

**Crystal Data:** Orthorhombic. *Point Group:*  $2/m\ 2/m\ 2/m$ . Crystals are small, prismatic and striated parallel [001], flattened on {010}. *Twinning:* Observed in polished section, of unknown law.

**Physical Properties:** *Cleavage:* Perfect on {010}, less so on {001}. *Fracture:* Conchoidal to uneven. *Tenacity:* Brittle. Hardness = 2 VHN = n.d. D(meas.) = 6.38 D(calc.) = 6.393

**Optical Properties:** Opaque. *Color:* Grayish to tin-white; pale yellow in polished section. *Luster:* Metallic. *Pleochroism:* Very low.

R<sub>1</sub>–R<sub>2</sub>: (400) 34.6–35.8, (420) 35.4–36.5, (440) 36.2–37.5, (460) 36.8–39.0, (480) 37.2–40.4, (500) 37.6–41.4, (520) 37.6–42.0, (540) 37.4–42.2, (560) 37.2–42.3, (580) 37.0–42.3, (600) 37.0–42.1, (620) 37.1–41.7, (640) 37.1–41.1, (660) 37.1–40.6, (680) 36.8–40.1, (700) 36.6–39.7

**Cell Data:** *Space Group:*  $Pnma$ .  $a = 6.1426(3)$   $b = 3.9189(4)$   $c = 14.5282(7)$   $Z = 4$

**X-ray Powder Pattern:** Tannenbaum mine, Germany.

3.05 (10), 3.23 (9), 3.13 (7), 7.38 (5), 2.34 (5), 2.17 (4), 1.863 (2)

**Chemistry:**

|       | (1)   | (2)   | (3)    |
|-------|-------|-------|--------|
| Cu    | 18.80 | 18.8  | 18.88  |
| Bi    | 61.95 | 64.0  | 62.08  |
| S     | 19.16 | 18.4  | 19.04  |
| Total | 99.91 | 101.2 | 100.00 |

(1) Tannenbaum mine, Germany; average of two analyses. (2) Sadisdorf, Germany; by electron microprobe. (3) CuBiS<sub>2</sub>.

**Occurrence:** In hydrothermal veins with other sulfides and sulfosalts formed at medium temperatures.

**Association:** Chalcopyrite, pyrite, sphalerite, molybdenite, quartz, fluorite (Horní Slavkov, Czech Republic); tetrahedrite–tennantite, luzonite–famatinitite, pyrite, mawsonite, nekrasovite, chalcopyrite, laïtakarite, bismuth, calcite, quartz, barite (Khayragatsch deposit, Uzbekistan).

**Distribution:** In Germany, in Saxony, sharp crystals from Johanngeorgenstadt [TL]; in the Tannenbaum mine, near Schwarzenberg; from Schneeberg, Annaberg, the Sadisdorf copper mine, near Schmiedeberg, and other localities; from Wittichen, Black Forest. In the Czech Republic, at Krupka, Horní Slavkov (Schlaggenwald), and Cínovec (Zinnwald). In Norway, at the Åmdal copper mines, Telemark. In Scotland, from Corrie Buie, Meal nan Oighreag, Perthshire. In the Khayragatsch gold deposit, Chatkal-Kuramin Mountains, eastern Uzbekistan. From Japan, in the Akenobe mine, Hyogo Prefecture, the Hade mine, Okayama Prefecture, and the Shin-Ohtoyo deposit, Hokkaido. In Mexico, from the El Cobre mine, Concepción del Oro, Zacatecas. At Bisbee, Cochise Co., Arizona, USA. In Chile, from Cerro Blanco, near Copiapó, Atacama, and in the El Indio mine, El Indio-Tambo district, east of La Serena, Coquimbo. Chile. In the Jules Verne mine, Salta Province, Argentina. Additional minor occurrences are known.

**Name:** From the Greek for *interwoven* or *entwined*; in reference to its sometimes intimate association with quartz.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 435–437. (2) Portheine, J.C. and W. Nowacki (1975) Refinement of the crystal structure of emplectite, CuBiS<sub>2</sub>. Zeits. Krist., 141, 387–402. (3) Berry, L.G. and R.M. Thompson (1962) X-ray powder data for the ore minerals. Geol. Soc. Amer. Mem. 85, 145–146.