Penzhinite  
\((\text{Ag, Cu})_4\text{Au(S, Se)}_4\)

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Crystal Data: Hexagonal.  
Point Group: 622.  
Intergrowths of elongate or platy grains, to 7 \(\mu\)m.

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:

\[
\begin{array}{c|c}
\text{Element} & \text{Formula} \\
\hline
\text{Ag} & 51.3 \\
\text{Au} & 24.3 \\
\text{Cu} & 3.1 \\
\text{Se} & 7.1 \\
\text{S} & 13.8 \\
\hline
\text{Total} & 99.6
\end{array}
\]

(1) Sergeevskoye deposit, Russia; by electron microprobe, corresponding to \((\text{Ag}_{3.65}\text{Cu}_{0.32})\Sigma=3.97\) \(\text{Au}_{0.97}(\text{S}_{3.31}\text{Se}_{0.69})\Sigma=4.00\).

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:  