

WELLAND GOULDSMITH SCHOOL, Patuli

Worksheet Answer Key

Subject: CHEMISTRY

Class XII

Total Questions 4

Time: 30 Minutes

Question-1

Answer A

They are- molecular solids, ionic solids, covalent solids and metallic solids.

Answer B

Unit cell is the smallest three dimensional group of lattice points which, when repeated in three dimensions in space, gives the whole lattice of the crystal.

Answer C

The unoccupied or vacant sites present in the lattice of a crystal are called holes or voids or interstices.

Answer D

The coordination number of a two dimensional hexagonal close packing is six as each sphere is in contact with six other spheres.

Answer E

The electrons trapped in anion vacancies are called F-centres (F stands for Farbe, a German word meaning colour) or colour centres because they impart colour to the crystals.

Question-2

Answers:-

- (i) The main characteristics of crystalline solids are:
 - (a) The arrangement of structural units are very regular and it extends in three dimensions throughout the crystal.
 - (b) They have definite geometrical configuration.
 - (c) They have very sharp melting points.
 - (d) On cleavage with a knife, they give a regular clean cut.
 - (e) They are true solids.

- (ii) The space occupied by the spheres in hexagonal close packing is 60.4% whereas it is only 52.4% in square close packing.
- (iii) Schottky defect arises when some of the lattice points in a crystal are unoccupied. It decreases the density of the crystal whereas Frenkel defect does not affect the density of the crystal.
- (iv) (a) simple cubic system - Since each corner atom is shared by eight unit cells, the contribution of each corner atom is $1/8$ to the unit cell. Hence, number of atoms in one simple cubic unit cell = $8 \times 1/8 = 1$.
- (b) body-centred cubic system: Since each corner atom is shared equally by eight unit cells and the atom present at the body centre belongs wholly to the unit cell, the contribution of each corner atom is $1/8$ and that of the body centred atom is 1 to the unit cell. Hence number of atoms in a body-centred unit cell
 $= (8 \times 1/8) + 1 = 1 + 1 = 2$ atoms
- (c) face-centred cubic system: Each corner atom is shared equally by eight unit cells, thus contributing $1/8$ to the unit cell. Each atom present at the centre of the face is shared equally by two unit cells, thus contributing $1/2$ to the unit cell. Hence, number of atoms in a face-centred unit cell
 $= (8 \times 1/8) + (6 \times 1/2) = 1 + 3 = 4$ atoms.

ANSWERS OF EXERCISES:

Choose the correct option:

1. (a) 2. (b) 3. (b) 4. (c) 5. (d) 6. (b) 7. (d) 8. (d)
 9. (b) 10. (b)

True or false:

1. T 2. T 3. F 4. T 5. F 6. T 7. F 8. T
 9. T 10. F

Fill in the blanks:

1. geometrical configuration. 2. supercooled 3. Unit cell
 4. body-centred 5. two 6. efficient, 74
 7. coordination number 8. double, four, eight