Tables and figures

Table 1. Cyclosilicates from groups VIIIC04, VIIIC05 [91N1].

Silicate	Ideal composition	Group
Ferro-axinite	$Ca_2FeAl_2(BO_3OH)(SiO_3)_4$	VIIIC04
Magnesio-axinite	$Ca_2MgAl_2(BO_3OH)(SiO_3)_4$	VIIIC04
Mangan-axinite	$Ca_2MnAl_2(BO_3OH)(SiO_3)_4$	VIIIC04
Kainosite-(Y)	$Ca_2(Y,Ce)_2(SiO_3)_4(CO_3) \cdot H_2O$	VIIIC04
Tinzenite	$(Ca,Mn,Fe^{3+})_3Al_2BSi_4O_{15}(OH)$	VIIIC04
Papagoite	$CaCuAlSi_2O_6(OH)_3$	VIIIC04
Baotite	$Ba_4(Ti,Fe,Nb)_8O_{16}(SiO_3)_4Cl$	VIIIC04
Taramellite	$Ba_4(Fe,Ti)_4(B_2Si_8O_{27})O_2Cl_x$	VIIIC04
Titantaramellite	$Ba_4(Ti,Fe,Mg)_4(B_2Si_8O_{27})O_2Cl_x$	VIIIC04
Nagashimalite	$Ba_4(V,Ti)_4(B_2Si_8O_{27})O_2Cl_x$	VIIIC04
Muirite	$Ba_{10}Ca_2MnTiSi_{10}O_{30}(OH,Cl,F)_{10}$	VIIIC04
Joaquinite-(Ce)	$NaBa_2FeTi_2Ce_2(SiO_3)_8O_2(OH) \cdot H_2O$	VIIIC05
Orthojoaquinite-(Ce)	$NaBa_2FeTi_2Ce_2(SiO_3)_8O_2(O,OH) \cdot H_2O$	VIIIC05
Strontio-joaquinite	$(Na,Fe)_2Ba_2Sr_2Ti_2(SiO_3)_8(O,OH)_2 \cdot H_2O$	VIIIC05
Strontio-orthojoaquinite	$Na_2Ba_2Sr_2Ti_2(SiO_3)_8(O,OH)_2 \cdot H_2O$	VIIIC05
Bario-orthojoaquinite	$(Ba,Sr)_4Fe_2Ti_2O_2(SiO_3)_8 \cdot H_2O$	VIIIC05
Baratovite	$KLi_3Ca_7(Ti,Zr)_2(SiO_3)_{12}F_2$	VIIIC05
Byelorussite-(Ce)	$NaBa_2Ce_2MnTi_2Si_8O_{26}(F,OH) \cdot H_2O$	VIIIC05
Katayamalite	$(K,Na)Li_3Ca_7Ti_2(SiO_3)_{12}(OH,F)_2$	VIIIC05

Table 2. Atomic parameters and temperature factors.

a) Axinite, having triclinic structure with space group $P\bar{1}$ [74T1].

Atom	*x*	*y*	*z*	$\beta_{ij} \cdot 10^5$					
				β_{11}	β_{22}	β_{33}	β_{12}	β_{13}	β_{23}
Fe	0.7687	0.5904	0.1120	215	261	153	–126	–2	113
Ca1	0.7465	0.3480	0.3956	281	75	129	–27	–95	82
Ca2	0.1831	0.1006	0.0837	286	130	114	–167	–242	107
Al1	0.0529	0.8009	0.2543	115	53	17	–21	–20	40
Al2	0.3520	0.9362	0.4212	113	63	56	–124	–38	–8
Si1	0.2120	0.4502	0.2356	114	57	44	–76	–64	9
Si2	0.2189	0.2748	0.5242	91	45	41	–49	–38	6
Si3	0.6995	0.2553	0.0112	142	66	12	–28	–39	18
Si4	0.6413	0.0189	0.2304	85	68	55	–88	7	–2
B	0.6419	0.6346	0.2860	171	69	20	73	–48	–18
O1	0.0564	0.6033	0.1897	320	101	121	–59	–42	–11
O2	0.2333	0.3386	0.0982	414	115	137	–51	60	–52
O3	0.4202	0.4864	0.3135	248	129	140	–265	–200	28
O4	0.1357	0.3739	0.3713	316	288	144	–242	–111	229
O5	0.0281	0.2419	0.5638	121	188	91	–87	37	74
O6	0.3261	0.3791	0.6455	131	103	131	–72	–60	–62
O7	0.3802	0.1274	0.4956	164	59	152	–69	–15	–37
O8	0.5371	0.3433	0.8773	360	146	47	18	52	114
O9	0.8759	0.1543	0.9334	198	120	89	151	6	–7
O10	0.7693	0.3655	0.1394	431	204	112	–198	–43	–121

Table 2 (cont.)

