Richelsdorfit 

\( \text{Ca}_2\text{Cu}_5\text{Sb}^{5+}(\text{AsO}_4)_4(\text{OH})_6\text{Cl} \cdot 6\text{H}_2\text{O} \)

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**Crystal Data:** Monoclinic, pseudotetragonal. *Point Group:* \(2/m\). Rare crystals, to 1 mm, flattened on \{001\}, with \{001\}, \{010\}, \{011\}, \{210\}; typically in spherical aggregates and botryoidal crystalline crusts. *Twining:* On \{001\}, common.

**Physical Properties:** *Cleavage:* Perfect on \{001\}. *Hardness:* \(\sim 2\) \(D(\text{meas.}) = 3.20(3)\) \(D(\text{calc.}) = 3.27-3.33\)

**Optical Properties:** *Translucent.* \(\alpha = 1.640-1.698\) \(\beta = 1.692-1.765\) \(\gamma = 1.694-1.799\) \(2V(\text{meas.}) = 10^\circ-15^\circ\); 69(2)° \(2V(\text{calc.}) = 21.6^\circ; 68.7^\circ\)

**Cell Data:** *Space Group:* \(C2/m\). \(a = 14.078-14.079\) \(b = 14.203-14.207\) \(c = 13.470-13.49\) \(\beta = 101.05^\circ-101.06^\circ\) \(Z = 4\)

**X-ray Powder Pattern:** Richelsdorf Mountains, Germany. 3.045 (100), 4.913 (70), 4.392 (60), 1.753 (60), 2.669 (50), 0.795 (50), 6.80 (30)

**Chemistry:**

<table>
<thead>
<tr>
<th>(\text{As}_2\text{O}_5)</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(\text{CaO})</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.18</td>
<td>35.23</td>
<td>34.80</td>
<td></td>
<td>8.97</td>
<td>8.36</td>
<td>8.49</td>
<td></td>
</tr>
<tr>
<td>(\text{Sb}_2\text{O}_5)</td>
<td>11.88</td>
<td>12.13</td>
<td>12.25</td>
<td>(\text{Cl})</td>
<td>1.83</td>
<td>2.44</td>
<td>2.68</td>
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<tr>
<td>(\text{FeO})</td>
<td>0.01</td>
<td></td>
<td></td>
<td>(\text{H}_2\text{O})</td>
<td>[17.19]</td>
<td>[11.98]</td>
<td>12.27</td>
</tr>
<tr>
<td>(\text{CuO})</td>
<td>28.71</td>
<td>30.41</td>
<td>30.11</td>
<td>(-\text{O} = \text{Cl}_2)</td>
<td>[0.41]</td>
<td>0.55</td>
<td>0.60</td>
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<tr>
<td>(\text{ZnO})</td>
<td>0.23</td>
<td></td>
<td></td>
<td>(\text{Total})</td>
<td>[99.59]</td>
<td>[100.00]</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Richelsdorf Mountains, Germany; by electron microprobe, \(\text{H}_2\text{O}\) by difference. (2) Triembach-au-Val, France; by electron microprobe, \(\text{H}_2\text{O}\) by difference. (3) \(\text{Ca}_2\text{Cu}_5\text{Sb}(\text{AsO}_4)_4\text{Cl}(\text{OH})_6 \cdot 6\text{H}_2\text{O}\).

**Occurrence:** In cavities in sandstone in the Kupferschiefer (Richelsdorf Mountains, Germany).

**Association:** Duftite, tyrolite, azurite, tetrahedrite–tennantite, calcite (Richelsdorf Mountains, Germany); tetrahedrite–tennantite, galena, brochantite, devilline, harmotome, calcite (Samson mine, Germany); erythrite, chalcophyllite, cornwallite, strashimirite, tetrahedrite–tennantite, barite (Triembach-au-Val, France).

**Distribution:** In Germany, from Iba, near Richelsdorf, Richelsdorf Mountains, and Reichenbach, near Bensheim, Hesse; at the Sauberg mine, Ehrenfriedersdorf, Saxony; in the Samson mine, St. Andreasberg, and on the dumps of the Glückrad mine, Oberschulenberg, Harz Mountains; in the Alte Buntekuh mine, near Niederschelden, and at Ramsbeck, North Rhine-Westphalia; in the Clara mine, near Oberwolfach, Black Forest. From Triembach-au-Val, Haut-Rhin, France. Large crystals at the Burrus mine, Pyramid district, Washoe Co., Nevada, USA.

**Name:** For its first observed occurrence in the Richelsdorf Mountains, Germany.

**Type Material:** Göttingen University, Göttingen, Germany; National Museum of Natural History, Washington, D.C., USA, 150229.


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