Rathite
\[ \text{Ag}_2\text{Pb}_{12-x}\text{Tl}_x/2\text{As}_{18+x/2}\text{S}_{40} \]

Crystal Data: Monoclinic. \textit{Point Group:} 2/m. Crystals prismatic to short prismatic and striated parallel to [100]. \textit{Twinning:} Polysynthetic on [001] in some material.

Physical Properties: \textit{Cleavage:} Perfect on \{001\}; parting on \{010\}. \textit{Fracture:} Subconchoidal. Hardness = 3 \quad \textit{VHN} = 161 \quad D(\text{meas.}) = 4.986-5.446 (varies with Tl content) \quad D(\text{calc.}) = 5.31


Cell Data: \textit{Space Group:} \textit{P2}_{1}/c. (Tl-poor) \( a = 8.471(2) \quad b = 7.926(2) \quad c = 25.186(5) \quad \beta = 100.58(3)^\circ \quad Z = 1 \); (Tl-rich) \( a = 8.521(2) \quad b = 8.005(2) \quad c = 25.031(5) \quad \beta = 100.56(3)^\circ \quad Z = 1 \)

X-ray Powder Pattern: Binntal, Switzerland.
2.75 (100), 3.60 (80), 3.39 (70), 2.87 (70), 4.19 (60), 2.97 (60), 2.22 (50)

Chemistry:

<table>
<thead>
<tr>
<th>( \text{Pb} )</th>
<th>( \text{Tl} )</th>
<th>( \text{Ag} )</th>
<th>( \text{As} )</th>
<th>( \text{Sb} )</th>
<th>( \text{S} )</th>
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<tr>
<td>36.61</td>
<td>5.36</td>
<td>4.13</td>
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<td>27.33</td>
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<td>99.95</td>
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</table>

(1) Binntal, Switzerland; by electron microprobe, average of 11 analyses; corresponds to \( \text{Ag}_{2.00}\text{Tl}_{1.36}\text{Pb}_{0.24}(\text{As}_{19.08}\text{Sb}_{0.64})\text{Z}_2\text{=19.92S}_{40.00} \). (2) Lengenbach quarry, Switzerland; electron microprobe analysis; corresponds to \( \text{Ag}_{1.76}\text{Tl}_{0.04}\text{Pb}_{12.49}(\text{As}_{15.88}\text{Sb}_{0.75})\text{Z}_2\text{=17.63S}_{40.17} \). (3) Lengenbach quarry, Switzerland; electron microprobe analysis; corresponds to \( \text{Ag}_{1.76}\text{Tl}_{2.91}\text{Pb}_{6.67}(\text{As}_{19.77}\text{Sb}_{0.90})\text{Z}_2\text{=20.68S}_{39.99} \).

Occurrence: In crystalline dolostone with other Pb-As-S minerals.

Association: Liveingite, baumhauerite, sartorite, hutchinsonite, dufrénoysite, tennantite, pyrite.

Distribution: From the Lengenbach quarry [TL] and at Reckibach, Binntal, Valais, Switzerland.

Name: Honors Gerhard von Rath (1830-1888), Professor of Mineralogy, Bonn, Germany.

Type Material: University of Fribourg, Fribourg, Switzerland, B742.