

**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 (-).  $\epsilon = 1.584(2)$   $\omega = 1.588(2)$  Smallest fragments: Biaxial (-).  $\alpha = 1.584(2)$   $\beta = 1.587(2)$   $\gamma = 1.588(2)$   $2V(\text{calc.}) = 60^\circ$  *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)

<b>Chemistry:</b>	(1)
Na <sub>2</sub> O	0.13
K <sub>2</sub> O	4.64
MgO	9.13
MnO	1.73
ZnO	0.84
Al <sub>2</sub> O <sub>3</sub>	2.47
Fe <sub>2</sub> O <sub>3</sub>	13.36
SO <sub>3</sub>	50.83
H <sub>2</sub> O	17.6
Total	100.73

(1) Alcaparrosa mine, Antofagasta region, Chile; average of 5 electron microprobe analyses supplemented by FTIR and Mössbauer spectroscopy, H<sub>2</sub>O by gas chromatography; corresponding to  $(\text{K}_{1.85}\text{Na}_{0.08})(\text{Mg}_{4.25}\text{Mn}_{0.46}\text{Zn}_{0.14})\text{Fe}^{3+}_{3.14}\text{Al}_{0.91}(\text{SO}_4)_{11.91}(\text{H}_2\text{O})_{18.325}\text{O}_{0.035}$ .

**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 *M1* 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,  $\text{K}_2\text{Mg}_5\text{Fe}^{3+}_3\text{Al}(\text{SO}_4)_{12} \cdot 18\text{H}_2\text{O}$ , 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).