

Crystal Data: Monoclinic. *Point Group:* $2/m$. Short prisms or tabular on {201}, pyramidal, with many forms, striated parallel to [001]; needlelike to columnar, to 5 cm; granular.

Physical Properties: *Cleavage:* Excellent on {100}, very good on {201}, good on {001}. *Tenacity:* Flexible, forming cleavage lamellae and fibers, with plastic deformation. Hardness = 2–2.5 VHN = n.d. D(meas.) = 5.53 D(calc.) = 5.53

Optical Properties: Translucent to transparent. *Color:* Cochineal-red to carmine-red surface, commonly dark lead-gray, may be coated by an ocher-yellow powder. *Streak:* Cherry-red.

Luster: Metallic, adamantine.

Optical Class: Biaxial (+) (?). *Pleochroism:* Weak; Y = purple-red; Z = orange-red.

Orientation: X, Y $\approx \perp$ {100}; Z = b. *Dispersion:* $r > v$, strong. $n = > 2.72$ (Li).

2V(meas.) = Large. *Anisotropism:* Strong.

R₁–R₂: (400) 28.8–30.6, (420) 28.7–30.7, (440) 28.6–30.8, (460) 28.4–30.9, (480) 28.2–31.2, (500) 27.8–31.1, (520) 27.5–30.6, (540) 27.0–29.8, (560) 26.4–28.8, (580) 25.8–27.7, (600) 25.0–26.7, (620) 24.4–26.0, (640) 23.9–25.5, (660) 23.5–25.0, (680) 23.2–24.7, (700) 22.9–24.5

Cell Data: *Space Group:* $P2_1/a$. $a = 12.296(9)$ $b = 11.313(5)$ $c = 6.114(1)$
 $\beta = 104.21(4)^\circ$ Z = 8

X-ray Powder Pattern: Alšar, Macedonia.

3.59 (10), 2.88 (8), 2.97 (7), 1.867 (5), 1.484(5), 5.28 (4), 2.64 (4)

Chemistry:

	(1)	(2)	(3)	(4)
Tl	59.76	58.75	59.5	59.46
As	22.30	21.65	21.6	21.87
S	18.99	19.26	18.8	18.67
rem.		0.08		
Total	101.05	99.74	99.9	100.00

(1–2) Alšar, Macedonia. (3) Carlin mine, Nevada, USA; by electron microprobe, average of five analyses. (4) TlAsS₂.

Occurrence: Although rare, the most widespread thallium mineral; of hydrothermal origin, typically formed at relatively low temperatures.

Association: Stibnite, realgar, orpiment, cinnabar, vrbite, greigite, marcasite, pyrite, tetrahedrite, antimonian sphalerite, arsenic, barite.

Distribution: From Alšar (Allchar), near Rošden, Macedonia [TL]. At the Dzhizhikrut Sb–Hg deposit, Tajikistan. From the Beshtau uranium deposit, near Pyatigorsk, northern Caucasus Mountains, Russia. An ore mineral in the Lanmuchang Hg–Tl deposit, Guizhou Province, China. At the Zarshuran gold deposit, near Takab, northeastern Iran. From the Lengenbach quarry, Binntal, Valais, Switzerland. In the USA, at the New Rambler Cu–Ni mine, Medicine Bow Mountains, east of Encampment, Albany Co., Wyoming; in Nevada, from the Carlin mine, 50 km northwest of Elko, Lynn district, Eureka Co., in the Jerritt Canyon mines, Independence Mountains district, Elko Co., and from the Getchell mine, Potosi district, Humboldt Co.; in the Mercur gold deposit, Tooele Co., Utah.

Name: For Eötvös Lorand (1848–1919), physicist of Budapest, Hungary.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 437–439. (2) Radtke, A.S., C.M. Taylor, R.C. Erd, and F.W. Dickson (1974) Occurrence of lorandite, TlAsS₂, at the Carlin gold deposit, Nevada. Econ. Geol., 69, 121–174. (3) Balić-Žunić, T., E. Makovicky, and Y. Moëlo (1995) Contributions to the crystal chemistry of thallium sulfosalts III. The crystal structure of lorandite (TlAsS₂) and its relation to weissbergite (TlSbS₂). Neues Jahrb. Mineral., Abh., 168, 213–235. (4) Vlasov, K.A., Ed. (1966) Mineralogy of rare elements, v. II, 592–597. (5) Berry, L.G. and R.M. Thompson (1962) X-ray powder data for the ore minerals. Geol. Soc. Amer. Mem. 85, 146–147.

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