Demesmaekerite $Pb_2Cu_5(UO_2)_2(Se^{4+}O_3)_6(OH)_6 \cdot 2H_2O$

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Crystal Data: Triclinic. *Point Group:* $\overline{1}$. Crystals are elongated along [001] and flattened on {100} or {010}, with dominant {100} and {010}, secondary faces typically striated ‖ [101], to 1 cm; in radial aggregates.

Physical Properties: Hardness = 3–4 D(meas.) = 5.28(4) D(calc.) = 5.42 Radioactive.

Optical Properties: Translucent to opaque. *Color:* Bottle-green to pale olive-green, becoming brownish green with dehydration.
Optical Class: Biaxial (+). *Pleochroism:* X' = yellow-green; Y' = brown. $\alpha = 1.835(5)$ (α') β = n.d. $\gamma = 1.910(5)$ (γ') 2V(meas.) = n.d.

Cell Data: *Space Group:* $P\overline{1}$. $a = 11.955(5)$ $b = 10.039(4)$ $c = 5.639(2)$ $\alpha = 89.78(4)°$ $\beta = 100.36(4)°$ $\gamma = 91.34(4)°$ Z = 1

X-ray Powder Pattern: Musonoi mine, Congo.
2.97 (FFF), 5.42 (FF), 5.89 (F), 3.34 (F), 5.14 (mF), 4.72 (mF), 4.67 (mF)

Chemistry:

	(1)	(2)
SeO_2	30.9	30.65
UO_3	27.6	26.34
PbO	19.4	20.55
CuO	18.2	18.31
H_2O	4.2	4.15
Total	100.3	100.00

(1) Musonoi mine, Congo; H_2O by the Penfield method; corresponds to $Pb_{1.87}Cu_{4.93}(UO_2)_{2.08}(SeO_3)_6(OH)_{6.04} \cdot 2H_2O$. (2) $Pb_2Cu_5(UO_2)_2(SeO_3)_6(OH)_6 \cdot 2H_2O$.

Occurrence: Rare in the lower oxidized portions of a selenium-bearing Cu–Co deposit.

Association: Cuprosklodowskite, kasolite, guilleminite, derriksite, chalcomenite, malachite, selenian digenite.

Distribution: From the Musonoi Co–Cu mine, near Kolwezi, Katanga Province, Congo (Shaba Province, Zaire).

Name: Honors Gaston Demesmaeker (1911–), Belgian mining geologist, Director, Geological Department, Union Minière du Haut Katanga.

Type Material: University of Pierre and Marie Curie, Paris, 9.097; Natural History Museum, Paris, 181.36; National School of Mines, Paris, France; The Natural History Museum, London, England, 1969,46.

References: (1) Cesbron, F., B. Bachet, and R. Oosterbosch (1965) La demesmaekerite, sélénite hydraté d'uranium, cuivre, et plomb. Bull. Minéral., 88, 422–425 (in French). (2) (1966) Amer. Mineral., 51, 1815–1816 (abs. ref. 1). (3) Ginderow, D. and F. Cesbron (1983) Structure de la demesmaekerite, $Pb_2Cu_5(SeO_3)_6(UO_2)_2(OH)_6 \cdot 2H_2O$. Acta Cryst., 39, 824–827 (in French). (4) Burns, P.C. and F.C. Hawthorne (1996) Static and dynamic Jahn-Teller effects in Cu^{2+} oxysalt minerals. Can. Mineral., 34, 1089–1105.

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