Argentoliveingite $Ag_{3+x}Pb_{36-2x}As_{51+x}S_{112}$ $(0 < x < 0.5)$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. Part of an elongate, coarsely crystalline, massive aggregate grading into prismatic, subparallel crystals with complex forms.

Physical Properties: *Cleavage*: None. *Tenacity*: Brittle. *Fracture*: Conchoidal. Hardness = 4 VHN = 208-225, 217 average (25 g load). D(meas.) = n.d. D(calc.) = 5.23

Optical Properties: Opaque. *Color*: Dark gray, white in reflected light with red internal reflections on thin edges or grain boundaries. *Streak*: Black. *Luster*: Metallic.
Optical Class: *Anisotropism*: Moderate, dark gray to neutral.
R_1-R_2: (470) 36.6-41.5, (546) 34.4-39.4, (589) 32.9-37.8, (650) 30.7-35.2

Cell Data: *Space Group*: $P\bar{1}$. $a = 7.905(2)$ $b = 8.469(2)$ $c = 137.96(4)$ $\alpha = 89.592(2)°$ $\beta = 88.969(2)°$ $\gamma = 89.893(2)°$ Z = 2

X-Ray Diffraction Pattern: Calculated pattern.
3.668 (100), 2.938 (94), 3.009 (91), 2.7305 (88), 2.9943 (87), 3.781 (85), 3.553 (83)

Chemistry:

	(1)
Ag	2.31
Tl	0.35
Pb	46.65
Sb	0.83
As	25.36
S	24.27
Total	99.97

(1) Lengenbach quarry, Imfeld, Binntal, Canton Wallis, Switzerland; average electron microprobe analysis; corresponds to $Ag_{3.17}Tl_{0.40}Pb_{33.31}Sb_{1.01}As_{50.08}S_{112.02}$.

Polymorphism & Series: Sartorite homologous series with N = 3.67.

Occurrence: In a stratabound deposit of Tl, Pb, Ag, and Cu bearing sulfosalts in meta-dolostone.

Association: Baumhauerite, argentobaumhauerite, hendekasartorite, liveingite, rathite, dufrénoysite.

Distribution: From Lengenbach quarry, Imfeld, Binntal, Canton Wallis, Switzerland.

Name: Prefix, *argento*, indicates the critical role of silver in the structure of a homeotype of *liveingite*.

Type Material: Natural History Museum, Vienna, Austria (H 1715 and N 9868) and the Natural History Museum, Basel, Switzerland (S83).

References: (1) Topa, D., U. Kolitsch, S. Graeser, E. Makovicky, and C. Stanley (2019) Argentoliveingite, $Ag_{3+x}Pb_{36-2x}As_{51+x}S_{112}$ ($0 \leq x < 0.5$), a new homeotype of liveingite from Lengenbach, Binntal, Switzerland, and the crystal chemistry of the liveingite group. Eur. J. Mineral., 31, 1079-1097.