Kaskasite $(Mo,Nb)S_2 \cdot (Mg_{1-x}Al_x)(OH)_{2+x}$

Crystal Data: Hexagonal. *Point Group*: $3m$, 32, or $\bar{3}\,2/m$. As lamellar or flaky, mica-like crystals flattened on [001], to 1.5 mm; epitaxial and coplanar with {001} of pyrrhotite; as irregular lamellae, sometimes with crude hexagonal outline; striations on {001} cross at 60°.

Physical Properties: *Cleavage*: Perfect on {001}. *Fracture*: Laminated. *Tenacity*: Flexible, inelastic. VHN = 34-38 (5 g load). Hardness = ~1 D(meas.) = n.d. D(calc.) = 3.83

Optical Properties: Opaque. *Color*: Iron black; light to dark gray in reflected light.
Streak: Black. *Luster*: Metallic. *Anisotropism:* Strong. *Pleochroism*: Strong, light gray with a yellowish hue to gray.
Optical Class: n.d.
R_1-R_2: (470) 8.6-21.5, (546) 9.2-21.6, (589) 9.2-21.5, (650) 8.9-21.3

Cell Data: *Space Group*: $P\bar{3}\,m1$, $P3m1$, or $P321$. [$a = 3.220(2)$ $c = 11.47(2)$ sulfide sub-lattice] [$a = 3.073(2)$ $c = 11.50(2)$ hydroxide sub-lattice] One-layer polytypes. Z = 1

X-ray Powder Pattern: Mt. Kaskasnyunchorr, Khibiny alkaline complex, Kola Peninsula, Russia.
5.72 (100), 11.46 (97), 2.786 (51), 1.613 (33), 1.557 (10), 2.627 (7), 2.219 (7)

Chemistry:

	(1)		(1)
Mg	5.94	Nb	13.39
Al	3.67	Mo	23.18
Ca	0.04	W	7.59
V	0.16	S	27.09
Mn	0.23	O	15.66
Fe	1.44	H	[0.99]
		Total	99.08

(1) Mt. Kaskasnyunchorr, Russia; average of 5 electron microprobe analyses, H calculated so that all O are OH-, presence of OH- confirmed by Raman spectroscopy; corresponding to $(Mo_{0.57}Nb_{0.34}W_{0.10}V_{0.01})_{\Sigma=1.02}S_2 \cdot (Mg_{0.58}Al_{0.32}Fe_{0.06}Mn_{0.01})_{\Sigma=0.97}(OH)_{2.32}$.

Mineral Group: Valleriite group.

Polymorphism & Series: Forms a series with manganokaskasite.

Occurrence: Of hydrothermal origin in fenites formed by the influence of a peralkaline fluid acting as a source of Nb on a large xenolith of alumina-rich metamorphic rocks (metapelites) located inside a huge intrusion of agpaitic nepheline syenite.

Association: Orthoclase, anorthoclase, nepheline, fluorophlogopite, corundum, pyrrhotite, pyrite, rutile, monazite-(Ce), graphite, edgarite, molybdenite, tungstenite, alabandite.

Distribution: From Mt. Kaskasnyunchorr, Khibiny alkaline complex, Kola Peninsula, Russia.

Name: For Mount Kaskasnyunchorr, the locality that produced the first specimens, whose name is based on the word for "juniper" - *kaskas* - in the Saami language of the Kola aboriginal people.

Type Material: The A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (# 94231).

References: (1) Pekov, I.V., V.O. Yapaskurt, Y.S. Polekhovsky, M.F. Vigasina, and O.I. Siidra (2014) Ekplexite $(Nb,Mo)S_2 \cdot (Mg_{1-x}Al_x)(OH)_{2+x}$, kaskasite $(Mo,Nb)S_2 \cdot (Mg_{1-x}Al_x)(OH)_{2+x}$ and manganokaskasite $(Mo,Nb)S_2 \cdot (Mn_{1-x}Al_x)(OH)_{2+x}$, three new valleriite-group mineral species from the Khibiny alkaline complex, Kola peninsula, Russia. Mineral. Mag., 78(3), 663-679. (2) (2015) Amer. Mineral., 100, 658-659 (abs. ref. 1).