

Crystal Data: Cubic. *Point Group:* $4/m\bar{3}2/m$. Most commonly cubic, crystals to a meter on an edge are known; more rarely cubo-octahedral or octahedral. May be tabular on {001}; also forms reticulated masses and skeletal crystals. As cleavable masses, coarse to very fine granular; fibrous, plumose. *Twining:* Twin plane {111}, as both contact and penetration twins; twin plane {114}, lamellar.

Physical Properties: *Cleavage:* Perfect on {001}; parting or cleavage on {111}. *Fracture:* Subconchoidal. *Tenacity:* Brittle. Hardness = 2.5–2.75 VHN = 79–104 (100 g load). D(meas.) = 7.58 D(calc.) = 7.57

Optical Properties: Opaque. *Color:* Lead-gray; in polished section, white. *Streak:* Lead-gray. *Luster:* Metallic. R: (400) 51.9, (420) 50.5, (440) 49.1, (460) 47.7, (480) 46.6, (500) 45.4, (520) 44.4, (540) 43.7, (560) 43.1, (580) 42.8, (600) 42.7, (620) 42.7, (640) 42.8, (660) 42.9, (680) 42.9, (700) 42.6

Cell Data: *Space Group:* $Fm\bar{3}m$. $a = 5.936$ $Z = 4$

X-ray Powder Pattern: Synthetic. 2.969 (100), 3.429 (84), 2.099 (57), 1.790 (35), 1.327 (17), 1.714 (16), 1.484 (10)

Chemistry:	(1)	(2)	(3)
Pb	86.50	85.9	86.60
Cu	0.07	trace	
Sb		0.7	
Bi		0.2	
S	13.31	12.6	13.40
Total	99.88	99.4	100.00

(1) Katanga Province, Congo (Shaba Province, Zaire); Cu assumed present in covellite and S equivalent deducted. (2) Barrow mine, Newlands, Cumbria, England; by electron microprobe. (3) PbS.

Polymorphism & Series: Forms a series with clausthalite.

Occurrence: In many different types of environments. In hydrothermal veins, formed under a wide range of temperatures; in contact metamorphic deposits, in pegmatites, rarely; limestones and dolostones are common host rocks.

Association: Sphalerite, marcasite, pyrite, chalcopyrite, tetrahedrite, silver minerals, siderite, calcite, dolomite, barite, quartz, many other hydrothermal minerals.

Distribution: The most important ore mineral of lead; only a few deposits of note can be mentioned. In the USA, in Idaho, in the Coeur d'Alene district, Shoshone Co.; in Colorado, at Leadville, Lake Co., and from Breckenridge, Summit Co. In the Mississippi Valley region, in the Tri-State district, at Joplin, Jasper Co., Missouri; Galena, Cherokee Co., Kansas; and Picher, Ottawa Co., Oklahoma. At the Miliken (Sweetwater) mine, Reynolds Co., Missouri, and other mines north along the Viburnum Trend district, brilliant crystals. From Příbram, Czech Republic. At Freiberg, Saxony; from near Bad Ems, Hesse; and at St. Andreasberg, Neudorf, and Clausthal, in the Harz Mountains, Germany. In France, from Pontgibaud, Puy-de-Dôme. In England, at Alston Moor, Cumbria. In Scotland, at Wanlockhead, Dumfries. In Ireland, from the Mogul mine, Silvermines, Co. Tipperary. At Naica and Santa Eulalia, Chihuahua, Mexico.

Name: A Latin word *galena*, given to lead ore or the dross from melted lead.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 200–204. (2) Deer, W.A., R.A. Howie, and J. Zussman (1962) Rock-forming minerals, v. 5, non-silicates, 180–185. (3) Ramsdell, L.S. (1925) The crystal structures of some metallic sulfides. Amer. Mineral., 10, 281–??. (4) (1953) NBS Circ. 539, 2, 18. (5) Ramdohr, P. (1969) The ore minerals and their intergrowths, (3rd edition), 635–649. (6) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 185.

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