Natroxalate  \( \text{Na}_2(\text{C}_2\text{O}_4) \)

**Crystal Data:** Monoclinic.  \textit{Point Group:} 2/\(m\).  Crystals are elongated along [001], to 5 mm, showing \(\{110\}, \{001\}, \{010\}, \{100\}, \{221\}\), in radiating aggregates; typically fine-grained, forming veins and nodules.  \textit{Twinning:} On \(\{110\}\).

**Physical Properties:**  \textit{Cleavage:} On \(\{100\}\), perfect; on \(\{001\}\) and \(\{221\}\), distinct.  \textit{Fracture:} Interrupted.  \textit{Tenacity:} Brittle.  Hardness = 3  \(D(\text{meas.}) = 2.32(3)\)  \(D(\text{calc.}) = 2.338\)  Soluble in \(\text{H}_2\text{O}\).

**Optical Properties:**  Transparent.  \textit{Color:} Cream to pale yellow, with pinkish or greenish tint.  \textit{Luster:} Vitreous.  \textit{Optical Class:} Biaxial (−).  \textit{Orientation:} \(Z = b, X \wedge c = 20^\circ\).  \textit{Dispersion:} \(r < v\), moderate.  \(\alpha = 1.415(2)\)  \(\beta = 1.524(2)\)  \(\gamma = 1.592(2)\)  \(2V(\text{meas.}) = 72(1)^\circ\)  \(2V(\text{calc.}) = 72^\circ\)

**Cell Data:**  \textit{Space Group:} \(P2_1/a\) (by analogy to synthetic).  \(a = 10.426(9)\)  \(b = 5.255(5)\)  \(c = 3.479(3)\)  \(\beta = 93.14(8)^\circ\)  \(Z = 2\)

**X-ray Powder Pattern:**  Mt. Alluaiv, Kola Peninsula, Russia.  2.826 (100), 2.602 (56), 2.334 (33), 2.898 (27), 2.041 (14), 5.203 (13), 2.117 (13)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
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</thead>
<tbody>
<tr>
<td>(\text{C}_2\text{O}_3)</td>
<td>53.70</td>
<td>53.75</td>
</tr>
<tr>
<td>(\text{Na}_2\text{O})</td>
<td>46.24</td>
<td>46.25</td>
</tr>
<tr>
<td>Total</td>
<td>99.94</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Mt. Alluaiv, Kola Peninsula, Russia.  (2) \(\text{Na}_2(\text{C}_2\text{O}_4)\).

**Occurrence:**  In a hydrothermally altered pegmatite in a differentiated alkaline massif.

**Association:**  Aegirine, albite, elpidite, natron, nenadkevichite, taeniolite, sphalerite, pyrite, galena.

**Distribution:**  From Mt. Alluaiv, Lovozero massif, Kola Peninsula, Russia.

**Name:**  For sodium, \textit{natrium}, in the composition, and as a naturally occurring oxalate.

**Type Material:**  Mining Institute, St. Petersburg, 2080/1; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 1522.