

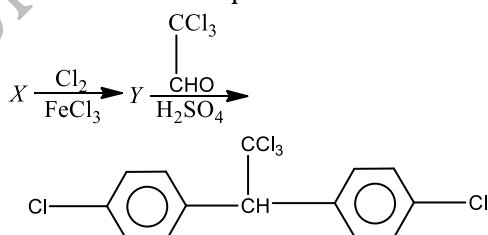
# HALOALKANES AND HALOARENES

## CHEMISTRY

### Single Correct Answer Type

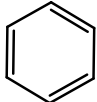

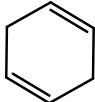
- Among the following the one that gives positive iodoform test upon reaction with  $I_2$  and NaOH is
  - $CH_3CH_2CH(OH)CH_2CH_3$
  - $C_6H_5CH_2CH_2OH$
  - $$\begin{array}{c} | \\ H_3C - CH - CH_2OH \\ | \\ CH_3 \end{array}$$
  - $PhCHOHCH_3$
- Vicinal and geminal dihalides can be distinguished by:
  - KOH(aq.)
  - KOH(alc.)
  - Zn dust
  - None of these
- An alkyl halide may be converted into an alcohol by:
  - Addition
  - Substitution
  - Dehydrohalogenation
  - Elimination
- Dehydrohalogenation in haloalkanes produces:
  - A single bond
  - A double bond
  - A triple bond
  - Fragmentation
- Chlorination of  $CS_2$  gives:
  - $CCl_4$
  - $CS_2Cl_2$
  - $CH_4$
  - $CHCl_3$
- Methylene chloride on hydrolysis yields:
  - HCHO
  - $CH_3CHO$
  - $CHCl_3$
  - $CH_3COCl$
- The greater the ionic character of the carbon metal bond:
  - The more reactive is the organometallic compound
  - The less reactive is the organometallic compound
  - Both are correct
  - None of the above is correct
- For the reaction,  
 $C_2H_5OH + HX \xrightarrow{ZnX_2} C_2H_5X$ , the order of reactivity is:
  - $HI > HCl > HBr$
  - $HI > HBr > HCl$
  - $HCl > HBr > HI$
  - $HBr > HI > HCl$
- The order of reactivities of methyl halides in the formation of Grignard reagent is
  - $CH_3I > CH_3Br > CH_3Cl$
  - $CH_3Cl > CH_3Br > CH_3I$
  - $CH_3Br > CH_3Cl > CH_3I$
  - $CH_3Br > CH_3I > CH_3Cl$
- The antiseptic character of iodoform is due to:
  - Its poisonous nature
  - Unpleasant smell
  - Liberation of free iodine
  - None of the above
- On treating a mixture of two alkyl halides with sodium metal in dry ether, 2-methyl propane was obtained. The alkyl halides are
  - 2-chloropropane and chloromethane
  - 2-chloropropane and chloroethane
  - Chloromethane and chloroethane
  - Chloromethane and 1-chloropropane
- The IUPAC name of the compound,  $(CH_3)_2CHCH_2CH_2Br$  is:
  - 2-methyl-3-bromopropane
  - 1-bromopentane
  - 2-methyl-4-bromobutane
  - 1-bromo-3-methylbutane

13. The given reaction is an example of,  
 $C_2H_5Br + KCN(aq.) \rightarrow C_2H_5CN + KBr$ :  
 a) Elimination  
 b) Nucleophilic substitution  
 c) Electrophilic substitution  
 d) Redox change
14. Which one of the following compound reacts with chlorobenzene to produce DDT?  
 a) Acetaldehyde  
 b) Nitrobenzene  
 c) *m*-chloroacetaldehyde  
 d) Trichloroacetaldehyde
15. Preparation of alkyl halides in laboratory is least preferred by:  
 a) Halide exchange  
 b) Direct halogenation of alkanes  
 c) Treatment of alcohols  
 d) Addition of hydrogen halides to alkenes
16. Which one of the following pairs is the strongest pesticide?  
 a) Chloroform and benzene hexachloride  
 b) DDT and 666  
 c) 666 and ether  
 d) isocyanides and alcohol
17. Iodoform gives a precipitate with  $AgNO_3$  on heating but chloroform does not because:  
 a) Iodoform is ionic  
 b) Chloroform is covalent  
 c) C—I bond in iodoform is weak and C—Cl bond in chloroform is strong  
 d) None of the above
18. Which reagent is useful in increasing the carbon chain of an alkyl halide?  
 a) HCN  
 b) KCN  
 c)  $NH_4CN$   
 d) AgCN
19. Chloroform on reaction with conc.  $HNO_3$  gives an insecticide and war gas known as:  
 a) Chloropicrin  
 b) Nitromethane  
 c) Picric acid  
 d) Acetylene
20. Aryl halides are less reactive towards electrophiles than alkyl halides due to:  
 a) Resonance  
 b) Stability of carbonium ions  
 c) High boiling point  
 d) None of the above
21. Carbon tetrachloride reacts with steam at  $500^\circ C$  to give:  
 a)  $COCl_2$   
 b)  $CHCl_3$   
 c) Both (a) and (b)  
 d) None of these
22. Chloroform on reaction with acetone yields:  
 a) Insecticide  
 b) Hypnotic agent  
 c) Analgesic  
 d) Isocyanide
23. In Wurtz reaction alkyl halide reacts with  
 a) Sodium in ether  
 b) Sodium in dry ether  
 c) Sodium only  
 d) Alkyl halide in ether
24. When iodoform is heated with silver powder it forms:  
 a) Acetylene  
 b) Ethylene  
 c) Methane  
 d) Ethane
25. 1,3-dibromopropane reacts with metallic zinc to form:  
 a) Propene  
 b) Cyclopropane  
 c) Propane  
 d) Hexane
26. In the reaction sequence

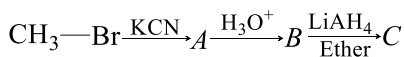


Compound 'X' is

- a) Chlorobenzene  
 b) Benzene  
 c) Toluene  
 d) Biphenyl methane

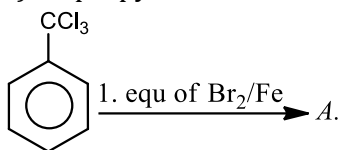
27. Which is used as a general anaesthetic in place of diethyl ether?  
 a)  $\text{CF}_3\text{—CHClBr}$                       b)  $\text{CF}_3\text{—CHCl}_2$                       c)  $\text{CF}_3\text{—CHBr}_2$                       d) None of these
28. Which of the following ketones will not respond to iodoform test?  
 a) Methyl isopropyl ketone                      b) Ethyl isopropyl ketone  
 c) Dimethyl ketone                      d) 2-hexanone
29. Propyl iodide and isopropyl iodide are:  
 a) Functional isomers                      b) Chain isomers                      c) Metamers                      d) Position isomers
30.  $X + \text{KCN} \rightarrow \text{CH}_3\text{CN} \xrightarrow{2\text{H}_2/\text{Ni}} \text{CH}_3\text{CH}_2\text{NH}_2$ ,  
 What is (X)?  
 a)  $\text{CH}_3\text{CH}_2\text{Cl}$                       b)  $\text{CH}_3\text{Cl}$                       c)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$                       d)  $(\text{CH}_3)_2\text{CHCl}$
31. 2-chlorobutane obtained by chlorination of butane, will be:  
 a) *meso*-form                      b) Racemic form                      c) *d*-form                      d) *l*-form
32. Reaction of alkyl halides with aromatic compounds in presence of anhy.  $\text{AlCl}_3$  is known as  
 a) Friedel-Craft's reaction                      b) Hofmann degradation  
 c) Kolbe's synthesis                      d) Beckmann rearrangement
33. Which of the following statements is incorrect regarding benzyl chloride?  
 a) It gives white precipitate with alcoholic  $\text{AgNO}_3$   
 b) It is an aromatic compound with substitution in the side chain  
 c) It undergoes nucleophilic substitution reaction  
 d) It is less reactive than vinyl chloride
34. Which of the following compounds is not formed in iodoform reaction of acetone?  
 a)  $\text{CH}_3\text{COCH}_2\text{I}$                       b)  $\text{ICH}_2\text{COCH}_2\text{I}$                       c)  $\text{CH}_3\text{COCHI}_2$                       d)  $\text{CH}_3\text{COCl}_3$
35. Of the isomeric hexanes, the isomers that give the minimum and maximum number of monochloro derivatives are respectively  
 a) 3-methylpentane and 2, 3-dimethylbutane                      b) 2, 3-dimethylbutane and *n*-hexane  
 c) 2, 2-dimethylbutane and 2-methylpentane                      d) 2, 3-dimethylbutane and 2-methylpentane
36. 1, 2-dibromo cyclohexane on dehydrogenation gives  
 a)                       b)                       c)                       d) None of these
37. Ethyl ortho formate is formed by heating ..... with sodium ethoxide.  
 a)  $\text{CHCl}_3$                       b)  $\text{C}_2\text{H}_5\text{OH}$                       c)  $\text{HCOOH}$                       d)  $\text{CH}_3\text{CHO}$
38. Chloroform is kept in dark coloured bottles because:  
 a) It is inflammable  
 b) It gives a peroxide  
 c) It undergoes rapid chlorination  
 d) It is oxidized to poisonous phosgene
39. Which of the following will not respond to iodoform test?  
 a) Ethyl alcohol                      b) Propanol-2                      c) Propanol-1                      d) Ethanal
40. At higher temperature, iodoform reaction is given by:  
 a)  $\text{CH}_3\text{COOCH}_3$                       b)  $\text{CH}_3\text{COOC}_2\text{H}_5$                       c)  $\text{C}_6\text{H}_5\text{COOCH}_3$                       d)  $\text{CH}_3\text{COOC}_6\text{H}_5$
41. Molecular formula of chloropicrin is  
 a)  $\text{CHCl}_3\text{NO}_2$                       b)  $\text{CCl}_3\text{NO}_3$                       c)  $\text{CCl}_2\text{NO}_2$                       d)  $\text{CCl}_3\text{NO}_2$
42. Which one of the following is not true for the hydrolysis of *t*-butyl bromide with aqueous  $\text{NaOH}$ ?  
 a) Reaction occurs through the  $\text{S}_\text{N}1$  mechanism.  
 b) The intermediate formed is a carbocation.  
 c) Rate of the reaction doubles when the concentration of alkali is doubled.  
 d) Rate of the reaction doubles when the concentration of *t*-butyl bromide is doubled.
43.  $\text{CHCl}_3$  reacts with conc.  $\text{HNO}_3$  to give  
 a)  $\text{CCl}_3\text{NO}_2$                       b)  $\text{CH}_3\text{NO}_2$                       c)  $\text{CH}_3\text{CN}$                       d)  $\text{CH}_3\text{CH}_2\text{NO}_2$

