

**Crystal Data:** Monoclinic, perhaps triclinic. *Point Group:*  $2/m$ ,  $m$ , or  $2$ ; perhaps  $\bar{1}$  or  $1$ . As very fine lamellae, typically intergrown with cylindrite.

**Physical Properties:** *Cleavage:* Excellent on  $\{100\}$ . *Hardness =* Very soft. *VHN =* n.d. *D(meas.) =* n.d. *D(calc.) =* n.d.

**Optical Properties:** Opaque. *Color:* In polished section, pale gray. *Anisotropism:* Distinct in greenish brown and brownish gray.

$R_1$ – $R_2$ : (480) 29.8–33.7, (540) 29.0–33.2, (600) 28.6–32.9, (640) 28.1–32.5

**Cell Data:** *Space Group:* Two subcells are recognized, both  $A2/m$ ,  $Am$ , or  $A2$ ; the first (pseudotetragonal) has:  $a = 17.29(2)$   $b = 5.79(1)$   $c = 5.83(2)$   $\beta = 94.14(30)^\circ$  and the second (pseudo-hexagonal) has:  $a = 17.25(2)$   $b = 3.66(1)$   $c = 6.35(2)$   $\beta = 91.13(20)^\circ$   $Z =$  n.d.

**X-ray Powder Pattern:** Poopó, Bolivia.

2.862 (100), 2.029 (80), 3.43 (70), 4.31 (60), 3.83 (40), 3.23 (40), 3.12 (40)

**Chemistry:**

	(1)	(2)
Pb	36.53	39.77
Ag	2.15	
Sn	23.09	22.79
Fe	2.35	2.68
Sb	12.70	11.68
S	23.20	23.08
Total	100.02	100.00

(1) Poopó, Bolivia; by electron microprobe, average of five analyses; corresponding to  $(\text{Pb}_{3.67}\text{Ag}_{0.37})_{\Sigma=4.04}\text{Sn}_{4.07}\text{Fe}_{0.88}\text{Sb}_{2.23}\text{S}_{15.00}$ . (2)  $\text{Pb}_4\text{Sn}_4\text{FeSb}_2\text{S}_{15}$ .

**Occurrence:** In hydrothermal Ag–Sn ores (Poopó, Bolivia).

**Association:** Cylindrite, stannite, miargyrite (Poopó, Bolivia).

**Distribution:** From Poopó, Bolivia [TL]. Found near Mejillones, north of Antofagasta, Chile. In the Hoei tin mine, Oita Prefecture, Japan.

**Name:** For the Incas, first recorded miners of the Ag–Sn ores in the Poopó–Oruro district, Bolivia.

**Type Material:** Redpath Museum, McGill University, Montreal, Canada, 898.

**References:** (1) Makovicky, E. (1974) Mineralogical data on cylindrite and incaite. *Neues Jahrb. Mineral., Monatsh.*, 235–256. (2) (1975) *Amer. Mineral.*, 60, 486–487 (abs. ref. 1). (3) Makovicky, E. (1976) Crystallography of cylindrite. Part I. Crystal lattices of cylindrite and incaite. *Neues Jahrb. Mineral., Abh.*, 126, 304–326.