Swartzite  
\[ \text{CaMg(UO}_2\text{)(CO}_3\text{)}_3\cdot12\text{H}_2\text{O} \]

**Crystal Data:**  
Monoclinic.  
**Point Group:** 2/m.  
As crystals, to about 0.3 mm, prismatic along [001], in efflorescent crusts.

**Physical Properties:**  
Hardness = n.d.  
\( D(\text{meas.}) = 2.3 \)  
\( D(\text{calc.}) = 2.32 \)  
Radioactive; soluble in \( \text{H}_2\text{O} \); fluoresces bright yellow-green under SW UV.

**Optical Properties:**  
Transparent.  
**Color:** Green; turns dull pale yellow on dehydration.  
**Optical Class:** Biaxial (−).  
**Pleochroism:** \( X = \) colorless; \( Y = Z = \) yellow.  
\( \alpha = 1.465 \)  
\( \beta = 1.51 \)  
\( \gamma = 1.540 \)  
\( 2V(\text{meas.}) = \) n.d.  
\( 2V(\text{calc.}) = 40^\circ \)

**Cell Data:**  
**Space Group:** \( P2_1/m \) (synthetic).  
\( a = 11.080(2) \)  
\( b = 14.634(2) \)  
\( c = 6.439(1) \)  
\( \beta = 99.43(1)^\circ \)  
\( Z = 2 \)

**X-ray Powder Pattern:**  
Hillside mine, Arizona, USA.  
8.76 (10), 5.50 (10), 7.31 (9), 4.82 (8), 2.91 (8), 2.06 (8), 1.707 (8)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{UO}_3 )</td>
<td>38.85</td>
<td>39.15</td>
</tr>
<tr>
<td>( \text{CO}_2 )</td>
<td>17.92</td>
<td>18.07</td>
</tr>
<tr>
<td>( \text{MgO} )</td>
<td>5.47</td>
<td>5.52</td>
</tr>
<tr>
<td>( \text{CaO} )</td>
<td>7.32</td>
<td>7.67</td>
</tr>
<tr>
<td>( \text{Na}_2\text{O} )</td>
<td>0.26</td>
<td></td>
</tr>
<tr>
<td>( \text{K}_2\text{O} )</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td>( \text{H}_2\text{O} )</td>
<td>29.69</td>
<td>29.59</td>
</tr>
</tbody>
</table>

Total [100.00] 100.00

(1) Hillside mine, Arizona, USA; recalculated to 100% after deduction of gypsum 4.38% and insoluble 0.30%.  
(2) \( \text{CaMg(UO}_2\text{(CO}_3\text{)}_3\cdot12\text{H}_2\text{O} \).

**Occurrence:**  
A secondary mineral in oxidized portions of a polymetallic sulfide deposit, the source of uranium undetermined.

**Association:**  
Gypsum, schröckingerite, andersonite, bayleyite (Hillside mine, Arizona, USA).

**Distribution:**  
In the USA, from the Hillside mine, about 5.5 km north of Bagdad, Eureka district, Yavapai Co., Arizona; in Colorado, in the Rifle mine, Garfield Co., and the Schwartzwalder mine, Jefferson Co.; at the Coral prospect, Elk Ridge, San Juan Co., Utah.

**Name:**  
Honors Charles K. Swartz (1861–1949), Professor of Geology and Mineralogy, Johns Hopkins University, Baltimore, Maryland, USA.

**Type Material:**  

**References:**  
(3) Mereiter, K. (1986) Synthetic swartzite, \( \text{CaMg(UO}_2\text{(CO}_3\text{)}_3\cdot12\text{H}_2\text{O} \), and its strontium analogue, \( \text{SrMg(UO}_2\text{(CO}_3\text{)}_3\cdot12\text{H}_2\text{O} \): crystallography and crystal structure. Neues Jahrb. Mineral., Monatsh., 481–492.  

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