Atom	x	y	z	$\beta_{ij} \cdot 10^5$					
				β_{11}	β_{22}	β_{33}	β_{12}	β_{13}	β_{23}
O11	0.6037	0.1348	0.0863	404	240	123	–256	70	155
O12	0.4359	0.9817	0.2442	191	127	121	–167	20	44
O13	0.7204	0.0998	0.3842	266	186	67	–243	–62	–21
O14	0.7943	0.8735	0.1783	169	159	159	39	19	–12
O15	0.3256	0.7464	0.3545	131	75	102	–57	25	–85
O16	0.0968	0.9954	0.3232	70	133	111	–3	15	–55
H	0.0023	0.9697	0.6259	69	–744	320	–1728	–467	–1481

b) Baotite[9)], having tetragonal structure, space group $I4_1/a$ [70N1].

Atom	x	y	z	B_{eq} [Å^2]
Ba	0.02947(2)	0.09737(2)	0.62138(6)	0.42(1)
Ti	0.21264(5)	0.10787(5)	0.8699(2)	0.34(2)
(Ti,Nb,Fe)	0.22174(3)	0.11789(3)	0.3728(2)	0.39(2)
Si	0.09288(7)	0.18533(7)	0.1244(3)	0.28(2)
O1	0.0168(2)	0.1568(2)	0.1350(8)	0.60(5)
O2	0.1265(2)	0.1593(2)	0.8933(8)	0.40(5)
O3	0.1284(2)	0.1617(2)	0.3587(9)	0.48(5)
O4	0.1846(2)	0.0530(2)	0.1304(8)	0.53(5)
O5	0.1812(2)	0.0547(2)	0.6214(8)	0.59(5)
O6	0.2468(2)	0.1684(2)	0.1206(8)	0.55(5)
O7	0.2415(2)	0.1703(2)	0.6305(8)	0.50(5)
Cl	0.0000	0.2500	0.6250	0.67(4)

9) See Table 3.

(c) Taramellite[11)], having orthorhombic symmetry, space group Pmmn [80M3].

Atom	Multiplicity	Point symmetry	x	y	z	B_{eq} [Å^2]
Ba1	2	mm	0.75	0.25	0.2394(1)	1.10
Ba2	2	mm	0.25	0.25	0.4659(2)	1.94
Ba3	4	m	0.25	0.4749(0)	0.0070(1)	0.81
M	8[a)]	1	0.6295(1)	0.5020(1)	0.4765(1)	0.75
Si1	8	1	0.4894(1)	0.3662(1)	0.2048(3)	0.52
Si2	8	1	0.4736(2)	0.6441(4)	0.2073(2)	0.45
B	4	m	0.25	0.6593(7)	0.2773(15)	0.64
O1	4	m	0.5062(6)	0.25	0.2212(10)	0.81
O2	4	m	0.5207(5)	0.75	0.2684(10)	0.76
O3	4	m	0.25	0.5767(4)	0.4088(9)	0.72
O4	4	m	0.75	0.5715(4)	0.3623(10)	1.24
O5	8	1	0.5388(4)	0.6092(3)	0.0167(7)	0.86
O6	8	1	0.3798(4)	0.4001(3)	0.3135(6)	0.83
O7	8	1	0.6073(3)	0.4110(3)	0.2617(7)	0.78
O8	8	1	0.3456(4)	0.6482(3)	0.1479(6)	0.74
O9	8	1	0.4946(4)	0.5722(3)	0.3763(7)	0.95
O10	2	mm	0.25	0.75	0.3803(11)	0.65
Cl	2[b)]	mm	0.25	0.25	–0.0088(9)	2.24

a) Site population 0.75Fe + 0.25Ti; b) site occupancy 0.89; 11) see Table 3.

Table 2 (cont.)

(d) Joaquinite[23)], having monoclinic structure, space group C2 [75D1].

