

**Crystal Data:** Tetragonal. *Point Group:*  $4/m\ 2/m\ 2/m$  (synthetic). As subhedral crystals, to 20  $\mu\text{m}$ , showing {111}, {100}, and {101}, included in sphalerite.

*Twinning:* Occasionally twinned on {101}.

**Physical Properties:** Hardness = [6–7] (about the same as associated cassiterite).  
D(meas.) = n.d. D(calc.) = [6.28]

**Optical Properties:** Semitransparent. *Color:* Light gray in reflected light.

*Optical Class:* Uniaxial. *Anisotropism:* Distinct.

R: (400) 14.8, (420) 13.7, (440) 12.6, (460) 11.6, (480) 11.2, (500) 11.0, (520) 11.0, (540) 11.0, (560) 11.0, (580) 10.9, (600) 10.9, (620) 10.9, (640) 10.9, (660) 10.9, (680) 11.0, (700) 11.0

**Cell Data:** *Space Group:*  $P4_2/mmm$  (synthetic).  $a = 4.3975(7)$   $c = 2.8625(8)$   $Z = 2$

**X-ray Powder Pattern:** Synthetic.

3.11 (100), 2.399 (60), 1.620 (50), 1.3045 (20), 1.5546 (18), 1.3004 (18), 2.199 (16)

**Chemistry:**

	(1)
GeO <sub>2</sub>	95.82
MnO <sub>2</sub>	0.17
FeO	1.20
ZnO	3.03
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Total	100.22

(1) Argut deposit, France; by electron microprobe, average of seven analyses; corresponds to  $(\text{Ge}_{0.94}\text{Zn}_{0.04}\text{Fe}_{0.02})_{\Sigma=1.00}\text{O}_{1.94}$ .

**Mineral Group:** Rutile group.

**Occurrence:** In a zinc deposit formed in metamorphosed lower Paleozoic sediments.

**Association:** Sphalerite, cassiterite, siderite, briartite.

**Distribution:** From the Argut deposit, central Pyrénées, Haute-Garonne, France.

**Name:** For the occurrence in the Argut deposit, France.

**Type Material:** n.d.

**References:** (1) Johan, Z., E. Oudin, and P. Picot (1983) Analogues germanifères et gallifères des silicates et oxydes dans les gisements de zinc des Pyrénées centrales, France; argutite et carboirite, deux nouvelles espèces minérales. *Tschermaks Mineral. Petrog. Mitt.*, 31, 97–119 (in French with English abs.). (2) (1984) *Amer. Mineral.*, 69, 406 (abs. ref. 1). (3) Yamanaka, T. and K. Ogata (1991) Structure refinement of GeO<sub>2</sub> polymorphs at high pressures and temperatures by energy-dispersive spectra of powder diffraction. *J. Appl. Cryst.*, 24, 111–118. (4) (1958) *NBS Mono.* 25, 8, 28.