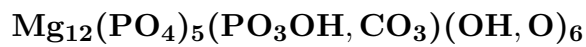


Holtedahlite



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Crystal Data: Hexagonal. *Point Group:* $3m$. Massive, in patches to 1 cm.

Physical Properties: *Fracture:* Uneven. Hardness = 4.5–5 $D(\text{meas.}) = 2.94(2)$
 $D(\text{calc.}) = 2.936$

Optical Properties: Transparent. *Color:* Colorless, grayish from inclusions of magnetite.

Luster: Vitreous.

Optical Class: Uniaxial (-). $\omega = 1.599(1)$ $\epsilon = 1.597(1)$

Cell Data: *Space Group:* $P31m$. $a = 11.203(3)$ $c = 4.977(1)$ $Z = 1$

X-ray Powder Pattern: Tingelstadtjern quarry, Norway.

2.438 (100), 3.722 (90), 3.475 (50), 3.234 (30), 2.796 (30), 2.177 (30), 1.859 (30)

Chemistry:

	(1)
P ₂ O ₅	41.19
CO ₂	2.06
MnO	0.06
MgO	50.01
Na ₂ O	0.22
F	0.34
H ₂ O	6.22
-O = F ₂	0.14
Total	99.96

(1) Tingelstadtjern quarry, Norway; by electron microprobe, $(\text{OH})^{1-}$, CO₂, and PO₄ confirmed by IR and elemental analyser; corresponds to $(\text{Mg}_{11.84}\text{Na}_{0.07})_{\Sigma=11.91}(\text{PO}_4)_5[(\text{PO}_3\text{OH})_{0.54}(\text{CO}_3)_{0.44}]_{\Sigma=0.98}[(\text{OH})_{5.83}\text{F}_{0.17}]_{\Sigma=6.00}$.

Polymorphism & Series: Dimorphous with althausite.

Occurrence: In a serpentine–magnesite deposit (Tingelstadtjern quarry, Norway); a common accessory mineral, of likely pneumatolytic origin, in an igneous magnetite–apatite deposit (Gole Gohar, Iran).

Association: Althausite, szaibelyite, apatite, talc, magnetite, magnesite (Tingelstadtjern quarry, Norway).

Distribution: From the Tingelstadtjern quarry, Modum, Norway. Into the millions of tons at the Gole Gohar iron deposit, Bafq district, Iran.

Name: Honors Olaf Holtedahl (1885–1975), Professor of Geology, University of Oslo, Oslo, Norway.

Type Material: Mineralogical-Geological Museum, University of Oslo, Oslo, Norway; National Museum of Natural History, Washington, D.C., USA, 128674.

References: (1) Raade, G. and M.H. Mladek (1979) Holtedahlite, a new magnesium phosphate from Modum, Norway. *Lithos*, 12, 283–287. (2) (1980) *Amer. Mineral.*, 65, 809–810 (abs. ref. 1). (3) Rømming, C. and G. Raade (1989) The crystal structure of natural and synthetic holtedahlite. *Mineral. Petrol.*, 40, 91–100. (4) Raade, G. (1990) Hydrothermal syntheses of Mg₂(PO₄)OH polymorphs. *Neues Jahrb. Mineral., Monatsh.*, 289–300. (5) Mücke, A. and R. Younessi (1994) Magnetite-apatite deposits (Kiruna-type) along the Sanandaj-Sirjan zone in the Bafq area, Iran, associated with ultramafic and calcalkaline rocks and carbonatites. *Mineral. Petrol.*, 50, 219–244.