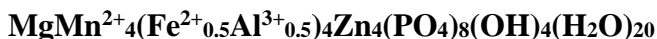


Ferraioloite

Crystal Data: Monoclinic. *Point Group:* 2/m. As plates or blades to 0.2 mm, in books or rosettes to 0.4 mm. Crystals display {010}, {100} and {011} and may have curved faces.

Physical Properties: *Cleavage:* Perfect on {100}. *Fracture:* Irregular. *Tenacity:* Flexible. Hardness = ~ 2 D(meas.) = n.d. D(calc.) = 2.59

Optical Properties: Transparent. *Color:* Greenish gray to lemon-yellow. *Streak:* n.d. *Luster:* Vitreous.

Optical Class: Biaxial (-). $\alpha = 1.575(\text{calc.})$ $\beta = 1.5825(5)$ $\gamma = 1.5835(5)$ $2V(\text{meas.}) = 40(5)^\circ$
Dispersion: Weak, $r > v$. *Orientation:* $X \approx a$, $Y = b$, $Z \approx c$. *Absorption:* $Y \gg X \approx Z$.
Pleochroism: X, Z = colorless, Y = blue-gray.

Cell Data: *Space Group:* I2/m. $a = 25.333(3)$ $b = 6.299(1)$ $c = 15.161(3)$ $\beta = 90.93(3)^\circ$ $Z = 2$

X-ray Powder Pattern: Foote mine, Kings Mountain district, North Carolina, USA. 2.6648 (100), 2.924 (8), 3.245 (7), 3.499 (5), 2.869 (5), 4.78 (4), 4.22 (4)

Chemistry:	(1)	(2)
CaO	0.65	
MgO	1.09	2.17
MnO	16.05	15.26
ZnO	18.90	17.52
FeO	8.02	7.73
Al ₂ O ₃	5.58	5.48
P ₂ O ₅	30.90	30.54
H ₂ O	[21.30]	21.30
Total	102.49	100.00

(1) Foote mine, Kings Mountain district, North Carolina, USA; average of 10 electron microprobe analyses, H₂O calculated; corresponds to Ca_{0.21}Mg_{0.50}Mn²⁺_{4.16}Fe²⁺_{2.05}Al³⁺_{2.01}Zn_{4.27}P_{8.00}H_{43.59}O₅₆.

(2) MgMn²⁺₄(Fe²⁺_{0.5}Al³⁺_{0.5})₄Zn₄(PO₄)₈(OH)₄(H₂O)₂₀.

Occurrence: A secondary phase in sugary pegmatite.

Association: Vivianite, fairfieldite/messelite, phosphophyllite, scholzite/parascholzite, rittmannite, mangangordonite, kingsmountite, kastningite, metaswitzerite.

Distribution: At the Foote Lithium Company mine, Kings Mountain district, Cleveland County, North Carolina, USA.

Name: Honors James (Jim) Anthony Ferraiolo (1947-2014), author of *A Systematic Classification of Nonsilicate Minerals* (Bulletin 172 of the American Museum of Natural History, 1982).

Type Material: Museum Victoria, Melbourne, Australia (M53492 and M53493) and the Natural History Museum of Los Angeles County, Los Angeles, California, USA (65593 and 65594).

References: (1) Mills, S.J., I.E. Grey, A.R. Kampf, C.M. Macrae, J.B. Smith, C.J. Davidson, and A.M. Glenn (2016) Ferraioloite, MgMn²⁺₄(Fe²⁺_{0.5}Al³⁺_{0.5})₄Zn₄(PO₄)₈(OH)₄(H₂O)₂₀, a new secondary phosphate mineral from the Foote mine, USA. *Eur. J. Mineral.*, 28(3), 655-661. (2) (2016) *Amer. Mineral.*, 101, 2779 (abs. ref. 1).