Paraumbite

\[ K_3Zr_2HSi_6O_{18}\cdot nH_2O \]

Crystal Data: Orthorhombic. Point Group: mm2. Equant crystals, to 1 mm; massive.

Physical Properties: Cleavage: \{010\}, perfect micaceous; \{100\} and \{110\}, less perfect. Fracture: Uneven. Hardness = \sim 4.5 \ VHN = 280–504, 384 average. \( D(\text{meas.}) = 2.59 \) \( D(\text{calc.}) = 2.92 \)

Optical Properties: Translucent to transparent. Color: Colorless to white, gray, pale green. Streak: White. Luster: Vitreous, pearly on cleavages. Optical Class: Biaxial (-). Orientation: \( X = c, Y = b, Z = a \). \( \alpha = 1.588(2), \beta = 1.601(2) \) \( \gamma = 1.610(2) \) \( 2V(\text{meas.}) = 82^\circ \)

Cell Data: Space Group: \( P2_1cm \). \( a = 10.34–10.39 \) \( b = 13.25–13.29 \) \( c = 14.55–14.57 \) \( Z = 4 \)

X-ray Powder Pattern: Khibiny massif, Russia. 5.95 \( (10b) \), 3.01 \( (9b) \), 6.46 \( (8) \), 3.47 \( (7) \), 2.90 \( (7) \), 2.56 \( (6) \), 4.06 \( (6b) \)

Chemistry:

\[
\begin{align*}
\text{SiO}_2 & \quad 39.58 \\
\text{TiO}_2 & \quad 0.89 \\
\text{ZrO}_2 & \quad 27.87 \\
\text{HfO}_2 & \quad 0.32 \\
\text{Fe}_2\text{O}_3 & \quad 0.10 \\
\text{CaO} & \quad 0.00 \\
\text{Na}_2\text{O} & \quad 0.12 \\
\text{K}_2\text{O} & \quad 15.39 \\
\text{H}_2\text{O} & \quad [15.73] \\
\text{Total} & \quad [100.00]
\end{align*}
\]

(1) Khibiny massif, Russia; by electron microprobe, \( \text{H}_2\text{O} \) by difference; corresponds to \( (K_{2.92}\text{Na}_{0.03})\Sigma=2.95(Zr_{2.02}\text{Ti}_{0.19}\text{Hf}_{0.01}\text{Fe}_{0.01})\Sigma=2.14\text{Si}_{5.89}\text{O}_{18}\text{H}_{0.94}\cdot 7.34\text{H}_2\text{O} \).

Occurrence: Replacing wadeite in a pegmatite in a differentiated alkaline massif (Khibiny massif, Russia); in altered pegmatite and sodalite xenoliths in an intrusive alkaline gabbro-syenite complex (Mont Saint-Hilaire, Canada).

Association: Eudialyte, wadeite, gaidonnayite, natrolite, pectolite, potassic feldspar (Khibiny massif, Russia); gaidonnayite (Mont Saint-Hilaire, Canada).

Distribution: On Mt. Eveslogchorr, Khibiny massif, Kola Peninsula, Russia. At Mont Saint-Hilaire, Quebec, Canada.

Name: From the Greek \( \text{para} \), for near, and its relation to umbite.

Type Material: Geology Museum, Kola Branch, Academy of Sciences, Apatity, 5842, 5843; Mineralogical Museum, St. Petersburg University, St. Petersburg, 17065; Mining Institute, St. Petersburg, 1630/1; Il’menskii Preserve Museum, Miass, 13095vr; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 82760, vis3464, vis4544, vis4545, vis5045.


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