Hocartite $Ag_2(Fe,Zn)SnS_4$

Crystal Data: Tetragonal. *Point Group:* $\bar{4}2m$. As grains, to less than 1 mm in diameter, and intergrowths. *Twinning:* Polysynthetic twinning, common.

Physical Properties: Hardness = ∼4 VHN = 209–234 (25 g load). D(meas.) = n.d. D(calc.) = 4.77

Optical Properties: Opaque. *Color:* In polished section, brownish gray. *Pleochroism:* Weak, gray-brown to gray-violet. *Anisotropism:* Distinct, orange to greenish.
R_1–R_2: (400) 25.8–26.0, (420) 25.8–25.9, (440) 25.5–25.7, (460) 25.1–25.4, (480) 24.7–25.0, (500) 24.4–24.7, (520) 24.1–24.5, (540) 23.8–24.3, (560) 23.7–24.0, (580) 23.6–24.0, (600) 23.5–24.1, (620) 23.8–24.3, (640) 24.2–24.4, (660) 24.2–24.3, (680) 23.9–24.0, (700) 23.5–23.6

Cell Data: *Space Group:* $I\bar{4}2m$. $a = 5.74$ $c = 10.96$ $Z = 2$

X-ray Powder Pattern: Tacama, Bolivia.
3.26 (100), 1.98 (80), 1.72 (70), 2.03 (50), 2.87 (40), 2.74 (30), 1.666 (30)

Chemistry:

	(1)	(2)	(3)
Ag	36.0	42.3	41.61
Fe	7.6	10.0	10.77
Zn	4.2		
Cu	1.8	0.2	
Sn	25.0	23.4	22.89
S	26.0	24.0	24.73
Total	100.6	99.9	100.00

(1) Tacama, Bolivia; by electron microprobe, corresponding to $(Ag_{1.65}Cu_{0.14})_{\Sigma=1.79}(Fe_{0.67}Zn_{0.32})_{\Sigma=0.99}Sn_{1.04}S_{4.00}$. (2) Himmelsfürst mine, Germany; by electron microprobe, corresponding to $(Ag_{2.10}Cu_{0.02})_{\Sigma=2.02}Fe_{0.96}Sn_{1.05}S_{4.00}$. (3) Ag_2FeSnS_4.

Polymorphism & Series: Forms a series with pirquitasite.

Mineral Group: Stannite group.

Occurrence: Of relatively high-temperature origin, typically in hydrothrmal tin-bearing deposits.

Association: Cassiterite, cylindrite, franckeite, suredaite, stannite, canfieldite, tetrahedrite, pyrargyrite, silver, sphalerite, wurtzite, siderite, fluorite.

Distribution: In Bolivia, from Tacama [TL], Hocaya, Colquechaca, Potosí, and Chocaya. In the Pirquitas deposit, Riconada Department, Jujuy Province, Argentina. At Fournial, Cantal, France [TL]. From the Himmelsfürst mine, Erbisdorf, near Freiberg, Saxony, Germany. In the Chat-Karagai tin deposit, Tallas Alatan, Russia. At the Huangshaping Pb–Zn deposit, Giuyang, Hunan Province, China. From the Toyoha mine, Hokkaido, Japan. In the USA, at Bisbee, Cochise Co., Arizona, and in the Dean mine, southeast of Battle Mountain, Lewis district, Lander Co., Nevada.

Name: Honors Raymond Hocart (1896–1983), Professor of Mineralogy, University of Paris, Paris, France.

Type Material: National School of Mines, Paris, France.

References: (1) Caye, R., Y. Laurent, P. Picot, R. Pierrot, and C. Lévy (1968) La hocartite, Ag_2SnFeS_4, une nouvelle espèce minérale. Bull. Soc. fr. Minéral., 91, 383–387 (in French with English abs.). (2) (1969) Amer. Mineral., 54, 573 (abs. ref. 1). (3) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 239.