Tephroite

\[ \text{Mn}^{2+}_2 \text{SiO}_4 \]

Crystal Data: Orthorhombic. Point Group: \(2/m 2/m 2/m\). Crystals typically short, prismatic, to 4 cm, or anhedral, equidimensional. Commonly in disseminated grains, compact, or massive. Twinning: \{011\}, not common.


Optical Class: Biaxial (−). Pleochroism: None or weak; \(X = \) brownish red; \(Y = \) reddish; \(Z = \) greenish blue. Orientation: \(X = b; Y = c; Z = a\). Dispersion: \(r > v\). \(\alpha = 1.770–1.788\) \(\beta = 1.807–1.810\) \(\gamma = 1.817–1.825\) 2V(meas.) = 60°–70°

Cell Data: Space Group: \(Pbnm\). \(a = 4.86–4.90\) \(b = 10.59–10.62\) \(c = 6.22–6.25\) \(Z = 4\)

2.560 (100), 2.867 (90), 1.814 (72), 2.607 (67), 3.627 (50), 1.565 (33), 2.695 (30)

Chemistry:

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO₂</td>
<td>29.27</td>
<td>29.75</td>
</tr>
<tr>
<td>FeO</td>
<td>1.20</td>
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<tr>
<td>MnO</td>
<td>65.23</td>
<td>70.25</td>
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<tr>
<td>MgO</td>
<td>1.98</td>
<td></td>
</tr>
<tr>
<td>CaO</td>
<td>2.32</td>
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</tr>
<tr>
<td>Total</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Benallt mine, Wales; corresponds to \((\text{Mn}^{2+}_{1.84} \text{Mg}_{0.10} \text{Ca}_{0.08} \text{Fe}^{2+}_{0.03})_c = 2.05 \text{Si}_{0.97} \text{O}_4\) · (2) \(\text{Mn}_2\text{SiO}_4\)

Polymorphism & Series: Forms two series, with fayalite, and with forsterite.

Mineral Group: Olivine group.

Occurrence: In Fe–Mn ore deposits, related skarns, and metamorphosed manganese-rich sediments.

Association: Zincite, willemite, franklinite, rhodonite, jacobsite, diopside, gageite, bustamite, manganocalcite, glaucochroite, calcite, banalsite, alleghanyite.

Distribution: In the USA, from Franklin and Sterling Hill, Ogdensburg, Sussex Co., New Jersey; at Bald Knob, near Sparta, Alleghany Co., North Carolina; and in the Sunnyside mine, San Juan Co., Colorado. From Buritirama, Piauí, Brazil. In the Harstigen mine, near Persberg; at Långban, Värmland; and in the Sjö mine, near Grythyttan, Örebro, Sweden. From the Benallt mine, near Rhiw, Lleyn Peninsula, Gwennyd, Wales. In the Meldon quarry, Okehampton, Devon, and the Treburland mine, Altarnun, Cornwall, England. At Val Malenco, Lombardy, Italy. From Bonneval-sur-Arc, Haute-Maurienne, Isère, France. Large crystals from the Wessels mine, near Kuruman, Cape Province, South Africa. In the Kaso mine, Totigi Prefecture, and the Noda-Tamagawa mine, Iwate Prefecture, Japan. From Broken Hill and Tamworth, New South Wales, Australia. On the Clark Peninsula, Wilkes Land, Antarctica.

Name: From the Greek for ash-colored.

Type Material: Mining Academy, Freiberg, Germany, 23653.

References:

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