Gaidonnayite

\( \text{Na}_2\text{ZrSi}_3\text{O}_9 \cdot 2\text{H}_2\text{O} \)

**Crystal Data:** Orthorhombic. *Point Group:* \( \text{mm}^2 \). Crystals well-formed, slightly bladed, flattened on \( \{010\} \), and elongated and heavily striated along \( \{100\} \), to 6 mm. *Twinning:* Common about \( \{012\} \) with irregular composition plane.

**Physical Properties:** *Fracture:* Conchoidal. *Tenacity:* Brittle. *Hardness:* \( \sim 5 \)

\( \text{D(meas.)} = 2.67(1) \quad \text{D(calc.)} = 2.70 \)

Commonly fluoresces bright green fluorescence under SW and LW UV.


\( \alpha = 1.573-1.575 \quad \beta = 1.590-1.592 \quad \gamma = 1.599-1.605 \)

\( 2\text{V(meas.)} = 53^\circ-59^\circ \quad 2\text{V(calc.)} = 55^\circ-62^\circ \)

**Cell Data:** *Space Group:* \( P2_1nb \). *Cell Parameters:*

\[ a = 11.740(3) \quad b = 12.820(3) \quad c = 6.691(1) \quad Z = 4 \]

**X-ray Powder Pattern:** Mont Saint-Hilaire, Canada; very similar to georgechaoite.

\[ 3.124 \ (100), \ 5.93 \ (80), \ 5.84 \ (80), \ 3.094 \ (80), \ 5.63 \ (50), \ 2.931 \ (40), \ 1.637 \ (40) \]

**Chemistry:**

\[
\begin{array}{ccc}
\text{SiO}_2 & 42.51 & 42.5 \\
\text{TiO}_2 & 0.42 & 0.5 \\
\text{ZrO}_2 & 30.21 & 27.7 \\
\text{Nb}_2\text{O}_5 & 3.00 & 1.4 \\
\text{CaO} & 2.20 & 6.4 \\
\text{Na}_2\text{O} & 13.11 & 8.7 \\
\text{K}_2\text{O} & 9.25 & [12.2] \\
\text{H}_2\text{O} & & \\
\text{Total} & 100.70 & [100.0]
\end{array}
\]

(1) Mont Saint-Hilaire, Canada, by electron microprobe, \( \text{H}_2\text{O} \) by TGA; corresponding to \( (\text{Na}_{1.72}\text{K}_{0.19})_{\Sigma=1.91}\text{Zr}_{1.00}\text{Nb}_{0.00}\text{Ti}_{0.02}\text{Si}_{2.88}\text{O}_9 \cdot 2\text{H}_2\text{O} \).

(2) Narssârsuq, Greenland; by electron microprobe, \( \text{H}_2\text{O} \) by difference; corresponding to \( (\text{Na}_{1.19}\text{K}_{0.58}\text{Ca}_{0.05})_{\Sigma=1.82}\text{Zr}_{0.95}\text{Nb}_{0.04}\text{Ti}_{0.03}\text{Si}_{3.00}\text{O}_9 \cdot n\text{H}_2\text{O} \).

**Polymorphism & Series:** Dimorphous with catapleiite.

**Occurrence:** In miarolitic cavities in nepheline syenite and altered pegmatite dikes in an intrusive alkalic gabbro-syenite complex (Mont Saint-Hilaire, Canada); in augite syenite (Narssârsuq, Greenland).

**Association:** Siderite, analcime, hilairite, aegirine, calcite, albite, catapleiite, zircon, pyrochlore, ancylite, burbankite (Mont Saint-Hilaire, Canada); vlasovite, gittinsite, apophyllite (Kipawa River, Canada); natrolite, aegirine, albite, siderite (Narssârsuq, Greenland).

**Distribution:** In Canada, from Mont Saint-Hilaire, near Saint-Amable, and in the Sheffield Lake complex, Kipawa River, Villedieu Township, Quebec. From Granite Mountain, near Little Rock, Pulaski Co., Arkansas, USA. In Greenland, at Narssârsuq. From the Lovozero and Khibiny massifs, Kola Peninsula, Russia. At Poços de Caldas, Minas Gerais, Brazil.

**Name:** For Professor Gabrielle Donnay (1920–1987), mineralogist of McGill University, Montreal, Quebec, Canada.

**Type Material:** Canadian Museum of Nature, Ottawa, T73/2-1, T73/2-2; Royal Ontario Museum, Toronto, Canada, 34803.


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