Vrbaite $Tl_4Hg_3Sb_2As_8S_{20}$

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Crystals, to 3 mm, tabular {010} or pyramidal {111}.

Physical Properties: *Cleavage:* {010}, good. *Fracture:* Uneven to conchoidal. *Tenacity:* Brittle. Hardness = 3.5 VHN = n.d. D(meas.) = 5.30(3) D(calc.) = [5.40]

Optical Properties: Opaque. *Color:* Dark gray-black with a bluish tint; in polished section, bluish white with red internal reflections; dark red in translucent thin fragments. *Streak:* Pale red with a yellow tone. *Luster:* Submetallic to metallic.
Optical Class: Biaxial (+). *Dispersion:* $r > v$. $n = > 2.72$
R_1–R_2: (400) 45.8–48.6, (420) 42.0–44.6, (440) 38.2–40.6, (460) 35.7–38.2, (480) 33.8–36.7, (500) 32.2–35.3, (520) 30.8–34.0, (540) 29.6–32.5, (560) 28.6–31.1, (580) 28.0–30.0, (600) 27.6–29.2, (620) 27.3–28.8, (640) 27.1–28.8, (660) 26.8–28.6, (680) 26.6–28.4, (700) 26.4–28.0

Cell Data: *Space Group: C*2*ca*. a = 13.399 b = 23.389 c = 11.287 Z = 4

X-ray Powder Pattern: Alšar, Macedonia.
4.04 (100), 3.33 (80), 2.57 (80), 5.18 (60), 3.15 (60), 2.29 (60), 4.31 (50)

Chemistry:

	(1)	(2)
Tl	28.8	28.15
Hg	20.5	20.73
Sb	8.2	8.39
As	20.5	20.64
S	22.1	22.09
Total	100.1	100.00

(1) Alšar, Macedonia; by electron microprobe. (2) $Tl_4Hg_3Sb_2As_8S_{20}$.

Occurrence: In a hydrothermal deposit with other As–Tl sulfide minerals.

Association: Realgar, orpiment.

Distribution: From Alšar (Allchar), near Rošden, Macedonia.

Name: For Professor Karel Vrba (1845–1922), University of Prague, Prague, Czechoslovakia, Czech mineralogist.

Type Material: National Museum, Prague, Czech Republic, 25292; National School of Mines, Paris, France; National Museum of Natural History, Washington, D.C., USA, R939.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 484–485. (2) Caye, R., P. Picot, R. Pierrot, and F. Permingeat (1967) Nouvelles données sur la vrbaïte, sa teneur en mercure. Bull. Soc. fr. Minéral., 90, 185–191 (in French). (3) (1968) Amer. Mineral., 53, 351 (abs. ref. 2). (4) Ohmasa, M. and W. Nowacki (1971) The crystal structure of vrbaite, $Hg_3Tl_4As_8Sb_2S_{20}$. Zeits. Krist., 134, 360–380.