Melanotekite  
\[ \text{Pb}_2\text{Fe}_2^{3+}\text{O}_2\text{Si}_2\text{O}_7 \]

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Crystal Data:  Orthorhombic.  \textit{Point Group:}  222.  As small spherules; commonly massive.

Physical Properties:  \textit{Cleavage:}  In two directions, one more prominent.  \textit{Hardness = 6.5}
\[ \text{D(meas.)} = 5.73-6.28 \quad \text{D(calc.)} = [6.30] \]

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

Cell Data:  \textit{Space Group:}  \( \text{C}_{222}^1 \).  \( a = 6.93 \quad b = 10.98 \quad c = 10.06 \quad Z = 4 \)

X-ray Powder Pattern:  \( \text{Lºangban, Sweden.} \)
\[ 2.90 \quad (\text{vs}), 2.86 \quad (\text{vs}), 2.735 \quad (\text{vs}), 3.71 \quad (\text{s}), 3.51 \quad (\text{s}), 3.24 \quad (\text{s}), 2.84 \quad (\text{s}) \]

Chemistry:  \[
\begin{array}{cccccc}
\text{SiO}_2 & 17.32 & 16.59 & 16.55 & \text{PbO} & 55.26 & 62.38 & 61.46 \\
\text{TiO}_2 & 0.90 & & & \text{MgO} & 0.10 & & \\
\text{Al}_2\text{O}_3 & 0.57 & & & \text{CaO} & 0.00 & & \\
\text{Fe}_2\text{O}_3 & 23.18 & 19.21 & 21.99 & \text{BaO} & 0.00 & & \\
\text{Mn}_2\text{O}_3 & 0.76 & 0.39 & & \text{rem.} & 3.59 & & \\
\text{MnO} & & & & & & & \\
\hline
\text{Total} & 100.11 & 100.14 & 100.00 & & & & \\
\end{array}
\]

(1) \( \text{Lºangban, Sweden; remainder FeO, CuO, MgO, CaO, BaO, Na}_2\text{O, K}_2\text{O, Cl, and P}_2\text{O}_5 \)
(2) \( \text{Jakobsberg, Sweden; by electron microprobe, corresponds to } \text{Pb}_2\text{Fe}_2^{3+}\text{O}_2\text{Si}_2\text{O}_7 \)
(3) \( \text{Pb}_2\text{Fe}_2\text{O}_2\text{Si}_2\text{O}_7 \)

Polymorphism & Series:  Forms a series with kentrolite.

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

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

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

Name:  From the Greek \textit{black} and \textit{to melt} or \textit{glass}, for the black bead formed under the blowpipe.

References:  (1) Dana, E.S. (1892) Dana’s system of mineralogy, (6th edition), 545.

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