

Heyrovskýite

Pb₄AgBi₃S₉

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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$ or $mm2$. As prismatic to acicular crystals, elongate [001] and flattened {010}, striated on {010} parallel to [001], to 2 cm.

Physical Properties: *Cleavage:* Poor on {hk0}. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = n.d. VHN = 166–234 (50 g load), strongly anisotropic. D(meas.) = 7.17 D(calc.) = 7.18

Optical Properties: Opaque. *Color:* Tin-white. *Streak:* Grayish black. *Luster:* Metallic, tarnishes black. *Pleochroism:* Weak to distinct, white to pale gray. *Anisotropism:* Strong, dark gray to white.

R₁–R₂: (470) 43.3–47.3, (546) 40.6–44.6, (589) 39.8–43.9, (650) 39.6–43.7

Cell Data: *Space Group:* $Cbmm$. $a = 13.600(3)$ $b = 30.485(12)$ $c = 4.110(1)$ $Z = 4$

X-ray Powder Pattern: Hůrky, Czech Republic.

3.435 (100), 2.962 (80), 2.098 (35), 1.790 (22), 3.343 (20), 3.006 (15), 2.067 (15)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
Pb	53.65	41.24	54.50	Bi	28.35	35.52	27.48
Ag	2.5	6.73	2.84	Sb		0.04	
Cu	0.05			Se		0.03	
Cd		0.07		S	14.4	15.96	15.18
				Total	98.95	99.97	100.00

(1) Hůrky, Czech Republic; by electron microprobe, corresponding to Pb_{5.19}Ag_{0.46}Cu_{0.02}Bi_{2.72}S_{9.00}. (2) La Roche-Balue quarry, France; by electron microprobe, average of five analyses; corresponding to Pb_{3.60}Cd_{0.04}Ag_{1.13}Cd_{0.04}Bi_{3.32}Sb_{0.01}S_{9.00}. (3) Pb₄AgBi₃S₉.

Occurrence: In high-temperature quartz veins.

Association: Pyrite, sphalerite, galena, molybdenite, cosalite, bismuth, galenobismutite, chalcopyrite, covellite, bursait, arsenopyrite, siderite, quartz, albite, microcline.

Distribution: In the Czech Republic, near Hůrky, about 65 km west of Prague [TL]. From the Toroiaga mine, Baia Boră district, and at Ocna de Fier (Morăvicza; Vaskó), Romania. In the Furka Pass, Uri, and at Goppenstein, Lotschental, Valais, Switzerland. From Rauriser Goldberg, Salzburg, Austria. In the La Roche-Balue quarry, west of Nantes, Loire Atlantique, France. At the Clara mine, near Oberwolfach, Black Forest, Germany. In Italy, on Vulcano, in the Lipari Islands. From the Corrie Buie deposit, south Loch Tayside, Scotland. In the Balikesir Balya deposit, Balikesir Province, Turkey. From the Spokoinoe deposit, eastern Transbaikalia, and at the Shumilovsk Sn–W deposit, western Transbaikalia, Russia. From 27 km west of Castlegar, British Columbia, Canada. In the USA, from Darwin, Inyo Co., California; at the Reward prospects, Ravenswood district, Lander Co., Nevada; in the Idarado mine, Ouray Co., and the Alaska mine, Poughkeepsie Gulch, near Ouray, San Juan Co., Colorado. At the Yakuki mine, Fukushima Prefecture, Japan. From the Juno mine, Tennant Creek, Northern Territory, Australia.

Name: In honor of Jaroslav Heyrovský (1890–1967), Czech Nobel Laureate in chemistry.

Type Material: Charles University, Prague, Czech Republic, 14265.

References: (1) Klomínský, J., M. Rieder, C. Kieft, and L. Mráz (1971) Heyrovskýite, 6(Pb_{0.86}Bi_{0.08}(Ag, Cu)_{0.04})S•Bi₂S₃ from Hůrky, Czechoslovakia, a new mineral of genetic interest. Mineralium Deposita, 6, 133–147. (2) (1972) Amer. Mineral., 57, 325 (abs. ref. 1). (3) Mozgova, N.N., Y.S. Borodaev, L.E. Syritso, and D.P. Romanov (1976) New data on goongarrite (warthaite) and about the identity of heyrovskýite with goongarrite. Neues Jahrb. Mineral., Abh., 127, 62–83. (4) Makovicky, E., W.G. Mumme, and B.F. Hoskins (1991) The crystal structure of Ag–Bi-bearing heyrovskyite. Can. Mineral., 29, 553–559.

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