

Avogadrite

(K, Cs)BF₄

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Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As minute octagonal crystals, tabular to platy on {001}, may be elongated along [010] or [100]; as dense crusts.

Physical Properties: Hardness = n.d. D(meas.) = n.d. D(calc.) = 2.507–3.305 Somewhat soluble in H₂O, with a bitter taste.

Optical Properties: Translucent. *Color:* Colorless to white, yellowish to reddish when impure; colorless in transmitted light.

Optical Class: Biaxial (-). *Orientation:* $X = c; Y = b; Z = a$. $\alpha = 1.3239$ (synthetic KBF₄). $\beta = 1.3245$ $\gamma = 1.3247$ 2V(meas.) = Very large.

Cell Data: *Space Group:* $Pnma$ (synthetic KBF₄). $a = 8.6588(5)$ $b = 5.4800(4)$
 $c = 7.0299(8)$ $Z = 4$

X-ray Powder Pattern: Synthetic KBF₄. (ICDD 16-378).
3.41 (100), 3.26 (80), 3.06 (75), 2.068 (55), 3.51 (45), 2.801 (40), 2.091 (35)

Chemistry:	(1)	(2)	(3)
K	15.2	31.05	
Cs	7.0		60.49
B	12.0	8.59	4.92
F		60.36	34.59
Total		100.00	100.00

(1) Vesuvius, Italy; partial analysis determined on H₂O extracts from mixtures of sublimates, B given as B₂O₃ 38.8% in the original analysis. (2) KBF₄. (3) CsBF₄.

Polymorphism & Series: Cubic above 273 °C.

Occurrence: Formed as a sublimation product around volcanic fumaroles.

Association: Sassolite, malladrite, hieratite (Vesuvius, Italy).

Distribution: From Vesuvius, Campania, and on Vulcano, Lipari Islands, Italy. At volcanoes on the Kamchatka Peninsula, Russia.

Name: For Amedeo Avogadro (1776–1856), Professor of Physics at the University of Turin, Turin, Italy.

Type Material: Natural History Museum, Paris, France, 126.148.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 97–98. (2) Vlasov, K.A., Ed. (1966) Mineralogy of rare elements, v. II, 65–66. (3) Brunton, G. (1969) The crystal structure of KBF₄. Acta Cryst., 25, 2161–2162.