Bilibinskite $Au_3Cu_2PbTe_2$

Crystal Data: Cubic (pseudocell). *Point Group:* n.d. Massive.

Physical Properties: Hardness = n.d. VHN = 329–419, 381 average (20 g load).
D(meas.) = 12.7 D(calc.) = [14.44]

Optical Properties: Opaque. *Color:* Pale brown, rose-brown. *Streak:* Gold-brown to brown. *Luster:* Semimetallic.
R: n.d.

Cell Data: *Space Group:* n.d. $a = 4.095$ Z = [0.5]

X-ray Powder Pattern: Aginsk deposit, Russia.
2.37 (100), 1.232 (80), 2.05 (70), 1.448 (60), 3.06 (40), 1.184 (20), 3.00 (10)

Chemistry:

	(1)	(2)
Au	48.4	50.06
Ag	1.54	
Cu	9.35	10.77
Fe	0.19	
Pb	19.2	17.55
Te	21.6	21.62
Se	0.34	
Total	100.6	100.00

(1) Aginsk deposit, Russia; by electron microprobe, average of eight analyses on two samples, leading to $(Au_{2.90}Ag_{0.17})_{\Sigma=3.07}(Cu_{1.74}Fe_{0.04})_{\Sigma=1.78}Pb_{1.10}(Te_{2.00}Se_{0.05})_{\Sigma=2.05}$. (2) $Au_3Cu_2PbTe_2$.

Occurrence: In the zone of weathering of tellurium deposits.

Association: Gold, bogdanovite, bezsmertnovite, belyakinite, other tellurides of Au, Cu, Pb, Fe (Aginsk deposit, Russia); sylvanite, krennerite (Southern Dzhelambet deposit, Kazakhstan).

Distribution: From the Aginsk gold telluride deposit, Kamchatka, Far Eastern Region, Russia [TL]. At the Southern Dzhelambet deposit, central Kazakhstan [TL].

Name: For Soviet geologist Yuri Aleksandrovich Bilibin (1901–1952), Karpkinskii All-Union Research Institute, St. Petersburg, Russia, specialist in gold deposits.

Type Material: Mining Institute, St. Petersburg, 101/1–2; Institute of Mineralogy and Geochemistry of Rare Elements, Moscow; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 78385, vis207.

References: (1) Spiridonov, E.M., M.S. Bezsmertnaya, T.N. Chvileva, and V.V. Bezsmertnyi (1978) Bilibinskite, $Au_3Cu_2PbTe_2$, a new mineral of gold-telluride deposits. Zap. Vses. Mineral. Obshch., 107, 310–315 (in Russian). (2) (1979) Amer. Mineral., 64, 652 (abs. ref. 1). (3) Spiridonov, E.M., M.S. Bezsmertnaya, T.N. Chvileva, and V.V. Bezsmertnyi (1978) Bilibinskite $Au_3Cu_2PbTe_2$ — a new mineral from gold-telluride deposits. Comments. Zap. Vses. Mineral. Obshch., 107, 501 (in Russian). (4) (1978) Chem. Abs., 89, 200512 (abs. ref. 3). (5) Bochek, L.I., Y.A. Malinovskiy, S.M. Sandomirskaya, and N.G. Chuvikina (1982) Bilibinskite and bezsmertnovite, new hybrid minerals of the intermetallic compound-oxide type rather than intermetallic compounds of gold. Doklady Acad. Nauk SSSR, 266, 1255–1259 (in Russian). (6) Spiridonov, E.M. (1991) Composition and structure of the bilibinskite-bogdanovite mineral group. Novye Dannye Mineral., 37, 138–145 (in Russian). (7) (1995) Amer. Mineral., 80, 848–849 (abs. ref. 6).