

Crystal Data: Hexagonal. *Point Group:* $6/m\ 2/m\ 2/m$. Forms hexagonal plates as large as 10 cm, flattened on {0001}, which may exhibit hexagonal striae; as rosettes of nearly parallel plates; commonly massive and foliated.

Physical Properties: *Cleavage:* Perfect on {0001}. *Tenacity:* Flexible in thin leaves. Hardness = 1.5–2 VHN = 128–138 (100 g load). $D(\text{meas.}) = 4.6\text{--}4.76$ $D(\text{calc.}) = 4.602$

Optical Properties: Opaque. *Color:* Indigo-blue or darker, commonly highly iridescent, brass-yellow to deep red. *Streak:* Lead-gray, shining. *Luster:* Submetallic, inclining to resinous, somewhat pearly on cleavage; subresinous to dull when massive.

Optical Class: Uniaxial (+). *Pleochroism:* Marked, deep blue to pale blue. *Dispersion:* Strong. $\omega = 1.45$ (589). $\epsilon = 2.62$ (589). *Anisotropism:* Strong.

$R_1\text{--}R_2$: (400) 14.5–32.0, (420) 14.7–31.5, (440) 14.3–30.3, (460) 13.3–29.0, (480) 11.7–27.6, (500) 10.1–26.2, (520) 8.5–24.7, (540) 6.9–23.4, (560) 5.5–22.1, (580) 4.2–21.1, (600) 3.3–21.1, (620) 3.3–21.6, (640) 4.9–22.3, (660) 9.8–22.7, (680) 16.4–22.6, (700) 24.9–22.4

Cell Data: *Space Group:* $P6_3/mmc$. $a = 3.7938(5)$ $c = 16.341(1)$ $Z = 6$

X-ray Powder Pattern: Synthetic.

2.813 (100), 1.896 (75), 3.048 (65), 2.724 (55), 1.735 (35), 1.556 (35), 3.220 (30)

Chemistry:

	(1)	(2)	(3)
Cu	66.06	65.49	66.48
Fe	0.14	0.25	
S	33.87	33.45	33.52
insol.	0.11		
Total	100.18	99.19	100.00

(1) Butte, Montana, USA. (2) Bor, Serbia. (3) CuS.

Occurrence: Most commonly of secondary origin in the zone of oxidation in sulfide copper deposits. Rarely of primary hydrothermal origin. Widespread in most copper deposits; common as an iridescent tarnish on other sulfides.

Association: Chalcopyrite, chalcocite, djurleite, bornite, enargite, pyrite, other sulfides.

Distribution: Numerous localities, but with only a few producing rich material. In Italy, from Vesuvius, Campania [TL] and as large crystals from the Calabona mine, Alghero, Sardinia. At Bor, Serbia. From Leogang, Salzburg, Austria. At Dillenburg, Hesse, and Sangerhausen, Saxony, Germany. From Kedabek, Caucasus Mountains, Russia. In the Bou-Skour mine, Bou Azzer district, Morocco. In the USA, from Butte, Silver Bow Co., Montana, as fine crystals in the primary ore; at Kennicott, Alaska; from Summitville, Rio Grande Co., Colorado; in the La Sal district, San Juan Co., Utah; a widespread but minor constituent of the ores in most porphyry copper mines in Arizona. In the Sierra de Famatina, La Rioja Province, Argentina.

Name: To honor Niccolò Covelli (1790–1829), discoverer of Vesuvian covellite.

Type Material: Mineral Museum, University of Naples, Naples, Italy, 12338.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 248–251. (2) Evans, H.T., Jr. and J.A. Konnert (1976) Crystal structure refinement of covellite. *Amer. Mineral.*, 61, 996–1000. (3) Ohmasa, M., M. Suzuki, and T. Takéuchi (1977) A refinement of the crystal structure of covellite, CuS. *Mineral. J. (Japan)*, 8, 311–319. (4) Fjellvåg, H., F. Grønvold, and S. Stølen (1988) Low-temperature structural distortion in CuS. *Zeits. Krist.*, 184, 111–121. (5) (1955) *NBS Circ.* 539, 4, 13–14. (6) Criddle, A.J. and C.J. Stanley, Eds. (1993) *Quantitative data file for ore minerals*, 3rd ed. Chapman & Hall, London, 117.

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