Haapalaite $4(Fe,Ni)S \cdot 3(Mg,Fe^{2+})(OH)_2$

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Crystal Data: Hexagonal. *Point Group:* n.d. As thin scales.

Physical Properties: Hardness = Very soft, less than that of graphite. VHN = 9–11 (3 g load). D(meas.) = n.d. D(calc.) = 3.57

Optical Properties: Opaque. *Color:* Bronze-red; in polished section, brown. *Luster:* Metallic, strong. *Pleochroism:* Distinct, light brown to grayish brown. *Anisotropism:* Very strong, bronze-red to grayish white.
R_1–R_2: n.d.

Cell Data: *Space Group:* n.d. $a = 3.64(2)$ $c = 34.02(2)$ Z = [1.5]

X-ray Powder Pattern: Near Outokumpu, Finland.
11.34 (100), 5.67 (90), 3.18 (80b), 1.841 (70), 1.821 (70), 2.835 (40), 2.59 (40)

Chemistry:

	(1)
Fe	24.13
Ni	14.85
Cu	0.12
Co	0.01
MgO	18.77
FeO	6.39
CaO	0.00
Al_2O_3	0.15
S	22.04
H_2O	[13.82]
Total	[100.28]

(1) Near Outokumpu, Finland; by electron microprobe, average of three analyses, H_2O calculated for $2(OH)^{1-}$; corresponding to $4(Fe_{0.63}Ni_{0.37}) \cdot 3.22(Mg_{0.84}Fe^{2+}_{0.16})(OH)_{2.00}$.

Occurrence: As thin scales in the Kokka serpentine and in carbonate; rarely in chrysotile.

Association: Pentlandite, maucherite, chalcopyrite, magnetite, chromite, lizardite, calcite.

Distribution: In the Kokka serpentinite body, about 33 km north-northwest from the Outokumpu mine, Tapiola, Finland [TL].

Name: In honor of Paavo Haapala (1906–), Chief Geologist of the Outokumpu Company, Finland.

Type Material: Preserved by the Outokumpu Company, Finland.

References: (1) Huhma, M., Y. Vuorelainen, T.A. Häkli, and H. Papunen (1973) Haapalaite, a new nickel–iron sulfide of the valleriite type from East Finland. Bull. Geol. Soc. Finland, 45, 103–106. (2) (1973) Amer. Mineral., 58, 1111 (abs. ref. 1).

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