

Classification of Crystalline Solids

Type of solid	Constituent particles	Attractive forces	Examples	Physical nature	Electrical conductivity	Melting point
1) Molecular Solid	Molecules					
a) Non polar		Dispersion/ London forces	Ar, CCl ₄ , H ₂ , I ₂ , CO ₂	Soft	Insulator	Very low
b) Polar		Dipole - dipole forces	HCl, SO ₂	Soft	Insulator	Low
c) Hydrogen bonded		Hydrogen bonding	H ₂ O (ice)	Hard	Insulator	Low
2) Ionic solids	Ions	Coulombic or Electrostatic	NaCl, MgO, ZnS, CaF ₂	Hard, brittle	Insulators in solid state but conductors in molten state and in aqueous solutions	High
3) Metallic Solids	Positive ions in a sea of delocalised electrons	Metallic bonding	Fe, Cu, Ag, Mg	Hard, Malleable and ductile	Conductors in solid state as well as in molten state	Fairly high
4) Covalent or network solid	Atoms	Covalent Bonding	SiO ₂ (quartz) SiC, Diamond AlN Graphite	Hard Soft	Insulator Conductor	Very high