Samfowlerite  

\[ \text{Ca}_{14}\text{Mn}_3\text{Zn}_2\text{(Be, Zn)}_2\text{Be}_6\text{(SiO}_4)_6\text{(Si}_2\text{O}_7)_4\text{(OH, F)}_6 \]

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**Crystal Data:**  
Monoclinic.  
**Point Group:**  \(2/m\).  
As crystals, to 0.05 mm, and in groups.

**Physical Properties:**  
Hardness = < 3.  
\(D(\text{meas.}) = 3.28(5)\)  
\(D(\text{calc.}) = 3.29\)  
Weakly fluoresces red under SW and LW UV.

**Optical Properties:**  
Semitransparent.  
**Color:** Colorless.  
**Streak:** White.  
**Luster:** Vitreous.  
**Optical Class:** Biaxial (-).  
**Orientation:**  
\(\gamma = 1.680(3)\)  
\(\alpha = 1.674(3)\)  
\(\beta = 1.681(3)\)  
\(2\nu(\text{meas.}) = 29.0(1)\)°

**Cell Data:**  
**Space Group:**  \(P2_1/c\).  
\(a = 9.068(2)\)  
\(b = 17.992(2)\)  
\(c = 14.586(2)\)  
\(\beta = 104.86(1)\)°  
\(Z = 2\)

**X-ray Powder Pattern:**  
Franklin, New Jersey, USA.  
2.863 (100), 2.653 (50), 2.388 (50), 2.771 (40), 2.272 (30), 1.832 (30), 2.329 (20)

**Chemistry:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>(\text{SiO}_2)</td>
<td>36.9</td>
</tr>
<tr>
<td>(\text{MnO})</td>
<td>9.3</td>
</tr>
<tr>
<td>(\text{ZnO})</td>
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<tr>
<td>(\text{BeO})</td>
<td>5.6</td>
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<tr>
<td>(\text{MgO})</td>
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<tr>
<td>(\text{CaO})</td>
<td>34.1</td>
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<tr>
<td>(\text{F})</td>
<td>1.0</td>
</tr>
<tr>
<td>(\text{H}_2\text{O})</td>
<td>[3.8]</td>
</tr>
<tr>
<td>(-\text{O} = \text{F}_2)</td>
<td>0.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>[100.0]</td>
</tr>
</tbody>
</table>

(1) Franklin, New Jersey, USA; by electron microprobe, Be and F by ion microprobe, \(\text{H}_2\text{O}\) by difference; crystal structure analysis indicates that Be is lower and \(\text{H}_2\text{O}\) is higher than reported; corresponding to \(\text{Ca}_{13.9}\text{Mg}_{0.1}\frac{\text{\(Z\)}}{\Sigma = 14.0}\text{Mn}_{3.0}\text{Zn}_{2.6}\text{Be}_{5.1}\text{Si}_{14.0}\text{O}_{56.5}\text{H}_{9.6}\text{F}_{1.2}\).  

**Occurrence:**  
In vugs in granular willemite-franklinite-andradite ore from a metamorphosed stratiform Zn–Mn deposit.

**Association:**  
Andradite-grossular, cahnite, clinochlore, leucophoenicite, johnbaumite, barite, franklinite, willemite.

**Distribution:**  
From Franklin, Sussex Co., New Jersey, USA.

**Name:**  
For Samuel Fowler, M.D. (1779–1844), who early encouraged study of the Franklin deposits.

**Type Material:**  

**References:**  

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