Hydropascoite \( \text{Ca}_3(\text{V}_{10}\text{O}_{28}) \cdot 24\text{H}_2\text{O} \)

**Crystal Data:** Triclinic.  \textit{Point Group:} \( \bar{1} \).  Crystals display \{001\}, \{010\}, \{011\}, \{10\overline{1}\}, \{\overline{1}1\overline{0}\} and \{101\}.  Typically, as blades, flattened on \{001\} and elongated along \[100\], to 2 mm.

**Physical Properties:** \textit{Cleavage:} Perfect on \{001\}.  \textit{Tenacity:} Brittle.  \textit{Fracture:} Irregular.  Hardness = 1.5  \( \text{D(meas.)} = 2.38(2) \)  \( \text{D(calc.)} = 2.324 \)  Slowly soluble in water.

**Optical Properties:** Transparent.  \textit{Color:} Dark yellow-green.  \textit{Streak:} Pistachio-green.  \textit{Luster:} Vitreous.  \textit{Optical Class:} Biaxial (-).  \( \alpha = 1.730(5) \)  \( \beta = 1.780(5) \)  \( \gamma = 1.790(5) \)  \( 2\text{V(meas.)} = 54.1(6)^\circ \)  \( 2\text{V(calc.)} = 47.1^\circ \)  \textit{Pleochroism:} \( X = \) bluish green, \( Y = \) orange, \( Z = \) yellowish green.  \textit{Absorption:} \( X > Z > Y \).  \textit{Orientation:} \( X^a \approx 10^\circ, Z^c * \approx 20^\circ \).  Anomalous extinction colors.  \textit{Dispersion:} Extreme.

**Cell Data:** \textit{Space Group:} \( \text{P}\overline{1} \).  \( a = 10.0870(19) \)  \( b = 11.0708(2) \)  \( c = 21.8112(15) \)  \( \alpha = 94.112(7)^\circ \)  \( \beta = 96.053(7)^\circ \)  \( \gamma = 116.398(8)^\circ \)  \( Z = 2 \)

**X-ray Powder Pattern:** Packrat mine, near Gateway, Mesa County, Colorado, USA.  8.92 (100), 10.70 (31), 9.77 (28), 7.41 (22), 7.75 (20), 6.91 (20), 2.988 (14)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{Na}_2\text{O} )</td>
<td>0.62</td>
<td></td>
</tr>
<tr>
<td>( \text{CaO} )</td>
<td>10.02</td>
<td>11.14</td>
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<tr>
<td>( \text{V}_2\text{O}_5 )</td>
<td>60.44</td>
<td>60.23</td>
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<tr>
<td>( \text{H}_2\text{O} )</td>
<td>[28.92]</td>
<td>28.63</td>
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<tr>
<td>\text{Total}</td>
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</tbody>
</table>

(1) Packrat mine, near Gateway, Mesa County, Colorado, USA; normalized average of 26 electron microprobe analyses, \( \text{H}_2\text{O} \) calculated from structure analysis; corresponds to \( (\text{Ca}_{2.69}\text{Na}_{0.30})\Sigma_{2} \cdot 17\text{H}_2\text{O} \).  \( \text{V}^5+10\text{O}_{28} \cdot 24\text{H}_2\text{O} \).  (2) \( \text{Ca}_3(\text{V}_{10}\text{O}_{28}) \cdot 24\text{H}_2\text{O} \).

**Occurrence:** A secondary mineral in an oxidized roll-front uranium and vanadium deposit in sandstone.

**Association:** Asphaltum, montroseite, curvusite, pascoite, rossite/metakarossite, sherwoodite.

**Distribution:** Found at the Packrat mine, near Gateway, Mesa County, Colorado, USA.

**Name:** Alludes to the compositional and structural similarity of the mineral to \textit{pascoite}, \( \text{Ca}_3(\text{V}_{10}\text{O}_{28}) \cdot 17\text{H}_2\text{O} \), and with a prefix for the fact that it has 41% more \( \text{H}_2\text{O} \) groups.

**Type Material:** Natural History Museum of Los Angeles County, Los Angeles, California, USA (66267).