44. The correct order of melting and boiling points of the primary (1°), secondary(2°) and tertiary (3°) alkyl halides is:
- a)  $P > S > T$                       b)  $T > S > P$                       c)  $S > T > P$                       d)  $T > P > S$
45. Ethyl alcohol gives ethyl chloride on treatment with:
- a) NaCl                      b)  $\text{SOCl}_2$                       c)  $\text{Cl}_2$                       d) KCl
46. 20% aqueous solution of sodium chloride containing ethyl alcohol on electrolysis gives:
- a) Ethyl chloride                      b) Chloral                      c) Acetaldehyde                      d) Chloroform
47. Which of the following statements about benzyl chloride is incorrect?
- a) It is less reactive than alkyl halides  
 b) It can be oxidised to benzaldehyde by boiling with copper nitrate solution  
 c) It is a lachrymatory liquid and answers Beilstein's test  
 d) It gives a white precipitate with alcoholic silver nitrate
48. The  $\text{S}_{\text{N}}1$  reactivity of ethyl chloride is:
- a) More or less equal to that of benzyl chloride  
 b) Less than that of benzyl chloride  
 c) More or less equal to that of chlorobenzene  
 d) Less than that of chlorobenzene
49. Which of the following will not give iodoform test?
- a) Isopropyl alcohol  
 b) Ethanol  
 c) Ethanal  
 d) Benzyl alcohol
50. Elimination of HBr from 2-bromobutane results in the formation of:
- a) Equimolar mixture of 1- and 2- butene  
 b) Predominantly 2-butene  
 c) Predominantly 1- butene  
 d) Predominantly 2-butyne
51. 1,2-dibromoethane is added to prevent deposition of lead metal in :
- a) Water pipes  
 b) Petrol engines  
 c) Electric heaters  
 d) Metal working lathe machines
52. For the reaction,
- $$\text{CH}_3\underset{\substack{| \\ X}}{\text{CH}}\cdot\text{CH}_2\text{CH}_3 \xrightarrow[475\text{K}]{\text{H}_2\text{SO}_4}$$
- $\rightarrow \text{CH}_3-\text{CH}=\text{CH}-\text{CH}_3$   
 $\rightarrow \text{CH}_2=\text{CH}\cdot\text{CH}_2\cdot\text{CH}_3$
- a)  $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}_3$  predominates  
 b)  $\text{CH}_2=\text{CH}-\text{CH}_2-\text{CH}_3$  predominates  
 c) Both are formed in equal amounts  
 d) The product ratio is dependent on the halogen X
53. Grignard reagent is prepared by the reaction between:
- a) Zinc and alkyl halide  
 b) Magnesium and alkyl halide  
 c) Magnesium and alkane  
 d) Magnesium and aromatic hydrocarbon
54. In the following swquence of reactions



the end product (C) is:

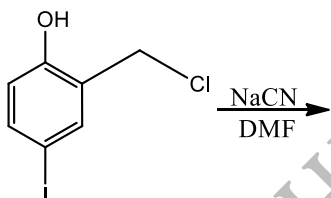
- a) Acetaldehyde                      b) Ethyl alcohol                      c) Acetone                      d) Methane
55. The IUPAC name of the compound,  
 $\text{CH}_3\text{COCH}(\text{Cl})\text{—CH}(\text{Br})\text{COOH}$  is:
- a) 2-bromo-3-chloro-4-oxopentanoic acid  
 b) 3-chloro-2-bromo-4-oxopentanoic acid  
 c) 4-carboxybromo-3-chloro-2-butanone  
 d) None of the above
56. Which of the following is primary halide?  
 a) Isopropyl halide                      b) Sec-butyl halide                      c) Tert-butyl halide                      d) Neo-hexyl chloride
- 57.



Compound A is

- a)
- b)
- c)
- d)

58. Which of the following do not form Grignard reagent?  
 a)  $\text{CH}_3\text{F}$                       b)  $\text{CH}_3\text{Cl}$                       c)  $\text{CH}_3\text{Br}$                       d)  $\text{CH}_3\text{I}$
59. The structure of the major product formed in the following reaction is

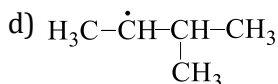
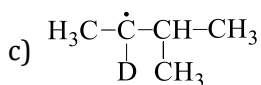
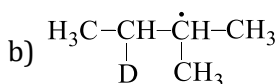
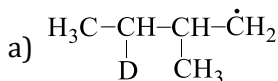


- a)
- b)
- c)
- d)

60. Butane nitrile may be prepared by heating:  
 a) Propyl alcohol with KCN  
 b) Butyl alcohol with KCN  
 c) Butyl chloride with KCN  
 d) Propyl chloride with KCN

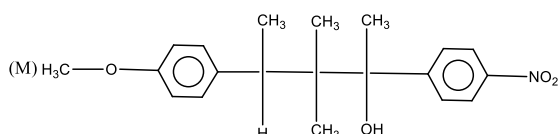
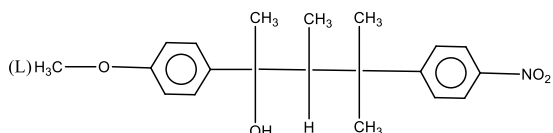
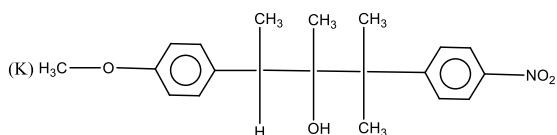
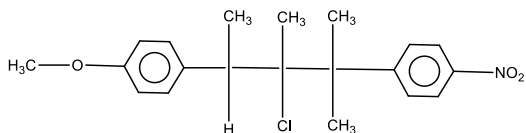
61. Consider the following reaction,  
 $\text{H}_3\text{C—CH}(\text{D})\text{—CH}(\text{CH}_3)\text{—CH}_3 + \text{Br} \cdot \rightarrow \text{X} + \text{HBr}$

Identify the structure of the major product 'X':



62. A mixture of 1-chloropropane and 2-chloropropane when treated with alcoholic KOH, it gives:  
 a) 1-propene  
 b) 2-propene  
 c) Isopropylene  
 d) A mixture of 1-propene and 2-propene
63. In Wurtz reaction of alkyl halides with sodium, the reactivity order of these halides is:  
 a)  $RI > RBr > RCl$       b)  $RCl > RBr > RI$       c)  $RBr > RI > RCl$       d) None of these
64. A mixture of sodium acetate and sodalime is heated and the product treated with excess of chlorine in presence of bright sunlight. The product is:  
 a)  $\text{CH}_3\text{COOH}$       b)  $\text{CH}_2\text{BrCOOH}$       c)  $\text{CCl}_4$       d)  $\text{CH}_3\text{Cl}$
65. 1-chlorobutane on reaction with alcoholic KOH gives:  
 a) 1-butene      b) 1-butanol      c) 2-butene      d) 2-butanol
66. Which halide does not get hydrolysed by sodium hydroxide?  
 a) Vinyl chloride      b) Methyl Chloride      c) Ethyl chloride      d) Isopropyl chloride
67. Iodoform test is not given by  
 a) 2-pentanone      b) Ethanol      c) Ethanal      d) 3-pentanone
68. The alkyl halides that can be made by free radical halogenation of alkanes are  
 a)  $RCl$  and  $RBr$  but not  $RF$  or  $RI$       b)  $RF, RCl$  and  $RBr$  but not  $RI$   
 c)  $RF, RCl, RBr, RI$       d)  $RF, RCl$  and  $RI$  but not  $RBr$
69. Non-sticking frying pans are coated with:  
 a) Ethylene  
 b) Styrene  
 c) Tetrafluoroethylene (Teflon)  
 d) Chlorofluoro methane
70. Ethyl chloride on heating with  $\text{AgCN}$  forms a compound  $X$ . The functional isomer of  $X$  is  
 a)  $\text{C}_2\text{H}_5\text{NC}$       b)  $\text{C}_2\text{H}_5\text{NH}_2$       c)  $\text{C}_2\text{H}_5\text{CN}$       d) None of these
71. Chlorine is most reactive towards  $\text{NaOH}$  in:  
 a)  $\text{CH}_3\text{Cl}$       b)  $\text{CH}_2=\text{CHCl}$       c)  $\text{C}_6\text{H}_5\text{Cl}$       d)  $\text{C}_6\text{H}_5\text{CH}_2\text{Cl}$
72. The chemical formula of 'tear gas' is  
 a)  $\text{COCl}_2$       b)  $\text{CO}_2$       c)  $\text{Cl}_2$       d)  $\text{CCl}_3\text{NO}_2$
73. The order of polarity of  $\text{CH}_3\text{I}$ ,  $\text{CH}_3\text{Br}$  and  $\text{CH}_3\text{Cl}$  molecules follows the order:  
 a)  $\text{CH}_3\text{Br} > \text{CH}_3\text{Cl} > \text{CH}_3\text{I}$   
 b)  $\text{CH}_3\text{I} > \text{CH}_3\text{Br} > \text{CH}_3\text{Cl}$   
 c)  $\text{CH}_3\text{Cl} > \text{CH}_3\text{Br} > \text{CH}_3\text{I}$   
 d)  $\text{CH}_3\text{Cl} > \text{CH}_3\text{I} > \text{CH}_3\text{Br}$
74. Chloroform gives a trichloro derivative of an alcohol on reaction with  
 a) conc. nitric acid      b) aq. alkali  
 c) acetone and alkali      d) a primary amine and an alkali
75. In order to convert aniline into chlorobenzene the reagent used is  
 a)  $\text{NaNO}_2/\text{HCl}, \text{CuCl}$       b)  $\text{Cl}_2/\text{CCl}_4$       c)  $\text{Cl}_2/\text{AlCl}_3$       d)  $\text{CuCl}_2$

