Strunzite $Mn^{2+}Fe_2^{3+}(PO_4)_2(OH)_2 \cdot 6H_2O$

Crystal Data: Triclinic, pseudomonoclinic. *Point Group:* $\overline{1}$. Crystals are flattened on {100}, typically needlelike to hairlike, to 2 cm; in radiating sprays, tufts, and coatings. *Twinning:* On $\{1\overline{2}0\}$, common.

Physical Properties: Hardness = n.d. D(meas.) = 2.52(5) D(calc.) = 2.49

Optical Properties: Semitransparent. *Color:* White, pale yellow, straw-yellow, brownish yellow. *Luster:* Vitreous.
Optical Class: Biaxial (–). *Pleochroism:* Faint; X = nearly colorless; Y = yellow-brown; Z = darker yellow-brown. *Orientation:* $Z \wedge c = 10°–19°$. *Absorption:* $Z > X = Y$. $\alpha = 1.619–1.625$ $\beta = 1.640–1.670$ $\gamma = 1.696–1.720$ 2V(meas.) = Medium. 2V(calc.) = 56°–93°

Cell Data: *Space Group:* $P\overline{1}$. $a = 10.228(5)$ $b = 9.837(5)$ $c = 7.284(5)$ $\alpha = 90.17(5)°$ $\beta = 98.44(5)°$ $\gamma = 117.44(5)°$ Z = 2

X-ray Powder Pattern: Hagendorf, Germany; nearly identical to ferrostrunzite.
9.02 (10), 5.32 (8), 4.35 (6), 4.27 (6), 3.29 (6), 3.23 (6), 4.50 (5)

Chemistry:

	(1)	(2)
P_2O_5	33.0	28.46
Fe_2O_3	36.0	32.02
MnO	9.1	14.23
H_2O^+	22.5	25.29
Total	100.6	100.00

(1) Hagendorf, Germany. (2) $Mn^{2+}Fe_2^{3+}(PO_4)_2(OH)_2 \cdot 6H_2O$.

Occurrence: A secondary mineral, typically altered from triphylite, in zoned complex granite pegmatites.

Association: Triphylite, laueite, rockbridgeite, many other Mn–Fe phosphates.

Distribution: From Hagendorf, Waidhaus, and Hühnerkobel, near Zwiesel, Bavaria, Germany. At Blaton, Belgium. In Portugal, from Sabugal, in the Mangualde pegmatite, near Mesquitela, and the Bendada pegmatite, near Guarda. In the Gravel Hill mine, Perranzabuloe, Cornwall, England. At the Norrö pegmatite, on Rånö Island, and from near Kapelludden, Utö Island, Sweden. From Morašice, Czech Republic. In the USA, from the Palermo #1 and Fletcher mines, near North Groton, Grafton Co., the G.E. Smith mine, Newport, Sullivan Co., and the Fitzgibbon mine, Alstead, Cheshire Co., New Hampshire; in Maine, at the Red Hill quarry, Rumford, and the BB quarry, Norway, Oxford Co., and elsewhere; in the Big Chief mine, one km south of Glendale, and the Hesnard and Etta mines, near Keystone, Pennington Co., from the Tip Top mine, 8.5 km southwest of Custer, Custer Co., South Dakota; from the Foote mine, Kings Mountain, Cleveland Co., North Carolina. At several mines around Linópolis, Minas Gerais, Brazil.

Name: To honor Dr. Hugo Strunz (1910–), Professor of Mineralogy, Technical University, Berlin, Germany, for his work on pegmatite phosphate minerals, especially those of Hagendorf, Germany.

Type Material: Harvard University, Cambridge, Massachusetts, USA, 106288–106301.

References: (1) Frondel, C. (1957) Strunzit, ein neues Mineral. Naturwiss., 45, 37–38 (in German). (2) (1958) Amer. Mineral., 43, 793–794. (3) Frondel, C. (1957) Strunzit, ein neues Eisen-Mangan-Phosphat. Neues Jahrb. Mineral., Monatsh., 222–226 (in German). (4) Fanfani, L., M. Tomassini, P.F. Zanazzi, and A.R. Zanzari (1978) The crystal structure of strunzite, a contribution to the crystal chemistry of basic ferric-manganous hydrated phosphates. Tschermaks Mineral. Petrog. Mitt., 25, 77–87.