

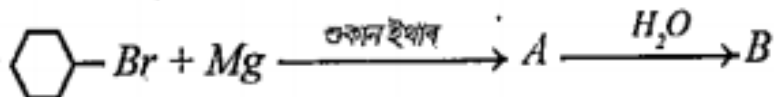
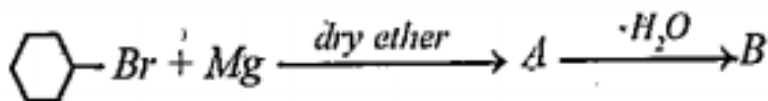
## CHEMISTRY

### BOOKS - R G PUBLICATION

### HALOALKANES AND HELOARENES

#### Exercise

1. Identify A and B in the following:

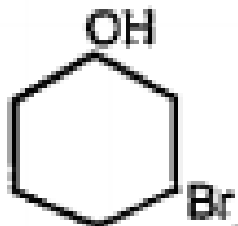


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2. Write the structure of the following compound. 1-Chloro-3-methylpentane.

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3. Name the compound according to IUPAC rule



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4. An alkylchloride (X) reacts with magnesium metal in presence of dry ether followed by treatment of ethanol

gives propane. Write the structure of the alkylchloride (X).



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5. Write the structural formula of the following compound. 1-Bromobut-2-ene



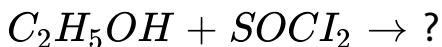
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6. Mention one use of tetrachloromethane.



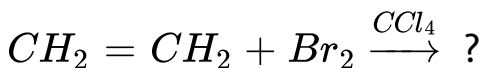
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7. Complete the following equations:



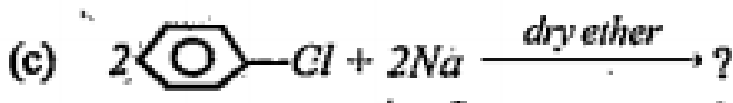
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8. Complete the following equations:



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9. Complete the following equations:

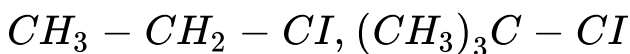


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10. Define enantiomers.

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11. In the following halogen compounds, which one will readily undergo  $S_N2$  reaction?



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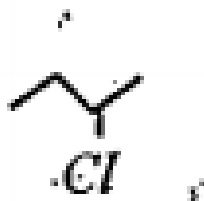
12. Explain why Grignard reagents should be prepared under anhydrous condition.

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13. Which of the following compound would undergo  $S_N1$  reaction faster and why?



(ii)

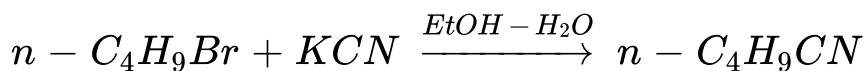


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14. What are ambident nucleophiles? Give an example.

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15. Write the mechanism of the following reaction:



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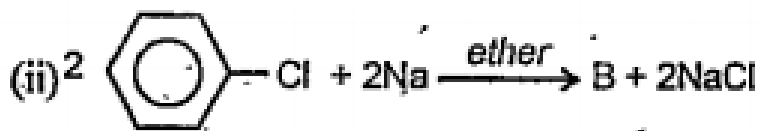
16. How can you convert benzene to diphenyl?

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17. What happens when bromo-cyclohexane is treated with Mg in presence of dry ether and the product is hydrolysed? Give chemical equations.

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18. Identify B in the following re-action:

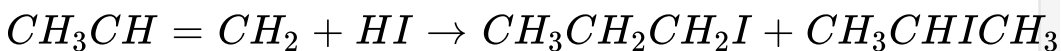


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19. What is racemic mixture? Give one example.

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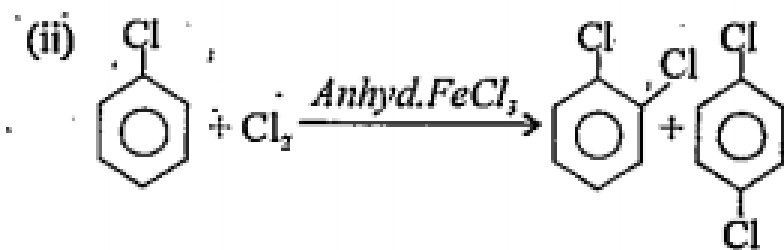
20. Identify the major product in the following reaction:



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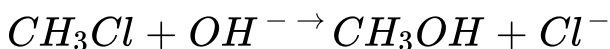
21. Identify the major product in the following reaction:



Write mechanism of this reaction.

