Chukhrovite-(Y)  \[
\text{Ca}_3(\text{Y}, \text{Ce})\text{Al}_2(\text{SO}_4)\text{F}_{13} \cdot 10\text{H}_2\text{O}
\]

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Crystal Data:  Cubic.  Point Group: 2/m 3. Crystals show varying degrees of dominance of \{100\} and \{111\}, to 1 cm.


Optical Properties:  Transparent to opaque.  Color: Colorless, white, rarely with a lilac tint.  Luster: Vitreous to pearly, greasy on fracture surfaces.  Optical Class: Isotropic, anomalously birefringent.  \( n = 1.42–1.44 \)

Cell Data:  Space Group: Fd\(\overline{3}\).  \(a = 16.80(0.5)\)  \(Z = 8\)

X-ray Powder Pattern:  Kara-Oba deposit, Kazakhstan.  2.193 (10), 1.834 (10), 3.261 (9), 2.572 (9), 2.843 (8), 1.684 (8), 1.512 (8), 1.684 (8), 1.512 (8)

Chemistry:

\[
\begin{align*}
\text{SO}_4 & \quad 10.38 \\
\text{Al}_2\text{O}_3 & \quad 10.56 \\
\text{RE}_2\text{O}_3 & \quad 18.00 \\
\text{MgO} & \quad 0.40 \\
\text{CaO} & \quad 21.52 \\
(\text{Na}, \text{K})_2\text{O} & \quad \text{trace} \\
\text{F} & \quad 28.32 \\
\text{H}_2\text{O}^+ & \quad 10.80 \\
\text{H}_2\text{O}^- & \quad 12.00 \\
\text{insol.} & \quad \text{trace} \\
-\text{O} = \text{F}_2 & \quad 11.89 \\
\text{Total} & \quad 100.09
\end{align*}
\]

(1) Kara-Oba deposit, Kazakhstan; \(\text{RE}_2\text{O}_3 = \text{Y}_2\text{O}_3 [40.9\%], \text{La}_2\text{O}_3 5\%, \text{Ce}_2\text{O}_3 15\%, \text{Pr}_2\text{O}_3 4\%, \text{Nd}_2\text{O}_3 12\%, \text{Sm}_2\text{O}_3 7.2\%, \text{Eu}_2\text{O}_3 0.2\%, \text{Gd}_2\text{O}_3 6.5\%, \text{Tb}_2\text{O}_3 0.9\%, \text{Dy}_2\text{O}_3 4.1\%, \text{Ho}_2\text{O}_3 0.8\%, \text{Er}_2\text{O}_3 1.7\%, \text{Tm}_2\text{O}_3 0.3\%, \text{Yb}_2\text{O}_3 1.2\%, \text{Lu}_2\text{O}_3 0.2\%\) by X-ray spectroscopy; corresponds to \(\text{Ca}_{3.03}(\text{Y}, \text{Ce})_{0.96}\text{Al}_{1.62}(\text{SO}_4)_{1.06}\text{F}_{11.46}(\text{OH})_{0.40}[\text{Cl}_{11.86} \cdot 9.55\text{H}_2\text{O}\]

Occurrence:  In the oxidation zone of a Mo–W deposit.

Association:  Halloysite, gearksutite, fluorite, creedite, anglesite, “limonite”.

Distribution:  From the Kara-Oba Mo–W deposit, Bet-Pak-Dal Desert, central Kazakhstan.

Name:  Honors Fedor Vasil’evich Chukhrov (1908–1988), Russian mineralogist, Director, Institute of Geology of Ore Deposits, Petrology, Mineralogy, and Geochemistry, Moscow, Russia, and yttrium, the dominant rare-earth element.


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