Mooreite

\[ \text{Mg}_9\text{Zn}_4\text{Mn}^{2+}_2(\text{SO}_4)_2(\text{OH})_{26}\cdot8\text{H}_2\text{O} \]

Crystal Data: Monoclinic. Point Group: 2/m. Crystals are flat tabular to platy \( \perp [010] \), with large \( \{010\} \), the edges modified by ten other forms, commonly distorted and etched, in subparallel aggregates, to 10 cm.

Physical Properties: Cleavage: On \( \{010\} \), perfect. Hardness = 3 D(meas.) = 2.47(2) D(calc.) = 2.444

Optical Properties: Transparent. Color: Pale yellowish brown; colorless in transmitted light. Luster: Vitreous. Optical Class: Biaxial (−). Orientation: \( X = b; Z \wedge c = 44^\circ \). Dispersion: \( r > v \), perceptible. \( \alpha = 1.533 \quad \beta = 1.545 \quad \gamma = 1.547 \quad 2V(\text{meas.}) = \sim50^\circ \)

Cell Data: Space Group: \( P2_1/a \). \( a = 11.147(3) \quad b = 20.350(6) \quad c = 8.202(3) \)
\( \beta = 92.69(4)^\circ \quad Z = 2 \)

X-ray Powder Pattern: Sterling Hill, New Jersey, USA.
5.079 (100), 10.089 (78), 2.379 (78), 1.619 (58), 3.452 (51), 1.832 (47), 2.667 (40)

Chemistry:

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{SO}_3 )</td>
<td>10.99</td>
<td>11.60</td>
</tr>
<tr>
<td>( \text{MnO} )</td>
<td>11.93</td>
<td>9.76</td>
</tr>
<tr>
<td>( \text{ZnO} )</td>
<td>24.58</td>
<td>23.99</td>
</tr>
<tr>
<td>( \text{MgO} )</td>
<td>25.38</td>
<td>26.75</td>
</tr>
<tr>
<td>( \text{H}_2\text{O} )</td>
<td>27.12</td>
<td>[27.90]</td>
</tr>
</tbody>
</table>

Total \( [100.00] \) \( [100.00] \)

(1) Sterling Hill, New Jersey, USA; average of two analyses, totalling 99.77%, recalculated to 100% after deduction of \( \text{SiO}_2 \) 0.06% and \( \text{CaCO}_3 \) 0.89%; corresponds to \( \text{Mg}_{8.61}\text{Zn}_{4.11}\text{Mn}_{2.28}(\text{SO}_4)_{1.86}(\text{OH})_{26.28}\cdot7.47\text{H}_2\text{O} \). (2) Do.; by electron microprobe, total Mn as MnO, \( \text{H}_2\text{O} \) by difference, \( (\text{OH})^{1−} \) calculated for charge balance, \( \text{SO}_3^{2−} \) and \( \text{H}_2\text{O} \) confirmed by IR; corresponds to \( \text{Mg}_{9.16}\text{Zn}_{4.04}\text{Mn}_{1.89}(\text{SO}_4)_{1.99}(\text{OH})_{26.08}\cdot8.21\text{H}_2\text{O} \).

Occurrence: Rarely in cavities and veinlets in franklinite–willemite–calcite ore from a metamorphosed stratiform zinc orebody.

Association: Pyrochroite, rhodochrosite, zincite, torreyite, fluoborite, franklinite, willemite, calcite.

Distribution: From Sterling Hill, Ogdensburg, Sussex Co., New Jersey, USA.

Name: Honoring Dr. Gideon Emmet Moore (1842–1895), University of California, Berkeley, California, USA, American chemist, an early investigator of Franklin and Sterling Hill minerals.
