

**Crystal Data:** Hexagonal. *Point Group:*  $\bar{3}$ . Granular, to 975  $\mu\text{m}$ , and as rims around other phosphates and silicates.

**Physical Properties:** *Cleavage:* Rhombohedral, probable. Hardness = 4.5–5  
D(meas.) = n.d. D(calc.) = 3.01

**Optical Properties:** Transparent. *Color:* Colorless, orange-brown with included iron oxides; gray in reflected light, with orange-brown internal reflections. *Luster:* Vitreous to resinous.  
*Optical Class:* Uniaxial.  $n = 1.60\text{--}1.61$  *Anisotropism:* Weak. *Birefractance:* Weak.

**Cell Data:** *Space Group:*  $R\bar{3}$ .  $a = 14.967(2)$   $c = 42.595(4)$   $Z = 18$

**X-ray Powder Pattern:** Carleton meteorite.  
3.694 (s), 2.960 (s), 2.753 (s), 3.558 (m), 2.500 (m), 2.126 (m), 1.851 (m)

Chemistry:	(1)	(2)	(3)
P <sub>2</sub> O <sub>5</sub>	49.9	45.8	51.55
SiO <sub>2</sub>	0.59		
FeO	2.2	16.0	
MnO	0.30	10.12	
NiO		0.08	
MgO	33.5	17.55	34.16
CaO	6.59	3.60	6.79
Na <sub>2</sub> O	6.6	6.66	7.50
Total	99.68	99.81	100.00

(1) Carleton meteorite; by electron microprobe, average of five analyses; corresponding to Na<sub>1.77</sub>Ca<sub>0.96</sub>(Mg<sub>6.96</sub>Fe<sub>0.26</sub>Mn<sub>0.04</sub>)<sub>Σ=7.26</sub>[(P<sub>0.96</sub>Si<sub>0.08</sub>)<sub>Σ=1.04</sub>O<sub>4</sub>]<sub>6</sub>. (2) GRA 95209 meteorite; by electron microprobe, average of 8 analyses, total Fe as FeO, total Mn as MnO; corresponds to Na<sub>1.99</sub>(Ca<sub>0.60</sub>Mg<sub>0.43</sub>)<sub>Σ=1.03</sub>(Mg<sub>3.60</sub>Fe<sub>2.07</sub>Mn<sub>1.33</sub>)<sub>Σ=7.00</sub>(P<sub>0.98</sub>O<sub>4</sub>)<sub>6</sub>. (3) Na<sub>2</sub>CaMg<sub>7</sub>(PO<sub>4</sub>)<sub>6</sub>.

**Occurrence:** As a single grain in a phosphate-rich inclusion in an iron meteorite (Carleton meteorite); in phosphate-rich portions of an acapulcoite-lodranite meteorite.

**Association:** Chlorapatite, olivine, pyroxene, plagioclase, schreibersite, nickel-iron, troilite, kamacite, hydrated iron oxides [of terrestrial origin] (Carleton meteorite); magnesian graffonite, orthopyroxene, olivine, plagioclase, nickel-iron (GRA 95209 meteorite).

**Distribution:** In the Carleton type IIICD iron and GRA 95209 primitive achondrite meteorites.

**Name:** Honors Professor Ernst Florens Friedrich Chladni (1756–1827), German physicist, University of Riga, Riga, Latvia, who first published the hypothesis that meteorites were of extraterrestrial origin.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 2707.

**References:** (1) McCoy, T.J., I.M. Steele, K. Keil, B.F. Leonard, and M. Endre (1994) Chladniite, Na<sub>2</sub>CaMg<sub>7</sub>(PO<sub>4</sub>)<sub>6</sub>: a new mineral from the Carleton (IIICD) iron meteorite. *Amer. Mineral.*, 79, 375–380. (2) Floss, C. (1999) Fe,Mg,Mn-bearing phosphates in the GRA 95209 meteorite: occurrences and mineral chemistry. *Amer. Mineral.*, 84, 1354–1359.