



CHEMISTRY

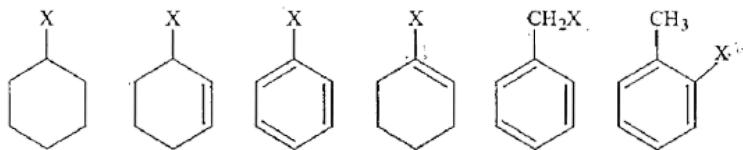
BOOKS - BETTER CHOICE PUBLICATION

HALOALKANES AND HALOARENES

Questions

1. Classify the following organohalogen compounds as alkyl, allylic, benzylic, vinylic and aryl halides. Also state the type of

hybridisation of the carbon of C-X band.



where X stands for halogen



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2. Differentiate between haloalkanes and haloarenes.



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3. Draw the structures of all the eight structural isomers that have the molecular formula $C_5H_{11}Br$. Name each isomer according to IUPAC system and classify them as primary, secondary or tertiary bromide.



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4. Write the position isomers of $C_5H_{11}Br$.



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5. Write the position isomers of C_4H_9Br .



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6. Write the position isomers of $C_6H_{13}Br$.



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7. Discuss the following:

Vicinal dihalides



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8. Discuss the following:

Geminal dihalides



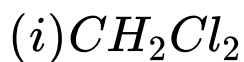
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9. Write the isomers of the compound having the formula C_4H_9Br .



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10. Which one of the following has the highest dipole moment ?



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11. Write short notes on the

Borodine Hunsdiecker reaction (Imp.)



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12. Write short notes on the
Finkelstein reaction



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13. Write short notes on the
Sandmeyer reaction



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14. Write short notes on the
Gattermann reaction



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15. Write short notes on the
Kharasch, effect (Peroxide effect or Anti-
Markownikoff's rule)



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16. Write short notes on the

Markowrukoff's rule



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17. How Sandmeyer's reaction differs from Gattermann's reaction.



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18. Hydrocarbon C_5H_{10} does not react with chlorine but gives a single monochloro compound, C_5H_9Cl in bright sunlight:
Identify the hydrocarbon.



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19. Write the equations for the preparation of
1-iodobutane from
1- butanol



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20. Write the equations for the preparation of
1-iodobutane from
1 - chlorobutane



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21. Write the equations for the preparation of
2-iodobutane from
but -1- ene



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



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23. Write short notes on

Swarts reaction



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24. Write short note in Balz Schiemann reaction.



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25. Arrange each set of compounds in order of increasing boiling points.

Bromomethane, Bromoform, Chloromethane, Dibromomethane.



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26. Arrange each set of compounds in order of increasing boiling points.

1-Chloropropane, Isopropyl chloride, 1-Chlorobutane.



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27. Haloarenes are insoluble in water but soluble in benzene. Explain.



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28. The dipole moment of chlorobenzene is lower than that of cyclohexyl chloride. Explain.



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29. Alkyl halides though polar, are immiscible with water, why ?



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30. Define Optical activity.



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31. Explain the term dextrorotatory and laevorotatory.



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32. State and explain the terms enantiomers and enantiomerism. How are the two enantiomers identified ?



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33. What is optical isomerism? What is the necessary and sufficient condition for a molecule to exhibit optical isomerism ?



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34. Give different Enantiomers of Butanol-2.



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35. Give different Enantiomers of 2 chlorobutane.



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36. Give different Enantiomers of 3-methyl hexane.



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37. State and explain the term diastereoisomers and mesomers.



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38. What is racemisation ?



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39. Define asymmetric synthesis.



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40. Point out the difference between :

Chirality and chiral centre (or chiral carbon atom or asymmetric carbon atom



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41. Point out the difference between :

Enantiomers and diastereomers.



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42. Differentiate between racemic mixture and meso compound .



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43. Define inversion.



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44. Define retention.



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45. The p-isomer of dichlorobenzene has higher melting point than O-and M-isomer. Why ?



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46. The p-isomer of dichlorobenzene has higher melting point than O-and M-isomer. Why ?



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47. Give reasons :

Boiling point of alkyl bromide is higher than alkyl chloride.



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48. Give reasons :

Alkyl halides are better solvents than aryl halides.



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49. Give reasons :

Haloalkanes used as solvents in industry are chloro compounds rather than bromo compounds.



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50. What are ambident nucleophiles ? Explain with an example.



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51. Alkyl Chloride is more reactive than chlorobenzene towards nucleophilic substitution. Explain.



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52. With the help of polarity of the carbon halogen bond show that aryl halides are less reactive than alkyl halides.



