Ferrostalderite  

CuFe₂TlAs₂S₆

Crystal Data: Tetragonal. 

Point Group: 4 2m. 

As equant to prismatic crystals to 50 μm displaying {110} and {101}.

Physical Properties: 

Cleavage: n.d. 

Tenacity: Brittle. 

Fracture: Irregular. 

Hardness = n.d. 

D(meas.) = n.d. 

D(calc.) = 4.528

Optical Properties: 

Opaque. 

Color: Black, dark gray in reflected light. 

Streak: Black. 

Luster: Metallic. 

Optical Class: Anisotropism: Weak, yellowish to bluish. Very weak internal reflections. 

R₁-R₂: (471.1) 24.2-25.4, (548.3) 23.7-24.7, (586.6) 22.9-23.8, (652.3) 21.0-22.0

Cell Data: Space Group: I₄ 2m. 

a = 9.8786(5) 

c = 10.8489(8) 

Z = 4

X-ray Powder Pattern: Lengenbach quarry, Binn Valley, Wallis, Switzerland. 

2.937 (100), 4.092 (70), 3.396 (35), 2.435 (33), 3.493 (23), 2.656 (33), 2.470 (19)

Chemistry:

<table>
<thead>
<tr>
<th>Element</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cu</td>
<td>6.24</td>
</tr>
<tr>
<td>Ag</td>
<td>4.18</td>
</tr>
<tr>
<td>Fe</td>
<td>9.95</td>
</tr>
<tr>
<td>Zn</td>
<td>4.46</td>
</tr>
<tr>
<td>Hg</td>
<td>1.22</td>
</tr>
<tr>
<td>Tl</td>
<td>26.86</td>
</tr>
<tr>
<td>As</td>
<td>19.05</td>
</tr>
<tr>
<td>Sb</td>
<td>0.63</td>
</tr>
<tr>
<td>S</td>
<td>25.39</td>
</tr>
<tr>
<td>Total</td>
<td>97.98</td>
</tr>
</tbody>
</table>

(1) Lengenbach quarry, Binn Valley, Wallis, Switzerland; average electron microprobe analysis; corresponds to Cu₀.₇₅Ag₀.₃₀Fe₁.₃₀Zn₀.₅₂Hg₀.₀₅Tl₁₀₀[As₁.₉₄Sb₀.₀₄]Σ=1.₉₈S₆.₀₄.

Mineral Group: Routherite isotypic series.

Occurrence: Formed as massive to interstitial sulfosalt accumulations in dolostone by late stage Tl-As-Cu-Fe-rich hydrothermal fluids during upper greenschist to lower amphibolite metamorphism.

Association: Dolomite, realgar, baumhauerite(?), pyrite.

Distribution: From the Lengenbach quarry, Binn Valley, Wallis, Switzerland.

Name: The prefix, ferro, indicates the iron isotype of stalderite.

Type Material: National History Museum, University of Florence, Italy (3148/I).