Melanothallite Cu_2OCl_2

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Platy or scaly, to 1 cm.

Physical Properties: *Cleavage:* One direction, perfect, probably prismatic.
Tenacity: Brittle. Hardness = n.d. D(meas.) = n.d. D(calc.) = 4.08 Alters rapidly to green minerals on exposure; partly dissolved in H_2O.

Optical Properties: Opaque, transparent in thin fragments. *Color:* Black to bluish black; deep brown in transmitted light. *Luster:* Vitreous.
Optical Class: Biaxial. α = n.d. β = n.d. γ = n.d. 2V(meas.) = n.d.

Cell Data: *Space Group: Fddd.* $a = 9.595(3)$ $b = 9.693(3)$ $c = 7.461(3)$ Z = 8

X-ray Powder Pattern: Tolbachik volcano, Russia.
5.041 (100), 2.518 (77), 2.947 (44), 2.422 (20), 2.176 (19), 2.816 (17), 1.928 (16)

Chemistry:

	(1)	(2)
Na	0.04	
K	0.06	
Cu	59.41	59.39
Zn	0.07	
Pb	0.01	
Li	0.04	
O	[8.55]	7.48
Cl	28.33	33.13
H_2O^+	0.05	
H_2O^-	1.75	
SO_4	1.20	
Total	[99.51]	100.00

(1) Tolbachik volcano, Russia; after deduction of excess Cu 8.63%, probably present as tenorite, O calculated from stoichiometry. (2) Cu_2OCl_2.

Occurrence: Sublimed on crater walls formed in 1868 and 1906 (Vesuvius, Italy); in volcanic fissures (Tolbachik volcano, Russia).

Association: Eriochalcite, chalcocyanite, euchlorine, dolerophanite (Vesuvius, Italy); euchlorine, chalcocyanite, dolerophanite, tenorite (Tolbachik volcano, Russia).

Distribution: On Vesuvius, Campania, Italy. From the Tolbachik fissure volcano, Kamchatka Peninsula, Russia.

Name: From the Greek for *black* and *a young shoot*, for the mineral's property of turning green on exposure.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 174.
(2) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 44. (3) Bergasova, L.P. and S.K. Filatov (1982) The chemical formula and crystallochemical characteristics of melanothallite, Cu_2OCl_2. Zap. Vses. Mineral. Obshch., 111, 562–565 (in Russian). (4) (1983) Amer. Mineral., 68, 852 (abs. ref. 3). (5) (1983) Mineral. Abs., 34, 348 [questions identity] (abs. ref. 3).