Arzakite $Hg_3S_2(Br,Cl)_2$

Crystal Data: Monoclinic (perhaps triclinic). *Point Group:* $2/m$, 2, or m. As complex intergrowths with lavrentievite, to 0.2 mm. *Twinning:* Noted.

Physical Properties: *Cleavage:* Perfect in two directions parallel to elongation. *Fracture:* Rough. *Tenacity:* Brittle. Hardness = 2.0–2.5 VHN = 85–90 (10 g load). D(meas.) = n.d. D(calc.) = 7.69

Optical Properties: Transparent. *Color:* Colorless to yellow, pale bog-brown, reddish brown, deepening on exposure to light; grayish to yellowish brown in thin section; gray in reflected light, with pale yellow to pale brown internal reflections. *Luster:* Vitreous to adamantine. *Streak:* Grayish yellow.
Optical Class: Biaxial. *Pleochroism:* Weak. *Orientation:* Extinction parallel to cleavage. *Bireflectance:* Very weak, grayish white to gray.
R_1–R_2: (546) 16.5–17.0, (590) 15.2–16.7, (620) 14.8–16.0, (656) 14.5–16.0

Cell Data: *Space Group:* $P2/m$, $P2$, or Pm. $a = 8.99(4)$ $b = 5.24(1)$ $c = 18.45(8)$ $\beta = 92.28(15)^\circ$ $Z = 5$

X-ray Powder Pattern: Arzak deposit, Russia; differs only by intensities from lavrentievite. 2.63 (10), 3.02 (6), 3.41 (5), 3.99 (4), 2.313 (4), 1.594 (4), 5.05 (3)

Chemistry:

	(1)	(2)
Hg	76.74	77.02
S	7.80	8.21
Br	12.06	10.23
Cl	3.29	4.54
Total	99.89	100.00

(1) Arzak deposit, Russia; by electron microprobe, average of five grains; corresponding to $Hg_{3.08}S_{1.96}(Br_{1.22}Cl_{0.75})_{\Sigma=1.97}$. (2) $Hg_3S_2(Br,Cl)_2$ with Br:Cl = 1:1.

Polymorphism & Series: Forms a series with lavrentievite.

Occurrence: In the oxidized zone of a hydrothermal deposit.

Association: Lavrentievite, cinnabar, corderoite, quartz, kaolinite.

Distribution: From the Arzak deposit, Pii-Khem district, Uyuk Range, Tuva, Siberia, Russia [TL].

Name: For the occurrence in the Arzak deposit, Russia.

Type Material: Mining Institute, St. Petersburg, 1677/1; Central Siberian Geological Museum, Novosibirsk, Russia, VI-24/1.

References: (1) Vasil'ev, V.L., N.A. Pal'chik, and O.K. Grechishchev (1984) Lavrentievite and arzakite, new natural sulfohalogenides of mercury. Geol. i Geofiz., 7, 54–63 (in Russian). (2) (1985) Amer. Mineral., 70, 873–874 (abs. ref. 1). (3) (1984) Chem. Abs., 101, 174794 (abs. ref. 1). (4) Vasil'ev, V.I., Y.G. Lavrent'ev, and N.A. Pal'chik (1986) New data on arzakite and lavrentievite. Doklady Acad. Nauk SSSR, 290, 948–951 (in Russian).