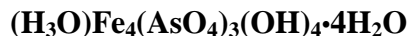


**Hydroniumpharmacosiderite**

**Crystal Data:** Isometric. *Point Group:*  $\bar{4} 3m$ . As a single elongated cubic crystal to 0.17 mm.

**Physical Properties:** *Cleavage:* On {001}. [By analogy with other pharmacosiderite group minerals.] *Fracture:* Irregular. *Tenacity:* Brittle. *D(meas.)* = n.d. *D(calc.)* = 2.559 *Hardness* = 2-3 [Determined on H<sub>3</sub>O-exchanged pharmacosiderite.]

**Optical Properties:** Transparent. *Color:* Yellowish green. *Streak:* White. *Luster:* Vitreous. *Optical Class:* Isotropic. Has anomalous birefringence. *n(min.)* = 1.690(2) *n(max.)* = 1.692(2)

**Cell Data:** *Space Group:*  $P\bar{4} 3m$ . *a* = 7.993(6) *Z* = 1

**X-ray Powder Pattern:** Cornwall, England.

8.050 (100), 3.265 (35), 2.412 (30), 2.830 (23), 4.628 (22), 2.528 (19), 4.005 (14)

<b>Chemistry:</b>	(1)
Na <sub>2</sub> O	0.25
K <sub>2</sub> O	2.84
Al <sub>2</sub> O <sub>3</sub>	1.45
Fe <sub>2</sub> O <sub>3</sub>	38.33
P <sub>2</sub> O <sub>5</sub>	1.30
As <sub>2</sub> O <sub>5</sub>	39.80
<u>H<sub>2</sub>O</u>	<u>[16.03]</u>
Total	100.00

(1) Cornwall, England; average of 4 electron microprobe analyses, H<sub>2</sub>O calculated; corresponding to [(H<sub>3</sub>O)<sub>0.5</sub>K<sub>0.48</sub>Na<sub>0.06</sub>]<sub>Σ=1.04</sub>(Fe<sub>3.79</sub>Al<sub>0.22</sub>)<sub>Σ=4.01</sub>[(As<sub>2.73</sub>P<sub>0.15</sub>)<sub>Σ=2.88</sub>O<sub>12</sub>](OH)<sub>4</sub>•4H<sub>2.14</sub>O.

**Mineral Group:** Pharmacosiderite supergroup.

**Occurrence:** n.d.

**Association:** n.d.

**Distribution:** From Cornwall, England (probably the St. Day group of mines). At the Wendy pit, Tambo mine, Elqui Province, Coquimbo Region, Chile.

**Name:** Signifies the H<sub>3</sub>O, *hydronium*, analog of *pharmacosiderite*.

**Type Material:** Harvard Mineralogical Museum, Cambridge, Massachusetts, USA (#142784).

**References:** (1) Mills, S.J., A.R. Kampf, P.A. Williams, P. Leverett, G. Poirier, M. Raudsepp, and C.A. Francis (2010) Hydroniumpharmacosiderite, a new member of the pharmacosiderite supergroup from Cornwall, U.K.: structure and description. *Mineral. Mag.*, 74(5), 863-869. (2) (2011) *Amer. Mineral.*, 96, 1655 (abs. ref. 1).