Mellinzinkalite $K_3Zn_2Cl_7$

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 H_2O.

Optical Properties: Transparent. *Color*: Yellow-brown to reddish brown (honey- or cognac-colored). *Streak*: Yellow. *Luster*: Vitreous.
Optical Class: Biaxial (–). α = 1.556(5) β = 1.612(5) γ = 1.663(5) 2V(meas.) = 85(5)° 2V(calc.) = 85° *Dispersion*: Distinct, $r < v$. *Pleochroism*: Strong; Z = brown to reddish brown, Y = swamp-green, X = pale swamp-green to almost colorless. *Absorption*: $Z >> Y > X$.

Cell Data: *Space Group*: $P\bar{1}$. a = 6.7737(4) b = 10.5715(13) c = 11.0730(9) α = 117.930(10)° β = 106.909(5)° γ = 90.389(8)° 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
Cl	50.02	50.01
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 $(K_{2.95}Rb_{0.03})_{\Sigma=2.98}(Zn_{1.84}Cu_{0.14}Mg_{0.09})_{\Sigma=2.07}Cl_{6.95}$. (2) $K_3Zn_2Cl_7$.

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, *melli*s (honey), *zink*um, and *kali*um 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, $K_3Zn_2Cl_7$. Eur. J. Mineral., 27(2), 247-253. (2) (2016) Amer. Mineral., 101, 1494 (abs. ref. 1).