

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. As euhedral crystals, tabular on {001}, slightly elongated along [100], with {001}, {100}, {010}, and {hk0} forms, to 0.3 mm, usually in aggregates. *Twining:* On {001}, polysynthetic, universal.

Physical Properties: *Cleavage:* {001}, perfect. *Fracture:* Irregular. *Tenacity:* Brittle. Hardness = 3–3.5 D(meas.) = 3.70(2) D(calc.) = [3.63]

Optical Properties: Transparent. *Color:* Light green to sea-green. *Streak:* Very pale green. *Luster:* Vitreous.

Optical Class: Biaxial (+). *Pleochroism:* Weak; X = Y = colorless; Z = pale green to pale gray. *Orientation:* X' \wedge c \simeq 90°; Y' \wedge a = 17°–18.5°; Z' \wedge b = 13°. *Dispersion:* r > v, weak. $\alpha = 1.656(2)$ $\beta = 1.692(2)$ $\gamma = 1.770(5)$ 2V(meas.) = 75(5)° 2V(calc.) = 71°

Cell Data: *Space Group:* C $\bar{1}$. a = 9.841(2) b = 10.818(2) c = 15.733(3) $\alpha = 95.71(2)^\circ$ $\beta = 90.94(2)^\circ$ $\gamma = 103.11(2)^\circ$ Z = 16

X-ray Powder Pattern: Cap Garonne mine, France.

7.83 (100), 3.260 (70), 3.070 (70), 3.925 (60), 2.611 (50), 3.107 (40), 2.825 (40)

Chemistry:

	(1)	(2)
As ₂ O ₅	52.4	51.89
CuO	36.5	35.91
H ₂ O	11.0	12.20
Total	99.9	100.00

(1) Cap Garonne mine, France; by AA, H₂O by TGA; corresponds to Cu_{1.04}(As_{1.03}O₃OH)•H₂O.

(2) Cu(AsO₃OH)•H₂O.

Polymorphism & Series: Dimorphous with pushcharovskite.

Occurrence: From an arsenic-bearing oxidized Pb–Cu deposit (Cap Garonne mine, France); on specimens from mine dumps at a gold-bearing arsenic sulfide deposit (Salsigne mine, France).

Association: Tennantite, covellite, chalcantite, lavendulan, pushcharovskite, antlerite, brochantite, quartz (Cap Garonne mine, France); lindackerite, yvonite, arsenopyrite, bismuth, chalcopyrite, pushcharovskite (Salsigne mine, France).

Distribution: In France, from the Cap Garonne mine, near le Pradet, Var, and in the Salsigne mine, 15 km north of Carcassonne, Aude. At Jáchymov (Joachimsthal), Czech Republic. From Hartenstein, Saxony, Germany.

Name: From the Latin *gemin*i, for *twins*, as the mineral is extensively twinned.

Type Material: Natural History Museum, Geneva, Switzerland, 435/80.

References: (1) Sarp, H. and P. Perroud (1990) Geminite, Cu₂As₂O₇•3H₂O, un nouveau minéral de la mine de Cap Garonne, Var, France. Schweiz. Mineral. Petrog. Mitt., 70, 309–314 (in French with English abs.). (2) (1992) Amer. Mineral., 77, 671 (abs. ref. 1). (3) Cooper, M.A. and F.C. Hawthorne (1995) The crystal structure of geminite, Cu²⁺(AsO₃OH)(H₂O), a heteropolyhedral sheet structure. Can. Mineral., 33, 1111–1118. (4) Prencipe, M., D.Y. Pushcharovskiy, H. Sarp, and G. Ferraris (1996) Comparative crystal chemistry of geminite Cu[AsO₃OH]H₂O and minerals related to it. Moscow Univ. Bull. Series 4, Geol. 4, 66–74 (in Russian). (5) (1998) Amer. Mineral., 83, 911 (abs. ref. 4).