Pseudomarkeyite  

\[
\text{Ca}_8(\text{UO}_2)_4(\text{CO}_3)_{12}(\text{H}_2\text{O})_{18}\cdot 3\text{H}_2\text{O}
\]

**Crystal Data:** Monoclinic. *Point Group:* 2/m. As tapering euhedral blades and tablets to ~1 mm flattened on \{10\} and elongated along [010], that display \{10\}, \{10\}, \{01\} and \{510\}. *Twining:* Ubiquitous, by 180° rotation about [101].

**Physical Properties:** *Cleavage:* Perfect on \{10\}, good on \{01\}, fair on \{01\}. *Tenacity:* Brittle. *Fracture:* Stepped. *Hardness:* ~1 D(meas.) = 2.88(2) D(calc.) = 2.877 Bright bluish white fluorescence (405 nm laser). Dissolves immediately with effervescence in dilute HCl.

**Optical Properties:** *Transparent.* *Color:* Pale green-yellow. *Streak:* White. *Luster:* Vitreous, pearly. *Optical Class:* Biaxial (-). *Orientation:* \(Y = b, Z \wedge a = 30^\circ\) in obtuse \(X \approx \perp \{10\}\). 

\[
\begin{array}{lcc}
\alpha & = 1.549(2) & \beta = 1.553(2) & \gamma = 1.557(2) \\
2V(meas.) & = 88(2)^\circ & 2V(calc.) & = 89.8^\circ \\
\end{array}
\]

Non-pleochroic.

**Cell Data:** *Space Group:* P2_1/m. \(a = 17.531(3) \quad b = 18.555(3) \quad c = 9.130(3) \quad \beta = 103.95(3)^\circ \quad Z = 2\).

**X-Ray Diffraction Pattern:** Markey mine, Red Canyon, White Canyon District, San Juan Co., Utah, USA.

\[
\begin{array}{c}
6.28 (100), 8.73 (86), 4.65 (80), 5.70 (72), 2.811 (59), 4.293 (55), 4.082 (47)
\end{array}
\]

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CaO</td>
<td>17.81</td>
<td>17.95</td>
</tr>
<tr>
<td>UO_3</td>
<td>45.73</td>
<td>45.78</td>
</tr>
<tr>
<td>H_2O</td>
<td>[15.16]</td>
<td>15.14</td>
</tr>
<tr>
<td>Total</td>
<td>99.81</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Markey mine, Red Canyon, San Juan Co., Utah, USA; average electron microprobe and Raman spectroscopic analyses, H_2O and CO_2 calculated from stoichiometry; corresponds to Ca_{7.95}(UO_2)_4(CO_3)_{12}(H_2O)_{18}\cdot 3H_2O (+ 0.10 H). (2) Ca_{8}(UO_2)_4(CO_3)_{12}\cdot 21H_2O.

**Occurrence:** Secondary phase on asphaltum in sandstones by oxidation of primary uraninite, montroseite and coffinite in a humid underground environment.

**Association:** Calcite, gypsum, markeyite.

**Distribution:** From the Markey mine, Red Canyon, White Canyon District, San Juan Co., Utah, USA.

**Name:** The prefix indicates the similarity in appearance to markeyite, named for the Markey mine.

**Type Material:** Natural History Museum of Los Angeles County, Los Angeles, California, USA (67091).