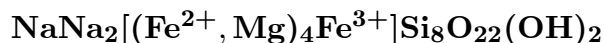


Arfvedsonite



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Crystal Data: Monoclinic. *Point Group:* $2/m$. Commonly as elongated prisms, showing {110}, striated and untruncated, to 0.60 m; may be tabular on {010}. As prismatic aggregates and radiating fibrous clusters. *Twinning:* Simple or lamellar twinning \parallel {100}.

Physical Properties: *Cleavage:* Perfect on {110}, with intersections of 56° and 124° ; parting on {010}. *Fracture:* Uneven. *Tenacity:* Brittle. *Hardness* = 5–6 $D(\text{meas.}) = \sim 3.3\text{--}3.5$ $D(\text{calc.}) = [3.33]$

Optical Properties: Translucent to opaque. *Color:* Black, deep green on thin edges; strongly colored in thin section. *Streak:* Deep bluish gray, gray-green. *Luster:* Vitreous. *Optical Class:* Biaxial (-). *Pleochroism:* Strong, in blue-greens, yellow-browns, or gray-violets. *Orientation:* $Z = b$; $X \wedge c = 5^\circ\text{--}30^\circ$; $Y \wedge a = 20^\circ\text{--}45^\circ$. *Dispersion:* $r > v$, very strong. *Absorption:* $X > Y > Z$. $\alpha = \sim 1.67\text{--}1.700$ $\beta = \sim 1.68\text{--}1.710$ $\gamma = \sim 1.69\text{--}1.715$ $2V(\text{meas.}) = 0^\circ\text{--}90^\circ$

Cell Data: *Space Group:* $C2/m$. $a = 10.007(2)$ $b = 18.077(2)$ $c = 5.332(1)$ $\beta = 104.101(7)^\circ$ $Z = 2$

X-ray Powder Pattern: Nunarsuatsiak, Tunugdliarfik, Greenland. (ICDD 14-633). 3.161 (100), 2.732 (80), 8.51 (70), 3.423 (45), 2.604 (35), 2.185 (35), 2.550 (25)

Chemistry:	(1)	(2)		(1)	(2)
SiO ₂	48.99	51.34	CaO	0.93	1.02
TiO ₂	0.77	1.34	Na ₂ O	6.94	8.68
Al ₂ O ₃	1.66	0.45	K ₂ O	3.67	1.60
Fe ₂ O ₃	7.52	3.70	F	0.21	
FeO	26.56	26.74	H ₂ O	1.64	[1.89]
MnO	0.94	1.78	-O = F ₂	[0.09]	
MgO	0.45	1.77	Total	[100.19]	[100.31]

- (1) Red Wine complex, Labrador, Newfoundland, Canada; by electron microprobe, averaged with wet chemical analysis, original total given as 100.18%; corresponding to $(\text{K}_{0.71}\text{Na}_{0.29})_{\Sigma=1.00}(\text{Na}_{1.84}\text{Ca}_{0.16})_{\Sigma=2.00}(\text{Fe}_{3.60}^{2+}\text{Fe}_{0.92}^{3+}\text{Al}_{0.15}\text{Mn}_{0.13}\text{Mg}_{0.11}\text{Ti}_{0.09})_{\Sigma=5.00}(\text{Si}_{7.83}\text{Al}_{0.17})_{\Sigma=8.00}\text{O}_{22}$
 (2) Kangerdlugssuaq Fjord, Greenland; by electron microprobe, H₂O calculated from stoichiometry.

Polymorphism & Series: Forms a series with magnesio-arfvedsonite.

Mineral Group: Amphibole (alkali) group: $\text{Fe}^{2+}/(\text{Fe}^{2+} + \text{Mg}) \geq 0.5$; $\text{Fe}^{3+}/(\text{Fe}^{3+} + \text{Al}^{\text{vi}}) \geq 0.5$; $(\text{Na} + \text{K})_{\text{A}} \geq 0.5$; $\text{Na}_{\text{B}} \geq 1.34$; $\text{Mn}_{\text{C}} < 2.5$.

Occurrence: Common in alkalic granites and other alkalic plutonic rocks and pegmatites.

Association: Nepheline, albite, aegirine, riebeckite, katophorite, magnesio-katophorite, quartz.

Distribution: Notable occurrences are: in Greenland, in the Ilímaussaq intrusion, from Kangerdlugssuaq Fjord, at Narssârssuk, and in the Ivigtut cryolite deposit. Around the Langesundsfjord, Norway. At Buchans, Newfoundland, and Mont Saint-Hilaire, Quebec, Canada. In the USA, from St. Peters Dome, near Pikes Peak, El Paso Co., Colorado; on Hurricane Mountain, Intervale, Carroll Co., New Hampshire; at Magnet Cove, Hot Spring Co., Arkansas; near Burnsville, Yancey Co., North Carolina. From the Lovozero massif, Kola Peninsula, Russia. At Bitola, Macedonia. On Mbolwe Hill, Mkushi River area, Central Province, Zambia. From Mt. Malosa, Zomba district, Malawi. In Australia, from Mittagong, New South Wales.

Name: To honor the Swedish chemist, Johan A. Arfvedson (1792–1841).

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