Edgarite $FeNb_3S_6$

Crystal Data: Hexagonal. *Point Group:* 622. Platy crystals, to 0.15 mm.

Physical Properties: *Cleavage:* Perfect on {0001}. Hardness = n.d. VHN = 135 (5 g load); 205 (10 g load). D(meas.) = 4.98 (synthetic). D(calc.) = 4.99

Optical Properties: Opaque. *Color:* Dark gray. *Pleochroism:* Distinct; gray to pale gray with a bluish tint. *Anisotropism:* Strong; nearly white to dark brown. *Bireflectance:* Distinct. R_1–R_2: (400) 28.4–40.3, (420) 28.3–40.3, (440) 28.2–40.3, (460) 28.2–40.3, (480) 28.1–40.2, (500) 27.9–40.2, (520) 27.5–39.8, (540) 27.4–39.4, (560) 27.1–38.9, (580) 27.0–38.6, (600) 27.0–38.0, (620) 27.0–37.6, (640) 27.0–37.1, (660) 27.0–36.6, (680) 27.2–36.3, (700) 27.4–35.8

Cell Data: *Space Group:* $P6_322$ (by analogy to synthetic). $a = 5.771(1)$ $c = 12.190(6)$ $Z = 2$

X-ray Powder Pattern: Khibiny massif, Russia.
2.096 (10), 6.11 (8), 2.606 (8), 1.665 (8), 1.126 (7), 3.04 (6), 1.524 (6)

Chemistry:

	(1)	(2)
Nb	52.87	52.89
Fe	10.12	10.60
Mn	0.10	
Ti	0.04	
V	0.36	
S	35.86	36.51
Total	99.35	100.00

(1) Khibiny massif, Russia; by electron microprobe, average of four analyses; corresponding to $(Fe_{0.96}V_{0.04}Mn_{0.01})_{\Sigma=1.01}Nb_{3.03}S_{5.95}$. (2) $FeNb_3S_6$.

Occurrence: In a feldspar-rich fenitized xenolith in a differentiated alkalic massif.

Association: Ti-V-rich pyrrhotite, Ti-V-rich marcasite, alabandite, monazite-(Ce), phlogopite.

Distribution: From the Khibiny massif, Kola Peninsula, Russia [TL].

Name: In honor of Dr. Alan D. Edgar (1935–1998), Professor of Petrology, University of Western Ontario, London, Canada, for his work on alkaline rocks.

Type Material: Royal Ontario Museum, Toronto, Canada, M46177.

References: (1) Barkov, A.Y., R.F. Martin, Y.P. Men'shikov, Y.E. Savchenko, Y. Thibault, and K.V.O. Laajoki (2000) Edgarite, $FeNb_3S_6$, first natural niobium-rich sulfide from the Khibina alkaline complex, Russian Far North: evidence for chalcophile behavior of Nb in a fenite. Contr. Mineral. Petrol., 138, 229–236. (2) (2000) Amer. Mineral., 85, 1843 (abs. ref. 1). (3) Anzenhofer, K., J.M. van den Berge, P. Cossee, and J.N. Helle (1970) The crystal structure and magnetic susceptibilities of $MnNb_3S_6$, $FeNb_3S_6$, $CoNb_3S_6$ and $NiNb_3S_6$. J. Phys. Chem. Solids, 31, 1057–1067.