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22. Write mechanism of the following reaction:



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23. Give an example of halogen substituted aromatic compound with formula.



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24. Write the structure of cyclic allylic halide & cyclic vinylic halide.



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25. Why C-X bond of alkyl halide is polarized? (Where X is halogen)



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26. How pure alkyl halide is prepared from alcohol?



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27. Why preparation of aryl halide is not possible by reaction of phenol with  $PCl_3$ ?

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28. Iodine can not be used for electrophilic substitution of arene. Why?

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29. Give one chemical test to distinguish alkane & alkene.

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**30.** What is Swarts reaction?

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**31.** Why sulphuric acid is not used during the reaction of alcohols with KI?

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**32.** Among the isomeric alkanes of molecular formula  $C_5H_{12}$  which give a single monochloride on photochemical chlorination?

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33. Why the boiling point of alkylhalide is more than that of corresponding alkane.

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34. Arrange each set of compounds in order of increasing boiling points: Bromomethane, Bromoform, Chloromethane, Dibromomethane.

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35. Which one of the following has the highest dipole moment and why:  $CH_2Cl_2$ ,  $CHCl_3$ ,  $CCl_4$

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36. What do mean by  $SN_2$  reaction?

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37. Among the following alkyl halide which will following  $SN_2$  reaction and which will follows  $SN_1$  reaction?

$CH_3I$ ,  $(CH_3)_3CI$ ,  $(CH_3)_2CHI$

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38. What do you mean by chiral molecule?

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39. Why racemic mixture is optically inactive?

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40. Why  $\beta$ -elimination is also called anti elimination?

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41. Write the formula of Freon 12. What is its effect on the atmosphere?

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42. Explain the following terms: Plane polarized light.

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43. Explain the following terms: asymmetric molecule

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44. Explain the following terms: optical activity

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45. Explain the following terms: Enantiomers

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46. Explain the following terms: Racemization

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47. Explain the following terms: Chirality

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48. Explain the following terms: Racemic mixture

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49. Explain the following terms:  $\beta$ -elimination



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50. Explain the following terms: organometallic compounds



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51. Explain the following terms: dextrorotatory and laevorotatory



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52. Answer the following: Haloalkanes easily dissolve in organic solvents, why?



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53. Give the structure of the main organic substitution product expected from the reaction of 1-bromobutane with:  $(CH_3)_3N$



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54. Give the structure of the main organic substitution product expected from the reaction of 1-bromobutane with:  $(CH_3)_2S$



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55. Give the structure of the main organic substitution product expected from the reaction of 1-bromobutane with:  $CH_3COOAg$

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56. Give the structure of the main organic substitution product expected from the reaction of 1-bromobutane with:  $LiAlH_4$

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57. Give the structure of the main organic substitution product expected from the reaction of 1-bromobutane

with:  $C_6H_5ONa$

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**58.** What is Sandmeyer's reaction? How will you prepare iodobenzene from aniline?

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**59.** Explain the difference in boiling points of all the isomers of the molecular formula  $C_4H_9Br$ .

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60. Why the solubility of alkyl halide in water is very low?

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61. What is ambidentate nucleophiles? Explain with two examples.

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62. Explain  $S_N2$  mechanism from stereochemical point of view.

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63. What are optical isomers? What are the essential condition for a molecule to be chiral?

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64. Identify the stereo centre if present with \* marks in the following molecules.



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65. Explain why  $SN_1$  reaction always give racemic mixture?

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66. Give three reasons why aryl halides are less reactive towards nucleophilic substitution reaction?

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67. Explain Why: The dipole moment of chlorobenzene is lower than that of cyclohexyl chloride.

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68. Explain why Grignard reagents should be prepared under anhydrous condition.

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

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70. Drawing the various resonating structures, show that nitrobenzene activate the ortho & para position of the benzene ring for nucleophilic substitution reaction.

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71. Though Chlorine is an electron withdrawing group but it activate the ortho & para position in the benzene ring for electrophilic attack. Explain.

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72. Why Chloroform is preserved in dark coloured glass bottle?

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**73.** Write the IUPAC name of DDT. Write one merit and one demerit of its use.



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**74.** Write two effect of Carbon tetrachloride in human body.



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**75.** A Chloro derivative (A) on treatment with Zn/Cu couple gives a hydrocarbon with five C-atoms when 'A' is dissolved in ether and treated with Sodium, 2,2,5,5 tetramethyl hexane is obtained. What is the original compound 'A'?



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76. Of the two bromoderivatives,  $C_6H_5CH(CH_3)Br$  and  $C_6H_5CH(C_6H_5)Br$ , which one is more reactive in  $SN_1$  substitution reaction and why?



