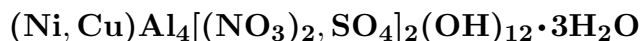


# Mbobomkulite



©2001-2005 Mineral Data Publishing, version 1

**Crystal Data:** Monoclinic. *Point Group:* 2. Pseudo-hexagonal crystals, to 10  $\mu\text{m}$ , 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(meas.) = 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)

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

(1) Mbobo Mkulu Cave, South Africa; C, N, H by gas chromatography; about 5% additional H<sub>2</sub>O is absorbed after removal from a dessicator; after deduction of SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, H<sub>2</sub>O 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).