

## **Holiday Homework**

### **Class—XII**

### **Chemistry (2025-26)**

- 1) Complete your investigatory project (except the observation part) in loose sheets including objective, material/chemicals, basic principle, procedure, conclusion and bibliography on the topic assigned in the class.
- 2) Answer all the questions based on “ Organic Chemistry” ( Haloalkanes and Haloarenes, Alcohols, Phenols and Ethers , Aldehydes, ketones and carboxylic acids)) from the last three years and this year CBSE question papers (2022, 2023 , 2024 and 2025) in your Chemistry register. Short cuts should not be used in Conversion reactions and mechanism part.
- 3) Make a list of all name reactions from the chapters (a) Haloalkanes and Haloarenes (b) Alcohol, Phenols and Ethers (c) Aldehydes, Ketones and carboxylic acids) in alphabetical order and write them in your Chemistry register neatly.
- 4) Read newspaper daily to extract scientific information and also to know what is happening around us .
- 5) Do the following assignment questions in your assignment register.

#### **Haloalkanes and Haloarenes**

- 1) An acid having molecular formula  $C_3H_5O_2Br$  is optically active. What is its structure?
- 2) An organic compound with molecular formula  $C_4H_9Br$  is treated with aq. KOH. The rate of reaction depends on the concentration of the compound A only. When another optically active isomer B of this compound was treated with aq. KOH solution, the rate of reaction was found to depend on the concentration of compound and KOH both.
  - (i) Write down the structural formula of both A and B.
  - (ii) Out of these two compounds which one will be converted to the product with inverted configuration?
- 3) Carry out the following conversions:
  - a) 2- Methylpent-1-ene to 2- Methylpentan-2-ol.

- b) Chlorobenzene to Benzene.
- c) Ethyl chloride to propanoic acid.

### **Alcohols, Phenols and Ethers**

- 1) What is power alcohol? Where it is used?
- 2) Why are ethers relatively less reactive compounds?
- 3) How many isomers are possible for the compound with the molecular formula  $C_4H_{10}O$ ? Which one is optically active and why?
- 4) Phenol is acidic but does not react with sodium bicarbonate solution. Give reason.
- 5) An organic compound A reacts with thionyl chloride to give compound B. B reacts with magnesium to form a Grignard reagent which is treated with acetone and the product is hydrolysed to give 2-methyl-2-butanol. What are A and B compounds?
- 6) When t-butanol and n-butanol are separately treated with a few drops of dilute  $KMnO_4$ , in one case only the purple color disappears and a brown ppt. is formed. Which of the two alcohols gives the above reaction and what is the brown ppt.?
- 7) A compound (A) with molecular formula  $C_4H_{10}O$  on oxidation forms compound (B). The compound (B) gives positive iodoform test and on reaction with  $CH_3MgBr$  followed by hydrolysis gives (C). Identify A, B and C and give the sequence of reactions.

### **Aldehydes, Ketones and Carboxylic acids**

- 1) Write chemical equations for the following reactions:
  - (a) Propanone is treated with dilute  $Ba(OH)_2$ .
  - (b) Acetophenone is treated with  $Zn(Hg)/conc. HCl$ .
  - (c) Benzoyl chloride is hydrogenated in presence of  $Pd/BaSO_4$ .
- 2) An organic compound A having molecular formula  $C_3H_8O$ , on treatment with copper at 573 K gives B. B does not reduce Fehling's solution but gives a yellow precipitate of the compound C with  $I_2/NaOH$ . Deduce the structures of A, B and C.
- 3) A hydrocarbon (A) with molecular formula  $C_5H_{10}$  on ozonolysis gives two products (B) and (C). Both (B) and (C) give a yellow precipitate when heated with iodine in presence of  $NaOH$  while only (B) give a silver mirror on reaction with Tollen's reagent.
  - (a) Identify (A), (B) and (C).
  - (b) Write the reaction of B with Tollen's reagent.

(c) Write the equation for Iodoform test for C.

(d) Write down the equation for aldol condensation reaction of B and C.

4) How will you convert ethanal into the following compounds? Give the chemical equation involved.

(i)  $\text{CH}_3\text{—CH}_3$

(ii)  $\text{CH}_3\text{—CH(OH)—CH}_2\text{CHO}$

(iii)  $\text{CH}_3\text{CH}_2\text{OH}$

5) An organic compound (X) having molecular formula  $\text{C}_4\text{H}_8\text{O}$  gives orange red ppt. with 2,4-DNP reagent. It does not reduce Tollen's reagent but gives yellow ppt. of Iodoform on heating with  $\text{NaOI}$ . Compound (X) on reduction with  $\text{LiAlH}_4$  gives a compound (Y) which undergoes dehydration reaction on heating with conc.  $\text{H}_2\text{SO}_4$  to give (Z). Identify the compounds (X), (Y) and (Z).