136. The order of reactivities of the following alkyl halides for an S_{N^2} reaction is
1) RF > RCl > RBr > RI 2) RF > RBr > RCl > RI
3) RCl > RBr > RF > RI 4) RI > RBr > RCl > RF

137. The reaction, $C_2H_5Cl + aq.KOH \rightarrow C_2H_5OH + KCl$ is
1) electrophilic addition 2) nucleophilic addition
3) electrophilic substitution 4) nucleophilic substitution

138. Aryl halides are less reactive towards nucleophilic substitution reaction as compared to alkyl halides due to
1) the formation of less stable carbonium ion
2) sp^2 – hybridized carbon attached to the halogen
3) longer carbon halogen bond 4) the inductive effect

139. In the addition of HBr to propene in the absence of peroxides, the first step involves the addition of
1) H^+ 2) Br^- 3) $H^\bullet$ 4) $Br^\bullet$

140. The intermediate during the addition of HCl to propane in presence of peroxide is
1) $CH_3\dot{C}HCH_2Cl$ 2) $CH_3\overset{+}{C}HCH_3$ 3) $CH_3\dot{C}HCH_3$ 4) $CH_3CH_2\dot{C}H_2$

141. 1, 2-Dibromopropane on treatment with X moles of $NaNH_2$ followed by treatment with ethyl bromide gives a pentyne. The value of X is :
1) one 2) two 3) three 4) four

142. The compound, $C_7H_8 \xrightarrow{3Cl_2/\Delta} A \xrightarrow{Br_2/Fe} B \xrightarrow{Zn/HCl} C$
The compound C is :
1) o-Bromotoluene 2) m-Bromotoluene
3) p-Bromotoluene 4) 3-Bromo-2, 4, 6, 6-trichlorotoluene

143. Two isomeric optically active halides A and B have molecular formula C_5H_9Cl. On adding H_2, A gives optically inactive compound while B gives a chiral compound. The two isomers are:
1) A is 3-chloro -1-pentene and B is 4-chloro-2-pentene
2) A is 4-chloro-1-pentene and B is 2-chloro-2-pentene
3) A is 3-chloro-2-pentene and B is 2-chloro-2-pentene
4) A is 1-chloro-1-pentene and B is 2-chloro-1-pentene

144. The conversion of 2, 3-dibromobutane to 2-butene with Zn and alcohol is
1) redox reaction 2) α -Elimination
3) β -Elimination 4) both β -Elimination and redox reaction

145. S_{N^1} reaction of optically active alkyl halides leads to
1) retention of configuration 2) racemization
3) inversion of configuration 4) none of the above

146. The addition of HBr is easiest with :
1) $CH_2 = CHCl$ 2) $ClCH = CHCl$ 3) $CH_3 - CH = CH_2$ 4) $(CH_3)_2C = CH_2$

147. Benzoyl chloride is prepared from benzoic acid by:
1) $SOCl_2$ 2) SO_2Cl_2 3) Cl_2, hv 4) Cl_2, H_2O

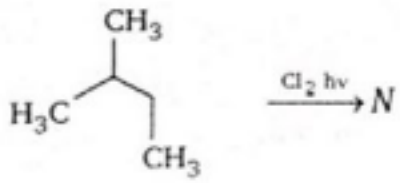
148. An S_{N^2} reaction at an asymmetric carbon of a compound always gives
1) an enantiomer of the substrate 2) a product with opposite optical rotation
3) a mixture of diastereomers 4) a single stereoisomers

149. Bottles containing C_6H_5I and $C_6H_5CH_2I$ lost their original labels. They were labelled as A and B for testing. A and B were separately taken in test tubes and boiled with NaOH solution. The end solution in each tube was made acidic with dil. HNO_3 and some $AgNO_3$ solution was added. Substance B gave a yellow precipitate. Which one of the following statements is true for this experiment?
1) addition of HNO_3 was unnecessary 2) A was C_6H_5I
3) A was $C_6H_5CH_2I$ 4) B was C_6H_5I

150. Which of the following are arranged in the decreasing order of dipole moment?
1) CH_3Cl, CH_3Br, CH_3F 2) CH_3Cl, CH_3F, CH_3Br
3) CH_3Br, CH_3Cl, CH_3F 4) CH_3Br, CH_3F, CH_3Cl

151. The most reactive nucleophile among the following is:
1) CH_3O^- 2) $C_6H_5O^-$ 3) $(CH_3)_2CHO^-$ 4) $(CH_3)_3CO^-$

152. Which of the following is least reactive in a nucleophilic substitution reaction?
1) $(CH_3)_3C-Cl$ 2) $CH_2=CHCl$ 3) CH_3CH_2Cl 4) $CH_2=CHCH_2Cl$

153.  (isomeric products)

$C_5H_{11}Cl \xrightarrow{\text{Fractional distillation}} M$ (*isomeric products*)

