

# Cornwallite



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**Crystal Data:** Monoclinic. *Point Group:*  $2/m$ . As microcrystalline or radial fibrous botryoidal to globular crusts, to 1 mm thick.

**Physical Properties:** *Fracture:* Conchoidal. Hardness = 4.5  $D(\text{meas.}) = 4.17$   
 $D(\text{calc.}) = 4.64$

**Optical Properties:** Semitransparent. *Color:* Verdigris-green to blackish green, pale green; in transmitted light, emerald-green.

*Optical Class:* Biaxial (+) or (-). *Orientation:*  $Y = \text{elongation}$ .  $\alpha = 1.81\text{--}1.820$   
 $\beta = 1.815\text{--}1.860$   $\gamma = 1.85\text{--}1.88$   $2V(\text{meas.}) = \text{Small}$ .

**Cell Data:** *Space Group:*  $P2_1/a$ .  $a = 17.33$   $b = 5.82$   $c = 4.60$   $\beta = 92^\circ 13'$   $Z = 2$

**X-ray Powder Pattern:** Wheal Carpenter, Cornwall, England.  
3.22 (10), 3.10 (9d), 3.53 (9t), 2.414 (9d), 4.60 (8b), 3.02 (8b), 2.478 (8b)

Chemistry:	(1)	(2)	(3)
$\text{P}_2\text{O}_5$	2.71		
$\text{As}_2\text{O}_5$	30.47	33.97	34.63
CuO	59.95	60.29	59.94
$\text{H}_2\text{O}$	8.23	5.80	5.43
insol.		0.82	
Total	101.36	100.88	100.00

(1) Cornwall, England. (2) Wheal Carpenter, Cornwall, England; by microchemical methods, corresponding to  $\text{Cu}_{4.85}(\text{AsO}_4)_{1.91}(\text{OH})_{4.12}$ . (3)  $\text{Cu}_5(\text{AsO}_4)_2(\text{OH})_4$ .

**Polymorphism & Series:** Dimorphous with cornubite.

**Occurrence:** A rare secondary mineral in oxidized copper deposits.

**Association:** Olivenite, cornubite, arthurite, clinoclase, chalcophyllite, strashimirite, lavendulan, tyrolite, spangolite, austinite, conichalcite, brochantite, azurite, malachite.

**Distribution:** In England, in Cornwall, from Wheals Gorland and Unity, Gwennap, at Wheal Carpenter, Gwinear, and other mines; in the Potts Gill mine, Caldbeck Fells, Cumbria. From Sainte-Marie-aux-Mines, Haut-Rhin, Triembach-au-Val, Haut-Rhin, and at the Cap Garonne mine, near le Pradet, Var, France. In the Clara Mine, near Oberwolfach, and at Neubulach, Black Forest; from Reichenbach, near Bensheim, Hesse, Germany. At L'ubietová, near Baňská Bystrica (Libethen, near Neusohl), Slovakia. From Bou Skour and Ounein, Morocco. At Chouichica, Tunisia. In the USA, from the Mammoth and Centennial Eureka mines, Tintic district, Juab Co., and crystallized at the Gold Hill mine, Tooele Co., Utah; at the Majuba Hill mine, Antelope district, Pershing Co., Nevada. From the Guerra al Tirano mine, Guazapares, Chihuahua, Mexico. In Australia, at Broken Hill, New South Wales; in the Ethiudna mine, near Olary, the Arkaroola Station area, and from the Dome Rock copper mine, about 40 km northwest of Mingary, South Australia; and at the Bali Lo copper prospect, 11 km west-southwest of Ashburton Downs homestead, Capricorn Range, Western Australia. A number of other localities are known.

**Name:** For its occurrence in the County of Cornwall, England.

**Type Material:** The Natural History Museum, London, England, MI 1985,1754.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 925. (2) Berry, L.G. (1951) Observations on conichalcite, cornwallite, euchroite lironite and olivenite. *Amer. Mineral.*, 36, 484–503. (3) Claringbull, G.F., M.H. Hey, and R.J. Davis (1959) Cornubite, a new mineral dimorphous with cornwallite. *Mineral. Mag.*, 32, 1–5.

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