Artsmithite $Hg^{1+}_4Al(PO_4)_{1.74}(OH)_{1.78}$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As matted nests of randomly scattered fibers, elongate along [001] to 1 mm, with length:width >100:1.

Physical Properties: *Cleavage*: None. *Fracture*: Irregular. *Tenacity*: Flexible.
Hardness = n.d. D(meas.) = n.d. D(calc.) = 6.40

Optical Properties: Transparent. *Color*: Colorless to white. *Streak*: White to cream.
Luster: Vitreous.
Optical Class: Biaxial (+). n = >1.80 2V(meas.) = ~ 60° Parallel extinction, length slow.
Orientation: $Z \approx c$. *Dispersion*: Distinct, $r < v$.

Cell Data: *Space Group: C*2/*c*. a = 17.007(7) b = 9.070(4) c = 7.013(5) β = 101.30(5)° Z = 4

X-ray Powder Pattern: Funderburk prospect, Pike County, Arkansas, USA.
8.326 (100), 2.979 (80), 2.784 (80), 2.660 (75), 4.739 (50), 2.952 (50), 1.755 (50)

Chemistry:

	(1)	(2)
Hg_2O	78.28	81.41
Al_2O_3	5.02	4.97
P_2O_5	11.39	12.05
H_2O	[1.63]	1.56
Total	96.32	99.99

(1) Funderburk prospect, Pike County, Arkansas, USA; average electron microprobe analysis supplemented by FTIR spectroscopy, H_2O calculated from structure; corresponds to $Hg^{1+}_{4.00}Al_{1.05}P_{1.71}O_{8.74}H_{1.78}$. (2) $Hg^{1+}_{4.00}Al_{1.74}(PO_4)_{1.74}(OH)_{1.78}$.

Occurrence: A weathering product filling fractures in a cinnabar and fluorapatite-bearing sandstone.

Association: Quartz, goethite, dickite, cinnabar.

Distribution: From dumps at the Funderburk prospect, on a ridge north of Cowhide Cove road, in the Cowhide Cove Recreation area, ~13 km north of Murfreesboro, Pike County, Arkansas, USA.

Name: Honors Arthur Edward *Smith* (1935-2009) of Houston, Texas, petroleum geologist, mineral collector, micromounter and expert on the mineral localities of Texas and Arkansas, who collected the holotype specimen.

Type Material: National Mineral Collection, Geological Survey of Canada, Ottawa, Ontario (NMCC68092).

References: (1) Roberts, A.C., M.A. Cooper, F.C. Hawthorne, R.A. Gault, J.D. Grice, and A.J. Nikischer (2003) Artsmithite, a new Hg^{1+}-Al phosphate-hydroxide from the Funderburk prospect, Pike County, Arkansas, U.S.A. Can. Mineral., 41, 721-725. (2) (2004) Amer. Mineral., 89(1), 249 (abs. ref. 1).