Petedunnite

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 (+).

α = 1.68(1)  
β = 1.69(1)  
γ = 1.70(1)  
2V(meas.) = 70°-90°

Pleochroism: X = Y = light yellow; Z = light green.  
Orientation: Y = b; Z^c = 35°-45°.

Dispersion: r > v; strong.  
Absorption: Z > X = Y.

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) 
SiO₂ 48.4  
Al₂O₃ 1.2  
Fe₂O₃ [3.8]  
FeO [5.7]  
MnO 5.8  
ZnO 12.6  
MgO 2.4  
CaO 21.3  
Na₂O 0.7  
Total 101.9

(1) Franklin, New Jersey, USA; by electron microprobe, Fe²⁺:Fe³⁺ by charge balance; corresponds to (Ca₀.92Na₀.06Mn₀.02)₁₋₁₀.Zn₀.37Fe²⁺₀.19Mn₀.18Mg₀.14Fe³⁺₀.12Ca₁₋₁₀(Si₁.₉₄Al₀.₀₆)₂₋₂.₀₀O₆-

Mineral Group: Ca pyroxene group.

Occurrence: In a metamorphosed stratiform zinc deposit, apparently formed under relatively high activity of sulfur and oxygen.  
Formed at high pressures (P > 0.8 GPa); at lower pressures and temperatures (>650 °C) decomposes to willemite, hardystonite, and quartz.

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 (1984-2007), Smithsonian Institution, Washington, D.C., USA, for 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 (NMNH 162211).

References:  
Amer. Mineral., 97, 739-749.