Montroyalite

\[ \text{Sr}_4\text{Al}_8(\text{CO}_3)_3(\text{OH}, \text{F})_{26} \cdot 10-11\text{H}_2\text{O} \]

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**Crystal Data:** Triclinic (probable). **Point Group:** n.d. As flattened or elongated polycrystalline hemispheres, composed of a waxy interior and radial fibers forming a rough exterior, to 1 mm; as aggregates of hemispheres. **Twinning:** Complex, polysynthetic, with multiple crystallites.

**Physical Properties:** Fracture: Uneven to splintery. Tenacity: Brittle. Hardness = 3.5

D(meas.) = 2.677(3) D(calc.) = n.d. Fluoresces white under SW and LW UV.

**Optical Properties:** Translucent. Color: White, pale blue or gray from inclusions. 


**Optical Class:** Biaxial (−). **Orientation:** Y ≃ elongation; X and Z at about 45° to plane of flattening of laths. \( \alpha = 1.515(5) \quad \beta = 1.530(5) \quad \gamma = 1.545(5) \quad 2V(\text{meas.}) = 80(10)^\circ \quad 2V(\text{calc.}) = 89^\circ \)

**Cell Data:** Space Group: n.d. \( a = 7.14 \quad b = 6.55 \quad c = \text{n.d.} \quad \alpha = \sim 77.5^\circ \quad \beta = \text{n.d.} \quad \gamma = \text{n.d.} \quad Z = \text{n.d.} \)

**X-ray Powder Pattern:** n.d.

6.57 (100), 3.283 (55), 4.00 (50), 3.190 (50), 2.365 (45b), 2.862 (40), 2.551 (40b)

**Chemistry:**

\[
\begin{array}{ccc}
\text{CO}_2 & 9.2 \\
\text{Al}_2\text{O}_3 & 28.8 \\
\text{CaO} & 1.1 \\
\text{SrO} & 27.7 \\
\text{F} & 11.5 \\
\text{H}_2\text{O} & 24.6 \\
\text{O} = \text{F}_2 & 4.8 \\
\text{Total} & 98.1
\end{array}
\]

(1) Francon quarry, Canada; by electron microprobe, CO\(_2\) and H\(_2\)O by TGA-EGA, (CO\(_3\))^2−, (OH)^−, and H\(_2\)O confirmed by IR; corresponds to (Sr\(_{3.78}\)Ca\(_{0.28}\))Σ=4.06\text{Al}_8\text{CO}_3\text{C}(OH)_{2.96}

\[(\text{OH})_{17.6\pm0.57}\Sigma=26.20\cdot10.52\text{H}_2\text{O}.\]

**Occurrence:** In cavities in a silicocarbonate sill.

**Association:** Albite, strontiodresserite, calcite, quartz, dawsonite, ankerite, fluorite, barite, strontianite, smithite, marcasite, pyrite, halloysite, doyleite.

**Distribution:** From the Francon quarry, Montreal Island, Montreal, Quebec, Canada.

**Name:** For the Monteregian Hill, Mont Royal, prominent landmark in Montreal, Canada, from which the city’s name was derived.

**Type Material:** Canadian Geological Survey, Ottawa, Canada, 64261–64265.