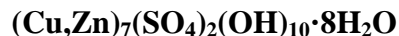


**Minohlite**

**Crystal Data:** Hexagonal. *Point Group:* n.d. Hexagonal platy crystals, to 50  $\mu\text{m}$ , form rosettes to 100  $\mu\text{m}$ .

**Physical Properties:** *Cleavage:* Perfect on {0001}. *Fracture:* n.d. *Tenacity:* Brittle. Hardness = < 2 D(meas.) = 3.39 [Impure material.] D(calc.) = 3.28 Soluble in dilute HCl.

**Optical Properties:** Transparent. *Color:* Bluish green. *Streak:* Pale green. *Luster:* Pearly to vitreous.

*Optical Class:* n.d. *Anisotropic.* *Birefringence:* Moderate. *Pleochroism:* None.

**Cell Data:** *Space Group:* n.d.  $a = 8.2535(11)$   $c = 8.1352(17)$   $Z = 1$

**X-ray Powder Pattern:** Hirao mine, Minoh (Minoo) City, Osaka Prefecture, Japan. 2.702 (100), 2.564 (76), 1.560 (43), 4.128 (24), 1.532 (24), 8.138 (20), 1.351 (12)

<b>Chemistry:</b>	(1)
CuO	37.18
ZnO	21.08
FeO	0.49
SO <sub>3</sub>	16.78
SiO <sub>2</sub>	0.44
<u>H<sub>2</sub>O</u>	<u>[24.03]</u>
Total	100.00

(1) Hirao mine, Minoh City, Osaka Prefecture, Japan; average of 5 electron microprobe analyses, H<sub>2</sub>O by difference, OH, H<sub>2</sub>O, SO<sub>4</sub> confirmed by IR spectroscopy; corresponds to  $(\text{Cu}_{4.43}\text{Zn}_{2.45}\text{Fe}_{0.06})_{\Sigma=6.94}[(\text{SO}_4)_{1.99}(\text{SiO}_4)_{0.07}]_{\Sigma=2.06}(\text{OH})_{9.64}\cdot 7.81\text{H}_2\text{O}$ .

**Occurrence:** A secondary mineral in the oxidized zone of a Cu Zn sulfide deposit.

**Association:** Chamosite, muscovite, smithsonite, serpierite, ramsbeckite, limonite, chalcocopyrite.

**Distribution:** From the Hirao mine, Minoh (Minoo) City, Osaka Prefecture, Japan.

**Name:** For Minoh City, from where the first specimens were collected.

**Type Material:** National Museum of Nature and Science, Tsukuba (NSM-M43670 & M43671), and the Kyoto University Museum, Kyoto (KUM-M00001), Japan.

**References:** (1) Ohnishi, M., N. Shimobayashi, D. Nishio-Hamane, K. Shinoda, K. Momma, and T. Ikeda (2013) Minohlite, a new copper-zinc sulfate mineral from Minoh, Osaka, Japan. *Mineral. Mag.*, 77(3), 335-342. (2) (2015) *Amer. Mineral.*, 100, 2011-2012 (abs. ref. 1).