Marécottite  
\[ \text{Mg}_3(\text{UO}_2)_4(\text{SO}_4)_2\text{O}_3(\text{OH}) \cdot 28\text{H}_2\text{O} \]

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Crystal Data: Orthorhombic. Point Group: \( mm2 \). Crystals, to 4 mm, are flattened on \{100\}, striated parallel [001], bound by large \{010\}, \{011\}, \{230\}; modified by \{230\}, \{101\}, \{201\}, \{301\}, \{211\}, \{210\}.

Physical Properties: Cleavage: Perfect on \{100\}; imperfect on \{010\}. Hardness = n.d.  
D(meas.) = 4.4  D(calc.) = 4.37  Radioactive; dehydrates at ambient temperature.

Optical Class: Biaxial (-). Pleochroism: \( Y = \) yellowish green; \( Z = \) yellowish brown. Orientation: \( X = a; Y = b; Z = c \). \( \alpha = \) n.d.  \( \beta = 1.780-1.785 \)  \( \gamma = 1.795-1.800 \)  2V(meas.) = 39°  2V(calc.) = n.d.

Cell Data: Space Group: \( P2_1bn \).  
\[ a = 16.4537(10) \quad b = 17.2229(10) \quad c = 6.9879(4) \quad Z = 4 \]

X-ray Powder Pattern: Musonoi mine, Congo.  
8.23 (FFF), 3.09 (FFF), 3.22 (FF), 2.900 (FF), 3.02 (F), 8.65 (mF), 4.44 (mF)

Chemistry:  
\[
\begin{array}{ll}
\text{Chemistry} & (1) & (2) \\
\text{UO}_3 & 60.5 & 65.82 \\
\text{SeO}_2 & 23.7 & 17.02 \\
\text{CuO} & 4.3 & 6.10 \\
\text{H}_2\text{O} & 10.7 & 11.06 \\
\text{Total} & 99.2 & 100.00 \\
\end{array}
\]

(1) Musonoi Extension mine, Congo; \( \text{H}_2\text{O} \) by the Penfield method., partially dehydrated material approaching a probable composition \( \text{Cu(UO}_2\text{)}_3\text{O}_2(\text{SeO}_3)_2\cdot6\text{H}_2\text{O} \).  
(2) \( \text{Cu(UO}_2\text{)}_3\text{O}_2(\text{SeO}_3)_2\cdot8\text{H}_2\text{O} \).

Occurrence: A rare alteration product of selenian digenite in the oxidation zone of a uranium-bearing Cu–Co hydrothermal ore deposit.

Association: Digenite, demesmaekerite, denningite, guilleminite.

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

Name: To honor Aimé Marthoz (1894–1962), former Director of the Union Minière de Haut-Katanga, Congo.

Type Material: University of Pierre and Marie Curie, Paris, 12.252; Natural History Museum, Paris; National School of Mines, Paris, France.

References:  
(3) Cooper, M.A. and F.C. Hawthorne (2001) Structure topology and hydrogen bonding in marthozite, \( \text{Cu}^{2+}[\text{(UO}_2\text{)}_3(\text{SeO}_3)_2\text{O}_2](\text{H}_2\text{O})_8 \), a comparison with guilleminite, \( \text{Ba}[\text{(UO}_2\text{)}_3(\text{SeO}_3)_2\text{O}_2](\text{H}_2\text{O})_3 \). Can. Mineral., 39, 797–807.

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