Rivadavite

\( \text{Na}_6\text{Mg}[\text{B}_6\text{O}_7(\text{OH})_6]_4 \cdot 10\text{H}_2\text{O} \)

**Crystal Data:** Monoclinic. *Point Group:* 2/m. Crystals, elongated along [010], and flattened on \{100\}, showing large \{100\} modified by \{\overline{1}02\}, \{012\}, \{\overline{1}12\}, to 3 mm, in subparallel massive aggregates.

**Physical Properties:** *Cleavage:* Perfect on \{100\}, \{\overline{1}02\}; poor on \{010\}. *Fracture:* Splintery. *Tenacity:* Brittle. Hardness = 3.5 \( \text{D(meas.)} = 1.905(2) \) \( \text{D(calc.)} = 1.91 \) Soluble in \( \text{H}_2\text{O} \).

**Optical Properties:** Transparent. *Color:* Colorless, white *Luster:* Vitreous, silky in aggregates. *Optical Class:* Biaxial (+). *Orientation:* \( Y = b; Z \wedge c = -32^\circ \). *Dispersion:* \( r > v \). \( \alpha = 1.470(1) \) \( \beta = 1.481(1) \) \( \gamma = 1.497(1) \) \( 2V(\text{meas.}) = 80^\circ \)

**Cell Data:** *Space Group:* \( P2_1/m \). \( a = 15.870 \) \( b = 8.010 \) \( c = 22.256 \) \( \beta = 116^\circ 26' \) \( Z = 1 \)

**X-ray Powder Pattern:** Tincalayu deposit, Argentina.

\( 14.2 \ (100), \ 7.59 \ (100), \ 2.950 \ (65), \ 3.246 \ (64), \ 6.23 \ (51), \ 4.740 \ (51), \ 5.340 \ (49) \)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
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<tbody>
<tr>
<td>( \text{B}_2\text{O}_3 )</td>
<td>58.2</td>
<td>57.30</td>
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<tr>
<td>( \text{FeO} )</td>
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<tr>
<td>( \text{MgO} )</td>
<td>2.70</td>
<td>2.76</td>
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<tr>
<td>( \text{Na}_2\text{O} )</td>
<td>12.7</td>
<td>12.76</td>
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<tr>
<td>( \text{K}_2\text{O} )</td>
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<tr>
<td>( \text{H}_2\text{O}^+ )</td>
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<tr>
<td>( \text{H}_2\text{O}^- )</td>
<td>1.4</td>
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<tr>
<td>( \text{H}_2\text{O} )</td>
<td>27.18</td>
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</tbody>
</table>

Total 100.38 100.00

(1) Tincalayu deposit, Argentina; corresponds to \( \text{Na}_{5.96}\text{Mg}_{0.94}[\text{B}_6\text{O}_7(\text{OH})_6]_4 \cdot 10\text{H}_2\text{O} \).

(2) \( \text{Na}_6\text{Mg}[\text{B}_6\text{O}_7(\text{OH})_6]_4 \cdot 10\text{H}_2\text{O} \).

**Occurrence:** In sedimentary borate deposits; deposited from borate-rich hot springs.

**Association:** Borax, tincalconite (Tincalayu deposit, Argentina).

**Distribution:** From the Tincalayu borax deposit, Salar del Hombre Muerto, Salta Province, Argentina. In the USA, from the Eagle Borax Spring, Furnace Creek district, Death Valley, Inyo Co., California. At the Tüllüovası deposit, Bigadiç borate district, Balıkesir Province, Turkey.

**Name:** In honor of Bernardino Rivadavia (1780–1845), first President of the Argentine Republic.

**Type Material:** Harvard University, Cambridge, Massachusetts, 109055; National Museum of Natural History, Washington, D.C., USA, 137290, 137295.

**References:**

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