Fluoro-potassichastingsite $KCa_2(Fe^{2+}_4Fe^{3+})Si_6Al_2O_{22}F_2$

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(meas.) = 40–70° 2V(calc.) = 70° *Pleochroism*: *X* = bluish green; *Y* = greenish to brownish green; *Z* = blue to light blue. *Dispersion*: *r* < *v*, weak. *Orientation*: *Y* = *b*; *Z* ^ *c* ≈ 23°.

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

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_2O	1.24
Al_2O_3	10.29	K_2O	2.93
V_2O_3	0.03	Li_2O	1.62
Cr_2O_3	0.01	F	2.23
Fe_2O_3	4.49	Cl	0.61
FeO	19.80	H_2O	0.70
MnO	0.20	-O=(F+Cl)	1.08
MgO	6.68	Total	99.86

(1) Greenwood (Patterson) iron mine, Orange County, New York; average of 12 electron microprobe analyses, Fe_2O_3 and FeO by Mössbauer spectroscopy, H_2O by hydrogen extraction; using H_2O from stoichiometry, corresponding to $(K_{0.59}Na_{0.25})_{\Sigma=0.84}(Ca_{1.87}Na_{0.13})_{\Sigma=2.00}(Fe^{2+}_{2.60}Mg_{1.56}Fe^{3+}_{0.53}Al_{0.26}Mn_{0.03}Ti_{0.01})_{\Sigma=4.99}(Si_{6.36}Al_{1.64})_{\Sigma=8.00}O_{22.68}O_3[F_{1.11}(OH)_{0.73}Cl_{0.16}]_{\Sigma=2.00}$.

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).