

Crystal Data: Triclinic. *Point Group:* $\bar{1}$ (probable) or 1. As rosettes of crystals, to 0.6 mm, tabular on {010}, showing forms {101}, {10 $\bar{1}$ }, and less commonly {100} and {001}, rectangular or square in outline; also finely granular and as porcelainous coatings.

Physical Properties: *Cleavage:* {010}, perfect; {100}, fair. *Tenacity:* Flexible. Hardness = 2.5–3 D(meas.) = 2.48(1) D(calc.) = 2.482

Optical Properties: Transparent to opaque. *Color:* Colorless, white, creamy, bluish white. *Streak:* White. *Luster:* Vitreous to pearly if colorless; otherwise dull. *Optical Class:* Biaxial (+). *Orientation:* X (90°, 41°); Y (240°, 53°); Z (343°, 74°) [with *c* (0°, 0°) and *b** (0°, 90°) using (ϕ, ρ)]. *Dispersion:* $r > v$, moderately strong. $\alpha = 1.545(1)$ $\beta = 1.553(1)$ $\gamma = 1.566(1)$ 2V(meas.) = 77° 2V(calc.) = 76.8°

Cell Data: *Space Group:* $P\bar{1}$ (probable), or $P1$. $a = 5.002(1)$ $b = 5.175(1)$ $c = 4.980(2)$ $\alpha = 97.50(1)^\circ$ $\beta = 118.60(1)^\circ$ $\gamma = 104.74(1)^\circ$ $Z = 2$

X-ray Powder Pattern: Mont Saint-Hilaire, Canada; minor preferred orientation. 4.794 (100), 2.360 (40), 1.972 (30), 1.857 (30), 1.842 (30), 4.296 (20), 4.182 (20)

Chemistry:	(1)	(2)	(3)	(4)
SiO ₂		0.03	3.22	
Al ₂ O ₃	65.2	63.7	59.6	65.36
FeO		0.14	0.08	
MgO			0.96	
CaO	0.48		0.23	
Na ₂ O		0.09	0.35	
H ₂ O	35.76	35.76	[35.56]	34.64
Total	101.44	99.72	[100.00]	100.00

(1) Mont Saint-Hilaire, Canada; H₂O by TGA, (OH)¹⁻ confirmed by IR. (2) Do.; by electron microprobe, H₂O from (1). (3) Francon quarry, Canada; by electron microprobe, average of four analyses, H₂O by difference. (4) Al(OH)₃.

Polymorphism & Series: Polymorphous with bayerite, gibbsite, and nordstrandite.

Occurrence: A late-stage hydrothermal mineral lining vugs in veins in nepheline syenite associated with an intrusive alkalic gabbro-syenite complex (Mont Saint-Hilaire, Canada); in vugs within silicocarbonatite sills intruding limestones (Francon quarry, Canada); in miarolitic cavities in a nepheline syenite sill (near Saint-Amable, Canada).

Association: Calcite, albite, pyrite (Mont Saint-Hilaire, Canada); weloganite, calcite, quartz, albite, pyrite, cryolite, strontianite, dresserite, dawsonite, fluorite, analcime (Francon quarry, Canada); microcline, eudialyte, yofortierite, astrophyllite, serandite, aegirine (near Saint-Amable, Canada).

Distribution: Found at Mont Saint-Hilaire, in the Francon quarry, Montreal Island, Montreal, and near Saint-Amable, Quebec, Canada.

Name: Honors Canadian physician E.J. Doyle, of Ottawa, Canada, who found the mineral at Mont Saint-Hilaire, Canada.

Type Material: Canadian Museum of Nature, Ottawa, 48932; Canadian Geological Survey, Ottawa; Royal Ontario Museum, Toronto, Canada, M41025; National Museum of Natural History, Washington, D.C., USA, 162728.

References: (1) Chao, G.Y., J. Baker, A.P. Sabina, and A.C. Roberts (1985) Doyleite, a new polymorph of Al(OH)₃, and its relationship to bayerite, gibbsite and nordstrandite. *Can. Mineral.*, 23, 21–28. (2) (1986) *Amer. Mineral.*, 71, 845 (abs. ref. 1).

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