

Hydrotungstite



©2001-2005 Mineral Data Publishing, version 1

Crystal Data: Monoclinic. *Point Group:* $2/m$. Platy crystals bounded by {210}, {100}, and {010}, to 75 μm , in fine reticulated intergrowths. *Twinning:* On {210}, polysynthetic, may be gridlike, universal.

Physical Properties: *Cleavage:* {010}, imperfect. Hardness = 2 $D(\text{meas.}) = 4.60$
 $D(\text{calc.}) = [4.66]$

Optical Properties: Semitransparent. *Color:* Dark green, becoming yellowish on exposure to air. *Luster:* Vitreous to dull.

Optical Class: Biaxial (-). *Pleochroism:* $X = \text{colorless}$; $Y = \text{yellow-green}$; $Z = \text{dark green}$.
Orientation: $Y = b$; $X \wedge c = 3^\circ$. *Dispersion:* $r < v$. *Absorption:* $Z > Y > X$. $\alpha = 1.70(2)$
 $\beta = 1.95(2)$ $\gamma = 2.04(2)$ $2V(\text{meas.}) = \sim 52^\circ$

Cell Data: *Space Group:* $P2/m$ (probable). $a = 7.379(5)$ $b = 6.901(5)$ $c = 3.748(5)$
 $\beta = 90^\circ 22(10)'$ $Z = 2$

X-ray Powder Pattern: San Antonio mine, Bolivia.
6.95 (vvs), 3.27 (vs), 3.73 (s), 3.46 (ms), 1.96 (ms), 2.63 (m), 2.54 (m)

Chemistry:	(1)	(2)	(3)
WO ₃	80.31	86.47	86.55
SiO ₂	6.65		
Fe ₂ O ₃	0.08		
H ₂ O	12.52	13.53	13.45
Total	99.56	[100.00]	100.00

(1) Calacalani mine, Bolivia. (2) Analysis (1), recalculated to 100% after deduction of ferberite and quartz. (3) WO₂(OH)₂ · H₂O.

Occurrence: An alteration product of ferberite in the oxidized zone of a hydrothermal tungsten deposit, where it was an ore mineral (Calacalani mine, Bolivia).

Association: Ferberite, tungstite.

Distribution: In Bolivia, from the Oruro district, at the San Antonio de Calacalani mine, near Colquiri, and in the Juliani mine. At Panasqueira, Portugal. From the Grancarica scheelite deposit, southwest of Velingrad, Bulgaria.

Name: For its content of H₂O and relation to *tungstite*.

Type Material: Harvard University, Cambridge, Massachusetts, 98896; National Museum of Natural History, Washington, D.C., USA, 104901.

References: (1) Kerr, P.F. and F. Young (1944) Hydrotungstite, a new mineral from Oruro, Bolivia. *Amer. Mineral.*, 29, 192–210. (2) Mitchell, R.S. (1963) X-ray data for hydrotungstite. *Amer. Mineral.*, 48, 935–939. (3) Sahama, T.G. and M. Lehtinen (1971) Refinement of the X-ray data for hydrotungstite from Calacalani, Bolivia. *Bull. Geol. Soc. Finland*, 43, 89–91. (4) Sahama, T.G. (1981) The secondary tungsten minerals, a review. *Mineral. Record*, 12, 81–87.