Junitoite  

**Chemical Formula:** $\text{CaZn}_2\text{Si}_2\text{O}_7 \cdot \text{H}_2\text{O}$

**Crystal Data:** Orthorhombic.  **Point Group:** $mm2$. Only as crystals, to 5 mm, with excellent faces and good evidence of hemihedrism; as sprays of individuals.

**Physical Properties:**  
- **Cleavage:** Good on $\{100\}$; poor on $\{010\}$ and $\{011\}$.  
- **Tenacity:** Brittle to semi-sectile as a result of alteration.  
- **Hardness:** $4.5$.  
- **D(meas.):** $3.5(1)$.  
- **D(calc.):** $3.516$.  
- **Strongly pyroelectric.**

**Optical Properties:**  
- **Cleavage:** Good on $f_{100}$; poor on $f_{010}$ and $f_{011}$.  
- **Tenacity:** Brittle to semi-sectile as a result of alteration.  
- **Color:** Colorless, milk-white, or colored in various tints as a result of alteration.  
- **Luster:** Vitreous.  
- **Optical Class:** Biaxial (+).  
- **Orientation:** $X = b$; $Y = a$; $Z = c$.  
- **Dispersion:** $r < v$, very weak.  
- **$\alpha = 1.656$, $\beta = 1.664$, $\gamma = 1.672$.**  
- **$2V(meas.) = n.d.$**  
- **$2V(calc.) = 86^\circ$.**

**Cell Data:**  
- **Space Group:** $Ama2$.  
- **$a = 12.510(7)$**  
- **$b = 6.318(3)$**  
- **$c = 8.561(6)$**  
- **$Z = 4$**

**X-ray Powder Pattern:**  
- Christmas, Arizona, USA.  
- $3.528$ (100), $2.816$ (100), $2.540$ (100), $2.352$ (70), $1.540$ (60), $4.703$ (50), $2.521$ (50)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{SiO}_2$</td>
<td>31.0</td>
<td>33.65</td>
</tr>
<tr>
<td>$\text{ZnO}$</td>
<td>44.8</td>
<td>45.59</td>
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<tr>
<td>$\text{CaO}$</td>
<td>15.5</td>
<td>15.71</td>
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<tr>
<td>$\text{H}_2\text{O}$</td>
<td>5.8</td>
<td>5.05</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>97.1</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

(1) Christmas, Arizona, USA. (2) $\text{CaZn}_2\text{Si}_2\text{O}_7 \cdot \text{H}_2\text{O}$.

**Occurrence:**  
In a retrogressively altered tactite zone, closely related to the breakdown of sphalerite in the ores.

**Association:**  
- Kinoite, apophyllite, calcite, xonotlite, smectite.

**Distribution:**  
In the USA, from the Christmas copper mine, Gila Co., Arizona.

**Name:**  
For Dr. Jun Ito (1926–1978), Japanese-American mineral chemist, Harvard University, Cambridge, Massachusetts, USA.

**Type Material:**  

**References:**  