Clinochalcomenite

Clinochalcomenite CuSe\(^{4+}\)\(\text{O}_3\)•\(2\text{H}_2\text{O}\)

Crystal Data: Monoclinic. Point Group: 2\(/m\). Crystals prismatic along and striated \(\parallel [001]\), to 0.6 mm; \{110\} and \{011\} dominant, \{210\}, \{100\}, \{010\}, \{001\} and \{101\} observed. Also as crusts and patchy coatings on chalcomenite.

Physical Properties: Cleavage: Perfect on \{110\}. Tenacity: Brittle. Hardness = 2
D(meas.) = 3.28 D(calc.) = 3.42

Optical Properties: Transparent. Color: Blue-green to pale green, may be black from included umangite; pale blue-green in transmitted light. Luster: Vitreous.

Optical Class: Biaxial (-). Pleochroism: \(X = Y = \) colorless; \(Z = \) blue-green. Orientation: \(Y = b\), \(X \wedge a = 3^\circ\); \(Z \wedge c = 10^\circ\). Dispersion: \(r < v\). \(\alpha = 1.675\) \(\beta = 1.723\) \(\gamma = 1.765\) 2V(meas.) = 78°

Cell Data: Space Group: \(P2_1/n\). \(a = 8.177\) \(b = 8.611\) \(c = 6.290\) \(\beta = 97^\circ16'\) \(Z = 4\)

X-ray Powder Pattern: Gansu Province, China. 5.89 (10), 3.66 (9), 2.926 (8), 4.06 (7), 2.694 (7), 2.482 (7), 1.818 (7)

Chemistry:

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SeO(_2)</td>
<td>53.27</td>
<td>48.98</td>
</tr>
<tr>
<td>CuO</td>
<td>37.15</td>
<td>35.11</td>
</tr>
<tr>
<td>H(_2)O</td>
<td>15.91</td>
<td>15.91</td>
</tr>
<tr>
<td>Total</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Gansu Province, China; by electron microprobe, here converted to oxides, 2H\(_2\)O by analogy to ahlfeldite and cobaltomenite. (2) CuSeO\(_3\)•2H\(_2\)O.

Polymorphism & Series: Dimorphous with chalcomenite.

Occurrence: A very rare secondary mineral in the oxidized zone of a uranium deposit in brecciated carbonaceous slate (China); in a hydrothermal selenium vein deposit (El Dragón mine, Bolivia).

Association: Volborthite, chalcomenite, umangite, malachite (China); chalcomenite, cobaltomenite, alunite (El Dragón mine, Bolivia).

Distribution: From an undisclosed locality in Gansu Province, China. At the El Dragón mine, 30 km southwest of Cerro Rico de Potosí, Potosí, Bolivia.

Name: As the monoclinic dimorph of chalcomenite.

Type Material: n.d.