Atom	x	y	z	B_{eq} [Å^2]
Ba	0.2366(1)	0.0	0.0058(1)	0.94(2)
R	0.1667(1)	0.7467(1)	0.4518(1)	1.17(2)
Ti	0.0490(3)	0.7369(5)	0.1276(3)	0.36(4)
Fe[a)]	0.0	0.3694(6)	0.5	0.6(1)
Na[a)]	0.0	0.054(3)	0.5	5.9(8)
Si1	0.3773(5)	0.7343(7)	0.2426(4)	0.66(8)
Si2	0.3085(5)	0.2674(7)	0.2432(5)	0.91(9)
Si3	0.1206(6)	0.0375(7)	0.2917(5)	0.80(9)
Si4	0.0929(6)	0.4365(6)	0.2709(6)	0.68(9)
O1[b)]	0.0	0.867(2)	0.0	0.6(3)
O2[b)]	0.0	0.606(2)	0.0	0.8(3)
O3	0.116(2)	0.881(2)	0.251(1)	1.2(2)
O4	0.188(1)	0.385(2)	0.191(1)	0.9(2)
O5	0.226(2)	0.115(2)	0.237(1)	1.3(3)
O6	0.233(1)	0.715(1)	0.133(1)	0.7(2)
O7	0.472(2)	0.605(2)	0.229(2)	1.6(3)
O8	0.086(2)	0.604(2)	0.268(1)	1.0(2)
O9	0.371(1)	0.737(2)	0.375(1)	1.0(2)
O10	0.412(1)	0.303(2)	0.372(1)	1.5(3)
O11	0.144(2)	0.368(2)	0.403(1)	1.4(3)
O12	0.173(2)	0.044(2)	0.443(1)	1.7(3)
O13	0.367(1)	0.254(2)	0.133(1)	0.8(2)
O14	0.439(2)	0.880(2)	0.203(2)	1.7(3)
OH[b)]	0.0	0.576(4)	0.5	5.0(9)
H_2O[b)]	0.0	0.199(3)	0.0	2.6(5)

a) Refined occupancy for the Fe site is (0.79Fe, 0.21Na), and that for the Na site is (0.75Na, 0.25Fe). Other sites are assumed to be fully occupied;

b) Atoms O1, O2 and H_2O are in 2a sites and atoms Fe, Na and OH are in 2b. All others are in the general positions 4c of space group C2;
The approximate coordinates of atoms in the orthorhombic form of joaquinite[23)] (subscript o) can be derived from those in the monoclinic cell (subscript c). The general equations are: $z_0 = (1/2)z_c + 1/4$; $x_0 = (1/2 - z_c) \cos\beta \frac{c_c}{a_c}$. The y coordinate is unchanged;

23) See Table 3.

Table 3. Crystal structures and lattice parameters at RT.

