Beudantite $PbFe_3^{3+}(AsO_4)(SO_4)(OH)_6$

Crystal Data: Hexagonal, pseudocubic. *Point Group:* $\overline{3}\ 2/m$. As tabular crystals, pseudocubes, or pseudo-octahedra, to 5 mm; also microcrystalline massive.

Physical Properties: *Cleavage:* Good on {0001}. Hardness = 3.5–4.5 D(meas.) = 4.48(2) D(calc.) = 4.49

Optical Properties: Transparent to translucent. *Color:* Yellow, greenish yellow, red, dark green, brown, black; crystals may exhibit biaxial sectoring. *Streak:* Grayish yellow to green. *Luster:* Vitreous, resinous, may be frosted.
Optical Class: Uniaxial (–), commonly anomalously biaxial. *Pleochroism:* O = yellow to red-brown; E = colorless to yellow. $\omega = 1.957$ $\epsilon = 1.943$

Cell Data: *Space Group:* $R\overline{3}m$. $a = 7.315$–7.339 $c = 17.034$–17.036 Z = 3

X-ray Powder Pattern: Washington mine, Montana, USA.
3.078 (100), 2.865 (80), 2.290 (70), 5.725 (50), 3.108 (50), 5.089 (45), 1.979 (35)

Chemistry:

	(1)	(2)
SO_3	11.15	11.25
As_2O_5	16.02	16.15
Fe_2O_3	33.48	33.65
CuO	0.22	
ZnO	0.11	
PbO	31.22	31.36
H_2O	[7.80]	7.59
Total	[100.00]	100.00

(1) Washington mine, Montana, USA; by electron microprobe, H_2O by difference, corresponding to $(Pb_{0.99}Cu_{0.02}Zn_{0.01})_{\Sigma=1.02}Fe_{2.98}(AsO_4)_{0.99}(SO_4)_{0.99}(OH)_{6.07}$. (2) $PbFe_3(AsO_4)(SO_4)(OH)_6$.

Mineral Group: Beudantite group.

Occurrence: A secondary mineral in the oxidized zone of polymetallic deposits.

Association: Carminite, scorodite, mimetite, dussertite, arseniosiderite, pharmacosiderite, olivenite, bayldonite, duftite, anglesite, cerussite, azurite.

Distribution: Many localities are known. In Germany, at the Louise mine, Horhausen, and the Schöne Aussicht mine, near Dernbach, Rhineland-Palatinate; at Reichenbach, near Bensheim, Hesse; from the Clara mine, near Oberwolfach, and elsewhere in the Black Forest. In France, from the Cap Garonne mine, near le Pradet, Var, and Blond, near Vauly, Haute-Vienne. In England, at many mines in Caldbeck Fells, Cumbria, and in Cornwall. In Greece, from Laurium, pure masses in the Kamariza mine, and in the slags. Superb crystals at Tsumeb, Namibia. In Mexico, from the Ojuela mine, Mapimí, Durango, and at La Mur, Trincheras, Sonora. From the Mohawk mine, Clark Mountains, San Bernardino Co., California; abundant at Bisbee, Cochise Co., Arizona, USA. In the Belvedere Au–Pb mine, near Mt. McGrath, Western Australia.

Name: Honors François Sulpice Beudant (1787–1850), French mineralogist, University of Paris, Paris, France.

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