Chlorkyuygenite

\( \text{Ca}_{12}\text{Al}_{14}\text{O}_{32}[(\text{H}_2\text{O})_4\text{Cl}_2] \)

**Crystal Data:** Isometric.  **Point Group:** \( \bar{4} \text{3m} \). As tris-tetrahedral \{211\} crystals or rounded grains to 50 \( \mu \text{m} \); as rims around wadalite crystals.

**Physical Properties:**  **Cleavage:** None.  **Fracture:** Irregular, conchoidal.  **Tenacity:** n.d.  Hardness = 5-5.5  VHN = 632 (50 g load).  D(meas.) = n.d.  D(calc.) = 2.941

**Optical Properties:**  **Streak:** White.  **Luster:** Vitreous.  **Color:** Colorless, rarely with greenish to yellowish tint.

**Cell Data:**  **Space Group:** \( \bar{4} \text{3d} \). \( a = 12.0285(1) \)  \( Z = 2 \)

**X-ray Powder Pattern:** Upper Chegem Caldera, Northern Caucasus, Kabardino-Balkaria, Russia.

2.690 (100), 2.455 (46), 3.007 (38), 4.91 (31), 1.668 (26), 2.196 (21), 3.215 (15)

**Chemistry:**

<table>
<thead>
<tr>
<th>Element</th>
<th>Formula</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO\textsubscript{2}</td>
<td>0.70</td>
<td>MgO</td>
</tr>
<tr>
<td>TiO\textsubscript{2}</td>
<td>0.17</td>
<td>CaO</td>
</tr>
<tr>
<td>Al\textsubscript{2}O\textsubscript{3}</td>
<td>43.00</td>
<td>Cl</td>
</tr>
<tr>
<td>Fe\textsubscript{2}O\textsubscript{3}</td>
<td>4.27</td>
<td>H\textsubscript{2}O</td>
</tr>
<tr>
<td>Y\textsubscript{2}O\textsubscript{3}</td>
<td>&lt; 0.08</td>
<td>–O = Cl\textsubscript{2}</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.23</td>
<td></td>
</tr>
</tbody>
</table>

(1) Upper Chegem Caldera, Northern Caucasus, Kabardino-Balkaria, Russia; average of 27 electron microprobe analyses supplemented by Raman spectroscopy, H\textsubscript{2}O from stoichiometry; corresponding to \( \text{Ca}_{11.99}(\text{Al}_{12.98}\text{Fe}^{3+}_{0.82}\text{Si}_{0.18}	ext{Ti}^{4+}_{0.03})\text{O}_{32}[(\text{H}_2\text{O})_{3.77}\text{Cl}_{2.23}]\text{Σ}_6=6 \).

**Polymorphism & Series:** Forms a series with wadalite.

**Mineral Group:** Mayenite group.

**Occurrence:** An accessory mineral in Ca-humite zones of calcareous skarn xenoliths in ignimbrite, crystallized initially as chlormayenite and was altered by volcanic gases containing water vapor.

**Association:** Chegemite-fluorchegemite, reinhardbraunsite, srebrodolskite.

**Distribution:** From the Upper Chegem Caldera, Northern Caucasus, Kabardino-Balkaria, Russia.

**Name:** Kyuygenite is for the locality, Kyuygen-Kaya Mountain and the prefix indicates the essential chlorine in the species.

**Type Material:** The Natural History Museum, Bern, Switzerland (NMBE 41538) and in the A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (3731/1).

**References:**