

Crystal Data: Monoclinic. *Point Group:* 2/*m*. Crystals, elongated, to 2 mm, in fibrous, mosslike growths incrusting basalt.

Physical Properties: Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.42 Readily soluble in cold H₂O; hygroscopic, alters rapidly to eriochalcite in air.

Optical Properties: Semitransparent. *Color:* Brown to golden brown. *Luster:* Pearly. *Optical Class:* Biaxial; high birefringence. *Pleochroism:* Pale greenish ⊥ elongation; dark reddish brown ∥ elongation. *Orientation:* Elongation positive. α = n.d. β = n.d. γ = n.d. 2V(meas.) = n.d.

Cell Data: *Space Group:* C2/*m* (synthetic). a = 6.9038(9) b = 3.2995(4) c = 6.824(1) β = 122.197(8)° Z = 2

X-ray Powder Pattern: Tolbachik volcano, Russia. 5.76 (100), 2.915 (35), 3.445 (25), 1.923 (5), 2.373 (3)

Chemistry:	(1)	(2)
CuO	51.99	59.16
ZnO	0.30	
PbO	0.11	
Na ₂ O	0.74	
K ₂ O	1.50	
Cl	42.59	52.74
H ₂ O ⁺	1.05	
H ₂ O ⁻	4.45	
SO ₄	4.24	
-O = Cl ₂	9.61	11.90
insol.	2.68	
Total	100.04	100.00

(1) Tolbachik volcano, Russia; analysis of a water extract. (2) CuCl₂.

Occurrence: As fumarolic incrustations on basalt (Tolbachik volcano, Russia); formed with other copper chlorides in an oxidized copper deposit (Bisbee, Arizona, USA).

Association: Tenorite, euchlorine, dolerophanite, piypite, ponomarevite, kamchatkite, klyuchevskite, chalcocyanite, cotunnite, softite, halite, sylvite, (Tolbachik volcano, Russia); paratacamite, nantokite, cuprite (Bisbee, Arizona, USA).

Distribution: At the Tolbachik fissure volcano, Kamchatka Peninsula, Russia. In the Southwest mine, Bisbee, Cochise Co., Arizona, USA.

Name: For its occurrence at the Tolbachik volcano, Russia.

Type Material: Mining Institute, St. Petersburg, Russia, 1290/1.

References: (1) Bergasova, L.P. and S.K. Filatov (1983) The new mineral tolbachite CuCl₂. Doklady Acad. Nauk SSSR, 270, 415–417 (in Russian). (2) (1984) Amer. Mineral., 69, 408 (abs. ref. 1). (3) (1983) Mineral. Abs., 35, 194 (abs. ref. 1). (4) Burns, P.C. and F.C. Hawthorne (1993) Tolbachite, CuCl₂, the first example of Cu²⁺ octahedrally coordinated by Cl⁻. Amer. Mineral., 78, 187–189.