

Crystal Data: Monoclinic, pseudorhombohedral. *Point Group:* 2/*m*. As complex intergrowths of crystals and twinned grains, to 1 mm; as powdery aggregates. *Twinning:* Very common on {100}.

Physical Properties: *Cleavage:* Perfect on {012}. *Fracture:* Even. *Tenacity:* Brittle. Hardness = 3 D(meas.) = n.d. D(calc.) = 3.77

Optical Properties: Transparent to translucent. *Color:* Green to dark greenish black, rarely greenish blue. *Luster:* Adamantine to vitreous.

Optical Class: Biaxial (-). *Orientation:* $X = b$; $Y \wedge a = 10^\circ$. *Dispersion:* $r \gg v$, strong. $\alpha = \text{n.d.}$ $\beta = \text{n.d.}$ $\gamma = \text{n.d.}$ $2V(\text{meas.}) = 75(5)^\circ$ $2V(\text{calc.}) = 69(3)^\circ$

Cell Data: *Space Group:* $P2_1/n$. $a = 6.157(2)$ $b = 6.814(3)$ $c = 9.105(5)$ $\beta = 99.65(4)^\circ$ $Z = 4$

X-ray Powder Pattern: Chuquicamata, Chile; nearly identical to paratacamite. 5.47 (100), 2.742 (70), 2.767 (60), 2.266 (60), 2.243 (50), 1.704 (50), 2.887 (40)

Chemistry:

	(1)	(2)
CuO	74.7	74.49
Cl	16.5	16.60
H ₂ O	[13.5]	12.65
-O = Cl ₂	3.7	3.74
Total	[101.0]	100.00

(1) Chuquicamata, Chile; by electron microprobe, H₂O calculated from stoichiometry; corresponds to Cu_{1.96}Cl_{0.97}O_{3.03}H_{3.11}. (2) Cu₂Cl(OH)₃.

Polymorphism & Series: Polymorphous with atacamite, botallackite, and paratacamite.

Occurrence: An oxidation product of other copper minerals.

Association: Atacamite, paratacamite, gypsum, alunite (Chuquicamata, Chile); atacamite, zincian paratacamite, caracolite, schwartzembergite, osarizawaite-beaverite, boleite (Sierra Gorda district, Chile).

Distribution: In Chile, from Chuquicamata, and in the Sierra Gorda district, southwest of Calama, Antofagasta; at Remolinos, Atacama. From Calumet, Keweenaw Co., Michigan, and Mason Pass, near Yerington, Lyon Co., Nevada, USA. At Wallaces Gully, Mount Painter, and Wallaroo, South Australia. From the Castletown mine, Lochgilphead, Scotland.

Name: As the monoclinic polymorph of *atacamite*.

Type Material: Royal Ontario Museum, Toronto, Canada, M32176.

References: (1) Jambor, J.L., J.E. Dutrizac, A.C. Roberts, J.D. Grice, and J.T. Szymański (1996) Clinoatacamite, a new polymorph of Cu₂(OH)₃Cl, and its relationship to paratacamite and "anarakite". Can. Mineral., 34, 61–72. (2) Grice, J.D., J.T. Szymański, and J.L. Jambor (1996) The crystal structure of clinoatacamite, a new polymorph of Cu₂(OH)₃Cl. Can. Mineral., 34, 73–78. (3) (1996) Amer. Mineral., 81, 1282 (abs. refs. 1 and 2).