

# Portlandite

# Ca(OH)<sub>2</sub>

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**Crystal Data:** Hexagonal. *Point Group:*  $\bar{3} 2/m$ . Hexagonal plates, to 6 cm; commonly fibrous, powdery, massive.

**Physical Properties:** *Cleavage:* {0001}, perfect. *Tenacity:* Sectile; cleavage flakes flexible. Hardness = 2 D(meas.) = 2.23 D(calc.) = 2.26 (synthetic). Soluble in H<sub>2</sub>O, yielding an alkaline solution.

**Optical Properties:** Transparent. *Color:* Colorless, white to greenish white; colorless in transmitted light. *Luster:* Pearly on cleavages.

*Optical Class:* Uniaxial (-).  $\omega = 1.575$   $\epsilon = 1.547$

**Cell Data:** *Space Group:*  $P\bar{3}m1$  (synthetic).  $a = 3.589(8)$   $c = 4.911(14)$   $Z = 1$

**X-ray Powder Pattern:** Synthetic.

2.628 (100), 4.90 (74), 1.927 (42), 1.796 (36), 3.112 (23), 1.687 (21), 1.484 (13)

**Chemistry:** Analyses of natural material appear not to have been made.

**Occurrence:** An alteration product of calcium silicates in larnite-spurrite contact metamorphic rocks (Scawt Hill, Ireland); in fumaroles (Vesuvius, Italy); as a precipitate from alkaline springs derived from ultramafic rocks (Jebel Awq, Oman); in burning coal measures (Chelyabinsk coal basin, Russia); in sedimentary deposits metamorphosed at high-temperature and low-pressure by spontaneous combustion of bitumen (Hatrum Formation, Israel; Maqarin area, Jordan).

**Association:** Afwillite, calcite, larnite, spurrite (Scawt Hill, Ireland); calcite, halite (Jebel Awq, Oman); calcite, brownmillerite, hydrocalumite, mayenite, ettringite (Eifel district, Germany).

**Distribution:** From Scawt Hill, Larne, Co. Antrim, Ireland. On Vesuvius, Campania, Italy. At the Bellerberg volcano, two km north of Mayen, Eifel district, Germany. In the Chelyabinsk coal basin, Southern Ural Mountains, Russia. From the Hatrum Formation, Israel. In the Maqarin area, north Jordan. From Jebel Awq, Northern Oman Mountains, Oman. Large crystals and masses in the Wessels mine, near Kuruman, Cape Province, South Africa. From Cerro de la Coronita, near Cuernavaca, Morelos, Mexico.

**Name:** For its relation to a principal hydrolysis product of Portland cement.

**Type Material:** The Natural History Museum, London, England, 1933,307.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 641–642. (2) Neal, C. and G. Stanger (1984) Calcium and magnesium hydroxide precipitation from alkaline groundwaters in Oman, and their significance to the process of serpentinization. *Mineral. Mag.*, 48, 237–241. (3) von Bezings, K.L., R.D. Dixon, D. Pohl, and G. Cavallo (1991) The Kalahari manganese field: an update. *Mineral. Record*, 22, 279–297, esp. 289. (4) Desgranges, L., D. Grebille, G. Calvarin, G. Chevrier, N. Floquet, and J.-C. Niepce (1993) Hydrogen thermal motion in calcium hydroxide: Ca(OH)<sub>2</sub>. *Acta Cryst.*, 49, 812–817. (5) (1953) NBS Circ. 539, 1, 58.