Melanotekite $Pb_2Fe_2^{3+}O_2Si_2O_7$

Crystal Data: Orthorhombic. *Point Group:* 222. As small spherules; commonly massive.

Physical Properties: *Cleavage:* In two directions, one more prominent. Hardness = 6.5 D(meas.) = 5.73–6.28 D(calc.) = [6.30]

Optical Properties: Nearly opaque; translucent in thin section. *Color:* Black to blackish gray or blackish green; dark green in thin section. *Streak:* Greenish gray. *Luster:* Metallic to greasy. *Optical Class:* Biaxial (+). *Pleochroism:* Bottle-green and red-brown. *Dispersion:* $r > v$, strong. $\alpha = 2.12$ $\beta = 2.17$ $\gamma = 2.31$ 2V(meas.) = 67°

Cell Data: *Space Group:* $C222_1$. $a = 6.93$ $b = 10.98$ $c = 10.06$ Z = 4

X-ray Powder Pattern: Långban, Sweden.
2.90 (vs), 2.86 (vs), 2.735 (vs), 3.71 (s), 3.51 (s), 3.24 (s), 2.84 (s)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
SiO_2	17.32	16.59	16.55	PbO	55.26	62.38	61.46
TiO_2		0.90		MgO		0.10	
Al_2O_3		0.57		CaO		0.00	
Fe_2O_3	23.18	19.21	21.99	BaO		0.00	
Mn_2O_3	0.76			rem.	3.59		
MnO		0.39		Total	100.11	100.14	100.00

(1) Långban, Sweden; remainder FeO, CuO, MgO, CaO, BaO, Na_2O, K_2O, Cl, and P_2O_5. (2) Jakobsberg, Sweden; by electron microprobe, corresponds to $Pb_{2.03}(Fe^{3+}_{1.75}Al_{0.08}Ti_{0.08}Mn_{0.04}Mg_{0.02})_{\Sigma=1.97}Si_{2.00}O_9$. (3) $Pb_2Fe_2O_2Si_2O_7$.

Polymorphism & Series: Forms a series with kentrolite.

Occurrence: In a metamorphosed Fe–Mn deposit, from which over one ton was removed (Långban, Sweden); in oxidized Pb–Cu ores (Artillery Peaks, Arizona, USA).

Association: Lead, magnetite, garnet (Långban, Sweden); leadhillite, alamosite (Tsumeb, Namibia); diaboleite (Tiger, Arizona, USA); luddenite, alamosite, shattuckite, mimetite, wulfenite, cerussite, wickenburgite (Artillery Peaks, Arizona, USA).

Distribution: At Långban, Jakobsberg, and Pajsberg, Värmland, Sweden. In the Merehead quarry, Wesley mine, and at Higher Pitts Farm, Priddy, Somerset, and at Westbury-on-Trym, Avon, England. From Tsumeb, Namibia. In the USA, from Hillsboro, Sierra Co., New Mexico; in Arizona, at the Mammoth-St. Anthony mine, Tiger, Pinal Co., and from a Pb–Cu prospect near Artillery Peaks, Mohave Co.

Name: From the Greek *black* and *to melt* or *glass*, for the black bead formed under the blowpipe.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 545. (2) Gabrielson, O. (1963) The crystal structures of kentrolite and melanotekite. Arkiv Mineral. Geol. 3, 141–151. (3) Glasser, F.P. (1967) New data on kentrolite and melanotekite: ternary phase relations in the system $PbO - Fe_2O_3 - SiO_2$. Amer. Mineral., 52, 1085–1093. (4) Welin, E. (1968) X-ray powder data for minerals from Långban and the related mineral deposits of Central Sweden. Arkiv Mineral. Geol., 4(30), 499–541. (5) Moore, P.B., P.K. Sen Gupta, J. Shen, and E.O. Schlemper (1991) The kentrolite-melanotekite series, $4Pb_2(Mn,Fe)_2^{3+}O_2[Si_2O_7]$: chemical crystallographic relations, lone-pair splitting, and cation relation to $8URe_2$. Amer. Mineral., 76, 1389–1399. (6) Holtstam, D. and J. Langhof (1994) Hancockite from Jakobsberg, Filipstad, Sweden: the second world occurrence. Mineral. Mag., 58, 172–174.