0.11}Mn^{3+}_{0.06})_{\Sigma 3.00}{}^{Z}Al_6[^{T}(Si_{5.92}Al_{0.08})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.66}F_{0.02}O_{0.32})_{\Sigma 1.00}$

Z18 $^{X}(Na_{0.73}\square_{0.26}Ca_{0.01})_{\Sigma 1.00}{}^{Y}(Al_{1.89}Li_{1.02}Mn^{2+}_{0.06}Mn^{3+}_{0.03}Fe^{3+}_{0.01})_{\Sigma 3.00}{}^{Z}Al_6[^{T}(Si_{5.79}Al_{0.21})O_{18}](BO_3)_3{}^{V}(OH)_{\Sigma 3.00}{}^{W}(OH_{0.54}F_{0.02}O_{0.44})_{\Sigma 1.00}$