76. Number of monochloro derivatives obtained when *neo* –pentane is chlorinated, is  
 a) One                                      b) Two                                      c) Three                                      d) Four
77. Which of the following will not form a yellow precipitate on heating with an alkaline solution of iodine?  
 a)  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$               b)  $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_3$       c)  $\text{CH}_3\text{OH}$                                       d)  $\text{CH}_3\text{CH}_2\text{OH}$
78.  $\text{CaOCl}_2 + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + X$   
 $X + \text{CH}_3\text{CHO} \rightarrow Y$   
 $Y + \text{Ca}(\text{OH})_2 \rightarrow \text{CHCl}_3$ .  
 What is 'Y'?  
 a)  $\text{CH}_3\text{CH}(\text{OH})_2$                       b)  $\text{CH}_2\text{Cl}_2$                                       c)  $\text{CCl}_3\text{CHO}$                                       d)  $\text{CCl}_3\text{COCH}_3$
79. Reaction of *trans*-2-phenyl-1-bromocyclopentane on reaction with alcoholic KOH produces  
 a) 4-phenylcyclopentene                      b) 2-phenylcyclopentene  
 c) 1-phenylcyclopentene                      d) 3-phenylcyclopentene
80. In order to get ethanethiol from  $\text{C}_2\text{H}_5\text{Br}$ , the reagent used is:  
 a)  $\text{Na}_2\text{S}$                                       b)  $\text{NaHS}$                                       c)  $\text{KCNS}$                                       d)  $\text{K}_2\text{S}$
81. Solvent used in dry-cleaning of clothes is:  
 a) Alcohol                                      b) Acetone                                      c) Carbon tetrachloride      d) freon
82. Correct order of reactivity for halides is:  
 a) Vinyl chloride > allyl chloride > propyl chloride  
 b) Propyl chloride > vinyl chloride > allyl chloride  
 c) Allyl chloride > propyl chloride > vinyl chloride  
 d) None of the above
83. The substance employed as tear gas is:  
 a) Westron                                      b) Chloropicrin                                      c) Chloretone                                      d) None of these
84. One of the following that cannot undergo dehydrohalogenation is  
 a) *iso*-propyl bromide      b) ethanol                                      c) Ethyl bromide                                      d) None of the above
85. The starting material for the preparation of  $\text{CHI}_3$  is:  
 a)  $\text{C}_2\text{H}_5\text{OH}$                                       b)  $\text{CH}_3\text{OH}$                                       c)  $\text{C}_2\text{H}_5\text{CHO}$                                       d)  $\text{HCHO}$
86. Optically active compound is:  
 a) 2-chloropropane                      b) 2-chlorobutane                                      c) 3-chloropentane                                      d) None of these
87.  $\text{CCl}_4$  is insoluble in water because:  
 a) Water is non-polar  
 b)  $\text{CCl}_4$  is non-polar  
 c) Water and  $\text{CCl}_4$  are polar  
 d) None of the above
88. Which one is most reactive towards  $\text{S}_{\text{N}}1$  reactions?  
 a)  $\text{C}_6\text{H}_5\text{CH}(\text{C}_6\text{H}_5)\text{Br}$       b)  $\text{C}_6\text{H}_5\text{CH}(\text{CH}_3)\text{Br}$                                       c)  $\text{C}_6\text{H}_5\text{C}(\text{CH}_3)(\text{C}_6\text{H}_5)\text{Br}$       d)  $\text{C}_6\text{H}_5\text{CH}_2\text{Br}$
89. Which of the following applies in the reaction,  
 $\text{CH}_3\text{CHBrCH}_2\text{CH}_3 \xrightarrow{\text{Alc.KOH}}$   
 (i)  $\text{CH}_3\text{CH}=\text{CHCH}_3$  (major product)  
 (ii)  $\text{CH}_2=\text{CHCH}_2\text{CH}_3$  (minor product)  
 a) Markownikoff's rule      b) Saytzeff's rule                                      c) Kharasch effect                                      d) Hofmann's rule
90. The following compound on hydrolysis in aqueous acetone will give

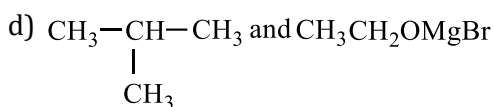
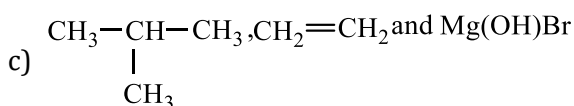
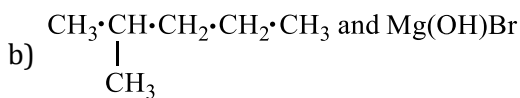


- a) Mixture of (K) and (L)  
 b) Mixture of (K) and (M)  
 c) Only (M)  
 d) Only (K)
91. The metal used for the de-bromination reaction of 1, 2-dibromoethane.  
 a) Na  
 b) Zn  
 c) Mg  
 d) Li
92. Reaction of *t*-butyl bromide with sodium methoxide produces  
 a) Isobutane  
 b) Isobutylene  
 c) Sodium *t*-butoxide  
 d) *t*-butylmethyl ether
93.  $\text{CH}_3\text{Br} + \text{KCN}(\text{alc.}) \rightarrow X$   
 $\xrightarrow[\text{Na} + \text{C}_2\text{H}_5\text{OH}]{\text{Reduction}} Y$
- What is Y in the series?  
 a)  $\text{CH}_3\text{CN}$   
 b)  $\text{C}_2\text{H}_5\text{CN}$   
 c)  $\text{C}_2\text{H}_5\text{NH}_2$   
 d)  $\text{CH}_3\text{NH}_2$
94. If methyl iodide and ethyl iodide are mixed in equal proportions, and the mixture is treated with metallic sodium in presence of dry ether, the number of possible products formed is:  
 a) 2  
 b) 3  
 c) 1  
 d) 4
95. An alkyl iodide on standing darkens, due to:  
 a) Hydrolysis  
 b) Conversion into ether  
 c) Liberation of iodine  
 d) Formation of alkanes
96. X compound reacts with Na to give  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$ , then compound X is  
 a)  $\text{CH}_3\text{CH}_2\text{OH}$   
 b)  $\text{CH}_3\text{CH}_2\text{Cl}$   
 c)  $\text{CH}_3\text{CH}_3$   
 d)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$
97. Maximum number of molecules of  $\text{CH}_3\text{I}$  that can react with a molecule of  $\text{CH}_3\text{NH}_2$  are  
 a) 3  
 b) 4  
 c) 2  
 d) 1
98. The  $\text{CCl}_4$  and  $\text{CHCl}_3$  can be distinguished by the action of:  
 a)  $\text{RNH}_2 + \text{KOH alc.}$   
 b)  $\text{RCN} + \text{KOH alc.}$   
 c) Hydrolysis  
 d) Burning in air



99. Alkyl halides reacts with dialkyl lithium cuprate to give:  
 a) Alkenes                      b) Alkyl Cu halide                      c) Alkanes                      d) Alkenyl halide
100. Which responds to the iodoform test?  
 a) Butanol                      b) Butan-1-al                      c) Butanone-2                      d) 3-pentanone
101. In the reaction sequence,  

$$\text{C}_2\text{H}_5\text{Cl} + \text{KCN} \xrightarrow{\text{C}_2\text{H}_5\text{OH}} \text{X} \xrightarrow[\Delta]{\text{H}_3\text{O}^{\oplus}} \text{Y}$$
 What is the molecular formula of Y?  
 a)  $\text{C}_3\text{H}_6\text{O}_2$                       b)  $\text{C}_3\text{H}_5\text{N}$                       c)  $\text{C}_2\text{H}_4\text{O}_2$                       d)  $\text{C}_2\text{H}_6\text{O}$
102. Which one of the following forms propane nitrile as the major product?  
 a) Ethyl bromide + alcoholic KCN                      b) Propyl bromide + alcoholic KCN  
 c) Propyl bromide + alcoholic AgCN                      d) Ethyl bromide + alcoholic AgCN
103. The compound A forms B with sodium metal and again A forms C with  $\text{PCl}_5$ , but B and C form diethyl ether. Therefore A, B and C are:  
 a)  $\text{C}_2\text{H}_5\text{OH}$ ,  $\text{C}_2\text{H}_5\text{ONa}$ ,  $\text{C}_2\text{H}_5\text{I}$     b)  $\text{C}_2\text{H}_5\text{OH}$ ,  $\text{C}_2\text{H}_5\text{Cl}$ ,  $\text{C}_2\text{H}_5\text{OCl}$     c)  $\text{C}_2\text{H}_5\text{OH}$ ,  $\text{C}_2\text{H}_5\text{Cl}$ ,  $\text{C}_2\text{H}_4\text{Cl}_2$     d)  $\text{C}_2\text{H}_5\text{OH}$ ,  $\text{C}_2\text{H}_5\text{Cl}$ ,  $\text{C}_2\text{H}_5\text{O}$
104. For the carbylamine reaction we need hot alcoholic KOH and:  
 a) Any amine and chloroform  
 b) Chloroform and silver powder  
 c) A primary amine and an alkyl halide  
 d) Any monoalkyl amine and trichloro methane
105. Ethyl bromide reacts with lead-sodium alloy to form:  
 a) Tetraethyl lead                      b) Tetraethyl bromide                      c) Both (a) and (b)                      d) None of these
106. The number of possible enantiomeric pairs that can be produced during mono-chlorination of 2-methyl butane is  
 a) 3                      b) 4                      c) 1                      d) 2
107. Alkyl halides on treatment with a suspension of  $\text{Ag}_2\text{O}$  moist in ether gives:  
 a) Alkanol                      b) Alkanal                      c) Alkanes                      d) Alkoxy alkane
108. The conversion of ethyl chloride into diethyl ether takes place by  
 a) Williamson's synthesis                      b) Perkin's reaction  
 c) Wurtz reaction                      d) Grignard reaction
109. Which process does not occur during formation of  $\text{CHCl}_3$  from  $\text{C}_2\text{H}_5\text{OH}$  and bleaching powder?  
 a) Hydrolysis                      b) Oxidation                      c) Elimination                      d) Chlorination
110. Which of the following does not answer iodoform test?  
 a) n-butyl alcohol                      b) Acetophenone                      c) Acetaldehyde                      d) Ethylmethyl ketone
111. Methyl bromide is not used:  
 a) As an insecticide  
 b) As disinfectant  
 c) For dyeing clothes  
 d) As disinfectant for young fruit trees
112. Which compound on reaction with ethyl magnesium bromide and water will form 2-methyl-2-butanol?  
 a)  $\text{CH}_3\text{COCH}_3$                       b)  $\text{CH}_3\text{COOCH}_3$                       c)  $\text{CH}_3\text{CH}_2\text{CHO}$                       d)  $\text{C}_2\text{H}_5\text{COCH}_3$
113. Alkyl halides are less soluble in water because  
 a) they ionise in water                      b) they do not form H-bonds with water  
 c) they are highly viscous                      d) they have very strong C – X bond
114. Hexachloroethane is also called  
 a) Artificial sweetner                      b) Artificial camphor                      c) Artificial polymer                      d) None of these
115. Isobutyl magnesium bromide with dry ether and absolute alcohol gives:  
 a) 
$$\text{CH}_3 \cdot \underset{\text{CH}_3}{\text{CH}} \cdot \text{CH}_2\text{OH} \cdot \text{and } \text{CH}_3 \cdot \text{CH}_2\text{MgBr}$$



