

2. THE SOLID STATE

PREVIOUS EAMCET BITS

1. The cubic Unit Cell of a metal (molar mass = 63.55 g mol^{-1}) has an edge length of 362 pm . Its density is 8.92 g.cm^3 . The type of unit cell is : **(2009 E)**

1) Primitive 2) Face centred 3) Body centred 4) End centred

Ans: 2

Sol :
$$Z = \frac{dNa^3}{M} = \frac{8.92 \times 6 \times 10^{23} \times 362 \times 10^{-10} \text{ cm}}{63.55}$$

$$Z = 4$$

\therefore It is Face centered unit cell.

2. For a crystal, the angle of diffraction (2θ) is 90° and the second order line has a d value of 2.28 \AA . The wavelength (in A°) of X-rays used for Bragg's diffraction is **(2008 E)**

1) 1.613 2) 2.00 3) 2.28 4) 4.00

Ans : 1

Sol: $n\lambda = 2d \sin \theta$

$$\begin{aligned} \lambda &= \frac{2 \times 2.28 \times \sin 45^\circ}{2} \\ &= \frac{2.28 \times 1}{\sqrt{2}} \\ &= \frac{2.28}{1.414} = 1.613 \end{aligned}$$

3. AB is an ionic solid. If the ratio of ionic radii of A^+ and B^- is 0.52. What is the coordination number of B^- ? **(2008 M)**

1) 2 2) 3 3) 6 4) 8

Ans : 3

Sol: Ratio $\frac{r^+}{r^-} = 0.414 - 0.732$

Coordination no. is 6.

4. Which of the following statements is correct **(2007 E)**

1) Silicon doped with Boron in an n-type semiconductor
2) Silicon doped with Arsenic is a p-type semiconductor
3) Metals are good conductors of electricity
4) Electrical conductivity of semiconductors increases with increasing temperature

Ans : 3, 4

Sol: Poly - p- hydroxybutyrate - Co - β - hydroxyl valerate (PHBV) is a biodegradable polymer

5. Schotky defect is observed in the crystal of **(2007 M)**

1) NaCl 2) HCl 3) AgCl 4) MgCl_2

Ans : 1

Sol: Schotky defect is in NaCl crystal