

Crystal Data: Monoclinic, pseudo-orthorhombic. *Point Group:* 2/m. Crystals rare, but may be to 8 cm, from several localities; tabular on {001}. Massive, as rounded and irregular grains; earthy. *Twinning:* Common on {001}; lamellar.

Physical Properties: *Cleavage:* Distinct on {011}. *Fracture:* Uneven. Hardness = 2.5 VHN = 144–160 (100 g load). D(meas.) = 6.46 D(calc.) = 6.44

Optical Properties: Opaque. *Color:* Pale lead-gray to pale gray; in polished section, pure white. *Streak:* Pale lead-gray to grayish blue. *Luster:* Metallic. *Pleochroism:* Weak. *Anisotropism:* Moderate.

R₁–R₂: (400) 40.5–45.3, (420) 40.4–45.0, (440) 40.0–44.4, (460) 39.7–43.9, (480) 39.5–43.6, (500) 39.3–43.2, (520) 39.1–42.8, (540) 38.8–42.3, (560) 38.6–41.9, (580) 38.3–41.5, (600) 38.0–41.1, (620) 37.7–40.6, (640) 37.2–40.1, (660) 36.5–39.4, (680) 35.9–38.8, (700) 35.1–38.2

Cell Data: *Space Group:* P2₁/m. a = 8.963(2) b = 31.93(2) c = 8.500(2)
β = 118.02(1)° Z = 2

X-ray Powder Pattern: Park City, Utah, USA.

3.54 (100), 3.06 (90), 2.89 (90), 3.39 (80), 3.18 (86), 2.98 (70), 3.71 (60)

Chemistry:

	(1)	(2)	(3)
Pb	68.90	67.52	68.60
Sb	9.27	11.48	8.64
As	4.54	3.65	5.32
S	17.13	17.45	17.44
Total	99.84	100.10	100.00

(1) Sala, Sweden; corresponds to Pb_{14.32}(Sb_{3.28}As_{2.61})_{Σ=5.89}S_{23.00}. (2) Silver King mine, Park City, Utah, USA; corresponds to Pb_{13.77}(Sb_{3.98}As_{2.06})_{Σ=6.04}S_{23.00}. (3) Pb₁₄(Sb, As)₆S₂₃ with Sb:As = 1:1.

Polymorphism & Series: Forms a series with jordanite.

Occurrence: In hydrothermal veins with sulfides and other sulfosalt minerals.

Association: Galena, pyrite, tetrahedrite, barite, fluorite, quartz.

Distribution: Only some of the best authenticated localities are mentioned here. In Sweden, from Sala, Västmanland [TL??only, not Falun=DS8??ck Swedish book??], and Falun, Kopparberg [??TL??MRM??]. In Ireland, in the Kilbricken mine, Co. Clare, and at Silvermines, Co. Tipperary. From the Treore mine, St. Treath [Teath in Criddle??ck], Cornwall, England. At Bournac, Montagne Noire, Finistère, France. From the Bayerland mine, Oberpfalz??, Germany. In Italy, at Pietrasanta, Val de Castello [Pollone mine, Valdicastello Carducci??], Tuscany. From Uzunzhai, Kazakhstan. At Smirnovsk, Transbaikal??, Siberia, Russia. From the Xanda mine, Virgem da Lapa, Minas Gerais, Brazil. In the Noche Buena mine, Mazapil, Zacatecas, Mexico. In the USA, in Utah, in the Silver King mine, Park City district, Summit Co.; and in the Tintic district, Juab Co.; in California, at Darwin, Inyo Co.; at the Inexo #1 mine, Jamestown, Boulder Co., Colorado. From the Hemlo gold deposit, Thunder Bay district, Ontario, Canada.

Name: From the Greek for *Earth* and *Saturn*, the alchemistic name for lead.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 395–396. (2) Douglass, R.M., M.J. Murphy, and A. Pabst (1954) Geocronite. Amer. Mineral., 39, 908–928. (3) Birnie, R. and C.W. Burnham (1976) The crystal structure and extent of solid solution of geocronite. Amer. Mineral., 61, 963–970. (4) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 192.

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