

Cornubite



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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Crystals very rare, to 5 mm, tabular || $\{2\bar{1}1\}$, in aggregates. Generally fibrous, botryoidal, globular, porcelaneous massive.

Physical Properties: *Cleavage:* Two observed, both $\perp \{2\bar{1}1\}$, intersecting at about 70° . Hardness = ~ 4 D(meas.) = 4.64 for fibrous material. D(calc.) = 4.85

Optical Properties: Translucent. *Color:* Apple-green, pale to dark green. *Streak:* Pale green. *Luster:* Vitreous.

Optical Class: Biaxial (-). *Dispersion:* $r > v$. $\alpha = 1.87$ $\beta = \text{n.d.}$ $\gamma = \sim 1.90$
2V(meas.) = Very large.

Cell Data: *Space Group:* $P\bar{1}$. $a = 6.121(1)$ $b = 6.251(1)$ $c = 6.790(1)$ $\alpha = 92.93(1)^\circ$
 $\beta = 111.30(1)^\circ$ $\gamma = 107.47(1)^\circ$ $Z = 1$

X-ray Powder Pattern: Potts Gill mine, England.

4.72 (10), 2.562 (10), 2.489 (10), 2.688 (9), 3.49 (8), 2.868 (7), 2.303 (7)

Chemistry:	(1)	(2)	(3)	(1)	(2)	(3)
SiO ₂		0.34		Fe ₂ O ₃	0.32	
P ₂ O ₅		0.25		CuO	59.86	59.94
As ₂ O ₅	35.07	32.01	34.63	H ₂ O	[5.07]	[5.27]
Al ₂ O ₃		0.15				
				Total	[100.00]	[96.94]
						100.00

(1) Wheal Carpenter, Cornwall, England; by microchemical methods, H₂O by difference; corresponds to Cu_{4.8}(AsO₄)_{1.95}(OH)_{3.6}. (2) Reichenbach, Germany; by electron microprobe, total Fe as Fe₂O₃, H₂O calculated from charge balance, original total given as 96.64%; corresponds to Cu_{5.03}[(As_{0.95}Si_{0.02}P_{0.01}Fe_{0.01}Al_{0.01}) $\Sigma=1.00$ O₄]₂(OH)₄. (3) Cu₅(AsO₄)₂(OH)₄.

Polymorphism & Series: Dimorphous with cornwallite.

Occurrence: A rare secondary mineral in oxidized copper deposits.

Association: Cornwallite, chalcophyllite, olivenite, lironite, chenevixite, clinoclase, pseudomalachite, bayldonite, parnaute, tyrolite, azurite, malachite, cuprite, chrysocola, quartz.

Distribution: In England, from Cornwall, at Wheal Carpenter, Gwinear; Wheals Gorland, Unity, and Muttrell, Gwennap; Wheal Phoenix, Linkinhorne; and a number of other mines; in the Bedford United mines, Tavistock, Devon; from the Potts Gill mine, Caldbeck Fells, Cumbria. At Southwick Cliffs, near Dalbeattie, Kirkcudbrightshire, Scotland. In Germany, at Neubulach and the Clara mine, near Oberwolfach, Black Forest; and from Reichenbach, near Bensheim, Hesse. From the Cap Garonne mine, near le Pradet, Var, and the Roua copper mines, about 50 km north of Nice, Alpes Maritimes, France. At L'ubietová, near Baňská Bystrica (Libethen, near Neusohl), Slovakia. In the USA, in the Centennial Eureka mine, Tintic district, Juab Co., and Gold Hill, Tooele Co., Utah; at the Majuba Hill mine, Antelope district, Pershing Co., Nevada; from near the Humboldt and Marshall mines, Santa Cruz Co., Arizona; at Sylvanite, Hidalgo Co., and in the Buckhorn mine, Red Cloud district, Lincoln Co., New Mexico. From Mindigi, Katanga Province, Congo (Shaba Province, Zaire).

Name: From *Cornubia*, the Latin name for Cornwall, source of the first specimens.

Type Material: The Natural History Museum, London, England, 1964R,8650.

References: (1) Claringbull, G.F., M.H. Hey, and R.J. Davis (1959) Cornubite, a new mineral dimorphous with cornwallite. *Mineral. Mag.*, 32, 1-5. (2) (1959) *Amer. Mineral.*, 44, 1321 (abs. ref. 1). (3) Laurent, Y. and R. Pierrot (1961) Sur la présence de cornubite au cap Garonne (Var). *Bull. Soc. fr. Minéral.*, 84, 318-319 (in French). (4) Tillmanns, E., W. Hofmeister, and K. Petitjean (1985) Cornubite, Cu₅(AsO₄)₂(OH)₄, first occurrence of single crystals, mineralogical description and crystal structure. *Bull. Geol. Soc. Finland*, 57, 119-127.

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