Ferrosilite

\((\text{Fe}^{2+}, \text{Mg})_2\text{Si}_2\text{O}_6\)

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Crystal Data: Orthorhombic. Point Group: \(2/m 2/m 2/m\). As coarse anhedral to subhedral grains, up to 5 mm. Twinning: On \(\{100\}\).

Physical Properties: Cleavage: Good on \(\{210\}\), \((210) \wedge (2\overline{7}0) \approx 88^\circ\); partings on \(\{100\}\), \(\{010\}\). Hardness = 5–6  \(D(\text{meas.}) = 3.96\)  \(D(\text{calc.}) = [3.87]\)

Optical Properties: Semitransparent. Color: Green, dark brown; greenish or reddish in thin section.

Optical Class: Biaxial (-). Orientation: \(X = b\). Dispersion: \(r < v\), strong. \(\alpha = 1.755-1.768\) \(\beta = 1.763-1.770\) \(\gamma = 1.772-1.788\) \(2V(\text{meas.}) = 55^\circ-90^\circ\)

Cell Data: Space Group: \(Pbca\). \(a = 18.431\) \(b = 9.080\) \(c = 5.238\) \(Z = 8\)


3.21 (100), 2.892 (75), 2.504 (55), 2.577 (50), 2.126 (50), 2.979 (45), 4.58 (35)

Chemistry:

\[
\begin{array}{l}
\text{SiO}_2 & 44.43 \\
\text{TiO}_2 & 0.12 \\
\text{Al}_2\text{O}_3 & 2.96 \\
\text{Fe}_2\text{O}_3 & 0.70 \\
\text{FeO} & 44.91 \\
\text{MnO} & 1.20 \\
\text{MgO} & 3.38 \\
\text{CaO} & 1.69 \\
\text{Na}_2\text{O} & 0.07 \\
\text{K}_2\text{O} & 0.05 \\
\text{Total} & 99.51 \\
\end{array}
\]

(1) Bauchi, Nigeria; corresponds to \((\text{Fe}^{2+}_{1.60}, \text{Mg}_{0.21}, \text{Ca}_{0.08}, \text{Mn}_{0.04}, \text{Fe}^{3+}_{0.02}, \text{Na}_{0.01})\Sigma=1.96 \\
(\text{Si}_{1.96}\text{Al}_{0.10})\Sigma=2.06\text{O}_6\).

Polymorphism & Series: Dimorphous with clinoferrrosilite; forms a series with enstatite.

Mineral Group: Pyroxene group.

Occurrence: In medium- to high-grade metamorphosed iron formations.

Association: Magnetite, hematite, ferroan diopside, quartz, almandine.

Distribution: From Bauchi, Nigeria. At Tirí, Mauritania. From Oribi Gorge, Marble Delta, Natal, South Africa. In the USA, in Montana, around Copper Mountain and Carmichael Creek, in the Tobacco Root Mountains; in the Ruby Creek area, in the Gravelly Range, Madison Co.; also the Carter Creek area, in the Ruby Mountains, Beaverhead and Madison Cos.; and in Utah, at Hanksville, Wayne Co. On Arcedeanek Island, District of Franklin, Arctic Canada.

Name: For FERROus iron and SILicon in the composition; originally a “normative” mineral in rocks.


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