



## CHEMISTRY

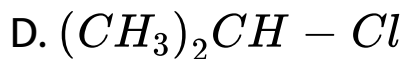
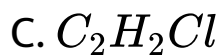
### BOOKS - MBD -HARYANA BOARD

### HALOALKANES AND HALOARENES

#### Objective Type Questions

1.  $S_{N2}$  reaction will be fastest in :



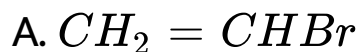


**Answer: D**



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2. Among the following, the most reactive towards alcoholic KOH is :



D.  $CH_3CH_2CH_2Br$

**Answer: D**



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3. Which of the following undergoes nucleophilic substitution exclusively by  $S_{N1}$  mechanism ?

- A. Benzyl chloride
- B. Ethyl chloride
- C. Chlorobenzene
- D. Isopropyl chloride,

**Answer: A**



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4. Which of the following organic compounds are formed by Wurtz reaction ?

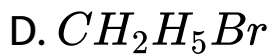
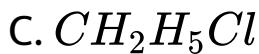
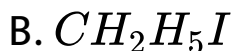
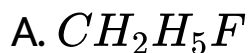
- A. Alcohols
- B. Hydrocarbons
- C. Haloalkanes
- D. Haloarenes.

**Answer: B**



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5. Alkyl halide having lowest b.pt is :

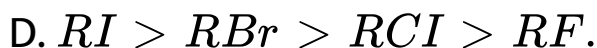
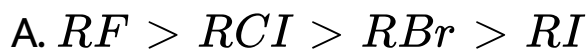


**Answer: A**



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6. The order of reactivities of the following alkyl halides for a  $S_N2$  reaction is :



**Answer: D**



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7. Which of the following has highest nucleophilicity?

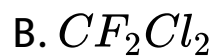


**Answer: C**



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8. Phosgene is :



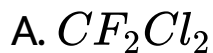
**Answer: C**



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9. Freon -12 is:



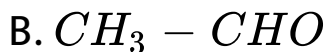


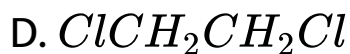
**Answer: A**



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**10.** Which of the following reacts with water?



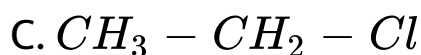
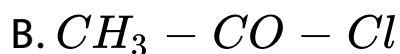
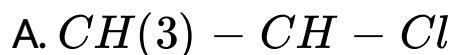


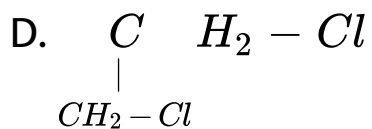
**Answer: B**



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**11.** Which on heating with aqueous KOH, produces acetaldehyde ?





**Answer: A**



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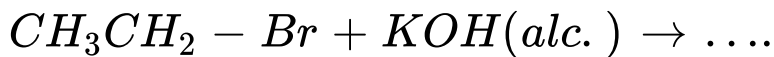
## Very Short Answer Type Questions

1. Write Gattermann's reaction.



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2. Complete the reaction



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3. Write Williamson's synthesis reaction.



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4. Write IUPAC name of 



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5. How is DDT prepared ?



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6. Write IUPAC name of 



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7. What is dehydrohalogenation reaction. Write its chemical reaction.



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8. What is  $\beta$ -elimination reaction ?

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9. Write Sandmeyer reaction.

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10. Which compound in each of the following pairs will react faster in  $S_N2$  reaction with  $^-OH$  :


(i)  $CH_2Br$  or  $CH_3I$  (ii)  $(CH_3)_3CCI$  or  $CH_3CI$  ?

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11. Discuss Swart's reaction.

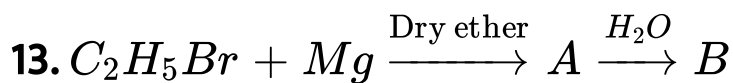


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12. Among  which has higher melting point and why?



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14. Give one chemical test to distinguish between  $C_2H_5Br$  and  $C_2H_5Cl$ .



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15. p-methoxybenzyl bromide reacts faster than p-nitrobenzyl bromide with ethanol to form an ether product. Explain why?



