Class: XII Subject: Chem Chapter: 1 Topic: By: [redacted]

Unit-1
SOLID STATE

* Solids

Substances having definite shape and volume, rigidity, high density, low compressibility.

The constituents particles (atoms, molecules or ions) are closely packed and held together by strong interparticle forces.

* TYPES OF SOLIDS :-

Character	Ionic solids	covalent solids	Molecular Solids	Metallic Solids
Constituent particles	positive and negative ions	Atoms	Molecules	positive metal ions (Kernels) and free electrons
Bonding forces	Electrostatic attraction	covalent	vander waals Dipole-dipole	Electrostatic attraction between positive ions and negative species
Melting point	High melting point	very high melting point	Low melting point	Moderate to high melting point

Hard/ Soft	Hard and brittle	very hard	very soft	Hard and soft
Conductance	Conductor in aqueous solution	Non-conductor own molten state	Insulator Conductor	~~Hard and soft~~ good Conductor
Examples	NaCl CaF_2	Diamond, Silica	H_2O, CO_2	Cu, Fe

* DIFFERENCE BETWEEN CRYSTALLINE AND AMORPHOUS SOLIDS :-

Crystalline solid	Amorphous solid
(1) These have definite and regular arrangement of the constituent particles in space.	• These doesn't have any regular arrangement of the constituent particles in space.
(2) These are true solids.	• These are super cooled arrangement liquids or pseudo solids.
(3) These have long order arrangement of the particles.	• These have short order arrangement of particle.
(4) These are anisotropic in nature, i.e., their physical properties are different directions.	• These are isotropic in nature i.e., their physical properties are same in all directions.
(5) They have sharp melting point.	• They melt over a certain range of temperature.
(6) They undergo a clean cleavage when cut.	• They undergo irregular cleavage when cut.

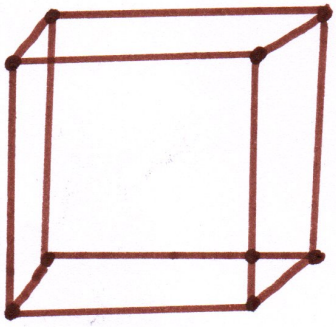
* Unit cell

"The smallest geometrical portion of crystal lattice which can be used as repetitive unit to build up the whole crystal is called **unit cell**."

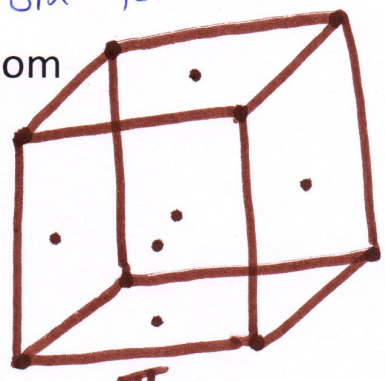
Types :-

I. **Simple unit cell** - Those in which particles are present in corner only

II. **Face centered unit cell** - Particles are present at the corners as well as the centre of each of six faces.



I.



II.

III. **Body Centered unit cell** - Particles are present at corners as well as centre

IV. **End central unit cell** - Particles are present in corners as well as two opposite faces.