

**Zodacite**

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**Crystal Data:** Monoclinic. *Point Group:* 2/m or m. Crystals, to 0.2 mm, may be isolated, usually in flat radial sprays.

**Physical Properties:** *Cleavage:* [On {010}] (by analogy to montgomeryite). *Hardness* = ~4  
D(meas.) = 2.68 D(calc.) = 2.65

**Optical Properties:** Semitransparent. *Color:* Pale to medium yellow, colorless. *Streak:* Pale yellow to white. *Luster:* Vitreous.

*Optical Class:* Biaxial (-). *Pleochroism:* Very weak; Y = very pale green; Z = pale green. *Orientation:* X = b; Y ∧ c = 24°; Z ∧ a = 23°. *Absorption:* Y < Z. α = 1.598(1)  
β = 1.601(1) γ = 1.602(1) 2V(meas.) = 83(1)° 2V(calc.) = 60°

**Cell Data:** *Space Group:* C2/c or Cc. a = 10.152(8) b = 24.14(3) c = 6.308(6)  
β = 91.14(7)° Z = 2

**X-ray Powder Pattern:** Mangualde pegmatite, Portugal.  
5.18 (10), 12.00 (6), 2.907 (5), 3.150 (4), 6.31 (3), 9.38 (2), 2.985 (2)

**Chemistry:**

	(1)	(2)
P <sub>2</sub> O <sub>5</sub>	34.8	32.94
Al <sub>2</sub> O <sub>3</sub>	7.7	
Fe <sub>2</sub> O <sub>3</sub>	14.1	24.71
MnO	4.8	5.49
MgO	0.2	
CaO	18.0	17.35
H <sub>2</sub> O	[20.4]	19.51
Total	[100.0]	100.00

(1) Mangualde pegmatite, Portugal; by electron microprobe, total Fe as Fe<sub>2</sub>O<sub>3</sub>, total Mn as MnO, H<sub>2</sub>O by difference; corresponds to Ca<sub>3.96</sub>(Mn<sub>0.83</sub>Mg<sub>0.06</sub>)<sub>Σ=0.89</sub>(Fe<sub>2.18</sub>Al<sub>1.86</sub>)<sub>Σ=4.04</sub>(PO<sub>4</sub>)<sub>6.05</sub>(OH)<sub>3.67</sub>•12.13H<sub>2</sub>O. (2) Ca<sub>4</sub>MnFe<sub>4</sub>(PO<sub>4</sub>)<sub>6</sub>(OH)<sub>4</sub>•12H<sub>2</sub>O.

**Mineral Group:** Montgomeryite group; Mn > Mg or Fe<sup>2+</sup>; Fe<sup>3+</sup> > Al.

**Occurrence:** Initially found on a museum specimen from a complex zoned granite pegmatite.

**Association:** Jahnsite-(CaMnMn), huréaulite, phosphosiderite, varulite, microcline.

**Distribution:** From the Mangualde pegmatite, near Mesquitela, Portugal.

**Name:** To honor Peter Zodac (1894–1967), American founder of Rocks and Minerals magazine.

**Type Material:** Canadian Museum of Nature, Ottawa, Canada, 53452; National Museum of Natural History, Washington, D.C., USA, 149953.

**References:** (1) Dunn, P.J., J.D. Grice, and W.C. Metropolis (1988) Zodacite, the Mn analogue of montgomeryite, from Mangualde, Portugal. *Amer. Mineral.*, 73, 1179–1181.