Laffittite $AgHgAsS_3$

Crystal Data: Monoclinic, pseudocubic. *Point Group:* $2/m$. As rough crystals, to 4 mm, spindlelike to prismatic, tabular on {100}; granular. *Twinning:* On {100}, twin axis $\perp$ {100}; also by an unknown law giving intergrowths at a 60° angle.

Physical Properties: *Cleavage:* Good to imperfect on {010}. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = n.d. VHN = 92–138 (25 g load). D(meas.) = 6.11 (synthetic). D(calc.) = 6.195

Optical Properties: Opaque; transparent in tiny crystals. *Color:* Dark red to cherry-red; in polished section, bluish white with numerous purple-red internal reflections. *Streak:* Pale cherry-red to brownish red. *Luster:* Metallic, adamantine. *Pleochroism:* Strong. *Anisotropism:* Strong to moderate, from pale gray-blue to dark gray.
R_1–R_2: (400) 34.5–38.4, (420) 34.6–37.7, (440) 34.7–37.0, (460) 34.4–36.1, (480) 33.8–35.2, (500) 32.9–34.3, (520) 31.8–33.4, (540) 30.7–32.5, (560) 29.5–31.7, (580) 28.6–30.8, (600) 28.0–30.1, (620) 27.4–29.7, (640) 27.1–29.4, (660) 26.8–29.4, (680) 26.6–29.2, (700) 26.3–28.9

Cell Data: *Space Group:* $A2/a$. $a = 7.732(3)$ $b = 11.285(7)$ $c = 6.643(4)$ $\beta = 115.16(3)°$ $Z = 4$

X-ray Powder Pattern: Jas Roux, France.
2.682 (100), 3.198 (80), 3.005 (80), 3.505 (70), 2.133 (60), 5.31 (50), 1.905 (50)

Chemistry:

	(1)	(2)	(3)
Ag	21.9	21.6	22.49
Hg	41.0	41.4	41.83
As	15.6	14.8	15.62
Sb		1.6	
S	20.3	19.8	20.06
Total	98.8	99.2	100.00

(1) Jas Roux, France; by electron microprobe, corresponding to $Ag_{0.97}Hg_{0.98}As_{1.01}S_{3.04}$. (2) Chauvai deposit, Kyrgyzstan; by electron microprobe, corresponding to $Ag_{0.97}Hg_{1.00}(As_{0.96}Sb_{0.06})_{\Sigma=1.02}S_{3.00}$. (3) $AgHgAsS_3$.

Occurrence: With other arsenic sulfides, in hydrothermal deposits.

Association: Smithite, stibnite, pierrotite, parapierrotite, aktashite, realgar, wakabayashilite, sphalerite, pyrite, routhiérite, chabournéite (Jas Roux, France); orpiment, realgar, stibnite, getchellite, sphalerite (Getchell mine, Nevada, USA); galkhaite, stibnite, cinnabar, metacinnabar, sphalerite, fluorite, calcite, quartz (Chauvai deposit, Kyrgyzstan).

Distribution: From the Jas Roux deposit, 10 km east of Chapelle-en-Valgaudemar, Hautes-Alpes, France [TL]. In the USA, at the Getchell mine, Potosi district, Humboldt Co., Nevada. From the Chauvai Sb–Hg deposit, Fergana Valley, Alai Range, southern Kyrgyzstan.

Name: For Pierre Laffitte (1925–), Director, National School of Mines, Paris, France.

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

References: (1) Johan, Z., J. Mantienne, and P. Picot (1974) La routhiérite, $TlHgAsS_3$, et la laffittite, $AgHgAsS_3$, deux nouvelles espèces minérales. Bull. Soc. fr. Minéral., 97, 48–53 (in French with English abs.). (2) (1975) Amer. Mineral., 60, 945–946 (abs. ref. 1). (3) Nakai, I. and D.E. Appleman (1983) Laffittite, $AgHgAsS_3$; crystal structure and second occurrence from the Getchell mine, Nevada. Amer. Mineral., 68, 235–244. (4) Stepanov, V.I., V.Y. Volgin, and N.I. Chistyakova (1986) Laffittite $AgHgAsS_3$ from the Chauvai mercury deposit, southern Kigizia, its first find in the USSR. Doklady Acad. Nauk SSSR, 288, 703–706 (in Russian).