

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Prismatic crystals elongated || [001], to 8 cm; flexible capillary fibers; commonly massive in aggregates of radiating prismatic, fibrous, or feathery forms.

Physical Properties: *Cleavage:* Very rare. *Fracture:* Uneven. *Tenacity:* Fibers are flexible. Hardness = 2.5–3 VHN = n.d. D(meas.) = 6.86–6.99 D(calc.) = 7.12

Optical Properties: Opaque. *Color:* Lead-gray to steel-gray to silver-white; in polished section, white, with only a trace of cream. *Streak:* Black. *Luster:* Metallic.

Pleochroism: Weak. *Anisotropism:* Weak, but distinct in oil.

R_1 – R_2 : (400) 48.2–51.4, (420) 47.0–50.3, (440) 45.9–49.5, (460) 44.9–48.7, (480) 43.9–47.9, (500) 43.0–47.1, (520) 42.2–46.4, (540) 41.6–45.9, (560) 41.1–45.5, (580) 40.8–45.3, (600) 40.5–45.2, (620) 40.4–45.2, (640) 40.2–45.2, (660) 40.1–45.2, (680) 40.1–45.2, (700) 40.0–45.1

Cell Data: *Space Group:* $Pbnm$. $a = 19.09$ $b = 23.87$ $c = 4.055$ $Z = 8$

X-ray Powder Pattern: Hagidaira mine, Gumma Prefecture, Japan. 3.44 (100), 2.81 (30), 3.37 (23), 2.96 (22), 1.911 (17), 2.13 (15), 3.72 (14)

Chemistry:	(1)	(2)	(3)
Pb	38.68	39.55	41.75
Cu	2.02	2.71	
Fe		0.25	
Bi	42.38	40.21	42.10
S	16.59	17.20	16.15
rem.		0.78	
Total	99.67	100.70	100.00

(1) McElroy Township, Canada; corresponds to $Pb_{1.80}Cu_{0.31}Bi_{1.96}S_{5.00}$. (2) Ocna de Fier, Romania; corresponds to $Pb_{1.78}Cu_{0.40}Fe_{0.04}Bi_{1.79}S_{5.00}$. (3) $Pb_2Bi_2S_5$.

Occurrence: In hydrothermal deposits formed at medium temperatures but also found in contact metasomatic replacements, and epithermal replacements, as well as in pegmatites.

Association: Sphalerite, chalcopyrite, pyrite, skutterudite, cobaltite, bornite, enargite, stromeyerite, bismuth, bismuthinite, calcite, tremolite, diopside, epidote, quartz.

Distribution: From numerous localities world-wide. From the Nuestra Señora mine, Cosalá, Sinaloa, Mexico [TL]. In the USA, at Deer Park, Stevens Co., Washington; in Colorado, in the Red Mountain district, San Juan Co.; in Arizona, at the Magma mine, Superior, Pinal Co., and from Landsman Camp, Gila Co.; at Darwin, Inyo Co., California. In Canada, in Ontario, at Boston Creek, McElroy Township, and at Cobalt; long crystals in the Caribou mine, Wells, British Columbia. From Hürky, Czech Republic. In Sweden, at the Bjelkes mine, Nordmark, and Boliden, Västerbotten. Large crystals from Kara Oba, Kazakhstan. At the Carrock Fell mine, Caldbeck Fells, Cumbria, England. From Băița (Rézbánya) and Ocna de Fier (Morávicza; Vaskő), Romania. In the New England Range, New South Wales, Australia. From Amparindravato, Madagascar.

Name: For the locality at Cosalá, Mexico.

Type Material: n.d.

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