Give the number of N and M :
1) 6, 6 2) 6, 4 3) 4, 4 4) 3, 3

154. Which of the following sequence of reactions (reagents can be used for conversion of $C_6H_5CH_2CH_3$ into $C_6H_5CH=CH_2$?
1) $SOCl_2$; H_2O 2) SO_2Cl_2 ; alc. KOH 3) Cl_2/hv ; H_2O 4) $SOCl_2$; alc.KOH

155. Which of the following compounds has the higher boiling point?
1) $CH_3CH_2CH_2Cl$ 2) $CH_3CH_2CH_2CH_2Cl$ 3) $CH_3CH(CH_3)CH_2Cl$ 4) $(CH_3)_3CCl$

156. The major product formed in the following reaction is

$CH_3CH(Cl)CH_2-CH_2OH \xrightarrow{aq.KOH}$

1) $CH_3CH=CHCH_2OH$ 2) $CH_2=CH-CH_2CH_2OH$
3) $CH_3-CH_2-O-CH_2-CH_2$ 4) $CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2CH_2CH$

157. Which of the following compounds is expected to be optically active?
1) $(CH_3)_2CHCHO$ 2) $CH_3CH_2CH_2CHO$ 3) $CH_3CH_2CHBrCHO$ 4) $CH_3CH_2CBr_2CHO$

158. Markovnikov's rule is best applicable to :
1) $C_2H_4 + HCl$ 2) $C_3H_6 + Br_2$ 3) $C_3H_6 + Br$ 4) $C_3H_6 + Cl_2$

159. Hydrolysis of benzyl chloride to form benzyl alcohol is
An example of:
1) electrophilic addition 2) elimination reaction 3) substitution reaction 4) hydrolysis reaction

160. HBr reacts with $CH_2=CH-OCH_3$ under anhydrous conditions at room temperature to give
1) CH_3CHO *and* CH_3Br 2) $BrCH_2CHO$ *and* CH_3OH
3) $BrCH_2-CH_2-OCH_3$ 4) $CH_3-CHBr-OCH_3$

161. $CH_3-Br+Nu^- \rightarrow CH_3-Nu+Br^-$ The decreasing order of the rate of the above reaction with nucleophiles *(Nu⁻)* A to D is:
$[Nu^- = (A)PhO^-, (B)AcO^-, (C)HO^-, (D)CH_3O^-]$
1) D > C > A > B 2) D > C > B > A 3) A > B > C > D 4) B > D > C > A

162. Fluorobenzene (C_6H_5F) can be synthesised in the laboratory:
1) by heating phenol with HF and KF
2) from aniline by diazotization followed by heating the diazonium salt with HBF_4
3) by direct fluorination of benzene with F_2 gas
4) by reacting bromobenzene with NaF solution.

163. Reaction of trans-2-phenyl-1-bromocyclopentane on reaction with alcoholic KOH produces:
1) 4-Phenylcyclopentane 2) 2-Phenylcyclopentene

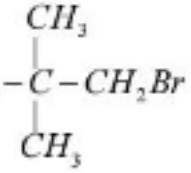
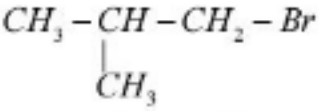
3) 1-Phenylcyclopentene 4) 3-Phenylcyclopentene

164. An alkyl halide by formation of its GR and heating with water yields propane. What is the original alkyl halide?
1) Methyl iodide 2) Ethyl iodide 3) Ethyl bromide 4) Propyl bromide

165. Which of the following undergoes nucleophilic substitution exclusively by S_{N^1} mechanism?
1) Ethyl chloride 2) Isopropyl chloride 3) Chlorobenzene 4) Benzyl chloride

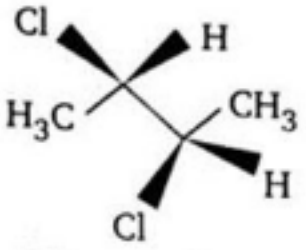
166. For : (i) I^- (ii) Cl^- (iii) Br^-, the increasing order of nucleophilicity would be:
1) $Cl^- < Br^- < I^-$ 2) $I^- < Cl^- < Br^-$ 3) $Br^- < Cl^- < I^-$ 4) $I^- < Br^- < Cl^-$

167. In an S_{N^2} substitution reaction of the type:
$R-Br+Cl^- \xrightarrow{DMF} R-Cl+Br^-$; Which one of the following has the highest reaction rate?

