

Crystal Data: Hexagonal. *Point Group:* $3m$, 32 , or $\bar{3} 2/m$. As lamellar or flaky, mica-like crystals flattened on $[001]$, to 1 mm; also epitaxial and coplanar with $\{001\}$ of pyrrhotite.

Physical Properties: *Cleavage:* Perfect on $\{001\}$. *Fracture:* Laminated. *Tenacity:* Flexible, inelastic. Hardness = ~ 1 D(meas.) = n.d. D(calc.) = 4.09

Optical Properties: Opaque. *Color:* Iron black; light to dark gray in reflected light. *Streak:* Black. *Luster:* Metallic. *Anisotropism:* Strong. *Pleochroism:* Strong, light yellowish to blue-gray. *Optical Class:* n.d.

R_1 - R_2 : (470) 10.4-25.6, (546) 10.5-25.0, (589) 10.6-24.7, (650) 10.6-24.5

Cell Data: *Space Group:* $P\bar{3}m1$, $P3m1$, or $P321$. [$a = 3.243(3)$ $c = 11.71(1)$ sulfide sub-lattice] [$a = 3.118(2)$ $c = 11.62(1)$ hydroxide sub-lattice] One-layer polytypes. $Z = 1$

X-ray Powder Pattern: Mt. Kaskasnyunchorr, Khibiny alkaline complex, Kola Peninsula, Russia. 5.66 (100), 11.39 (85), 2.769 (43), 2.663 (25), 1.608 (23), 2.455 (18), 1.559 (13)

Chemistry:	(1)		(1)
Mg	0.06	Nb	14.15
Al	3.00	Mo	20.08
Ca	0.00	W	9.12
V	0.15	S	24.84
Mn	11.44	O	13.36
Fe	2.06	<u>H</u>	<u>[0.89]</u>
		Total	99.15

(1) Mt. Kaskasnyunchorr, Russia; average of 5 electron microprobe analyses, H calculated so that all O are OH⁻, OH⁻ confirmed by Raman spectroscopy; corresponding to $(\text{Mo}_{0.57}\text{Nb}_{0.34}\text{W}_{0.10}\text{V}_{0.01})_{\Sigma=1.02}\text{S}_2 \cdot (\text{Mg}_{0.58}\text{Al}_{0.32}\text{Fe}_{0.06}\text{Mn}_{0.01})_{\Sigma=0.97}(\text{OH})_{2.32}$.

Mineral Group: Valleriite group.

Polymorphism & Series: Forms a series with kaskasite.

Occurrence: Of hydrothermal origin in fenites formed by a peralkaline fluid, as a source of Nb, reacting with a xenolith of alumina-rich metamorphic rocks (metapelites) in agpaite nepheline syenite.

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

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

Name: As the manganese analog of *kaskaite*.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (# 94232).

References: (1) Pekov, I.V., V.O. Yapaskurt, Y.S. Polekhovskiy, M.F. Vigasina, and O.I. Siidra (2014) Ekplexite $(\text{Nb,Mo})\text{S}_2 \cdot (\text{Mg}_{1-x}\text{Al}_x)(\text{OH})_{2+x}$, kaskasite $(\text{Mo,Nb})\text{S}_2 \cdot (\text{Mg}_{1-x}\text{Al}_x)(\text{OH})_{2+x}$ and manganokaskasite $(\text{Mo,Nb})\text{S}_2 \cdot (\text{Mn}_{1-x}\text{Al}_x)(\text{OH})_{2+x}$, 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).