

Schumacherite**Bi₃O(VO₄, AsO₄, PO₄)₂(OH)**

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Crystal Data: Triclinic. *Point Group:* $\bar{1}$. Crystals are tabular || {010}, with $\{\bar{1}10\}$, and $\{10\bar{1}\}$, to 0.1 mm, in crusts.

Physical Properties: *Fracture:* Conchoidal. Hardness = ~ 3 D(meas.) = n.d.
D(calc.) = 6.90

Optical Properties: Translucent. *Color:* Yellow, yellow-brown, red-brown.

Luster: Adamantine.

Optical Class: Biaxial (+), probable. *Orientation:* $X' \wedge c \simeq 22^\circ$; OAP $\simeq \{11\bar{1}\}$. $\alpha = > 2.20(2)$
 $\beta = \text{n.d.}$ $\gamma = 2.42(2)$ $2V(\text{meas.}) = \sim 90^\circ$

Cell Data: *Space Group:* $P\bar{1}$. $a = 10.05(3)$ $b = 7.46(3)$ $c = 6.90(3)$ $\alpha = 87.7(3)^\circ$
 $\beta = 115.3(3)^\circ$ $\gamma = 111.5(3)^\circ$ $Z = 2$

X-ray Powder Pattern: Schneeberg, Germany; very similar to preisingerite and petitjeanite.
3.28 (10), 3.19 (8), 3.09 (8), 4.57 (6), 1.976 (5), 6.21 (4), 4.13 (4)

Chemistry:

	(1)
P ₂ O ₅	3.6
As ₂ O ₅	5.8
V ₂ O ₅	10.9
Bi ₂ O ₃	79.0
H ₂ O	[1.0]
Total	[100.3]

(1) Schneeberg, Germany; by electron microprobe, H₂O calculated; corresponds to Bi_{3.03}O_{0.97} [(V_{0.54}As_{0.22}P_{0.22}) $\Sigma=0.98$ O₄]₂(OH)_{1.00}.

Polymorphism & Series: Forms series with petitjeanite and preisingerite.

Occurrence: Very rare, in the oxidized zone of Bi-rich hydrothermal deposits.

Association: Pucherite, namibite, quartz (Schneeberg, Germany); bismutite, bismutoferrite, bismutostibiconite, koechlinite, namibite (Lodi #4 mine, California, USA); beyerite, namibite (Mica Lode mine, Colorado, USA); mrázekite, pucherite (Morass Creek, Australia).

Distribution: From the Pucher shaft, Wolfgang Maassen mine, and on the Sauschwart mine dump, Schneeberg, Saxony, Germany. In the USA, at the Lodi #4 mine, Spring Creek district, Plumas Co., California; from the Mica Lode mine, Eight Mile Park, Fremont Co., Colorado; from Manhattan, Nye Co., Nevada. At Morass Creek, north of Benambra, Victoria, Australia.

Name: To honor Professor Friedrich Schumacher (1884–1975), Universities of Freiberg and Bonn, Germany.

Type Material: University of Stuttgart, Stuttgart, Germany; National Museum of Natural History, Washington, D.C., USA, 149596.

References: (1) Walenta, K., P.J. Dunn, G. Hentschel, and K. Mereiter (1983) Schumacherit, ein neues Wismutmineral von Schneeberg in Sachsen. *Tschermaks Mineral. Petrog. Mitt.*, 31, 165–173 (in German with English abs.). (2) (1985) *Amer. Mineral.*, 70, 438 (abs. ref. 1). (3) Krause, W., K. Belendorff, and H.-J. Bernhardt (1993) Petitjeanite, Bi₃O(OH)(PO₄)₂, a new mineral, and additional data for the corresponding arsenate and vanadate, preisingerite and schumacherite. *Neues Jahrb. Mineral., Monatsh.*, 487–503.