Wightmanite $Mg_5O(BO_3)(OH)_5 \cdot 2H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Small rough prismatic unterminated pseudohexagonal crystals, showing {010}, {100}, $\{1\bar{1}0\}$, 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:* $Z \wedge c = 5°$; OAP $\wedge$ {010} $\simeq 8°$. *Dispersion:* $r < v$, strong. $\alpha = 1.585(3)$ $\beta = 1.603(3)$ $\gamma = 1.604(3)$ 2V(meas.) = 33°

Cell Data: *Space Group:* $I2/m$. $a = 13.46(2)$ $b = 3.102(5)$ $c = 18.17(2)$ $\beta = 91.60(5)°$ 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_2O_3	11.30	10.97
TiO_2	0.16	
Al_2O_3	2.16	
FeO	2.26	
MgO	58.15	63.49
CaO	2.77	
F	1.85	
Cl	0.96	
H_2O^+	16.95	
H_2O^-	4.83	
H_2O		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 $(Mg_{4.74}Ca_{0.16}Fe_{0.10})_{\Sigma=5.00}O[(B_{1.07}Al_{0.14})_{\Sigma=1.21}O_3](OH)_5 \cdot 2H_2O$.
(2) $Mg_5O(BO_3)(OH)_5 \cdot 2H_2O$.

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, $Mg_2Mn^{3+}O_2[BO_3]$; warwickite, $Mg(Mg_{0.5}Ti_{0.5})O[BO_3]$; wightmanite, $Mg_5(O)(OH)_5[BO_3] \cdot nH_2O$: crystal chemistry of complex 3 Å wallpaper structures. Amer. Mineral., 59, 985–1004.