Kosnarite  
\( \text{KZr}_2(\text{PO}_4)_3 \)

Crystal Data: Hexagonal, pseudocubic. Point Group: \( \overline{3} 2/m \). As rhombohedral pseudocubic crystals, to 0.9 mm, with \{10\overline{1}2\} and tiny \{0001\}.

Physical Properties: Cleavage: Perfect on \{10\overline{1}2\}. Fracture: Conchoidal. Tenacity: Brittle. Hardness = 4.5  D(meas.) = 3.194(2)  D(calc.) = 3.206

Optical Properties: Transparent to translucent. Color: Pale blue to blue-green, bluish gray, nearly colorless. Streak: White. Luster: Vitreous. Optical Class: Uniaxial (+).  \( \omega = 1.656(2) \)  \( \epsilon = 1.682(2) \)

Cell Data: Space Group: \( \text{R}3\text{c} \).  \( a = 8.687(2) \)  \( c = 23.877(7) \)  \( Z = 6 \)

X-ray Powder Pattern: Mt. Mica, Maine, USA. 4.329 (100), 3.806 (90), 2.928 (90), 6.41 (50), 4.679 (50), 2.502 (50), 1.903 (45)

Chemistry:

\[
\begin{array}{lcc}
\text{P}_2\text{O}_5 & \text{ZrO}_2 & \text{HfO}_2 \\
43.3 & 44.5 & 0.5 \\
42.2 & 47.9 & 0.9 \\
42.04 & 48.66 & <0.1 \\
\end{array}
\]

FeO 0.2  MnO 1.0  Na\(_2\)O 1.4  K\(_2\)O 8.7  Rb\(_2\)O 0.25  F 0.20  −O=F 0.08  Total 99.97 100.57 100.00

(1) Mt. Mica, Maine, USA; by electron microprobe, total Fe as FeO, total Mn as MnO; corresponds to \((\text{K}_{0.93}\text{Na}_{0.06}\text{Rb}_{0.01})_{\Sigma=1.02}(\text{Zr}_{1.81}\text{Na}_{0.15}\text{Mn}_{0.07}\text{Fe}_{0.01}\text{Hf}_{0.01})_{\Sigma=2.05}\) \( \text{P}_{1.02}(\text{O}_{3.98}\text{F}_{0.02})_{\Sigma=4.00}\_3 \). (2) Black Mountain, Maine, USA; by electron microprobe, total Fe as FeO, total Mn as MnO; corresponds to \((\text{K}_{0.99}\text{Rb}_{0.01})_{\Sigma=1.00}(\text{Zr}_{1.96}\text{Hf}_{0.02})_{\Sigma=1.98}\) \( \text{P}_{1.00}(\text{O}_{3.98}\text{F}_{0.02})_{\Sigma=4.00}\_3 \). (3) \( \text{KZr}_2(\text{PO}_4)_3 \).

Occurrence: A very rare mineral, formed by late hydrothermal alteration, probably of beryl and zircon, in complex granite pegmatites.

Association: Eosphorite, fluorapatite, móræsite, siderite, zircon, quartz (Mt. Mica, Maine, USA); siderite, albite, quartz (Black Mountain quarry, Maine, USA); wycheproofite, eosphorite, selwynite, cyrilovite, schoorl (Wycheproof, Australia).


Name: For Richard A. Kosnar (1946–), American mineral dealer of Black Hawk, Colorado, USA, long interested in pegmatite minerals.
