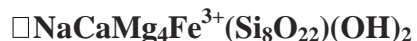


Ferri-winchite

Crystal Data: Monoclinic. *Point Group:* 2/m. As thin borders on crystals of ferrian winchite and as finely acicular individuals dominated by {110}.

Physical Properties: *Cleavage:* Perfect on {110}, intersecting at ~56°. *Fracture:* Hackley. *Tenacity:* Brittle. Hardness = 5.5 D(meas.) = n.d. D(calc.) = 3.14

Optical Properties: Transparent. *Color:* Black. *Streak:* Greenish gray. *Luster:* Vitreous. *Optical Class:* Biaxial (-). $\alpha = 1.670(2)$ $\beta = 1.680(5)$ $\gamma = 1.685(6)$ $2V(\text{meas.}) = \text{n.d.}$ $2V(\text{calc.}) = \text{n.d.}$ *Orientation:* $Z = b$, optic plane \perp (010). *Pleochroism:* \perp to bc plane = bright brownish yellow, $Y = \text{lilac}$, $Z = \text{dark blue}$.

Cell Data: *Space Group:* C2/m. $a = 9.811(6)$ $b = 18.014(6)$, $c = 5.295(4)$ $\beta = 104.10(6)^\circ$ $Z = \text{n.d.}$

X-ray Powder Pattern: Ilmen Mountains alkaline complex, Southern Urals, Russia. 8.42 (100), 3.116 (60), 2.711 (20), 3.268 (13), 3.391 (10), 2.800 (10), 2.957 (7)

Chemistry:	(1)
SiO ₂	54.90
TiO ₂	0.11
Al ₂ O ₃	1.11
FeO	15.91
MnO	0.76
MgO	14.17
CaO	5.10
Na ₂ O	5.18
<u>K₂O</u>	<u>0.51</u>
Total	97.76

(1) Ilmen Mountains alkaline complex, Southern Urals, Russia; average of 5 electron microprobe analyses supplemented by spectroscopy; corresponds to $(\text{Na}_{0.64}\text{K}_{0.38})(\text{Na}_{1.98}\text{Ca}_{0.02})(\text{Li}_{0.66}\text{Mg}_{1.42}\text{Fe}^{2+}_{0.75}\text{Mn}^{2+}_{0.26}\text{Zn}_{0.02}\text{Fe}^{3+}_{1.69}\text{V}^{3+}_{0.01}\text{Ti}^{4+}_{0.14}\text{Al}_{0.03})(\text{Si}_{7.93}\text{Al}_{0.07})_{\Sigma=8.00}\text{O}_{22}[\text{F}_{1.57}(\text{OH})_{0.16}\text{O}_{0.27}]_{\Sigma=2.00}$.

Mineral Group: Amphibole supergroup, sodium calcium amphibole group.

Occurrence: In veins cutting pyroxene fenite in an alkaline igneous complex.

Association: Calcite, quartz, pyrite.

Distribution: From 1 km east of the Selyankinsky cordon, Ilmen Mountains alkaline complex, Southern Urals, Russia.

Name: As the Fe³⁺ analog of *winchite*.

Type Material: Natural Science Museum of the Ilmen Preserve, Urals Division of the Russian Academy of Sciences, Miass, Russia (#8987).

References: (1) Bazhenov, A.G., A.B. Mironov, V.A. Muftakhov, and P.V. Khvorov (2005) Ferriwinchite $\text{NaCaMnFe}^{3+}[\text{Si}_8\text{O}_{22}](\text{OH},\text{F})_2$, a new amphibole-group mineral (Ilmen Mountains alkaline complex, Southern Urals). *Zap. Ross. Mineral. Obshch.*, 134(3), 74-77 (in Russian, English abstract). (2) (2006) *Amer. Mineral.*, 91, 1203 (abs. ref. 1). (3) Hawthorne, F.C., R. Oberti, G.E. Harlow, W.V. Maresch, R.F. Martin, J.C. Schumacher, and M.D. Welch (2012) Nomenclature of the amphibole supergroup. *Amer. Mineral.*, 97, 2031-2048.