Wilhelmkleinite

\[ \text{ZnFe}_{2}^{3+} (\text{AsO}_{4})_{2} (\text{OH})_{2} \]

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Crystal Data: Monoclinic. \textit{Point Group}: \(2/m\). Spearhead-shaped crystals, to 5 mm, exhibiting \{100\}, \{430\}, \{31\}, in aggregates. \textit{Twinning}: Interpenetration twins on \{101\}.


Optical Properties: \textit{Translucent}. \textit{Color}: Blackish green. \textit{Streak}: Green. \textit{Luster}: Dull, adamantine on fractures. \textit{Optical Class}: Biaxial. \textit{Pleochroism}: Strong; olive-green to emerald-green to reddish brown. \(n = \sim 1.94\) \(\alpha = \text{n.d.}\) \(\beta = \text{n.d.}\) \(\gamma = \text{n.d.}\). \(2V(\text{meas.}) = \text{n.d.}\)

Cell Data: \textit{Space Group}: \(P2_1/n\). \(a = 6.631(1)\) \(b = 7.611(1)\) \(c = 7.377(1)\) \(\beta = 91.80(1)^\circ\) \(Z = 2\)

X-ray Powder Pattern: Tsumeb, Namibia.

3.385 (100), 3.315 (78), 2.939 (47), 1.621 (34), 1.652 (32), 2.381 (29), 2.839 (28)

Chemistry:

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
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</thead>
<tbody>
<tr>
<td>As(_2)O(_5)</td>
<td>46.69</td>
<td>47.01</td>
</tr>
<tr>
<td>Fe(_2)O(_3)</td>
<td>33.60</td>
<td>32.66</td>
</tr>
<tr>
<td>ZnO</td>
<td>13.81</td>
<td>16.65</td>
</tr>
<tr>
<td>H(_2)O</td>
<td>[5.90]</td>
<td>3.68</td>
</tr>
</tbody>
</table>

Total [100.00] 100.00

(1) Tsumeb, Namibia; by electron microprobe, average of five analyses, total Fe as \(\text{Fe}_2\text{O}_3\), \(\text{H}_2\text{O}\) by difference; corresponding to \(\text{Zn}_{0.84}\text{Fe}_{2.07}(\text{AsO}_4)_2(\text{OH}_{1.6})_2\). (2) \(\text{ZnFe}_2(\text{AsO}_4)_2(\text{OH})_2\).

Occurrence: Very rare from a deep oxidation zone in a dolostone-hosted hydrothermal polymetallic ore deposit.

Association: Scorodite, gerdrtremmelite, adamite.

Distribution: From Tsumeb, Namibia.

Name: To honor Wilhelm Klein (1889–1939), Manager of the Otavi Mining and Railroad Company mines in Namibia (1916–1939), an early collector of Tsumeb minerals.

Type Material: Mineralogical Museum, University of Hamburg, Hamburg, Germany.