Meta-autunite

\[
\text{Ca(UO}_2\text{)}_2\text{(PO}_4\text{)}_2\cdot2\text{–6H}_2\text{O}
\]

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**Crystal Data:** Tetragonal. *Point Group:* \(4/m\ 2/m\ 2/m\) or \(422\). As rectangular tabular crystals, exhibiting \{001\}, \{111\}, \{110\}, \{011\}, rarely pyramidal; as foliated or scaly aggregates.

**Physical Properties:** *Cleavage:* Perfect on \{001\}; indistinct on \{010\}. **Hardness** = 2–2.5. **D(meas.)** = 3.35–3.55. **D(calc.)** = 3.31. Radioactive. Fluoresces yellowish green under UV. Dehydrates irreversibly from autunite under ambient conditions.

**Optical Properties:** Translucent to opaque. *Color:* Lemon-yellow to greenish yellow, yellowish green, dark green. *Luster:* Pearly to dull. *Optical Class:* Uniaxial (–), anomalously biaxial (–). *Pleochroism:* \(X = \) colorless to pale yellow; \(Y = Z = \) dark yellow. *Orientation:* \(Z = c\). *Dispersion:* \(\omega > v\), strong. \(\epsilon = 1.594–1.598\) \(\alpha = 1.596–1.604\) \(\beta = 1.602–1.622\) \(\gamma = 1.603–1.630\). \(2V(\text{meas.}) = 5–20\)°

**Cell Data:** *Space Group:* \(P4/nmm\) or \(P4_22\). \(a = 6.99\) \(c = 8.46\) \(Z = 1\)

**X-ray Powder Pattern:** Les Oudots mine, Saône-et-Loire, France. (ICDD 39-1351). 8.46 (100), 3.620 (60), 2.115 (35), 2.615 (30), 1.601 (25), 5.39 (20), 4.233 (20)

**Chemistry:** (1) The mineral usually analyzed as autunite; meta-autunite I contains 6H\(_2\)O; meta-autunite II contains 2H\(_2\)O and probably does not occur in nature.

**Mineral Group:** Meta-autunite group.

**Occurrence:** A secondary mineral, formed as dehydration pseudomorphs after autunite.

**Association:** Autunite.

**Distribution:** Widespread. All autunite (q.v.) localities probably contain meta-autunite.

**Name:** The prefix *meta* indicates the dehydration product of *autunite*.


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