Perraultite  \( \text{Na}_2\text{KBaMn}^{2+}_8(\text{Ti}, \text{Nb})_4\text{Si}_8\text{O}_{32}(\text{OH}, \text{F}, \text{H}_2\text{O})_7 \)

Crystal Data:  
Monoclinic.  
Point Group: 2/m, m, or 2.  
Prismatic crystals, flattened on {010} and elongated along [100], with {001}, {010}, {100}, and {101}, to 1 mm.  
Twinning: Simple contact twins, with {001} as twin and composition plane, common.

Physical Properties:  
Cleavage: Very good on {001}.  
Fracture: Uneven to irregular.  
Tenacity: Very brittle.  
Hardness = 4 D(meas.) = 3.71(5) D(calc.) = 3.808

Optical Properties:  
Opaque to translucent, transparent in small fragments.  
Color: Orange-brown.  
Streak: Pale brown.  
Luster: Vitreous on fresh surfaces to slightly waxy on exposed faces.

Optical Class: Biaxial (-).  
Pleochroism: X = Y = light yellow; Z = dark brown.  
Orientation: r < v, strong.  
\( \alpha = 1.785(2) \)  
\( \beta = 1.81(1) \)  
\( \gamma = 1.82(1) \)  
2V(meas.) = 66(1)°  
2V(calc.) = 64°

Cell Data:  
Space Group: C2/m, Cm, or C2.  
\( a = 10.820(2) \)  
\( b = 13.843(4) \)  
\( c = 20.93(1) \)  
\( \beta = 95.09(2)° \)  
\( Z = 4 \)

X-ray Powder Pattern:  
Mont Saint-Hilaire, Canada.  
3.474 (100), 10.43 (42), 2.606 (40), 3.186 (15), 2.804 (15), 2.867 (13), 3.573 (11)

Chemistry:  

<table>
<thead>
<tr>
<th>Element</th>
<th>Formula</th>
<th>(1)</th>
<th>(1)</th>
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<tbody>
<tr>
<td>SiO₂</td>
<td>27.32</td>
<td>MgO</td>
<td>0.06</td>
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<tr>
<td>TiO₂</td>
<td>9.44</td>
<td>BaO</td>
<td>8.88</td>
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<tr>
<td>ZrO₂</td>
<td>0.12</td>
<td>Na₂O</td>
<td>3.52</td>
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<td>Al₂O₃</td>
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<td>K₂O</td>
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<td>Nb₂O₅</td>
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<td>F</td>
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<td>FeO</td>
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<td>H₂O</td>
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<td>MnO</td>
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<td>–O = F₂</td>
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<td>Total</td>
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</tbody>
</table>

(1) Mont Saint-Hilaire, Canada; by electron microprobe, average of three analyses, H₂O by TGA; corresponds to Na₂0.22K₀.₀₂Ba₁.₀₂(Mn₇.₇₃Fe₀.₀²Mg₀.₀₃)Σ=₇.₀²(Ti₁₀₂₈Nb₁.₇₂Zr₀.₀₂)Σ=₃.₈₇(Si₈.₀₁Al₀.₀₁)Σ=₈.₀₂O₃₂(athomOH)₅.₆₂(F)₀.₇₈(H₂O)₀.₆₀Σ=₇.₀ο.

Occurrence:  
In pegmatite dikes in nepheline syenite in an intrusive alkalic gabbro-syenite complex.

Association:  
Kupletskite, catapleiite, microcline, albite, aegirine, rhodochrosite, natrolite, tetranatrolite, lorenzenite, polythionite, ancolite, fluorite, calcite, pyrochlore.

Distribution:  
From Mont Saint-Hilaire, Quebec, Canada.

Name:  
To honor Professor Guy Perrault, École Polytechnique, Montreal, Canada, for his work on the mineralogy of Mont Saint-Hilaire.

Type Material:  
Canadian Museum of Nature, Ottawa, 50037; Royal Ontario Museum, Toronto, Canada, M41005.

References:  

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