Silicate	Space group	Lattice parameters				Refs.
		a [Å]	*b* [Å]	*c* [Å]	α, β, γ	
Ferro-axinite[1)]	$P\bar{1}$	7.1479(4)	9.1962(5)	8.9576(4)	α = 91.857(4)° β = 98.177(4)° γ = 77.359(4)°	00S1
Ferro-axinite[2)]	$P\bar{1}$	7.148	9.156	8.960	α = 88°04′ β = 81.36′ γ = 77°42′	52I1
Ferro-axinite[3)]	$P\bar{1}$	7.1437(4)	9.1898(6)	8.9529(4)	α = 91.857(6)° β = 98.188(5)° γ = 77.359(4)°	81S1
Axinite[4)]	$P\bar{1}$	7.1566(15)	9.1995(20)	8.959(2)	α = 91.8(8)° β = 98.14(02)° γ = 77.30(2)°	74T1
Magnesio-axinite[5)]	$P\bar{1}$	7.1381(3)	9.1626(4)	8.9421(4)	α = 91.903(4)° β = 98.105(3)° γ = 77.468(4)°	00S1
Mangan-axinite[6)]	$P\bar{1}$	7.1849(4)	9.2152(5)	8.9765(4)	α = 91.761(4)° β = 98.153(4)° γ = 77.150(4)°	00S1
Mangan-axinite[7)]	$P\bar{1}$	7.161(2)	9.190(3)	8.978(3)	α = 88.26(3)° β = 81.80(3)° γ = 77.26(2)°	72F1
Kainosite (natural)		13.01	14.27	6.75		50B1
Kainosite (natural)	Pmnb	12.93(3)	14.33(3)	6.73(3)		61R1
Kainosite-(Y)[8)]	Pmnb	13.05(1)	14.33(1)	6.73(1)		64P1
Baotite[9)]	$I4_1/a$	19.99(1)		5.908(2)		70N1
Taramellite[10)]	Pmmn	13.95	12.21	7.15		65M1
Taramellite[11),a)]	Pmmn	12.150(3)	13.946(3)	7.129(2)		80M3
Taramellite[11),a)]	Pmmn	12.125(6)	13.929(6)	7.136(5)		84A1
Taramellite[12)]		7.05	13.95	12.01		57M1, 65M1
Ti-taramellite[13),a)]	Pmmn	12.200(2)	13.952(2)	7.128(1)		80M3
Ti-taramellite[13),a)]	Pmmn	12.184(4)	13.938(6)	7.127(3)		84A1
Ti-taramellite[14),a)]	Pmmn	12.217(6)	13.954(8)	7.130(4)		84A1
Ti-taramellite[15),a)]	Pmmn	12.202(4)	13.981(5)	7.134(3)		84A1
Ti-taramellite[16),a)]	Pmmn	12.220(5)	14.005(9)	7.141(3)		84A1
Ti-taramellite[17),a)]	Pmmn	12.199(7)	13.962(8)	7.140(4)		84A1
Ti-taramellite[18),a)]	Pmmn	12.213(4)	13.980(3)	7.136(2)		84A1
Ti-taramellite[19),a)]	Pmmn	12.149(7)	13.904(12)	7.12(2)		84A1
Ti-taramellite[20),a)]	Pmmn	12.053(5)	13.93(2)	7.138(3)		84A1
Nagashimalite[21)]	Pmmn	12.122(3)	13.937(3)	7.116(2)		80M1,2
Muirite[22)]	P4/mmm, P4mm, P422 or $P\bar{4}2m$	13.942		5.590		65A2
Joaquinite-(Ce)[23)]	C2	10.516(3)	9.686(3)	11.833(4)	β = 109.670(3)°	75D1
Joaquinite-(Ce)[24)]	C2, Cm,or C2/m	10.51(2)	9.66(2)	11.82(2)	β = 109.5(2)°	72L1
Orthojoaquinite[23)]	Cc2m,$Ccm2_1$ or Ccmm	10.48	9.66	22.26		75D1
Orthojoaquinite[24)]		10.48(2)	9.66(2)	22.26(2)		72L1

Table 3 (cont.)

Silicate	Space group	Lattice parameters				Refs.
		a [Å]	*b* [Å]	*c* [Å]	α, β, γ	
Strontio-joaquinite[25)]	P2, Pm or P2/m	10.516(6)	9.764(5)	11.87(1)	β = 109°17(4)′	82W1
Strontio-orthojoaquinite[26)]	Pcam, $Pca2_1$	10.517	9.777	22.392		74C1
Bario-orthojoaquinite[27)]	Ccmm,$Ccm2_1$, or Cc2m	10.477(6)	9.599(1)	22.59(1)		82W1
Baratovite[28)]	C2/c	16.941(3)	9.746(2)	20.907(3)	β = 112.50(10)°	79M1
Katayamalite[29)]	C1	9.721	16.923	19.942	α = 91.43° β = 104.15° γ = 89.94°	83M1
Katayamalite[29)]	P1	9.763	9.721	19.942	α = 104.15° β = 81.76° γ = 119.92°	83M1

