Schoepite $(UO_2)_4O(OH)_6 \cdot 6H_2O$

Crystal Data: Orthorhombic. *Point Group:* $mm2$. Commonly in crystals, tabular ∥ {001}, equant, may be short prismatic along {001}, to 1.5 mm; highly developed, with over 20 forms noted; rarely in microcrystalline aggregates.

Physical Properties: *Cleavage:* {001}, perfect. *Tenacity:* Brittle. Hardness = ∼2.5 D(meas.) = 4.8–4.96 D(calc.) = 4.87 Radioactive; fluoresces green under UV.

Optical Properties: Transparent. *Color:* Sulfur-yellow to citron-yellow; brownish yellow to amber-yellow, as a surficial alteration towards metaschoepite and paraschoepite; yellow in transmitted light. *Streak:* Yellow. *Luster:* Adamantine.
Optical Class: Biaxial (–). *Pleochroism:* X = almost colorless; $Y = Z$ = lemon-yellow to golden yellow. *Orientation:* $X = c$; $Y = b$; $Z = a$. *Dispersion:* $r > v$, strong. $\alpha = 1.690(3)$ $\beta = 1.714(3)$ $\gamma = 1.735(3)$ 2V(meas.) = 75°–85°

Cell Data: *Space Group:* $P2_1ca$. $a = 14.337(3)$ $b = 16.813(5)$ $c = 14.731(4)$ Z = 8

X-ray Powder Pattern: Shaba Province, Congo.
7.35 (100), 3.66 (50), 3.24 (9), 2.446 (9), 2.571 (4), 3.21 (3), 3.162 (3)

Chemistry:

	(1)	(2)
UO_3	87.73	87.59
H_2O	12.32	12.41
Total		100.00

(1) Shaba Province, Congo; UO_3 average of four partial determinations, H_2O average of two partial determinations. (2) $(UO_2)_4O(OH)_6 \cdot 6H_2O$.

Occurrence: A rare alteration product of uraninite in hydrothermal uranium deposits; may form directly from ianthinite.

Association: Uraninite, becquerelite, billietite, vandendriesscheite, fourmarierite, ianthinite, curite, soddyite, rutherfordine, uranophane (Shinkolobwe, Congo); paraschoepite, arsenuranylite, metazeunerite, uranospinite, nováčekite (Cherkasar deposit, Uzbekistan).

Distribution: From Shinkolobwe, Katanga Province, Congo (Shaba Province, Zaire). In the USA, at Beryl Mountain, Acworth, Sullivan Co., and in the Ruggles mine, Grafton, and the Palermo mine, near North Groton, Grafton Co., New Hampshire; in Utah, at the Consolidated mine, Green Vein Mesa, Emery Co., the Happy Jack mine, White Canyon, and the Frey No. 4 mine, Red Canyon, San Juan Co., and the Oyler Tunnel claim, near Fruita, Wayne Co.; at the Lookout No. 22 claim, Marshall Pass district, Saguache Co., Colorado; from the Monument No. 2 mine, Apache Co., the Abe Lincoln mine, northeast of Wickenburg, Yavapai Co., and the Black Point-Murphy mine, near Cameron, Coconino Co., Arizona; from Paguate, Valencia Co., New Mexico; in the Lucky Mc mine, Gas Hills district, Fremont Co., Wyoming. From Wölsendorf, Bavaria, Germany. In the Margnac mine, Compreignac, Haute-Vienne, and at the Mas-d'Alary and Rabéjac uranium deposits, south of Lodève, Hérault, France. In Japan, at Akura, Okayama Prefecture, and in the Tarumi mine, Kagoshima Prefecture. From the Cherkasar uranium deposit, Chaktal Mountains, Uzbekistan. Several additional localities are known.

Name: Honors Alfred Schoep (1881–1966), Professor of Mineralogy, University of Ghent, Ghent, Belgium, for his contributions to uranium mineralogy.

Type Material: Royal Ontario Museum, Toronto, Canada, M13072.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 627–628. (2) Frondel, C. (1958) Systematic mineralogy of uranium and thorium. U.S. Geol. Sur. Bull. 1064, 72–78. (3) Toussaint, J. and H. Brasseur (1959) Sur la structure de quelques composés uranifères hydratés. Bull. Cl. Sci. Acad. Roy. Belg., 45, 501–506 (in French). (4) Christ, C.L. and J.R. Clark (1960) Crystal chemical studies of some uranyl oxide hydrates [schoepite-I]. Amer. Mineral., 45, 1026–1061. (5) Finch, R.J., M.A. Cooper, F.C. Hawthorne, and R.C. Ewing (1996) The crystal structure of schoepite, $[(UO_2)_8O_2(OH)_{12}](H_2O)_{12}$. Can. Mineral., 34, 1071–1088.