Otwayite  \( \text{Ni}_2(\text{CO}_3)(\text{OH})_2\cdot\text{H}_2\text{O} \)

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**Crystal Data:** Orthorhombic (?).  **Point Group:** n.d. Fiber bundles, to several hundred \( \mu \text{m} \), in divergent interlocking sprays perpendicular to veinlet walls; as spherules, claylike coatings.

**Physical Properties:** Hardness = n.d.  \( \text{VHN} = 130–360 \) (5 g load).  \( \text{D(meas.)} = 3.41 \)

\( \text{D(calc.)} = 3.346 \)

**Optical Properties:** Opaque to translucent.  **Color:** Bright green; pale green in transmitted light.  **Luster:** Silky to waxy.  **Optical Class:** Biaxial.  **Pleochroism:** Weak; deepest color \( \perp \) fiber axis.  **Orientation:** Parallel extinction, length-fast.  \( \alpha = 1.65 \quad \beta = \text{n.d.} \quad \gamma = 1.72 \quad 2\text{V(meas.)} = \text{n.d.} \)

**Cell Data:**  **Space Group:** n.d.  \( a = 10.18 \quad b = 27.4 \quad c = 3.22 \quad Z = 8 \)

**X-ray Powder Pattern:** Otway deposit, Western Australia.  6.84 (10), 5.67 (8), 2.737 (6), 3.022 (5), 2.529 (5), 2.24 (5), 2.370 (4)

**Chemistry:**

<table>
<thead>
<tr>
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<th>(1)</th>
<th>(2)</th>
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</thead>
<tbody>
<tr>
<td>( \text{CO}_2 )</td>
<td>19.57</td>
<td>19.18</td>
</tr>
<tr>
<td>( \text{NiO} )</td>
<td>62.87</td>
<td>65.11</td>
</tr>
<tr>
<td>( \text{MgO} )</td>
<td>1.14</td>
<td></td>
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<tr>
<td>( \text{H}_2\text{O} )</td>
<td>16.42</td>
<td>15.71</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.00</td>
<td>100.00</td>
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</table>

(1) Otway deposit, Western Australia; by AA, colorimetry, and direct determination of C and H, recalculated to 100\% from an original total of 99.01\% after deduction of SiO\(_2\) 0.28\% as pecoraite; then corresponding to \((\text{Ni}_{1.99}\text{Mg}_{0.06})_{\Sigma=1.06}(\text{CO}_3)_{0.01}(\text{OH})_{1.92} \cdot 1.10\text{H}_2\text{O}\).  (2) \( \text{Ni}_2(\text{CO}_3)(\text{OH})_2\cdot\text{H}_2\text{O} \).  (3) Lord Brassey mine, Tasmania, Australia; average of 14 analyses, \( (\text{CO}_3)^{2-}, (\text{SO}_4)^{2-}, (\text{OH})^{1-} \), and \( \text{H}_2\text{O} \) confirmed by IR; stated to correspond to \( \text{Ni}_2[(\text{CO}_3/0.84)(\text{SO}_4/0.16)]_{\Sigma=1.00}(\text{OH})_2 \cdot 2\text{H}_2\text{O} \).

**Occurrence:** In veinlets in serpentinite (Otway prospect, Western Australia; Lord Brassey mine, Tasmania, Australia).

**Association:** Magnesite, pecoraite, gisementite, paraotwayite, millerite, polydymite, nickelooan chrysotile, apatite (Otway deposit, Western Australia); theophrastite, hellyerite, zaratite, magnetite (Lord Brassey mine, Tasmania, Australia).

**Distribution:** In Australia, from the Otway nickel deposit, near Spinnaway, Nullagine district, and in the 132 North nickel mine, 4 km southwest of Widgiemooltha, Western Australia; at the Lord Brassey mine, near Heazlewood, Tasmania.

**Name:** To honor Charles Albert Otway (1922– ), prospector of Gosnells, Western Australia, owner of the Otway prospect.

**Type Material:** Western Australian Museum, Perth, Australia, M.60.1991; National Museum of Natural History, Washington, D.C., USA, 142804.


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