Palermoite \((\text{Li}, \text{Na})_2(\text{Sr}, \text{Ca})\text{Al}_4(\text{PO}_4)_4(\text{OH})_4\)

©2001-2005 Mineral Data Publishing, version 1

Crystal Data: Orthorhombic. **Point Group:** \(2/m 2/m 2/m\). Long prismatic crystals, showing \{100\}, \{010\}, \{110\}, \{031\}, \{011\}, striated \([100]\), to 5 mm; granular.

Physical Properties: **Cleavage:** On \{001\}, perfect; on \{100\}, fair. **Fracture:** Fibrous to subconchoidal. **Tenacity:** Brittle. Hardness = 5.5 D(meas.) = 3.22 D(calc.) = 3.26 White cathodoluminescence in X-ray beam.

Optical Properties: **Semitransparent.** **Color:** Colorless, white, pale pink. **Streak:** White. **Luster:** Vitreous to subadamantine. **Optical Class:** Biaxial (−). **Orientation:** \(X = a; Y = c; Z = b\). **Dispersion:** \(r < v\), moderate. \(\alpha = 1.627\) \(\beta = 1.642\) \(\gamma = 1.644\) 2V(meas.) ∼20°

Cell Data: **Space Group:** \(\text{Im} \bar{c} b\). \(a = 11.556(5)\) \(b = 15.847(7)\) \(c = 7.315(4)\) \(Z = 4\)

X-ray Powder Pattern: Palermo #1 mine, New Hampshire, USA. 3.089 (100), 4.360 (64), 3.129 (60), 2.905 (53), 3.320 (52), 2.596 (48), 2.436 (46)

Chemistry:

<table>
<thead>
<tr>
<th>(\text{P}_2\text{O}_5)</th>
<th>(1) 42.89 (2) 43.65</th>
<th>BaO</th>
<th>0.10</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\text{Al}_2\text{O}_3)</td>
<td>30.83</td>
<td>(\text{Li}_2\text{O})</td>
<td>4.00</td>
</tr>
<tr>
<td>(\text{Fe}_2\text{O}_3)</td>
<td>0.30</td>
<td>(\text{Na}_2\text{O})</td>
<td>1.32</td>
</tr>
<tr>
<td>FeO</td>
<td>0.00</td>
<td>(\text{K}_2\text{O})</td>
<td>0.10</td>
</tr>
<tr>
<td>MgO</td>
<td>0.10</td>
<td>(\text{H}_2\text{O}^+)</td>
<td>5.36</td>
</tr>
<tr>
<td>CaO</td>
<td>1.39</td>
<td>(\text{H}_2\text{O}^-)</td>
<td>0.30</td>
</tr>
<tr>
<td>SrO</td>
<td>12.93</td>
<td>13.34</td>
<td>Total 99.69</td>
</tr>
</tbody>
</table>

(1) Palermo #1 mine, New Hampshire, USA; corresponds to \((\text{Li}_{1.74} \text{Na}_{0.28}\text{K}_{0.01})\Sigma = 2.03\) \((\text{Sr}_{0.81} \text{Ca}_{0.16}\text{Fe}_{0.02}\text{Mg}_{0.02})\Sigma = 1.01\) \((\text{Al}_{3.93}\text{PO}_4)_{3.92}(\text{OH})_{3.87}\). (2) Giogo di Toirano, Italy; partial analysis by electron microprobe, total Fe as FeO.

Occurrence: A late hydrothermal product in a complex zoned granite pegmatite (Palermo #1 mine, New Hampshire, USA); near quartz veins in sandstones and conglomerates subjected to greenschist metamorphism (Giogo di Toirano, Italy).

Association: Siderite, childrenite–esphorite, beraunite, crandallite, whitlockite, brazilianite, goyazite, apatite, quartz (Palermo #1 mine, New Hampshire, USA); lazulite, goyazite, brazilianite (Giogo di Toirano, Italy).

Distribution: In the Palermo #1 mine, near North Groton, Grafton Co., New Hampshire, USA. From Giogo di Toirano, near Bardinetto, Liguria, Italy. In the Xiyuantou pegmatite, Nanping, Fujian Province, China.

Name: For its occurrence at the Palermo #1 mine, New Hampshire, USA.

Type Material: Harvard University, Cambridge, Massachusetts, USA, 101342.


All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of Mineral Data Publishing.