

# Johnbaumite

# Ca<sub>5</sub>(AsO<sub>4</sub>)<sub>3</sub>(OH, F)

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**Crystal Data:** Hexagonal. *Point Group:* 6/*m*. Anhedronal, granular, to 8 mm, or massive.

**Physical Properties:** *Cleavage:* Distinct on {10 $\bar{1}$ 0}. *Tenacity:* Brittle. Hardness = ~4.5  
D(meas.) = 3.68(3) D(calc.) = 3.73 Fluoresces medium pinkish orange under SW UV; exhibits  
pale pink cathodoluminescence.

**Optical Properties:** Translucent. *Color:* Grayish white; colorless in thin section.  
*Streak:* White. *Luster:* Adamantine to greasy on fracture surfaces, vitreous on cleavage  
surfaces.

*Optical Class:* Uniaxial (-).  $\omega = 1.687\text{--}1.716$   $\epsilon = 1.684\text{--}1.698$

**Cell Data:** *Space Group:* [P6<sub>3</sub>/*m*] (by analogy to the apatite group).  $a = 9.70\text{--}9.80$   
 $c = 6.93\text{--}6.97$   $Z = 2$

**X-ray Powder Pattern:** Franklin, New Jersey, USA.  
2.895 (100), 2.820 (70), 2.798 (70), 3.98 (50), 3.47 (50), 2.683 (45), 1.879 (45)

Chemistry:	(1)	(2)
P <sub>2</sub> O <sub>5</sub>	1.7	
As <sub>2</sub> O <sub>5</sub>	52.2	54.28
FeO	0.2	
MgO	0.1	
CaO	43.5	44.14
F	0.2	1.50
Cl	0.1	
H <sub>2</sub> O	1.3	0.71
-O = (F, Cl) <sub>2</sub>	0.1	0.63
Total	99.2	100.00

(1) Franklin, New Jersey, USA; by electron microprobe, H<sub>2</sub>O by DTA-TGA; corresponding  
to (Ca<sub>4.86</sub>Fe<sub>0.02</sub>Mg<sub>0.02</sub>) $\Sigma=4.90$ [(As<sub>0.95</sub>P<sub>0.05</sub>) $\Sigma=1.00$ O<sub>3.99</sub>]<sub>3</sub>[(OH)<sub>0.90</sub>F<sub>0.06</sub>Cl<sub>0.02</sub>] $\Sigma=0.98$ .

(2) Ca<sub>5</sub>(AsO<sub>4</sub>)<sub>3</sub>(OH, F) with OH:F = 1:1.

**Mineral Group:** Apatite group.

**Occurrence:** A very rare mineral, part of a metamorphic skarn assemblage in a metamorphosed  
stratiform zinc orebody (Franklin, New Jersey, USA).

**Association:** Yeatmanite, diopside, andradite, franklinite, copper, roméite (Franklin, New  
Jersey, USA); tilasite (ångban, Sweden).

**Distribution:** From Franklin and Sterling Hill, Ogdensburg, Sussex Co., New Jersey, USA.  
In Russia, at undisclosed deposits in the Ural Mountains and Siberia [Novofrolovskoye copper  
deposit, Turinsk district, near Krasnoturinsk, Northern Ural Mountains; Yuliya Svintsovaya  
Pb-Zn deposit, 20 km east-northeast of Son railway station, western Siberia]. At Långban,  
Värmland, Sweden.

**Name:** Honors John L. Baum (1916– ), Hamburg, New Jersey, USA, Curator of the Franklin  
Mineral Museum, and collector of the first specimen containing the mineral.

**Type Material:** Royal Ontario Museum, Toronto, Canada; The Natural History Museum,  
London, England; Harvard University, Cambridge, Massachusetts, 116461; National Museum of  
Natural History, Washington, D.C., USA, 144444.

**References:** (1) Dunn, P.J., D.R. Peacor, and N. Newberry (1980) Johnbaumite, a new member  
of the apatite group from Franklin, New Jersey. *Amer. Mineral.*, 65, 1143–1145. (2) Malinko, S.V.,  
G.S. Rumyantsev, and G.A. Sidorenko (1966) Svabite [= johnbaumite] from contact-metamorphic  
deposits of Siberia and the Urals. *Doklady Acad. Nauk SSSR*, 166, 1195–1198 (in Russian).

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