Hydroxylwagnerite $Mg_2PO_4(OH)$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As grains to 400 μm.

Physical Properties: *Cleavage*: Poor, two sets nearly perpendicular. *Fracture*: Uneven. *Tenacity*: Brittle. Hardness = ~ 5 (by analogy to wagnerite) D(meas.) = n.d. D(calc.) = 3.074

Optical Properties: Transparent to translucent. *Color*: Creamy white. *Streak*: White. *Luster*: Vitreous.
Optical Class: Biaxial (+). $\alpha = 1.584(1)$ $\beta = 1.586(1)$ $\gamma = 1.587(1)$ 2V(meas.) = 43(2)°
Orientation: $Y = b$. *Dispersion*: $r > v$ (synthetic material).

Cell Data: *Space Group*: $P2_1/c$. $a = 9.646(3)$ $b = 12.7314(16)$ $c = 11.980(4)$ $\beta = 108.38(4)°$ $Z = 16$

X-ray Powder Pattern: Synthetic β-Mg_2PO_4OH.
3.011 (100), 2.870 (81), 3.124 (69), 3.304 (53), 2.758 (33), 2.731 (22), 2.506 (21)

Chemistry:	(1)	(2)	(3)
P_2O_5	44.1	43.99	44.20
SiO_2	0.28	0.02	
TiO_2	0.20	0.16	
Al_2O_3	0.06	0.03	
MgO	48.8	49.12	50.19
FeO	0.33	0.48	
MnO	0.01	0.02	
CaO	0.12	0.10	
Na_2O	0.01	n.d.	
F	5.6	4.67	
$-O = F_2$	2.35	1.97	
H_2O	[2.9]	3.36	5.61
Total	100.1	99.98	100.00

(1) Dora-Maira Massif, Val Varaita, Piemonte, Italy; average of 4 electron microprobe analyses, H_2O from stoichiometry; corresponding to $(Mg_{1.95}Fe_{0.01}Ti_{<0.01}Ca_{<0.01}Al_{<0.01}Na_{<0.01})_{\Sigma=1.97}$ $(P_{1.00}Si_{0.01})_{\Sigma=1.01}O_4(OH_{0.53}F_{0.47})_{\Sigma=1.00}$. (2) Dora-Maira Massif, Val Varaita, Piemonte, Italy; average of 4 electron microprobe analyses; corresponding to $(Mg_{1.97}Fe_{0.01}Ti_{<0.01}Ca_{<0.01}Al_{<0.01})_{\Sigma=1.99}$ $(P_{1.00}Si_{<0.01})_{\Sigma=1.00}O_4(OH_{0.60}F_{0.40})_{\Sigma=1.00}$. (3) $Mg_2PO_4(OH)$.

Mineral Group: Triplite-triploidite supergroup, triploidite group.

Occurrence: An accessory rock-forming mineral in quartz-rich, pyrope-kyanite-phengite schist lenses within metagranite in ultrahigh-pressure metamorphic rocks.

Association: Talc, clinochlore, kyanite, rutile, apatite, pyrope.

Distribution: From the Dora-Maira Massif, western Alps, Vallone di Gilba, Val Varaita, Piemonte, Italy.

Name: Indicates the *hydroxyl* analogue of *wagnerite*.

Type Material: Mineralogy Museum, School of Mines, Paris, France (83104, 83015) and the Institute for Geology, Mineralogy and Geophysics, Ruhr-University Bochum, Germany.

References: (1) Chopin, C., T. Armbruster, E.S. Grew, A. Baronnet, C. Leyx, and O. Medenbach (2014) The triplite-triploidite supergroup: structural modulation in wagnerite, discreditation of magniotriplite, and the new mineral hydroxylwagnerite. Eur J. Mineral., 26(4), 553-565. (2) (2016) Amer. Mineral., 101, 1493-1494 (abs. ref. 1). (3) Raade, G. and C. Rømming (1986) The crystal structure of β-Mg_2PO_4OH, a synthetic hydroxyl analogue of wagnerite. Z. Kristallogr., 177, 15-26.