

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. $a = 21.09$ $b = 22.11$ $c = 8.05$ $\beta = 103.02^\circ$ $Z = 2$

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:	(1)	(2)	(3)	(4)
Pb	56.50	57.94	57.14	59.37
Ag	0.04	0.00		
Fe	0.00	0.31		
Sb	22.48	21.44	22.97	20.94
S	15.56	15.44	16.29	15.62
Cl	3.78	4.39	3.60	4.06
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 semseyite, pyrostilpnite, argentian tetrahedrite, anglesite (Madjarovo, Bulgaria); sphalerite, pyrrhotite, chalcopyrite, magnetite, scheelite, stannite, pyrrargyrite, silver, antimony, 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.

References: (1) Breskovska, V.V., N.N. Mozgova, N.S. Bortnikov, A.I. Gorshkov, and A.I. Tsepin (1982) Ardaite — a new lead-antimony chlorosulphosalt. *Mineral. Mag.*, 46, 357–61. (2) (1983) *Amer. Mineral.*, 68, 642 (abs. ref. 1). (3) Burke, E.A.J., C. Kieft, and M.A. Zakrzewski (1981) The second occurrence of ardaite: Gruvåsen, Bergslagen, Sweden. *Can. Mineral.*, 19, 419–422.