Metakirchheimerite $Co(UO_2)_2(AsO_4)_2 \cdot 8H_2O$

Crystal Data: Tetragonal. *Point Group:* n.d. As square tabular crystals, to 50 μm.

Physical Properties: *Cleavage:* Perfect on {001}; good on {010}. Hardness = 2–2.5 D(meas.) = > 3.33 D(calc.) = [4.11] Radioactive.

Optical Properties: Transparent to translucent. *Color:* Pale rose to flesh-pink; colorless in transmitted light. *Luster:* Pearly on {001}.
Optical Class: Uniaxial (–), anomalously biaxial (–). ω = 1.644(2) ϵ = 1.617(2)
2V(meas.) = 0°–20°

Cell Data: *Space Group:* n.d. $a = 6.98$ $c = 16.93$ Z = [2]

X-ray Powder Pattern: Sophia mine, Germany; indistinguishable from metakahlerite.
8.78 (10), 3.57 (10), 5.08 (6), 4.30 (6), 3.01 (6), 3.42 (5), 2.52 (5)

Chemistry: (1) Sophia mine, Germany; no quantitative analysis has been performed, qualitatively major Co, U, As and minor Fe, Ni were confirmed by microchemical analysis.

Mineral Group: Meta-autunite group.

Occurrence: A very rare secondary mineral formed in the oxidized zone of a U–As deposit.

Association: Metakahlerite, nováčekite, metaheinrichite, erythrite, uraninite.

Distribution: From the dump of the Sophia mine, near Wittichen, Black Forest, Germany.

Name: The prefix *meta* indicates membership of this species in the *meta-autunite* group; the name honors Professor Franz Waldemar Kirchheimer (1911–), former Director of the Geological Survey of Baden-Württemberg, Germany.

Type Material: n.d.

References: (1) Walenta, K. (1958) Die sekundären Uranmineralien des Schwarzwaldes. Jahresheft geol. Landesamt Baden-Württemberg, 3, 17–51, esp. 34–36 (in German).
(2) (1959) Amer. Mineral., 44, 466 (abs. ref. 1). (3) Vochten, R. and A. Goeminne (1984) Synthesis, crystallographic data, solubility, and electrokinetic properties of meta-zeunerite, meta-kirchheimerite and nickel-uranylarsenate. Phys. Chem. Minerals, 11, 95–100.