

Crystal Data: Triclinic. *Point Group:* 1 or $\bar{1}$. As thin, bladed crystals which are commonly bent or curled, to 4 cm; the large flat face {100} is striated parallel to its elongation direction.

Twinning: On {100}; twin lamellae seen in polished section.

Physical Properties: *Cleavage:* Perfect on {100}; two others across the flat {100} face. *Tenacity:* Malleable, flexible, but not elastic. *Hardness* = 1.5–2 VHN = 35
D(meas.) = 5.80–5.85 D(calc.) = [5.78]

Optical Properties: Opaque. *Color:* Steel-gray, may tarnish to iridescence.

Streak: Brown-black. *Luster:* Metallic. *Anisotropism:* Weak.

R_1 – R_2 : (400) 38.9–40.0, (420) 38.5–39.8, (440) 38.2–39.4, (460) 37.6–39.0, (480) 37.3–38.7, (500) 36.8–38.3, (520) 36.3–37.9, (540) 35.9–37.4, (560) 35.5–36.9, (580) 35.3–36.5, (600) 35.1–36.1, (620) 34.7–35.7, (640) 34.2–35.2, (660) 33.5–34.4, (680) 32.8–33.7, (700) 32.0–32.9

Cell Data: *Space Group:* Two subcells are recognized: the first (pseudotetragonal) has $a = 36.892(20)$ $b = 5.842(5)$ $c = 5.847(5)$ $\alpha = 90.00^\circ$ $\beta = 92.00^\circ$ $\gamma = 91.01(1)^\circ$
 $Z = 6$ and the second (pseudohexagonal) has $a = 36.892(20)$ $b = 3.895(4)$ $c = 6.378(7)$
 $\alpha = 90.00^\circ$ $\beta = 90.00^\circ$ $\gamma = 91.01(1)^\circ$ $Z = 6$

X-ray Powder Pattern: Binntal, Switzerland.

3.06 (100), 2.84 (90), 4.60 (30), 2.93 (20), 2.04 (20), 9.31 (10), 7.69 (10)

Chemistry:

	(1)	(2)	(3)
Pb	57.89	54.5	58.3
Ag	5.64	9.4	8.9
Cu	2.36	2.5	1.0
Fe	0.17		
Sb	0.77		0.2
As	13.46	13.5	12.5
S	19.33	20.8	18.2
Total	99.62	100.7	99.1

(1) Binntal, Switzerland; corresponds to $\text{Pb}_{6.02}(\text{Ag}_{1.13}\text{Cu}_{0.80})_{\Sigma=1.93}(\text{As}_{3.87}\text{Sb}_{0.14})_{\Sigma=4.01}\text{S}_{13.00}$.

(2) Do.; by electron microprobe, corresponds to $\text{Pb}_{5.27}(\text{Ag}_{1.75}\text{Cu}_{0.79})_{\Sigma=2.54}\text{As}_{3.61}\text{S}_{13.00}$. (3) Do.; by electron microprobe, corresponds to $\text{Pb}_{6.44}(\text{Ag}_{1.89}\text{Cu}_{0.36})_{\Sigma=2.25}(\text{As}_{3.82}\text{Sb}_{0.04})_{\Sigma=3.86}\text{S}_{13.00}$.

Occurrence: Of hydrothermal origin.

Association: Pyrite, sphalerite, jordanite.

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

Name: For the locality at the Lengenbach quarry, Switzerland.

Type Material: n.d.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 398. (2) Nowacki, W. (1968) Über Hatchit, Lengenbachit und Urbait. Neues Jahrb. Mineral., Monatsh., 69–75 (in German). (3) Williams, T.B. and A. Pring (1988) Structure of lengenbachite: a high-resolution transmission electron microscope study. Amer. Mineral., 73, 1426–1433. (4) Makovicky, E., E. Leonardson, and Y. Moëlo (1994) The crystallography of lengenbachite, a mineral with the non-commensurate layer structure. Neues Jahrb. Mineral., Abh., 166, 169–191. (5) Berry, L.G. and R.M. Thompson (1962) X-ray powder data for the ore minerals. Geol. Soc. Amer. Mem. 85, 130. (6) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 318.

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