

Penberthycroftite

Crystal Data: Monoclinic. *Point Group:* 2/m. As crusts of rectangular laths, to 20 μm , flattened on {010} and elongated on [100]. Sometimes in sprays.

Physical Properties: *Cleavage:* Perfect on {010}. *Fracture:* Irregular. *Tenacity:* Flexible. Hardness = n.d. D(meas.) = n.d. D(calc.) = 2.18

Optical Properties: Translucent. *Color:* White. *Streak:* White. *Luster:* Vitreous to pearly. *Optical Class:* Biaxial. $n = 1.520\text{-}1.532$

Cell Data: *Space Group:* $P2_1/c$. $a = 7.753(2)$ $b = 24.679(5)$ $c = 15.679(3)$ $\beta = 94.19(3)^\circ$ $Z = 4$

X-ray Powder Pattern: Penberthy Croft mine, St. Hilary, Cornwall, England. 9.732 (100), 13.264 (46), 7.420 (28), 12.402 (16), 5.670 (8), 5.423 (6), 3.598 (6)

Chemistry:	(1)	(2)
Al ₂ O ₃	37.6	31.3
Fe ₂ O ₃	0.42	0.35
As ₂ O ₅	41.0	34.1
SO ₃	2.58	2.15
<u>H₂O</u>	<u>32.1</u>	<u>32.1</u>
Total	113.7	100.00

(1) Penberthy Croft mine, St. Hilary, Cornwall, England; average of 14 electron microprobe analyses supplemented by IR spectroscopy, H₂O by TGA, high total ascribed to dehydration during analysis.

(2) Normalized analysis 1; corresponds to



Occurrence: Exceptionally rare, in the oxidized zone of a multi-stage, polymetallic hydrothermal deposit.

Association: Arsenopyrite, bettertonite, bulachite, cassiterite, chalcopyrite, chamosite, goethite, liskeardite, pharmacoalumite-pharmacosiderite, scorodite, quartz.

Distribution: From the Penberthy Croft mine, St. Hilary, Cornwall, England.

Name: For the mine that produced the first specimens.

Type Material: Museum Victoria, Melbourne, Victoria, Australia (M53452), and in the Natural History Museum, London, England (BM 2015,3).

References: (1) Gray, I.E., J. Betterton, A.R. Kampf, C.M. MacRae, F.L. Shanks, and J.R. Price (2016) Penberthycroftite, $[\text{Al}_6(\text{AsO}_4)_3(\text{OH})_9(\text{H}_2\text{O})_5] \cdot 8\text{H}_2\text{O}$, a second new hydrated aluminium arsenate mineral from the Penberthy Croft mine, St. Hilary, Cornwall, UK. *Mineral. Mag.*, 80(7), 1149-1160. (2) (2017) *Amer. Mineral.*, 102, 698 (abs. ref. 1). (3) Grey, I.E., H.E.A. Brand, and J. Betterton, (2016) Dehydration phase transitions in new aluminium arsenate minerals from the Penberthy Croft mine, Cornwall, UK. *Mineral. Mag.*, 80(7), 1205-1217.