Baumstarkite  \[\text{Ag}_3\text{Sb}_3\text{S}_6\]

**Crystal Data:** Triclinic.  
*Point Group:* \(\overline{1}\).  
Equant to prismatic crystals, to 3 mm, display \{001\}, \{101\}, \{01\}, \{10\}, \{01\}, and \{10\}.  
*Twinning:* Common, on [001].

**Physical Properties:**  
*Cleavage:* Perfect on \{001\}, less perfect on \{100\}.  
*Fracture:* Even.  
*Tenacity:* Sectile, somewhat flexible.  
*Hardness:*= 2.5  
*VHN* = 46-98 (25 g load).  
D(meas.) = 5.33  
D(calc.) = 5.39

**Optical Properties:**  
Opaque, transparent on thin edges.  
*Color:* Iron-black, grayish black on fresh surfaces; deep blood-red in transmitted light, may show red internal reflections; gray to white in reflected light.  
*Streak:* Grayish red to grayish black.  
*Luster:* Metallic.  
*Optical Class:* Anisotropism: Strong, bright white to gray with a brownish tint to very dark blue; dull greenish yellow to brown to mauve to dark blue on twinned grains.  
*Bireflectance:* Weak to moderate; light bluish gray to light brownish white.

**Cell Data:**  
*Space Group:* \(P\overline{1}\).  
\(a = 7.766(2)\)  
\(b = 8.322(2)\)  
\(c = 8.814(2)\)  
\(\alpha = 100.62(2)^\circ\)  
\(\beta = 104.03(2)^\circ\)  
\(\gamma = 90.22(2)^\circ\)  
\(Z = 2\)

**X-ray Powder Pattern:** San Genaro mine, Peru; similar to aramayoite.

2.798 (100), 3.425 (8), 2.841 (8), 3.224 (6), 1.3994 (6), 2.013 (5), 1.971 (5)

**Chemistry:**

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
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<tbody>
<tr>
<td>Ag</td>
<td>36.3</td>
<td>38.4</td>
<td>36.72</td>
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<tr>
<td>As</td>
<td>0.7</td>
<td>6.7</td>
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<tr>
<td>Sb</td>
<td>40.2</td>
<td>30.8</td>
<td>41.45</td>
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<tr>
<td>S</td>
<td>22.0</td>
<td>22.9</td>
<td>21.83</td>
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<tr>
<td>Total</td>
<td>99.4</td>
<td>99.5</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(1) San Genaro mine, Peru; by electron microprobe, average of 22 analyses; corresponding to \(\text{Ag}_2\cdot97(\text{Sb}_{2.91}\text{As}_{0.09})_2\cdot98\text{S}_6\cdot03\).  
(2) Koryu mine, Hokkaido, Japan; electron microprobe analysis, corresponds to \(\text{Ag}_3\cdot00(\text{Sb}_{2.14}\text{As}_{0.84})_2\cdot98\text{S}_6\cdot02\).  
(3) \(\text{Ag}_3\text{Sb}_3\text{S}_6\).

**Polymorphism & Series:** Trimorphous with cuboargyrite and miargyrite.

**Occurrence:** Of hydrothermal hypogene origin coating miargyrite (Peru); in an epithermal gold-silver quartz vein cutting black mudstone (Japan).

**Association:** Miargyrite, pyrargyrite, stannite, kesterite, andorite, diaphorite, robinsonite, galena, chalcopyrite, sphalerite, pyrite (Peru); pyrargyrite-proustite, miargyrite (Japan).

**Distribution:** From the San Genaro mine, Huancavelica Department, Peru [TL]; from the 60 m level of the No. 3 vein, Koryu mine, Hokkaido, Japan.

**Name:** Honors Manfred Baumstark (b. 1954), German mineralogist, who provided the type material.

**Type Material:** Mineralogical Institute, University of Salzburg, Salzburg, Austria (14524 and 14525); The Natural History Museum, London, England (2000,32 and 2000,33).

**References:**  