Tsnigriite $Ag_9SbTe_3(S,Se)_3$

Crystal Data: Monoclinic. *Point Group*: 2/*m* or *m*. As irregular grains, to 0.1 mm, rarely with rhombic cross sections.

Physical Properties: *Cleavage*: None reported. *Tenacity*: n.d. *Fracture*: n.d.
Hardness = n.d. VHN = 125 (20 g load). D(meas.) = n.d. D(calc.) = 7.38

Optical Properties: Opaque (?). *Color*: n.d.; gray with a weak greenish blue tint in reflected light. *Streak*: n.d. *Luster*: Metallic. *Bireflectance*: Weak. *Anisotropism*: Brown and gray. *Optical Class*: n.d.
R_1-R_2: (470) 38.0–34.2, (546) 36.6–32.2, (589) 35.7–31.8, (650) 34.0–30.2

Cell Data: *Space Group*: *P2/m* or *Pm*. a = 8.89(1) b = 8.292(8) c = 19.50(1) β = 97.02(3)°
Z = 4

X-ray Powder Pattern: Bethumi, India.
2.20 (100), 3.78 (70), 4.26 (50), 2.89 (40), 2.85 (40), 2.29 (40), 2.10(40)

Chemistry:

	(1)	(2)
Ag	60.7	59.95
Cu		0.04
Pb		1.84
Sb	7.7	7.28
As		0.05
Bi		0.06
Te	24.4	25.25
S	5.2	6.08
Se	1.9	
Total	99.9	100.53

(1) Vysokovol'tnoye, Uzbekistan, average of 6 electron microprobe analyses, corresponding to $Ag_{8.99}Sb_{1.01}Te_{3.05}(S_{2.57}Se_{0.38})_{\sum=2.95}$. (2) Bethumi, India, average of 2 electron microprobe analyses, corresponding to $(Ag_{8.78}Pb_{0.14}Cu_{0.01})_{\sum=8.93}(Sb_{0.94}As_{0.01})_{\sum=0.95}Te_{3.13}S_{3.00}$.

Occurrence: In hydrothermal polymetallic gold silver or lead zinc deposits.

Association: Galena, sphalerite, pyrrhotite, falkmanite (Bethumi, India); hessite, mercurian gold, trellurian canfieldite or quartz, tetrahedrite, miargyrite (Vysokovol'tnoye, Uzbekistan).

Distribution: Vysokovol'tnoye deposit, western part of the south Tian Shan fold belt, Uzbekistan, and the Bethumi deposit, Rajasthan, India.

Name: An acronym derived from the initials of the Russian name for the Central Scientific Research Institute of Geological Prospecting in Moscow.

Type Material: A.E. Fersman Mineralogical Museum of the Russian Academy of Sciences, Moscow.

References: (1) Sandomirskaya, S.M., Ch. Kh. Arifulov, M.M. Botova, N.N. Mozgova, S.N. Nenasheva, A.I. Tsepin, A.V. Sivtsov (1992) Tsnigriite $Ag_9SbTe_3(S,Se)_3$: a new mineral. Zapiski Vses. Mineral. Obsch., l2l, 95-l0l (in Russian). (2) (1994) Amer. Mineral., 79, 389-390 (abs. ref. 1).