

# Nesquehonite

# Mg(HCO<sub>3</sub>)(OH)·2H<sub>2</sub>O

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**Crystal Data:** Monoclinic, pseudo-orthorhombic. *Point Group:* 2/m. Crystals are prismatic, elongated along [010], {001}, {010}, {011}, {101} striated || [010], to 3 cm; radial sprays and flat radial coatings, botryoidal. *Twinning:* Synthetic material is universally twinned on {001}.

**Physical Properties:** *Cleavage:* Perfect on {101}; good on {010}. *Fracture:* Splintery to fibrous. Hardness = 2.5 D(meas.) = 1.824–1.854 D(calc.) = 1.856 Very slightly soluble in H<sub>2</sub>O; may fluoresce green under SW UV.

**Optical Properties:** Transparent to translucent. *Color:* Colorless to white; colorless in transmitted light. *Luster:* Vitreous to slightly greasy. *Optical Class:* Biaxial (-). *Orientation:* X = a; Y = b; Z ≈ c. *Dispersion:* r < v, weak. α = [1.417] β = 1.503(1) γ = 1.527(1) 2V(meas.) = 53°

**Cell Data:** *Space Group:* P2<sub>1</sub>/m (synthetic). a = 7.7053(11) b = 5.3673(6) c = 12.1212(11) β = 90.451(13)° Z = 4

**X-ray Powder Pattern:** Synthetic. (ICDD 20-669). 6.48 (100), 3.85 (75), 2.617 (55), 3.03 (30), 3.23 (20), 2.337 (20), 1.925 (16)

Chemistry:	(1)	(2)
CO <sub>2</sub>	30.22	31.81
MgO	29.22	29.13
H <sub>2</sub> O	40.32	39.06
Total	99.76	100.00

(1) Lansford, Pennsylvania, USA; average of four analyses. (2) Mg(HCO<sub>3</sub>)(OH)·2H<sub>2</sub>O, supported by proton magnetic resonance spectroscopy, TGA, and IR.

**Occurrence:** Typically recently formed under near-surface conditions, as efflorescences in coal mines; in fractures in serpentinites; deposits around springs; in caves due to loss of CO<sub>2</sub> in waters.

**Association:** Lansfordite, dypingite, calcite, aragonite, artinite, hydromagnesite, brucite, pyroaurite, monohydrocalcite.

**Distribution:** In the USA, from Nesquehoning, near Lansford, Carbon Co., Pennsylvania; near the Robinson Gulch pegmatite, Jefferson Co., Colorado. Along Rapid Creek, Yukon Territory, Canada. In France, large crystals at a coal mine at Lamure, Isère, and from Restivalgues, near Salers, Cantal. In Austria, at Kraubath, Styria. In Italy, from near Rain, Taufers, Tirol; on Monte Ramazzo, north of Borzoli, Liguria; in the Francisa asbestos mine, Val Lanterna, Val Malenco, Lombardy; from Cogne, Val d'Aosta, Piedmont; and at Viu, near Fubina, Val di Lanzo. From the Feragen ultramafic body, Sør-Trøndelag, Norway. In Australia, from Paddy's River mine, Australian Capital Territory, and under Rainbow Falls, Sempill Creek, Barrington Tops, New South Wales. Around Mt. Erebus, Victoria Land, Antarctica. In Japan, from Yoshikawa, Aichi Prefecture, and at Shiraki, Mie Prefecture. A few other minor localities are known.

**Name:** For its first-noted occurrence at Nesquehoning, Pennsylvania, USA.

**Type Material:** Yale University, New Haven, Connecticut, USA, 3.1550, 3.1566, 3.1567.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 225–227. (2) Kinsolving, M.R., C. MacGillavry, and R. Pepinsky (1950) Twinning in nesquehonite, MgCO<sub>3</sub>·3H<sub>2</sub>O. Amer. Mineral., 35, 127. (3) Stephan, G.W. and C.H. MacGillavry (1972) The crystal structure of nesquehonite, MgCO<sub>3</sub>·3H<sub>2</sub>O. Acta Cryst., 28, 1031–1033. (4) Gasiunas, K., A. Kaminskas, I. Kapacauskas, B. Valuziene, and P. Kicas (1973) Nature of water in nesquehonite. Zh. Neorg. Khim. 18(9), 2332–2335 (in Russian). (5) (1974) Chem. Abs., 80, 154 (abs. ref. 4).

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