Toyohaite

\( \text{Ag}_2\text{FeSn}_3\text{S}_8 \)

\( \text{©2001-2005 Mineral Data Publishing, version 1} \)

**Crystal Data:** Monoclinic. \( \text{Point Group: } 2/m, \, 2, \, \text{or } m. \) As tiny grains.

**Physical Properties:** Hardness = n.d. VHN = n.d. D(meas.) = n.d. \( \text{D(calc.) } = 7.25 \)

**Optical Properties:** Opaque. \( \text{Color: } \) In polished section, white. \( \text{Anisotropism: } \) Distinct to strong; pale gray to steel-bluish black.

\( R_1-R_2: \) n.d.

**Cell Data:** \( \text{Space Group: } B2/m, \, B2, \, \text{or } Bm. \)

\( a = 13.349(10) \quad b = 26.538(20) \quad c = 4.092(7) \quad \beta = 92.77(7)^\circ \quad Z = 4 \)

**X-ray Powder Pattern:** Treasury \[sic\] mine, Colorado, USA.

3.49 (100), 3.22 (80), 1.989 (60), 1.955 (60), 3.63 (50), 2.93 (50), 2.86 (50)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag</td>
<td>12.7</td>
<td>12.26</td>
</tr>
<tr>
<td>Pb</td>
<td>19.6</td>
<td>20.18</td>
</tr>
<tr>
<td>Bi</td>
<td>50.5</td>
<td>50.90</td>
</tr>
<tr>
<td>S</td>
<td>16.4</td>
<td>16.66</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>99.2</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

(1) Treasury \[sic\] mine, Colorado, USA; by electron microprobe, corresponding to \( \text{Ag}_{1.82}\text{Pb}_{1.46}\text{Bi}_{3.73}\text{S}_{7.89} \)

\( (2) \text{ Ag}_7\text{Pb}_6\text{Bi}_{15}\text{S}_{32} \)

**Occurrence:** In hydrothermal vein material (Treasure Vault mine, Colorado, USA).

**Association:** A fine-grained decomposition product of treasurite having very similar optical properties (Treasure Vault mine, Colorado, USA).

**Distribution:** In the USA, from the Treasure Vault (misnamed Treasury) mine, Geneva district, Clear Creek Co., Colorado [TL]; and from a prospect, 10 km southwest of Tyrone, Grant Co., New Mexico. At the Kochbulak gold deposit, Chatkal-Kuramin Mountains, eastern Uzbekistan. In the Beregovo district, near Mukachevo, Ukraine.

**Name:** For the Treasure Vault lode, Colorado, USA, where it occurs.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, R9714.

**References:**