Dufrénoysite $Pb_2As_2S_5$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals tabular in shape and somewhat elongated [100]; also elongated [010] and striated ‖ [100], to 3 cm. *Twinning:* With {001} as twin plane; polysynthetic lamellae are rarely observed in polished section.

Physical Properties: *Cleavage:* {010}, perfect. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 3 VHN = 135–146 (100 g load). D(meas.) = 5.50–5.57 D(calc.) = 5.61

Optical Properties: Subtranslucent. *Color:* Lead-gray to steel-gray; in polished section, white, may show deep red internal reflections; dark red-brown in transmitted light. *Streak:* Reddish brown to chocolate-brown.
Optical Class: Biaxial. *Luster:* Metallic. *Pleochroism:* Very weak. $n = > 2.72$ (Li).
Anisotropism: Strong, in brown-violet and dark green colors.
R_1–R_2: (400) 39.5–42.1, (420) 39.0–41.7, (440) 38.5–41.1, (460) 38.1–40.6, (480) 37.8–40.2, (500) 37.4–39.7, (520) 37.0–39.0, (540) 36.6–38.4, (560) 36.1–37.6, (580) 35.6–36.9, (600) 34.9–36.2, (620) 34.2–35.4, (640) 33.3–34.6, (660) 32.5–33.7, (680) 31.7–33.0, (700) 31.0–32.4

Cell Data: *Space Group:* $P2_1/m$. $a = 7.90$ $b = 25.74$ $c = 8.37$ $\beta = 90°21'$ Z = 2

X-ray Powder Pattern: Binntal, Switzerland.
3.74 (100), 3.00 (90), 2.70 (80), 3.21 (60), 2.36 (60), 2.23 (60), 3.56 (50)

Chemistry:

	(1)	(2)
Pb	57.42	57.20
As	20.89	20.68
S	22.55	22.12
Total	100.86	100.00

(1) Binntal, Switzerland. (2) $Pb_2As_2S_5$.

Occurrence: An uncommon mineral of medium- to low-temperature hydrothermal origin.

Association: Chalcopyrite, sphalerite, realgar, orpiment, tetrahedrite.

Distribution: In Switzerland, from Binntal, Valais, in the Lengenbach quarry [TL], and at Recki Bach. From the Bleikvassli Zn–Pb–Cu deposit, Nordland, Norway. At Wheal Boys, St. Endellion, Cornwall, England. In the USA, from the Silver Star claims, near Fruitland, Stevens Co., Washington, and at the Zuni mine, San Juan Co., Colorado. From the Hemlo gold deposit, Thunder Bay district, Ontario, Canada.

Name: To honor Professor Ours Pierre Armand Petit-Dufrénoy (1792–1857), French mineralogist, National School of Mines, Paris, France.

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