Metakahlerite $Fe^{2+}(UO_2)_2(AsO_4)_2 \cdot 8H_2O$

Crystal Data: Tetragonal. *Point Group:* n.d. As square tabular crystals, to 80 μm, and in scaly aggregates.

Physical Properties: *Cleavage:* Perfect on {001}; good on {010}. Hardness = n.d. D(meas.) = 3.73–3.77 (synthetic) D(calc.) = [3.83] Radioactive.

Optical Properties: Transparent. *Color:* Yellow to yellow-brown. *Luster:* Pearly on {001}. *Optical Class:* Uniaxial (–), anomalously biaxial (–). *Pleochroism:* Weak; O = pale yellow; E = colorless. $\omega = 1.642(2)$ $\epsilon = 1.608(2)$ 2V(meas.) = 0°–22°

Cell Data: *Space Group:* n.d. $a = 20.25(1)$ $c = 17.20(1)$ Z = 16

X-ray Powder Pattern: Sophia mine, Germany; indistinguishable from metakirchheimerite. 8.55 (10), 3.59 (9), 4.30 (6), 5.11 (5), 3.45 (4), 3.01 (4), 2.15 (4)

Chemistry: (1) Sophia mine, Germany; no quantitative analysis performed, the qualitatively dominant presence of Fe, As, U confirmed by microchemical analysis.

Mineral Group: Meta-autunite group.

Occurrence: A secondary mineral in the oxidized zone of U–As bearing deposits.

Association: Arseniosiderite, scorodite, löllingite, uraninite, siderite (Hüttenberg, Austria); kahlerite (Southwick Cliffs, Scotland).

Distribution: In Germany, in the Black Forest, from the Sophia and St. Joseph mines and at the Schmiedestollen, near Wittichen, and from Menzenschwand; at Ellweiler, Rhineland-Palatinate; and from Schneeberg, Saxony. From Hüttenberg, Carinthia, Austria. At Southwick Cliffs, near Dalbeattie, Kirkcudbrightshire, Scotland. From the Krantzberg mine, 20 km west of Karibib, Namibia.

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

Type Material: n.d.

References: (1) Walenta, K. (1958) Die sekundären Uranmineralien des Schwarzwaldes. Jahresheft geol. Landesamt Baden-Württemberg, 3, 17–51, esp. 33–34 (in German). (2) (1960) Amer. Mineral., 45, 254 (abs. ref. 1). (3) Walenta, K. (1964) Beiträge zur Kenntnis seltener Arsenatmineralien unter besonderer Berücksichtigung von Vorkommen des Schwarzwaldes. 1. Folge. Tschermaks Mineral. Petrog. Mitt., 9, 111–174, esp. 173 (in German). (4) Vochten, R., E. De Grave, and J. Pelsmaekers (1986) Synthesis, crystallographic and spectroscopic data, solubility, and electrokinetic properties of metakahlerite and its Mn analogue. Amer. Mineral., 71, 1037–1044.