Viaeneite  \((\text{Fe, Pb})_4\text{S}_8\text{O}\)

Crystal Data:  Monoclinic.  \text{Point Group}: n.d. As crystals, to 80 \(\mu\)m, in oval aggregates.

Physical Properties:  \text{Cleavage}:  On \{110\}, clearly observed under transmission electron microscopy.  Hardness = 3  \text{VHN} = 123–357, average 252 (200 g load).  \text{D(meas.)} = 3.8(1) \text{D(calc.)} = 3.65

Optical Properties:  \text{Opaque}.  \text{Color}:  Yellow; in reflected light, yellow with a brassy hue.  \text{Streak}:  Black.  \text{Luster}:  Metallic.  \text{Anisotropism}:  Strong; orange, yellow-orange, greenish gray.  \text{Bireflectance}:  Distinct; grayish brown to orange to yellow-orange.


Cell Data:  \text{Space Group}: n.d.  \text{a} = 9.717(8)  \text{b} = 7.280(6)  \text{c} = 6.559(7)  \beta = 95.00(3)^\circ  \text{Z} = 2

X-ray Powder Pattern:  Engis, Belgium.

2.709 (10), 2.419 (8), 1.758 (8), 2.323 (7), 0.9576 (7), 1.925 (6), 0.9605 (6)

Chemistry:

\[
\begin{array}{ccc}
\text{Fe} & 42.37 & 45.04 \\
\text{Ni} & 0.20 & \\
\text{Zn} & 0.05 & \\
\text{Pb} & 4.02 & \\
\text{As} & 0.17 & \\
\text{S} & 49.74 & 51.73 \\
\text{O} & 3.69 & 3.23 \\
\hline
\text{Total} & 100.24 & 100.00
\end{array}
\]

(1) Engis, Belgium; by electron microprobe, average of three analyses, corresponds to \((\text{Fe}_{0.91}\text{Pb}_{0.09}\text{Ni}_{0.02})_{\Sigma=1.03}(\text{S}_{8.00}\text{As}_{0.01})_{\Sigma=8.01}\text{O}_{1.16}\); determination of sulfur valencies leads to \((\text{Fe, Pb})_{12}(\text{S}^2-\text{S}^6)^{11}(\text{S}^6\text{O}_{3})\). (2) \(\text{Fe}_3\text{S}_8\text{O}\).

Occurrence:  In a carbonate-hosted Pb–Zn deposit.

Association:  Pyrite, melnikovite, marcasite, greigite, sphalerite, galena, goethite, zincian siderite, smithsonite, dolomite, quartz, cerussite, anglesite.

Distribution:  From the Mallieue Pb–Zn deposit, Engis, about 40 km southwest of Liège, Belgium [TL].

Name:  To honor Professor Willy A. Viaene (1940–), Catholic University, Louvain, Belgium, who has made important contributions to geological sciences in Belgium.

Type Material:  Academy of Mining & Metallurgy, Kraków, Poland, EMP9; Catholic University, Louvain, KUR32, ONB2, ONB3; Museum of Natural History, Brussels, Belgium, RN 6380.


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