

Ternovite**(Mg, Ca)Nb₄O₁₁ · nH₂O (n ~10)**

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Crystal Data: Tetragonal, pseudocubic. *Point Group:* 4/m (probable). Pyramidal pseudo-octahedral crystals, with prominent {112}, {001}, and {100}, pseudocubic to rhombic; in globular, rough masses, to 1 mm.

Physical Properties: Hardness = n.d. D(meas.) = 3.65 D(calc.) = 3.79

Optical Properties: Transparent to translucent. *Color:* Honey-yellow, brownish orange, bright yellow.

Optical Class: Uniaxial (-). $\omega = 1.724$ $\epsilon = 1.720$

Cell Data: *Space Group:* $P4_2/n$. $a = 7.787(1)$ $c = 7.797(1)$ $Z = [4]$

X-ray Powder Pattern: Foote mine, North Carolina, USA.

3.939 (100), 2.7698 (90), 1.7604 (50), 1.6050 (40), 4.518 (30), 3.880 (30), 2.2637 (25)

Chemistry:	(1)	(2)	(3)
WO ₃		6.52	
SiO ₂	0.9		
SnO ₂	45.7	45.02	54.67
Al ₂ O ₃	0.4		
Fe ₂ O ₃	1.3		
MnO	25.2	25.90	25.73
CaO	0.3	0.16	
MgO	0.2	0.59	
H ₂ O		[21.81]	19.60
Total		[100.00]	100.00

(1) Foote mine, North Carolina, USA; by electron microprobe, original analysis given as elements, here converted to oxides, total Mn as MnO, total Fe as Fe₂O₃, H₂O by difference; corresponding to (Mn_{0.94}²⁺Fe_{0.04}³⁺Ca_{0.01}Mg_{0.01})_{Σ=1.00}(Sn_{0.98}⁴⁺Si_{0.01}Al_{0.01})_{Σ=1.00}(OH)₆. (2) Långban, Sweden; by electron microprobe, total Mn as MnO. (3) MnSn(OH)₆.

Polymorphism & Series: Dimorphous with wickmanite.

Mineral Group: Stottite group.

Occurrence: As a very rare late-formed mineral in fractures in lithium-rich pegmatite (Foote mine, North Carolina, USA); on a museum specimen from a metamorphosed Fe–Mn orebody (Långban, Sweden).

Association: Bavenite, eakerite, siderite–rhodochrosite, albite, quartz (Foote mine, North Carolina, USA); magnetite, barite (Långban, Sweden).

Distribution: In the Foote mine, Kings Mountain, Cleveland Co., North Carolina, USA. At Långban, Värmland, Sweden.

Name: As the TETRAgonal dimorph of *wickmanite*.

Type Material: National Museum of Natural History, Washington, D.C., USA, 120239, 121265.

References: (1) White, J.S., Jr. and J.A. Nelen (1973) Tetrawickmanite, tetragonal MnSn(OH)₆, a new mineral from North Carolina, and the stottite group. *Mineral. Record*, 4, 24–30. (2) (1973) *Amer. Mineral.*, 58, 966–967 (abs. ref. 1). (3) Dunn, P.J. (1978) Tungstenian tetrawickmanite from Långban, Sweden. *Mineral. Record*, 9, 41.