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53. Why are haloarenes more stable than haloalkanes ?



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54. Why do alkyl halides undergo hydrolysis more readily than aryl halides.



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55. With the help of resonance show that aryl halides are lesser reactive than alkyl halides.



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56. With the help of hybridisation show that aryl halides are lesser reactive than alkyl halides.



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57. With the help of polarity of the carbon halogen bond show that aryl halides are less reactive than alkyl halides.



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58. Why does electrophilic substitution take place at ortho and para positions in haloarenes ?



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59. Why does electrophilic substitution take place at ortho and para positions in haloarenes ?



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60. Haloarene is ortho and para directing
Explain.



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61. Write short notes on :

Wurtz reaction



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62. Write Fittig reaction.



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63. Write short notes on :

Friedel Craft's reaction



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64. Write Fittig reaction.



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65. Write Ullmann reaction.



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66. Write the following reactions :

Friedel Craft alkylation.



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67. Name the reagent used to convert 1-chloropropane to 1-nitropropane.



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68. Name the reagent used to convert bromoethane to ether.



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69. Write a chemical reaction to illustrate Saytzeff's rule.



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70. Which metal is used in the preparation of Grignard's reagent from haloalkanes ?



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71. Explain why

Grignard reagents should be prepared under anhydrous conditions.



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



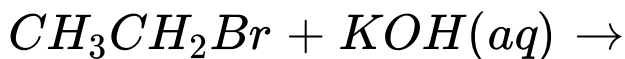
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73. The treatment of alkyl halides with alcoholic KOH leads to the formation of alkenes. Justify.



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74. Complete the following reaction :



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75. Write the structure of the major organic product in each of the following reactions :



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76. Explain why is thionyl chloride method preferred for preparing alkyl chlorides from alcohol ?



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77. Out of HCl and $SOCl_2$ which is preferred for converting ethanol into chloroethane ? Explain.



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78. Primary alkyl halide C_4H_9Br (A) is reacted with alcoholic KOH to give compound (B). Compound (B) is reacted with HBr to give (C) which is an isomer of (A). When (A) is reacted with sodium metal, it gives compound (D) C_8H_{18} which is different from the compound when A-butyl bromide is reacted with sodium. Give the structural formula of (A) and write the equations for all the reactions.



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79. How do the products differ when ethyl bromide reacts separately with KNO_2 and $AgNO_2$? Name the products.



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80. The treatment of alkyl halides with KNO_2 leads to the formation of alkyl nitrites. Justify.



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81. Alkyl halides react with $AgNO_2$ to give

$R - NO_2$ not $R-ONO$. Why?



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82. The treatment of alkyl halides with alcoholic KOH leads to the formation of alkenes. Justify.



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83. Alkyl halides react with $AgNO_2$ to give

$R - NO_2$ not $R-ONO$. Why?



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84. Rearrange the compounds of each of the following sets in order of reactivity towards

S_N^2 displacement :

1-Bromo-3-methylbutane,

2-Bromo-2-

methylbutane, 3-Bromo-2-methylbutane



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85. Allyl chloride is more reactive than n-propyl chloride towards nucleophilic substitution reaction. Explain why ?



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86. Haloalkanes react with potassium cyanide (KCN) to give alkyl cyanide, but gives alkyl isocyanide with silver cyanide (Ag CN).



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87. Although chlorine is an electron withdrawing group, yet it is ortho-, para-directing in electrophilic aromatic substitution reaction. Why?



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88. How will you convert the following :

Isopropylbromide to Propene



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89. How will you convert the following :

Bromoethane to iodoethane.



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90. How will you convert the following:

Chlorobenzene to Aniline



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91. How will you convert the following:

Aniline to Fluorobenzene



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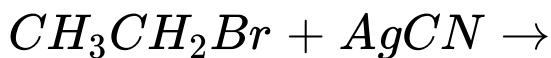
92. How will you convert.

Aniline into chlorobenzene.



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93. Complete the following reaction :



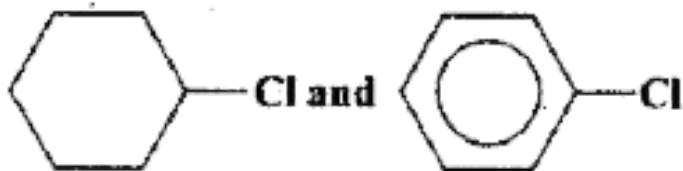
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94. How will you convert Ethylbromide to Ethylisocyanide.



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95. Give chemical test to distinguish between following pair of compounds.



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96. Give chemical test to distinguish between following pair of compounds.



