Adachiite

\[
\text{CaFe}_3\text{Al}_6(\text{Si}_{5.15}\text{AlO}_{18})(\text{BO}_3)_3(\text{OH})_3(\text{OH})
\]

Crystal Data: Hexagonal.  
Point Group: 3m.  
Crystals are hexagonal prismatic, to 2 cm.

Physical Properties:  
Cleavage: n.d.  
Fracture: n.d.  
Tenacity: n.d.  
Hardness = 7

D(meas.) = n.d.  
D(calc.) = 3.228

Optical Properties:  
Color: Brownish purple to bluish purple, black (massive aggregates).  
Streak: n.d.  
Luster: n.d.  
Pleochroism: Strong, \(O\) = dark green to dark blue, \(E\) = brownish yellow.

Optical Class: Uniaxial (−).  
\(\alpha = 1.674(2)\)  
\(\varepsilon = 1.644(2)\)

Cell Data:  
Space Group: R\(\overline{3}\)m.  
\(a = 15.9290(2)\)  
\(c = 7.1830(1)\)  
\(Z = 3\)

X-ray Powder Pattern:  
Kiura mine, Saiki City, Oita Prefecture, Japan.  
2.584 (100), 4.002 (65), 2.043 (52), 4.225 (40), 4.9602 (34), 3.4553 (34), 2.9027 (33)

Chemistry:  

<table>
<thead>
<tr>
<th>Element</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\text{Na}_2\text{O})</td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td>(\text{CaO})</td>
<td>3.34</td>
<td>5.24</td>
</tr>
<tr>
<td>(\text{MgO})</td>
<td>2.32</td>
<td></td>
</tr>
<tr>
<td>(\text{FeO})</td>
<td>11.90</td>
<td>20.15</td>
</tr>
<tr>
<td>(\text{B}_2\text{O}_3)</td>
<td>10.09</td>
<td>9.77</td>
</tr>
<tr>
<td>(\text{Al}_2\text{O}_3)</td>
<td>36.70</td>
<td>33.37</td>
</tr>
<tr>
<td>(\text{TiO}_2)</td>
<td>0.46</td>
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<tr>
<td>(\text{SiO}_2)</td>
<td>29.79</td>
<td>28.09</td>
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<tr>
<td>(\text{H}_2\text{O})</td>
<td>3.10</td>
<td>3.37</td>
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<tr>
<td>Total</td>
<td>98.54</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Kiura mine, Japan; average of 13 electron microprobe analyses, \(\text{H}_2\text{O}\) calculated from stoichiometry, \(\text{OH}^-\) confirmed by IR spectroscopy, \(\text{Fe}^{2+}\) estimated from structural analysis; corresponding to \(\text{Ca}_{0.62}\text{Na}_{0.28}\text{Fe}_{1.58}\text{Al}_{0.81}\text{Mg}_{0.55}\text{Ti}_{0.06}\text{B}_{0.55}\text{OH}_{0.56}\text{O}_{0.44}\).  
(2) \(\text{CaFe}_3\text{Al}_6(\text{Si}_{5.15}\text{AlO}_{18})(\text{BO}_3)_3(\text{OH})_3(\text{OH})\).

Mineral Group: Tourmaline group.

Occurrence: In a hydrothermal vein that cuts a lateritic metamorphic emery (corundum and hercynite) deposit.

Association: Margarite, chlorite, diaspore, schorl.

Distribution: From the Nabagasako adit, Kiura mine, Saiki City, Oita Prefecture, Japan.

Name: Honors Tomio Adachi (b. 1923), an amateur mineralogist.


References:  