116. Strong reducing agent converts  $\text{CHCl}_3$  into:

- a)  $\text{C}_2\text{H}_2$                       b)  $\text{C}_2\text{H}_6$                       c)  $\text{C}_2\text{H}_4$                       d)  $\text{CH}_4$

117. Which of the following are arranged in decreasing order of dipole moment:

- a)  $\text{CH}_3\text{Cl}$ ,  $\text{CH}_3\text{Br}$ ,  $\text{CH}_3\text{F}$     b)  $\text{CH}_3\text{Cl}$ ,  $\text{CH}_3\text{F}$ ,  $\text{CH}_3\text{Br}$     c)  $\text{CH}_3\text{Br}$ ,  $\text{CH}_3\text{Cl}$ ,  $\text{CH}_3\text{F}$     d)  $\text{CH}_3\text{Br}$ ,  $\text{CH}_3\text{F}$ ,  $\text{CH}_3\text{Cl}$

118. Fluorobenzene ( $\text{C}_6\text{H}_5\text{F}$ ) can be synthesised in the laboratory

- a) By heating phenol with  $\text{HF}$  and  $\text{KF}$   
 b) From aniline by diazotisation followed by heating the diazonium salt with  $\text{HBF}_4$   
 c) By direct fluorination of benzene with  $\text{F}_2$  gas  
 d) By reacting bromobenzene with  $\text{NaF}$  solution

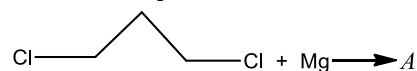
119. 1-chlorobutane on reaction with alcoholic potash gives

- a) but-1-ene                      b) butan-1-ol                      c) but-2-ene                      d) butan-2-ol

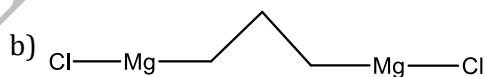
120. On warming with silver powder, chloroform is converted into

- a) Acetylene                      b) Hexachloroethane  
 c) 1, 1, 2, 2-tetrachloroethane    d) Ethylene

121. What is the product *A* in the following?

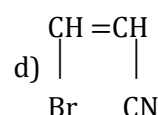
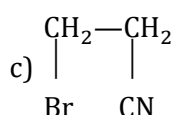
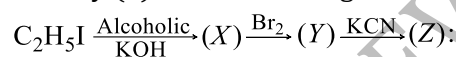


c) Both (a) and (b)

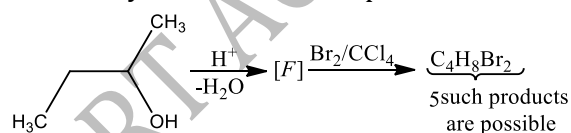


d) None of the above

122. Identify (Z) in the following reaction series,



123. How many structures of *F* is possible?



- a) 2                      b) 5                      c) 6                      d) 3

124. PVC plastics are produced by the polymerization of:

- a) Vinyl acetate                      b) Allyl chloride                      c) Vinyl chloride                      d) Ethene

125. Ethylene dichloride can be prepared by the reaction of  $\text{HCl}$  and :

- a) Ethane                      b) Ethylene                      c) Acetylene                      d) Ethylene glycol

126. Polymer of chloroethylene is:

- a) PVC                      b) Teflon                      c) Nylon                      d) Terylene

127. Most readily hydrolysed halides is:

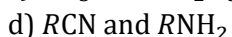
- a)  $\text{C}_6\text{H}_5\text{Cl}$                       b)  $(\text{C}_6\text{H}_5)_2\text{CHCl}$                       c)  $\text{C}_6\text{H}_5\text{CH}_2\text{Cl}$                       d)  $(\text{C}_6\text{H}_5)_3\text{CCl}$

128. What is the product of the reaction of 1, 3-butadiene with  $\text{Br}_2$ ?

- a) 1, 4-dibromo butene                      b) 1, 2-dibromo butene  
 c) 3, 4-dibromo butene                      d) 2, 3-dibromo-2-butene

129. Chlorobenzene gives aniline with  
 a)  $\text{NH}_3/\text{Cu}_2\text{O}$       b)  $\text{NH}_3/\text{H}_2\text{SO}_4$       c)  $\text{NaNH}_2$       d) None of the above
130. In the following compound, least number of monochlorination is possible  
 a)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$   
 b) 
$$\begin{array}{c} \text{H}_3\text{C}-\text{CH}-\text{CH}_2-\text{CH}_3 \\ | \\ \text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$$
  
 c) 
$$\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{H} \\ | \\ \text{CH}_3 \end{array}$$
  
 d) 
$$\begin{array}{c} \text{H}_3\text{C}-\text{C}-\text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$$
131. 2, 2-dichloro propane on hydrolysis yields  
 a) Acetone      b) 2, 2-propane diol  
 c) Isopropyl alcohol      d) Acetaldehyde
132. The product of vinyl chloride and HCl is a  
 a) *gem* chloride      b) Ethylidene chloride  
 c) 1, 1 dichloroethane      d) All of the above are correct
133. Among the following, the molecule with the highest dipole moment is:  
 a)  $\text{CH}_3\text{Cl}$       b)  $\text{CH}_2\text{Cl}_2$       c)  $\text{CHCl}_3$       d)  $\text{CCl}_4$
134.  $\text{CO}_2$  on reaction with  $\text{C}_2\text{H}_5\text{MgBr}$  and  $\text{H}_2\text{O}$  gives:  
 a) Ethane      b) Propionic acid      c) Acetic acid      d) None of these
135. Methyl chloride reacts with silver acetate to yield:  
 a) Acetic acid      b) Methyl acetate      c) Acetyl chloride      d) Acetaldehyde
136. A compound *A* of formula  $\text{C}_3\text{H}_6\text{Cl}_2$  on reaction with alkali can give *B* of formula  $\text{C}_3\text{H}_6\text{O}$  or *C* of formula  $\text{C}_3\text{H}_4$ . *B* on oxidation gave a compound of the formula  $\text{C}_3\text{H}_6\text{O}_2$ . *C* with dilute  $\text{H}_2\text{SO}_4$  containing  $\text{Hg}^{2+}$  ion gave *D* of formula  $\text{C}_3\text{H}_6\text{O}$ , which with bromine and NaOH gave the sodium salt of  $\text{C}_2\text{H}_4\text{O}_2$ . Then *A* is:  
 a)  $\text{CH}_3\text{CH}_2\text{CHCl}_2$   
 b)  $\text{CH}_3\text{CCl}_2\text{CH}_3$   
 c)  $\text{CH}_2\text{ClCH}_2\text{CH}_2\text{Cl}$   
 d)  $\text{CH}_3\text{CHClCH}_2\text{Cl}$
137. Compounds formed, when methyl amine is heated with chloroform in the presence of KOH is:  
 a)  $\text{CH}_3-\text{C}\equiv\text{N}$       b)  $\text{CH}_3\text{N}^+\equiv\text{C}^-$       c)  $\text{CH}_3-\text{N}^-\equiv\text{C}^+$       d)  $\text{CH}_3\text{NHCH}_3$
138. Tertiary butyl alcohol gives tertiary butyl chloride on treatment with  
 a) Conc. HCl/anhy.  $\text{ZnCl}_2$       b) KCN      c) NaOCl      d)  $\text{Cl}_2$
139. The reaction of toluene with  $\text{Cl}_2$  in presence of  $\text{FeCl}_3$  gives predominantly  
 a) Benzoyl chloride      b) Benzyl chloride  
 c) *o*- and *p*-chlorotoluene      d) *m*-chlorotoluene
140. Which one of the following compounds when heated with KOH and a primary amine gives carbylamine test?  
 a)  $\text{CHCl}_3$       b)  $\text{CH}_3\text{Cl}$       c)  $\text{CH}_3\text{OH}$       d)  $\text{CH}_3\text{CN}$
141. In the following reaction:  

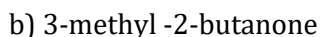
$$\text{C}_6\text{H}_5\text{CH}_2\text{Br} \xrightarrow[2. \text{H}_3\text{O}^+]{1. \text{Mg/ether}} \text{X}$$
; the product 'X' is :  
 a)  $\text{C}_6\text{H}_5\text{CH}_2\text{OCH}_2\text{C}_6\text{H}_5$       b)  $\text{C}_6\text{H}_5\text{CH}_2\text{OH}$       c)  $\text{C}_6\text{H}_5\text{CH}_3$       d)  $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{C}_6\text{H}_5$
142. For a given alkyl group, the densities/b. p./m. p. are in the order:  
 a)  $\text{RI} < \text{RBr} < \text{RCl}$       b)  $\text{RI} < \text{RCl} < \text{RBr}$       c)  $\text{RBr} < \text{RI} < \text{RCl}$       d)  $\text{RCl} < \text{RBr} < \text{RI}$
143. Carbylamine test is performed by heating alc. KOH with:  
 a)  $\text{CHCl}_3$  and Ag  
 b) Trihalogenated methane and primary amine



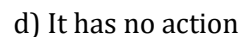
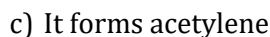
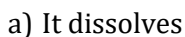
144. Which of these compounds is synthesised by chloral?



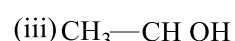
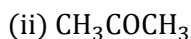
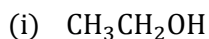
145. Iodoform can be prepared from all except:



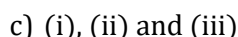
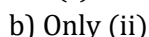
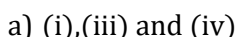
146. When vinyl chloride is passed through alcoholic KOH solution:



147. Following compounds are given:



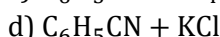
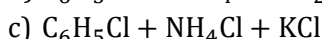
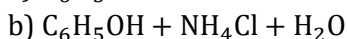
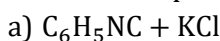
Which of the above compound(s), on being warmed with iodine solution and NaOH, will give iodoform?



