Microcline  \( \text{KAlSi}_3\text{O}_8 \)

Crystal Data:  Triclinic. Point Group: \( \overline{1} \). Prismatic crystals elongated along \([001]\) or \([100]\), perhaps the largest of any species, to 50 m and 13,500 t. Cleavable to granular, massive. Commonly exhibits banded perthitic intergrowths from exsolution of albite. Twinning: Carlsbad, Baveno, and Manebach laws very common; polysynthetic twinning on the Albite and Pericline laws give an orthogonal grid pattern on \( (001) \).

Physical Properties:  Cleavage: Perfect on \([001]\) and \([010]\), intersecting at \( \sim 90^\circ \); partings on \([100]\), \([110]\), \([\overline{1}10]\), and \([201]\). Fracture: Uneven. Tenacity: Brittle. Hardness = 6–6.5

\[ \begin{align*}
D(\text{meas.}) & = 2.54–2.57 \\
D(\text{calc.}) & = 2.56
\end{align*} \]

Optical Properties:  Transparent to translucent. Color: White, pale cream-yellow; red, green, blue; colorless in thin section. Luster: Vitreous, pearly on cleavage.

Optical Class:  Biaxial (−). Orientation: \( X \cap (001) = 15^\circ \). Dispersion: \( r > v \), weak.

\[ \begin{align*}
\alpha & = 1.514–1.529 \\
\beta & = 1.518–1.533 \\
\gamma & = 1.521–1.539 \\
2V(\text{meas.}) & = 66^\circ–103^\circ
\end{align*} \]

Cell Data:  Space Group: \( \text{C}\overline{1} \). \( a = 8.5784 \quad b = 12.9600 \quad c = 7.2112 \quad \alpha = 90^\circ18' \quad \beta = 115^\circ58' \quad \gamma = 87^\circ7.5' \quad Z = 4 \)


Chemistry:

<table>
<thead>
<tr>
<th>Element</th>
<th>Formula</th>
<th>Measurement</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO₂</td>
<td>64.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Al₂O₃</td>
<td>18.55</td>
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<tr>
<td>Fe₂O₃</td>
<td>0.14</td>
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<tr>
<td>CaO</td>
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<tr>
<td>Na₂O</td>
<td>0.49</td>
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<td>K₂O</td>
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<tr>
<td>H₂O</td>
<td>+0.06</td>
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</tr>
<tr>
<td>Total</td>
<td></td>
<td>99.94</td>
<td></td>
</tr>
</tbody>
</table>

Chemistry: \( (\text{K}_{0.95}\text{Na}_{0.04}\text{Ca}_{0.01})\Sigma=1.00\text{Al}_{1.01}\text{Si}_{2.98}\text{O}_8 \).

Polymorphism & Series:  Dimorphous with orthoclase.

Mineral Group:  Feldspar (alkali) group; (Si,Al) is completely ordered in low microcline.

Occurrence:  Common in plutonic felsic rocks, as granites, granite pegmatites, syenites; in metamorphic rocks of the greenschist and amphibolite facies; in hydrothermal veins. A detrital component in sedimentary rocks and as authigenic overgrowths.

Association:  Quartz, sodic plagioclase, muscovite, biotite, “hornblende.”


Name:  From the Greek for “little” and “inclined,” for the small deviation of the cleavage planes from 90°.


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