Juonniite  \( \text{CaMgSc(PO}_4\text{)}_2(\text{OH})\cdot4\text{H}_2\text{O} \)

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**Crystal Data:** Orthorhombic.  *Point Group:* 2/m 2/m 2/m.  Platy crystals, subparallel, curved, to 12 \( \mu \)m, in spherulites.

**Physical Properties:** Hardness = 4–4.5  \( \text{VHN} = 315–355,330 \) average (20 g load).  
D(meas.) = 2.43(3)  D(calc.) = 2.44


**Optical Class:** Biaxial \((-\)).  \( \alpha = 1.574(1) \)  \( \beta = 1.579(1) \)  \( \gamma = 1.582(2) \)  \( 2V(\text{meas.}) = \text{n.d.} \)  \( 2V(\text{calc.}) = 70.2^\circ \)

**Cell Data:** *Space Group:* [Pbca] (by analogy to overite).  
\( a = 15.03(5) \)  \( b = 18.95(4) \)  \( c = 7.59(1) \)  \( Z = 8 \)

**Chemistry:**

\[
\begin{array}{ccc}
\text{P}_2\text{O}_5 & (1) & 36.16 \\
\text{TiO}_2 & & 0.38 \\
\text{Sc}_2\text{O}_3 & & 13.17 \\
\text{FeO} & & 1.07 \\
\text{MnO} & & 1.28 \\
\text{MgO} & & 12.08 \\
\text{CaO} & & 12.33 \\
\text{SrO} & & 0.55 \\
\text{BaO} & & 1.58 \\
\text{H}_2\text{O} & [21.42] & 20.87 \\
\text{Total} & [100.00] & 100.00 \\
\end{array}
\]

(1) Kovdor massif, Kola Peninsula, Russia; by electron microprobe, average of nine analyses, total Fe as FeO, total Mn as MnO, H\(_2\)O by difference; PO\(_4\), (OH)\(^{−}\), H\(_2\)O confirmed by IR; corresponds to \( \text{Ca}_{0.86}\text{Mn}_{0.07}\text{Ba}_{0.02}\text{Sr}_{0.02}\Sigma=0.99}\text{Mg}_{1.00}\text{Sc}_{0.75}\text{M}_{0.18}\text{Fe}_{0.05}\Sigma=1.00\) PO\(_4\)(OH)\(_{0.83}\) \( \cdot \) 4.25H\(_2\)O.  (2) \( \text{CaMgSc(PO}_4\text{)}_2(\text{OH})\cdot4\text{H}_2\text{O} \).

**Occurrence:** A rare mineral in cavities and contacts with ore minerals in a metasomatized carbonatite stockwork.

**Association:** Dolomite, magnesite, bobierrite, kovdorskite, manasseite, hydrotalcite, apatite, strontiowhitlockite, pyrite, strontian collinsite, rimkorolgite, talc, baddeleyite, zircon, gypsum.

**Distribution:** From the Zhelezny iron mine, Kovdor alkalic massif, Kola Peninsula, Russia.

**Name:** From the Finnish name (Juonni) for the Yona River, in allusion to the locality of first occurrence of the species.

**Type Material:** St. Petersburg Mining Institute, St. Petersburg, Russia.


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