

Hauchecornite

Ni₉Bi(Sb, Bi)S₈

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Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. Crystals are tabular on {001}, also short prismatic and dipyramidal, to 4 mm.

Physical Properties: *Fracture:* Flat, conchoidal. Hardness = 5 VHN = 447–655 (50 g load). D(meas.) = 6.35–6.47 D(calc.) = 6.58

Optical Properties: Opaque. *Color:* Pale bronze-yellow, tarnishing darker. *Streak:* Gray-black. *Luster:* Lively metallic on fresh break. *Pleochroism:* Very weak in air; more distinct in oil. *Anisotropism:* Distinct.

R₁–R₂: (400) 35.8–37.9, (420) 37.2–39.3, (440) 38.6–40.7, (460) 40.0–42.2, (480) 41.4–43.8, (500) 42.7–45.4, (520) 44.0–46.9, (540) 45.2–48.2, (560) 46.3–49.3, (580) 47.3–50.2, (600) 48.2–51.0, (620) 49.0–51.7, (640) 49.7–52.3, (660) 50.4–52.9, (680) 51.0–53.4, (700) 51.5–53.9

Cell Data: *Space Group:* $P4/mmm$. $a = 7.300(3)$ $c = 5.402(2)$ $Z = 1$

X-ray Powder Pattern: Friedrich mine, Germany.

2.79 (10), 2.39 (6), 2.30 (6), 4.34 (5), 1.861 (5), 3.64 (4), 3.25 (4)

Chemistry:

	(1)	(2)	(3)
Ni	45.47	46.8	45.57
Co	0.76	0.3	
Fe	0.22		
Bi	24.11	22.3	27.05
Sb	6.48	7.8	5.25
As	0.67	0.2	
S	22.75	22.6	22.13
Total	100.46	100.0	100.00

(1) Friedrich mine, Germany; average of two analyses, corresponds to (Ni_{8.74}Co_{0.14}Fe_{0.04})_{Σ=8.92}(Bi_{1.30}Sb_{0.60}As_{0.10})_{Σ=2.00}S_{8.00}. (2) Do.; by electron microprobe, corresponds to (Ni_{9.05}Co_{0.06})_{Σ=9.11}(Bi_{1.21}Sb_{0.73}As_{0.03})_{Σ=1.97}S_{8.00}. (3) Ni₉Bi(Sb, Bi)S₈ with Bi:Sb = 3:1.

Mineral Group: Hauchecornite group.

Occurrence: Of hydrothermal origin.

Association: Millerite, bismuthian-arsenian ullmannite, antimonian gersdorffite, siegenite, bismuthinite, gold, galena, sphalerite, quartz.

Distribution: From the Friedrich mine, near Wissen, North Rhine-Westphalia, Germany [TL].

Name: Honors William Hauchecorn (1828–1900), Director of the Geological Survey and the Mining Academy, Berlin, Germany.

Type Material: Harvard University, Cambridge, Massachusetts, USA, 89710.

References: (1) Peacock, M.A. (1950) Hauchecornite. *Amer. Mineral.*, 35, 440–446. (2) Gait, R.I. and D.C. Harris (1972) Hauchecornite – antimonian arsenian, and tellurian varieties. *Can. Mineral.*, 11, 819–825. (3) Kocman, V. and E.W. Nuffield (1974) The crystal structure of antimonian hauchecornite from Westphalia. *Can. Mineral.*, 12, 269–274. (4) Just, J. (1980) Bismutohauchecornite – new name: hauchecornite redefined. *Mineral. Mag.*, 43, 873–876.