Ardaite  

Crystal Data: Monoclinic. Point Group: n.d. As aggregates of acicular crystals, to 2 μm, as isolated inclusions in sulfides and sulfosalts.

Physical Properties: 
- Hardness = n.d.
- VHN = n.d.
- D(meas.) = n.d.
- D(calc.) = [6.44]

Optical Properties: 
- Opaque. 
- Color: Grayish green or bluish green.
- Luster: Metallic.
- Pleochroism: Distinct.
- Anisotropism: Distinct.
- R₁–R₂: (400) —, (420) —, (440) 31.3–33.2, (460) —, (480) 32.1–34.4, (500) —, (520) 32.3–35.1, (540) —, (560) —, (580) 31.7–34.7, (600) —, (620) 31.1–33.9, (640) —, (660) 30.6–32.8, (680) —, (700) 30.3–31.8

Cell Data: 
- Space Group: n.d.
- a = 21.09
- b = 22.11
- c = 8.05
- β = 103.02°
- Z = 2

X-ray Powder Pattern: Synthetic.
- 3.43 (100), 2.83 (80), 3.13 (40), 1.90 (30), 4.24 (20), 3.90 (20), 2.36 (20)

Chemistry:

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
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</thead>
<tbody>
<tr>
<td>Pb</td>
<td>56.50</td>
<td>57.94</td>
<td>57.14</td>
<td>59.37</td>
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<tr>
<td>Ag</td>
<td>0.04</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>Fe</td>
<td>0.00</td>
<td>0.31</td>
<td>0.31</td>
<td>0.31</td>
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<tr>
<td>Sb</td>
<td>22.48</td>
<td>21.44</td>
<td>22.97</td>
<td>20.94</td>
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<tr>
<td>S</td>
<td>15.56</td>
<td>15.44</td>
<td>16.29</td>
<td>15.62</td>
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<td>Cl</td>
<td>3.78</td>
<td>4.39</td>
<td>3.60</td>
<td>4.06</td>
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</table>

Total 98.36 99.52 100.00 100.00

(1) Madjarovo, Bulgaria; by electron microprobe, average of six analyses. (2) Gruvåsen, Sweden; by electron microprobe, average of 17 analyses. (3) Pb₁₉Sb₁₃S₃₅Cl₇. (4) Pb₁₀Sb₆S₁₇Cl₄.

Occurrence: Very rare in polymetallic ore deposits.

Association: Galena, nadorite, chlorian robinsonite, chlorian senseyite, pyrostilpnite, argentian tetrahedrite, anglesite (Madjarovo, Bulgaria); sphalerite, pyrrhotite, chalcopryite, magnetite, scheelite, stannite, pyrargyrite, silver, antimonite, arsenopyrite, nisbite, graphite (Gruvåsen, Sweden).

Distribution: From Madjarovo, eastern Rhodope Mountains, Bulgaria [TL]. In the Dressfall mine, Gruvåsen, Bergslagen metallic province, Sweden.

Name: For the Arda River, Bulgaria, which runs through the Madjarovo deposit.

Type Material: n.d.