Flinteite

**Crystal Data:** Orthorhombic.  
*Point Group:* mm2.  
As prismatic crystals, to 1.2 mm, and as granular aggregates or crusts, to 5 mm.

**Physical Properties:**  
*Cleavage:* Distinct in one direction.  
*Fracture:* Uneven.  
*Tenacity:* Brittle.  
Hardness ~ 2  
*D(meas.)* = n.d.  
*D(calc.)* = 2.49

**Optical Properties:**  
*Color:* Light green, light yellow, bright greenish yellow, colorless.  
*Streak:* White.  
*Luster:* Vitreous.  
*Optical Class:* Biaxial (+).  
\[ \alpha = 1.573(1) \quad \beta = 1.574(1) \quad \gamma = 1.576(1) \]  
*2V(meas.)* = 40(25)°  
*2V(calc.)* = 71°

**Cell Data:**  
*Space Group:* Pn\(a2_1\).  
\[ a = 26.8090(10) \quad b = 12.4085(6) \quad c = 7.2512(3) \]  
\( Z = 12 \)

**X-ray Powder Pattern:** Tolbachik volcano, Kamchatka, Russia.  
3.599 (100), 3.629 (98), 5.123 (88), 2.688 (46), 3.133 (35), 2.897 (35), 6.23 (27)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>24.97</td>
<td>27.40</td>
</tr>
<tr>
<td>Tl</td>
<td>5.82</td>
<td></td>
</tr>
<tr>
<td>Co</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>Zn</td>
<td>22.23</td>
<td>22.91</td>
</tr>
<tr>
<td>Cl</td>
<td>46.95</td>
<td>49.69</td>
</tr>
<tr>
<td>Total</td>
<td>100.04</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) First Scoria cone, Tolbachik volcano, Kamchatka, Russia; average of 4 electron microprobe analyses supplemented by Raman spectroscopy; corresponding to \((K_{1.91} Tl_{0.09})_2 Zn_{1.04} Cl_{3.96}\).

(2) \( K_2 ZnCl_4 \).

**Occurrence:** Formed as sublimates on basaltic scoria around active volcanic fumaroles, probably as the result of a phase transition when cooling after the extraction of crystals of its protophase.

**Association:** Langbeinite, calciolangbeinite, aphphtaitite, fluoborite, sylvite, halite, arcanite, tenorite, zincite, chubarovite, krasheninnikovite, vanhoffite, wulfite, johillerite, urusovite (Arsenatnaya fumarole, Second scoria cone); belloite, avdoninite, eriochalcite, mellizinkalite, sylvite, halite, carnallite, mitscherlichite, sanguite, chrysothallite, romanorlovite, gypsum, chlorothionite, kainite (Glavnaya Tenoritovaya fumarole, Second scoria cone); and halite, sellaite, fluorite, saltonseaite, chubarovite, hollandite (First Scoria cone).

**Distribution:** From the First scoria cone and the Arsenatnaya and Glavnaya Tenoritovaya fumaroles, Second scoria cone, Northern Breakthrough of the Great Tolbachik Fissure Eruption, Tolbachik volcano, Kamchatka, Russia.

**Name:** Honors the Russian crystallographer Evgeniy Evgenievich Flint (1887-1975), Professor of Crystallography, Moscow State University (1925-1930), Professor of Mineralogy and Crystallography, Moscow Geological Prospecting Institute (1930-1962) and Senior Researcher, Institute of Crystallography, USSR Academy of Sciences (1938-1962). He was a specialist in goniometry, X-ray crystallography and compiled a catalogue of pyroelectric and piezoelectric crystals including almost 1000 species.

**Type Material:** A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (94374).

**References:**  