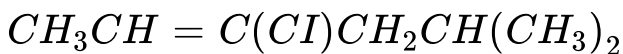
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77. A solution of KOH hydrolyses  $CH_3CHClCH_2CH_3$  &  $CH_3(CH_2)_3Cl$ . Which one of these is more easily hydrolysed?



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78. Write the IUPAC name of the following:



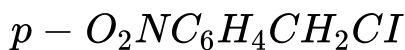
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79. Write the IUPAC name of the following:



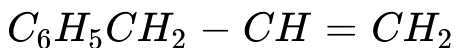
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80. Write the IUPAC name of the following:



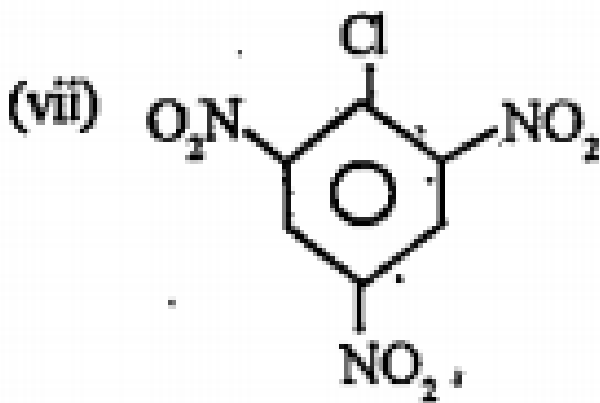
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81. Write the IUPAC name of the following:



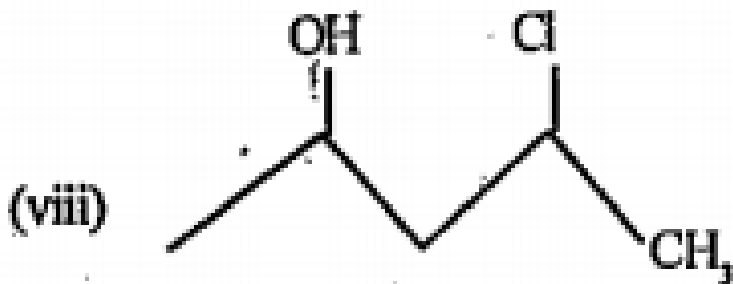
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82. Write the IUPAC name of the following:



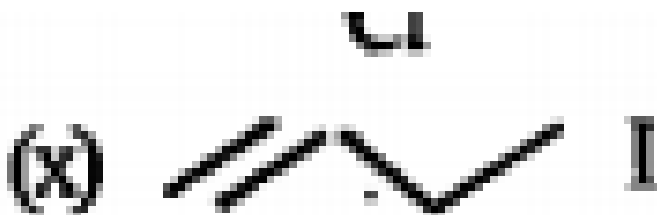
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83. Write the IUPAC name of the following:



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84. Write the IUPAC name of the following:



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85. What happens when: Ethanol reacts with HBr in presence of  $ZnCl_2$ ?

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86. What happens when: Propane reacts with  $Cl_2$  in presence of UV light

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87. What happens when: Butene reacts with HI

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**88.** What happens when: 4-Hydroxy benzyl alcohol reacts with HCl in presence of heat.

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**89.** What happens when: Ethyl bromide reacts with sodium iodide.

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**90.** What happens when: Tertiary butoxide ion reacts with isopropyl bromide.

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**91.** What happens when: Ethyl bromide reacts with magnesium in presence of dry ether.

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**92.** What happens when: Propyl bromide reacts with sodium in dry ether.

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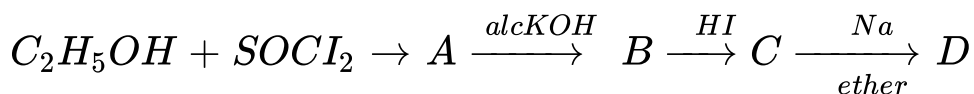
**93.** What happens when: Chlorobenzene is nitrated.

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94. What happens when: Chlorobenzene reacts with ethanoyl chlo-ride in presence of anhydrous  $AlCl_3$ .

