

Unit Practice Test

for Board Examination

Ch.10 Haloalkanes & Haloarenes

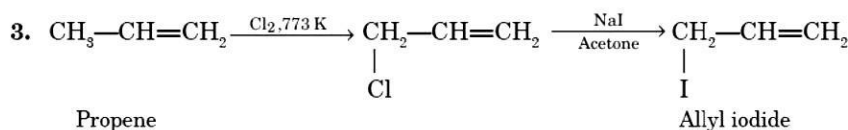
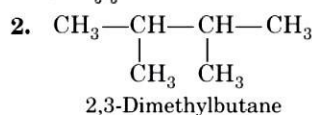
Time Allowed : 1:30 hrs

Maximum Marks : 35

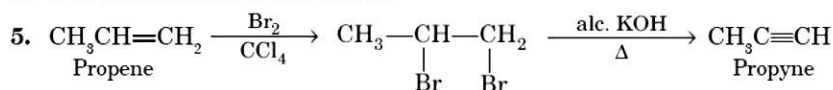
1. Which isomer of C_4H_9Cl will have the lowest boiling point? (1)
2. Write the formula of the main product formed in the reaction : (1)
$$(CH_3)_2CHCl \xrightarrow[\text{Dry ether}]{Na}$$
3. How will you convert propene into allyl iodide? Give equation. (1)
4. Why does iodoform has appreciable antiseptic property? (1)
5. How will you convert propene to propyne? (1)
6. Out of $C_6H_5CH_2Cl$ and $C_6H_5CHClC_6H_5$, which is more easily hydrolysed by aqueous KOH? Why? (2)
7. Which compound in each of the following pairs will react faster in S_N2 reaction with $-OH^-$? (2)
 - (i) CH_3Br or CH_3I
 - (ii) $(CH_3)_3CCl$ or CH_3Cl
8. Write the IUPAC names of the following: (2)
 - (i) 
 - (ii) $CH_3CH=CH-C(CH_3)_2Br$
9. Discuss the role of Lewis acids in the preparation of aryl bromides and chlorides in the dark. (2)
10. Why is the solubility of haloalkanes in water very low? (2)
11. How will you distinguish between: (3)
 - (a) Ethyl chloride and ethyl bromide
 - (b) Chlorobenzene and cyclohexyl chloride.
 - (c) Vinyl chloride and ethyl chloride.
12. How do the products differ when ethyl bromide react with KCN and AgCN? Give reasons. (3)
13. How would you distinguish between S_N1 and S_N2 mechanisms of substitution reactions? Give one example of each. (3)
14. How will you convert: (3)
 - (a) Ethyl chloride to propanoic acid.
 - (b) 1-Bromopropane to 2-bromopropane
 - (c) tert-butyl bromide to isobutyl bromide
15. (a) Grignard reagent should be prepared under anhydrous conditions? Explain. (3)
 - (b) Give two uses of iodoform.
 - (c) Write the structure and formula of D.D.T.
16. (a) Why are haloarenes less reactive than haloalkanes? Explain. (3)
 - (b) Predict the alkenes that would be formed by dehydrohalogenation of the following halides with sodium ethoxide in ethanol and predict the major alkene:
 - (i) 2-Chloro-2-methylbutane
 - (ii) 3-bromo- 2, 2, 3-trimethylpentane
 - (c) How is chlorobenzene prepared from benzenediazonium chloride? (5)

HINTS & SOLUTIONS TO UNIT PRACTICE TESTS

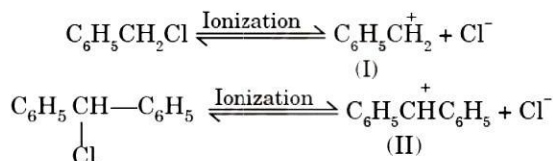
UNIT 10 : HALOALKANES AND HALOARENES



4. Due to liberation of free iodine.



6. $\text{C}_6\text{H}_5\text{CH}_2\text{Cl}$ is a 1° aralkyl halide and $\text{C}_6\text{H}_5\text{CHClC}_6\text{H}_5$ is a 2° aralkyl halide. In $\text{S}_\text{N}1$ reaction, the reaction proceeds through the formation of carbocation. In the first step, the aralkyl halide ionizes to give carbocation :



The carbocation (II) is more stable than (I) because the +ve charge on carbon can be delocalised over two benzene rings. On the other hand, the +ve charge in carbocation (I) is delocalised over only one benzene ring. Therefore, $\text{C}_6\text{H}_5\text{CHClC}_6\text{H}_5$ can be more easily hydrolysed than $\text{C}_6\text{H}_5\text{CH}_2\text{Cl}$ in $\text{S}_\text{N}1$ reactions. However, in $\text{S}_\text{N}2$ reactions, the reactivity depends upon the steric hindrance. Therefore, $\text{C}_6\text{H}_5\text{CH}_2\text{Cl}$ will get hydrolysed more easily than $\text{C}_6\text{H}_5\text{CHClC}_6\text{H}_5$ because of less steric hindrance.

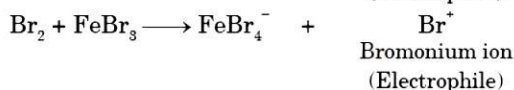
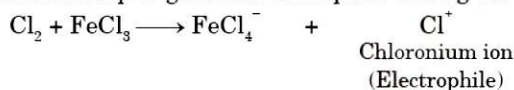
7. (i) CH_3I , because I^- ion is a better leaving group than Br^- .

(ii) CH_3Cl , because of steric hindrance in case of $(\text{CH}_3)_3\text{CCl}$.

8. (i) 3-Bromo-2-methylpropene

(ii) 4-Bromo-4-methylpent-2-ene

9. Lewis acids help to generate electrophile during the bromination and chlorination.



The electrophile then attacks the benzene ring to form a carbocation, which loses a proton to form aryl chloride or aryl bromide.

10. The haloalkanes are only slightly soluble in water. In order to dissolve a haloalkane in water, energy is required to overcome the attractions between the haloalkane molecules and break the hydrogen bonds between water molecules. Since less energy is released in the formation of new attractions between haloalkane and water molecules and these are not very strong as the original hydrogen bonds present in water and hence the solubility of haloalkanes is low.

