

Crystal Data: Monoclinic. *Point Group:* *m*. Minute crystals, in concretions and vermiform aggregates.

Physical Properties: Hardness = n.d. D(meas.) = 2.663 (synthetic). D(calc.) = 2.68
Soluble in H₂O; dehydrates from chalcantite.

Optical Properties: Semitransparent. *Color:* Pale blue; colorless in transmitted light.
Optical Class: Biaxial (+). $\alpha = 1.554\text{--}1.559$ $\beta = 1.577\text{--}1.578$ $\gamma = 1.615\text{--}1.618$
2V(meas.) = 71°–79°

Cell Data: *Space Group:* *Cc* (synthetic). $a = 5.592(5)$ $b = 13.029(10)$ $c = 7.341(6)$
 $\beta = 97^\circ 3(7)'$ $Z = 4$

X-ray Powder Pattern: Capo Calamita, Elba, Italy.
4.40 (100), 3.24 (67), 5.09 (65), 3.65 (54), 3.42 (50), 2.814 (43), 3.00 (39)

Chemistry:	(1)	(2)
SO ₃	36.49	37.47
FeO	0.82	
CuO	35.23	37.23
MgO	0.25	
H ₂ O	27.33	25.30
Total	100.12	100.00

(1) Capo Calamita, Elba, Italy; corresponds to CuSO₄•3H₂O 85.15%, CuSO₄•5H₂O 14.85%. Identification rests on correspondence of the X-ray powder pattern and optical data with that of synthetic CuSO₄•3H₂O. (2) CuSO₄•3H₂O.

Occurrence: A secondary mineral in a pyrite deposit (Capo Calamita, Elba, Italy).

Association: Chalcantite, pyrite (Capo Calamita, Elba, Italy); quartz, gypsum, pyrite, poitevinite, scorodite (Avoca claim, Canada).

Distribution: From [Cantiere Macei,] Capo Calamita, Elba, Italy. At the Recsk copper mine, Mátra Mountains, Hungary. On the Avoca claim, Hat Creek, Bonaparte River area, Lillooet district, British Columbia, Canada. At Steamboat Hot Springs, Steamboat Springs district, Washoe Co., Nevada, USA. In the Undu mine, Nukundamu, Vanua Levu, Fiji. From Mina Raua, near Lima, Peru.

Name: To honor Stefano Bonatti (1902–1968), Italian petrologist, University of Pisa, Pisa, Italy.

Type Material: University of Florence, Florence, Italy, 1973/I.

References: (1) Garavelli, C.L. (1957) Bonattite: un nuovo minerale di alterazione del giacimento Elbano di Capo Calamita. Rend. Soc. Ital. Mineral. Petrol., 13, 268 (in Italian). (2) (1958) Amer. Mineral., 43, 180 (abs. ref. 1). (3) Jambor, J.L. (1962) Second occurrence of bonattite. Can. Mineral., 7, 245–252. (4) Zahrobsky, R.F. and W.H. Bauer (1968) On the crystal chemistry of salt hydrates. V. The determination of the crystal structure of CuSO₄•3H₂O (bonattite). Acta Cryst., 24, 508–513.