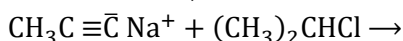
148. DDT is obtained by the reaction of chlorobenzene with



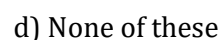
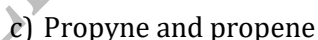
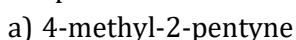
149. The reaction products of the reaction between  $\text{C}_6\text{H}_5\text{NH}_2$ ,  $\text{CHCl}_3$  and KOH are:



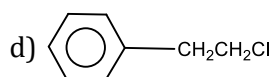
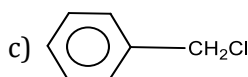
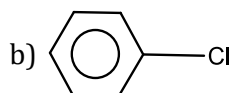
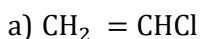
150. In the reaction,



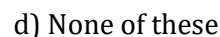
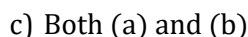
the product formed is:



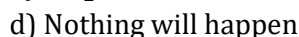
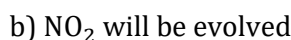
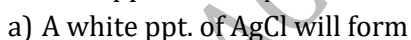
151. Which one of the following chlorohydrocarbons readily undergoes solvolysis?



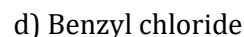
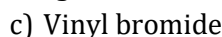
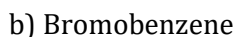
152. Grignard reagent with hydrogen cyanide gives:



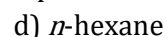
153. What happens if  $\text{CCl}_4$  is treated with  $\text{AgNO}_3$ ?



154. Among the following which one has weakest carbon-halogen bond?



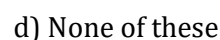
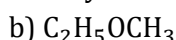
155. Of the five isomeric hexanes, the isomer which can give two monochlorinated compounds is



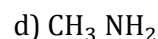
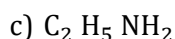
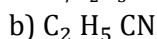
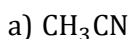
156. Which of the following compounds gives trichloromethane on distilling with bleaching powder?



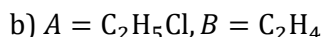
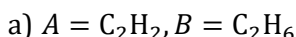
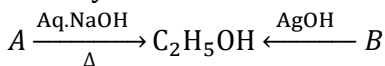
157. Sodium ethoxide reacts with ethyl iodide to yield:



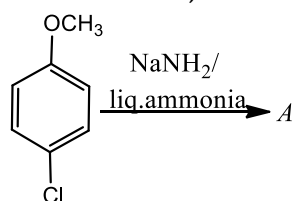
158.  $\text{CH}_3\text{Br} + \text{KCN} (\text{alc.}) \rightarrow X \xrightarrow[\text{Na/C}_2\text{H}_5\text{OH}]{\text{Reduction}} Y$ , what is  $Y$  in the series?



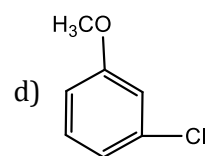
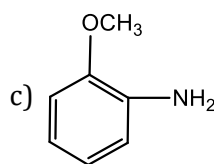
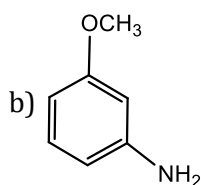
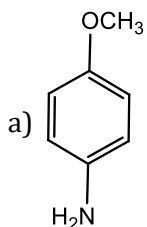
159. Identify  $A$  and  $B$  in the following reactions



- c)  $A = C_2H_4, B = C_2H_5Cl$                       d)  $A = C_2H_5Cl, B = C_2H_5Cl$
160. The reagent used in the conversion of 1-butanol to 1-bromobutane is:  
 a)  $CHBr_3$                       b)  $Br_2$                       c)  $CH_3Br$                       d)  $P + Br_2$
161. *t*-butyl chloride preferably undergo hydrolysis by  
 a)  $S_N1$  mechanism  
 b)  $S_N2$  mechanism  
 c) Any of (a) and (b)  
 d) None of the above
162. Which statement is wrong about chloroform?  
 a) Chloroform is used as anaesthetic  
 b) Chloroform has distorted tetrahedral shape  
 c) Chloroform is used as a solvent  
 d) Chloroform has  $sp^2$ -hybridised carbon atom
163. When  $CCl_4$  is boiled with  $KOH$ , the product formed is:  
 a) Formic acid                      b) Methyl alcohol                      c) Formaldehyde                      d) Carbon dioxide
164. Which set of reagents will produce freon( $CCl_2F_2$ ) ?  
 a)  $C + F_2 + Cl_2 \rightarrow$                       b)  $CH_3Cl + F_2 \rightarrow$                       c)  $CCl_4 + HF \xrightarrow{SbCl_5}$                       d)  $CCl_4 + F_2 \rightarrow$
165. Which of the following will not give positive iodoform test?  
 a)  $CH_3CH_2CHOHCH_3$                       b)  $CH_3CH_2CH_2COCH_3$                       c)  $CH_3CH_2COCH_2CH_3$                       d)  $CH_3COC_6H_5$
166. Which of the following does not react with benzene in presence of anhydrous  $AlCl_3$ ?  
 a)  $C_6H_5Cl$                       b)  $C_6H_5CH_2Cl$                       c)  $CH_3Cl$                       d)  $C_6H_5CH_2CH_2CH_2Cl$
167. Iodoform is obtained when ethanol is heated with  
 a)  $KI$  and aq.  $KOH$                       b)  $I_2$  and aq.  $KOH$                       c)  $I_2$ /aq.  $KI$                       d)  $HI$  and  $HIO_3$
168. *n*-propyl bromide reacts with ethanolic  $KOH$  to form:  
 a) Propane                      b) Propene                      c) Propyne                      d) Propyl alcohol
169. Which of the following statements regarding the  $S_N1$  reaction shown by alkyl halide is not correct?  
 a) The added nucleophile plays no kinetic role in  $S_N1$  reaction.  
 b) The  $S_N1$  reaction involves the inversion of configuration of the optically active substrate.  
 c) The  $S_N1$  reaction on the chiral starting material ends up with racemization of the product.  
 d) The more stable the carbocation intermediate the faster the  $S_N1$  reaction.
170. Pick up the correct statement about alkyl halides:  
 a) They show H-bonding.  
 b) They are soluble in water.  
 c) They are soluble in organic solvents.  
 d) They do not contain any polar bond.
171. The product of reaction between alcoholic silver nitrite with ethyl bromide is  
 a) Ethene                      b) Ethane                      c) Ethyl nitrile                      d) Nitro ethane
172. 1-phenyl, 2-chloropropane on treating with alc.  $KOH$  gives mainly:  
 a) 1-phenylpropene  
 b) 2-phenylpropene  
 c) 1-phenylpropan-2-ol  
 d) 1-phenylpropan-1-ol
173. In the reaction,



The major product *A* is



174.  $(\text{CH}_3)_3\text{CMgCl}$  on reaction with  $\text{D}_2\text{O}$  gives:

- a)  $(\text{CH}_3)_3\text{CD}$                       b)  $(\text{CH}_3)_3\text{OD}$                       c)  $(\text{CD}_3)_3\text{CD}$                       d)  $(\text{CD}_3)_3\text{OD}$

175. Grignard reagent shows addition on:

- a)  $>\text{C}=\text{O}$                       b)  $-\text{C}\equiv\text{N}$                       c)  $>\text{C}=\text{S}$                       d) All of these

176. When tetrahydrofuran is treated with excess HI, the product formed is

- a) 1, 4-diiodobutane                      b) 1, 4-butanediol  
c) 2-iodotetrahydrofuran                      d) 4-iodo-1-butanol

177. Iodoform can be used in medicine as:

- a) Anaesthetic                      b) Antiseptic                      c) Analgesic                      d) Antifebrin

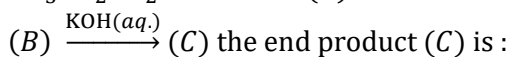
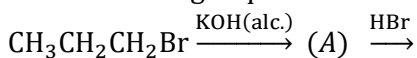
178. A mixture of two organic compounds was treated with sodium metal in ether solution. Isobutane was obtained as a product. The two chlorine compounds are:

- a) Methyl chloride and propyl chloride  
b) Methyl chloride and ethyl chloride  
c) Isopropyl chloride and methyl chloride  
d) Isopropyl chloride and ethyl chloride

179. Wurtz's reaction involves the reduction of alkyl halide with

- a) Zn/HCl                      b) HI                      c) Zn/Cu couple                      d) Na in ether

180. In the following sequences of reactions;



- a) Propene  
b) Propyne  
c) Propan-1-ol  
d) Propan-2-ol

181. When  $\text{CHCl}_3$  is boiled with NaOH, it gives

- a) Formic acid                      b) Trihydroxy methane  
c) Acetylene                      d) Sodium formate

182. Which of the following compounds has the highest boiling point ?

- a)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$                       b)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Cl}$   
c)  $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_2\text{Cl}$                       d)  $(\text{CH}_3)_3\text{CCl}$

183. Which one is liquid at room temperature?

- a)  $\text{CH}_3\text{Cl}$                       b)  $\text{C}_2\text{H}_5\text{Cl}$                       c)  $\text{CH}_3\text{Br}$                       d)  $\text{C}_2\text{H}_5\text{Br}$

184. The organic chloro compound, which shows complete stereochemical inversion during an  $\text{S}_\text{N}2$  reaction is

- a)  $(\text{C}_2\text{H}_5)_2\text{CHCl}$                       b)  $(\text{CH}_3)_3\text{CCl}$                       c)  $(\text{CH}_3)_2\text{CHCl}$                       d)  $\text{CH}_3\text{Cl}$

185. The best method for the conversion of an alcohol into an alkyl chloride is by treating the alcohol with

- a)  $\text{PCl}_3$                       b)  $\text{PCl}_5$   
c)  $\text{SOCl}_2$  in presence of pyridine                      d) dry HCl in the presence of anhydrous  $\text{ZnCl}_2$

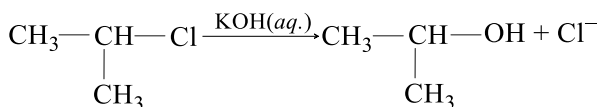
186. Which compound is used in cooling?

