

Bellingerite

$\text{Cu}_3(\text{IO}_3)_6 \cdot 2\text{H}_2\text{O}$

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Complex euohedral crystals, to 2 mm, elongated along [010] and flattened on [100], show {100}, {010}, {001}, {102}, {201}, {20 $\bar{1}$ }, {011}, {02 $\bar{1}$ }, and 20 other forms; {100} striated parallel [010]. *Twinning:* On { $\bar{1}$ 10}, common, but may not show re-entrants.

Physical Properties: *Fracture:* Subconchoidal. *Tenacity:* Brittle. Hardness = ~ 4
D(meas.) = 4.89(1) D(calc.) = 4.932 Slightly soluble in hot H_2O .

Optical Properties: Semitransparent. *Color:* Pale green; pale bluish green in transmitted light. *Streak:* Very pale green.
Optical Class: Biaxial (+). *Pleochroism:* X = Y = pale bluish green; Z = blue-green.
Orientation: X ($70^\circ, -70^\circ$); Y ($38^\circ, 175^\circ$); Z ($59^\circ, 34^\circ$) [with c ($0^\circ, 0^\circ$) and b* ($0^\circ, 90^\circ$) using (ϕ, ρ)]. *Dispersion:* $r > v$, strong. *Absorption:* $Z > X = Y$. $\alpha = 1.890$ $\beta = 1.90$ $\gamma = 1.99$
2V(meas.) = Medium.

Cell Data: *Space Group:* $P\bar{1}$. $a = 7.2560(23)$ $b = 7.9503(15)$ $c = 7.8559(17)$
 $\alpha = 105.096(16)^\circ$ $\beta = 92.945(22)^\circ$ $\gamma = 96.952(21)^\circ$ Z = 1

X-ray Powder Pattern: Chuquicamata, Chile. (ICDD 19-393).
3.72 (100), 3.35 (90), 3.17 (90), 3.82 (70), 3.07 (65), 3.13 (60), 3.57 (55)

Chemistry:

	(1)	(2)
I_2O_5	18.65	18.70
CuO	77.55	78.48
H_2O	3.22	2.82
Total	99.42	100.00

(1) Chuquicamata, Chile; corresponds to $\text{Cu}_{3.00}(\text{IO}_3)_{5.94} \cdot 2.28\text{H}_2\text{O}$. (2) $\text{Cu}_3(\text{IO}_3)_6 \cdot 2\text{H}_2\text{O}$.

Occurrence: A rare secondary mineral in veinlets in a porphyry copper deposit.

Association: Leightonite, gypsum.

Distribution: From Chuquicamata, Antofagasta, Chile.

Name: To honor Herman C. Bellinger (1867–1940), General Manager of the Chile Exploration Company, who submitted the first specimens.

Type Material: Harvard University, Cambridge, Massachusetts, USA, 95026.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 313–315. (2) Ghose, S. and C. Wan (1974) Structural chemistry of copper and zinc minerals. II. Stereochemistry of copper(II) and iodine(V) in bellingerite, $3\text{Cu}(\text{IO}_3)_2 \cdot 2\text{H}_2\text{O}$. Acta Cryst., 30, 965–974. (3) Berman, H. and C.W. Wolfe (1940) Bellingerite, a new mineral from Chuquicamata, Chile. Amer. Mineral., 25, 505–512.