

SOLID STATE

Density, Bragg's Equation, Crystal Defects and Properties of solids

1. If Z is the number of atoms in the unit cell that represents the closest packing sequence $ABCABCABC.....$ the number of tetrahedral voids in the unit cell is equal to (AIPMT 2005)

1. Z 2. $2Z$ 3. $\frac{Z}{2}$ 4. $\frac{Z}{4}$

2. In a face – centered cubic unit cell, edge length is : (DPMT 2005)

1. $\frac{4}{\sqrt{3}}r$ 2. $\frac{4}{\sqrt{2}}r$ 3. $2r$ 4. $\frac{\sqrt{3}}{2}r$

3. The Ca^{2+} and F^- are located in CaF_2 crystal respectively at face – centered cubic lattice points and in (AIIMS 2006)

1. Tetrahedral voids 2. Half of tetrahedral voids
3. Octahedral voids 4. Half of Octahedral voids

4. The number of atoms contained in one face-centered cubic unit cell of monatomic substance is : (PMT 2006)

1. 1 2. 2 3. 4 4. 3

5. If NaCl is doped with 10^{-4} mol % of $SrCl_2$, the concentration of cation vacancies will be ($N_A = 6.023 \times 10^{23}$) (CBSE 2007)

1. $6.02 \times 10^{16} mol^{-1}$ 2. $6.02 \times 10^{17} mol^{-1}$ 3. $6.02 \times 10^{14} mol^{-1}$ 4. $6.02 \times 10^{15} mol^{-1}$

6. In a solid lattice, the cation has left a lattice site and is located at an interstitial position. The lattice defect is : (BHU 2008)

1. Interstitial defect 2. Vacancy defect 3. Frenkel defect 4. Schottky defect

7. A particular solid is very hard and has a high melting point. In solid state, it is a non – conductor and its melt is a conductor of electricity. Classify the solid (CMC 2008)

1. Metallic 2. Molecular
3. Network 4. Ionic 5. Amorphous

8. Percentage of free space in a body – centred cubic unit cell is (CBSE 2008)

1. 34 % 2. 28 % 3. 30 % 4. 32 %

9. Which of the following statements is not correct (CBSE 2008)

1. The number of carbon atoms in a unit cell of diamond is 4
2. The number of Bravais lattices in which a crystal can be categorized is 14
3. The fraction of the total volume occupied by the atoms in a primitive cell is 0.48
4. Molecular solids are generally volatile.

10. In a stands for the edge length of the cubic systems: simple cubic, body-centred cubic and face-centred cubic, then the ratio of radii of the spheres in these systems will be respectively : (CBSE 2008)

1. $\frac{1}{2}a : \frac{\sqrt{3}}{2}a : \frac{\sqrt{2}}{2}a$ 2. $a : \sqrt{3}a : \sqrt{2}a$ 3. $\frac{1}{2}a : \frac{\sqrt{3}}{4}a : \frac{1}{2\sqrt{2}}a$ 4. $\frac{1}{2}a : \sqrt{3}a : \frac{1}{\sqrt{2}}a$

KEY

- 1) 2 2) 2 3) 1 4) 3 5) 2 6) 3 7) 4 8) 4 9) 4 10) 3