Zanazziite $\mathbf{Ca_2(Mg,Fe^{2+})(Mg,Fe^{2+},Al)_4Be_4(PO_4)_6(OH)_4 \cdot 6H_2O}$

Crystal Data: Monoclinic. *Point Group:* $2/m$. In barrel-shaped pseudohexagonal crystals, to 4 mm, showing {100}, {110}, and {001}, in subparallel groups and divergent hemispherical sprays, with mosaic terminations; rarely as bladed crystals.

Physical Properties: *Cleavage:* {100}, good; {010}, distinct. Hardness = ~5
D(meas.) = 2.76 D(calc.) = 2.77

Optical Properties: Translucent. *Color:* Pale to dark olive-green, antithetically zoned in Fe:Mn content, yellowish green; nearly colorless to tan. *Streak:* White. *Luster:* Vitreous to pearly on cleavages.
Optical Class: Biaxial (+). *Orientation:* $X = b$; $Z \wedge a = 3°$. $\alpha = 1.606(2)$ $\beta = 1.610(2)$ $\gamma = 1.620(2)$ 2V(meas.) = 72° 2V(calc.) = 65°

Cell Data: *Space Group:* $C2/c$. $a = 15.874(4)$ $b = 11.854(3)$ $c = 6.605(1)$ $\beta = 95.34°$ Z = 2

X-ray Powder Pattern: Lavra da Ilha pegmatite, Brazil; close to roscherite.
5.91 (100), 9.50 (90), 3.16 (70), 3.05 (50), 2.766 (50), 1.642 (50b), 2.682 (40b)

Chemistry:

	(1)
SiO_2	0.36
P_2O_5	39.27
Al_2O_3	1.54
Fe_2O_3	0.76
FeO	9.63
MnO	1.77
BeO	9.81
MgO	11.66
CaO	10.65
H_2O	13.32
Total	98.77

(1) Lavra da Ilha pegmatite, Brazil; by electron microprobe, average of 25 analyses on four grains, Fe^{2+}:Fe^{3+} from titrimetric analysis, Be by AA, H_2O by H analyzer; corresponds to $(Ca_{1.97}Mn_{0.03})_{\Sigma=2.00}(Mg_{0.61}Fe^{2+}_{0.40})_{\Sigma=1.01}(Mg_{2.38}Fe^{2+}_{1.08}Al_{0.31}Mn_{0.23}Fe^{3+}_{0.10})_{\Sigma=4.10}Be_4[(P_{0.96}Be_{0.01}Si_{0.01})_{\Sigma=0.98}O_4]_6(OH)_{3.4} \cdot 6.6H_2O$.

Occurrence: In a simply zoned granite pegmatite with other phosphates (Lavra da Ilha pegmatite, Brazil).

Association: Quartz, albite, muscovite, wardite, eosphorite, whiteite, apatite, pyrite, manganese oxides (Lavra da Ilha pegmatite, Brazil); fluorapatite, albite (Martin prospect, Newry, Maine, USA).

Distribution: From the Lavra da Ilha pegmatite, in the Jequitinhonha River, three km north of Taquaral, Minas Gerais, Brazil. In the Bell pit and from the Martin prospect, Newry, Oxford Co., Maine, USA.

Name: To honor Dr. Pier Francesco Zanazzi (1939–), Professor of Mineralogy, University of Perugia, Perugia, Italy, for his structural studies of many minerals, including this one.

Type Material: National Museum of Natural History, Washington, D.C., USA, R17847, 154805.

References: (1) Leavens, P.B., J.S. White, and J.A. Nelen (1990) Zanazziite, a new mineral from Minas Gerais, Brazil. Mineral. Record, 21, 413–417. (2) (1991) Amer. Mineral., 76, 1732 (abs. ref. 1). (3) Fanfani, L., A. Nunzi, P.F. Zanazzi, and A.R. Zanzari (1975) The crystal structure of roscherite. Tschermaks Mineral. Petrog. Mitt., 22, 266–277.