Orthominasragrite $V^{4+}O(SO_4)\cdot 5H_2O$

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Irregular grains, to 200 μm, in crusts and efflorescences.

Physical Properties: Hardness = ∼1 D(meas.) = n.d. D(calc.) = 2.00 Readily dissolves in H_2O.

Optical Properties: Semitransparent. *Color:* Pale blue to bright blue. *Streak:* Pale blue. *Luster:* Vitreous.
Optical Class: Biaxial (+), pseudouniaxial (+). *Orientation:* $X = b$; $Y = c$; $Z = a$.
$\alpha = 1.529(2)$ $\beta = 1.534(2)$ $\gamma = 1.534(2)$ 2V(meas.) = 2° 2V(calc.) = 0°

Cell Data: *Space Group:* $Pmn2_1$. $a = 7.242(1)$ $b = 9.319(2)$ $c = 6.192(1)$ Z = 2

X-ray Powder Pattern: Temple Mountain, Utah, USA.
4.70 (100b), 3.322 (50), 2.865 (40), 2.602 (30), 3.734 (20), 3.622 (20), 3.108 (20)

Chemistry:

	(1)	(2)
SO_3	31.97	31.64
VO_2	33.88	32.77
H_2O	[36.30]	35.59
Total	[102.15]	100.00

(1) Temple Mountain, Utah, USA; by electron microprobe, H_2O from crystal-structure analysis; corresponds to $V_{1.01}O_{1.00}(S_{0.99}O_4)\cdot 5H_2O$. (2) $VO(SO_4)\cdot 5H_2O$.

Polymorphism & Series: Dimorphous with minasragrite.

Occurrence: In a silicified tree, formed as an oxidation product of pyrite reacting with vanadium-rich organic material.

Association: Minasragrite, pyrite, szomolnokite, kornelite, ferricopiapite, rozenite, montroseite, sulfur.

Distribution: From the [North Mesa No. 5 mine,] North Mesa mine group, Temple Mountain district, Emery County, Utah, USA.

Name: As the ORTHOrhombic polymorph of *minasragrite*.

Type Material: Canadian Museum of Nature, Ottawa, 83269; Canadian Geological Survey, Ottawa, Canada.

References: (1) Hawthorne, F.C., M. Schindler, J.D. Grice, and P. Haynes (2001) Orthominasragrite, $V^{4+}O(SO_4)(H_2O)_5$, a new mineral species from Temple Mountain, Emery County, Utah, U.S.A. Can. Mineral., 39, 1325–1331. (2) (2002) Amer. Mineral., 87, 997 (abs. ref. 1).