**Hannebachite**

\[2\text{CaSO}_3 \cdot \text{H}_2\text{O}\]

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**Crystal Data:** Orthorhombic. Point Group: \(2/m 2/m 2/m\). As thin bladed crystals, flattened on \{001\}, elongated along \[010\], to 1 mm, dominated by \{101\} and \{021\} with some faces curved; typically in spraylike aggregates.

**Physical Properties:** Cleavage: Perfect on \{110\}. Hardness = \(\sim 3.5\) D(meas.) = 2.52 D(calc.) = 2.54

**Optical Properties:** Transparent. Color: Colorless; changes to milky white on exposure to humid air. Streak: White. Luster: Vitreous. Optical Class: Biaxial (+). Orientation: \(X = a; Y = c; Z = b\). \(\alpha = 1.596(2)\) \(\beta = 1.600(2)\) \(\gamma = 1.634(2)\) 2V(meas.) = 38(5)° 2V(calc.) = 38°

**Cell Data:** Space Group: \(P\overline{b}n\alpha\). \(a = 6.473(5)\) \(b = 9.782(9)\) \(c = 10.646(9)\) \(Z = 4\)

**X-ray Powder Pattern:** Hannebacher Ley volcano, Germany. 3.15 (100), 2.617 (90), 3.79 (80), 1.843 (50), 5.54 (40), 1.950 (40), 1.671 (40)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
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</thead>
<tbody>
<tr>
<td>(\text{SO}_2)</td>
<td>49.5</td>
<td>49.60</td>
</tr>
<tr>
<td>(\text{CaO})</td>
<td>43.1</td>
<td>43.42</td>
</tr>
<tr>
<td>(\text{H}_2\text{O})</td>
<td>[7.4]</td>
<td>6.98</td>
</tr>
<tr>
<td>Total</td>
<td>[100.0]</td>
<td>100.00</td>
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</tbody>
</table>

(1) Hannebacher Ley volcano, Germany; average of 10 electron microprobe analyses, \(\text{H}_2\text{O}\) by TGA, presence of \(\text{SO}_3\) confirmed by IR. (2) \(2\text{CaSO}_3 \cdot \text{H}_2\text{O}\).

**Occurrence:** Lining cavities in blocks of melilite-nepheline-leucitite at the base of a volcano.

**Association:** Calcite, aragonite, gypsum, barite, celestine, thamausite, chabazite, phillipsite, gismondine, whewellite, perovskite.

**Distribution:** From the Hannebacher Ley volcano, one km east-northeast of Hannebach, and at Kalem, near Birresborn, Eifel district, Germany.

**Name:** For the locality, Hannebacher Ley volcano, Germany, from which the first specimens were collected.

**Type Material:** Natural History Museum, Mainz, Germany, M1990/3093.