

Crystal Data: Monoclinic. *Point Group:* 2. As sheaf-like aggregates to 0.4 mm or bundles of acicular prismatic crystals.

Physical Properties: *Cleavage:* None. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = ~ 2 VHN = 53 (100 g load). D(meas.) = n.d. D(calc.) = 4.743

Optical Properties: Transparent. *Color:* White with a bluish tint, light gray with beige tints in reflected light with greenish gray internal reflections. *Streak:* White. *Luster:* Adamantine.

Optical Class: n.d.

R₁-R₂: (470) 6.4-6.7, (546) 6.5-6.9, (589) 6.6-7.1, (650) 6.8-7.3

Cell Data: *Space Group:* $P2_1$. $a = 4.6524(4)$ $b = 11.0757(9)$ $c = 9.3876(7)$ $\beta = 98.353(2)^\circ$ $Z = 2$

X-ray Powder Pattern: Great Fissure Tolbachik volcano, Kamchatka Peninsula, Russia. 3.438 (100), 4.253 (81), 4.289 (64), 2.945 (59), 2.354 (54), 2.982 (52), 3.557 (47)

Chemistry:	(1)	(2)
Th ₂ O	61.43	61.93
VO ₂	11.53	12.09
SO ₃	23.55	23.34
H ₂ O	[2.61]	2.62
Total	99.12	100.00

(1) Great Fissure Tolbachik volcano, Kamchatka Peninsula, Russia; average of 20 electron microprobe analyses, H₂O calculated; corresponding to Th_{2.00}V_{0.96}S_{2.03}O₉(H₂O).

(2) Th₂VO(SO₄)₂(H₂O).

Occurrence: A sublimate on rock around a volcanic fumarole.

Association: Shcherbinaite, pauflerite, bobjonesite, markhininite, evdokimovite.

Distribution: First cinder cone, North Breach of the Great Fissure Tolbachik volcano, Kamchatka Peninsula, Russia.

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Type Material: Mineralogical Museum, St. Petersburg State University, St. Petersburg, Russia (1/19543).

References: (1) Siidra, O.I., L.P. Vergasova, Y.L. Kretser, Y.S. Polekhovsky, S.K. Filatov, and S.V. Krivovichev (2014) Unique thallium mineralization in the fumaroles of the Tolbachik volcano, Kamchatka Peninsula, Russia. II. Karpovite, Th₂VO(SO₄)₂(H₂O). Mineral. Mag., 78(7), 1699-1709. (2) (2015) Amer. Mineral., 100, 1650-1651 (abs. ref. 1).