

Crystal Data: Triclinic, pseudocubic. *Point Group:* 1. Flattened to columnar crystals, typically corroded, to about 1.2 cm. *Twinning:* Crystals are twinned complexly; principal laws are twin planes {010} and {110}.

Physical Properties: *Fracture:* Irregular. *Tenacity:* Brittle. Hardness = ~4 VHN = 373 D(meas.) = 5.2(3) D(calc.) = [4.46] (synthetic).

Optical Properties: Opaque. *Color:* Steel-gray. *Streak:* Gray-black. *Luster:* Metallic. R₁-R₂: n.d.

Cell Data: *Space Group:* P1. $a = 9.064(8)$ $b = 9.830(8)$ $c = 9.078(8)$ $\alpha = 90^\circ 00(20)'$ $\beta = 109^\circ 30(20)'$ $\gamma = 107^\circ 48(20)'$ $Z = 2$

X-ray Powder Pattern: Binntal, Switzerland.

3.02 (100), 1.852 (80), 1.581 (70), 1.205 (30), 3.34 (20), 1.556 (20), 1.312 (20)

Chemistry:

	(1)	(2)	(3)
Cu	41.3	39.1	39.32
As	29.2	29.7	30.91
S	29.8	28.7	29.77
Total	100.3	97.5	100.00

(1) Binntal, Switzerland; by electron microprobe, corresponding to Cu_{6.29}As_{3.77}S_{9.00}. (2) Do.; by electron microprobe, corresponding to Cu_{6.19}As_{3.99}S_{9.00}. (3) Cu₆As₄S₉.

Occurrence: On sulfides in crystalline dolostone.

Association: Tennantite, galena, sphalerite.

Distribution: From the Lengenbach quarry, Binntal, Valais, Switzerland [TL].

Name: Honors Rudolph von Sinner (1890–1960), President of the Commission of the Natural History Museum, Bern, Switzerland.

Type Material: Mineralogical-Petrographical Institute, University of Bern, Bern, Switzerland, L2120-62; University of Copenhagen, Copenhagen, Denmark.

References: (1) Nowacki, W., F. Marumo, and Y. Takéuchi (1964) Untersuchungen an Sulfiden aus dem Binnatal (Kt. Wallis, Schweiz). Schweiz. Mineral. Petrog. Mitt., 44, 5–9 (in German). (2) (1975) Mineral. Abs., 17, 74 (abs. ref. 1). (3) Marumo, F. and W. Nowacki (1964) The crystal structure of lautite and of sinnerite, a new mineral from the Lengenbach Quarry. Schweiz. Mineral. Petrog. Mitt., 44, 439–454. (4) (1965) Amer. Mineral., 50, 1504 (abs. ref. 3). (5) Makovicky, E. and B.J. Skinner (1972) Studies of the sulfosalts of copper. II. The crystallography and composition of sinnerite, Cu₆As₄S₉. Amer. Mineral., 57, 824–834. (6) Makovicky, E. and B.J. Skinner (1975) Studies of the sulfosalts of copper. IV. Structure and twinning of sinnerite, Cu₆As₄S₉. Amer. Mineral., 60, 998–1012.