Fluoro-potassichastingsite  

**KCa$_2$(Fe$^{2+4}$Fe$^{3+}$)Si$_6$Al$_2$O$_{22}$F$_2$**

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


**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 $\wedge c \approx 23°$.

**Cell Data:** *Space Group:* C2/m.  

\[
\begin{align*}
a &= 9.9480(3) \\
b &= 18.1777(6) \\
c &= 5.3302(2) \\
\beta &= 105.140(1)° \\
Z &= 2
\end{align*}
\]

**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:**

\[
\begin{align*}
\text{SiO}_2 & = 40.49 \\
\text{TiO}_2 & = 0.11 \\
\text{Al}_2\text{O}_3 & = 10.29 \\
\text{V}_2\text{O}_3 & = 0.03 \\
\text{Cr}_2\text{O}_3 & = 0.01 \\
\text{Fe}_2\text{O}_3 & = 4.49 \\
\text{FeO} & = 19.80 \\
\text{MnO} & = 0.20 \\
\text{MgO} & = 6.68
\end{align*}
\]

\[
\begin{align*}
\text{CaO} & = 11.13 \\
\text{Na}_2\text{O} & = 1.24 \\
\text{K}_2\text{O} & = 2.93 \\
\text{Li}_2\text{O} & = 1.62 \\
\text{F} & = 2.23 \\
\text{Cl} & = 0.61 \\
\text{H}_2\text{O} & = 0.70 \\
\text{O} & = 1.08 \\
\text{Total} & = 99.86
\end{align*}
\]

(1) Greenwood (Patterson) iron mine, Orange County, New York; average of 12 electron microprobe analyses, Fe$_2$O$_3$ and FeO by Mössbauer spectroscopy, H$_2$O by hydrogen extraction; using H$_2$O from stoichiometry, corresponding to (K$_{0.59}$Na$_{0.25}$)$_{2.84}$Ca$_{1.8}$Na$_{0.13}$Fe$_{2.60}$Mg$_{1.56}$Fe$^{3+}_{0.53}$Al$_{0.26}$Mn$_{0.06}$Ti$_{0.01}$)$_{2.84.80}$Si$_{6.36}$Al$_{1.64}$O$_{22.68}$[F$_{1.11}(\text{OH})_{0.73}Cl_{0.16}]_{2.00}$.

**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).