

Zellerite**Ca(UO₂)(CO₃)₂•5H₂O**

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Crystal Data: Orthorhombic. *Point Group:* 2/m 2/m 2/m or *mm*2. As fine hairlike fibers, to 2 mm, in roughly radial aggregates, veinlets, and incrustations.

Physical Properties: *Cleavage:* One, || elongation, possible. Hardness = ~2
D(meas.) = 3.25(1) D(calc.) = 3.242 Radioactive; fluoresces patchy green under SW and LW UV.

Optical Properties: Transparent. *Color:* Pale lemon-yellow; very pale yellow in transmitted light.

Optical Class: Biaxial (+). *Pleochroism:* X = Y = colorless; Z = pale yellow. *Orientation:* Z = c. *Dispersion:* r < v. α = 1.536(5) β = 1.559(5) γ = 1.697(5) 2V(meas.) = 25°–30°

Cell Data: *Space Group:* *Pmmm* or *Pmn*2₁. a = 11.220(15) b = 19.252(16)
c = 4.933(16) Z = 4

X-ray Powder Pattern: Lucky Mc mine, Wyoming, USA.
9.66 (100), 4.848 (50), 5.591 (35), 3.651 (35), 4.407 (25), 7.33 (18), 2.947 (13)

Chemistry:	(1)	(2)
CO ₂	16.9	16.92
UO ₃	53.9	54.98
CaO	10.3	10.78
H ₂ O ⁺	12.3	
H ₂ O [−]	6.6	
H ₂ O		17.32
Total	[100.0]	100.00

(1) Lucky Mc mine, Wyoming, USA; CO₂ and H₂O by CHN analyzer; recalculated to 100.0% after deduction of R₂O₃ 1.0%, Na₂O 0.4%, K₂O 0.2%, SiO₂ + insoluble 0.5% from an original total of 100.2%; corresponds to Ca_{1.00}(UO₂)_{1.03}(CO₃)_{2.09}•3.72H₂O. (2) Ca(UO₂)(CO₃)₂•5H₂O.

Occurrence: A rare weathering product of uranium ores, formed at low pH in the presence of oxidizing pyrite.

Association: Metazellerite, gypsum, “limonite”, iron sulfides, schoepite, meta-autunite, uranophane, “opal”.

Distribution: In the USA, from the Lucky Mc mine, Wind River Basin, Fremont Co., and the Pat No. 8 mine, Powder River Basin, Converse Co., Wyoming; in the White Canyon No. 1 mine, Frey Point, San Juan Co., Utah; at the Alta mine, Ambrosia Lake district, and Westwater Canyon, McKinley Co., New Mexico. In the Hatrurim Formation, Israel. From Jáchymov (Joachimsthal), Czech Republic.

Name: To honor Howard Davis Zeller (1922–), geologist with the U.S. Geological Survey, who discovered the mineral.

Type Material: National Museum of Natural History, Washington, D.C., USA, 112827.

References: (1) Coleman, R.G., D.R. Ross, and R. Meyrowitz (1966) Zellerite and metazellerite, new uranyl carbonates. *Amer. Mineral.*, 51, 1567–1578.