

Petedunnite

Ca(Zn, Mn²⁺, Fe²⁺, Mg)Si₂O₆

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Crystal Data: Monoclinic. *Point Group:* 2/m. As portions of an anhedral crystal consisting of a mosaic of 10–100 μm-sized subgrains containing abundant inclusions.

Physical Properties: *Cleavage:* {110}. Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.68

Optical Properties: Translucent. *Color:* Dark green; in transmitted light, light yellow to pale green. *Luster:* Vitreous.

Optical Class: Biaxial (+). *Pleochroism:* X = Y = light yellow; Z = light green. *Orientation:* Y = b; Z ⊥ c = 35°–45°. *Dispersion:* r > v, strong. *Absorption:* Z > X = Y. α = 1.68(1) β = 1.69(1) γ = 1.70(1) 2V(meas.) = 70°–90°

Cell Data: *Space Group:* C2/c. a = 9.82(2) b = 9.00(1) c = 5.27(2) β = 105.6(2)°
Z = 4

X-ray Powder Pattern: Franklin, New Jersey, USA.

3.02 (100), 2.537 (80), 2.96 (40), 2.589 (30), 2.022 (30), 6.49 (10), 2.227 (10)

Chemistry:

	(1)
SiO ₂	48.4
Al ₂ O ₃	1.2
Fe ₂ O ₃	3.8
FeO	5.7
MnO	5.8
ZnO	12.6
MgO	2.4
CaO	21.3
Na ₂ O	0.7
Total	101.9

(1) Franklin, New Jersey, USA; by electron microprobe, Fe²⁺:Fe³⁺ by charge balance; corresponds to (Ca_{0.92}Na_{0.06}Mn_{0.02})_{Σ=1.00}(Zn_{0.37}Fe_{0.19}²⁺Mn_{0.18}Mg_{0.14}Fe_{0.12}³⁺)_{Σ=1.00}(Si_{1.94}Al_{0.06})_{Σ=2.00}O₆.

Mineral Group: Pyroxene group.

Occurrence: In a metamorphosed stratiform zinc deposit, apparently formed under relatively high activity of sulfur and oxygen.

Association: Calcite, gahnite, willemite, genthelvite, garnet, albite, sphalerite.

Distribution: From Franklin, Sussex Co., New Jersey, USA.

Name: In honor of Dr. Pete J. Dunn, Department of Mineral Sciences, Smithsonian Institution, Washington, D.C., USA, for his contributions to the mineralogy of Franklin and Sterling Hill, New Jersey, USA.

Type Material: Department of Geological Sciences, University of Michigan, Ann Arbor, Michigan; National Museum of Natural History, Washington, D.C., USA, 162211.

References: (1) Essene, E.J. and D.R. Peacor (1987) Petedunnite (CaZnSi₂O₆), a new zinc clinopyroxene from Franklin, New Jersey, and phase equilibria for zincian pyroxenes. *Amer. Mineral.*, 72, 157–166.