

Crystal Data: Tetragonal. *Point Group:* 4mm. Crystals tabular on {001}, exhibiting square or octagonal outline with vicinal forms, rarely showing pyramidal hemihedralism, to 2 cm; in subparallel aggregates; massive.

Physical Properties: *Cleavage:* {001}, perfect. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 2.5 D(meas.) = 5.42 D(calc.) = 5.48

Optical Properties: Transparent to translucent. *Color:* Deep blue; pale blue in transmitted light. *Streak:* Pale blue. *Luster:* Adamantine, pearly on cleavages. *Optical Class:* Uniaxial (-). *Absorption:* O > E, in thick fragments. $\omega = 1.98(1)$ $\epsilon = 1.85(1)$

Cell Data: *Space Group:* P4mm. $a = 5.880(1)$ $c = 5.500(2)$ $Z = 1$

X-ray Powder Pattern: Tiger, Arizona, USA.
5.51 (10), 2.283 (10), 3.305 (9), 2.580 (9), 1.755 (9), 1.537 (9), 2.929 (8)

Chemistry:	(1)	(2)	(3)
CuO	12.90	12.68	12.90
PbO	72.09	72.01	72.36
Cl	10.89	11.42	11.49
H ₂ O	6.14	6.03	5.84
insol.		0.19	
-O = Cl ₂	2.46	2.57	2.59
Total	99.56	99.76	100.00

(1) Mendip Hills, England; corresponding to Pb_{2.10}Cu_{1.06}Cl_{2.00}(OH)_{4.44}. (2) Tiger, Arizona, USA; corresponding to Pb_{1.98}Cu_{0.98}Cl_{1.98}(OH)_{4.01}. (3) Pb₂CuCl₂(OH)₄.

Occurrence: In oxidized manganese ores (Mendip Hills, England); a secondary mineral in deeply oxidized Pb-Cu ores (Tiger, Arizona, USA); in slag exposed to seawater.

Association: Chloroxiphite, hydrocerussite, mendipite, cerussite (Mendip Hills, England); boleite, wherryite, hydrocerussite, leadhillite, phosgenite, caledonite, atacamite, paratacamite, cerussite (Tiger, Arizona, USA).

Distribution: In England, at the Higher Pitts Farm, Mendip Hills, and the Merehead quarry, near Shepton Mallet, Somerset; at Padstow Consols, Padstow, Cornwall. In Germany, from the Christian-Levin mine, near Essen, North Rhine-Westphalia, and from Richelsdorf, Hesse, in slag. Along Baratti Beach, Tuscany, Italy, in slag. At Laurium, Greece, in slag. In the USA, exceptional crystals from the Mammoth-St. Anthony mine, Tiger, Pinal Co., and from the Rowley mine, Maricopa Co., Arizona. In Iran, in the Tchah Khuni and other mines in the Anarak district; the Seh-Changi mine, near Neyband, Khorassan; and at Abdol Abad, Tabas. From Moolyella, and at the Anticline prospect, 11 km west-southwest of Ashburton Downs homestead, Capricorn Range, Western Australia. In the Santa Ana mine, Caracoles, Sierra Gorda district, Chile. Found at an undefined locality in the Kopet-Dag Range, Cheleken Peninsula, Russia.

Name: From the Greek for *separate from*, and the related mineral *boleite*.

Type Material: The Natural History Museum, London, England, 1923,521; National Museum of Natural History, Washington, D.C., USA, 94813.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 82-83. (2) Winchell, R.E. and H.E. Wenden (1968) Synthesis and study of diaboleite. *Mineral. Mag.*, 36, 932-939. (3) Rouse, R.C. (1971) The crystal chemistry of diaboleite. *Zeits. Krist.*, 134, 69-80. (4) Bideaux, R.A. (1980) Tiger, Arizona. *Mineral. Record*, 11, 155-181. (5) Cooper, M.A. and F.C. Hawthorne (1995) Diaboleite, Pb₂Cu(OH)₄Cl₄, a defect perovskite structure with stereoactive lone-pair behavior of Pb²⁺. *Can. Mineral.*, 33, 1125-1129.