**Tetrataenite**

**Crystal Data:** Tetragonal. *Point Group: 4/m 2/m 2/m.* As irregular crystals, to 100 µm, as grains, and in rims around taenite. As prismatic crystals elongated along [001] with trapezoidal cross section (terrestrial).

**Physical Properties:** Hardness = n.d.  \( VHN = 170-200 \) (25 g load).  \( D = 8.28 \)


**Cell Data:** *Space Group: P4/mmm.*  \( a = 2.533(2) \)  \( c = 3.582(2) \)  \( Z = 1 \)

**X-ray Powder Pattern:** Linville Ni-rich ataxite meteorite.

\[
\begin{align*}
3.40 (100), & \quad 2.879 (80), \quad 2.526 (80), \quad 4.239 (60), \quad 2.279 (10), \quad 2.187 (10), \quad 2.070 (10) \\
\end{align*}
\]

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fe</td>
<td>49.00</td>
<td>48.75</td>
<td>37.02</td>
</tr>
<tr>
<td>Ni</td>
<td>51.00</td>
<td>51.25</td>
<td>50.49</td>
</tr>
<tr>
<td>Cu</td>
<td>0.20</td>
<td>3.19</td>
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</tr>
<tr>
<td>Co</td>
<td>0.08</td>
<td>8.20</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>&lt; 0.01</td>
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</tr>
<tr>
<td>Total</td>
<td>100.28</td>
<td>100.00</td>
<td>99.10</td>
</tr>
</tbody>
</table>

(1) By electron microprobe, average of analyses from 18 meteorites.  (2) FeNi.  (3) Pokphur magnetite body, Indo-Myanmar ranges, northeast India; average of 3 electron microprobe analyses, total includes 0.01% Ag, 0.10% Cd, 0.03% In, 0.03% Au and 0.12% Mn.

**Occurrence:** In slowly cooled meteorites, by the ordering of Fe and Ni atoms in taenite. It is most abundant in mesosiderites and chondrites. In a serpentinized, ophiolite-hosted, Ni-bearing magnetite body formed by hydrothermal alteration of ferromagnesian minerals of the olivine and pyroxene groups (terrestrial).

**Association:** Kamacite, troilite, taenite (meteorites); chamosite, magnetite, chromite, Cr-Al spinel (terrestrial).

**Distribution:** Widely distributed in chondrite, mesosiderite, iron, and pallas types of meteorites. From the Pokphur magnetite body, north-eastern most part of the Nagaland-Manipur ophiolite belt, Indo-Myanmar ranges, northeast India.

**Name:** In allusion to the symmetry of the mineral, and the genetic link to *taenite.*

**Type Material:** National Museum of Natural History, Washington, D.C., USA (meteorite collection 1025).

**References:**