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# DenSity $= \frac{\mathbf{Z} \times \mathbf{M}}{\mathbf{N}_{\mathbf{A}} \times \mathbf{A}^{\mathbf{3}}}$ **d** = Coordination No. Packging Efficiency (P.E.) (C.N.) $\frac{\mathbf{Z}\times\frac{\mathbf{H}}{\mathbf{3}}\pi \mathbf{r}^{\mathbf{3}}}{\mathbf{a}^{\mathbf{3}}}\times\mathbf{100}$ It is no. of nearest Neighbours of a PE = -lattice point

# STRUCTURE OF VARIOUS IONIC CRYSTALS

Crystal Structure	Lattice Points	C.N.	Number of Formula Units per unit cell	Eg
Rock Salt NaCl type	Cl <sup>-</sup> CCP Na <sup>+</sup> -OV	6:6	ч	LICI, KCI RbCI, AgCI
Zinc-Blende Zns type	S <sup>2-</sup> -CCP ZN <sup>2+</sup> -Alternate TV	વઃવ	ч	ZNS. BES. CUCI. CUI
CSCL LYPE (BCC LYPE)	Cl <sup>-</sup> -Corners Cs <sup>+</sup> -Body centre	8:8	1	CSBr. CSI. CSCN
Fluorite type (Caf <sub>2</sub> )	Са²+-ССР F-аш ТV	8:4	ч	Srf <sub>2</sub> , Baf <sub>2</sub> , SrCl <sub>2</sub>
Anti-Fluorite type (Na <sub>2</sub> 0)	0²CCP Li⁺-all TV	4:8	ч	K <sub>2</sub> 0, Li <sub>2</sub> 0, K <sub>2</sub> S

### MAGNETIC & ELECTRICAL PROPERTIES

# MAGNETIC PROPERTIES

- Paramagnetic- weakly attracted by magnetic field. eg. 0,. Cu<sup>2+</sup> etc.
- · Diamagnetic- weakly repelled by magnetic field. H.O. NaCl. etc.
- · Ferromagnetic- permanent magnetism even in absence of magnetic fields eg. fe. Ni. CO. Cro., etc.
- ·Ferrimagnetic-Magnetic moment is smaller than that of ferromagnetic Substances. eg.
- ·Antiferromagnetic-Zero magnetic moment due to equal no. of antiparallel eg. domains. eg. MNO. etc.

### ELECTRICAL PROPERTIES

- Conductors- Valence bond is partially filled or it overlaps with higher energy unoccupied conduction bond.
- . Insulators- Large energy gap between valance and conduction bond.
- ·Semi-conductors- Small energy gap between valance and conduction bond.
- ·P-Lype Semiconductor (by doping e- deficient impurities
- N-type Semiconductor (by doping e-rich impurities

•	•		•	0	<b>0</b> <sup>2-</sup>
00	•		0	0	
0 0	$\circ$	0	0	lacksquare	Fe <sup>3+</sup>
00	0		0	lacksquare	•
00	•		0	0	● Fe <sup>3+</sup>

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