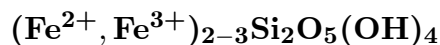


Greenalite



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Crystal Data: Monoclinic. *Point Group:* n.d. Rarely as minute crystals, more commonly as rounded grains, to 1 mm; as porphyroblasts, oolites; cryptocrystalline.

Physical Properties: Hardness = n.d. $D(\text{meas.}) = 2.85\text{--}3.15$ $D(\text{calc.}) = \text{n.d.}$ Moderately magnetic.

Optical Properties: Semitransparent. *Color:* Green, light yellow-green; blue-green in transmitted light.

Optical Class: Isotropic when fine grained. *Pleochroism:* Pale yellow to green. $n = 1.670$

Cell Data: *Space Group:* n.d. $a = 5.54$ $b = 9.55$ $c = 7.44$ $\beta = 104^\circ 20'$ $Z = 2$

X-ray Powder Pattern: Mesabi Range, Minnesota, USA.

2.571 (100), 7.12 (80), 3.559 (80), 1.593 (60), 2.184 (40), 1.553 (40), 2.849 (20)

Chemistry:

	(1)	(2)	(3)
SiO ₂	33.58	34.7	36.5
Al ₂ O ₃		0.90	0.25
Fe ₂ O ₃	11.16		
FeO	45.19	47.3	40.2
MnO		0.15	8.71
MgO		4.98	3.75
H ₂ O	10.07	n.d.	n.d.
Total	[100.00]	88.03	89.41

(1) Mesabi Range, Minnesota, USA; recalculated to 100% after deduction of SiO₂ and other impurities; corresponds to $(\text{Fe}_{2.34}^{2+}\text{Fe}_{0.45}^{3+})_{\Sigma=2.79}\text{Si}_{2.18}\text{O}_5(\text{OH})_{3.28}$. (2) Do.; by electron microprobe. (3) Bluebell mine, Riondel, Canada; by electron microprobe.

Polymorphism & Series: Group A (1M, 2M₁, 3A) and Group C (1A, 2A, 3R) polytypes may be intergrown.

Mineral Group: Kaolinite-serpentine group.

Occurrence: A primary phase in some banded iron formations.

Association: Minnesotaite, stilpnomelane, siderite, chamosite, quartz, pyrite.

Distribution: Some localities for studied material follow. Widespread in the Biwabik Iron Formation, Mesabi Range, St. Louis Co., Minnesota, USA. In Canada, in the Sokoman Iron Formation, Howells River area, Labrador, Newfoundland; in the Gunflint Iron Formation, northeast of Gunflint Lake, Ontario; and in the Bluebell mine, Riondel, British Columbia. In the Matsumo mine, Kochi prefecture, Japan. From the Weld Range, northwest of Cue, Western Australia. In the Salsigne mine, 15 km north of Carcassone, Aude, France. At Glenluce, Wigtownshire, Scotland. From the San Valentin mine, Cartagena district, La Union, Murcia Province, Spain.

Name: In allusion to its green color.

Type Material: National Museum of Natural History, Washington, D.C., USA, 91160, 124953.

References: (1) Dana, E.S. and W.E. Ford (1909) Dana's system of mineralogy, (6th edition), app. II, 47. (2) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 3, sheet silicates, 164–169. (3) Jolliffe, F. (1935) A study of greenalite. *Amer. Mineral.*, 20, 405–425. (4) Gruner, J.W. (1936) The structure and chemical composition of greenalite. *Amer. Mineral.*, 21, 449–455. (5) Bayliss, P. (1981) Unit cell data of serpentine group minerals. *Mineral. Mag.*, 44, 153–156. (6) Guggenheim, S., S.W. Bailey, R.A. Eggleton, and P. Wilkes (1982) Structural aspects of greenalite and related minerals. *Can. Mineral.*, 20, 1–18.

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