**Samfowlerite**

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

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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(meas.) = 3.28(5)  
D(calc.) = 3.29–3.31  
Weakly fluoresces red under SW and LW UV.

**Optical Properties:** Semitransparent.  
**Color:** Colorless.  
**Streak:** White.  
**Luster:** Vitreous.

**Optical Class:** Biaxial (−).  
**Orientation:** Y = b; X ∩ a = 44°; Z ∩ c = 29°.  
α = 1.674(3)  
β = 1.680(3)  
γ = 1.681(3)  
2V(meas.) = 29.0(1)°

**Cell Data:**  
**Space Group:** P2₁/c.  
a = 9.068(2)  
b = 17.992(2)  
c = 14.586(2)  
β = 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:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Formula</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO₂</td>
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<td>36.9</td>
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<tr>
<td>MnO</td>
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<td>9.3</td>
</tr>
<tr>
<td>ZnO</td>
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<td>9.5</td>
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<td>BeO</td>
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<tr>
<td>MgO</td>
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<td>CaO</td>
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<td>F</td>
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<td>H₂O</td>
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<td>O = F₂</td>
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<td>0.4</td>
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<tr>
<td>Total</td>
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<td>100.0</td>
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</tbody>
</table>

(1) Franklin, New Jersey, USA; by electron microprobe, Be and F by ion microprobe, H₂O by difference; crystal structure analysis indicates that Be is lower and H₂O is higher than reported; corresponding to \( \text{Ca}_{14.9}\text{Mg}_{0.1}\text{Mn}_{3.0}\text{Zn}_{2.6}\text{Be}_{5.1}\text{Si}_{14.0}\text{O}_{56.5}\text{H}_{9.9}\text{F}_{1.2} \).

**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:** National Museum of Natural History, Washington, D.C., USA, M04254.