Tvalchrelidzeite $Hg_3(As,Sb)_2S_3$

Crystal Data: Triclinic. *Point Group:* 1. As granular aggregates, to 1 cm, without well-formed crystals.

Physical Properties: *Cleavage:* Perfect in one direction. *Fracture:* Uneven and conchoidal. Hardness = < 3 VHN = 172 D(meas.) = 7.380(5) D(calc.) = 7.234

Optical Properties: Translucent. *Color:* Lead-gray; whitish in reflected light, with strong dark red internal reflections; in transmitted light, cherry-red. *Streak:* Nearly black, with a dark reddish tint. *Luster:* Adamantine. *Pleochroism:* White to grayish white, pale lilac to a distinctly greenish tint. *Anisotropism:* Distinct; dark olive to dark violet.

R_1–R_2: (400) 39.9–45.0, (420) 40.0–44.5, (440) 40.1–43.4, (460) 40.3–42.6, (480) 40.7–40.9, (500) 40.8–39.9, (520) 40.6–38.7, (540) 39.2–37.1, (560) 37.7–35.8, (580) 36.5–34.8, (600) 35.5–34.0, (620) 34.7–33.4, (640) 33.8–32.8, (660) 33.2–32.4, (680) 32.6–32.0, (700) 32.0–31.6

Cell Data: *Space Group:* $P1$. $a = 4.39$ $b = 11.57$ $c = 15.67$ $\alpha = 88.17°$ $\beta = 90.01°$ $\gamma = 89.98°$ Z = 1

X-ray Powder Pattern: Gomi deposit, Georgia.
3.49 (100), 2.92 (100), 2.89 (100), 2.080 (100), 3.29 (70), 2.031 (35), 3.19 (30)

Chemistry:

	(1)	(2)	(3)
Hg	66.50	66.1	66.4
Cu		0.15	
Fe		0.11	
Sb	13.75	12.9	14.0
As	8.60	8.54	8.4
S	10.95	10.3	10.9
Total	99.80	98.1	99.7

(1) Gomi deposit, Georgia; by electron microprobe, average of two analyses; corresponding to $Hg_{2.91}(As_{1.01}Sb_{0.99})_{\Sigma=2.00}S_{3.00}$. (2) Tyute deposit, Russia; by electron microprobe, corresponding to $Hg_{3.00}Cu_{0.02}Fe_{0.02}(As_{1.04}Sb_{0.96})_{\Sigma=2.00}S_{2.92}$. (3) Chauvai deposit, Russia; by electron microprobe, corresponding to $Hg_{2.92}(Sb_{1.01}As_{0.99})_{\Sigma=2.00}S_{2.99}$.

Occurrence: In gold-bearing hydrothermal As–Sb–Hg deposits.

Association: Cinnabar, metacinnabar, realgar, mercurian tennantite, mercury, cubanite, pyrrhotite, chalcopyrite, marcasite, fluorite, quartz.

Distribution: From the Gomi deposit, Caucasus Mountains, Georgia [TL]. At the Tyute mercury deposit, Altai Mountains, Russia. In the Chauvai Sb–Hg deposit, Fergana Valley, Alai Range, southern Kyrgyzstan. From the Hemlo gold deposit, Thunder Bay district, Ontario, Canada. At the Getchell mine, Potosi district, Humboldt Co., Nevada, USA.

Name: In honor of Academician Aleksander Antonovich Tvalchrelidze (1881–1957), founder of the Georgian Mineralogical-Petrographic School, Tbilisi University, Tbilisi, Georgia.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 77110; National Museum of Natural History, Washington, D.C., USA, 143827.

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