## Edenharterite $PbTlAs_3S_6$



**Crystal Data:** Orthorhombic. *Point Group:* $mm2$. Crystals are lathlike, slightly elongated along [001], to 0.2 mm, in subparallel aggregates.

**Physical Properties:** *Cleavage:* One, parallel to {001}. *Fracture:* Uneven. Hardness = 2.5–3 VHN = 95–101, 98 average (10 g load). D(meas.) = n.d. D(calc.) = 5.09

**Optical Properties:** Opaque to translucent. *Color:* Brown-black to black, dark red in thin fragments; in reflected light, grayish white with bluish tint, with bright red internal reflections. *Streak:* Raspberry-red.
*Optical Class:* Biaxial.
$R_1$–$R_2$: (480) 28.5–30.5, (546) 28.5–31.5, (589) 27.0–28.5, (656) 27.0–29.0

**Cell Data:** *Space Group:* $Fdd2$. $a = 15.4764(8)$ $b = 47.602(3)$ $c = 5.8489(4)$ $Z = 16$

**X-ray Powder Pattern:** Binntal, Switzerland.
3.801 (100), 2.767 (43), 2.732 (41), 3.389 (23), 2.656 (24), 2.901 (19), 3.755 (15)

**Chemistry:**

| | (1) | (2) | (3) |
|---|---|---|---|
| Pb | 25.08 | 23.44 | 25.01 |
| Tl | 25.51 | 24.71 | 24.66 |
| Cu | | < 0.04 | |
| Sn | 0.06 | < 0.04 | |
| As | 27.09 | 27.03 | 27.12 |
| Sb | | 1.32 | |
| S | 23.50 | 23.17 | 23.21 |
| Total | 100.91 | [100.00] | 100.00 |

(1) Binntal, Switzerland; by electron microprobe, average of three analyses; corresponds to $Pb_{1.00}Tl_{1.03}As_{2.99}S_{5.98}$. (2) Do.; by electron microprobe, original total given as 100.02%; corresponds to $Pb_{0.94}Tl_{1.00}(As_{2.98}Sb_{0.09})_{\Sigma=3.07}S_{6.06}$. (3) $PbTlAs_3S_6$.

**Occurrence:** In a hydrothermal deposit in dolostone.

**Association:** Baumhauerite, realgar, orpiment, hutchinsonite, hatchite, wallisite, lorandite, sartorite, jentschite, erniggliite, stalderite, bernardite.

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

**Name:** Honors Dr. Andreas Edenharter (1933– ), University of Göttingen, Göttingen, Germany, who had previously synthesized the compound.

**Type Material:** Natural History Museum, Basel, Switzerland, L 18,393.

**References:** (1) Graeser, S. (1988) Three new mineral species from the Binntal. Uni Nova, 49, 17–19 (in German). (2) Graeser, S. and H. Schwander (1992) Edenharterite ($TlPbAs_3S_6$): a new mineral from Lengenbach, Binntal (Switzerland). Eur. J. Mineral., 4, 1265–1270. (3) (1993) Amer. Mineral., 78, 845–846 (abs. refs. 1 and 2). (4) Berlepsch, P. (1995) Chemical and crystallographical investigations on edenharterite ($TlPbAs_3S_6$). Schweiz. Mineral. Petrogr. Mitt., 75, 277–281. (5) Berlepsch, P. (1996) Crystal structure and crystal chemistry of the homeotypes edenharterite ($TlPbAs_3S_6$) and jentschite ($TlPbAs_2SbS_6$) from Lengenbach, Binntal (Switzerland). Schweiz. Mineral. Petrogr. Mitt., 76, 147–157.