Phosphofibrite

$\text{KCuFe}_{15}^{3+}(\text{PO}_4)_{12}(\text{OH})_{12}\cdot12\text{H}_2\text{O}$

Crystal Data: Orthorhombic. Point Group: 2/m 2/m 2/m. Crystals are fibrous, to 0.5 mm, in radial aggregates.

Physical Properties: Cleavage: One, nearly perfect, pinacoidal. Hardness $\sim 4$

D(meas.) = 2.90  D(calc.) = 2.94


Optical Class: Biaxial (−). Orientation: Y = elongation. Dispersion: $r \ll v$. $\alpha = 1.755(4)$ $\beta = \text{n.d.}$ $\gamma = 1.790(4)$ 2V(meas.) = Moderate.

Cell Data: Space Group: Pbnm or Pnmm. $a = 14.40$  $b = 18.76$  $c = 10.40$  $Z = 2$

X-ray Powder Pattern: Clara mine, Germany.

9.50 (100), 3.23 (60), 3.13 (60), 4.35 (50), 2.99 (50), 2.77 (50), 2.10 (50)

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>34.0</td>
<td>34.07</td>
</tr>
<tr>
<td>$\text{Al}_2\text{O}_3$</td>
<td>1.5</td>
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<tr>
<td>$\text{Fe}_2\text{O}_3$</td>
<td>46.6</td>
<td>47.90</td>
</tr>
<tr>
<td>CuO</td>
<td>2.6</td>
<td>3.18</td>
</tr>
<tr>
<td>$\text{K}_2\text{O}$</td>
<td>1.9</td>
<td>1.88</td>
</tr>
<tr>
<td>$\text{H}_2\text{O}$</td>
<td>[13.4]</td>
<td>12.97</td>
</tr>
</tbody>
</table>

Total [100.0] 100.00

(1) Clara mine, Germany; by electron microprobe and microchemical methods, $\text{H}_2\text{O}$ by difference; corresponding to $\text{K}_{1.00}\text{Cu}_{0.81}(\text{Fe}_{14.52}\text{Al}_{0.73})\Sigma=15.25(\text{P}_{0.96}\text{O}_{3.97})_{12}(\text{OH})_{12.36}\cdot12.33\text{H}_2\text{O}$.

(2) $\text{KCuFe}_{15}(\text{PO}_4)_{12}(\text{OH})_{12}\cdot12\text{H}_2\text{O}$.

Occurrence: In a hydrothermal polymetallic barite–fluorite deposit.

Association: Beraunite, strengite, barian pharmacosiderite, quartz.

Distribution: From the Clara mine, near Oberwolfach, Black Forest, Germany.

Name: For phosphorus in the composition and its characteristic fibrous habit.

Type Material: n.d.