Aramayoite $Ag_3Sb_2(Bi,Sb)S_6$

Crystal Data: Triclinic. *Point Group:* $\overline{1}$. As thin plates parallel to (010), showing striations along {100} and {001}, to 1 cm. *Twinning:* About [$\overline{1}$01] with the composition plane near {$\overline{1}$01}.

Physical Properties: *Cleavage:* Perfect on {010}, fair on {100}, poor on {001}. *Tenacity:* Sectile, thin flakes are flexible but not elastic. Hardness = 2.5 VHN = n.d. D(meas.) = 5.602 D(calc.) = 5.88

Optical Properties: Nearly opaque. *Color:* Iron-black, with thin edges showing deep blood-red; white in reflected light. *Streak:* Black to red-brown. *Luster:* Brilliant metallic. *Pleochroism:* Distinct in oil. *Anisotropism:* Very high in oil.
R_1–R_2: (400) 38.9–43.4, (420) 38.8–42.5, (440) 38.5–41.9, (460) 38.4–41.6, (480) 38.2–41.1, (500) 38.0–40.9, (520) 37.8–40.5, (540) 37.5–40.2, (560) 37.3–40.0, (580) 37.1–40.1, (600) 37.0–40.1, (620) 36.7–39.9, (640) 36.6–39.5, (660) 36.2–39.1, (680) 36.1–39.0, (700) 36.3–39.8

Cell Data: *Space Group:* $P\overline{1}$. $a = 7.813(2)$ $b = 8.268(2)$ $c = 8.880(2)$ $\alpha = 100.32(2)°$ $\beta = 104.07(2)°$ $\gamma = 90.18(2)°$ Z = 2

X-ray Powder Pattern: Animas mine, Bolivia; similar to baumstarkite.
2.806 (100), 3.21 (40), 1.940 (30), 3.43 (20), 2.048 (20), 1.705 (20), 1.402 (20)

Chemistry:

	(1)	(2)
Ag	34.74	34.3
Cu	0.53	
Fe	trace	
Sb	29.95	30.6
Bi	13.75	14.1
As		0.2
S	20.87	20.8
Total	99.84	100.0

(1) Animas mine, Bolivia; corresponding to $(Ag_{2.97}Cu_{0.07})_{\Sigma=3.04}Sb_{2.00}(Bi_{0.61}Sb_{0.27})_{\Sigma=0.98}S_{6.00}$.
(2) Do.; by electron microprobe, average of nine analyses, corresponding to $Ag_{2.94}Sb_{2.00}(Bi_{0.62}Sb_{0.32}As_{0.02})_{\Sigma=0.96}S_{6.00}$.

Occurrence: Rare, typically in vein-controlled hydrothermal Sn–Ag ores.

Association: Tetrahedrite, miargyrite, stannite, pyrite, quartz.

Distribution: From the Animas mine, Chocaya, Potosí, Bolivia [TL]. At Herminia, Julcani district, and in the San Genaro mine, Huancavelica, Peru. From the Armonia mine, El Quevar, Salta Province, and in the Pirquitas deposit, Riconada Department, Jujuy Province, Argentina. From Portugalete, Bolivia. At the El Indio mine, El Indio-Tambo district, east of La Serena, Coquimbo, Chile. From the Flathead mine, about 13 km north of Niarada, Flathead Co., Montana, USA. At Monts de Blond and Le Bourneix, Hautes-Vienne, and Sainte-Marie-aux-Mines, Haut-Rhin, France. From Altenberg, fSalzburg, Austria.

Name: For Felix Avelino Aramayo (1846–1929), former Managing Director of the Compagnie Aramayo de Mines en Bolivie.

Type Material: The Natural History Museum, London, England, 1926,292, 1940,10; Royal Ontario Museum, Toronto, Canada, M15125; National Museum of Natural History, Washington, D.C., USA, 95553.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 427–428. (2) Graham, A.R. (1951) Matildite, aramayoite, miargyrite. Amer. Mineral., 36, 436–449. (3) Effenberger, H., W.H. Paar, D. Topa, A.J. Criddle, and M. Fleck (2002) The new mineral baumstarkite and a structural reinvestigation of aramayoite and miargyrite. Amer. Mineral., 87, 753–764.