

**Miserite****K(Ca, Ce)<sub>6</sub>Si<sub>8</sub>O<sub>22</sub>(OH, F)<sub>2</sub>**

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**Crystal Data:** Triclinic. *Point Group:*  $\bar{1}$ . Crystals, unterminated, to 12 mm. Prismatic fragments are largely composed of fine fibers; in cleavable masses. *Twinning:* Lamellar.

**Physical Properties:** *Cleavage:* Perfect on {100}, imperfect on {010}.  
*Fracture:* Subconchoidal to uneven. *Hardness* = 5.5–6 *D*(meas.) = 2.84–2.93  
*D*(calc.) = 2.80

**Optical Properties:** Transparent to translucent. *Color:* Red-brown, raspberry-red, pink, with a lavender hue where weathered. *Streak:* White. *Luster:* Vitreous.  
*Optical Class:* Biaxial (+). *Orientation:*  $Z \simeq a$  on {100};  $Y \wedge c \simeq 2^\circ$  on {100};  $Y \wedge c = 11^\circ$  on {010}. *Dispersion:*  $r > v$ , weak.  $\alpha = 1.576\text{--}1.587$   $\beta = 1.583\text{--}1.589$   $\gamma = 1.591\text{--}1.594$   
 $2V$ (meas.) =  $65^\circ\text{--}86^\circ$   $2V$ (calc.) =  $65^\circ\text{--}87^\circ$

**Cell Data:** *Space Group:*  $P\bar{1}$ .  $a = 10.100(5)$   $b = 16.014(7)$   $c = 7.377(5)$   $\alpha = 96^\circ 25(3)'$   
 $\beta = 111^\circ 9(3)'$   $\gamma = 76^\circ 34(2)'$   $Z = 2$

**X-ray Powder Pattern:** Kipawa Lake, Canada.  
 15.42 (100), 3.14 (90), 3.18 (80), 3.17 (80), 1.667 (66), 2.377 (65), 3.106 (64)

**Chemistry:**

	(1)		(1)
SiO <sub>2</sub>	50.18	Yb <sub>2</sub> O <sub>3</sub>	0.47
Al <sub>2</sub> O <sub>3</sub>	0.60	Lu <sub>2</sub> O <sub>3</sub>	0.04
Y <sub>2</sub> O <sub>3</sub>	3.34	FeO	0.14
La <sub>2</sub> O <sub>3</sub>	0.59	MnO	0.45
CeO <sub>2</sub>	1.00	MgO	0.37
Pr <sub>6</sub> O <sub>11</sub>	0.21	CaO	31.00
Nd <sub>2</sub> O <sub>3</sub>	0.86	Na <sub>2</sub> O	0.81
EuO	0.04	K <sub>2</sub> O	5.58
Dy <sub>2</sub> O <sub>3</sub>	0.58	F	2.04
Er <sub>2</sub> O <sub>3</sub>	0.31	H <sub>2</sub> O	0.55
Tm <sub>2</sub> O <sub>3</sub>	0.03	Total	99.19

(1) Kipawa Lake, Canada; by electron microprobe, augmented by separate analyses for F, Cl, H<sub>2</sub>O; corresponds to  $K_{1.14}(Ca_{5.29}Y_{0.28}RE_{0.22})_{\Sigma=5.79}Si_{8.00}O_{22}[F_{1.03}(OH)_{0.28}]_{\Sigma=1.31}$ .

**Occurrence:** In banded metamorphosed shales at the contact with a dike of nepheline syenite (Wilson Springs, Arkansas, USA); in a carbonatite vein (Kipawa Lake, Canada); in quartz-albite-aegirine veinlets and in albitites in syenites (Dara-i-Pioz massif, Tajikistan).

**Association:** Wollastonite, orthoclase, aegirine (Wilson Springs, Arkansas, USA); “hornblende,” eudialyte, scapolite, fluorite, mosandrite (Kipawa Lake, Canada); baratovite, ekanite, titanite (Dara-i-Pioz massif, Tajikistan).

**Distribution:** In the USA, from the Wilson Springs (Potash Sulphur Springs) mine, between Hot Springs and Magnet Cove, Garland Co., Arkansas, and at Wausau, Marathon Co., Wisconsin. In Canada, from the [Sheffield Lake complex,] Kipawa River, Villedieu Township, and at Mont Saint-Hilaire, Quebec. From the Dara-i-Pioz massif, Alai Range, Tien Shan, Tajikistan. In the Murun massif, southwest of Olekminsk, Yakutia, and other less-well-defined localities in Russia.

**Name:** For Dr. Hugh Dinsmore Miser (1884–1969), geologist with the U.S. Geological Survey.

**Type Material:** National Museum of Natural History, Washington, D.C., USA.

**References:** (1) Schaller, W.T. (1950) Miserite from Arkansas; a renaming of natroxonotlite. *Amer. Mineral.*, 35, 911–921. (2) Berry, L.G., H.-C. Lin, and G.C. Davis (1972) A new occurrence of miserite from the Kipawa Lake area, Temiscamingue Co., Quebec. *Can. Mineral.*, 11, 569 (abs.). (3) Scott, J.D. (1976) Crystal structure of miserite, a Zoltai type 5 structure. *Can. Mineral.*, 14, 515–528. (4) Mandarino, J.A. and V. Anderson (1989) *Monteregian Treasures*. Cambridge Univ. Press, 141.

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