

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. As equant grains to 0.5 mm or as elongated, flattened, crystals to 1.3 mm; as granular crusts to 2 mm.

Physical Properties: *Cleavage:* None. *Fracture:* Uneven. *Tenacity:* Brittle, slightly plastic. Hardness = ~2 D(meas.) = 2.46(2) D(calc.) = 2.49 Hygroscopic; soluble in H₂O.

Optical Properties: Transparent. *Color:* Yellow-brown to reddish brown (honey- or cognac-colored). *Streak:* Yellow. *Luster:* Vitreous. *Optical Class:* Biaxial (-). $\alpha = 1.556(5)$ $\beta = 1.612(5)$ $\gamma = 1.663(5)$ $2V(\text{meas.}) = 85(5)^\circ$ $2V(\text{calc.}) = 85^\circ$ *Dispersion:* Distinct, $r < v$. *Pleochroism:* Strong; $Z =$ brown to reddish brown, $Y =$ swamp-green, $X =$ pale swamp-green to almost colorless. *Absorption:* $Z \gg Y > X$.

Cell Data: *Space Group:* $P\bar{1}$. $a = 6.7737(4)$ $b = 10.5715(13)$ $c = 11.0730(9)$ $\alpha = 117.930(10)^\circ$ $\beta = 106.909(5)^\circ$ $\gamma = 90.389(8)^\circ$ $Z = 2$

X-ray Powder Pattern: Glavnaya Tenoritovaya fumarole, Tolbachik volcano, Kamchatka, Russia. 6.40 (100), 4.608 (92), 3.473 (73), 9.20 (69), 3.393 (66), 3.499 (55), 3.075 (49)

Chemistry:	(1)	(2)
K	23.48	23.64
Rb	0.52	
Mg	0.47	
Cu	1.77	
Zn	24.44	26.35
<u>Cl</u>	<u>50.02</u>	<u>50.01</u>
Total	100.70	100.00

(1) Glavnaya Tenoritovaya fumarole, Tolbachik volcano, Kamchatka, Russia; average of 4 electron microprobe analyses supplemented by Raman spectroscopy; corresponding to $(\text{K}_{2.95}\text{Rb}_{0.03})_{\Sigma=2.98}(\text{Zn}_{1.84}\text{Cu}_{0.14}\text{Mg}_{0.09})_{\Sigma=2.07}\text{Cl}_{6.95}$. (2) K₃Zn₂Cl₇.

Occurrence: A sublimate around a volcanic fumarole.

Association: Belloite, avdoninite, eriochalcite, sylvite, halite, carnallite, mitscherlichite, sanguite, chrysothallite, romanorlovite, gypsum, chlorothionite, kainite, hematite, tenorite, chalcocyanite.

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

Name: From Latin words, *mellis* (honey), *zinkum*, and *kalium* for its color and species-defining cations, zinc and potassium.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (94375).

References: (1) Pekov, I.V., N.V. Zubkova, V.O. Yapaskurt, I.S. Lykova, D.I. Belakovskiy, M.F. Vigasina, E.G. Sidorov, S.N. Britvin, and D.Yu. Pushcharovsky (2015) New zinc and potassium chlorides from fumaroles of the Tolbachik volcano, Kamchatka, Russia: mineral data and crystal chemistry. I. Mellizinkalite, K₃Zn₂Cl₇. *Eur. J. Mineral.*, 27(2), 247-253. (2) (2016) *Amer. Mineral.*, 101, 1494 (abs. ref. 1).