

**Crystal Data:** Orthorhombic. *Point Group:*  $2/m\ 2/m\ 2/m$ . Fine-grained, massive.

**Physical Properties:** Hardness = Soft. VHN = n.d. D(meas.) = n.d. D(calc.) = 6.72

**Optical Properties:** Opaque. *Color:* Lead-gray; in polished section, creamy grayish white, paler than penroseite. *Pleochroism:* Distinct in oil, gray to pale gray. *Anisotropism:* Very strong, yellowish gray to gray to almost black.

R<sub>1</sub>-R<sub>2</sub>: n.d.

**Cell Data:** *Space Group:*  $Pn\bar{m}$  (probable).  $a = 4.89$   $b = 5.96$   $c = 3.67$   $Z = 2$

**X-ray Powder Pattern:** Kuusamo, Finland.

2.64 (100), 2.545 (100), 2.935 (80), 1.925 (80), 1.84 (80), 1.648 (60), 2.095 (40)

Chemistry:	(1)	(2)
Ni	23.1	27.10
Co	1.4	
Fe	1.91	
Cu	0.5	
Se	73.1	72.90
Total	100.01	100.00

(1) Kuusamo, Finland; by X-ray fluorescence. (2) NiSe<sub>2</sub>.

**Polymorphism & Series:** Dimorphous with penroseite.

**Mineral Group:** Marcasite group.

**Occurrence:** In calcite veins in sills of albite diabase in schist, associated with low-grade uranium mineralization, almost exclusively as an alteration product of wilkmanite.

**Association:** Wilkmanite, sederholmite, penroseite, selenium, ferroselite.

**Distribution:** From Kuusamo, northeastern Finland [TL].

**Name:** In honor of Gunnar Kullerud (1921–1989), Norwegian-American mineralogist, Geophysical Laboratory, Washington, D.C., USA.

**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) *Amer. Mineral.*, 50, 519–520 (abs. ref. 1).