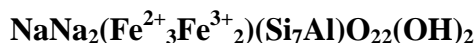


**Ferro-ferri-nybøite**

**Crystal Data:** Monoclinic. *Point Group:* 2/m. Crystals are stubby prismatic, elongated along [001] and displaying {100} and {110}, to 3 cm.

**Physical Properties:** *Cleavage:* Perfect on {110}, (planes intersecting at ~ 56°).  
*Fracture:* Splintery. *Tenacity:* Brittle. *Hardness* = ~ 6 *D(meas.)* = n.d. *D(calc.)* = 3.424

**Optical Properties:** Translucent. *Color:* Jet-black. *Streak:* Grayish green to black.  
*Luster:* Vitreous.  
*Optical Class:* Biaxial. *Pleochroism:* Strong, shades of dark greenish blue to black.

**Cell Data:** *Space Group:* C2/m. *a* = 9.9190(5) *b* = 18.0885(8) *c* = 5.3440(3)  
*β* = 103.813(1)° *Z* = 2

**X-ray Powder Pattern:** Poudrette quarry, Mont Saint-Hilaire, Québec, Canada.  
8.520 (100), 3.162 (55), 2.834 (24), 1.671 (19), 2.732 (10), 2.552 (10), 2.344 (9)

Chemistry:	(1)		(1)
SiO <sub>2</sub>	45.80	MgO	0.23
Al <sub>2</sub> O <sub>3</sub>	3.11	CaO	0.99
TiO <sub>2</sub>	0.50	Na <sub>2</sub> O	8.01
Fe <sub>2</sub> O <sub>3</sub>	11.18	K <sub>2</sub> O	1.30
FeO	23.45	F	0.81
MnO	2.28	H <sub>2</sub> O	[1.47]
ZnO	0.12	<u>-O = F<sub>2</sub></u>	<u>0.34</u>
		Total	98.91

(1) Poudrette quarry, Mont Saint-Hilaire, Québec, Canada; average of 10 electron microprobe analyses supplemented by Mossbauer spectroscopy, H<sub>2</sub>O calculated from stoichiometry; corresponding to (Na<sub>0.66</sub>K<sub>0.27</sub>)<sub>Σ=0.93</sub>(Na<sub>1.83</sub>Ca<sub>0.17</sub>)<sub>Σ=2.00</sub>(Mg<sub>0.06</sub>Fe<sup>2+</sup><sub>3.15</sub>Mn<sub>0.31</sub>Zn<sub>0.01</sub>Fe<sup>3+</sup><sub>1.38</sub>Ti<sub>0.06</sub>Al<sub>0.03</sub>)<sub>Σ=5.00</sub>(Si<sub>7.35</sub>Al<sub>0.65</sub>)<sub>Σ=8.00</sub>O<sub>22</sub>(OH<sub>1.58</sub>F<sub>0.42</sub>)<sub>Σ=2.00</sub>.

**Mineral Group:** Amphibole supergroup, sodium amphibole subgroup.

**Occurrence:** The earliest mineral in an igneous microbreccia in an alkaline syenite-gabbro complex.

**Association:** An astrophyllite-group mineral, a eudialyte-group mineral, albite, nepheline.

**Distribution:** From Poudrette quarry, Mont Saint-Hilaire, La Vallée-du-Richelieu RCM, Montérégie (formerly Rouville County), Québec, Canada.

**Name:** Signifies an amphibole in the compositional range of nybøite with a dominance of Fe<sup>2+</sup> and Fe<sup>3+</sup> substituting for Mg and Al respectively.

**Type Material:** Royal Ontario Museum, Toronto, Ontario, Canada (M55980).

**References:** (1) Lussier, A.J., F.C. Hawthorne, Y.A. Abdu, N.A. Ball, K.T. Tait, M.E. Back, A.H. Steede, R. Taylor, and A.M. McDonald (2014) Ferro-ferri-nybøite, NaNa<sub>2</sub>(Fe<sup>2+</sup><sub>3</sub>Fe<sup>3+</sup><sub>2</sub>)(Si<sub>7</sub>Al)O<sub>22</sub>(OH)<sub>2</sub>, a new clin amphibole from Mont Saint-Hilaire, Québec, Canada: description and crystal structure. *Can. Mineral.*, 52(6), 1019-1026. (2) (2016) *Amer. Mineral.*, 101, 1492 (abs. ref. 1). (3) Hawthorne, F.C., R. Oberti, G.E. Harlow, W.V. Maresch, R.F. Martin, J.C. Schumacher, and M.D. Welch (2012) Nomenclature of the amphibole supergroup. *Amer. Mineral.*, 97, 2031-2048.