

Offretite

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Crystal Data: Hexagonal. *Point Group:* $\bar{6}m2$. Crystals form hexagonal prisms, which may be hollow, vertically striated, to 3 mm; in hemispherical forms with radiating structure. Typically in complex overgrowths on erionite and levyne.

Physical Properties: *Cleavage:* {0001}, distinct. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 4 D(meas.) = 2.13 D(calc.) = 2.06

Optical Properties: Transparent to translucent. *Color:* Colorless to white. *Luster:* Vitreous. *Optical Class:* Uniaxial (-). $\omega = 1.489\text{--}1.495$ $\epsilon = 1.486\text{--}1.492$

Cell Data: *Space Group:* $P\bar{6}m2$. $a = 13.291(2)$ $c = 7.582(6)$ $Z = 1$

X-ray Powder Pattern: Mont Sémiol, France; close to erionite. 11.50 (100), 2.880 (64), 4.352 (59), 3.837 (43), 5.76 (35), 3.322 (22), 6.64 (20)

Chemistry:

	(1)
SiO ₂	53.0
Al ₂ O ₃	18.1
MgO	2.0
CaO	4.1
K ₂ O	3.6
H ₂ O ⁺	17.7
H ₂ O ⁻	1.1
Total	99.6

(1) Mont Sémiol, France; Na₂O 0.01% by microspectrochemical analysis; corresponds to $(\text{K}_{1.1}\text{Ca}_{1.1}\text{Mg}_{0.7})_{\Sigma=2.9}\text{Al}_{5.2}\text{Si}_{12.8}\text{O}_{36} \cdot 15.2\text{H}_2\text{O}$.

Mineral Group: Zeolite group.

Occurrence: Lining cavities in basalt.

Association: Zeolites, especially erionite, levyne, celadonite, montmorillonite.

Distribution: From Mont Sémiol (Mont Simiouse), Montbrison, Loire, France. At a number of localities on the Vogelsberg, Hesse, Germany. In the USA, in Oregon, from Milwaukie, Clackamas Co., at Gordon Gulch, Owyhee Dam, Malheur Co., and Ritter Hot Springs, Grant Co.; in Washington, at Rock Island Dam, Douglas Co.; in Arizona, from Queen Creek, 10 km west of Superior, Pinal Co., and from three km south of Horseshoe Dam, Maricopa Co. From southwest of Westwold, British Columbia, Canada. There are many other occurrences, most overgrowing erionite or levyne.

Name: For Professor Albert Jules Joseph Offret (1857-?), of Lyons, France.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 1043. (2) Sheppard, R.A. and A.J. Gude, 3d (1969) Chemical composition and physical properties of the related zeolites offretite and erionite. *Amer. Mineral.*, 54, 875-886. (3) Gard, J.A. and J.M. Tait (1972) The crystal structure of the zeolite offretite, $\text{K}_{1.1}\text{Ca}_{1.1}\text{Mg}_{0.7}[\text{Si}_{12.8}\text{Al}_{5.2}\text{O}_{36}] \cdot 15\text{H}_2\text{O}$. *Acta Cryst.*, 28, 825-834. (4) Wise, W.S. and R.W. Tschernich (1976) The chemical compositions and origin of the zeolites offretite, erionite, and levyne. *Amer. Mineral.*, 61, 853-863.