Stibnite Sb_2S_3

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Slender to stout, complexly terminated crystals, elongated along [001], to 0.65 m; bent crystals not uncommon, rarely twisted. In radiating and confused groups of acicular crystals; also columnar, granular, or very fine masses. *Twinning:* Rare; twin planes {130}, {120}, and perhaps {310}.

Physical Properties: *Cleavage:* Perfect and easy on {010}; imperfect on {100} and {110}. *Fracture:* Subconchoidal. *Tenacity:* Highly flexible but not elastic; slightly sectile. Hardness = 2 VHN = 71–86, {010} section (100 g load). D(meas.) = 4.63 D(calc.) = 4.625

Optical Properties: Opaque. *Color:* Lead-gray, tarnishing blackish or iridescent; in polished section, white. *Streak:* Lead-gray. *Luster:* Metallic, splendent on cleavage surfaces. *Anisotropism:* Strong.

R_1–R_2: (400) 31.1–53,3, (420) 30.8–53.2, (440) 30.6–53.0, (460) 30.7–52.8, (480) 31.0–52.2, (500) 31.2–51.1, (520) 31.4–49.7, (540) 31.2–48.5, (560) 30.8–47.2, (580) 30.3–45.8, (600) 29.7–44.5, (620) 29.3–43.5, (640) 29.2–42.6, (660) 29.4–41.8, (680) 29.6–41.1, (700) 29.4–40.3

Cell Data: *Space Group: Pbnm.* $a = 11.234(3)$ $b = 11.314(2)$ $c = 3.837(2)$ Z = 4

X-ray Powder Pattern: Synthetic.
2.764 (100), 3.053 (95), 3.556 (70), 3.573 (65), 5.052 (55), 2.680 (50), 2.525 (45)

Chemistry:

	(1)	(2)
Sb	71.45	71.69
S	28.42	28.31
Total	99.87	100.00

(1) Wolfsberg, Germany. (2) Sb_2S_3.

Polymorphism & Series: Dimorphous with metastibnite.

Mineral Group: Forms a series with bismuthinite.

Occurrence: Of hydrothermal origin, formed in veins through a wide range of temperatures.

Association: Realgar, orpiment, cinnabar, galena, lead sulfantimonides, pyrite, marcasite, arsenopyrite, cervantite, stibiconite, calcite, ankerite, barite, chalcedonic quartz.

Distribution: The most important ore of antimony, although large deposits are rare. The following localities have produced outstanding crystallized material. In the USA, at the White Caps mine, Manhattan district, Nye Co., and the Murray mine, Independence Mountains district, Elko Co., Nevada. From the San José and other mines, Oruro, Bolivia. In Germany, at Wolfsberg, Harz Mountains, and near Arnsberg, North Rhine-Westphalia. At Kremnica (Kremnitz) and Banská Štiavnica (Schemnitz), Slovakia. From Příbram, Czech Republic. At Baia Sprie (Felsőbánya) and Herja (Kisbánya), Baia Mare (Nagybánya) district, Romania. In France, at Massaic, Cantal; and at La Lucette, Mayenne. At the Kusa mine, near Bau, Sarawak, Malaysia. From Thames, New Zealand. At Bahar-Lou, near Hamadan, Iran. From Kadamzhay, Kyrgyzstan. Magnificent groups of crystals in the Ichinokawa mine, near Saijo, Ehime Prefecture (Iyo Province), Japan. In China, from the Xikuangshan mine, northeast of Lengshuijiang, Hunan Province, economically very important; fine crystals from the [?? verify in MR as spelling seems off, not in mindat.org ?? and Lushi is a Co.??] Lijai Valligy mine, Lushi, Henan Province.

Name: From the Greek *stibi*, then Latin *stibium*, an old name for the mineral.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 270–275. (2) Kyono, A., M. Kimata, M. Matsuhisa, Y. Miyashita, and K. Okamoto (2002) Low-temperature crystal structures of stibnite implying orbital overlap of Sb $5s^2$ inert pair electrons. Phys. Chem. Minerals, 29, 254–260. (3) Kuze, S., D. Du Boulay, N. Ishizawa, A. Saiki, and A. Pring (2004) X-ray diffraction evidence for a monoclinic form of stibnite, Sb_2S_3, below 290 K. Amer. Mineral., 89, 1022–1025. (4) (1955) NBS Circ. 539, 5, 6. (5) Ramdohr, P. (1969) The ore minerals and their intergrowths, (3rd edition), 692–697. (6) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 538.