Simferite

Li(Mg,Fe$^{3+}$,Mn$^{3+}$)$_2$(PO$_4$)$_2$

Crystal Data: Orthorhombic.  

**Point Group:** $2/m$ $2/m$ $2/m$ or $mm2$.  

As equant grains to 3 mm.  

Rare crystals, to 0.1 mm, are tabular, with [001], [010], [110], [120].  

**Twinning:** Common as simple interpenetration twins.

Physical Properties: 

**Cleavage:** Prominent on {010}, poor on {100}, intersecting at 87-90°.  

**Fracture:** Uneven to conchoidal.  

**Hardness:** n.d.  

**VHN:** 457(30) (100 g load).  

**D(meas.)** = 3.22-3.27  

**D(calc.)** = 3.25

Optical Properties: 

**Semitransparent.**  

**Color:** Dark red to nearly black.  

**Streak:** Cinnamon-brown.  

**Luster:** Vitreous to greasy.  

**Optical Class:** Biaxial (+).  

$\alpha$ = 1.690-1.704  

$\beta$ = 1.702-1.716  

$\gamma$ = 1.712-1.726  

$2V$(meas.) = 54°-60°  

**Pleochroism:** Intense, $X$ = light brown to red; $Y$ = brownish yellow to brown; $Z$ = yellow to reddish yellow.  

**Orientation:** $X$ = c, $Y$ = a, $Z$ = b.  

**Dispersion:** Strong, $r > v$.  

Cell Data: 

**Space Group:** Pbnm or Pbn$_2$.  

$a$ = 4.7468(7)  

$b$ = 10.101(2)  

$c$ = 5.8992(7)  

$Z$ = 2

X-ray Powder Pattern: Radionovskoye pegmatite field, Ukraine.

2.48 (10), 4.30 (9), 2.93 (8), 3.85 (6), 3.45 (6), 2.42 (6), 2.23 (6)

Chemistry:

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P$_2$O$_5$</td>
<td>51.90</td>
<td>51.00</td>
</tr>
<tr>
<td>Fe$_2$O$_3$</td>
<td>16.87</td>
<td>17.39</td>
</tr>
<tr>
<td>Mn$_2$O$_3$</td>
<td>9.84</td>
<td>14.83</td>
</tr>
<tr>
<td>MgO</td>
<td>15.78</td>
<td>12.36</td>
</tr>
<tr>
<td>CaO</td>
<td>0.00</td>
<td>0.08</td>
</tr>
<tr>
<td>Li$_2$O</td>
<td>[5.45]</td>
<td>[5.35]</td>
</tr>
</tbody>
</table>

Total: 99.84 101.01

(1) Radionovskoye pegmatite field, Ukraine, electron microprobe analysis supplemented by spectroscopy, Li$_2$O calculated; corresponds to Li$_{1.00}(\text{Mg}_{1.06}\text{Fe}^{3+}_{0.57}\text{Mn}^{3+}_{0.34})_2\text{P}_2\text{O}_7$.  

(2) Do.; corresponds to Li$_{0.98}(\text{Mg}_{0.85}\text{Fe}^{3+}_{0.60}\text{Mn}^{3+}_{0.52})_2\text{P}_2\text{O}_7$.

Occurrence: At the contact of a rare-earth-bearing granite pegmatite and phlogopitized ultramafic tremolite rock.

Association: Muscovite, quartz, oligoclase, albite, phlogopite, tourmaline, apatite.

Distribution: In the Radionovskoye pegmatite field, middle Berda River, Zaporozhe district, Ukraine.

Name: For the city of Simferopol, Crimea, Ukraine, where the mineral was studied.

Type Material: A.E. Fersman Museum, Russian Academy of Sciences, Moscow, Russia.

References:  


