

Wightmanite

Mg₅O(BO₃)(OH)₅•2H₂O

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Crystal Data: Monoclinic. *Point Group:* 2/m. Small rough prismatic unterminated pseudohexagonal crystals, showing {010}, {100}, {110}, several other minor forms; commonly in radial aggregates.

Physical Properties: *Cleavage:* On {010}, perfect; on {100}, fair. *Hardness* = 5.5
D(meas.) = 2.60 D(calc.) = 2.58

Optical Properties: Semitransparent. *Color:* Colorless, may have a faint green tint.
Luster: Vitreous.

Optical Class: Biaxial (-). *Orientation:* $Z \wedge c = 5^\circ$; $OAP \wedge \{010\} \simeq 8^\circ$. *Dispersion:* $r < v$, strong. $\alpha = 1.585(3)$ $\beta = 1.603(3)$ $\gamma = 1.604(3)$ $2V(\text{meas.}) = 33^\circ$

Cell Data: *Space Group:* $I2/m$. $a = 13.46(2)$ $b = 3.102(5)$ $c = 18.17(2)$ $\beta = 91.60(5)^\circ$
 $Z = 4$

X-ray Powder Pattern: Commercial quarry, California, USA.
10.70 (10), 9.07 (10), 3.03 (3), 2.67 (3), 4.74 (2), 2.446 (2), 2.35 (2)

Chemistry:	(1)	(2)
B ₂ O ₃	11.30	10.97
TiO ₂	0.16	
Al ₂ O ₃	2.16	
FeO	2.26	
MgO	58.15	63.49
CaO	2.77	
F	1.85	
Cl	0.96	
H ₂ O ⁺	16.95	
H ₂ O ⁻	4.83	
H ₂ O		25.54
-O = (F, Cl) ₂	1.01	
Total	[100.38]	100.00

(1) Commercial quarry, California, USA; recalculated after deduction of szaibélyite estimated 3%; corresponds to (Mg_{4.74}Ca_{0.16}Fe_{0.10})_{Σ=5.00}O[(B_{1.07}Al_{0.14})_{Σ=1.21}O₃](OH)₅•2H₂O.

(2) Mg₅O(BO₃)(OH)₅•2H₂O.

Occurrence: Very rare in contact metamorphosed limestone.

Association: Fluoborite, szaibélyite, dolomite, calcite (Commercial quarry, California, USA).

Distribution: In the USA, from the Commercial quarry, near Crestmore, Riverside Co., and north of Huntington Lake, Twin Lakes region, Fresno Co., California.

Name: Honors Randall H. Wightman (1915–1969), Director of Exploration and Mining of the Riverside Cement Co., Riverside, California, USA.

Type Material: n.d.

References: (1) Murdoch, J. (1962) Wightmanite, a new borate mineral from Crestmore, California. *Amer. Mineral.*, 47, 718–722. (2) Moore, P.B. and T. Araki (1974) Pinakiolite, Mg₂Mn³⁺O₂[BO₃]; warwickite, Mg(Mg_{0.5}Ti_{0.5})O[BO₃]; wightmanite, Mg₅(O)(OH)₅[BO₃]•nH₂O: crystal chemistry of complex 3 Å wallpaper structures. *Amer. Mineral.*, 59, 985–1004.