1) 
2) CH_3-CH_2-Br
3) $CH_3-CH_2-CH_2-Br$
4) 

168. The organochloro compound which shows complete stereo chemical inversion during the S_{N^2} reaction is:
1) CH_3Cl 2) C_2H_5Cl 3) $(CH_3)_3CCl$ 4) $(CH_3)_2CHCl$

169. The correct statement(s) about the compound given below is (are):



1) the compound is optically active 2) the compound possesses centre of symmetry
3) the compound possesses plane of symmetry 4) None of the above

170. Which of the following is correct order of decreasing S_{N^2} reactivity?
1) $R_2CHX > R_3CX > RCH_2X$ 2) $RCH_2X > R_3CX > R_2CHX$
3) $RCH_2X > R_2CHX > R_3CX$ 4) $R_3CX > R_2CHX > RCH_2X$ (X = halogen)

171. How many stereoisomers does this molecule have?
$CH_3CH=CHCH_2CHBrCH_3$
1) 8 2) 2 3) 4 4) 6

172. The synthesis of 3-octyne is achieved by adding a bromoalkane into a mixture of sodium amide and an alkyne. The bromoalkane and alkyne respectively are
1) $BrCH_2CH_2CH_2CH_3$ *and* $CH_3CH_2C\equiv CH$ 2) $BrCH_2CH_2CH_3$ *and* $CH_3CH_2CH_2C\equiv CH$
3) $BrCH_2CH_2CH_2CH_2CH_3$ *and* $CH_3C\equiv CH$ 4) $BrCH_2CH_2CH_2CH_3$ *and* $CH_3CH_2C\equiv CH$

173. Out of the following, the alkene that exhibits optical isomerism is:
1) 3-methyl -1-pentene 2) 2-methyl-2-pentene 3) 3-methyl-2-pentene 4) 4-methyl-1-pentene

174. The order of rate of hydrolysis of alkyl halides 1°, 2°, 3° and CH_3X by the S_{N^2} pathway is
1) 1° > 2° > 3° > CH_3X 2) CH_3X > 3° > 2° > 1°
3) CH_3X > 1° > 2° > 3° 4) 3° > 2° > 1° > CH_3X

175. The ease of dehydrohalogenation of alkyl halides with alcoholic KOH is
1) 3° < 2° < 1° 2) 3° > 2° > 1° 3) 3° < 2° > 1° 4) 3° > 2° < 1°

176. Arrange the following

171. How many stereoisomers does this molecule have?
$CH_3CH=CHCH_2CHBrCH_3$
1) 8 2) 2 3) 4 4) 6

172. The synthesis of 3-octyne is achieved by adding a bromoalkane into a mixture of sodium amide and an alkyne. The bromoalkane and alkyne respectively are
1) $BrCH_2CH_2CH_2CH_3$ and $CH_3CH_2C\equiv CH$ 2) $BrCH_2CH_2CH_3$ and $CH_3CH_2CH_2C\equiv CH$
3) $BrCH_2CH_2CH_2CH_2CH_3$ and $CH_3C\equiv CH$ 4) $BrCH_2CH_2CH_2CH_3$ and $CH_3CH_2C\equiv CH$

173. Out of the following, the alkene that exhibits optical isomerism is:
1) 3-methyl -1-pentene 2) 2-methyl-2-pentene 3) 3-methyl-2-pentene 4) 4-methyl-1-pentene

174. The order of rate of hydrolysis of alkyl halides 1°, 2°, 3° and CH_3X by the S_{N^1} pathway is
1) $1°>2°>3°>CH_3X$ 2) $CH_3X>3°>2°>1°$
3) $CH_3X>1°>2°>3°$ 4) $3°>2°>1°>CH_3X$

175. The ease of dehydrohalogenation of alkyl halides with alcoholic KOH is
1) $3°<2°<1°$ 2) $3°>2°>1°$ 3) $3°<2°>1°$ 4) $3°>2°<1°$

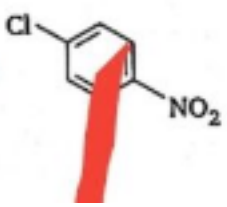
176. Arrange the following

CH_3CH_2Cl (I), $CH_3CH_2CHClCH_3$(II), $(CH_3)_2CHCH_2Cl$(III) and $(CH_3)_3C-Cl$(IV)
In order of decreasing tendency towards S_{N^1} reactions
1) I > III > II > IV 2) III > IV > II > I 3) II > I > III > IV 4) IV > III > II > I

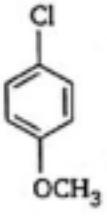
177. Among the following, the optically active compound is
1) CH_3CH_2OH 2) $CH_3CH=CHCH_3$ 3) CH_3CHDOH 4) $CH_3CH_2COCH_3$

178. Which of the following compounds is chiral
1) 3- Pentanol 2) 1-Pentanol 3) 3-Methyl-1-butanol 4) 3-methyl-2-butanol

179. How many chiral compounds are possible on monochlorination of 2-methylbutane?
1) 2 2) 4 3) 6 4) 8

180. Which of the following compounds undergo nucleophilic substitution reaction most easily?
1) 

2) 

3) 

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