Winchite

\[ \text{[NaCa]}[(\text{Mg, Fe}^{2+})_4\text{Al}]\text{Si}_8\text{O}_{22}(\text{OH})_2 \]

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Crystal Data: Monoclinic. Point Group: 2/m. In stout prismatic to acicular crystals, to 4 cm. As blades, fibers, and in rosettes or spherules.

Physical Properties: Cleavage: [Perfect on \{110\}, intersecting at \sim 56^\circ and \sim 124^\circ; partings on \{100\}, \{001\}.] Fracture: [Uneven.] Tenacity: [Brittle.] Hardness = [5–6] D(meas.) = 2.97–3.175 D(calc.) = [3.02]. Crystals are commonly strongly zoned chemically.

Optical Properties: Transparent to translucent. Color: Colorless, cobalt blue to bluish violet; colorless to pale blue in thin section. Luster: [Vitreous.]

Optical Class: Biaxial (-). Pleochroism: X = colorless; Y = light blue-violet; Z = light blue.

Orientation: [Z \wedge c = 16^\circ.] Dispersion: \( r > v \), strong. \( \alpha = 1.629 \quad \beta = 1.643 \quad \gamma = 1.650 \)

2V(meas.) = 64(2)°

Cell Data: Space Group: C2/m. \( a = 9.834 \) (ICDD 20-1390). \( b = 18.062 \quad c = 5.300 \)

\( \beta = 104.449^\circ \quad Z = 2 \)

X-ray Powder Pattern: Kajlidongri mine, India. (ICDD 20-1390). 2.699 (100), 8.40 (90), 2.528 (90), 4.48 (70), 3.40 (70), 3.12 (50), 2.976 (40)

Chemistry:

<table>
<thead>
<tr>
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<th>(1)</th>
<th>(2)</th>
<th>(1)</th>
<th>(2)</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{SiO}_2 )</td>
<td>56.08</td>
<td>54.41</td>
<td>FeO</td>
<td>6.09</td>
<td>Na(_2)O</td>
<td>3.48</td>
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<tr>
<td>( \text{TiO}_2 )</td>
<td>0.00</td>
<td>0.20</td>
<td>MnO</td>
<td>0.67</td>
<td>K(_2)O</td>
<td>0.55</td>
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<tr>
<td>( \text{Al}_2\text{O}_3 )</td>
<td>1.91</td>
<td>7.00</td>
<td>MgO</td>
<td>20.66</td>
<td>14.25</td>
<td></td>
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<tr>
<td>( \text{Fe}_2\text{O}_3 )</td>
<td>5.27</td>
<td>4.72</td>
<td>CaO</td>
<td>8.56</td>
<td>6.32</td>
<td></td>
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</tbody>
</table>

(1) Kajlidongri mine, India: by electron microprobe, total Fe as Fe\(_2\)O\(_3\); corresponds to \( (\text{Ca}_{1.27}\text{Na}_{0.94}\text{K}_{0.10})_2\Sigma=2.31(\text{Mg}_{0.47}\text{Fe}^{2+}_{0.53}\text{Al}_{0.09}\text{Mn}_{0.09})_2\Sigma=4.99(\text{Si}_{7.78}\text{Al}_{0.22})_2\Sigma=8.00\text{O}_{22}(\text{OH})_2 \).

(2) Margarita Island, Venezuela: by electron microprobe, \( \text{Fe}^{2+}:\text{Fe}^{3+} \) calculated from stoichiometry; corresponds to \( (\text{Na}_{1.09}\text{Ca}_{0.95}\text{K}_{0.03})_2\Sigma=2.07(\text{Mg}_{5.97}\text{Al}_{0.73}\text{Fe}^{2+}_{0.71}\text{Fe}^{3+}_{0.50})_2\Sigma=8.00\text{O}_{22}(\text{OH})_2 \).

Polymorphism & Series: Forms a series with ferrowinchite.

Mineral Group: Amphibole (sodic-calcic) group: \( \text{Mg}/(\text{Mg} + \text{Fe}^{2+}) \geq 0.5 \); \( (\text{Na} + \text{K})_A < 0.5 \); 0.67 \( \text{Na}_B \); 1.33; \( (\text{Ca} + \text{Na})_B \geq 1.34; \text{Si} \geq 7.5 \).

Occurrence: In schists with low-grade metamorphosed manganese deposits; in metabasalts of the jadeite-glaucophane and amphibolite-eclogite facies; in manganiferous cherts that have undergone blueschist facies metamorphism.

Association: Calcite, microcline, diopside, plagioclase, apatite, tremolite (Kajlidongri mine, India); omphacite, garnet, rutile, quartz, actinolite, epidote, albite, titanite, apatite (Margarita Island, Venezuela); actinolite, glaucophane, albite, quartz (Ward Creek, California, USA).

Distribution: In the Kajlidongri mine, Jhabua district, Madya Pradesh, India. From near El Valle del Espiritu Santo, Margarita Island, Venezuela. In the Praborna mine, near St. Marcel, Val d’Aosta, Italy. At Ward Creek, Cazadero, Sonoma Co., California, USA. From north of Kitami City, Hokkaido, Japan.

Name: For H.J. Winch, who first found the mineral.

Type Material: n.d.

References:


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