Magnesiovoltaite $K_2Mg_5Fe^{3+}_3Al(SO_4)_{12}\cdot 18H_2O$

Crystal Data: Cubic. *Point Group*: 4/*m* $\bar{3}$ 2/*m*. As compositionally-zoned cubic crystals to 2 mm, displaying {111}, {100}, {110} and rarely {211}.

Physical Properties: *Cleavage*: None. *Tenacity*: Brittle. *Fracture*: Subconchoidal. Hardness = 2.5 D(meas.) = 2.51(2) D(calc.) = 2.506

Optical Properties: Transparent. *Color*: Amber-yellow, brownish yellow, pale yellow, pale greenish yellow, almost colorless. *Streak*: n.d. *Luster*: n.d. *Optical Class*: Uniaxial (-). ε = 1.584(2) ω = 1.588(2) Smallest fragments: Biaxial (–). α = 1.584(2) β = 1.587(2) γ = 1.588(2) 2V(calc.) = 60° *Dispersion*: Medium, $r > v$.

Cell Data: *Space Group*: $Fd\bar{3}\,c$. a = 27.161(1) Z = 16

X-ray Powder Pattern: Alcaparrosa mine, Cerro Alcaparrosa, Antofagasta region, Chile. 3.392 (100), 3.532 (68), 5.53 (61), 3.034 (45), 6.77 (37), 2.845 (30), 9.56 (29)

Chemistry:	(1)
Na_2O	0.13
K_2O	4.64
MgO	9.13
MnO	1.73
ZnO	0.84
Al_2O_3	2.47
Fe_2O_3	13.36
SO_3	50.83
H_2O	17.6
Total	100.73

(1) Alcaparrosa mine, Antofagasta region, Chile; average of 5 electron microprobe analyses supplemented by FTIR and Mössbauer spectroscopy, H_2O by gas chromatography; corresponding to $(K_{1.85}Na_{0.08})(Mg_{4.25}Mn_{0.46}Zn_{0.14})Fe^{3+}_{3.14}Al_{0.91}(SO_4)_{11.91}(H_2O)_{18.325}O_{0.035}$.

Mineral Group: Voltaite group.

Occurrence: In the oxidized zone of a hydrothermal, polymetallic, sulfide vein deposit hosted by volcanic rocks in an arid region.

Association: On coquimbite: tamarugite, alum-(Na), rhomboclase, yavapaiite, voltaite, opal; on botryogen and opal: tamarugite, alum-(K), pickeringite, magnesiocopiapite, jarosite or natrojarosite.

Distribution: From the Alcaparrosa mine, north side of Cerro Alcaparrosa, El Loa province, Antofagasta region, Chile.

Name: As an analog of *voltaite* and zincovoltaite with Mg dominant at the *M*1 structural position.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4780/1 and 4780/2).

References: (1) Chukanov, N.V., S.M. Aksenov, R.K. Rastsvetaeva, G. Möhn, V.S. Rusakov, I.V. Pekov, R. Scholz, T.A. Eremina, D.I. Belakovskiy, and J.A. Lorenz (2016) Magnesiovoltaite, $K_2Mg_5Fe^{3+}_3Al(SO_4)_{12}\cdot 18H_2O$, a new mineral from the Alcaparrosa mine, Antofagasta region, Chile. Eur. J. Mineral., 28, 1005-1017. (2) (2017) Amer. Mineral., 102, 1568 (abs. ref. 1).