- a)  $\text{CHCl}_3$                       b)  $\text{CCl}_4$                       c)  $\text{CF}_4$                       d)  $\text{CCl}_2\text{F}_2$

187. Which is finally produced when acetylene reacts with HCl?

- a)  $\text{CH}_2=\text{CHCl}$                       b)  $\text{CH}_3\text{CHCl}_2$                       c)  $\text{ClCH}=\text{CHCl}$                       d) None of these

188. The reaction,

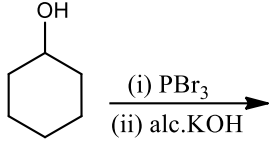

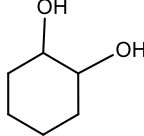
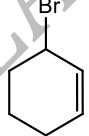

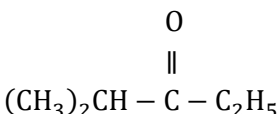
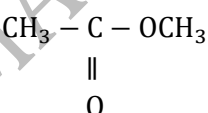


shows:

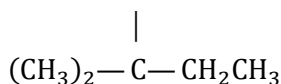
- Reduction
  - Oxidation
  - Neutralisation
  - Nucleophilic substitution
189. Which of the following alkyl halide is used as methylating agent?
- C<sub>2</sub>H<sub>5</sub>Cl
  - C<sub>2</sub>H<sub>5</sub>Br
  - C<sub>2</sub>H<sub>5</sub>I
  - CH<sub>3</sub>I
190. The products of reaction of alcoholic silver nitrite with ethyl bromide are:
- Ethane
  - Ethene
  - Ethyl alcohol
  - Nitroethane
191. Which is most reactive for S<sub>N</sub>2 reactions?
- CH<sub>3</sub>I
  - C<sub>2</sub>H<sub>5</sub>I
  - C<sub>3</sub>H<sub>7</sub>I
  - C<sub>4</sub>H<sub>9</sub>I
192. The product obtained on treatment of ethyl chloride with potassium cyanide is reduced by sodium and alcohol to give:
- Propyl amine
  - Ethyl amine
  - Diethyl amine
  - Acetic acid
193. The molecular formula of the chlorinated acetone formed in the distillation of acetone with bleaching powder is:
- CH<sub>3</sub>COCl
  - CCl<sub>2</sub>OCl<sub>3</sub>
  - CH<sub>2</sub>ClCOOH
  - CCl<sub>3</sub>COCH<sub>3</sub>
194. Compound 'A' reacts with alcoholic KOH to yield compound 'B' which on ozonolysis followed by reaction with Zn/H<sub>2</sub>O gives methanal and propanal. Compound 'A' is
- 1-propanol
  - 1-butanol
  - 1-chlorobutane
  - 1-chloropentane
195. Phenol is heated with CHCl<sub>3</sub> and alcoholic KOH when salicylaldehyde is produced. The reaction is known as:
- Rosenmund's reaction
  - Reimer-Tiemann reaction
  - Friedel-Craft's reaction
  - Sommelet reaction
196. Which of the following can be used as local anaesthetic?
- CHCl<sub>3</sub>
  - C<sub>2</sub>H<sub>4</sub> with O<sub>2</sub>
  - C<sub>2</sub>H<sub>5</sub>Cl
  - C<sub>2</sub>H<sub>5</sub>OH
197. Which of the following is not inflammable?
- CHCl<sub>3</sub>
  - Benzene
  - Toluene
  - Carbon tetrachloride
198. Which of the following does not answer iodoform test?
- N*-butyl alcohol
  - Sec*-butyl alcohol
  - Acetophenone
  - Acetaldehyde
199. Grignard reagent is not prepared in aqueous medium but prepared in ether medium, because
- the reagent is highly reactive in ether
  - the reagent does not react with water
  - the reagent becomes inactive in water
  - the reagent reacts with water
200. The reaction in which phenol differs from alcohol is
- It undergoes esterification with carboxylic acid
  - It reacts with ammonia
  - It forms yellow crystals of iodoform
  - It liberates H<sub>2</sub> with Na metal
201. Which compound is used as helminthicide for elimination of hook worms?
- CH<sub>4</sub>
  - CHCl<sub>3</sub>
  - C<sub>2</sub>H<sub>2</sub>Cl<sub>4</sub>
  - CCl<sub>4</sub>
202. In the preparation of chlorobenzene from aniline, the most suitable reagent is
- Chlorine in the presence of ultraviolet light
  - Chlorine in the presence of AlCl<sub>3</sub>
  - Nitrous acid followed by heating with Cu<sub>2</sub>Cl<sub>2</sub>
  - HCl and Cu<sub>2</sub>Cl<sub>2</sub>
203. Methyl magnesium iodide on treatment with D<sub>2</sub>O furnishes a hydrocarbon, alongwith Mg(OD)I. The hydrocarbon is:
- CH<sub>3</sub>D
  - CH<sub>3</sub>CH<sub>2</sub>D
  - CH<sub>4</sub>
  - None of these
204. A Grignard reagent is prepared by reacting magnesium with:

- a) Methyl amine                      b) Diethyl ether                      c) Ethyl iodide                      d) Ethyl alcohol
205. Identify *A* and *B* in the following reaction
- $$\text{C}_2\text{H}_5\text{Cl} \xrightarrow{\text{A}} \text{C}_2\text{H}_5\text{OH} \xleftarrow{\text{B}} \text{C}_2\text{H}_5\text{Cl}$$
- a) *A*= aqueous KOH; *B*= AgOH                      b) *A*= alcoholic KOH/ Δ; *B*=aqueous NaOH  
c) *A*= aqueous NaOH; *B*= AgNO<sub>2</sub>                      d) *A* = AgNO<sub>2</sub>; *B* = KNO<sub>2</sub>
206. A yellow precipitate is obtained when aqueous AgNO<sub>3</sub> is added to a solution of the compound:
- a) CCl<sub>3</sub>CHO                      b) CHI<sub>3</sub>                      c) CHCl<sub>3</sub>                      d) C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>Cl
207. Which statement is correct?
- a) C<sub>2</sub>H<sub>5</sub>Br reacts with alcoholic KOH to form C<sub>2</sub>H<sub>5</sub>OH  
b) C<sub>2</sub>H<sub>5</sub>Br when treated with metallic sodium gives ethane  
c) C<sub>2</sub>H<sub>5</sub>Br when treated with sodium ethoxide forms diethyl ether  
d) C<sub>2</sub>H<sub>5</sub>Br with AgCN forms ethyl cyanide
208. Phosgene is a common name for:
- a) CO<sub>2</sub> and PH<sub>3</sub>                      b) Phosphoryl chloride                      c) Carbonyl chloride                      d) Carbon tetrachloride
209. The alkyl halide which does not give white precipitate with alcoholic AgNO<sub>3</sub> solution is:
- a) Ethyl chloride                      b) Allyl chloride                      c) Isopropyl chloride                      d) Vinyl chloride
210. An alkyl halide reacts with equivalent amount of NH<sub>3</sub> to give:
- a) Amide                      b) Cyanide                      c) Amine                      d) None of these
211. The combination which produces *t*-butyl alcohol when treated with Grignard reagent:
- a) CH<sub>3</sub>MgBr + CH<sub>3</sub>COCH<sub>3</sub>  
b) C<sub>2</sub>H<sub>5</sub>MgBr + CH<sub>3</sub>COCH<sub>3</sub>  
c) CH<sub>3</sub>MgBr + (CH<sub>3</sub>)<sub>2</sub>CHOH  
d) CH<sub>3</sub>MgBr + (CH<sub>3</sub>)<sub>3</sub>COH
212. Methyl chloride on treatment with potassium cyanide followed by hydrolysis yields:
- a) HCOOH                      b) CH<sub>3</sub>COOH                      c) CH<sub>3</sub>CN                      d) CH<sub>3</sub>COOK
213. 9.65 C of electric current is passed through fused anhydrous magnesium chloride. The magnesium metal thus, obtained is completely converted into a Grignard reagent. The number of moles of the Grignard reagent obtained is
- a) 5 × 10<sup>-4</sup>                      b) 1 × 10<sup>-4</sup>                      c) 5 × 10<sup>-5</sup>                      d) 1 × 10<sup>-5</sup>
214. A bromoalkane 'X' reacts with magnesium in dry ether to form compound 'Y'. The reaction of 'Y' with methanal followed by hydrolysis yield an alcohol having molecular formula C<sub>4</sub>H<sub>10</sub>O. The compound 'X' is
- a) Bromoethane                      b) Bromomethane                      c) 1-bromopropane                      d) 2-bromopropane
215.  $\text{C}_2\text{H}_5\text{Br} \xrightarrow{\text{KCN}} (\text{A}) \xrightarrow{\text{Hydrolysis}} (\text{B})$   
The compound (*B*) in above reaction is:
- a) Ethylene chloride                      b) Acetic acid                      c) Propionic acid                      d) Ethyl cyanide
216. A salt solution is treated with chloroform drops and is shaken with chlorine water. Chloroform layer becomes violet, solution contains:
- a) NO<sub>2</sub><sup>-</sup>                      b) NO<sub>3</sub><sup>-</sup>                      c) Br<sup>-</sup>                      d) I<sup>-</sup>
217. Which of the following is least reactive in a nucleophilic substitution reaction?
- a) (CH<sub>3</sub>)<sub>3</sub>CCl                      b) CH<sub>2</sub>=CHCl                      c) CH<sub>3</sub>CH<sub>2</sub>Cl                      d) CH<sub>2</sub>=CHCH<sub>2</sub>Cl
218. Ethylidene dichloride (CH<sub>3</sub>CHCl<sub>2</sub>) can be prepared by the addition of hydrogen chloride on:
- a) C<sub>2</sub>H<sub>6</sub>                      b) C<sub>2</sub>H<sub>4</sub>                      c) C<sub>2</sub>H<sub>2</sub>                      d) All of these
219. Which of the following statements is true?
- a) Allyl chloride is more reactive than vinyl chloride  
b) Vinyl chloride is as reactive as allyl chloride  
c) Vinyl chloride is more reactive than allyl chloride  
d) Both of them are more reactive than chlorobenzene
220. An alkyl halide (RX) reacts with Na to form 4, 5-diethyloctane. Compound RX is
- a) CH<sub>3</sub> (CH<sub>2</sub>)<sub>3</sub> Br                      b) CH<sub>3</sub> (CH<sub>2</sub>)<sub>2</sub> CH(Br)CH<sub>2</sub>CH<sub>3</sub>  
c) CH<sub>3</sub> (CH<sub>2</sub>)<sub>3</sub> CH(Br)CH<sub>3</sub>                      d) CH<sub>3</sub>(CH<sub>2</sub>)<sub>5</sub> Br



