Ekatite  \((\text{Fe}^{3+},\text{Fe}^{2+},\text{Zn})_{12}(\text{OH})_{6}[\text{AsO}_3]_6[\text{AsO}_3,\text{HO}\text{SiO}_3]_2\)

**Crystal Data:** Hexagonal.  *Point Group:* 6mm. As sprays of acicular crystals to 2 mm, elongated along [001] and striated.

**Physical Properties:**  
* Cleavage: None.  
* Fracture: n.d.  
* Tenacity: Brittle.  
Hardness = \(\sim 3\)  
\(D(\text{meas.}) = \text{n.d.}\)  
\(D(\text{calc.}) = 4.061\)

**Optical Properties:** Translucent.  
* Color: Brownish black.  
* Streak: Brown.  
* Luster: Vitreous.  
Optical Class: Uniaxial (+).  \(\omega = \sim 1.99\)  
\(\epsilon = \sim 2.08\)  
\(n(\text{calc.}) = 2.013\)

**Cell Data:** Space Group: \(P\text{6}_3\text{mc}\).  
\(a = 12.773(2)\)  
\(c = 5.051(1)\)  
\(Z = 1\)

**X-ray Powder Pattern:** Tsumeb, Namibia.  

**Chemistry:**

<table>
<thead>
<tr>
<th>element</th>
<th>formula</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FeO</td>
<td>[21.19]</td>
<td>21.41</td>
<td></td>
</tr>
<tr>
<td>(\text{Fe}_2\text{O}_3)</td>
<td>[27.26]</td>
<td>27.45</td>
<td></td>
</tr>
<tr>
<td>ZnO</td>
<td>3.80</td>
<td>3.73</td>
<td></td>
</tr>
<tr>
<td>(\text{As}_2\text{O}_3)</td>
<td>42.56</td>
<td>41.94</td>
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</tr>
<tr>
<td>SiO(_2)</td>
<td>2.12</td>
<td>2.07</td>
<td></td>
</tr>
<tr>
<td>(\text{H}_2\text{O})</td>
<td>[3.42]</td>
<td>3.40</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.35</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

(1) Tsumeb, Namibia; average electron microprobe analysis, supplemented by IR spectroscopy,  
\(\text{FeO:Fe}_2\text{O}_3\) and \(\text{H}_2\text{O}\) calculated from structure; corresponding to \((\text{Fe}^{3+})_{5.90}\text{Fe}^{2+}_{5.14}\text{Zn}_{0.81})_{\Sigma=11.90}\) \((\text{OH})_{6.00}\) \((\text{As}_{1.01}\text{O}_3)_{6.00}\) \([\text{AsO}_3]_{1.43}\) \((\text{HO}\text{SiO}_3)_{0.61}\) \(\Sigma=2.04\) - (2) “Ideal composition” indicated by author.

**Occurrence:** In the oxidized portion of a polymetallic sulfide mineral deposit.

**Association:** Chalcocite, quartz.

**Distribution:** From Tsumeb, Otjikoto region, Namibia (probably from the second oxidation zone).

**Name:** Honors Namibian mining engineer Dieter Ekat (1935-1996).

**Type Material:** Institute for Mineralogy and Crystal Chemistry, University of Stuttgart, Germany (NM20).

**References:** (1) Keller, P. (2001) Ekatite, \((\text{Fe}^{3+},\text{Fe}^{2+},\text{Zn})_{12}(\text{OH})_{6}[\text{AsO}_3]_6[\text{AsO}_3,\text{HO}\text{SiO}_3]_2\), a new mineral from Tsumeb, Namibia, and its crystal structure. Eur. J. Mineral., 13, 769-777.  