Holiday Homework Class XII
Chemistry

Haloalkenes and Haloarenes

1. Write the structures of the following organic halogen compounds. (i) 2-Chloro-3-methylpentane (ii) p-Bromochlorobenzene
2. What are ambident nucleophiles? Explain with an example.
3. Which compound in each of the following pairs will react faster in SN2 reaction with –OH? (i) CH3Br or CH3I (ii) (CH3)3CCl or CH3Cl
4. Write the mechanism of the following reaction: nBuBr + KCN   nBuCN
5. Out of C6H5CH2Cl and C6H5CHClC6H5, which is more easily hydrolysed by aqueous KOH?
6. What happens when (i) n-butyl chloride is treated with alcoholic KOH, (ii) bromobenzene is treated with Mg in the presence of dry ether.
7. What are: (i)Enantiomers (ii)Racemic Mixture.
8. Which one of the following compound is more easily hydrolysed by KOH and why?

   $CH_3CHClCH_2CH_3$ or $CH_3CH_2CH_2Cl$

9.Give reasons -

   (a) Allyl chloride is hydrolysed more readily than n-propyl chloride.
   (b) Vinyl chloride is hydrolysed more slowly than ethyl chloride.
   (c) Ethyl iodide undergoes SN^2 reaction faster than ethyl Bromide.
   (d) ($\underline{+}$) 2-butanol is optically inactive.

10. An optically active compounds having molecular formula $C_7H_{15}Br$ reacts with aqueous KOH to give a racemic mixture of products. Write the mechanism involved.

11. What happens when –

   (a) Ethyl Chloride is treated with NaI in presence of acetone.

   (b) Chloro benzene is treated with Na metal in presence of dry ether.

   (c) Methyl Chloride is treated with KNO_2.

12. Distinguish between –

   (a) Ethyl Chloride and Vinyl chloride.

   (b) Chloro benzene and benzyl chloride

13. Arrange the following in order of decreasing boiling point

 (a) n-pentyl chloride, iso-pentyl chloride, neo-pentyl chloride

Alcohols Phenols and Ethers

1. Explain why propanol has higher boiling point than that of the hydrocarbon, butane?
2. Give the equations of reactions for the preparation of phenol from cumene.
3. Explain the following with an example.
    (i) Kolbe's reaction.
    (ii) Reimer-Tiemann reaction.
4. Give equations of the following reactions: (i) Oxidation of propan-1-ol with alkaline KMnO4 solution. (ii) Bromine in CS2 with phenol.
5. How are the following conversions carried out? (i) Benzyl chloride $\rightarrow$ Benzyl alcohol. (ii) Ethyl magnesium chloride $\rightarrow$ Propan-1-ol.
6. Write the equation of the reaction of hydrogen iodide with: (i) methoxybenzene and (ii) benzyl ethyl ether.
7. Write equations of the following reactions: (i) Friedel-Crafts reaction – alkylation of anisole. (ii) Nitration of anisole.

Solutions

1. An aqueous solution of 2% non-volatile solute exerts a pressure of 1.004 bar at the normal boiling point of the solvent. What is the molar mass of the solute?
2. Heptane and octane form an ideal solution. At 373 K, the vapour pressures of the two liquid components are 105.2 kPa and 46.8 kPa respectively. What will be the vapour pressure of a mixture of 26.0 g of heptane and 35 g of octane?
3. The vapour pressure of water is 12.3 kPa at 300 K. Calculate vapour pressure of 1 molal solution of a non-volatile solute in it.
4. Calculate the mass of a non-volatile solute (molar mass 40 g mol–1) which should be dissolved in 114 g octane to reduce its vapour pressure to 80%.
5. A solution containing 30 g of non-volatile solute exactly in 90 g of water has a vapour pressure of 2.8 kPa at 298 K. Further, 18 g of water is then added to the solution and the new vapour pressure becomes 2.9 kPa at 298 K. Calculate: (i) molar mass of the solute (ii) vapour pressure of water at 298 K.
6. 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.