

**Crystal Data:** Tetragonal. *Point Group:*  $4/m\ 2/m\ 2/m$ . As elongated tabular crystals, to 0.3 mm; as grains and massive.

**Physical Properties:** Hardness = n.d. VHN = 360–392, average 375 (10 g load).  
D(meas.) = n.d. D(calc.) = [6.25]

**Optical Properties:** Opaque. *Color:* Bronze-yellow. *Pleochroism:* Moderate.  
*Anisotropism:* Weak in reflected light.

R<sub>1</sub>–R<sub>2</sub>: n.d.

**Cell Data:** *Space Group:*  $P4/mmm$ .  $a = 7.37$   $c = 5.88$   $Z = [1]$

**X-ray Powder Pattern:** Oktyabr mine, Russia.  
2.80 (10), 1.867 (8), 4.34 (6), 2.40 (6), 2.32 (6), 3.67 (5), 1.808 (4)

<b>Chemistry:</b>	(1)	(2)	(3)
Ni	43.6	45.85	43.93
Fe	0.2	0.22	
Co	0.8	0.66	
Pb		0.01	
As	0.5	0.72	
Bi	33.9	27.76	34.75
S	21.4	22.46	21.32
Total	100.4	97.68	100.00

(1) Oktyabr mine, Russia; by electron microprobe, corresponding to (Ni<sub>8.90</sub>Co<sub>0.16</sub>Fe<sub>0.04</sub>)<sub>Σ=9.10</sub>(Bi<sub>1.94</sub>As<sub>0.08</sub>)<sub>Σ=2.02</sub>S<sub>8.00</sub>. (2) Zimmer Lake, Canada; by electron microprobe, corresponding to (Ni<sub>8.92</sub>Co<sub>0.13</sub>Fe<sub>0.04</sub>)<sub>Σ=9.09</sub>(Bi<sub>1.52</sub>As<sub>0.11</sub>)<sub>Σ=1.63</sub>S<sub>8.00</sub>. (3) Ni<sub>9</sub>Bi<sub>2</sub>S<sub>8</sub>.

**Mineral Group:** Hauchecornite group.

**Occurrence:** Of hydrothermal origin; as secondary pore-fillings and replacements of sandstone and conglomerate (Zimmer Lake, Canada); in ultramafic rocks (Liu Zhuang, China).

**Association:** Chalcocite, galena, pentlandite, altaite (Oktyabr mine, Russia); chalcopyrite, pyrrhotite, millerite (Zimmer Lake, Canada).

**Distribution:** In the Oktyabr mine, Talnakh area, Noril'sk region, western Siberia, Russia [TL]. From near Zimmer Lake, northern Saskatchewan, Canada. At the Mihara mine, Okayama Prefecture, and the Tsumo mine, Shimane Prefecture, Japan. In China, from Liu Zhuang, Tongbai Co., Henan Province.

**Name:** For the relation to hauchecornite.

**Type Material:** A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 77168.

**References:** (1) Kovalenker, V.A., T.L. Evstigneeva, V.D. Begizov, L.N. Vyal'sov, A.V. Smirnov, Y.K. Krakovetskii, and V.S. Balbin (1978) Hauchecornite from copper-nickel ores of the Oktyabr'skoe deposit. *Trudy Min. muzeya Akad. Nauk SSSR*, 26, 201–205 (in Russian). (2) (1979) *Chem. Abs.*, 90, 158 (abs. ref. 1). (3) Just, J. (1980) Bismutohauchecornite—new name: hauchecornite redefined. *Mineral. Mag.*, 43, 873–876. (4) Watkinson, D.H., J.B. Heslop, and W.D. Ewert (1975) Nickel sulphide-arsenide assemblages associated with uranium mineralization, Zimmer Lake area, northern Saskatchewan. *Can. Mineral.*, 13, 198–204.