

**Crystal Data:** Monoclinic. *Point Group:* 2/*m*. Rare in crystals, typically needlelike, to 9 mm, elongated along [010], tabular on {001}, may be pseudorhomboidal, with prominent {100}, {001}, smaller {110}, and additional forms; as rosettes and radial fibrous spherical aggregates, to 5 cm; in crusts and coatings.

**Physical Properties:** *Cleavage:* On {001}, perfect. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 2.5–3 D(meas.) = 4.38 D(calc.) = 4.42

**Optical Properties:** Transparent to translucent. *Color:* Dark greenish blue to greenish black; in transmitted light, blue-green. *Streak:* Bluish green. *Luster:* Vitreous, pearly on cleavages. *Optical Class:* Biaxial (-). *Pleochroism:* X = pale blue-green; Y = pale blue-green; Z = Benzol-green. *Orientation:* Y = b; Z ≈ a. *Dispersion:* r < v, very strong. α = 1.756 β = 1.874 γ = 1.896 2V(meas.) = 50°

**Cell Data:** *Space Group:* P2<sub>1</sub>/a. a = 12.33–12.38 b = 6.42–6.46 c = 7.21–7.26 β = 99°22′–99°51′ Z = 4

**X-ray Powder Pattern:** Cornwall, England and the Tintic district, Utah, USA. 3.55 (10), 3.13 (8), 10.4 (6), 2.30 (5), 2.05 (5), 2.88 (4), 2.53 (4)

**Chemistry:**

	(1)	(2)
P <sub>2</sub> O <sub>5</sub>	1.50	
As <sub>2</sub> O <sub>5</sub>	27.08	30.20
Fe <sub>2</sub> O <sub>3</sub>	0.49	
CuO	62.80	62.70
H <sub>2</sub> O	7.57	7.10
Total	99.44	100.00

- (1) Cornwall, England; corresponding to (Cu<sub>2.97</sub>Fe<sub>0.02</sub><sup>3+</sup>)<sub>Σ=2.99</sub>(As<sub>0.89</sub>P<sub>0.08</sub>)<sub>Σ=0.97</sub>O<sub>4</sub>(OH)<sub>3.16</sub>.  
 (2) Cu<sub>3</sub>(AsO<sub>4</sub>)(OH)<sub>3</sub>.

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

**Occurrence:** A rare secondary mineral in the oxidized zone of some arsenic-rich hydrothermal base-metal deposits.

**Association:** Olivenite, cornwallite, cornubite, conichalcite.

**Distribution:** In England, from Cornwall, at Wheals Gorland and Unity, the Ting Tang and St. Day United mines, and others, Gwennap, in the Providence mine, Lelant, at Wheal Hazard, St. Just; from the Bedford United mines, near Tavistock, Devon. At Sainte-Marie-aux-Mines, Haut-Rhin, and the Cap Garonne mine, near le Pradet, Var, France. From the Altväter samt Eschig mine, near Sayda, Saxony; in the Neues Jahr mine, near Freudenstadt, and the Clara mine, near Oberwolfach, Black Forest, Germany. At the Santa Lucia mine, near Muravera, Sardinia, Italy. From Novoveská Huta, Slovakia. In the Mammoth and other mines, Tintic district, Juab Co., and the Gold Hill mine, Tooele Co., Utah; fine examples from the Majuba Hill mine, Antelope district, Pershing Co., Nevada, USA. From San Francisco de los Andes, San Juan Province, Argentina. At the Lantaro mine, near Copiapó, Atacama, Chile. In the Hillside quarry, near Stavoren, Transvaal, South Africa. From the Kitabira mine, Yamaguchi Prefecture, Japan. At the Dome Rock copper mine, about 40 km northwest of Mingary, and Moonta, South Australia. Many other minor localities are known.

**Name:** From the Greek for *to incline* and *to break*, remarking the oblique basal cleavage.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 787–789. (2) Palache, C. and L.G. Berry (1946) Clinoclasite. Amer. Mineral., 31, 243–258. (3) Eby, R.K. and F.C. Hawthorne (1990) Clinoclase and the geometry of [5]-coordinate Cu<sup>2+</sup> in minerals. Acta Cryst., C46, 2291–2294.

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