221.  $\text{PCl}_5$  reacts with propanone, to give:
- a) Gem dichloride      b) Vic dichloride      c) Propanal      d) Propane chloride
222. Which is not present in Grignard reagent?
- a) Carboxylic radical represented by  $\text{COOH}$   
 b) Magnesium represented by  $\text{Mg}$   
 c) Alkyl radical represented by  $R$   
 d) Halide radical represented by  $X$
223. Alkyl iodide reacts with  $\text{NaCN}$  to give alkyl cyanide and small amount of alkyl isocyanide. Formation of these two products is due to the
- a) ionic character of  $\text{NaCN}$       b) nucleophilic character of  $\text{CN}^-$   
 c) ambidentate character of  $\text{CN}^-$       d) Electrophilic character of  $\text{CN}^-$
224. Which of the following gives iodoform test?
- a)  $\text{CH}_3 - \text{CH}_2 (\text{OH})$   
 b)  $\text{C}_2\text{H}_5\text{CHO}$   
 c)  $(\text{CH}_2\text{OH})_2$   
 d) None of the above
225.  $\text{C}_2\text{H}_5 \text{Br}$  can be obtained in the laboratory by the action of ethyl alcohol with:
- a)  $\text{KBr}$       b)  $\text{NH}_4\text{Br}$       c)  $\text{Br}_2$       d)  $\text{KBr}$  and conc.  $\text{H}_2\text{SO}_4$
226. Predict the product,
- 
- a)       b)       c)       d) 
227. Trichloro acetone reacts with lime water to form:
- a)  $\text{CH}_3\text{CHO}$       b)  $\text{CHCl}_3$       c)  $\text{CH}_3\text{Cl}$       d)  $\text{CH}_3\text{OH}$
228. When 32.25 g of ethyl chloride is subjected to dehydrohalogenation reaction the yield of the alkene formed is 50%. The mass of the product formed is (atomic mass of chlorine is 35.5)
- a) 14 g      b) 28 g      c) 64.5 g      d) 7 g
229. Which one of the following possess highest m.pt. ?
- a) Chlorobenzene      b) *o*-dichlorobenzene      c) *m*-dichlorobenzene      d) *p*-dichlorobenzene
230. Which of the compounds when brominated turns to *meso* 2, 3-dibromobutane?
- a) *Cis*-2-butene      b) *Iso*-butane      c) Butane      d) *Trans*-2-butene
231. Iodoform can be obtained on warming  $\text{NaOH}$  and iodine with
- a)  $\text{CH}_3 - \text{CH}_2 - \text{CH}(\text{OH})\text{CH}_3$       b)   
 c)       d)  $(\text{CH}_3)_3 \text{CCH}_2\text{OH}$
232. 1-chlorobutane on reaction with alcoholic potash gives
- a) 1-butene      b) 1-butanol      c) 2-butene      d) 2-butanol
233.  $\text{S}_{\text{N}}1$  reaction is favoured by:
- a) Non-polar solvents  
 b) More no. of alkyl group on the carbon atom attached to the halogen atom  
 c) Small groups on the carbon attached to the halogen atom  
 d) None of the above
234. What mass of isobutylene is obtained from 37 g of tertiary butyl alcohol by heating with 20%  $\text{H}_2\text{SO}_4$  at

- 363 K, if the yield is 65%?
- a) 16 g                      b) 18.2 g                      c) 20 g                      d) 22 g
235. Tertiary alkyl halides are practically inert to substitution by  $S_N2$  mechanism because of
- a) Steric hindrance              b) Inductive effect              c) Instability              d) Insolubility
236. Identify the set of reagents/reaction conditions 'X' and 'Y' in the following set of transformations:
- $$\text{CH}_3\text{CH}_2\text{CH}_2\text{Br} \xrightarrow{\text{'X'}} \text{Product} \xrightarrow{\text{'Y'}} (\text{CH}_3)_2\text{CHBr}$$
- a) X = dilute NaOH aq.; 20°C  
Y = HBr/acetic acid; 20°C
- b) X = conc., alc. NaOH; 80°C  
Y = HBr/acetic acid; 20°C
- c) X = dilute aqueous NaOH; 20°C  
Y = Br<sub>2</sub>/CHCl<sub>3</sub>; 0°C
- d) X = conc., alc. NaOH; 80°C  
Y = Br<sub>2</sub>/CHCl<sub>3</sub>; 0°C
237. In the dichlorination reaction of propane, mixture of products are obtained. How many isomers the mixture contains?
- a) 2                      b) 3                      c) 4                      d) 5
238. The number of stereoisomers of compound  $\text{CH}_3-\text{CH}=\text{CH}-\text{CHBr}-\text{CH}_3$  would be:
- a) 3                      b) 6                      c) 2                      d) 4
239. The industrial preparation of chloroform employs acetone and:
- a) Sodium chloride              b) Chlorine gas              c) Calcium hypochlorite              d) Phosgene
240.  $\text{RX} + \text{A} \rightarrow \text{RNC}$   
A is
- a) AgCN                      b) KCN                      c) NaCN                      d) HCN
241. On mixing a certain alkane with chlorine and irradiating it with ultraviolet light, it forms only one monochloroalkane.
- a) Propane                      b) Pentane                      c) *Iso*-pentane                      d) *Neo*-pentane
242. Formation of alkane by the action of Zn on alkyl halide is called:
- a) Wurtz reaction              b) Kolbe's reaction              c) Cannizzaro's reaction              d) Frankland's reaction
243. Chloroform used as a drug is prepared by the reaction of acetone with:
- a) Chlorine                      b) Ethyl chloride                      c) Chloroform                      d) Ethylene dichloride
244. Which is gem dihalide?
- a)  $\text{CH}_3 \cdot \text{CHBr}_2$                       b)  $\text{CH}_2\text{Br} \cdot \text{CH}_2\text{Br}$                       c)  $\text{CH}_3 \cdot \text{CHBr} \cdot \text{CH}_2\text{Br}$                       d) None of these
245. Which of the following is a Grignard reagent?
- a) Ammoniacal solution of AgNO<sub>3</sub>  
b) Ethereal solution of C<sub>2</sub>H<sub>5</sub>MgCl  
c) Alcoholic solution of KOH  
d) Aqueous solution of caustic soda
246. The product formed on reaction of ethyl alcohol with bleaching powder is
- a) CHCl<sub>3</sub>                      b) CCl<sub>3</sub>CHO                      c) CH<sub>3</sub>COCH<sub>3</sub>                      d) CH<sub>3</sub>CHO
247. Chloral is:
- a) CCl<sub>3</sub>CHO                      b) CCl<sub>3</sub> · CO · CH<sub>3</sub>                      c) CCl<sub>3</sub> · CO · CCl<sub>3</sub>                      d) CCl<sub>3</sub> · CH<sub>2</sub>OH
248. Which of the following compounds undergo E<sub>2</sub> reactions more easily?
- a) 
$$\begin{array}{c} (\text{CH}_3)_2\text{C} \cdot \text{CH}_2\text{CH}_3 \\ | \\ \text{Br} \end{array}$$
- b) CH<sub>3</sub>(CH<sub>2</sub>)<sub>2</sub>CH<sub>2</sub>Cl  
c) CH<sub>3</sub>(CH<sub>2</sub>)<sub>2</sub>CH<sub>2</sub>I  
d) 
$$\begin{array}{c} \text{I} \end{array}$$



249. Decomposition of benzene diazonium chloride by using  $\text{Cu}_2\text{Cl}_2/\text{HCl}$  to form chlorobenzene is

- a) Raschig's reaction                      b) Sandmeyer's reaction  
c) Kolbe's reaction                         d) Cannizaro's reaction

250. Isobutyl chloride and butyl chloride are:

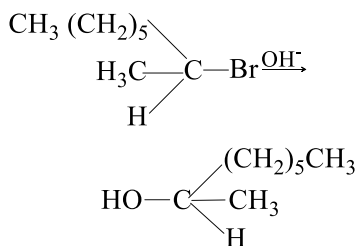
- a) Position isomers                      b) Chain isomers                      c) Functional isomers                      d) Metamers

251.  $\text{CH}_3\text{Br} + \text{Nu}^- \rightarrow \text{CH}_3 - \text{Nu} + \text{Br}^-$

The decreasing order of the rate of the above reaction with nucleophiles ( $\text{Nu}^-$ ) A to D is [ $\text{Nu}^- = (\text{A})\text{PhO}^-$ ,  $(\text{B})\text{AcO}^-$ ,  $(\text{C})\text{HO}^-$ ,  $(\text{D})\text{CH}_3\text{O}^-$ ]

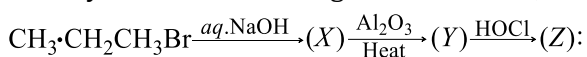
- a)  $D > C > A < B$                       b)  $D > C > B > A$                       c)  $A > B > C > D$                       d)  $B > D > C > A$

252. The reaction described below is:

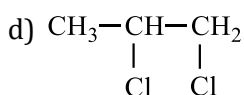
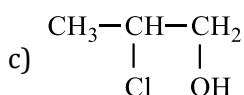
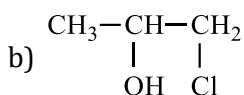
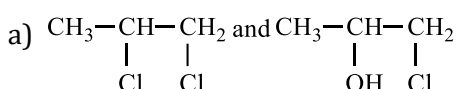


- a)  $\text{S}_{\text{E}}1$                                       b)  $\text{S}_{\text{N}}2$                                       c)  $\text{S}_{\text{N}}1$                                       d)  $\text{S}_{\text{E}}2$

253. Identify 'Z' in the following reaction series,



Mixture of



254. Which of the following when heated with KOH and primary amine gives carbylamine test?

- a)  $\text{CHCl}_3$                                       b)  $\text{CH}_2\text{Cl}_2$                                       c)  $\text{CH}_3\text{OH}$                                       d)  $\text{CCl}_4$

255. The reagent used for dehalogenation of 1,2-dichloropropane is:

- a) Zn dust                                      b) Zn—Hg                                      c) Na                                      d) Zn—Cu couple

256.  $\text{CH}_3\text{NH}_2$  reacts with  $\text{CH}_3\text{MgX}$  to give:

- a) Acetone                                      b) Alcohol                                      c) Methane                                      d) Ethane

257. Which of the following haloalkanes is most reactive?

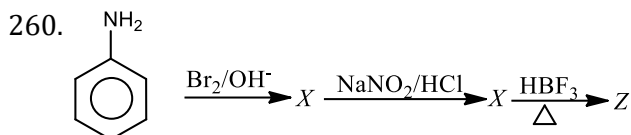
- a) 1-chloropropane                      b) 1-bromopropane                      c) 2-chloropropane                      d) 2-bromopropane

