**Vestaite**

$(\text{Ti}^{4+}\text{Fe}^{2+})\text{Ti}^{4+}\text{O}_9$

**Crystal Data:** Monoclinic.  *Point Group:* $2/m$.  As euhedral to subhedral columnar to platy crystals to ~2.5 mm.


*Optical Class:* n.d.

**Cell Data:**  *Space Group:* $C2/c$.  
$a = 17.03(2)$  
$b = 4.98(1)$  
$c = 7.08(1)$  
$\beta = 106.3(2)\degree$  
$Z =$ n.d.

**X-ray Powder Pattern:** Selected-area electron diffraction (SAED) data provided.

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TiO$_2$</td>
<td>79.0</td>
<td>81.64</td>
</tr>
<tr>
<td>Al$_2$O$_3$</td>
<td>8.13</td>
<td></td>
</tr>
<tr>
<td>Cr$_2$O$_3$</td>
<td>0.19</td>
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<tr>
<td>MgO</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
<td>FeO</td>
<td>12.0</td>
<td>18.36</td>
</tr>
<tr>
<td>MnO</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) Northwest Africa (NWA) 8003 meteorite; average TEM-EDX analysis; corresponds to $(\text{Ti}^{4+}0.73\text{Fe}^{2+}0.63\text{Al}_{0.60}\text{Mn}_{0.03}\text{Mg}_{0.02}\text{Cr}_{0.01})_{2-2.02}\text{Ti}^{4+}\text{O}_9$.  
(2) $(\text{Ti}^{4+}\text{Fe}^{2+})\text{Ti}^{4+}\text{O}_9$

**Mineral Group:** An Andersson phase $(\text{M}_2\text{M}_n\text{O}_{2n-1}, n = 5)$.

**Polymorphism & Series:** Forms a solid solution series with machiite.

**Occurrence:** In two titanium-rich, shock melt pockets (20-30 mm in size), which are enclosed by former plagioclase (now maskelynite, plagioclase, and tissintite), augite and ilmenite in a basaltic eucrite meteorite.

**Association:** Corundum, ilmenite, Al-Ti-rich pyroxene.

**Distribution:** From the Northwest Africa (NWA) 8003 meteorite.

**Name:** After asteroid 4 *Vesta*.

**Type Material:** Mineralogical Collection, Friedrich Schiller University, Jena, Germany (42073 and 42074).

**References:**  