Sidorenkite \( \text{Na}_3\text{Mn}^{2+}(\text{PO}_4)(\text{CO}_3) \)

**Crystal Data:** Monoclinic, pseudo-orthorhombic. *Point Group:* 2/m or 2. Crystals, elongated along [001], are boxlike, showing \{100\}, \{010\}, rarely \{001\}, to 3 cm; granular.

**Physical Properties:**  
**Cleavage:** On \{100\} and \{010\}, perfect; on \{001\}, imperfect.  
**Fracture:** Uneven.  
**Tenacity:** Brittle. Hardness = \(~2\) D(meas.) = 2.90–3.03 D(calc.) = 2.98

**Strongly electromagnetic.**

**Optical Properties:**  
**Transparency:** Transparent.  
**Color:** Colorless, pale rose-red to pale pink, with surficial brownish or yellowish tint.  
**Luster:** Vitreous, pearly on cleavages.  
**Optical Class:** Biaxial (−).  
**Orientation:** \( X = b; Y = c; Z = a. \) \( \alpha = 1.521(2) \) \( \beta = 1.563(2) \) \( \gamma = 1.585(2) \) \( 2V(\text{meas.}) = 68^\circ \) \( 2V(\text{calc.}) = 70^\circ \)

**Cell Data:**  
**Space Group:** \( P2_1/m \) or \( P2_1 \).  
\( a = 8.997(4) \)  
\( b = 6.741(2) \)  
\( c = 5.163(2) \)  
\( \beta = 90.16(4)^\circ \)  
\( Z = 2 \)

**X-ray Powder Pattern:** Mt. Alluaiv, Kola Peninsula, Russia.
3.36 (100), 8.97 (20), 1.682 (20), 2.69 (15), 2.99 (12), 2.243 (12), 2.58 (8)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>Step 1</th>
<th>Step 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{P}_2\text{O}_5 )</td>
<td>25.77</td>
<td>25.45</td>
</tr>
<tr>
<td>( \text{CO}_2 )</td>
<td>15.71</td>
<td>15.78</td>
</tr>
<tr>
<td>( \text{FeO} )</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td>( \text{MnO} )</td>
<td>22.40</td>
<td>25.44</td>
</tr>
<tr>
<td>( \text{MgO} )</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>( \text{CaO} )</td>
<td>2.20</td>
<td></td>
</tr>
<tr>
<td>( \text{Na}_2\text{O} )</td>
<td>32.36</td>
<td>33.33</td>
</tr>
<tr>
<td>( \text{K}_2\text{O} )</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>99.37</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Mt. Alluaiv, Kola Peninsula, Russia; corresponds to \((\text{Na}_{2.93}\text{K}_{0.03})\Sigma=2.96(\text{Mn}_{0.89}\text{Ca}_{0.11})\Sigma=1.00\text{Fe}_{0.02}(\text{PO}_4)_{1.02}(\text{CO}_3)_{1.00}.\)  
(2) \( \text{Na}_3\text{Mn}(\text{PO}_4)(\text{CO}_3).\)

**Occurrence:** A rare low-temperature hydrothermal mineral, formed very late in the crystallization of hyperagpaitic pegmatites in a differentiated alkalic massif (Mt. Alluaiv, Kola Peninsula, Russia); in sodalite syenite xenoliths associated with an intrusive alkalic gabbro-syenite complex (Mont Saint-Hilaire, Canada).

**Association:** Villiaumite, kogarkoite, thermonatrite, aegirine (Mt. Alluaiv, Kola Peninsula, Russia); rasvumite, ussingite, villiaumite (Mont Saint-Hilaire, Canada).

**Distribution:** From Mt. Alluaiv, Lovozero massif, and in the Khibiny massif, Kola Peninsula, Russia. On Mont Saint-Hilaire, Quebec, Canada.

**Name:** Honors Academician Aleksandr Vasil’evich Sidorenko (1917–1982), noted Russian geologist, a founder of the Kola Branch of the Russian Academy of Sciences.

**Type Material:** Geology Museum, Kola Branch, Academy of Sciences, Apatity, 5198; Mining Institute, St. Petersburg, 1110/1–2; Vernadsky Geological Museum, Moscow, 51718; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 79775.

**References:**  
(2) (1979) Amer. Mineral., 64, 1332 (abs. ref. 1).  

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.