Swaknoite

$\text{(NH}_4\text{)}_2\text{Ca(PO}_3\text{OH)}_2\cdot\text{H}_2\text{O}$

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Crystal Data: Orthorhombic. Point Group: n.d. Crystals are needlelike, elongate along [001], with {110}, {100}, {111}, {001}, to 1 mm, in rosettes; as coatings.

Physical Properties: Tenacity: Brittle. Hardness = Soft. D(meas.) = 1.91 D(calc.) = 1.89 Soluble on $\text{H}_2\text{O}$.

Optical Properties: Semitransparent. Color: White. Luster: Vitreous. Optical Class: Biaxial (-). Orientation: $X = b; Y = a; Z = c$. $\alpha = 1.506\quad\beta = 1.510\quad\gamma = 1.512\quad2V(\text{meas.}) = 65(10)^\circ\quad2V(\text{calc.}) = 70^\circ$

Cell Data: Space Group: n.d. $a = 20.959\quad b = 7.403\quad c = 6.478\quad Z = 4$

X-ray Powder Pattern: Arnhem Cave, Namibia. 6.99 (100), 3.705 (89), 10.5 (57), 3.177 (55), 3.651 (39), 4.739 (36), 5.24 (21)

Chemistry:

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
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<tbody>
<tr>
<td>$\text{P}_2\text{O}_5$</td>
<td>48.93</td>
<td>49.61</td>
</tr>
<tr>
<td>CaO</td>
<td>21.46</td>
<td>19.60</td>
</tr>
<tr>
<td>(NH$_4$)$_2$O</td>
<td>16.06</td>
<td>18.20</td>
</tr>
<tr>
<td>$\text{H}_2\text{O}$</td>
<td>12.78</td>
<td>12.59</td>
</tr>
<tr>
<td>Total</td>
<td>99.23</td>
<td>100.00</td>
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</table>

(1) Arnhem Cave, Namibia; by electron microprobe, NH$_4$ and H$_2$O by CHN analyzer; corresponds to (NH$_4$)$_{1.78}$Ca$_{1.10}$(PO$_3$OH)$_{1.96}$$\cdot$$1.05\text{H}_2\text{O}$. (2) (NH$_4$)$_2$Ca(PO$_3$OH)$_2$$\cdot$$\text{H}_2\text{O}$.

Polymorphism & Series: Dimorphous with mundrabillaite.

Occurrence: Formed from bat guano and urine by reaction with cave walls.

Association: Mundrabillaite, dittmarite, arcanite, dolomite.

Distribution: Found in Arnhem Cave, 150 km east of Windhoek, Namibia.

Name: From Suid Wes Africa Karst Navorsing Organisasie (SWAKNO), a speleological exploration organization, the members of which noted the species.

Type Material: State Museum, Windhoek, Namibia; Transvaal Museum, Pretoria, South Africa.