Toyohaite  

\[ \text{Ag}_2\text{FeSn}_3\text{S}_8 \]

©2001-2005 Mineral Data Publishing, version 1

**Crystal Data:** Monoclinic.  
**Point Group:** 2/m, 2, or m.  
As tiny grains.

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

**Optical Properties:**  
Opaque.  
**Color:** In polished section, white.  
**Anisotropism:** Distinct to strong; pale gray to steel-bluish black.

\[ R_1-R_2: \text{n.d.} \]

**Cell Data:**  
**Space Group:** B2/m, B2, or Bm.  
\[ a = 13.349(10) \quad b = 26.538(20) \]
\[ c = 4.092(7) \quad \beta = 92.77(7)^\circ \quad Z = 4 \]

**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>
</tbody>
</table>

Total 99.2 100.00

(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:**  

**References:**  
(3) (1979) Amer. Mineral., 64, 243 (abs. refs. 1 and 2).