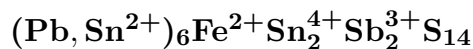


Franckeite



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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Thin crystals, tabular on {010}; elongated || [100], to 6 cm, striated on {010}, may be warped or bent; typically in spherical, rosette- or cauliflowerlike aggregates of thin plates; commonly massive, radiated, or foliated.

Twinning: Complex twinning has been observed.

Physical Properties: *Cleavage:* {010}, perfect. *Tenacity:* Flexible, inelastic; slightly malleable. Hardness = 2.5–3. VHN = n.d. D(meas.) = 5.88–5.92 D(calc.) = 5.88

Optical Properties: Opaque. *Color:* Grayish black. *Streak:* Grayish black. *Luster:* Metallic. *Anisotropism:* Weak.

R_1 – R_2 : (400) 38.2–39.4, (420) 37.9–39.2, (440) 37.6–39.0, (460) 37.3–38.7, (480) 36.9–38.5, (500) 36.6–38.2, (520) 36.2–37.9, (540) 35.8–37.6, (560) 35.4–37.3, (580) 35.0–36.9, (600) 34.6–36.5, (620) 34.2–36.1, (640) 33.8–35.7, (660) 33.4–35.3, (680) 33.0–34.9, (700) 32.6–34.5

Cell Data: *Space Group:* $P\bar{1}$ with pseudo-hexagonal $a = 17.2$ $b = 3.65$ $c = 6.30$
 $\alpha = 91.3^\circ$ $\beta = 96.2^\circ$ $\gamma = 88.6^\circ$ and pseudotetragonal $a = 17.2$ $b = 5.79$ $c = 5.82$
 $\alpha = 91.4^\circ$ $\beta = 95.5^\circ$ $\gamma = 88.2^\circ$

X-ray Powder Pattern: Bolivia.

3.44 (100), 2.91 (100), 2.86 (100), 2.82 (100), 2.05 (75), 4.30 (50), 3.11 (50)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
Pb	50.57	46.23	48.40	Sn	12.34	17.05	16.64
Fe	2.48	2.69	2.61	Sb	10.51	11.56	11.38
Zn	1.22	0.57		S	21.04	21.12	20.97
Ag		0.97		rem.	0.71		
				Total	98.87	100.19	100.00

(1) Chocaya, Bolivia. (2) Poopó, Bolivia. (3) $\text{Pb}_5\text{FeSn}_3\text{Sb}_2\text{S}_{14}$.

Occurrence: In hydrothermal Ag–Sn deposits (Bolivia); in a limestone contact metamorphic deposit (Kalkar quarry, California, USA).

Association: Cyndrite, teallite, plagonite, zinkenite, cassiterite, wurtzite, pyrrhotite, marcasite, arsenopyrite, galena, pyrite, sphalerite, siderite (Bolivia); cassiterite, galena, stannite, teallite, cyndrite (Russia).

Distribution: In Bolivia, from Chocaya [TL], Poopó, Oruro, Llallagua, Huanuni, Colquechaca, and Cerro Rico, Potosí. At the Pirquitas mine, Jujuy Province, Argentina. In the Thompson mine, Darwin district, Inyo Co., and the Kalkar quarry, Santa Cruz, Santa Cruz Co., California, USA. From near the headwaters of the east branch of the Coal River, Yukon Territory, Canada. At Vens Haut, Cantal, France. In the Sinantscha zinc deposit, Sichota-Alin, and from Smirnowsk, Transbaikalia, Russia. At the Changpo-Tongkeng tin deposit, Dachang district, Guangxi Autonomous Region, China. From the Hoei tin mine, Oita Prefecture, Japan. At the Renison Bell mine, Tasmania, and the Wallah Wallah mine, Rye Park, New South Wales, Australia.

Name: For the mining engineers Carl and Ernest Francke.

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