**Clinoatacamite**

\[ \text{Cu}_2\text{Cl(OH)}_3 \]

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**Crystal Data:** Monoclinic, pseudorhombohedral. Point Group: 2/m. As complex intergrowths of crystals and twinned grains, to 1 mm; as powdery aggregates. Twinning: Very common on {100}.


**Optical Properties:** Transparent to translucent. Color: Green to dark greenish black, rarely greenish blue. Luster: Adamantine to vitreous.


\[ \alpha = \text{n.d.} \quad \beta = \text{n.d.} \quad \gamma = \text{n.d.} \]

\[ 2V(\text{meas.}) = 75(5)^\circ \quad 2V(\text{calc.}) = 69(3)^\circ \]

**Cell Data:** Space Group: \( P\bar{2}_1/n \). \( a = 6.157(2) \) \( b = 6.814(3) \) \( c = 9.105(5) \) \( \beta = 99.65(4)^\circ \)

\( Z = 4 \)

**X-ray Powder Pattern:** Chuquicamata, Chile; nearly identical to paratacamite.

5.47 (100), 2.742 (70), 2.767 (60), 2.266 (60), 2.243 (50), 1.704 (50), 2.887 (40)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CuO</td>
<td>74.7</td>
<td>74.49</td>
</tr>
<tr>
<td>Cl</td>
<td>16.5</td>
<td>16.60</td>
</tr>
<tr>
<td>H(_2)O</td>
<td>[13.5]</td>
<td>12.65</td>
</tr>
<tr>
<td>−O = Cl(_2)</td>
<td>3.7</td>
<td>3.74</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>[101.0]</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Chuquicamata, Chile; by electron microprobe, H\(_2\)O calculated from stoichiometry; corresponds to Cu\(_{1.96}\)Cl\(_{0.97}\)O\(_{3.03}\)H\(_{3.11}\). (2) Cu\(_2\)Cl(OH)\(_3\).

**Polymorphism & Series:** Polymorphous with atacamite, botallackite, and paratacamite.

**Occurrence:** An oxidation product of other copper minerals.

**Association:** Atacamite, paratacamite, gypsum, alunite (Chuquicamata, Chile); atacamite, zinccian paratacamite, caracolite, schwartzembergite, osarizawaite-beaverite, boleite (Sierra Gorda district, Chile).

**Distribution:** In Chile, from Chuquicamata, and in the Sierra Gorda district, southwest of Calama, Antofagasta; at Remolinos, Atacama. From Calumet, Keweenaw Co., Michigan, and Mason Pass, near Yerington, Lyon Co., Nevada, USA. At Wallaces Gully, Mount Painter, and Wallaroo, South Australia. From the Castletown mine, Lochgilphead, Scotland.

**Name:** As the monoclinic polymorph of atacamite.

**Type Material:** Royal Ontario Museum, Toronto, Canada, M32176.

**References:**