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97. Give chemical test to distinguish between following pair of compounds.

Chlorobenzene and benzy chloride.



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98. How will you differentiate between S_{N1} and S_{N2} reaction mechanism ?



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99. What are freons ?



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100. Write two environmental effects of dichloromethane.



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101. Give two uses of chloroform.



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102. Why the use of chloroform as anesthetic is decreasing ?



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103. Give one use of freon.



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104. Iodoform gives a precipitate with $AgNO_3$.

Why ?



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105. What is iodoform test ?



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106. Write short note on Iodoform reaction.



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



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108. What happens when chloroform is exposed to air and sun light?



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109. Why is chloroform stored in dark coloured bottles ?



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110. What happens when chloroform is heated with silver powder ?



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111. Chloroform contains chlorine but does not give reaction with $AgNO_3$ why ?



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112. Give IUPAC name of D.D.T.



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113. How will you prepare chloroform from ethanol ? Give reactions of chloroform with

nitric acid



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114. Write short note on Haloform reaction.



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115. How is DDT prepared from chlorobenzene
? Give the chemical equation only.



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116. Give the reaction chloroform with alcoholic KOH.



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117. Explain with example S_{N1} mechanism.



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118. How tert-butyl bromide reacts with aqueous KOH ? Give the mechanism and

kinetics of · reaction.



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119. Explain S_N^2 reactions. What is the preference order of different alkyl halides to undergo nucleophilic substitution reaction via S_N2 mechanism ?



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120. How tert-butyl bromide reacts with aqueous KOH ? Give the mechanism and kinetics of · reaction.



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121. Give the mechanism of substitution nucleophilic bimolecular, S_N^2 reactions.



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122. How tert-butyl bromide reacts with aqueous KOH ? Give the mechanism and kinetics of · reaction.



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123. How does chlorobenzene reacts with the following:

Sodium



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124. How does chlorobenzene reacts with the following:



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125. How does chlorobenzene react with : Mg.



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126. How does chlorobenzene reacts with the following:



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127. How does chlorobenzene react with:
Lithium



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128. How does chlorobenzene react with:



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129. What happens when :

Chlorobenzene is treated with CH_3Cl in the presence of Anhydrous $AlCl_3$.



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130. Explain the following reactions :

Nitration of haloarenes.



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131. How does chlorobenzene react with sodium in the presence of ether ? What is the name of reaction ?



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132. How does chlorobenzene react with : Mg.



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133. How does chlorobenzene react with : Cl_2 .



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134. How does iodobenzene react with copper powder in a sealed tube ? What is the name of reaction ?



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135. How does chlorobenzene react with methyl chloride in the presence of sodium in anhydrous ether ? What is the name of reaction ?



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136. What happens when chlorobenzene is treated with nitric acid ?





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137. Why is dehydrohalogenation reaction in haloalkane termed as `beta-elimination` ?



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138. What do you mean by dehydrohalogenation reaction ?



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139. Why is Wurtz reaction not suitable for the preparation of odd number alkanes ?



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140. Benzyl chloride is more reactive than chlorobenzene towards nucleophilic substitution. Explain.



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141. Write the following reactions :

Carbylamine reaction.



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142. Write following name reactions :

Riemer Tiemann reaction.



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143. Explain the following :

Hoffmann amonolysis



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144. Write the following reactions :

Williamson's synthesis



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145. Explain the following reactions:

Diazotisation reaction.



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146. Alkyl halides are amongst the most reactive of the organic compounds. Why ?



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147. Alkyl halides are regarded as synthetic tools in the hands of a chemist. Justify.



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148. How do the products differ when ethyl bromide reacts separately with aqueous KOH and alcoholic KOH ? Name the products.



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149. What is the purpose of anhydrous $ZnCl_2$ in the preparation of haloalkanes from alcohols ?



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150. What happens when :

Ethyl chloride is treated with (aq) KOH.



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151. What happens when :

Methyl chloride is treated with KCN.



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152. Methyl bromide is treated with sodium in the presence of dry ether.



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153. What happens when :

n-butyl chloride is treated with alcoholic KOH.



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154. What happens when an ethyl bromide reacts with :



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155. What happens when an ethyl bromide reacts with :

Ag CN (alc.) ?



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156. Haloalkanes undergo nucleophilic substitution reactions while haloarenes undergo electrophilic substitution reactions. Explain.



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157. How aryl halides react with sodium metal?

Explain why alkyl halides show nucleophilic substitution reaction ?



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158. The presence of electron withdrawing group increases the reactivity of haloarenes towards nucleophilic substitution reaction.

Explain.



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