

**Crystal Data:** Cubic. *Point Group:*  $4/m\bar{3}2/m$  (synthetic Fe<sub>4</sub>N is  $\bar{4}3m$ ). As planar foils, to 2  $\mu\text{m}$  thick but many mm long, forming bursts embedded in kamacite.

**Physical Properties:** *Tenacity:* Ductile. Hardness = n.d. VHN = 600–900 (estimated). D(meas.) = n.d. D(calc.) = 7.21 (synthetic).

**Optical Properties:** Opaque. *Color:* White in reflected light.

*Optical Class:* Isotropic.

R: n.d.

**Cell Data:** *Space Group:*  $Pm\bar{3}m$  (synthetic Fe<sub>4</sub>N is  $P\bar{4}3m$ ).  $a = 3.79(4)$   $Z = 1$

**X-ray Powder Pattern:** Synthetic Fe<sub>4</sub>N.

2.191 (100), 1.144 (85), 1.897 (75), 1.342 (65), 0.949 (45), 1.095 (40), 2.684 (20)

**Chemistry:**

	(1)	(2)
Fe	89.8	88.6
Co	n.d.	0.53
Ni	5.58	6.35
N	6.3	7.6
Total	101.68	103.08

(1) Jerslev meteorite; by electron microprobe, trace Co assumed; corresponds to (Fe<sub>3.76</sub>Ni<sub>0.22</sub>Co<sub>0.02</sub>) $\Sigma=4.00$ N. (2) Youdegin meteorite; by electron microprobe, corresponds to (Fe<sub>3.72</sub>Ni<sub>0.26</sub>Co<sub>0.02</sub>) $\Sigma=4.00$ N.

**Occurrence:** A rare accessory mineral in iron-nickel meteorites, probably formed by diffusion of nitrogen.

**Association:** Kamacite, cohenite, schreibersite, carlsbergite, daubreelite.

**Distribution:** In the Jerslev, Youdegin, and Canyon Diablo iron meteorites.

**Name:** Honors Roald Norbach Nielsen (1928– ), Danish electron microprobe analyst, of the Department of Metallurgy, Danish Technical Institute, Lyngby, Denmark.

**Type Material:** University of Copenhagen, Copenhagen, Denmark, 1977,540.

**References:** (1) Buchwald, V.F. and H.P. Nielsen (1981) Roaldite, a new nitride in iron meteorites. *Lunar and Planetary Science*, 12, 112–114. (2) (1981) *Amer. Mineral.*, 66, 1100 (abs. ref. 1). (3) Dvoriankina, G.G. and Z.G. Pinsker (1958) An investigation of the structure of Fe<sub>4</sub>N. *Kristallografiya (Sov. Phys. Crystal.)*, 3, 439–444.