1) $Ca_{3.94}Mn_{0.06}Fe^{2+}_{1.68}Mg_{0.30}Al_{3.95}B_{2.07}Si_{7.99}O_{30.0}(OH)_2$;
2) $Ca_2Mn_{0.3}Fe_{0.7}Al_2BSi_4O_{16}H$;
3) $Ca_{3.90}(Ti_{0.01}K_{0.044}Na_{0.13}Mn_{0.26}Fe_{1.10}Mg_{0.37})(Al_{3.56}Fe_{0.18})(OH)_{1.96}B_{1.96}Si_8O_{29.34}$;
4) $Ca_2(Fe,Mn)Al_2BSi_4O_{16}H$ with Fe: Mn ratio close to 1 : 1;
5) $Ca_{3.96}Mn_{0.07}Mg_{1.92}Al_{4.00}B_{2.00}Si_{8.04}O_{30.1}(OH)_{1.9}$;
6) $Ca_{3.87}Mn_{2.02}Al_{3.76}Fe^{3+}_{0.31}Fe^{2+}_{0.07}B_{1.99}Si_{8.02}O_{30.2}(OH)_{1.8}$;
7) $(Ca_{1.85}Mg_{0.04}Fe^{2+}_{0.26}Mn^{2+}_{0.94})(Al_{2.03}Fe^{3+}_{0.01})B_{0.99}Si_{3.98}O_{16}H_{0.83}$;
8) Composition [mol %]: CaO-0.2992; Na_2O-0.0006; K_2O-0.0001; Ce_2O_3-0.0012; Nd_2O_3-0.0006; Sm_2O_3-0.0008; Y_2O_3-0.1119; Gd_2O_3-0.0067; Dy_2O_3-0.0083; Er_2O_3-0.0092; Yb_2O_3-0.0069; Fe_2O_3-0.0036; Al_2O_3-0.0118; SiO_2-0.5867; TiO_2-0.0003; ThO_2-0.0001; CO_2-0.1045; H_2O^+-0.1437; No. of atoms in the cell determined from above include $4H_2$;
9) $Ba_4Ti_4(Ti_{0.48}Nb_{0.36}Fe_{0.16})_4ClO_{16}[Si_4O_{12}]$;
10) Natural sample, Candoglia, Italy. Composition close to [11)];
11),a) $Si_{15.74}Al_{0.26}Ti_{2.61}Fe_{4.72}Mg_{0.04}V_{0.04}Ba_{7.50}Cl_{1.20}$; (O content not mentioned);
12) Natural sample, Rush Creek, California;
13),a) $Si_{15.85}Al_{0.15}Ti_{3.91}Fe_{2.61}Mg_{0.91}Mn_{0.12}V_{0.14}Cr_{0.01}Ba_{7.71}Cl_{1.72}$;
14),a) $Si_{15.89}Al_{0.11}Ti_{3.34}Fe_{3.21}Mg_{0.53}Cr_{0.09}Ba_{7.47}Cl_{1.89}$;
15),a) $Si_{15.91}Al_{0.09}Ti_{3.58}Fe_{1.30}Mg_{2.29}Mn_{0.03}V_{0.18}Cr_{0.04}Ba_{7.34}Cl_{1.38}$;
16),a) $Si_{15.87}Al_{0.13}Ti_{3.75}Fe_{2.37}Mg_{1.0}Mn_{0.02}V_{0.12}Cr_{0.05}Ba_{7.52}Cl_{1.68}$;
17),a) $Si_{15.86}Al_{0.14}Ti_{3.98}Fe_{1.20}Mg_{1.54}Mn_{0.48}V_{0.31}Ba_{7.45}Cl_{1.68}$;
18),a) $Si_{15.87}Al_{0.13}Ti_{3.32}Fe_{1.64}Mg_{1.63}Mn_{0.08}V_{0.82}Cr_{0.25}Ba_{7.40}Cl_{1.48}$;
19),a) $Si_{15.75}Al_{0.25}Ti_{3.88}Fe_{1.40}Mg_{1.04}V_{1.21}Cr_{0.03}Ba_{7.37}Cl_{1.71}$;
20),a) $Si_{15.92}Al_{0.08}Ti_{4.58}Fe_{3.08}Mg_{0.10}V_{0.03}Ba_{7.47}Cl_{0.03}$. For samples[11, 13-20)] O content not mentioned;
a) For samples[11, 13-20)] O and B content not mentioned. The B content was suggested to be close to that given by $(Si_{16}B_4O_{54})$
21) $Ba_{4.01}(V^{3+}_{3.30}Ti_{0.51}Mn_{0.10})B_{1.71}Si_8O_{27.64}(OH)_{1.28}Cl_{0.72}$;
22) $(Ba_{9.82}K_{0.05}Sr_{0.03})Ca_{2.10}(Mn_{0.73}Fe_{0.14}Mg_{0.07})Ti_{1.32}(Si_{9.31}Al_{0.26})O_{29.52}(OH_{5.05}Cl_{3.21}F_{1.86})$;
23) Natural sample, San Benito country; ideal composition $NaFe^{2+}Ba_2R_2Ti_2Si_8O_{26}OH \cdot H_2O$;
24) $Ba_{8.1}(Sr_{1.7}R_{6.5}Ti_{0.1})(Ca_{0.2}Na_{3.3}Fe_{3.1}Li_{0.8}Mg_{0.1})Ti_{8.1}Si_{32}O_{98.7}(OH)_{18.3}$;
25) $(Na_{2.28}Li_{0.11}Fe^{2+}_{1.44}\square_{0.17})\square_2Ba_{4.09}Ti_{4.00}[O_{1.27}(OH)_{2.73}]Sr_{4.01}R_{0.01}[Si_4O_{12}]_4 \cdot 1.62H_2O$;
26) Natural sample;
27) $(Na_{0.11}Fe_{3.61}Mn_{0.24}\square_{0.05})\square_2Ba_4(Ti_{3.88}Al_{0.12})(Ba_{2.88}Sr_{0.88}Ca_{0.08}Al_{0.19})O_4[Si_4O_{12}]_4 \cdot 2.0H_2O$;
28) $KLi_3Ca_7(Ti_{0.87}Zr_{0.13})_2[Si_6O_{18}]_2F_2$;