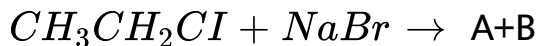
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95. Identify 'A', 'B', 'C', 'D' from the following:



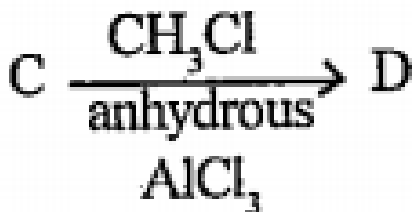
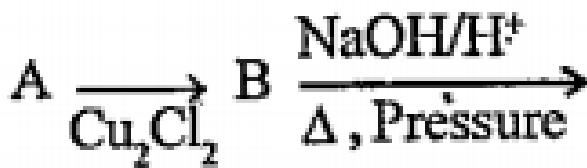
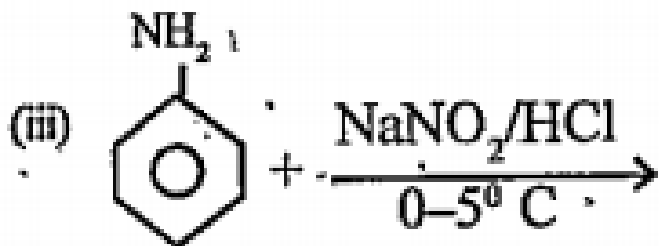
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96. Identify 'A', 'B' from the following:



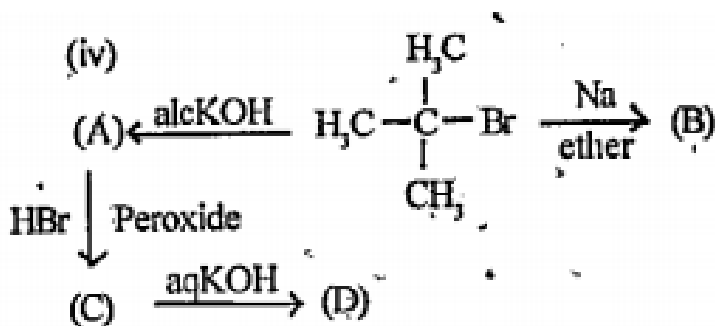
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97. Identify 'A', 'B', 'C', 'D' from the following:



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98. Identify 'A', 'B', 'C', 'D' from the following:



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99. convert the following: Toluene to benzyl alcohol

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100. Convert the following: Aniline to bromobenzene

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**101.** Identify 'A', 'B', 'C', 'D' from the following: Propene to propyne

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**102.** Convert the following: Benzene to diphenyl

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**103.** Which of the two C-Cl bond shown below will have more dipole moment and why?



or (অথবা)  $\text{CH}_3\text{CH}_2\text{Cl}$ ?

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**104.** Haloalkanes undergo nucleophilic substitutions, whereas haloarenes undergo electrophilic substitution why?

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**105.** A sweet smelling organic compound 'A' is slowly oxidised by air in presence of light to a highly poisonous gas. On warming compound A with silver powder, it forms

a gaseous substance 'B' which is also produced by the action of calcium carbide on water. identify 'A' and 'B' and write the chemical reactions involved.

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**106.** Give a Chemical test to distinguish between the following pairs of compounds: Benzyl chloride and Chloro benzen

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**107.** Give a Chemical test to distinguish between the following pairs of compounds: Chloroform and carbon tetra chloride





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108. What happens when  $CH_3Br$  is treated with  $AgCN$ ?



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109. Answer the following questions: What is meant by chirality of compound? Give an example.



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110. A solution of  $KOH$  hydrolyses  $CH_3CHClCH_2CH_3$  &  $CH_3(CH_2)_3Cl$ . Which one of these is more easily hydrolysed?



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**111.** Iodoform gives a precipitate with  $AgNO_3$  on heating while chloroform does not why?



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**112.** Explain: Allyl chloride is hydrolysed more readily than n-propyl chloride.



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**113.** Starting from acetylene how can you prepare DDT from chloro benzene? Write all possible reactions?



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**114.** An alkyl compound ( $C_5H_{11}X$ ) is an optically active compound. The compound was treated with metallic magnesium in ether and the product on treatment with ethanol produces 2-methyl-butane. Write all the reactions and find out the structure of the alkyl halide



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**115.** What happens when:-Chlorobenzene is treated with  $Cl_2 / FeCl_3$ ?



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**116.** What happens when:-Ethyl chloride is treated with  $AgNO_2$ ?

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**117.** What happens when:-2-Bromo-pentane is treated with alcoholic KOH?

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**118.** Give reasons for the following: Ethyl iodide under goes  $S_N2$  reaction faster than ethyl bromide.

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119. Give reasons for the following: ( $\pm$ ) 2-Butanol is optically inactive

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120. Give reasons for the following: C-X bond length in halobenzene is smaller

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121. A hydro carbon  $C_5H_{10}$  does not react with chlorine in dark but gives a single monochloro compound  $C_5H_9Cl$  in bright sun light. Identify the hydrocarbon.

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