**Faheyite** $(Mn^{2+},Mg)Fe_2^{3+}Be_2(PO_4)_4 \cdot 6H_2O$



**Crystal Data:** Hexagonal. *Point Group:* 622 (probable). As needlelike crystals, showing $\{10\bar{1}0\}$, $\{11\bar{2}0\}$, $\{0001\}$, and several $\{h0\bar{i}l\}$ forms; more generally fibrous, to 1 mm, elongated along [0001], in flat rosettes and botryoidal masses; in mats.

**Physical Properties:** *Cleavage:* One, ‖ [0001], perfect. Hardness = n.d. D(meas.) = 2.660 D(calc.) = 2.670

**Optical Properties:** Semitransparent. *Color:* White, bluish white to brownish white. *Optical Class:* Uniaxial (+). $\omega = 1.631$ $\epsilon = 1.652$

**Cell Data:** *Space Group:* $P6_222$, $P6_422$, $6mm$, 622, $\bar{6}m2$, or $6/mmm$. a = 9.42(2) $c = 15.98(3)$ Z = 3

**X-ray Powder Pattern:** Sapucaia mine, Brazil.
5.72 (10), 7.28 (9), 3.244 (6), 3.085 (6), 3.029 (6), 3.962 (5), 2.724 (3)

**Chemistry:**

| | (1) |
|---|---|
| $P_2O_5$ | 42.08 |
| $Al_2O_3$ | 0.11 |
| $Fe_2O_3$ | 23.65 |
| $Mn_2O_3$ | 0.00 |
| FeO | 0.00 |
| MnO | 6.61 |
| BeO | 8.02 |
| MgO | 1.26 |
| $Na_2O$ | 0.93 |
| $K_2O$ | trace |
| F | trace |
| $H_2O$ | 16.45 |
| Total | [99.11] |

(1) Sapucaia mine, Brazil; Na and K by flame photometry, recalculated after deduction of insoluble quartz and muscovite 9.44%; then corresponding to $(Mn_{0.61}Mg_{0.21}Na_{0.20})_{\Sigma=1.02}(Fe_{1.95}Al_{0.01})_{\Sigma=1.96}Be_{2.11}(PO_4)_{3.90} \cdot 6.01H_2O$.

**Occurrence:** A rare late-stage secondary mineral in a complex granite pegmatite (Sapucaia mine, Brazil).

**Association:** Quartz, muscovite, variscite, frondelite (Sapucaia mine, Brazil); strengite (Roosevelt mine, South Dakota, USA).

**Distribution:** From the Sapucaia pegmatite mine, about 50 km east-southeast of Governador Valadares, Minas Gerais, Brazil. In the USA, at the Roosevelt mine, near Custer, Custer Co., South Dakota. From the Noumas mine, Blesberg, Cape Province, South Africa.

**Name:** Honoring Joseph John Fahey (1901–1980), American analytical chemist, U.S. Geological Survey, Washington, D.C., USA.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 112653.

**References:** (1) Lindberg, M.L. and K.J. Murata (1953) Faheyite, a new phosphate mineral from the Sapucaia pegmatite mine, Minas Gerais, Brazil. Amer. Mineral., 38, 263–270.
(2) Lindberg, M.L. (1964) Crystallography of faheyite, Sapucaia pegmatite mine, Minas Gerais, Brazil. Amer. Mineral., 49, 395–398.