

Crystal Data: Orthorhombic. *Point Group:* *mm*2. Rodlike crystals, elongated along [001], rectangular or rhombic in cross-section, to 3 mm, exhibiting {110}, {100}, {010}, {001}.

Physical Properties: *Cleavage:* On {011} and {100}, perfect. *Tenacity:* "Fragile".
Hardness = 3.5 D(meas.) = 3.48(1) D(calc.) = 3.58 Soluble in H₂O; decomposes in air in a few weeks due to hydration.

Optical Properties: Transparent. *Color:* Greenish yellow-brown; yellow in transmitted light.
Streak: Yellow. *Luster:* Vitreous.

Optical Class: Biaxial (+). *Orientation:* *X* = *c*; *Y* = *a*; *Z* = *b*. $\alpha = 1.695(2)$ $\beta = 1.718(2)$
 $\gamma = 1.759(2)$ $2V(\text{meas.}) = \text{n.d.}$ $2V(\text{calc.}) = 75^\circ$

Cell Data: *Space Group:* *Pna*2₁. *a* = 9.741(5) *b* = 12.858(6) *c* = 7.001(3) *Z* = 4

X-ray Powder Pattern: Tolbachik volcano, Russia.

7.76 (100), 3.501 (65), 2.591 (41), 3.217 (30), 2.682 (30), 2.274 (23), 2.898 (20)

Chemistry:	(1)	(2)
SO ₃	33.96	33.83
CuO	48.62	50.42
ZnO	0.62	
PbO	0.17	
Na ₂ O	0.20	
K ₂ O	10.48	9.95
Cl	6.20	7.49
H ₂ O ⁺	0.00	
H ₂ O ⁻	1.75	
insol.	0.20	
-O = Cl ₂	1.40	1.69
Total	100.80	100.00

(1) Tolbachik volcano, Russia; by AA, flame photometry, and volume-weight analysis; after deduction of H₂O and calculation of O²⁺ for charge balance, corresponds to (K_{1.06}Na_{0.03})_{Σ=1.09} (Cu_{2.92}Zn_{0.04})_{Σ=2.96}(SO₄)_{2.03}O_{1.04}Cl_{0.84}. (2) KCu₃(SO₄)₂OCl.

Occurrence: A volcanic sublimate formed between 120 °C and 140 °C.

Association: Ponomarevite, tolbachite, klyuchevskite, hematite.

Distribution: From the Tolbachik fissure volcano, Kamchatka Peninsula, Russia.

Name: For its occurrence on the Kamchatka Peninsula, Russia.

Type Material: Mining Institute, St. Petersburg, Russia, 1947/1.

References: (1) Vergasova, L.P., S.K. Filatov, Y.K. Serafimova, and T.V. Varaksina (1988) Kamchatkite KCu₃OCl(SO₄)₂ – a new mineral from volcanic sublimates. *Zap. Vses. Mineral. Obshch.*, 117, 459–461 (in Russian with English abs.). (2) (1990) *Amer. Mineral.*, 75, 1210 (abs. ref. 1). (3) Varaksina, T.V., V.S. Fundamensky, and S.K. Filatov (1990) The crystal structure of kamchatkite, a new naturally occurring oxychloride sulphate of potassium and copper. *Mineral. Mag.*, 54, 613–616.