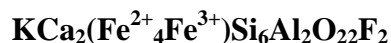


Fluoro-potassichastingsite

Crystal Data: Monoclinic. *Point Group:* 2/m. Crystals, prismatic; in compact aggregates to 1 cm.

Physical Properties: *Cleavage:* Perfect on {110}, intersecting at 56°. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 6 D(meas.) = n.d. D(calc.) = 3.14

Optical Properties: Transparent. *Color:* Black, green on thin edges. *Streak:* Greenish gray. *Luster:* Vitreous.

Optical Class: Biaxial (-). $\alpha = 1.668(2)$ $\beta = 1.688(2)$ $\gamma = 1.698(2)$ $2V(\text{meas.}) = 40\text{--}70^\circ$ $2V(\text{calc.}) = 70^\circ$ *Pleochroism:* X = bluish green; Y = greenish to brownish green; Z = blue to light blue. *Dispersion:* $r < v$, weak. *Orientation:* $Y = b$; $Z \wedge c \approx 23^\circ$.

Cell Data: *Space Group:* C2/m. $a = 9.9480(3)$ $b = 18.1777(6)$ $c = 5.3302(2)$
 $\beta = 105.140(1)^\circ$ $Z = 2$

X-ray Powder Pattern: Greenwood (Patterson) iron mine, Orange County, New York, USA. 8.499(100), 3.151(76), 2.830 (53), 3.299(32), 2.722(23), 2.402(17), 3.401(11)

Chemistry:	(1)	(1)
SiO ₂	40.49	CaO 11.13
TiO ₂	0.11	Na ₂ O 1.24
Al ₂ O ₃	10.29	K ₂ O 2.93
V ₂ O ₃	0.03	Li ₂ O 1.62
Cr ₂ O ₃	0.01	F 2.23
Fe ₂ O ₃	4.49	Cl 0.61
FeO	19.80	H ₂ O 0.70
MnO	0.20	<u>-O=(F+Cl)</u> 1.08
MgO	6.68	Total 99.86

(1) Greenwood (Patterson) iron mine, Orange County, New York; average of 12 electron microprobe analyses, Fe₂O₃ and FeO by Mössbauer spectroscopy, H₂O by hydrogen extraction; using H₂O from stoichiometry, corresponding to (K_{0.59}Na_{0.25}) $\Sigma=0.84$ (Ca_{1.87}Na_{0.13}) $\Sigma=2.00$ (Fe²⁺_{2.60}Mg_{1.56}Fe³⁺_{0.53}Al_{0.26}Mn_{0.03}Ti_{0.01}) $\Sigma=4.99$ (Si_{6.36}Al_{1.64}) $\Sigma=8.00$ O_{22.68}O₃[F_{1.11}(OH)_{0.73}Cl_{0.16}] $\Sigma=2.00$.

Mineral Group: Amphibole group.

Occurrence: A product of potassium-halogen metasomatism of a hastingsite and diopside-bearing rock.

Association: Magnetite, diopside, enstatite, pyrrhotite, chalcopyrite, pyrite, phlogopite.

Distribution: Greenwood (Patterson) iron mine, Harriman State Park, near Tuxedo, Orange County, New York, USA.

Name: For its composition and relationship to hastingsite.

Type Material: New York State Museum, Albany, New York, USA (catalog no. 21205).

References: (1) Lupulescu, M.V., J. Rakovan, D.M. Dyar, G.W. Robinson, and J.M. Hughes (2009) Fluoro-potassichastingsite from the Greenwood mine, Orange County, New York: a new end-member calcic amphibole. *Can. Mineral.*, 47, 909–916. (2) (2010) *Amer. Mineral.*, 95, 205 (abs. ref. 1).