

Crystal Data: Monoclinic. *Point Group:* $2/m$. As imperfect acicular crystals to 1 mm in aggregates to 2 mm [TL] or as cuboid prismatic crystals to 1 mm [Poland].

Physical Properties: *Cleavage:* None. *Tenacity:* Brittle, thin fibers flexible. *Fracture:* Uneven. Hardness = 1-2 D(meas.) = n.d. D(calc.) = 1.504 Nonfluorescent. Soluble in water.

Optical Properties: Transparent to translucent. *Color:* Colorless, white. *Streak:* White. *Luster:* Vitreous.

Optical Class: Biaxial (+). $\alpha = 1.469(2)$ $\beta = 1.479(2)$ $\gamma = 1.496(2)$ $2V(\text{meas.}) = 80(10)^\circ$ $2V(\text{calc.}) = 75.7^\circ$ *Dispersion:* $r > v$, very weak. *Orientation:* $c \wedge Z = 40^\circ$. Nonpleochroic.

Cell Data: *Space Group:* $C2/c$. $a = 9.2709(3)$ $b = 9.5361(2)$ $c = 13.2741(4)$ $\beta = 90.054(3)^\circ$ $Z = 4$

X-Ray Diffraction Pattern: Plosky Tolbachik volcano, Kamchatka Peninsula, Russia. 3.330 (100), 2.976 (45), 2.353 (29), 3.825 (26), 1.997 (25), 3.883 (22), 2.253 (18)

Chemistry:	(1)	(2)
N	3.8	5.46
O	35.2	37.38
Mg	9.3	9.47
Cl	34.5	41.41
K	6.7	
<u>H</u>	<u>[5.5]</u>	<u>6.28</u>
Total	89.5	100.00

(1) Plosky Tolbachik volcano, Kamchatka Peninsula, Russia; average electron microprobe analysis supplemented by IR spectroscopy, H_2O calculated from structure; corresponding to $[(\text{NH}_4)_{0.70}\text{K}_{0.45}]_{\Sigma=1.15}\text{Mg}_{1.00}\text{Cl}_{2.55} \cdot 6\text{H}_{1.92}\text{O}_{0.96}$. (2) $(\text{NH}_4)\text{MgCl}_3 \cdot 6\text{H}_2\text{O}$.

Occurrence: Formed on basaltic lava by exposure of the host rocks to eruptive gas exhalations enriched in HCl and NH_3 . Abundant on a burning coal dump (Radlin).

Association: Gypsum, halite (Tolbachik).

Distribution: From the 2012-2013 Tolbachik fissure eruption at the Plosky Tolbachik volcano, Kamchatka Peninsula, Russia [TL]. On coal dumps, at Radlin, Rybnik area, Upper Silesia, Poland and near Chelabinsk, Southern Urals, Russia ('redikortsevite').

Name: Honors Prokopyy Trifonovich *Novograbenov* (1892-1934), a researcher of the Kamchatka Peninsula, a teacher, naturalist, geographer, and geologist.

Type Material: A.E. Fersman Mineralogical Museum, RAS, Moscow, Russia (5003/1).

References: (1) Okrugin, V.M., S.S. Kudaeva, O.V. Karimova, O.V. Yakubovich, D.I. Belakovskiy, N.V. Chukanov, A.A. Zolotarev, V.V. Gurzhiy, N.G. Zinovieva, A.A. Shiryayev, and P.M. Kartashov (2019) The new mineral novograbenovite, $(\text{NH}_4,\text{K})\text{MgCl}_3 \cdot 6\text{H}_2\text{O}$ from the Tolbachik volcano, Kamchatka, Russia: mineral description and crystal structure. *Mineral. Mag.*, 83, 223-231. (2) Parafiniuk, J., M. Stachowicz, and K. Woźniak (2021) Novograbenovite from Radlin, Upper Silesia, Poland and its relation to 'redikortsevite'. *Mineral. Mag.*, 85, 132-141.