Dessauite $(Sr,Pb)(Y,U)(Ti,Fe^{3+})_{20}O_{38}$

Crystal Data: Tetragonal. *Point Group:* 4*mm*. Crystals tabular on {001}, exhibiting square or octagonal outline with vicinal forms, rarely showing pyramidal hemihedralism, to 4 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:* *P*4*mm*. $a = 5.880(1)$ $c = 5.500(2)$ $Z = 1$

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_2O	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) $Pb_2CuCl_2(OH)_4$.

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, near Caracoles, Sierra Gorda district, Antofagasta, 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, $Pb_2Cu(OH)_4Cl_4$, a defect perovskite structure with stereoactive lone-pair behavior of Pb^{2+}. Can. Mineral., 33, 1125–1129.