Afmite  \( \text{Al}_3(\text{OH})_4(\text{H}_2\text{O})_3(\text{PO}_4)(\text{PO}_3\text{OH}) \cdot \text{H}_2\text{O} \)

**Crystal Data:** Triclinic.  *Point Group:* 1. Diamond-shaped crystals, tabular on {001} and elongated on [010], form cockscomb aggregates. Crystals display {001}, {100}, {110}, and {010}. *Twinning:* As ubiquitous polysynthetic twins on {001} or by rotation on [010] with composition planes {010} and {110}, forming star-like sixlings, which are slightly concave/convex (dish-like).

**Physical Properties:** *Cleavage:* Perfect on {001}, good on {010} and {110}. *Tenacity:* Flexible. *Hardness* \( \sim 1.5 \)  \( \text{D(meas.)} = 2.39(3) \)  \( \text{D(calc.)} = 2.394 \)


**Cell Data:** *Space Group:* P1.  \( a = 7.386(3) \)  \( b = 7.716(3) \)  \( c = 11.345(4) \)

**X-ray Powder Pattern:** Fumade, Castelnau-de-Brassac, Tarn, France. 11.089 (100), 3.540 (81), 5.484 (79), 2.918 (60), 3.089 (33), 4.022 (30), 6.826 (23)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
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</thead>
<tbody>
<tr>
<td>( \text{Al}_2\text{O}_3 )</td>
<td>40.20</td>
<td>36.41</td>
</tr>
<tr>
<td>( \text{P}_2\text{O}_5 )</td>
<td>38.84</td>
<td>35.17</td>
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<tr>
<td>( \text{H}_2\text{O} )</td>
<td>25.64</td>
<td>[28.42]</td>
</tr>
<tr>
<td>Total</td>
<td>103.68</td>
<td>100.00</td>
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</tbody>
</table>

(1) Fumade, Castelnau-de-Brassac, Tarn, France; average of 4 electron microprobe analyses, \( \text{PO}_3\text{OH}, \text{OH} \) and \( \text{H}_2\text{O} \) confirmed by IR and Raman spectroscopy. \( \text{H}_2\text{O} \) by CHN.

(2) Fumade, Castelnau-de-Brassac, Tarn, France; normalized electron microprobe analyses supplemented by IR and Raman spectroscopy, \( \text{H}_2\text{O} \) calculated from structure analysis.

**Occurrence:** A secondary mineral formed by remobilization and crystallization during low-temperature hydrothermal activity and/or weathering and ground water activity.

**Association:** Matulaite, variscite (France); kobokoboite (Democratic Republic of Congo).

**Distribution:** From Fumade, Castelnau-de-Brassac, Tarn, France. From the Bachman mine, Hellertown, Pennsylvania, USA. From the Kobokobo pegmatite, Democratic Republic of Congo.

**Name:** Honors the Association Française de Microminéralogie (AFM), an amateur association devoted to the collection and study of micro-minerals.

**Type Material:** Natural History Museum of Los Angeles County, Los Angeles, California, USA. (#55425).

**References:**
