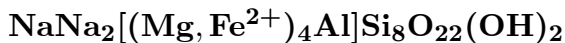


Eckermannite



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Crystal Data: Monoclinic. *Point Group:* $2/m$. As elongated prismatic crystals. Also as fibrous aggregates, to 5 cm. *Twinning:* Simple or multiple twinning $\parallel \{100\}$.

Physical Properties: *Cleavage:* Perfect on $\{110\}$, intersecting at 56° and 124° ; parting on $\{010\}$. *Fracture:* [Uneven.] *Tenacity:* [Brittle.] *Hardness* = 5–6 *D*(meas.) = 3.0–3.3 *D*(calc.) = [3.14]

Optical Properties: Translucent to opaque. *Color:* Black, dark green, bluish green; pale bluish green in thin section. *Luster:* [Vitreous.]

Optical Class: Biaxial (–). *Pleochroism:* Strong; *X* = bluish green, yellow, indigo; *Y* = light bluish green, yellow-brown, gray-violet; *Z* = pale green, deep green, pale brownish green, colorless. *Orientation:* $Y = b$; $X \wedge c = 30^\circ\text{--}50^\circ$; $Z \wedge a = 45^\circ\text{--}70^\circ$. *Dispersion:* $r > v$, strong. *Absorption:* $X > Y > Z$. $\alpha = 1.610\text{--}1.640$ $\beta = 1.625\text{--}1.650$ $\gamma = 1.630\text{--}1.655$ $2V(\text{meas.}) = 15^\circ\text{--}80^\circ$

Cell Data: *Space Group:* $C2/m$. $a = 9.799$ $b = 17.833$ $c = 5.273$ $\beta = 104.18^\circ$ $Z = 2$

X-ray Powder Pattern: Synthetic $\text{Na}_3\text{Mg}_4\text{AlSi}_8\text{O}_{22}(\text{OH})_2$ (ICDD 20-386). 3.10 (100), 2.708 (80), 3.40 (70), 3.25 (70), 2.500 (60), 2.965 (50), 2.164 (50)

Chemistry:	(1)		(2)	
	(1)	(2)	(1)	(2)
SiO ₂	58.65	57.10	CaO	1.40
TiO ₂		0.35	Li ₂ O	1.15
Al ₂ O ₃	5.98	6.19	Na ₂ O	9.30
Fe ₂ O ₃	2.37	8.01	K ₂ O	1.10
FeO	1.34	2.69	F	2.69
MnO		0.34	H ₂ O ⁺	2.20
ZnO		0.59	H ₂ O [–]	0.08
MgO	18.56	9.13	–O = F ₂	1.13
			Total	100.90
				100.15

(1) Tawmaw, Myanmar; corresponds to $(\text{Na}_{2.43}\text{Ca}_{0.20}\text{K}_{0.19})_{\Sigma=2.82}(\text{Mg}_{3.73}\text{Al}_{0.86}\text{Fe}_{0.24}^{3+}\text{Fe}_{0.15}^{2+})_{\Sigma=4.98}(\text{Si}_{7.91}\text{Al}_{0.09})_{\Sigma=8.00}\text{O}_{22}(\text{OH})_{1.98}$. (2) Norra Kärr complex, Sweden; corresponds to $(\text{Na}_{2.66}\text{K}_{0.42}\text{Ca}_{0.05})_{\Sigma=3.13}(\text{Mg}_{1.91}\text{Fe}_{0.85}^{3+}\text{Li}_{0.65}\text{Fe}_{0.32}^{2+}\text{Zn}_{0.06}\text{Mn}_{0.04}\text{Ti}_{0.04})_{\Sigma=3.87}\text{Al}_{1.02}\text{Si}_{8.02}\text{O}_{22}[\text{F}_{1.19}(\text{OH})_{0.47}]_{\Sigma=1.66}$.

Polymorphism & Series: Forms a series with ferro-eckermannite.

Mineral Group: Amphibole (alkali) group: $\text{Fe}^{2+}/(\text{Fe}^{2+} + \text{Mg}) < 0.5$; $\text{Fe}^{3+}/(\text{Fe}^{3+} + \text{Al}^{\text{vi}}) < 0.5$; $(\text{Na} + \text{K})_{\text{A}} \geq 0.5$; $\text{Na}_{\text{B}} \geq 1.34$.

Occurrence: In alkalic plutonic igneous rocks; rarely in alkalic volcanics and nepheline-bearing pegmatites.

Association: Nepheline, albite, aegirine, katophorite.

Distribution: From the Norra Kärr complex, near Gränna, Sweden. At Tawmaw, Myitkyina-Mogaung district, Kachin State, northern Myanmar (Burma). In the Noda-Tamagawa mine, Iwate Prefecture, Japan. In the Snowy Range mine, Camp Albion, Boulder Co., Colorado, USA.

Name: To honor Professor Claes Walther Harry von Eckermann (1886–1969), Swedish petrologist, Stockholm, Sweden.

Type Material: The Natural History Museum, London, England, 1949,151.

References: (1) Adamson, O.J. (1942) Eckermannite, a new alkali amphibole. Preliminary note. Geol. Fören. Förhandl. Stockholm, 64, 329–334. (2) (1944) Amer. Mineral., 29, 455 (abs. ref. 1). (3) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 2, chain silicates, 364–374. (4) Phillips, W.R. and D.T. Griffen (1981) Optical mineralogy, 243–245.

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