

Geffroyite

(Cu, Fe, Ag)₉(Se, S)₈

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Crystal Data: Cubic. *Point Group:* $4/m\bar{3}2/m$. Commonly in a micro-myrmekitic intergrowth, to 0.7 mm, with clausthalite and eskebornite.

Physical Properties: Hardness = n.d. VHN = 67.5–72.4 (15 g load). D(meas.) = n.d. D(calc.) = 5.39

Optical Properties: Opaque. *Color:* Brown with a creamy tint in reflected light. *Luster:* Metallic.

R: (400) —, (420) 19.0, (440) 21.4, (460) 23.5, (480) 25.5, (500) 27.5, (520) 29.1, (540) 30.1, (560) 31.7, (580) 32.7, (600) 33.6, (620) 34.4, (640) 35.1, (660) 35.8, (680) 36.3, (700) 36.9

Cell Data: *Space Group:* $Fm\bar{3}m$. $a = 10.889$ $Z = 4$

X-ray Powder Pattern: Chaméane mine, France.

1.925 (100), 3.282 (90), 3.145 (90), 2.094 (60), 1.112 (60), 1.660 (50), 2.436 (40)

Chemistry:

	(1)	(2)
Cu	28.57	28.81
Fe	19.01	19.38
Ag	7.05	5.16
Se	34.42	35.76
S	10.06	9.87
Total	99.11	98.98

(1) Chaméane mine, France; by electron microprobe, corresponds to $(\text{Cu}_{4.80}\text{Fe}_{3.63}\text{Ag}_{0.70})_{\Sigma=9.13}(\text{Se}_{4.65}\text{S}_{3.35})_{\Sigma=8.00}$. (2) Do.; by electron microprobe, corresponds to $(\text{Cu}_{4.77}\text{Fe}_{3.65}\text{Ag}_{0.50})_{\Sigma=8.90}(\text{Se}_{4.76}\text{S}_{3.24})_{\Sigma=8.00}$.

Mineral Group: Pentlandite group.

Occurrence: As late-stage deposits in veins cutting granite (Chaméane mine, France).

Association: Eskebornite, clausthalite, chaméanite, ankerite (Chaméane mine, France).

Distribution: From the Chaméane uranium mine, near Vernet-la-Varenne, Puy-de-Dôme, France [TL]. In the San Miguel prospect, 10 km northwest of the Moctezuma (Bambolla) mine, 12 km south of Moctezuma, Sonora, Mexico.

Name: To honor Jacques Geffroy (1918–1993), metallurgist for the French Atomic Energy Commission.

Type Material: National School of Mines, Paris, France.

References: (1) Johan, Z., P. Picot, and F. Ruhlmann (1982) Evolution paragenétique de la minéralisation uranifère de Chaméane (Puy-de-Dôme) France: chaméanite, geffroyite et giraudite, trois sélénures nouveaux de Cu, Fe, Ag, and As. *Tschermaks Mineral. Petrog. Mitt.*, 29, 151–167 (in French with English abs.). (2) (1982) *Amer. Mineral.*, 67, 1074–1075 (abs. ref. 1).