Holmquistite $\mathbf{Li_2[(Mg,Fe^{2+})_3Al_2]Si_8O_{22}(OH)_2}$

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As prismatic or acicular crystals, to 10 cm, typically striated on {210}. In columnar sheaflike aggregates, massive.

Physical Properties: *Cleavage:* Perfect on {210}, intersecting at ∼54° and ∼126°; partings on {001}, {112}, and {113}. *Tenacity:* Brittle. Hardness = 5–6 D(meas.) = 2.95–3.13 D(calc.) = 3.09

Optical Properties: Transparent to translucent. *Color:* Black, dark violet to light sky-blue; pale yellow to violet in thin section. *Streak:* White, with sky-blue tinge. *Luster:* Vitreous. *Optical Class:* Biaxial (–). *Pleochroism:* Strong in shades of violet when dark-colored. *Orientation:* $X = a$; $Y = b$; $Z \wedge c = 0°$–$4°$. *Dispersion:* $r > v$, weak. *Absorption:* $Z > Y > X$. $\alpha = 1.622$–1.642 $\beta = 1.642$–1.660 $\gamma = 1.646$–1.666 2V(meas.) = 45°–52° 2V(calc.) = 78(8)°

Cell Data: *Space Group: Pnma.* $a = 18.30$ $b = 17.69$ $c = 5.30$ Z = 4

X-ray Powder Pattern: Barraute, Canada.
8.107 (100), 3.00 (90), 4.43 (70), 3.34 (60), 3.61 (50), 2.538 (50), 2.797 (40)

Chemistry:	(1)	(2)		(1)	(2)		(1)	(2)
SiO_2	59.58	59.73	MnO	0.41	0.20	K_2O	0.27	0.15
TiO_2		0.17	MgO	11.66	10.16	F	0.21	0.24
Al_2O_3	7.19	11.21	CaO	0.06	0.56	H_2O^+	2.23	2.08
Fe_2O_3	9.35	2.97	Li_2O	3.54	3.56	H_2O^-	0.03	0.02
FeO	4.88	8.92	Na_2O	0.50	0.18	$-O = F_2$	0.10	0.10
						Total	[99.81]	100.05

(1) Utö, Sweden; original total given as 99.82%, corresponding to $(Li_{1.90}Na_{0.13}K_{0.05}Ca_{0.01})_{\Sigma=2.09}(Mg_{2.32}Fe^{2+}_{0.54}Mn_{0.05})_{\Sigma=2.91}(Al_{1.08}Fe^{3+}_{0.94})_{\Sigma=2.02}(Si_{7.95}Al_{0.05})_{\Sigma=8.00}O_{22}[(OH)_{1.99}F_{0.09}]_{\Sigma=2.08}$.
(2) Barraute, Canada; corresponding to $(Li_{1.90}Ca_{0.08}Na_{0.05}K_{0.03})_{\Sigma=2.06}(Mg_{2.01}Fe^{2+}_{0.99}Mn_{0.02})_{\Sigma=3.02}(Al_{1.67}Fe^{3+}_{0.30}Ti_{0.02})_{\Sigma=1.99}(Si_{7.92}Al_{0.08})_{\Sigma=8.00}O_{22}[(OH)_{1.84}F_{0.10}]_{\Sigma=1.94}$.

Polymorphism & Series: Dimorphous with clinoholmquistite; forms a series with ferroholmquistite.

Mineral Group: Amphibole (Fe–Mn–Mg) group: 0.1 $Mg/(Mg + Fe^{2+})$ 0.89; $(Ca + Na)_B < 1.34$; $Li \geq 1.0$.

Occurrence: As metasomatic replacements near the outer margins of lithium-rich pegmatites.

Association: Quartz, clinoholmquistite, tourmaline, spodumene, plagioclase, biotite, clinozoisite, "hornblende."

Distribution: At Utö, Sweden. From Brandrücken, Austria. In the USA, from Hiddenite, Alexander Co., and the Foote mine, Kings Mountain, Cleveland Co., North Carolina; in the Harding pegmatite, Dixon, Taos Co., New Mexico; and around Keystone, Pennington Co., South Dakota. At Barraute, and near St. Benoit, Quebec, and in the Tanco pegmatite, Bernic Lake, Manitoba, Canada. In the Benson pegmatite mine, Mtoko-Fungwe area, Zimbabwe. From the Vredefort Ring crater, Orange Free State, South Africa. At Greenbushes, Western Australia.

Name: To honor the Swedish petrologist, Per Johan Holmquist (1866–1946), of Stockholm.

Type Material: n.d.

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