Table 3 (cont.)

[29] $(K_{0.85}Na_{0.10})Li_{3.00}(Ca_{6.94}Mn_{0.04})(Ti_{1.90}Fe^{3+}{}_{0.05})Si_{12.00}O_{35.78}(OH)_{1.85}F_{0.25}$;
[30] $(Ba_{3.872}Na_{0.089}Ca_{0.040}K_{0.041})(Ti_{5.822}Nb_{1.322}\ Fe^{2+}{}_{0.408}\ Fe^{3+}{}_{0.201}Al_{0.233}Cr_{0.009})(Si_{3.739}Al_{0.261})O_{12}(O_{15.186}OH_{0.814})$ $(Cl_{0.897}OH_{0.103})$;
[31] Natural sample, 2.87 % Fe;
[32] Composition [wt %]: BaO-39.3; FeO-6.70; MgO-1.13; MnO-0.40; TiO-11.6; SiO_2-33.0 Cl-1.95.

Table 4. Hyperfine parameters determined by NGR method at ^{57}Fe.

Sample	T [K]	Site	δ[1)] [mm/s]	ΔQ [mm/s]	DH [mm/s]	A [%]	Refs.
Baotite[30)]	95	Fe^{2+}(Ti)	1.15(1)	2.65(2)	0.37(2)	69	98S1
		Fe^{3+}(Ti)	0.46(5)	0.61(6)	0.51(6)	31	
	298	Fe^{2+}(Ti)	1.02(1)	2.64(1)	0.34(1)	67	
		Fe^{3+}(Ti)	0.37(3)	0.61(1)	0.50(3)	33	
Baotite[31)]	298	Fe^{2+}	1.029	2.632	0.318	43.1	92Q1
		Fe^{3+}	0.389	0.636	0.602	56.9	

[1)] Relative to α-Fe.
[30), 31)] See Table 3.

Table 5. Refractive indices.

Sample	n_α	n_β	n_γ	$2V$ [°] exp.	$2V$ [°] calc.		Refs.
Mangan-axinite[7)]	1.678(3)	1.687(3)	1.692(3)	75(5)		biaxial negative	72F1
Kainosite-(Y)[8)]	1.665(1)	1.685(1)	1.689(1)	40	49.5	biaxial negative	64P1
Ti-Taramellite[13)]	1.753(2)	1.757(2)	1.782(3)	45(5)			84A1
Ti-Taramellite[14)]	1.752(2)	1.760(1)	1.770(6)	77(3)		biaxial positive	84A1
Ti-Taramellite[15)]	1.747(1)	1.758(1)					84A1
Ti-Taramellite[16)]	1.751(2)	1.761(2)		59(5)			84A1
Ti-Taramellite[17)]	1.751(3)	1.757(2)	1.780(6)	51(2)			84A1
Ti-Taramellite[18)]	1.739(1)	1.749(2)					84A1
Ti-Taramellite[19)]	1.748(2)	1.752(2)					84A1
Nagashimalite[21)]	1.750(2)	1.753(2)	1.780(5)	≈30		biaxial positive	80M1, 80M2
Muirite[22)]	1.697(ω)		1.704(ε)			uniaxial positive	65A2
Joaquinite[24)]	1.753(1)	1.767(1)	1.822(2)	30…55		biaxial positive	72L1
Joaquinite[26)]	1.748	1.767	1.823	50			32P1
Strontio-joaquinite[25)]	1.710(2)	1.718(2)	1.780(3)	35…45		biaxial positive	82W1
Bario-orthojoaquinite[27)]	1.735(2)	1.737(2)	1.80(1)	10…15		biaxial positive	82W1
Katayamalite[29)]	1.670	1.671	1.677	32		biaxial positive	83M1

For footnotes see Table 3.