PRERNA EDUCATION
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Chapter 1 The Solid State

Assignment 3

Class 12

PRERNA EDUCATION

DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth **SUBJECT : CHEMISTRY**
DATE : **DPP No. : 3**

Topic :- THE SOLID STATE

1. The orthorhombic, the value of a, $b$and $c$are respectively 4.2 Å, $6.8A$ Å and 8.3 Å. Given the molecular mass of the solute is 155 g mol^{-1} and that of density is 3.3g/cc, the number of formula units per unit cell is
   a) 2 b) 3 c) 4 d) 6

2. Which one of the following is a covalent crystal?
   a) Rock salt b) Ice c) Quartz d) Dry ice

3. LiF is a/an :
   a) Ionic crystal b) Metallic crystal c) Covalent crystal d) Molecular crystals

4. A binary solid (A^+B^-) has a rock salt structure. If the edge length is 400 pm and radius of cation is 75 pm the radius of anion is :
   a) 100 pm b) 125 pm c) 250 pm d) 325 pm

5. The limiting radius ratio for tetrahedral shape is
   a) 0 to 0.155 b) 0.255 to 0.414 c) 0.155 to 0.225 d) 0.414 to 0.732

6. A metallic element has a cubic lattice. Each edge of the unit of cell is 2Å. The density of the metal is 2.5 g cm^{-3}. The unit cells in 200 g of metal are
   a) 1×10^{24} b) 1×10^{20} c) 1×10^{22} d) 1×10^{25}

7. Potassium has a bcc structure with nearest neighbour distance 4.52 Å. Its atomic weight is 39. Its density will be :
   a) 454 kg m^{-3} b) 804 kg m^{-3} c) 852 kg m^{-3} d) 910 kg m^{-3}

8. Lithium forms body centred cube structure. The length of the side of its unit cell is 351 pm. Atomic radius of the lithium will be :
   a) 300 pm b) 240 pm c) 152 pm d) 75 pm

9. Bragg's equation is :
   a) $n\lambda = 2\theta \sin\theta$ b) $n\lambda = 2d \sin\theta$ c) $2n\lambda = d \sin\theta$ d) $\lambda = (2d/n) \sin\theta$

10. The intermetallic compound LiAg has a cubic crystalline structure in which each Li atom has 8 nearest neighbor silver atoms and $vice - versa$. What is the type of unit cell?
    a) Body centred cubic

    b) Face centred cubic

    c) Simple cubic for either Li atoms alone or Ag atoms alone

    d) None of the above

11. In the face centred cubic lattice, atom A occupies the corner positions and atom B occupies the face centre positions. If one atom of B is missing from one of the face centred points, the formula of the compound is
    a) A_2B b) AB_2 c) A_2B_2 d) A_2B_5

12. Which compound has highest lattice energy?
    a) LiBr b) LiCl c) LiI d) LiF

13. In a face centred cubic cell, an atom at the face centre is shared by :
    a) 4 unit cells b) 2 unit cells c) 1 unit cell d) 6 unit cells

14. Extremely pure samples of Ge and Si are non-conductors, but their conductivity increases suddenly on introducing ….in their crystal lattice.
    a) As b) B c) Both (a) and (b) d) None of these

15. Iodine crystals are :
    a) Metallic solid b) Ionic solid c) Molecular solid d) Covalent solid

16. Which of the following statements about amorphous solids is incorrect?
    a) They melt over a range of temperature b) They are anisotropic
    c) There is no orderly arrangement of particles d) They are rigid and incompressible

17. The number of atoms present in a simple cubic unit cell are :
    a) 4 b) 3 c) 2 d) 1

18. An AB_2 type structure is found in :
    a) NaCl b) CaF_2 c) Al_2O_3 d) N_2O

19. A cubic crystal possesses in all ……elements of symmetry.

a) 9 b) 13 c) 1 d) 23

20. A solid compound contains X, Y and Z atoms in a cubic lattice with X atom occupying the corners. Y atoms in the body centred positions and Z atoms at the centres of faces of the unit cell. What is the empirical formula of the compound?

a) XY_2Z_3 b) XYZ_3 c) $X_2Y_2Z_3$ d) X_8YZ_6