Metatorbernite  
\[ \text{Cu(UO}_2\text{)}_2(\text{PO}_4\text{)}_2\cdot8\text{H}_2\text{O} \]

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Crystal Data: Tetragonal. Point Group: \(4/m\) (with \(4/m 2/m 2/m\) pseudosymmetry). Typically pseudomorphous after torbernite, as square tabular crystals, flattened on \{001\} and modified by \{011\}, in lamellar or subparallel to sheaflike aggregates, and as rosettes, to 2 cm.

Physical Properties: Cleavage: Perfect on \{001\}; indistinct on \{010\}. Tenacity: Brittle. Hardness = 2.5 \(D(\text{meas.}) = 3.52-3.70\) \(D(\text{calc.}) = 3.70-3.71\) Radioactive.

Optical Properties: Transparent to translucent. Color: Pale green to dark green. Luster: Vitreous, subadamantine, pearly on \{001\}. Optical Class: Uniaxial (+) or uniaxial (−); anomalously biaxial in sectors. Pleochroism: Weak; \(O = \) green; \(E = \) pale green to blue. Dispersion: \(r > v\), extreme. Absorption: \(O > E\). \(\omega = 1.618-1.631\) \(\epsilon = 1.622-1.628\)

Cell Data: Space Group: \(P4/n\). \(a = 6.969-6.972\) \(c = 17.277-17.306\) \(Z = 2\)

X-ray Powder Pattern: Schneeberg, Germany. 8.71 (100), 3.678 (100), 3.480 (80), 3.232 (80), 5.44 (75), 4.93 (75), 2.931 (70)

Chemistry:

\[
\begin{array}{ccc}
\text{UO}_3 & 59.67 & 61.01 \\
\text{P}_2\text{O}_5 & 14.00 & 15.14 \\
\text{SiO}_2 & 0.40 & \\
\text{CuO} & 8.50 & 8.48 \\
\text{H}_2\text{O} & 15.00 & 15.37 \\
\hline
\text{Total} & 97.57 & 100.00 \\
\end{array}
\]

(1) Gunnislake mine, England. (2) \(\text{Cu(UO}_2\text{)(PO}_4\text{)}_2\cdot8\text{H}_2\text{O}\).

Mineral Group: Meta-autunite group.

Occurrence: Typically a secondary mineral, a dehydration product of torbernite formed during weathering; formed directly above 75 °C.

Association: Torbernite, meta-autunite.

Distribution: Widespread; probably occurs at all localities for torbernite (q.v.). First described from Schneeberg, Saxony, Germany. Material from the Gunnislake mine, Calstock, Cornwall, England, is thought to be primary.

Name: The prefix meta indicates the dehydration product of torbernite.


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