Mertieite-I  \[ \text{Pd}_{11}(\text{Sb, As})_4 \]


**Crystal Data:** Hexagonal; possibly monoclinic, pseudohexagonal. *Point Group:* n.d.
As small grains, to 0.5 mm.

**Physical Properties:** Hardness = n.d.  VHN = 561–593, 578 average (50 g load).

R\text{1}–R\text{2}: n.d.

**Cell Data:** *Space Group:* n.d.  \( a = 15.04 \)  \( c = 22.41 \)  \( Z = 18 \)

**X-ray Powder Pattern:** Goodnews Bay, Alaska, USA.
2.278 (vs), 2.171 (vs), 2.232 (m), 2.017 (m), 1.918 (m), 1.861 (m), 1.572 (m)

**Chemistry:**

<table>
<thead>
<tr>
<th>Element</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pd</td>
<td>72.9</td>
</tr>
<tr>
<td>Cu</td>
<td>&lt; 1.2</td>
</tr>
<tr>
<td>Sb</td>
<td>15.3</td>
</tr>
<tr>
<td>As</td>
<td>9.2</td>
</tr>
<tr>
<td>Total</td>
<td>&lt; 98.6</td>
</tr>
</tbody>
</table>

(1) Goodnews Bay, Alaska, USA; by electron microprobe, average of four grains; corresponding to \( (\text{Pd}_{11.03}\text{Cu}_{0.30})\Sigma=11.33(\text{Sb}_{2.02}\text{As}_{1.98})\Sigma=4.00 \).

**Polymorphism & Series:** Dimorphous with isomertieite.

**Occurrence:** As fine grains in precious metal placer concentrates, apparently derived from ultramafic source rock.

**Association:** Gold, chromite, laurite, mertieite-II, Pt–Ir–Os alloys.

**Distribution:** In the USA, from the placer dredgings at Goodnews Bay, Alaska [TL].

**Name:** To honor John Beaver Mertie, Jr. (1888–1980), geologist, U.S. Geological Survey, who provided the original material; “I” to distinguish its unique composition and crystallography from that of mertieite-II and isomertieite.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 132499.

**References:**