Teruggite

\[ \text{Ca}_4\text{MgAs}_2\text{B}_{12}\text{O}_{22}(\text{OH})_{12}\cdot14\text{H}_2\text{O} \]

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Crystal Data: Monoclinic. Point Group: 2/m. Acicular [001] to tabular {100} crystals, prismatic {110} with rhomboidal cross-section, to 0.1 mm; aggregated into cauliflower-shaped nodules.

Physical Properties: Cleavage: On {001}, good; on {110}, fair. Tenacity: Brittle. Hardness = 2.5 D(meas.) = 2.149–2.20 D(calc.) = 2.192


Cell Data: Space Group: \( P2_1/a \). \( a = 15.675(13) \quad b = 19.920(14) \quad c = 6.255(4) \)
\( \beta = 99°20(5)' \quad Z = 2 \)

X-ray Powder Pattern: Loma Blanca deposit, Argentina. 12.13 (100b), 2.785 (30), 9.98 (22b), 3.577 (22b), 4.65 (21b), 8.37 (20b), 4.571 (17)

Chemistry:

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{As}_2\text{O}_5 )</td>
<td>17.99</td>
<td>18.06</td>
</tr>
<tr>
<td>( \text{B}_2\text{O}_3 )</td>
<td>32.88</td>
<td>32.83</td>
</tr>
<tr>
<td>( \text{MgO} )</td>
<td>3.17</td>
<td>3.17</td>
</tr>
<tr>
<td>( \text{CaO} )</td>
<td>17.57</td>
<td>17.62</td>
</tr>
<tr>
<td>( \text{H}_2\text{O}^+ )</td>
<td>25.57</td>
<td></td>
</tr>
<tr>
<td>( \text{H}_2\text{O}^- )</td>
<td>2.82</td>
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<tr>
<td>( \text{H}_2\text{O} )</td>
<td>28.32</td>
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<tr>
<td>Total [100.00]</td>
<td></td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Loma Blanca deposit, Argentina; recalculated to 100% from an original total of 99.94% after deduction of \( \text{SiO}_2 \) 0.29%; then corresponds to \( \text{Ca}_{3.98}\text{Mg}_{1.00}\text{As}_{1.99}\text{B}_{12}\text{O}_{22}(\text{OH})_{12}\cdot14\text{H}_2\text{O} \).
(2) \( \text{Ca}_4\text{MgAs}_2\text{B}_{12}\text{O}_{22}(\text{OH})_{12}\cdot14\text{H}_2\text{O} \).

Occurrence: In lacustrine borate deposits, typically associated with volcanic hot springs and diagensis of playa sediments.

Association: Inyoite, calcite, ulexite, aragonite, realgar, montmorillonite (Loma Blanca deposit, Argentina); colemanite, meyerhofferite, ulexite (Emet deposits, Turkey).

Distribution: From the Loma Blanca borate deposit, eight km southwest of Coranzulí, Jujuy Province, Argentina. At the Hisarcık borate mine, near Emet, Kütahya Province, Turkey.

Name: Honors Mario E. Teruggi, Professor of Sedimentology and Petrology, National University, Plata, Argentina.

Type Material: Harvard University, Cambridge, Massachusetts, 109056; National Museum of Natural History, Washington, D.C., USA, 145925.

References: (1) Aristarain, L.F. and C.S. Hurlbut, Jr. (1968) Teruggite, \( 4\text{CaO} \cdot \text{MgO} \cdot 6\text{B}_2\text{O}_3 \cdot \text{As}_2\text{O}_5 \cdot 18\text{H}_2\text{O} \), a new mineral from Jujuy, Argentina. Amer. Mineral., 53, 1815–1827.