Fettelite $Ag_{24}HgAs_5S_{20}$

Crystal Data: Hexagonal *Point Group:* $\overline{3}$ $2/m$, $3m$, or 32. Hexagonal tablets and flakes, to 0.2 mm, in subparallel aggregates, rosettelike groups, and clusters.

Physical Properties: *Cleavage:* Perfect on {0001}. *Fracture:* Irregular. *Tenacity:* Brittle. Hardness = 3.75 VHN = 138–174, 158 average (20 g load). D(meas.) = n.d. D(calc.) = 6.29

Optical Properties: Opaque. *Color:* Dark violet to scarlet, wine-red in thin fragments; in reflected light, gray with a greenish tint, with strong red internal reflections. *Streak:* Dark vermillion. *Luster:* Submetallic to adamantine.
Optical Class: Biaxial. *Anisotropism:* Weak; bright greenish gray to dark bluish gray. *Bireflectance:* Weak.
R_1–R_2: (400) — , (420) 30.7–31.3, (440) 30.7–31.3, (460) 30.5–31.1, (480) 30.0–30.8, (500) 29.4–30.3, (520) 28.6–29.8, (540) 27.6–29.2, (560) 27.1–28.6, (580) 26.0–27.6, (600) 25.7–27.1, (620) 25.0–26.3, (640) 24.3–25.4, (660) 23.6–24.5, (680) 23.0–23.8, (700) 22.5–23.3

Cell Data: *Space Group:* $P\overline{3}m1$, $P\overline{3}1m$, $P3m1$, $P31m$, $P321$, or $P312$. $a = 15.00$ $c = 15.46$ $Z = 3$

X-ray Powder Pattern: Niederbeerbach mine, Germany.
3.091 (10), 1.878 (8), 3.175 (6), 2.998 (4), 2.755 (3), 3.243 (2), 2.497 (2)

Chemistry:

	(1)	(2)
Tl	0.13	
Hg	5.21	5.27
Ag	67.55	68.03
Pb	0.07	
Cu	0.07	
Fe	0.04	
As	9.80	9.85
Sb	0.23	
S	16.79	16.85
Total	99.88	100.00

(1) Niederbeerbach mine, Germany; by electron microprobe, average of 28 analyses on five crystals; corresponds to $Ag_{24.00}Hg_{1.00}Cu_{0.04}Fe_{0.03}Tl_{0.02}Pb_{0.01}As_{5.01}S_{20.07}$. (2) $Ag_{24}HgAs_5S_{20}$.

Occurrence: A rare mineral in low-temperature hydrothermal prehnite–calcite–quartz veins.

Association: Proustite, pearceite, xanthoconite, safflorite.

Distribution: From the Niederbeerbach mine, 10 km south of Darmstadt, Odenwald, Hesse, Germany [TL].

Name: To honor M. Fettel, who first noted the mineral.

Type Material: Institute of Mineralogy, University of Heidelberg, Heidelberg, Germany.

References: (1) Wang, N. and A. Paniagua (1996) Fettelite a new Hg-sulfosalt mineral from Odenwald. Neues Jahrb. Mineral., Monatsh., 313–320. (2) (1997) Amer. Mineral., 82, 621 (abs. ref. 1).