

**Crystal Data:** Orthorhombic. *Point Group:*  $2/m\ 2/m\ 2/m$ . Prismatic crystals, to 2 cm.

**Physical Properties:** *Cleavage:* Good on {010}, fair on {100}. *Hardness* = 2–3  
VHN = n.d. *D*(meas.) = 6.96 *D*(calc.) = 6.903

**Optical Properties:** Opaque. *Color:* Lead-gray. *Streak:* Black. *Luster:* Metallic.

*R*<sub>1</sub>–*R*<sub>2</sub>: (400) 44.0–46.0, (420) 44.6–46.1, (440) 44.9–46.2, (460) 45.1–46.3, (480) 45.1–46.4, (500) 45.1–46.6, (520) 45.0–46.8, (540) 44.9–46.9, (560) 44.8–46.9, (580) 44.7–46.8, (600) 44.6–46.7, (620) 44.4–46.4, (640) 44.1–46.0, (660) 43.8–45.4, (680) 43.5–44.9, (700) 43.2–44.4

**Cell Data:** *Space Group:* *Pmcn*. *a* = 4.0044(4) *b* = 33.575(3) *c* = 11.480(1) *Z* = 4

**X-ray Powder Pattern:** Gladhammar, Sweden. (ICDD 25-1422).  
3.56 (100), 1.308 (90b), 1.101 (90), 1.082 (90), 2.81 (70), 1.948 (70), 1.916 (70)

Chemistry:	(1)	(2)	(3)
Pb	12.40	13.4	12.92
Cu	3.98	3.84	3.96
Fe	0.19	0.05	
Bi	64.96	64.3	65.14
S	18.04	17.88	17.98
insol.	0.12		
Total	99.69	99.5	100.00

(1) Gladhammar, Sweden; corresponding to Pb<sub>0.96</sub>Cu<sub>1.00</sub>Fe<sub>0.05</sub>Bi<sub>4.97</sub>S<sub>9.00</sub>. (2) Felbertal, Austria; by electron microprobe, corresponding to Pb<sub>1.02</sub>Cu<sub>0.99</sub>Bi<sub>4.98</sub>S<sub>9.00</sub>. (3) PbCuBi<sub>5</sub>S<sub>9</sub>.

**Occurrence:** Of hydrothermal origin.

**Association:** Bismuthinite-aikinite, galenobismutite, makovickyite, nuffieldite, berryite, galena, quartz.

**Distribution:** From Gladhammar, Kalmar, Sweden [TL]. At Bleka, Telemark, Norway. From the Kochbulak gold deposit, Chatkal-Kuramin Mountains, eastern Uzbekistan. At Krupka, Czech Republic. In Romania, from Ocna de Fier (Morávicza; Vaskó); at Baia Borşa, Baia Mare (Nagybánya); and Băița (Rézbánya). From Narechenski Basni, southern Rhodope Mountains, Bulgaria. In the Loch Shin monzogranite, near Lairg, Scotland. From the Felbertal tungsten mine, Salzburg, and in the Waschgang Au–Cu deposit, Goldberg Mountains, Upper Carinthia, Austria. In the Beregovo district, near Mukachevo, Ukraine. From the Tanco deposit, Bernic Lake, Manitoba, Canada. In the Comstock mine, Dos Cabezas, Cochise Co., Arizona, USA.

**Name:** For the original locality, Gladhammar, Sweden.

**Type Material:** Swedish Museum of Natural History, Stockholm, Sweden.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 483. (2) Welin, E. (1968) Notes on the mineralogy of Sweden. 5. Bismuth-bearing sulphosalts from Gladhammar, a revision. *Arkiv Mineral. Geol.*, 4(30), 377–386. (3) (1968) *Amer. Mineral.*, 53, 351 (abs. ref. 2). (4) Topa, D., E. Makovicky, and T. Balić-Žunić (2002) The structural role of excess Cu and Pb in gladite and krupkaite based on new refinements of their structure. *Can. Mineral.*, 40, 1147–1159. (5) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 200.