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16. Which of the following compounds will give positive iodoform test? Butan-1-ol, Butan-2-ol, tert-butylalcohol, Ethanol, Propanal, Propanone, Butan- 2-one, Pentan-3-one, Cyclohexanone, 1-Methyl- cyclohexanol, 1-Phenyl ethanol, 2-Phenylethanol.



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17. What effect will the resonance have on the dipole moment of vinyl chloride?



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**18.** Organic compounds used in industry as solvents are chlorides rather than bromides and iodides. Why?



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**19.** Complete the following reaction :



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20. How is ethyl iodide prepared from ethanol ?



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21. Name the product formed when chlorobenzene is heated with aqueous ammonia in presence of cuprous oxide.



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22. How does iodobenzene react with copper powder ? What is the name of the reaction ?



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**23.** What happens when ethanol is heated with phosphorus tribromide ?



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**24.** Give chemical equation for the preparation of iodoform from acetone.



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25. What happens when an alkyl halide reacts with  $AgNO_2$  and the product is reduced ?

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26. Why a small amount of ethyl alcohol is usually added to chloroform bottles ?

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Short Answer Type Questions

1. How will you bring about following conversions

:

(i) 1-Chlorobutane to n-octane

(i) 1-Bromopropane to 2-Bromopropane

(ii) 2-Chloropropane to 1-propanol ?



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2. How will you prepare haloalkane from alcohol and hydrocarbon ? Write one chemical reaction of each.



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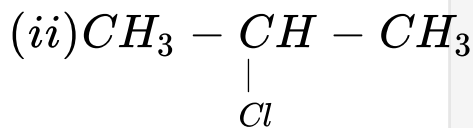
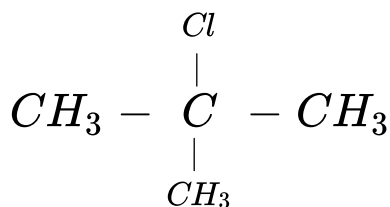
3. Explain the solubility of haloalkanes and haloarenes in water ?



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4. Write IUPAC names of the following compounds :

(i)



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5. What happens when : (i) Ethyl chloride is treated with aqueous KOH ?

(ii) Methyl bromide is treated with sodium in the presence of dry ether?



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6. Arrange the compounds of each set in increasing order of reactivity towards  $S_N2$  displacement :

(i) 2-Bromo-2-methylbutane, 1-Bromopentane, 2-Bromopentane.

(ii) 1-Bromo-3-methylbutane, 2-Bromo-2-



methylbutane,

2-Bromo-3-methylbutane.



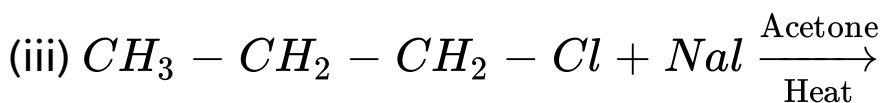
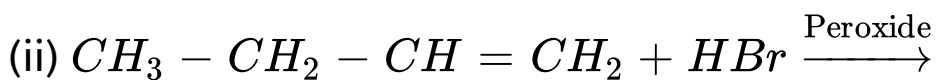
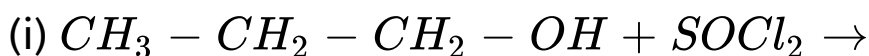
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7. Give the uses of Freon-12, DDT and iodoform.



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8. Complete the following reactions :





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9. The treatment of alkyl chloride with aqueous KOH leads to formation of alcohols but in the presence of alcoholic KOH, alkenes are major products. Explain.



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10. How will you convert an alkyl halide  
(i) into an alcohol and (ii) into an alkyl cyanide ?



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**11.** How will you convert an Alkyl halide into

(i) an alcohol and (ii) alkyl isocyanide ?



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**12.** How will you convert an Alkyl halide

(i) into ether and (ii) into an Alkyl cyanide ?



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13. How will you convert an Alkyl halide into (i) alkane and (ii) alkyl nitrite ?

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14. Write the isomers of the compound having formula  $C_4H_9Br$

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15. Why haloarenes are less reactive than haloalkanes ?



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16. Write various isomers of  $C_7H_7Cl$  containing benzene ring. Which of these has weakest C-Cl bond ?



