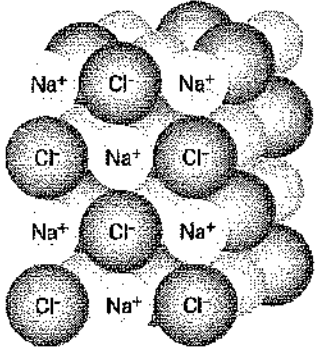
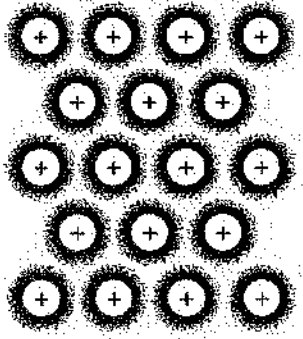
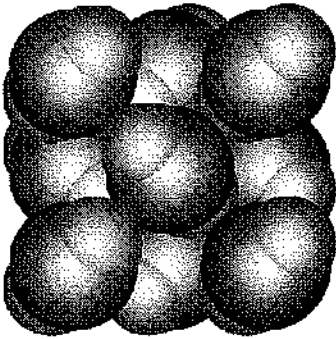


Crystalline Solids

SUMMARY**Properties of Ionic, Metallic, Molecular, and Covalent Network Crystals**

Crystal	Particles	Force/Bond	Properties	Examples	Models
Ionic	ions (+, -) Metals + Non- metals	ionic 3D crystal Lattice	hard; brittle; high melting point; liquid and solution conducts Does not conduct as solid Many are H ₂ O soluble	NaCl _(s) , Na ₃ PO _{4(s)} , CuSO ₄ ·5H ₂ O _(s)	
Metallic	cations Metals	metallic Sea of electrons	soft to very hard; solid and liquid conducts; ductile; malleable; lustrous Not H ₂ O soluble	Pb _(s) , Fe _(s) , Cu _(s) , Al _(s)	
Molecular	molecules Covalent Non- Metals	London dipole-dipole hydrogen	soft; low melting point; nonconducting solid, liquid, and solution Many are H ₂ O Soluble	Ne _(g) , H ₂ O _(l) , HCl _(g) , CO _{2(g)} , CH _{4(g)} , I _{2(s)}	
Covalent Network	atoms of Group 14 Si+C	covalent	very hard; very high melting point; nonconducting Not H ₂ O soluble	C _(s) , SiC _(s) , SiO _{2(s)} → Diamond + Graphite	