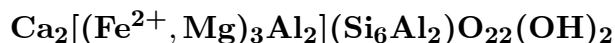


# Ferrotschermakite



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**Crystal Data:** Monoclinic. *Point Group:*  $2/m$ . [Prismatic.] *Twinning:* [Simple or multiple twinning  $\parallel \{100\}$ .]

**Physical Properties:** *Cleavage:* [Perfect on  $\{110\}$ , with intersections at  $\sim 56^\circ$  and  $\sim 124^\circ$ ; partings on  $\{100\}$ ,  $\{001\}$ .] *Tenacity:* [Brittle.] *Hardness* = [5–6] *D*(meas.) = 3.323–3.353 *D*(calc.) = [3.25]

**Optical Properties:** Transparent to translucent. *Color:* Green; green to tan in thin section. *Luster:* [Vitreous.]

*Optical Class:* Biaxial (-). *Pleochroism:* Distinct;  $X$  = light tan;  $Y$  = green;  $Z$  = blue-green. *Orientation:*  $Y = b$ ;  $Z \wedge c \simeq 7^\circ\text{--}14^\circ$ . *Absorption:*  $Z = Y > X$ .  $\alpha = 1.660\text{--}1.694$   $\beta = 1.680\text{--}1.732$   $\gamma = 1.688\text{--}1.736$   $2V$ (meas.) =  $45^\circ\text{--}75^\circ$

**Cell Data:** *Space Group:*  $C2/m$ .  $a = 9.864$   $b = 18.130$   $c = 5.331$   $\beta = 104.95^\circ$   $Z = 2$

**X-ray Powder Pattern:** n.d.

Chemistry:	(1)	(2)		(1)	(2)
SiO <sub>2</sub>	40.51	40.43	Na <sub>2</sub> O	1.05	0.89
TiO <sub>2</sub>	1.42	1.25	K <sub>2</sub> O	1.00	1.01
Al <sub>2</sub> O <sub>3</sub>	13.39	12.62	F	0.13	0.90
Fe <sub>2</sub> O <sub>3</sub>	5.32	4.24	Cl	0.04	
FeO	17.16	22.15	H <sub>2</sub> O <sup>+</sup>	1.78	1.76
MnO	0.35	0.28	H <sub>2</sub> O <sup>-</sup>	0.02	0.05
MgO	6.47	3.80	-O = (F, Cl) <sub>2</sub>	0.06	0.38
CaO	11.43	11.60	Total	100.01	100.60

(1) Emeryville, New York, USA; corresponds to  $(\text{Ca}_{1.87}\text{Na}_{0.31}\text{K}_{0.20})_{\Sigma=2.38}(\text{Fe}_{2.20}^{2+}\text{Mg}_{1.48}\text{Fe}_{0.61}^{3+}\text{Al}_{0.60}\text{Ti}_{0.16}\text{Mn}_{0.04})_{\Sigma=5.09}(\text{Si}_{6.20}\text{Al}_{1.80})_{\Sigma=8.00}\text{O}_{22}[(\text{OH})_{1.81}\text{O}_{0.12}\text{F}_{0.06}\text{Cl}_{0.01}]_{\Sigma=2.00}$ . (2) Lake's Grave, Australia; corresponds to  $(\text{Ca}_{1.92}\text{Na}_{0.27}\text{K}_{0.20})_{\Sigma=2.39}(\text{Fe}_{2.86}^{2+}\text{Mg}_{0.87}\text{Fe}_{0.49}^{3+}\text{Al}_{0.53}\text{Ti}_{0.15}\text{Mn}_{0.04})_{\Sigma=4.94}(\text{Si}_{6.24}\text{Al}_{1.76})_{\Sigma=8.00}\text{O}_{21.75}[(\text{OH})_{1.81}\text{F}_{0.44}]_{\Sigma=2.25}$ .

**Polymorphism & Series:** Forms a series with tschermakite.

**Mineral Group:** Amphibole (calcic) group:  $\text{Mg}/(\text{Mg} + \text{Fe}^{2+}) < 0.5$ ;  $(\text{Na} + \text{K})_{\text{A}} < 0.5$ ;  $\text{Na}_{\text{B}} < 0.67$ ;  $(\text{Ca} + \text{Na})_{\text{B}} \geq 1.34$ ;  $\text{Si} < 6.25$ ;  $\text{Ti} < 0.5$ .

**Occurrence:** A product of medium- to high-pressure metamorphism of highly aluminous rocks, producing schists, gneisses, or amphibolites; from differentiated mafic plutonic igneous rocks.

**Association:** Almandine, chlorite, biotite, muscovite, quartz, anorthite, apatite (metamorphic).

**Distribution:** From Emeryville, St. Lawrence Co., New York, USA. At Lake's Grave, Broken Hill, New South Wales, Australia.

**Name:** For *ferrous* iron in its composition and relation to *tschermakite*.

**Type Material:** n.d.

**References:** (1) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 2, chain silicates, 263–314. (2) Leake, B.E. (1968) A catalog of analyzed calciferous and subcalciferous amphiboles together with their nomenclature and associated minerals. Geol. Soc. Amer. Special Paper 98, 210 p. [analyses 882 and 885]. (3) Phillips, W.R. and D.T. Griffen (1981) Optical mineralogy, 232–234.

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