

Buckhornite

Au³⁺Pb₂BiTe₂S₃

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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Euhedral to subhedral bladed crystals, flattened $\perp \{100\}$, to 1.5 mm, may be foillike, warped, bowed, or in helical spirals; commonly aggregated in clusters.

Physical Properties: *Cleavage:* Perfect on $\{100\}$. *Tenacity:* Sectile and flexible. Hardness = n.d. VHN = 46–60, 54 average (10 g load). D(meas.) = n.d. D(calc.) = 8.43

Optical Properties: Opaque. *Color:* Black. *Streak:* Gray. *Luster:* Splendent metallic. *Optical Class:* Biaxial. *Pleochroism:* Distinct; purplish gray to pale blue. *Anisotropism:* Distinct; blue to mauve. *Bireflectance:* Moderate to strong. R₁–R₂: (400) 50.7–52.4, (420) 50.8–53.1, (440) 50.7–53.3, (460) 50.2–53.0, (480) 49.3–52.3, (500) 48.4–51.4, (520) 47.3–50.4, (540) 46.0–49.2, (560) 44.9–48.0, (580) 43.9–46.9, (600) 43.1–46.0, (620) 42.5–45.3, (640) 42.0–44.7, (660) 41.6–44.2, (680) 41.3–43.7, (700) 40.9–43.3

Cell Data: *Space Group:* $Pmmm$. $a = 4.073\text{--}4.092$ $b = 12.245\text{--}12.326$ $c = 9.322\text{--}9.374$ $Z = 2$

X-ray Powder Pattern: Buckhorn mine, Colorado, USA. 2.763 (vvs), 2.390 (vvs), 3.739 (vs), 3.108 (vs), 2.456 (vs), 2.044 (s), 1.7084 (s)

Chemistry:	(1)	(2)	(3)
Au	17.0	16.97	16.81
Pb	34.5	37.02	35.37
Cu	0.1		
Te	22.3	22.38	21.78
Sb		3.26	
Bi	18.4	12.41	17.83
S	7.8	8.17	8.21
Total	100.1	100.21	100.00

(1) Buckhorn mine, Colorado, USA; by electron microprobe, average of seven analyses; corresponds to Au_{1.02}Cu_{0.02}Pb_{1.97}Bi_{1.04}Te_{2.06}S_{2.89}. (2) Bohuliby mine, Czech Republic; by electron microprobe, average of 38 analyses; corresponds to Au_{1.03}Pb_{2.13}(Bi_{0.69}Sb_{0.31})_{Σ=1.00}Te_{2.05}S_{2.95}. (3) AuPb₂BiTe₂S₃.

Occurrence: In hydrothermal Au–Te-bearing deposits.

Association: Pyrite, aikinite, tetradymite, calaverite, gold, chalcopyrite, covellite, bornite, chalcocite, galena, sphalerite, hematite (Buckhorn mine, Colorado, USA); pyrite, nagyágite, tellurobismuthite, altaite, galena, calaverite, gold (Bohuliby mine, Czech Republic); pyrite, melonite, tetradymite (Golden Sunlight mine, Montana, USA).

Distribution: In the USA, from the Buckhorn Pb–Ag mine, 1.6 km northwest of Jamestown, Boulder Co., Colorado [TL], and at the Golden Sunlight mine, near Whitehall, Jefferson Co., Montana. In the Pepř and Bohuliby mines, Jílové gold deposit, 30 km southeast of Prague, Czech Republic. From the Megradzor district, Armenia.

Name: For its occurrence in the Buckhorn mine, Colorado, USA.

Type Material: The Natural History Museum, London, England, 1991,51, 1991,52, E.1102; Harvard University, Cambridge, Massachusetts, 126786; National Museum of Natural History, Washington, D.C., USA, ??.

References: (1) Francis, C.A., A.J. Criddle, C.J. Stanley, D.E. Lange, S. Shieh, and J.G. Francis (1992) Buckhornite, AuPb₂BiTe₂S₃, a new mineral species from Boulder County, Colorado, and new data for aikinite, tetradymite and calaverite. *Can. Mineral.*, 30, 1039–1047. (2) (1993) *Amer. Mineral.*, 78, 1108 (abs. ref. 1). (3) Johan, Z., I. Dódony, P. Morávek, and J. Pašava (1994) La buckhornite, Pb₂AuBiTe₂S₃, du gisement d'or de Jílové, République tchèque. *Compt. Rendus Acad. Sci. Paris*, 318, 1225–1231 (in French with English abs.). (3) Effenberger, ??, ?? (2000) ??title?? *Zeits. Krist.*, 215, 10.

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