Magnesio-riebeckite

\[ \text{Na}_2[(\text{Mg}, \text{Fe}^{2+})_3\text{Fe}^{3+}_2]\text{Si}_8\text{O}_{22}(\text{OH})_2] \]

Crystal Data: Monoclinic. Point Group: 2/m. [As prismatic crystals. Also columnar, fibrous, or granular aggregates.] Twinning: [Simple or multiple twinning \( || \{100\}.\)]

Physical Properties: Cleavage Perfect on \( \{110\} \), intersecting at \( \sim 58^\circ \) and \( \sim 122^\circ \); partings on \( \{010\} \), \( \{001\}.\] Fracture: [Conchoidal to uneven.] Tenacity: [Brittle.] Hardness = 6

D(meas.) = 3.12–3.29 D(calc.) = [3.15]

Optical Properties: Semitransparent. Color: Blue, black; light blue in thin section.

Luster: [Vitreous.]

Optical Class: Biaxial (+) or (−). Pleochroism: Strong; \( X = \) dark blue; \( Y = \) indigo;
\( Z = \) yellow-green. Orientation: \( Y = b \); \( X \wedge c = 15^\circ–32^\circ. \)

\( \alpha = 1.657–1.673 \quad \beta = 1.660–1.677 \quad \gamma = 1.657–1.675 \quad 2V(\text{meas.}) = 0^\circ–80^\circ \)

Cell Data: Space Group: \( C2/m \). \( a = 9.745 \quad b = 17.912 \quad c = 5.278 \quad \beta = 103.49^\circ \quad Z = 2 \)

X-ray Powder Pattern: Puolanka, Finland. (ICDD 29-1236). 3.09 (100), 8.35 (99), 4.23 (20), 3.25 (18), 4.49 (16), 2.692 (12), 3.40 (9)

Chemistry:

<table>
<thead>
<tr>
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<th>(1)</th>
<th>(2)</th>
<th>(1)</th>
<th>(2)</th>
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<tbody>
<tr>
<td>( \text{SiO}_3 )</td>
<td>54.84</td>
<td>56.1</td>
<td>8.91</td>
<td>14.5</td>
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<tr>
<td>( \text{TiO}_2 )</td>
<td>0.27</td>
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<td>2.74</td>
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<td>( \text{Al}_2\text{O}_3 )</td>
<td>1.80</td>
<td>0.66</td>
<td>5.58</td>
<td>5.05</td>
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<td>( \text{Fe}_2\text{O}_3 )</td>
<td>11.69</td>
<td>15.6</td>
<td>0.16</td>
<td>0.71</td>
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<tr>
<td>( \text{FeO} )</td>
<td>12.11</td>
<td>4.06</td>
<td>( \text{H}_2\text{O}^+ )</td>
<td>[2.21]</td>
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<tr>
<td>( \text{MnO} )</td>
<td>0.43</td>
<td></td>
<td>( \text{H}_2\text{O}^- )</td>
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<tr>
<td>Total</td>
<td>98.53</td>
<td></td>
<td>[100.03]</td>
<td></td>
</tr>
</tbody>
</table>

(1) Kodiak Islands, Alaska, USA; by electron microprobe, \( \text{Fe}^{2+} : \text{Fe}^{3+} \) calculated; corresponding to \( (\text{Na}_{1.56} \text{Ca}_{0.43} \text{K}_{0.03})_2 \text{(H}_{2}\text{O})_2 \text{Si}_{8} \text{O}_{22}(\text{OH})_{2} \).

(2) Cochabamba Province, Bolivia; \( \text{H}_2\text{O} \) calculated from stoichiometry, corresponding to \( (\text{Na}_{1.38} \text{Ca}_{0.17} \text{K}_{0.13}) \text{Si}_{8} \text{O}_{22}(\text{OH})_{2} \).

Polymorphism & Series: Forms a series with riebeckite.

Mineral Group: Amphibole (alkali) group: \( \text{Fe}^{2+} / (\text{Fe}^{3+} + \text{Mg}) < 0.5; \text{Fe}^{3+} / (\text{Fe}^{3+} + \text{Al}^{3+}) \geq 0.7; (\text{Na} + K)_A < 0.5; (\text{Na} + \text{K})_B \geq 1.34. \)

Occurrence: In granulites, ironstones, ferruginous metacherts, greenschist facies schists, and carbonatites.

Association: Stilpnomelane, epidote, quartz, muscovite, winchite.

Distribution: Many localities; may be in large deposits of asbestiform material. In the Ternovsk mine, Krivoy Rog basin, Ukraine. From the Norra Kärr complex, near Grämm, Sweden. In Bolivia, around Chapare, Cochabamba Province. In South Africa, over a large area from Koegeas, Cape Province, to Botswana, and to the east of Pietersburg, Transvaal. At Lusaka, Zambia. Through the Hamersley Ranges, Western Australia. At Bizen and Suberidani, Tokushima Prefecture, Japan. In the USA, at Franklin, Sussex Co., New Jersey.

Name: For its high magnesium content and similarity to riebeckite.

Type Material: n.d.


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