

**Crystal Data:** Orthorhombic. *Point Group:* n.d. Small aggregates of anhedral crystals, to 200  $\mu\text{m}$ .

**Physical Properties:** Hardness = n.d. VHN = 212–222 (50 g load). D(meas.) = n.d. D(calc.) = 5.64

**Optical Properties:** Opaque. *Color:* In reflected light, gray with olive-brown tint. *Luster:* Metallic. *Pleochroism:* Distinct. *Anisotropism:* Strong, in yellowish green to bluish gray.  
R<sub>1</sub>–R<sub>2</sub>: n.d.

**Cell Data:** *Space Group:* n.d.  $a = 11.439$   $b = 14.093$   $c = 3.754$   $Z = 4$

**X-ray Powder Pattern:** Valle del Frigido, Italy.  
3.62 (vs), 3.20 (vs), 2.63 (vs), 2.51 (vs), 2.98 (s), 2.89 (s), 14.0 (m)

Chemistry:	(1)	(2)
Fe	9.41	10.85
Cu	0.30	
Sb	29.90	23.65
Bi	33.28	40.59
As	0.16	
S	27.43	24.91
Total	100.48	100.00

(1) Valle del Frigido, Italy; by electron microprobe, corresponds to Fe<sub>0.79</sub>Cu<sub>0.02</sub>Sb<sub>1.15</sub>Bi<sub>0.74</sub>As<sub>0.01</sub>S<sub>4.00</sub>. (2) FeSbBiS<sub>4</sub>.

**Occurrence:** In a hydrothermal copper deposit with disseminated chalcopyrite in siderite gangue.

**Association:** Chalcopyrite, tetrahedrite, pyrrhotite, pyrite, marcasite, galena, sphalerite, meneghinite, ullmannite, pentlandite, vaesite, bismuthinite, chalcanthite, siderite, quartz.

**Distribution:** At Valle del Frigido, one km east of Massa, Tuscany, Italy.

**Name:** In honor of Professor Carlo L. Garavelli (1929– ), Italian mineralogist, University of Bari, Bari, Italy.

**Type Material:** University of Florence, Florence, 100/l; University of Bari, Bari, Italy; National School of Mines, Paris, France; National Museum of Natural History, Washington, D.C., USA, 145868.

**References:** (1) Gregorio, F., P. Lattanzi, G. Tanelli, and F. Vurro (1979) Garavellite, FeSbBiS<sub>4</sub>, a new mineral from the Cu–Fe deposit of Valle del Frigido in the Apuane Alps, northern Tuscany, Italy. *Mineral. Mag.*, 43, 99–102. (2) (1979) *Amer. Mineral.*, 64, 1329–1330 (abs. ref. 1).