Wilhelmvierlingite  

\[ \text{CaMn}^{2+}\text{Fe}^{3+}(\text{PO}_4)_2(\text{OH})\cdot2\text{H}_2\text{O} \]

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**Crystal Data:** Orthorhombic.  
**Point Group:** 2/m 2/m 2/m. As prismatic to equant crystals, showing \(\{100\}, \{010\}, \{110\}, \{001\}\), to 40µm, typically in radial fibrous aggregates.

**Physical Properties:** Cleavage: On \(\{010\}\), perfect. Hardness = 4 D(meas.) = 2.58  
D(calc.) = 2.60

**Optical Properties:** Translucent. Color: Yellow to brownish yellow. Streak: Pale yellow.  
Luster: Vitreous.  
**Optical Class:** Biaxial (−) or (+). Pleochroism: \(X = Y = \) light yellow; \(Z = \) dark yellow.  
**Orientation:** \(X = b; Y = a; Z = c\). \(\alpha = 1.637\) \(\beta = 1.664\) \(\gamma = 1.692\)  
2V(meas.) = n.d.  
2V(calc.) = 45°

**Cell Data:**  
**Space Group:** Pbca.  
\(a = 14.80(5)\)  
\(b = 18.70(5)\)  
\(c = 7.31(2)\)  
\(Z = 8\)

**X-ray Powder Pattern:** Hagendorf, Germany.  
2.86 (10), 9.34 (7), 5.00 (6d), 1.98 (5), 4.67 (4), 2.58 (4), 1.96 (4d)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\text{P}_2\text{O}_5)</td>
<td>35.5</td>
<td>36.04</td>
</tr>
<tr>
<td>(\text{Fe}_2\text{O}_3)</td>
<td>19.0</td>
<td>20.27</td>
</tr>
<tr>
<td>(\text{MnO})</td>
<td>17.6</td>
<td>18.01</td>
</tr>
<tr>
<td>(\text{ZnO})</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>(\text{CaO})</td>
<td>11.9</td>
<td>14.24</td>
</tr>
<tr>
<td>(\text{H}_2\text{O})</td>
<td>[13.4]</td>
<td>11.44</td>
</tr>
</tbody>
</table>

Total [100.0] 100.00

(1) Hagendorf, Germany; by electron microprobe, originally given as \(\text{PO}_4\) 47.5%, \(\text{Fe}\) 13.3%, \(\text{Mn}\) 13.6%, \(\text{Zn}\) 2.1%, \(\text{Ca}\) 8.5%, \(\text{H}_2\text{O}\) 15.0% by difference, total 100.0%, here converted to oxides, total \(\text{Fe}\) as \(\text{Fe}_2\text{O}_3\), total \(\text{Mn}\) as \(\text{MnO}\), \((\text{OH})\)^{1−} determined present by IR; stated to correspond to \((\text{Ca}_{0.85}\text{Zn}_{0.15})\Sigma=0.98\text{Mn}^{2+}\text{Fe}^{3+}(\text{PO}_4)_2(\text{OH})\cdot2.33\text{H}_2\text{O}\). (2) \(\text{CaMn}^{2+}\text{Fe}^{3+}(\text{PO}_4)_2(\text{OH})\cdot2\text{H}_2\text{O}\).

**Mineral Group:** Overite group.

**Occurrence:** A rare secondary mineral in a complex zoned granite pegmatite.

**Association:** Rockbridgeite, zwieselite.

**Distribution:** From Hagendorf, Bavaria, Germany.

**Name:** To honor Wilhelm Vierling (1901–1995), Weiden, Germany, a longtime student of Hagendorf minerals.

**Type Material:** Institute for Mineralogy and Crystallography, Technical University, Berlin, Germany.