Écrinsite $AgTl_3Pb_4As_{11}Sb_9S_{36}$

Crystal Data: Triclinic. *Point Group*: 1. Rarely as prismatic crystals with complex forms, typically as massive aggregates to 1.5 mm.

Physical Properties: *Cleavage*: None. *Tenacity*: Brittle. *Fracture*: Conchoidal.
Hardness = 3-3.5 VHN = 175-201 189 average (25 g load). D(meas.) = n.d. D(calc.) = 4.96

Optical Properties: Opaque. *Color*: Dark gray; white in reflected light. *Streak*: Black.
Luster: Metallic. *Anisotropism*: Distinct in grayish tints. *Bireflectance:* Weak.
Pleochroism: None.
Optical Class: n.d.
R_1-R_2: (400) 38.6-39.3, (420) 38.3-39.1, (440) 38.0-38.9, (460) 37.6-38.7, (470) 37.3-38.6, (480) 37.0-38.4, (500) 36.5-38.0, (520) 36.0-37.5, (540) 35.4-36.9, (546) 35.2-36.7, (560) 34.9-36.4, (580) 34.3-35.8, (589) 34.0-35.5, (600) 33.7-35.1, (620) 32.9-34.4, (640) 32.3-33.7, (650) 32.0-33.3, (660) 31.6-33.0, (680) 31.2-32.5, (700) 30.8-32.2

Cell Data: *Space Group*: *P*1. a = 8.0802(1) b = 8.5332(2) c = 22.6122(4) α = 90.233(1)° β = 97.174(1)° γ = 90.832(1)° Z = 1

X-ray Powder Pattern: Calculated pattern.
3.56 (100), 3.72 (92), 3.53 (80), 3.48 (72), 4.14 (68), 11.22 (65), 2.794 (65)

Chemistry:

	(1)	(2)
Ag	2.03	2.33
Cu	0.02	
Tl	14.57	13.26
Pb	16.23	17.92
Sb	23.97	23.70
As	17.87	17.82
S	25.20	24.97
Total	99.88	100.00

(1) Jas Roux deposit, Parc national des Écrins, Hautes-Alpes, France; average of 20 electron microprobe analyses; corresponds to $Ag_{0.87}Cu_{0.02}Tl_{3.28}Pb_{3.61}As_{10.98}Sb_{9.06}S_{36.19}$.
(2) $AgTl_3Pb_4As_{11}Sb_9S_{36}$.

Polymorphism & Series: N = 3.5 homeotype of the sartorite homologous series.

Occurrence: Of low-temperature hydrothermal origin related to tectonometamorphism.

Association: Jasrouxite, stibnite, smithite, guettardite, chabournéite, pierrotite, As-bearing zinkenite.

Distribution: At the Jas Roux sulfosalt deposit, Parc national des Écrins, Hautes-Alpes, France.

Name: For the Parc national des *Écrins*, Hautes-Alpes, France, in which the type locality (Jas Roux) is located.

Type Material: Natural History Museum, Vienna, Austria (N 9870).

References: (1) Topa, D., U. Kolitsch, E. Makovicky, and C. Stanley (2017) Écrinsite, $AgTl_3Pb_4As_{11}Sb_9S_{36}$, a new thallium-rich homeotype of baumhauerite from the Jas Roux sulphosalt deposit, Parc national des Écrins, Hautes-Alpes, France. Eur. J. Mineral., 29(4), 689-700. (2) (2018) Amer. Mineral., 103, 828-829 (abs. ref. 1).