

Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m. As prismatic crystals to 0.3 mm elongated along [010]; in aggregates as divergent sprays to sheaf-like.

Physical Properties: *Cleavage:* Perfect on {100} and {001}. *Fracture:* Stepped. *Tenacity:* Brittle. *Hardness* = ~ 3.5 D(meas.) = n.d. D(calc.) = 4.934

Optical Properties: Transparent. *Color:* Bright grass-green to light yellowish green. *Streak:* Very light green. *Luster:* Vitreous. *Optical Class:* Biaxial (-). $\alpha = 1.885(8)$ $\beta = 1.895(8)$ $\gamma = 1.900(8)$ $2V(\text{meas.}) = 75(10)^\circ$ $2V(\text{calc.}) = 70^\circ$ *Pleochroism:* Distinct; X = green, Y = Z = yellowish green. *Orientation:* X = b. *Absorption:* X > Y = Z. *Dispersion:* Strong, $r > v$.

Cell Data: *Space Group:* Pnma. $a = 8.2581(4)$ $b = 6.4026(4)$ $c = 13.8047(12)$ Z = 4

X-ray Powder Pattern: Arsenatnaya fumarole, Tolbachik volcano, Kamchatka, Russia. 3.455 (100), 2.509 (92), 2.712 (87), 2.732 (82), 3.194 (72), 2.910 (69), 3.728 (34)

Chemistry:	(1)	(2)
CuO	58.06	58.06
ZnO	1.04	
Fe ₂ O ₃	0.12	
SiO ₂	0.12	
P ₂ O ₅	1.23	
V ₂ O ₅	0.37	
As ₂ O ₅	38.78	41.94
SO ₃	0.43	
Total	100.15	100.00

(1) Arsenatnaya fumarole, Tolbachik volcano, Kamchatka, Russia; average of 4 electron microprobe analyses supplemented by Raman spectroscopy; corresponding to (Cu_{3.95}Zn_{0.07}Fe_{0.01})_{Σ=4.03}(As_{1.83}P_{0.09}S_{0.03}V_{0.02}Si_{0.01})_{Σ=1.98}O₉. (2) Cu₄O(AsO₄)₂.

Occurrence: As complex incrustations on the surface of basalt scoria or in open pockets. Deposited directly from volcanic gas or as the result of gas-rock interactions at temperatures > 380 °C.

Association: Ericlaxmanite, urusovite, lammerite, lammerite-β, popovite, alarsite.

Distribution: From Arsenatnaya fumarole, Second scoria cone, Northern Breakthrough of the Great Tolbachik Fissure Eruption, Tolbachik volcano, Kamchatka, Russia.

Name: Honors the Russian geographer and traveler, Cossack officer Ivan Petrovich Kozyrevskiy (1680-1734), one of the first explorers of Kamchatka and the Kuril Islands who made the first map of the East Coast of the Kamchatka Peninsula in 1726.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (94133).

References: (1) Pekov, I.V., N.V. Zubkova, V.O. Yapaskurt, D.I. Belakovskiy, M.F. Viganina, E.G. Sidorov, and D.Yu. Pushcharovsky (2014) New arsenate minerals from the Arsenatnaya fumarole, Tolbachik volcano, Kamchatka, Russia. II. Ericlaxmanite and kozyrevskite, two natural modifications of Cu₄O(AsO₄)₂. *Mineral. Mag.*, 78(7), 1553-1569. (2) (2016) *Amer. Mineral.*, 101, 1242-1243 (abs. ref. 1).