

# Leightonite

# $\text{K}_2\text{Ca}_2\text{Cu}(\text{SO}_4)_4 \cdot 2\text{H}_2\text{O}$

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**Crystal Data:** Orthorhombic. *Point Group:*  $2/m\ 2/m\ 2/m$ . Lathlike crystals, flattened on {100}, elongated along [010], or equant, showing {100}, {101}, {110}, {113}, several other forms, to 4 mm; commonly forms cross-fiber veinlets. *Twining:* On  $\{20\bar{1}\}$ .

**Physical Properties:** Hardness = 3 D(meas.) = 2.95 D(calc.) = 2.95

**Optical Properties:** Transparent to translucent. *Color:* Pale watery blue to greenish blue; pale blue in transmitted light. *Luster:* Vitreous.

*Optical Class:* Biaxial (-). *Orientation:*  $X = c; Y = b; Z = a$ . *Dispersion:*  $r > v$ , moderately strong.  $\alpha = 1.574\text{--}1.578$   $\beta = 1.587$   $\gamma = 1.595$   $2V(\text{meas.}) = \sim 60^\circ$   $2V(\text{calc.}) = 89^\circ 06'$

**Cell Data:** *Space Group:*  $Fmmm$ .  $a = 11.654(2)$   $b = 7.497(1)$   $c = 10.097(1)$   
 $\beta = 125.21(1)^\circ$   $Z = 2$

**X-ray Powder Pattern:** Chuquicamata, Chile.

2.90 (100), 3.18 (60), 1.781 (30), 2.22 (20), 2.51 (10), 2.40 (10), 1.461 (10)

## Chemistry:

	(1)	(2)
SO <sub>3</sub>	49.33	49.87
CuO	11.97	12.39
CaO	18.41	17.46
Na <sub>2</sub> O	0.56	
K <sub>2</sub> O	13.93	14.67
H <sub>2</sub> O	5.71	5.61
Total	99.91	100.00

(1) Chuquicamata, Chile; corresponds to  $(\text{K}_{1.92}\text{Na}_{0.12})_{\Sigma=2.04}\text{Ca}_{2.13}\text{Cu}_{0.98}(\text{SO}_4)_{4.00} \cdot 2.06\text{H}_2\text{O}$ .

(2)  $\text{K}_2\text{Ca}_2\text{Cu}(\text{SO}_4)_4 \cdot 2\text{H}_2\text{O}$ .

**Occurrence:** Of localized occurrence in the oxidized zone of a copper deposit, probably formed under conditions of low acidity (Chuquicamata, Chile).

**Association:** Natrochalcite, blödite, atacamite, bellingerite, kröhnkite, gypsum, quartz (Chuquicamata, Chile); chalcantite, anhydrite, lammerite (Tsumeb, Namibia).

**Distribution:** From Chuquicamata, Antofagasta, Chile. At Tsumeb, Namibia.

**Name:** Honors Tomás Leighton Donoso (1896–1967), Chilean mining engineer and Professor of Mineralogy, University of Santiago, Santiago, Chile.

**Type Material:** The Natural History Museum, London, England, 1938,56; Harvard University, Cambridge, Massachusetts, 97540–97544; National Museum of Natural History, Washington, D.C., USA, C5536.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 461–462. (2) Van Loan, P.R. (1962) An X-ray study of leightonite. *Can. Mineral.*, 7, 272–277. (3) Manchetti, S., L. Bindi, P. Bonazzi, and F. Olmi (2002) Disordered distribution of Cu in the crystal structure of leightonite,  $\text{K}_2\text{Ca}_2\text{Cu}(\text{SO}_4)_4 \cdot 2\text{H}_2\text{O}$ . *Amer. Mineral.*, 87, 721–725.