Cupropolybasite $[Cu_6Sb_2S_7][Ag_9CuS_4]$

Crystal Data: Hexagonal. *Point Group*: $\bar{3}$ 2/*m*. As grains to 350 μm.

Physical Properties: *Cleavage*: None. *Fracture*: n.d. *Tenacity*: Brittle.
Hardness = 3-3.5 VHN = 121-137, 129 average (100 g load). D(meas.) = n.d. D(calc.) = 6.310

Optical Properties: Opaque. *Color*: n.d. *Streak*: Black. *Luster*: Metallic.
Optical Class: Anisotropic. *Bireflectance*: Moderate. *Pleochroism*: Weak, light gray to blue-gray.
R_1-R_2: (471.1) 32.4-33.3, (548.3) 31.2-32.7, (586.6) 30.8-31.9, (652.3) 29.6-30.5

Cell Data: *Space Group*: *P* $\bar{3}$ *m*1. *a* = 7.3277(3) *c* = 11.7752(6) Z = 1

X-ray Powder Pattern: Calculated pattern.
2.9438 (100), 2.7932 (56), 3.0637 (45), 11.7752 (43), 2.2948 (41), 2.4676 (39), 2.1581 (38)

Chemistry:

	(1)
Cu	14.63
Ag	58.86
Pb	0.10
Zn	0.06
Se	0.01
Fe	0.01
Sb	6.95
As	2.62
S	16.51
Total	99.75

(1) Premier mine, British Columbia, Canada; average electron microprobe analysis; corresponds to $[(Cu_{3.82}Ag_{2.42}Zn_{0.02}Pb_{0.01})_{\Sigma=6.27}(Sb_{1.19}As_{0.73})_{\Sigma=1.92}S_7][Ag_9CuS_4]$.

Polymorphism & Series: *Tac* polytype.

Mineral Group: Pearceite-polybasite group.

Occurrence: Supergene, in a hydrothermal epithermal silver-gold deposit.

Association: Silver, quartz.

Distribution: Premier mine, British Columbia, Canada.

Name: The prefix, *cupro*, identifies the Cu-dominant analogue of *polybasite*.

Type Material: Mineralogical Collection, Royal Ontario Museum, Department of Natural History, Toronto, Ontario, Canada (M12128).

References: (1) Bindi, L., M. Evain, P.G. Spry, K.T. Tait, and S. Menchetti (2007) Structural role of copper in the minerals of the pearceite-polybasite group: the case of the new minerals cupropearcite and cupropolybasite. Mineral. Mag., 71, 641-650. (2) Bindi, L., A.K. Schaper, H. Kurata, and S. Menchetti (2013) The composite modulated structure of cupropearceite and cupropolybasite and its behavior toward low temperature. Amer. Mineral., 98, 1279-1284.