

**Crystal Data:** Orthorhombic. *Point Group:*  $2/m\ 2/m\ 2/m$ . As topotactically oriented alteration rims, threaded by minute tubes || [001], on schoepite crystals.

**Physical Properties:** *Cleavage:* [{001}] (by analogy to schoepite and paraschoepite, with which this is an intermediate dehydration product). *Tenacity:* [Brittle.] *Hardness* = [~2.5] *D*(meas.) = n.d. *D*(calc.) = [4.69–4.97] *Radioactive.*

**Optical Properties:** Semitransparent. *Color:* Bright yellow.

*Optical Class:* Biaxial (–) (indices given here are intermediate between schoepite and paraschoepite). *Pleochroism:*  $X$  = almost colorless;  $Y = Z$  = lemon-yellow to golden yellow. *Orientation:*  $X = c$ ;  $Y = b$ ;  $Z = a$ . *Dispersion:*  $r > v$ .  $\alpha = 1.690$ – $1.700$   $\beta = 1.714$ – $1.750$   $\gamma = 1.735$ – $1.770$   $2V$ (meas.) = Large.

**Cell Data:** *Space Group:*  $Pbna$ .  $a = 13.99(4)$   $b = 16.72(5)$   $c = 14.73(4)$   $Z = 32$

**X-ray Powder Pattern:** Shinkolobwe, Congo; identical to paraschoepite.

5.09 (100), 3.45 (25), 3.39 (17), 2.890 (7), 2.48 (7b), 2.542 (6), 2.023 (5)

**Chemistry:** Composition intermediate between schoepite, UO<sub>3</sub>•2H<sub>2</sub>O, and paraschoepite, UO<sub>3</sub>•1–2H<sub>2</sub>O.

**Occurrence:** An irreversible alteration product of schoepite from the oxidized zone of uranium-bearing mineral deposits.

**Association:** Schoepite, paraschoepite.

**Distribution:** From Shinkolobwe, Katanga Province, Congo (Shaba Province, Zaire). Probably at many other schoepite occurrences.

**Name:** From the Greek *meta*, for a lower hydration state, and its relation to *schoepite*.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 94712.

**References:** (1) Christ, C.L. and J.R. Clark (1960) Crystal chemical studies of some uranyl oxide hydrates [schoepite II]. *Amer. Mineral.*, 45, 1026–1061. (2) Christ, C.L. (1965) Phase transformations and crystal chemistry of schoepite. *Amer. Mineral.*, 50, 235–239.