Ferri-winchite $\square NaCaMg_4Fe^{3+}(Si_8O_{22})(OH)_2$

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 ~56º. *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 (-). α = 1.670(2) β = 1.680(5) γ = 1.685(6) 2V(meas.) = n.d. 2V(calc.) = n.d. *Orientation*: *Z* = *b*, optic plane ⊥ (010).
Pleochroism: ⊥ to *bc* plane = bright brownish yellow, *Y* = lilac, *Z* = dark blue.

Cell Data: *Space Group*: *C*2/*m*. *a* = 9.811(6) *b* = 18.014(6), *c* = 5.295(4) β = 104.10(6)°
Z = 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_2O_3	1.11
FeO	15.91
MnO	0.76
MgO	14.17
CaO	5.10
Na_2O	5.18
K_2O	0.51
Total	97.76

(1) Ilmen Mountains alkaline complex, Southern Urals, Russia; average of 5 electron microprobe analyses supplemented by spectroscopy; corresponds to $(Na_{0.64}K_{0.38})(Na_{1.98}Ca_{0.02})(Li_{0.66}Mg_{1.42}Fe^{2+}_{0.75}Mn^{2+}_{0.26}Zn_{0.02}Fe^{3+}_{1.69}V^{3+}_{0.01}Ti^{4+}_{0.14}Al_{0.03})(Si_{7.93}Al_{0.07})_{\Sigma=8.00}O_{22}[F_{1.57}(OH)_{0.16}O_{0.27}]_{\Sigma=2.00}$.

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 Fe^{3+} 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 $NaCaMnFe^{3+}[Si_8O_{22}](OH,F)_2$, 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.