Penzhinite $(Ag, Cu)_4Au(S, Se)_4$

Crystal Data: Hexagonal. *Point Group:* 622. Intergrowths of elongate or platy grains, to 7 μm.

Physical Properties: Hardness = n.d. VHN = n.d. D(meas.) = n.d. D(calc.) = 8.35

Optical Properties: Opaque. *Color:* In reflected light, pale gray. *Anisotropism:* Evident; creamy yellow and greenish gray.
R_1–R_2: n.d.

Cell Data: *Space Group:* $P6_322$. $a = 13.779$ $c = 16.980$ $Z = 18$

X-ray Powder Pattern: Sergeevskoye deposit, Russia.
2.59 (10), 2.71 (9), 2.14 (9), 2.11(9), 1.989 (6), 3.38 (5), 1.784 (5)

Chemistry:

	(1)
Ag	51.3
Au	24.3
Cu	3.1
Se	7.1
S	13.8
Total	99.6

(1) Sergeevskoye deposit, Russia; by electron microprobe, corresponding to $(Ag_{3.65}Cu_{0.32})_{\Sigma=3.97}Au_{0.97}(S_{3.31}Se_{0.69})_{\Sigma=4.00}$.

Occurrence: In a near-surface Au–Ag deposit.

Association: Gold, aguilarite, chalcopyrite, galena.

Distribution: From the Sergeevskoye Au–Ag deposit, 60 km northeast of Pevirechenskii, near the Penzhina River, northern Kamchatka, Russia [TL].

Name: For the Penzhina River, near the Kamchatka Peninsula, Russia.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 82766.

References: (1) Bochek, L.I., S.M. Sandomirskaya, N.G. Chuvikina, and V.P. Khvorostov (1984) A new selenium-containing sulfide of silver, gold, and copper – penzhinite $(Ag, Cu)_4Au(S, Se)_4$. Zap. Vses. Mineral. Obshch., 113, 356–360 (in Russian). (2) (1985) Amer. Mineral., 70, 875–876 (abs. ref. 1).