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**Max Time : 1 hr** **Class = 12th Chemistry Test Max Marks : 30**

**SOLID STATE**

1. The ability of a substance to assume in two or more crystalline structure is called :

|  |  |  |  |
| --- | --- | --- | --- |
| a) isomerism | b) polymorphism | c) isomorphism | d) amorphism |

1. Right option for the number of tetrahedral and octahedral voids in hexagonal primitive unit cell are :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 8 , 4 | b) 6 , 12 | c) 2 , 1 | d) 12 , 6 |

1. The correct option for the number of body centered unit cells in all 14 types of Bravais lattice unit cell is

|  |  |  |  |
| --- | --- | --- | --- |
| a) 7 | b) 5 | c) 2 | d) 3 |

1. An element has a body centered cubic (bcc) structure with a cell edge of 288 pm. The atomic radius is

|  |  |  |  |
| --- | --- | --- | --- |
| a) x 288 pm | b) x 288 pm | c) x 288 pm | d) x 288 pm |

1. A compound is formed by cation C and anion A. The anions form hexagonal close packed (hcp) lattice and the cations occupy 75 % of octahedral voids. The formula of the compound is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) C3A2 | b) C3A4 | c) C4A3 | d) C2A3 |

1. The ionic radii of A+ and B – ions are 0.98 x 10 – 10 m and 1.81 x 10 – 10 m. The coordination number of each ion in AB is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 4 | b) 8 | c) 2 | d) 6 |

1. In calcium fluoride, having the fluorite structure, the coordination numbers for calcium ion (Ca2+) and fluoride ion (F – ) are :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 4 & 2 | b) 6 & 6 | c) 8 & 4 | d) 4 & 8 |

1. The vacant space in bcc lattice cell is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 26 % | b) 48 % | c) 23 % | d) 32 % |

1. A given metal crystallises out with a cubic structure having edge length of 361 pm. If there are four metal atoms in one unit cell, what is the radius of one atom?

|  |  |  |  |
| --- | --- | --- | --- |
| a) 40 pm | b) 127 pm | c) 80 pm | d) 108 pm |

1. Lithium metal crystallises in a body centred cubic (bcc) crystal. If the length of the side of the unit cell of lithium is 351 pm, the atomic radius of the lithium will be :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 240.8 pm | b) 151.8 pm | c) 75.5 pm | d) 300.5 pm |

1. Which one of the following statement is incorrect?

a) The fraction of the total volume occupied by the atoms in a primitive cell is 0.48

b) Molecular solids are generally volatile

c) The number of carbon atoms in an unit cell of diamond is 4

d) The number of Bravais lattices in which a crystal can be categorized is 14.

1. The fraction of total volume occupied by the atoms present in a simple cube is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) | b) | c) | d) |

1. In a face centred cubic (fcc) lattice, a unit cell is shared equally by how many unit cells?

|  |  |  |  |
| --- | --- | --- | --- |
| a) 8 | b) 4 | c) 2 | d) 6 |

1. A compound formed by elements X and Y crystallises in a cubic structure in which the X-atoms are at the corners of a cube and the Y-atoms are at the centres. The formula of the compound is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) XY3 | b) X3Y | c) XY | d) XY2 |

1. Zn converts from its melted state to its solid state, it has hcp structure, then find out the number of nearest atoms.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 6 | b) 8 | c) 12 | d) 4 |

1. The edge length of face centred unit cubic cell is 508 pm. If the radius of the cation is 110 pm, the radius of anion is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 288 pm | b) 398 pm | c) 144 pm | d) 618 pm |

1. The intermetallic compound LiAg crystallises in cubic lattice in which both lithium and silver have coordination number of 8. The crystal class is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) simple cube | b) bcc | c) fcc | d) none of above |

1. The edge length of a centred unit cubic cell is 508 pm. If the radius of the cation is 100 pm, the radius of anion is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 288 pm | b) 398 pm | c) 154 pm | d) 618 pm |

1. In the fluorite structure, the coordination number of Ca2+ ion is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 4 | b) 6 | c) 8 | d) 3 |

1. Copper crystallises in fcc unit cell with cell edge length of 3.608 x 10 – 8 cm. The density of copper is 8.92 g/cm3. Calculate the atomic mass of copper:

|  |  |  |  |
| --- | --- | --- | --- |
| a) 31.55 u | b) 60 u | c) 65 u | d) 63.1 u |

1. Which one of the following compounds show both, Frenkel as well as Schottky defects?

|  |  |  |  |
| --- | --- | --- | --- |
| a) AgBr | b) AgI | c) NaCl | d) ZnS |

1. Formula of nickel oxide with metal deficiency defect in its crystal is Ni0.98O. The crystal contains Ni2+ and Ni3+ ions. The fraction of nickel existing as Ni2+ ions in the crystal is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 0.96 | b) 0.04 | c) 0.5 | d) 0.31 |

1. If NaCl is doped with 10 – 4 mol % of SrCl2, the concentration of cation vacancies will be :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 6.023 x 1015 mol – 1 | b) 6.023 x 1016 mol – 1 | c) 6.023 x 1017 mol – 1 | d) 6.023 x 1014 mol – 1 |

1. The appearance of colour in solid alkali metal halides is generally due to :

|  |  |  |  |
| --- | --- | --- | --- |
| a) F centres | b) Schottky defect | c) Frenkel defect | d) interstitial positions |

1. CsBr crystallises in a body centred cubic lattice. The unit cell length is 436.6 pm. Given that the atomic mass of Cs = 133 u and that of Br = 80 u , the density of CsBr is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 42.5 g/cm3 | b) 0.425 g/cm3 | c) 8.25 g/cm3 | d) 4.25 g/cm3 |

1. Schottky defect in a crystal is observed when:

a) An ion leaves its normal sites and occupies an interstitial sites

b) Unequal number of cations and anions are missing from the lattice

c) Density of the crystal is increased

d) Equal number of cations and anions are missing from the lattice

1. When electrons are trapped into the crystalline anion vacancy, the defect is known as:

|  |  |  |  |
| --- | --- | --- | --- |
| a) Schottky defect | b) stoichiometric defect | c) Frenkel defect | d) F centres |

1. With which one of the following elements silicon should be doped so as to give p-type of semiconductor?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Germanium | b) Arsenic | c) Selenium | d) Boron |

1. A solid with high electrical and thermal conductivity from the following is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Si | b) Li | c) NaCl | d) ice |

1. On doping ‘Ge’ metal with a little of ‘In’ or ‘Ga’, one gets:

|  |  |  |  |
| --- | --- | --- | --- |
| a) p-type semiconductor | b) insulator | c) n-type semiconductor | d) rectifier |

**[Class =12th]**

**Answers**

**Topic: Solid State**

|  |
| --- |
| 1. b |
| 1. d |
| 1. d |
| 1. d |
| 1. b |
| 1. d |
| 1. c |
| 1. d |
| 1. b |
| 1. b |
| 1. a |
| 1. a |
| 1. d |
| 1. a |
| 1. c |
| 1. c |
| 1. b |
| 1. c |
| 1. c |
| 1. d |
| 1. a |
| 1. a |
| 1. c |
| 1. a |
| 1. d |
| 1. d |
| 1. d |
| 1. d |
| 1. b |
| 1. a |