

Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. Crystals minute, scaly or thin rectangular, rarely with corners truncated at 45° ; platy, columnar-fibrous, earthy, compact massive.

Physical Properties: *Cleavage:* Perfect on {001}. *Tenacity:* Very plastic. Hardness = 2–2.5
D(meas.) = 7.36 D(calc.) = 7.784

Optical Properties: Opaque, transparent in fine grains. *Color:* Cream-white, pale gray, yellowish brown; colorless in thin section. *Luster:* Greasy, silky, pearly on cleavage surfaces; dull to earthy when massive.

Optical Class: Uniaxial (-). $\omega = 2.15$ (synthetic). $\epsilon = \text{n.d.}$

Cell Data: *Space Group:* $P4/nmm$ (synthetic). $a = 3.887$ $c = 7.354$ $Z = 2$

X-ray Powder Pattern: Synthetic.

3.44 (100), 2.677 (95), 2.753 (75), 7.38 (40), 1.946 (35), 2.205 (30), 1.574 (30)

Chemistry:	(1)	(2)	(3)
Fe ₂ O ₃	0.12		
Bi ₂ O ₃	88.49	88.53	92.74
Cl	13.00	12.51	7.06
H ₂ O ⁺	0.87	1.58	1.79
H ₂ O ⁻		0.20	
insol.	0.77		
-O = Cl ₂	2.93	2.82	1.59
Total	100.32	[100.00]	100.00

(1) Jakkalswater, South Africa. (2) Goldfield, Nevada, USA; recalculated to 100% after deduction of quartz 34.81%, Fe₂O₃ 0.28%. (3) BiO(Cl, OH) with Cl:OH = 1:1.

Occurrence: In an alluvial specimen, found near bismuth-bearing granite pegmatites (Jackals Water, South Africa); in greisen (Bygoo, Australia).

Association: Bismutite, mica (Jackals Water, South Africa); bismuthinite (Bygoo, Australia); bismutite, jarosite, alunite, cerussite (Tintic district, Utah, USA); atacamite, connellite, uranium minerals (near Dalbeattie, Scotland).

Distribution: In South Africa, about 25 km northwest of Jakkalswater, near Steinkopf, Cape Province. From Mt. Holland, Western Australia, and Bygoo, New South Wales, Australia. In the USA, from the Eagle and Blue Bell mines, Tintic district, Juab Co., Utah; in the Grizzly Bear and other mines, Goldfield, Esmeralda Co., Nevada. In the Falcacci mine, Rio Marina, Elba, Italy. From near Dalbeattie, Kirkcudbrightshire, Scotland. At the Croft Gothall mine, Cornwall, England. From Wittichen, Black Forest, Germany. At Tary-Ekan, Karamazan, Tajikistan. From the Kara-Oba Mo-W deposit, Bet-Pak-Dal Desert, central Kazakhstan.

Name: In allusion to its composition, a *bismuth oxychloride*.

Type Material: n.d.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 60–62. (2) Mountain, E.D. (1937) Two new bismuth minerals from South Africa. *Mineral. Mag.*, 24, 59–64. (3) Keramidis, K.G., G.P. Voutsas, and P.I. Rentzeperis (1993) The crystal structure of BiOCl. *Zeits. Krist.*, 205, 35–40. (4) (1953) *NBS Circ.* 539, 4, 54–55.