Wilkmanite Ni_3Se_4

Crystal Data: Monoclinic. *Point Group:* $2/m$. Massive (?).

Physical Properties: Hardness = n.d. VHN = n.d. D(meas.) = n.d. D(calc.) = 6.96

Optical Properties: Opaque. *Color:* Pale grayish yellow. *Pleochroism:* Distinct, pale yellow to grayish yellow. *Anisotropism:* Strong, pink to yellowish green.

R_1–R_2: n.d.

Cell Data: *Space Group:* $I2/m$. $a = 6.22$ $b = 3.63$ $c = 10.52$ $\beta = 90.53°$ Z = 2

X-ray Powder Pattern: Kuusamo, Finland.
2.70 (100), 2.02 (100), 1.800 (100), 2.00 (80), 1.815 (80), 1.532 (60), 1.497 (60)

Chemistry:

	(1)	(2)
Ni	33.7	35.80
Co	1.0	
Cu	trace	
Fe	trace	
Se	65.3	64.20
Total	100.0	100.00

(1) Kuusamo, Finland; by electron microprobe. (2) Ni_3Se_4.

Polymorphism & Series: Dimorphous with trüstedtite.

Occurrence: A primary phase and an alteration product of sederholmite, in albite diabase sills that cut a schist formation, associated with low-grade uranium mineralization.

Association: Sederholmite, penroseite, selenium, ferroselite, selenian vaesite, cattierite, calcite.

Distribution: From Kuusamo, northeastern Finland.

Name: For W.W. Wilkman, geologist.

Type Material: n.d.

References: (1) Vuorelainen, Y., A. Huhma, and A. Häkli (1964) Sederholmite, wilkmanite, kullerudite, mäkinenite, and trüstedtite, five new nickel selenide minerals. Compt. Rendus Soc. Géol. Finlande, 36, 113–125. (2) (1965) 50, 519 (abs. ref. 1).