

## INSTRUCTIONS

1. Home work should be written in "LAB OBSERVATION BOOK"
2. Number of times (1)
3. It should be in hand written — NO TYPED MATERIAL
4. DATE OF SUBMISSION → ON THE 1<sup>ST</sup> LAB SESSION AFTER HOLIDAYS

## CHEMISTRY II. PU holiday Home work

## Chemistry

DEPARTMENT OF CHEMISTRY  
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- 1) Calculate Packing efficiency in simple cubic unit cell.
- 2) Calculate Packing efficiency in BCC lattice.
- 3) Calculate Packing efficiency in a CCP or HCP or FCC crystal lattice.
- 4) What is Schottky defect? What is the effect on the density of the solid?
- 5) Silver crystallizes in CCP lattice. The edge length of its unit cell is 408.6 pm. Calculate the density of silver [atomic mass of silver is 107.9].
- 6) State Henry's law. Give its mathematical form.
- 7) Mention the differences between ideal and non-ideal solution.
- 8) What is azeotropic mixture? Give example.
- 9) State Raoult's law of liquid mixtures.
- 10) What is reverse osmosis? Mention one of its practical utility.
- 11) The vapour pressure of a pure benzene at certain temperature is 0.850 bar. A non-volatile solid weighing 0.5 g when added to 39 gm of benzene (molar mass 78) vapour pressure of the solution then is 0.845 bar. What is the molar mass of the substance?
- 12) On dissolving 2.34 g of solute in 40 g of benzene, the boiling point of the solution was higher than that of benzene by 0.81 K.  $K_b$  value for benzene is  $2.53 \text{ K kg mol}^{-1}$ . Calculate the molar mass of the solute.

- 13) 15.0 gm of unknown substance was dissolved in 450 g of water, the resulting solution was found to freeze at  $-0.34^{\circ}\text{C}$ . Calculate the molar mass of the substance [ $K_f$  for  $\text{H}_2\text{O} = 1.86 \text{ K kg mol}^{-1}$ ]
- 14) 300  $\text{cm}^3$  of an aqueous solution of a protein contains 2.12 gm of the protein, the Osmotic Pressure of such a solution at 300K is found to be  $3.89 \times 10^{-3}$  bar. Calculate the molar mass of Protein
- 15) Derive an integrated rate equation for rate constant of a zero order reaction.
- 16) Derive an integrated rate equation for rate constant of a first order reaction.
- 17) What is half life period of a reaction? Show that half period for a zero order reaction is directly proportional to initial concentration.
- 18) What is half life period of a reaction? Show that half life period of a first order reaction is independent of initial concentrations.
- 19) Describe the three steps involved in the leaching of bauxite to get pure alumina.
- 20) Explain the extraction of aluminium by Hall Heroult Process.
- 21)  $\text{Cu}^{2+}$  ions are coloured and  $\text{Zn}^{2+}$  ions are colourless. Give reason.
- 22) How is Potassium dichromate manufactured from chromite ore?
- 23) How is Potassium Permanganate manufactured from  $\text{MnO}_2$  [Pyrolusite]?
- 24) Explain the Preparation of phenols from cumene

- 25) Explain the mechanism of dehydration of ethanol.
- 26) Explain Kolbe's reaction.
- 27) Explain Reimer-Tiemann reaction.
- 28) Explain Williamson's ether synthesis.
- 29) Explain Friedel-Crafts alkylation of anisole.
- 30) How ethanol is manufactured from molasses?