

**Zaratite****Ni<sub>3</sub>(CO<sub>3</sub>)(OH)<sub>4</sub>•4H<sub>2</sub>O**

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**Crystal Data:** n.d. *Point Group:* n.d. Coatings composed of fibrous to spherulitic microcrystals and gellike amorphous material.

**Physical Properties:** *Fracture:* Conchoidal, in aggregates. *Tenacity:* Brittle. Hardness = 3.5  
D(meas.) = 2.57–2.69 D(calc.) = n.d.

**Optical Properties:** Transparent to translucent. *Color:* Emerald-green; green in transmitted light. *Luster:* Vitreous to greasy.

*Optical Class:* Biaxial, may be weakly birefringent, banded. *Pleochroism:* Emerald-green along fiber length; yellow-green perpendicular to fiber length.  $n = 1.56\text{--}1.62$   $\alpha = 1.597$   $\beta = 1.602$   
 $\gamma = 1.609$   $2V(\text{meas.}) = \text{n.d.}$

**Cell Data:** *Space Group:* n.d.  $Z = \text{n.d.}$

**X-ray Powder Pattern:** Lancaster Co., Pennsylvania, USA or Heazlewood, Tasmania, Australia; diffuse pattern, probably of a mixture.

5.07 (vs), 8.93 (s), 2.45 (s), 2.73 (m), 2.00 (mw), 1.91 (w), 1.55 (w)

**Chemistry:**

	(1)	(2)
CO <sub>2</sub>	11.69	11.70
NiO	58.81	59.57
H <sub>2</sub> O	29.50	28.73
Total	100.00	100.00

(1) Texas, Pennsylvania, USA. (2) Ni<sub>3</sub>(CO<sub>3</sub>)(OH)<sub>4</sub>•4H<sub>2</sub>O.

**Occurrence:** An uncommon secondary mineral formed by alteration of chromite, pentlandite, pyrrhotite, and millerite in serpentinites and ultramafic rocks.

**Association:** Brucite, hydromagnesite, calcite, aragonite, dolomite.

**Distribution:** In the USA, in Pennsylvania, from Wood's, Carter's, and Low's mines, Texas, Lancaster Co., and at Phillip's chrome mine, West Nottingham, Chester Co. At Igdlokunguak, Greenland. In the Talmessi mine, 35 km west of Anarak, Iran. On Dun Mountain, Nelson, New Zealand. At the Lord Brassey mine, Heazlewood, Tasmania, Australia. In the Hagdale quarry, Unst, Shetland Islands, Scotland. On Cape Ortegal, Galicia, Spain. At Lillaz, Val d'Aosta, Piedmont, Italy. In Austria, at Kraubath, Styria, and in the Stubachtal, Tirol. From Vrapice and Dubi, near Kladno, Czech Republic. On Mabilikwe Hill, Cape Province, South Africa. A few additional minor occurrences are known.

**Name:** To honor Antonio Gil y Zarate (1793–1861), Spanish dramatist.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 245–246. (2) Isaacs, T. (1963) The mineralogy and chemistry of the nickel carbonates. Mineral. Mag., 33, 663–678.