Tavagnascoite $Bi_4O_4(SO_4)(OH)_2$

Crystal Data: Orthorhombic. *Point Group*: *mm*2. As blocky crystals to 40 μm.

Physical Properties: *Cleavage*: None. *Fracture:* n.d. *Tenacity*: Brittle.
Hardness = n.d. D(meas.) = n.d. D(calc.) = 6.505

Optical Properties: Transparent to translucent. *Color*: Colorless. *Streak*: n.d. *Luster*: Silky.
Optical Class: n.d. n = 2.00 (calculated.)

Cell Data: Space Group: $Pca2_1$. a = 5.831(1) b = 11.925(2) c = 15.123(1) Z = 4

X-ray Powder Pattern: Calculated pattern.
3.213 (100), 4.019 (32), 6.39 (29), 3.604 (28), 4.95 (19), 3.210 (17), 2.6981 (17)

Chemistry:	(1)	(2)
Bi_2O_3	85.32	90.48
Sb_2O_3	0.58	
PbO	2.18	
SO_3	8.46	7.77
H_2O	[1.77]	1.75
Total	98.31	100.00

(1) Espérance superiore tunnel, Tavagnasco ore district, Piedmont, Italy; average of 3 electron microprobe analyses, H_2O calculated; corresponds to $(Bi_{3.74}Pb_{0.10}Sb_{0.04})_{\Sigma=3.88}O_{3.68}(SO_4)_{1.08}(OH)_2$.
(2) $Bi_4O_4(SO_4)(OH)_2$.

Occurrence: Within vugs in hydrothermal veins, in association with secondary Bi-minerals from the alteration of a bismuthinite ± Bi-sulfosalt assemblage.

Association: Quartz, Bi-oxides and sulfates.

Distribution: From the Espérance superiore tunnel, Tavagnasco ore district, Alto Canavese region, 50 km north of Turin, Piedmont, Italy.

Name: For the district that produced the first specimens.

Type Material: Natural History Museum, University of Florence, Italy (3149/1).

References: (1) Bindi, L., C. Biagioni, B. Martini, A. Salvetti, G.D. Fontana, M. Taronna, and M.E. Ciriotti (2016) Tavagnascoite, $Bi_4O_4(SO_4)(OH)_2$, a new oxyhydroxy bismuth sulfate related to klebelsbergite. Mineral. Mag., 80(4), 647-657. (2) (2017) Amer. Mineral., 102, 469-470 (abs. ref. 1).