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# XII UNIT 1

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Solid State



असतो मा सद्गमय

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CHEMISTRY MANTRA

105 Dilbagh Nagar Extension Jalandhar

## Unit 1

### The Solid State

#### Q.1 What are fluids?

**Answer:** Liquids and gases which have ability to flow are called fluids.

#### Q.2 What is the cause of rigidity in solids?

**Answer:** The constituents particles in solids have fixed positions and can only oscillate about their mean position. This is cause of rigidity in solids.

#### Q.3 What kind of attractive forces are present in the molecular solids?

**Answer:** Dipole-dipole interactions, London dispersion forces and hydrogen bonding.

#### Q.4 What kind of attractive forces are present in the ionic solids?

**Answer:** Coulombic or electrostatic force of attraction. (Ionic bonding)

#### Q.5 What kind of attractive forces are present in the covalent solid?

**Answer:** Covalent bonding.

#### Q.6 What kind of attractive forces are present in the metallic solids?

**Answer:** Metallic bonding.

#### Q.7 Are ionic solids electrical conductors or insulators?

**Answer:** Insulators.

#### Q.8 What are pseudo solids?

**Answer:** Amorphous solids.

#### Q.9 What is isotropy?

**Answer:** The phenomenon due to which in amorphous solids a physical property has same value in all the direction is called isotropy.

#### Q.10 What is anisotropy?

**Answer:** The phenomenon due to which in crystalline solids same physical properties have different values in different directions is called anisotropy.

#### Q.11 Which type of solids have sharp melting point?

**Answer:** Crystalline solids have sharp melting point.

#### Q.12 Which type of solids have definite enthalpy of fusion?

**Answer:** Crystalline solids have definite enthalpy of fusion.

#### Q.13 Which type of solids have long range ordered arrangement of constituent particles?

**Answer:** Crystalline solids have long range order.

#### Q.14 What is photovoltaic materials? Give example.

**Answer:** A substance which converts solar energy into electrical energy is called photovoltaic materials e.g. amorphous silicon.

#### Q.15 Which type of intermolecular force is present in non-polar molecular solids?

**Answer:** London dispersion force is present in non polar molecular solids.

#### Q.16 Which type of intermolecular force is present in polar molecular



**solids? Answer:** Dipole-dipole interaction and H-bonding is present in polar molecular solids.

**Q.17 Which type of intermolecular force is present in ice?**

**Answer:** H-bonding is present in ice.

**Q.18 Which type of solids are hard and brittle?**

**Answer:** Ionic solids are hard and brittle.

**Q.19 Which type of solids are soft and brittle?**

**Answer:** Molecular solids are soft and brittle.

**Q.20 Which type of solids are called giant molecules?**

**Answer:** Covalent (network) solids are called giant molecules.

**Q.21 Which type of motion is possible in solid particles?**

**Answer:** Only oscillatory motion is possible in solid particles.

**Q.22 Which property of glass enables it to be moulded and blown into various shapes?**

**Answer:** Amorphous solids soften over a range of temperature. This enables the glass to be moulded and blown into various shapes.

**Q.21 What is a unit cell?**

**Answer:** The smallest repeating pattern of constituent particles which represents structure of a solid is called unit cell.

**Q.22 Define space lattice.**

**Answer:** The arrangement of lattice points in three dimensional space of a solid is called space lattice.

**Q.23 What are primitive and non-primitive unit cells?**

**Answer:** A unit cell in which lattice points are only at the corners are called primitive unit cells. A unit cell in which lattice points are at the corners as well as at the centres of body, faces, edges etc. are called non-primitive unit cells.

**Q.24 What is the co-ordination number of each lattice point in hexagonal close pack structure?**

**Answer:** 12 (6 in the same layer + 3 each above and below layer).

**Q.25 What is the co-ordination number in the body centred cubic close packed structure?**

**Answer:** 8

**Q.26 What is the co-ordination number in the cubic close packed (face centred-cubic) structure?**

**Answer:** 12

**Q.27 Which type of voids are present in a solid crystal?**

**Answer:** Two types of voids present in a solid crystals are (a) tetrahedral and (b) octahedral.

**Q.28 What is the coordination number of octahedral voids?**

**Answer:** 6

**Q.27 What is the number of octahedral and tetrahedral voids per unit cell of**



**cubic close packing (fcc)?**

**Answer:** Number of tetrahedral voids = 8, number of octahedral voids = 4.

**Q.28 What happens to a sodium chloride structure when high pressure is applied to it?**

**Answer:** When pressure is applied and structure (coordination number = 6:6) changes to CsCl structure (coordination number = 8:8).

**Q.29 What happens to a caesium chloride structure when high temperature is applied to it?**

**Answer:** When high temperature is applied CsCl structure (coordination number = 8:8) changes to fcc structure (coordination number = 6:6).

**Q.30 What is the name of unit cell in which atoms are placed at the corners of all 12 edges of a cubic unit cell?**

**Answer:** Simple cubic (or primitive)

