Kamenevite

\[ \text{K}_2\text{TiSi}_3\text{O}_9\cdot\text{H}_2\text{O} \]

**Crystal Data:** Orthorhombic. *Point Group:* 222. As equant or rectangular lamellar crystals flattened on [010] to 0.3 mm; as aggregates to 0.7 mm.

**Physical Properties:** *Cleavage:* Good on [010]. *Fracture:* Stepped. *Tenacity:* Brittle. 
Hardness = \( \sim 4 \) \( \text{D(meas.)} = 2.69(2) \) \( \text{D(calc.)} = 2.698 \)


*Luster:* Vitreous.

**Optical Class:** Biaxial (-). \( \alpha = 1.650(4) \) \( \beta = 1.678(5) \) \( \gamma = 1.685(5) \) \( 2\nu(\text{meas.}) = 60(10)^\circ \) \( 2\nu(\text{calc.}) = 52^\circ \) *Orientation:* \( \mathbf{Y} = b \).

**Cell Data:** *Space Group:* \( \text{P}2_12_12_1 \), \( a = 9.9166(4) \) \( b = 12.9561(5) \) \( c = 7.1374(3) \) \( Z = 4 \)

**X-ray Powder Pattern:** Oleniy Ruchey mine, Mt. Suoluaiv, Kola Peninsula, Russia. 2.954 (100), 5.823 (95), 2.988 (84), 7.92 (70), 2.834 (69), 2.906 (68), 6.51 (47)

**Chemistry:**

<table>
<thead>
<tr>
<th>Compounds</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{Na}_2\text{O} )</td>
<td>0.48</td>
<td></td>
</tr>
<tr>
<td>( \text{K}_2\text{O} )</td>
<td>24.37</td>
<td>25.30</td>
</tr>
<tr>
<td>( \text{CaO} )</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>( \text{Fe}_2\text{O}_3 )</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>( \text{SiO}_2 )</td>
<td>48.78</td>
<td>48.41</td>
</tr>
<tr>
<td>( \text{TiO}_2 )</td>
<td>20.30</td>
<td>21.45</td>
</tr>
<tr>
<td>( \text{ZrO}_2 )</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>( \text{Nb}_2\text{O}_5 )</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>( \text{H}_2\text{O} )</td>
<td>[4.85]</td>
<td>4.84</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.50</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Oleniy Ruchey mine, Mt. Suoluav, Khibiny complex, Kola Peninsula, Russia; average of 4 electron microprobe analyses; \( \text{H}_2\text{O} \) calculated from structure analysis; corresponds to \( (\text{K}_{1.92}\text{Na}_{0.06}\text{Ca}_{0.01})\cdot(\text{Fe}_{0.02}\text{Zr}_{0.03}\text{Nb}_{0.01})\cdot\text{S}_{1.91}\text{O}_{9.06}\text{H}_2\text{O} \). (2) \( \text{K}_2\text{TiSi}_3\text{O}_9\cdot\text{H}_2\text{O} \).

**Occurrence:** A late-stage hydrothermal mineral in K-rich peralkaline pegmatites related to rischorrites associated with apatite-nepheline rocks.

**Association:** Lomonosovite, aegirine, lamprophyllite, pectolite, shafranovskite, ershovite, lovozerite.

**Distribution:** At the Oleniy Ruchey (Reindeer Stream) mine, Mt. Suoluav and the Rasvumchorr mine, Mt. Rasvumchorr, Khibiny complex, Kola Peninsula, Russia.

**Name:** Honors Russian geologist Evgeniy Arsenievich Kamenev (1934-2017) for his contribution to the geological study and exploration of the Khibiny complex apatite deposits.

**Type Material:** A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (95903).