Itelmenite $Na_2CuMg_2(SO_4)_4$

Crystal Data: Orthorhombic. *Point Group*: 2/*m* 2/*m* 2/*m*. As irregular grains or microcrystalline masses.

Physical Properties: *Cleavage*: None. *Fracture*: Uneven. *Tenacity*: Brittle. Hardness = 2-3 D(meas.) = n.d. D(calc.) = 3.10 Water soluble and hydroscopic.

Optical Properties: Transparent. *Color*: Light grayish blue. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Biaxial (+). α = 1.535(2) β = 1.555(2) γ = 1.585(2) 2V(calc.) = 79.82° *Pleochroism*: None.

Cell Data: Space Group: *Pbca*. a = 9.568(2) b = 8.790(2) c = 28.715(8) Z = 4

X-ray Powder Pattern: Saranchinaitovaya fumarole, Naboko cone, Tolbachik volcano, Russia. 2.939 (100), 3.846 (87), 5.912 (64), 3.393 (62), 2.498 (56), 3.629 (52), 3.000 (44)

Chemistry:

	(1)
Na_2O	10.77
K_2O	0.20
MgO	11.10
CuO	15.38
ZnO	5.61
SO_3	56.42
Total	99.48

(1) Saranchinaitovaya fumarole, Naboko cone, Tolbachik volcano, Kamchatka Peninsula, Russia; average of 10 EDS analyses; corresponds to $(Na_{3.93}K_{0.05})_{\Sigma=3.98}Mg_{3.12}(Cu_{2.19}Zn_{0.78})_{\Sigma=2.97}S_{7.97}O_{32}$.

Occurrence: As sublimates on basaltic scoria near a volcanic fumarole vent (~600-610 °C.).

Association: Anhydrite, saranchinaite, hermannjahnite, euchlorine, thénardite, aphthitalite, hematite.

Distribution: From the Saranchinaitovaya fumarole, Naboko scoria cone, Tolbachik volcano, Kamchatka Peninsula, Russia.

Name: Honors the Itelmens, an ethnic group who are the original inhabitants of the area around Tolbachik volcano and the Kamchatka Peninsula.

Type Material: Mineralogical Museum, St. Petersburg State University, St. Petersburg, Russia (1/19637).

References: (1) Nazarchuk, E.V., O.I. Siidra, A.A. Agakhanov, E.A. Lukina, E.Y. Avdontseva, and G.A. Karpov (2018) Itelmenite, $Na_2CuMg_2(SO_4)_4$, a new anhydrous sulfate mineral from the Tolbachik volcano. Mineral. Mag., 82(6), 1233-1241. (2) (2019) Amer. Mineral., 104(12), 1868 (abs. ref. 1).