Hoganite \( \text{Cu(C}_2\text{H}_3\text{O}_2)_2\cdot\text{H}_2\text{O} \)  

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**Crystal Data:** Monoclinic.  
Point Group: 2/m.  
Isolated crystals are short prismatic, thick tabular, showing \{110\}, \{10\overline{1}\}, \{01\overline{1}\}, \{2\overline{1}\overline{1}\}, \{1\overline{1}\overline{2}\}, to 0.6 mm.

**Physical Properties:**  
Cleavage: On \{001\}, perfect; on \{110\}, distinct (synthetic).  
Fracture: Conchoidal.  
Tenacity: Brittle.  
Hardness = 1.5  
\( D(\text{meas.}) = \text{n.d.} \)  
\( D(\text{calc.}) = 1.910 \)

**Optical Properties:**  
Transparent.  
Color: Dark bluish green.  
Streak: Pale blue.  
Luster: Vitreous.

**Optical Class:** Biaxial (+) (synthetic).  
*Pleochroism:* Strong; X = blue; Y = pale blue; Z = pale bluish green.  
Dispersion: \( r < v \), medium.  
Absorption: \( X > Y > Z \).  
\( \alpha = 1.533(2) \)  
\( \beta = 1.541(3) \)  
\( \gamma = 1.554(2) \)  
\( 2V(\text{meas.}) = 85(5)^\circ \)  
\( 2V(\text{calc.}) = 76.8^\circ \)

**Cell Data:**  
Space Group: \( \text{C}2/c \).  
\( a = 13.162(3) \)  
\( b = 8.555(2) \)  
\( c = 13.850(3) \)  
\( \beta = 117.08(3)^\circ \)  
\( Z = 8 \)

**X-ray Powder Pattern:** Potosi pit, Australia.

6.921 (100), 3.532 (28), 6.176 (14), 3.592 (11), 5.382 (10), 2.278 (10), 5.872 (9)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cu</td>
<td>31.6</td>
<td>31.83</td>
</tr>
<tr>
<td>Fe</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>23.85</td>
<td>24.06</td>
</tr>
<tr>
<td>H</td>
<td>3.95</td>
<td>4.04</td>
</tr>
<tr>
<td>O</td>
<td>[40.2]</td>
<td>40.07</td>
</tr>
<tr>
<td>Total</td>
<td>[100.0]</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Potosi pit, Australia; by AA, C and H by CHN analyzer, average of two analyses, O by difference; corresponds to \( \text{Cu}_{1.00}\text{Fe}_{0.01}\text{C}_{4.00}\text{H}_{7.89}\text{O}_{5.07} \); equivalence to the synthetic compound was established by crystal-structure analysis.  
(2) \( \text{Cu(C}_2\text{H}_3\text{O}_2)_2\cdot\text{H}_2\text{O} \).

**Occurrence:** Formed in ferruginous gossan by reaction of oxidized zone metallic minerals with decaying vegetable matter provided by leaf litter and possibly mine timbers.

**Association:** Paceite, linarite, malachite, azurite, cuprian smithsonite, cerussite, goethite, hematite, quartz.

**Distribution:** From the Potosi Ag–Pb–Zn pit, two km northeast of Broken Hill, New South Wales, Australia.

**Name:** To honor Graham P. Hogan (1957– ), Broken Hill, Australia, miner and collector of Broken Hill minerals, who found the first specimens.

**Type Material:** Broken Hill Geocentre, Broken Hill; Australian Museum, Sydney; Museum of Victoria, Melbourne, Australia, M47465.

**References:**  

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