Santabarbaraite $Fe^{3+}_3(PO_4)_2(OH)_3 \cdot 5H_2O$

Crystal Data: Amorphous. *Point Group*: n.d. As aggregates, to 9 cm, of submillimetric pseudocrystals after vivianite, and as pseudomorphs of vivianite.

Physical Properties: *Cleavage*: None, good parting along the {010} cleavage of the vivianite precursor. *Fracture*: n.d. *Tenacity*: Brittle. Hardness = n.d. D(meas.) = 2.42 D(calc.) = n.d.

Optical Properties: Translucent. *Color*: Brown; amber in transmitted light. *Streak*: Amber. *Luster*: Vitreous to greasy.
Optical Class: Isotropic. n = 1.695(5)

Cell Data: *Space Group*: Amorphous.

X-ray Powder Pattern: X-ray amorphous.

Chemistry:

	(1)	(2)
MgO	0.61	0.69
CaO	-	2.93
Mn_2O_3	2.23	-
Fe_2O_3	43.97	43.22
P_2O_5	29.48	28.60
H_2O	23.90	23.05
Total	100.19	98.49

(1) Valdarno Superiore, Upper Arno River Valley, Tuscany, Italy; average of 30 electron microprobe analyses supplemented by FTIR and X-ray absorption spectroscopy (XANES and EXAFS), H_2O by TGA and LOI, Fe^{3+} confirmed by XANES; corresponds to $(Fe_{2.64}Mn_{0.13}Mg_{0.07})_{\Sigma=2.84}(PO_4)_2(OH)_{2.45} \cdot 5.1H_2O$. (2) Wannon Falls, ~7 km west of Hamilton, Victoria, Australia; average of 12 electron microprobe analyses supplemented by FTIR and X-ray absorption spectroscopy (XANES and EXAFS), H_2O by TGA and LOI, Fe^{3+} confirmed by XANES; corresponds to $(Fe_{2.69}Ca_{0.26}Mg_{0.08})_{\Sigma=3.03}(PO_4)_2(OH)_{2.75} \cdot 5.0H_2O$.

Occurrence: In cavities within concretionary nodules, in clays in a clastic rock sequence (Italy) and in clay underlying basalt (Australia). Formed in-situ by oxidation of Fe^{2+} in vivianite, progressing through metavivianite to santabarbaraite.

Association: Vivianite, metavivianite, clay.

Distribution: From Valdarno Superiore, Upper Arno River Valley, Tuscany, Italy and Wannon Falls, ~7 km west of Hamilton, Victoria, Australia.

Name: For the locality in the *Santa Barbara* mining district of Tuscany, Italy, and for the Christian martyr *Santa Barbara*, the patron saint of miners.

Type Material: Natural History Museum, University of Florence, Italy (2862/RI) and Museum Victoria, Australia (M22892 and M34637).

References: (1) Pratesi, G., C. Cipriani, G. Giuli, and W.D. Birch (2003) Santabarbaraite: a new amorphous phosphate mineral. Eur. J. Mineral., 15, 185-192. (2) (2003) Amer. Mineral., 88, 1838 (abs. ref. 1).