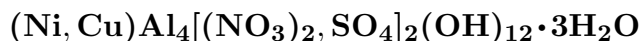


Mbobomkulite



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Crystal Data: Monoclinic. *Point Group:* 2. Pseudo-hexagonal crystals, to 10 μm , stacked along [001] and as rosettes, forming very fine-grained powdery nodules.

Physical Properties: *Cleavage:* On {001}, perfect. Hardness = "Very soft".
D(meas.) = 2.30 D(calc.) = 2.344

Optical Properties: Semitransparent. *Color:* Pale blue; colorless in transmitted light.
Optical Class: Biaxial. *Orientation:* $X' \wedge c \simeq 10^\circ$. $\alpha = 1.515$ $\beta = \text{n.d.}$ $\gamma = 1.585$
 $2V(\text{meas.}) = \text{n.d.}$

Cell Data: *Space Group:* $P2_1$ (by analogy to chalcoalumite). $a = 10.171$ $b = 8.865$
 $c = 17.145$ $\beta = 95.37^\circ$ $Z = 4$

X-ray Powder Pattern: Mbobo Mkulu Cave, South Africa.
8.550 (100), 4.271 (40), 7.87 (15), 4.549 (15), 3.179 (15), 3.054 (15), 2.512 (15)

Chemistry:	(1)
SO ₃	3.81
N ₂ O ₅	15.23
SiO ₂	1.91
Al ₂ O ₃	39.42
NiO	7.98
CuO	4.28
C	0.26
F	0.07
H ₂ O	27.90
-O = F ₂	0.03
Total	100.83

(1) Mbobo Mkulu Cave, South Africa; C, N, H by gas chromatography; about 5% additional H₂O is absorbed after removal from a dessicator; after deduction of SiO₂, Al₂O₃, H₂O as allophane, corresponds to $(\text{Ni}_{0.57}\text{Cu}_{0.29})_{\Sigma=0.86}\text{Al}_{3.93}[(\text{NO}_3)_{1.50}(\text{SO}_4)_{0.25}]_{\Sigma=1.75}[(\text{OH})_{11.45}\text{F}_{0.02}]_{\Sigma=11.47} \cdot 1.59\text{H}_2\text{O}$.

Occurrence: A rare product of oxidation and leaching of Ni-Cu from sulfides in the cave roof, reacting with aluminum from phyllosilicates and nitrate from bat guano (Mbobo Mkulu Cave, South Africa); in a sedimentary U-V deposit (Jomac mine, Utah, USA).

Association: Allophane, chalcoalumite, hydrombobomkulite (Mbobo Mkulu Cave, South Africa); oswaldpeetersite, cuprite, antlerite, goethite, lepidocrocite, hydrombobomkulite, sklodowskite, gypsum (Jomac mine, Utah, USA).

Distribution: In the Mbobo Mkulu Cave, near Ngodwana, Eastern Transvaal, South Africa. From the Jomac mine, White Canyon district, San Juan Co., Utah, USA.

Name: For the Mbobo Mkulu Cave, South Africa, the mineral's first-noted occurrence.

Type Material: Museum of the Geological Survey, Pretoria, South Africa.

References: (1) Martini, J.E.J. (1980) Mbobomkulite, hydrombobomkulite and nickelalumite, new minerals from Mbobo Mkulu Cave, eastern Transvaal. *Ann. Geol. Surv. South Africa*, 14(2), 1-10. (2) (1982) *Amer. Mineral.*, 67, 415-416 (abs. ref. 1).