Artsmithite $Hg_4^{1+}Al(PO_4)_{2-x}(OH)_{1+3x}$ (x = 0.26)

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals are short prismatic, to 5 μm, in granular aggregates.

Physical Properties: Hardness = 1.5–2 D(meas.) = n.d. D(calc.) = 2.85

Optical Properties: Translucent. *Color:* Turquoise-blue to sky-blue. *Luster:* Earthy. *Optical Class:* Biaxial. *Pleochroism:* X = blue; Z = colorless. $\alpha = 1.632(5)$ (α'). β = n.d. $\gamma = 1.680(5)$ (γ'). 2V(meas.) = n.d.

Cell Data: *Space Group:* $[I2/m]$ (by analogy to vivianite). $a = 9.889(15)$ $b = 13.225(11)$ $c = 4.645(4)$ $\beta = 102.41(11)^\circ$ Z = 2

X-ray Powder Pattern: Santa Catherina meteorite.
6.624 (100), 7.878 (26), 4.818 (24), 3.152 (24), 2.922 (23), 3.805 (21), 2.672 (17)

Chemistry:

	(1)	(2)
P_2O_5	27.60	27.83
FeO	4.53	
CoO	0.39	
NiO	40.18	43.92
H_2O	[27.30]	28.25
Total	[100.00]	100.00

(1) Santa Catherina meteorite; by electron microprobe, total Fe as FeO, H_2O by difference; corresponds to $(Ni_{2.78}Fe^{2+}_{0.33}Co_{0.03})_{\Sigma=3.14}(PO_4)_{2.01}O_{0.12}\bullet 7.84H_2O$. (2) $Ni_3(PO_4)_2\bullet 8H_2O$.

Mineral Group: Vivianite group.

Occurrence: A weathering product of a nickel-rich iron meteorite.

Association: Reevesite, honessite, akaganéite, hematite, goethite, magnetite.

Distribution: In the Santa Catherina iron meteorite.

Name: To honor Hans Henning Arup (1928–), Director of the Danish Corrosion Center, Copenhagen, Denmark.

Type Material: Division of Meteorites, National Museum of Natural History, Washington, D.C., USA, 659, 804, 877.

References: (1) Buchwald, V.F. (1990) A new mineral, arupite, $Ni_3(PO_4)_2\bullet 8H_2O$, the nickel analog of vivianite. Neues Jahrb. Mineral., Monatsh., 76–80. (2) (1990) Amer. Mineral., 75, 1209 (abs. ref. 1).