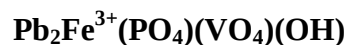


Ferribushmakinite

Crystal Data: Monoclinic. *Point Group:* 2/m. As flattened prisms, elongated along [010], to 0.2 mm, and exhibiting {001}, {10 $\bar{1}$ }, and {1 $\bar{1}$ 0}. *Twinning:* Ubiquitous, typically as X-shape twins on (223) or sixlings.

Physical Properties: *Cleavage:* Fair, two directions $\parallel$ [010]. *Fracture:* Irregular to splintery. *Tenacity:* Brittle. Hardness = $\sim$ 2 D(meas.) = n.d. D(calc.) = 6.154 Soluble in dilute HCl.

Optical Properties: Translucent. *Color:* Yellow. *Streak:* Pale yellow. *Luster:* Adamantine. *Optical Class:* n.d. *n*(calc.) = 2.127 *Orientation:* Y = b.

Cell Data: *Space Group:* P2₁/m. *a* = 7.7719(10) *b* = 5.9060(7) *c* = 8.7929(12) β = 111.604(8)° *Z* = 2

X-ray Powder Pattern: Silver Coin mine, Valmy, Humboldt County, Nevada, USA. 2.947 (100), 3.245 (84), 2.743 (49), 4.794 (46), 2.288 (30), 1.7204 (28), 1.8532 (27)

Chemistry:	(1)	(2)	(3)
PbO	56.47	63.69	64.03
CaO	0.06	0.07	
CuO	0.98	1.11	
Fe ₂ O ₃	6.77	7.63	11.45
Al ₂ O ₃	1.45	1.63	
V ₂ O ₅	11.22	12.65	
As ₂ O ₅	2.74	3.09	
P ₂ O ₅	7.65	8.63	10.18
H ₂ O	[1.33]	1.50	1.29
Total	88.67	100.00	100.00

(1) Silver Coin mine, Valmy, Humboldt County, Nevada, USA; average of 4 electron microprobe analyses, H₂O from structure analysis, low total attributed to inadequate polish; corresponding to (Pb_{1.99}Ca_{0.01}) $\Sigma=2.00$ (Fe_{0.66}Al_{0.22}Cu_{0.10}) $\Sigma=0.98$ (V_{0.97}P_{0.85}As_{0.19}) $\Sigma=2.01$ O_{7.84}(OH)_{1.16}. (2) Normalized recalculation of analysis #1. (3) Pb₂Fe³⁺(PO₄)(VO₄)(OH).

Mineral Group: Brackebuschite supergroup.

Occurrence: A low-temperature, secondary mineral in the oxidized portion of a quartz vein containing argentiferous galena, sphalerite and pyrite, and cutting phosphatic argillite.

Association: Plumbogummite, mottramite, Br-rich chlorargyrite, barite, quartz.

Distribution: From the 'phosphate stope', Silver Coin mine, Valmy, Iron Point district, Humboldt County, Nevada, USA.

Name: Signifies the Fe³⁺ analog of *bushmakinite*.

Type Material: Natural History Museum of Los Angeles County, Los Angeles, California, USA (65412).

References: (1) Kampf, A.R., P.M. Adams, B.P. Nash, and J. Marty (2015) Ferribushmakinite, Pb₂Fe³⁺(PO₄)(VO₄)(OH), the Fe³⁺ analog of bushmakinite from the Silver Coin mine, Valmy, Nevada. *Mineral. Mag.*, 79(3), 661-669. (2) (2016) *Amer. Mineral.*, 101, 1492 (abs. ref. 1).