INTERNATIONAL INDIAN SCHOOL , RIYADH

STD. XII SUB. CHEMISTRY

WORKSHEET 2015-16

1. What is the formula of a compound in which the element Y forms ccp lattice and atoms of X occupy $2/3^{rd}$ of the octahedral voids?
2. An element X (molar mass= 60 g/mol) has a density of 6.23 gcm^{-3}. Identify the type of cubic unit cell if the edge length of the unit cell is 4×10^{-8} cm.
3. Define the term 'amorphous'. Give a few examples of amorphous solids.
4. How will you distinguish between the following pairs of terms:
   (i) Hexagonal close-packing and cubic close-packing?
   (ii) Crystal lattice and unit cell?
   (iii) Tetrahedral void and octahedral void?
5. How many lattice points are there in one unit cell of each of the following lattice?
   (i) Face-centred cubic
   (ii) Face-centred tetragonal
6. Calculate the efficiency of packing in case of a metal crystal for
   (i) simple cubic
   (ii) body-centred cubic
   (iii) face-centred cubic (with the assumptions that atoms are touching each other).
7. A cubic solid is made of two elements P and Q. Atoms of Q are at the corners of the cube and P at the body-centre. What is the formula of the compound? What are the coordination numbers of P and Q?
8. Niobium crystallises in body-centred cubic structure. If density is 8.55 g cm^{-3}, calculate atomic radius of niobium using its atomic mass 93 u.
9. Classify each of the following as being either a p-type or a n-type semiconductor:
   (i) Ge doped with In (ii) Si doped with B.
10. Gold (atomic radius = 0.144 nm) crystallises in a face-centred unit cell. What is the length of a side of the cell?
11. Explain the following terms with suitable examples:

(i) Schottky defect (ii) Frenkel defect (iii) Interstitials and (iv) F-centres.

12. Explain the following with suitable examples:

(i) Ferromagnetism
(ii) Paramagnetism
(iii) Ferrimagnetism
(iv) Antiferromagnetism

13. Define the following terms:

(i) Mole fraction (ii) Molality (iii) Molarity (iv) Mass percentage.

14. Concentrated nitric acid used in laboratory work is 68% nitric acid by mass in aqueous solution. What should be the molarity of such a sample of the acid if the density of the solution is 1.504 g mL^{-1}?

15. A solution of glucose in water is labelled as 10% w/w, what would be the molality and mole fraction of each component in the solution?
If the density of the solution is 1.2 g mL^{-1}, then what shall be the molarity of the solution?
16. A sample of drinking water was found to be severely contaminated with chloroform (CHCl3) supposed to be a carcinogen. The level of contamination was 15 ppm (by mass):
(i) express this in percent by mass
(ii) determine the molality of chloroform in the water sample.
17. What role does the molecular interaction play in a solution of alcohol and water?
18. State Henry's law and mention some important applications?
19. What is meant by positive and negative deviations from Raoult's law and how is the sign of ΔmixH related to positive and negative deviations from Raoult's law?
20. A 5% solution (by mass) of cane sugar in water has freezing point of 271K. Calculate the freezing point of 5% glucose in water if freezing point of pure water is 273.15 K.
21. Henry's law constant for the molality of methane in benzene at 298 K is 4.27 × 105 mm Hg. Calculate the solubility of methane in benzene at 298 K under 760 mm Hg.

22. What is meant by negative deviation from Raoult's law ? Give an example. What is the sign of $\Delta_{mix}H$ for the negative deviation?
23. Define azeotropes.
24. Calculate the mass of NaCl (molar mass=58.5 g/mol) to be dissolved in 37.2 g of water to lower the freezing point by 2°C, assuming that NaCl undergoes complete dissociation.(K_f for water= 1.86K kg / mol).