

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. $D(\text{meas.}) = 3.65$ $D(\text{calc.}) = 3.79$

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_2O_3	0.4		
Fe_2O_3	1.3		
MnO	25.2	25.90	25.73
CaO	0.3	0.16	
MgO	0.2	0.59	
H_2O		[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 Fe_2O_3 , H_2O by difference; corresponding to $(\text{Mn}_{0.94}^{2+}\text{Fe}_{0.04}^{3+}\text{Ca}_{0.01}\text{Mg}_{0.01})_{\Sigma=1.00}(\text{Sn}_{0.98}^{4+}\text{Si}_{0.01}\text{Al}_{0.01})_{\Sigma=1.00}(\text{OH})_6$. (2) Långban, Sweden; by electron microprobe, total Mn as MnO. (3) $\text{MnSn}(\text{OH})_6$.

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 $\text{MnSn}(\text{OH})_6$, 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.