

## Metaköttigite



©2001-2005 Mineral Data Publishing, version 1

**Crystal Data:** Triclinic. *Point Group:* 1 or  $\bar{1}$ . Tabular crystals, very small, intergrown with köttigite. *Twinning:* Universal on  $\{1\bar{1}0\}$ .

**Physical Properties:** *Cleavage:*  $\{1\bar{1}0\}$ , perfect. Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.03

**Optical Properties:** Semitransparent. *Color:* Bluish gray.

*Optical Class:* Biaxial (-). *Pleochroism:* Strong; X = deep blue; Y = yellow; Z = light yellow.  $\alpha = 1.648(3)$   $\beta = 1.680(1)$   $\gamma = 1.716(2)$   $2V(\text{meas.}) = 94(1)^\circ$

**Cell Data:** *Space Group:* P1 or  $P\bar{1}$ .  $a = 7.96(2)$   $b = 9.44(2)$   $c = 4.72(1)$   $\alpha = 95.6(2)^\circ$   $\beta = 97.0(2)^\circ$   $\gamma = 107.8(2)^\circ$  Z = 1

**X-ray Powder Pattern:** Ojuela mine, Mexico; very similar to symplecite. 6.91 (100), 8.90 (40), 3.93 (30), 3.00 (30), 3.11 (25), 2.83 (25), 4.99 (20)

### Chemistry:

	(1)
As <sub>2</sub> O <sub>5</sub>	37.36
FeO	14.70
CoO	0.09
ZnO	22.50
H <sub>2</sub> O	[25.35]
Total	[100.00]

(1) Ojuela mine, Mexico; by electron microprobe, average of two analyses, total Fe as FeO, H<sub>2</sub>O by difference; corresponds to  $(\text{Zn}_{1.72}\text{Fe}_{1.27}\text{Co}_{0.01})_{\Sigma=3.00}(\text{AsO}_4)_{2.02} \cdot 8[\text{H}_2\text{O, (OH)}]$ .

**Polymorphism & Series:** Dimorphous with köttigite.

**Occurrence:** A rare secondary mineral from the oxide zone of an arsenic-rich polymetallic mineral deposit, formed by oxidation and concomitant dehydrogenization of ferroan köttigite.

**Association:** Köttigite, smithsonite, adamite, goethite.

**Distribution:** In the Ojuela mine, Mapimí, Durango, Mexico.

**Name:** For its dimorphous relation to köttigite, and by analogy to *metavivianite*.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 160541.

**References:** (1) Schmetzer, K., G. Amthauer, V. Stähle, and O. Medenbach (1982) Metaköttigite,  $(\text{Zn, Fe}^{3+})(\text{Zn, Fe}^{3+}, \text{Fe}^{2+})_2(\text{AsO}_4)_2 \cdot 8(\text{H}_2\text{O, OH})$ , ein neues Mineral aus Mapimi, Mexiko. Neues Jahrb. Mineral., Monatsh., 506-518 (in German with English abs.). (2) (1983) Amer. Mineral., 68, 1039 (abs. ref. 1).