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17. Describe the following:

(A) Fittig reaction

(B) Dow's process

(C) Finkelstein's reaction.



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**18. Write the following reactions:**

**(a) Wurtz reaction,**

**(b) Fittig reaction,**

**(c) Finkelstein's reaction**



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**19. Write the following reactions :**

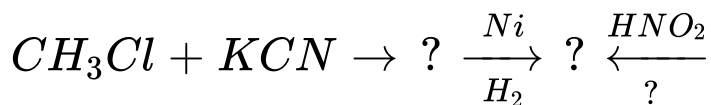
**(a) Swart's reaction**

(b) Sandmeyer reaction

(c) Wurtz-Fittig reaction

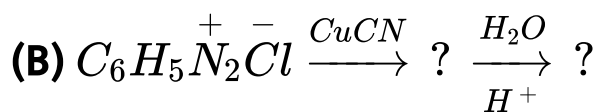
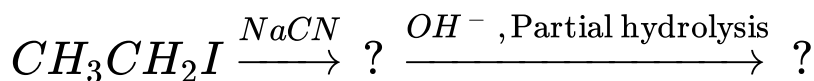
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20. Complete the following :



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21. Fill in the blanks : (A)





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**22. What are ambident nucleophiles ? Explain with an example.**



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**23. Explain why**

**(a) the dipole moment of chlorobenzene is lower than that of cyclohexyl chloride ?**

**(b) alkyl halides, though polar, are immiscible with water ?**



(c) vinyl chloride is unreactive in nucleophilic substitution reactions ?

(d) neopentyl bromide undergoes nucleophilic substitution reactions very slowly ?

(e) 3-bromocyclohexane is more reactive than 4-bromocyclohexane in hydrolysis with aqueous NaOH ? (f) tert butyl chloride reacts with aqueous sodium hydroxide by  $S_{N1}$  mechanism while n-butyl chloride reacts by  $S_{N2}$  mechanism.

(g) Grignard reagents should be prepared under anhydrous conditions ?



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24. Why do alkyl halides undergo hydrolysis more readily than aryl halides?



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25.  $\text{RCI}$  is hydrolysed to  $\text{ROH}$  slowly but the reaction is rapid if catalytic amount of  $\text{KI}$  is added to reaction mixture. Explain.



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26. Alkyl halides give cyanides with KCN but isocyanides with AgCN as the products. Why?



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27. How are isopropyl bromide and n-propyl bromide obtained from propene ?



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28. Although chlorine is an electron withdrawing group, yet it is ortho-para directing in

**electrophilic aromatic substitution reactions, why**

**?**



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**29. Benzyl chloride is more reactive than chlorobenzene towards nucleophilic substitution.**

**Explain.**



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**Long Answer Type Questions**

1. Give the preparation of alkyl halide by the reaction of:

(i) HCl and

(ii)  $PCl_5$  on ethanol and give its reaction with :

(a) Aq. KOH

(b) AgCN and

(c) Mg.



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2. Give the preparation of chlorobenzene from benzene diazonium chloride and give its reaction

**with :**

**(i) Na (ii)  $CH_3Cl$  in the presence of anhydrous  $AlCl_3$**

**(iii)  $H_2SO_4$  and (iv)  $HNO_3$  in the presence of conc.  $H_2SO_4$**



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**3. Haloarenes are less reactive than haloalkanes, why?**



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4. Why are aryl halides less reactive towards nucleophilic substitution reactions than alkyl halides? Explain



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5. Write structure of different dihalogen derivatives propane.



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6. What is  $S_N2$  reaction ? Discuss its mechanism.



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**7. Write brief notes on :-**

**(a) Benzene hexachloride**

**(b) p,p'- Dichlorodiphenyl trichloroethane**

**(c) Freons.**



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**8. (a) What is iodoform test?**

**(b) Discuss the main chemical properties of  $CCl_4$**



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9. How will you bring about the following conversions

(i) Propene into Isopropyl bromide

(ii) Propene into n-propyl bromide.



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10. How will you convert  $C_2H_5 - Br$  into :

(i)  $C_2H_6$  (ii)  $C_2H_5 - O - C_2H_5$

(iii)  $C_2H_5 - CN$



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