**Spessartine**

\[
\text{Mn}^{2+}_3\text{Al}_2(\text{SiO}_4)_3
\]

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**Crystal Data:** Cubic. Point Group: \(4/m \bar{3}m\). Commonly as euhedral crystals, dodecahedra or trapezohedra, or in combination with other cubic forms, to 10 cm. Fine or coarse granular, compact, massive.

**Physical Properties:** Fracture: Uneven to conchoidal. Tenacity: Brittle. Hardness = 7–7.5

\[
\text{D(meas.)} = 4.190 \quad \text{D(calc.)} = 4.179
\]

**Optical Properties:** Transparent to translucent. Color: Red, reddish orange, yellow, yellowish brown, reddish brown, brown, black; pale pink to pale brown in thin section, may be sectored.


Optical Class: Isotropic; may show weak anisotropy. Dispersion: Weak. \(n = 1.800\)

**Cell Data:** Space Group: \(Ia\bar{3}d\). \(a = 11.621 \quad Z = 8\)

**X-ray Powder Pattern:** Synthetic.

2.60 (100), 1.557 (40), 1.614 (30), 2.91 (25), 1.886 (20), 1.681 (20), 2.37 (16)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\text{SiO}_2)</td>
<td>35.33</td>
<td>36.41</td>
</tr>
<tr>
<td>(\text{TiO}_2)</td>
<td>trace</td>
<td></td>
</tr>
<tr>
<td>(\text{Al}_2\text{O}_3)</td>
<td>21.50</td>
<td>20.60</td>
</tr>
<tr>
<td>(\text{FeO})</td>
<td>trace</td>
<td></td>
</tr>
<tr>
<td>(\text{MnO})</td>
<td>41.06</td>
<td>42.99</td>
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<tr>
<td>(\text{MgO})</td>
<td>trace</td>
<td></td>
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<tr>
<td>(\text{CaO})</td>
<td>1.02</td>
<td></td>
</tr>
<tr>
<td>(\text{H}_2\text{O})</td>
<td>0.86</td>
<td></td>
</tr>
</tbody>
</table>

Total 99.77 100.00

(1) Kinko mine, Yamaguchi Prefecture, Japan; corresponds to \((\text{Mn}^{2.82}\text{Ca}^{0.09})\Sigma=2.91\) \(\text{Al}_{1.92}(\text{Si}_{2.86}\text{Al}_{0.14})\Sigma=3.00\text{O}_{12}\). (2) \(\text{Mn}_3\text{Al}_2(\text{SiO}_4)_3\).

**Polymorphism & Series:** Forms a series with almandine.

**Mineral Group:** Garnet group.

**Occurrence:** Common in granite pegmatites, granites, and rhyolites. Formed in some skarns and metasomatic manganese-rich rocks adjacent to igneous intrusions or in regionally metasomatized areas.

**Association:** Quartz, potassic feldspar, tourmaline, rhodonite, pyroxmangite, tephroite, alleghanite, galaxite, muscovite, topaz, apatite, beryl, albite, bixbyite, pseudobrookite.


**Name:** For the locality near Spessart, Germany.

**References:**


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