

Devilline**CaCu₄(SO₄)₂(OH)₆•3H₂O**

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Crystal Data: Monoclinic. *Point Group:* 2/m. As pseudo-hexagonal crystals, platy on {001}, striated || [010], typically in rosettes, to 1 cm; in crusts. *Twining:* On {010}.

Physical Properties: *Cleavage:* On {001}, perfect; on {110}, {101}, {10 $\bar{1}$ }, distinct. *Tenacity:* Brittle. Hardness = 2.5 D(meas.) = 3.13, on impure material. D(calc.) = 3.084 Soluble in H₂O.

Optical Properties: Transparent to translucent. *Color:* Blue-green, dark emerald-green, verdigris-green; green in transmitted light. *Streak:* Pale green. *Luster:* Vitreous, may be pearly on {001}.

Optical Class: Biaxial (-). *Pleochroism:* X = pale green; Y = bluish green; Z = dark green. *Orientation:* Z = b; X \simeq c. *Dispersion:* r < v, marked. $\alpha = 1.585(3)$ $\beta = 1.649(3)$ $\gamma = 1.660(3)$ 2V(meas.) = 39°

Cell Data: *Space Group:* P2₁/c. a = 20.870(2) b = 6.135(2) c = 22.191(3) $\beta = 102^\circ 44(1)'$ Z = 8

X-ray Powder Pattern: Špania Dolina, Slovakia (similar to serpierite). 10.22 (100), 5.099 (93), 3.392 (67), 2.098 (37), 3.209 (35), 3.745 (34), 3.185 (33)

Chemistry:

	(1)	(2)
SO ₃	24.41	24.92
SiO ₂	2.11	
CuO	48.39	49.52
CaO	8.32	8.73
H ₂ O	16.22	16.83
Total	99.45	100.00

(1) Špania Dolina, Slovakia; after deduction of SiO₂ as quartz, corresponds to Ca_{0.98}Cu_{4.02}(SO₄)_{2.02}(OH)_{5.96}•2.97H₂O. (2) CaCu₄(SO₄)₂(OH)₆•3H₂O.

Occurrence: An uncommon secondary mineral in the oxidized portions of copper sulfide deposits; may be of post-mining origin in dumps and on timbers.

Association: Langite, antlerite, brochantite, posnjakite, linarite, malachite, azurite, gypsum.

Distribution: In England, from Cornwall, at several mines around St. Just, St. Hilary, and Gwinear; at Wheal Friendship, Mary Tavy, Devon; from Caldbeck Fells, Cumbria. Fine examples at Špania Dolina (Herrengrund) and Piesky, Slovakia. In Germany, from Bad Ems, Rhineland-Palatinate, and at Sailauf, northeast of Aschaffenburg, Bavaria. In Italy, in the Monte Rosso gypsum cave; from the Baccu Locci mine, near Villaputzu, Sarrabus district, Sardinia. At Tsumeb, Namibia. From the Kabasaka and Nyukaku mines, Hyogo Prefecture, Japan. At the Tui mine, Mt. Te Aroha, New Zealand. In the USA, from the Ecton mine, Montgomery Co., Pennsylvania; at Sterling Hill, Ogdensburg, New Jersey; from Majuba Hill, Pershing Co., and at several other minor localities in Nevada; in the Trixie mine, Tintic district, Juab Co., Utah; in Arizona, from the Grandview mine, Grand Canyon, Coconino Co., in the Mammoth mine, Tiger, Pinal Co., at Ajo, Pima Co., and elsewhere.

Name: Honors Henri Etienne Sainte-Claire Deville (1818–1881), French chemist.

Type Material: n.d.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 590–592. (2) Mrázek, Z., T. Řidkošil, and J. Ederová (1983) New data for devillite [devilline]. Neues Jahrb. Mineral., Monatsh., 79–88. (3) Sabelli, C. and P.F. Zanazzi (1972) The crystal structure of devillite [devilline]. Acta Cryst., 28, 1182–1189. (4) Krause, W. and H. Täuber (1992) Zum Kenntnisstand der Minerale Serpierit, Orthoserpierit und Devillin. Aufschluss, 43(1), 1–25 (in German).

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