Pararobertsite: Ca$_2$Mn$_3^{3+}$O$_2$(PO$_4$)$_3$•3H$_2$O

Crystal Data: Monoclinic. Point Group: 2/m. Platy triangular crystals, tabular on {100}, to 0.2 mm, and in subparallel aggregates.


Cell Data: Space Group: $P2_1/c$. $a = 8.825(3)$ $b = 13.258(4)$ $c = 11.087(3)$ $\beta = 101.19(4)$° $Z = 4$

X-ray Powder Pattern: Tip Top mine, South Dakota, USA. 8.69 (100), 2.772 (70), 5.66 (60), 2.884 (60), 2.611 (60), 2.163 (60), 5.44 (50)

Chemistry:

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P$_2$O$_5$</td>
<td>35.2</td>
<td>34.57</td>
</tr>
<tr>
<td>Fe$_2$O$_3$</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Mn$_2$O$_3$</td>
<td>38.0</td>
<td>38.45</td>
</tr>
<tr>
<td>CaO</td>
<td>18.3</td>
<td>18.21</td>
</tr>
<tr>
<td>H$_2$O</td>
<td>[8.4]</td>
<td>8.77</td>
</tr>
</tbody>
</table>

Total [100.0] 100.00

(1) Tip Top mine, South Dakota, USA; by electron microprobe, total Fe as Fe$_2$O$_3$, total Mn as Mn$_2$O$_3$, H$_2$O by difference; corresponds to Ca$_{2.01}$Mn$_{2.97}$Fe$_{0.01}$O$_{2.98}$P$_{1.88}$O$_{4.93}$•2.88H$_2$O.

(2) Ca$_2$Mn$_3$O$_2$(PO$_4$)$_3$•3H$_2$O.

Polymorphism & Series: Dimorphous with robertsite.

Occurrence: A rare secondary mineral in a complex zoned granite pegmatite.

Association: Whitlockite, carbonate-apatite, quartz.

Distribution: In the Tip Top mine, 8.5 km southwest of Custer, Custer Co., South Dakota, USA.

Name: From the Greek para, for near, and its relation to robertsite.