258. Iodoform is formed when ethanol is heated with:

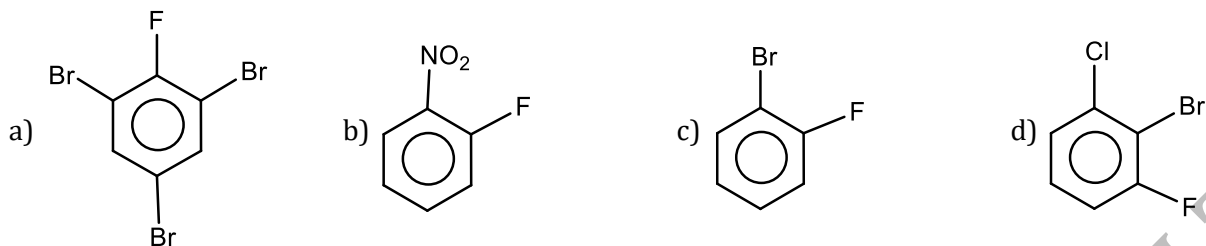
- a) Potassium iodide and sodium hydroxide  
b) Iodine and aqueous potassium hydroxide  
c) Chloroform and iodine  
d) Iodine and potassium iodide

259. Tertiary alkyl halides are practically inert to  $\text{S}_{\text{N}}2$  mechanism because of:

- a) Insolubility                                      b) Instability                                      c) Inductive effect                                      d) Steric hinderance



The final product, is



261. Carbon tetrachloride on treatment with Fe/H<sub>2</sub>O gives:

- a) Chloromethane      b) Methane      c) Chloroform      d) Methylene chloride

262. Which group is displaced by a halogen group?

- a) Hydroxyl (OH) group  
b) Aldehyde (—CHO) group  
c) Nitro (—NO<sub>2</sub>) group  
d) Keto (C=O) group

263. A small amount of alcohol is usually added to CHCl<sub>3</sub> bottles because:

- a) It retards the anaesthetic property of CHCl<sub>3</sub>  
b) It retards the oxidation of CHCl<sub>3</sub> to phosgene  
c) It converts any phosgene formed to harmless ethyl carbonate  
d) Both (b) and (c)

264. Which one is correct?

- a) Freon-14 is CF<sub>4</sub>; Freon-13 is CF<sub>3</sub>Cl; Freon-12 is CF<sub>2</sub>Cl<sub>2</sub> and Freon-11 is CFCl<sub>3</sub>  
b) Freons are chlorofluorocarbons  
c) Freons are used as refrigerants  
d) All of the above

265. The reactivity order of alkyl halides depends upon:

- a) Nature of alkyl group only  
b) Nature of halogen atom only  
c) Nature of both alkyl group and halogen atom  
d) None of the above

266. *p*-nitrobromobenzene can be converted to *p*-nitroaniline by using NaNH<sub>2</sub>. The reaction proceeds through the intermediate named

- a) Carbocation      b) Carbanion      c) Benzyne      d) Dianion

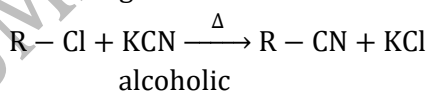
267. Reagent not used to prepare an alkyl halide from an alcohol is:

- a) HCl + ZnCl<sub>2</sub>      b) NaCl      c) PCl<sub>5</sub>      d) SOCl<sub>2</sub>

268. The catalyst used in the preparation of an alkyl chloride by the action of dry HCl on an alcohol is

- a) anhy. AlCl<sub>3</sub>      b) FeCl<sub>3</sub>      c) anhy. ZnCl<sub>2</sub>      d) Cu

269. Following is the substitution reaction in which —CN replaces —Cl.



To obtain propanenitrile, R — Cl should be

- a) Chloroethane      b) 1-chloropropane      c) Chloromethane      d) 2-chloropropane

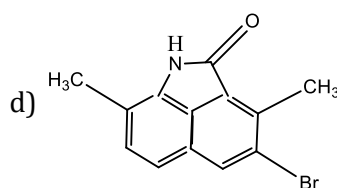
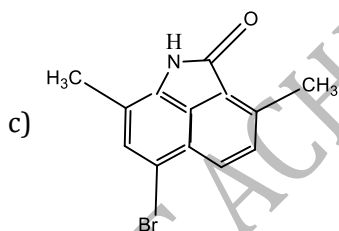
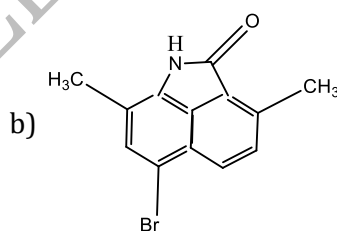
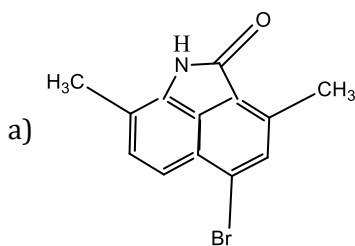
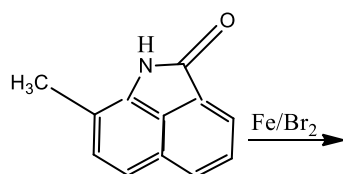
270. CH<sub>3</sub>Br + OH<sup>−</sup> → CH<sub>3</sub>OH + Br<sup>−</sup> reaction proceeds by S<sub>N</sub>2 mechanism. Its rate is dependent on the concentration of

- a) CH<sub>3</sub>Br, OH<sup>−</sup>      b) CH<sub>3</sub>Br only      c) OH<sup>−</sup> only      d) CH<sub>3</sub>Br, CH<sub>3</sub>OH

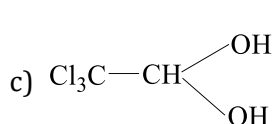
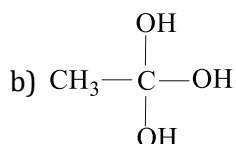
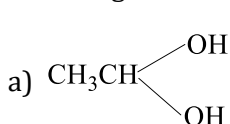
271. If chloroform is left open in air in presence of sun-rays:

- a) Explosion takes place

- b) Poisonous phosgene gas is formed  
 c) Polymerization takes place  
 d) No reaction takes place
272. Westrosol is:  
 a) Acetylene tetrachloride  
 b) Acetylene dichloride  
 c) Trichloroethyne  
 d) 1,1,2-trichloroethene
273. The compound formed on heating chlorobenzene with chloral in the presence of concentrated sulphuric acid is  
 a) Gammexane                      b) DDT                      c) Freon                      d) Hexachloroethane
274. The C—Mg bond in  $\text{CH}_3\text{CH}_2\text{MgBr}$  is:  
 a) Ionic                      b) Non-polar covalent                      c) Polar covalent                      d) Hydrogen
275. In  $\text{S}_{\text{N}}1$  reaction, the first step involves the formation of:  
 a) Free radical                      b) Carbanion                      c) Carbocation                      d) Final product
276. The alkyl group of Grignard reagent acts as:  
 a) Free radical                      b) Carbonium ion                      c) Carbanion                      d) None of these
277. Methyl ketone is identified by  
 a) Iodoform test                      b) Fehling solution                      c) Tollen's reagent                      d) Schiff's reagent
278. Product on monobromination of this compound is



279. Which of the following is added to chloroform to slow down its aerial oxidation in presence of light?  
 a) Carbonyl chloride                      b) Ethyl alcohol                      c) Sodium hydroxide                      d) Nitric acid
280. When a solution of  $\text{AgNO}_3$  is added to pure  $\text{CCl}_4$ :  
 a) A pale yellow precipitate is formed  
 b) Curdy white precipitate is formed  
 c) No precipitate is formed  
 d) None of the above
281. A compound containing two —OH groups attached with one carbon atom is unstable but which one of the following is stable?



d) None of these

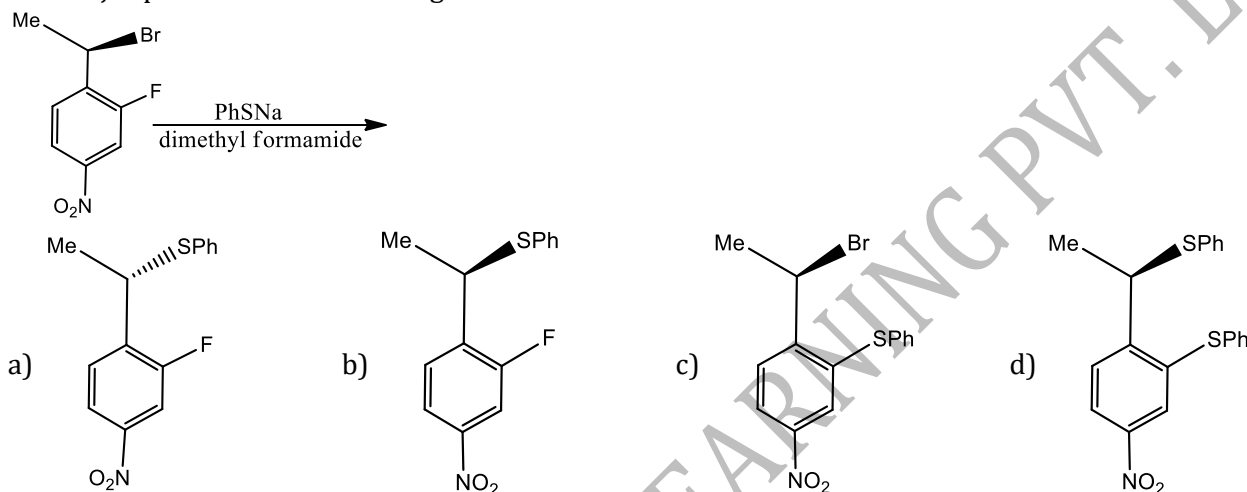
282. Westron is:

- a)  $\text{CHCl}=\text{CHCl}$       b)  $\text{CHCl}_2 \cdot \text{CHCl}_2$       c)  $\text{CH}_2\text{Cl}-\text{CH}_2\text{Cl}$       d) None of these
283. Monohalogen derivative of alkanes with alcoholic KOH gives:
- a) Alkane  
b) Alkene  
c) Alkyne  
d) Alicyclic hydrocarbon

284. The reaction  $\text{RCl} + \text{NaI} \xrightarrow{\text{Acetone}} \text{R}-\text{I} + \text{NaCl}$  is known as:
- a) Wurtz reaction      b) Fittig reaction      c) Frankland's reaction      d) Finkelstein's reaction

285. The hydrogen atom in chloroform is:
- a) Acidic      b) Basic      c) Neutral      d) None of these

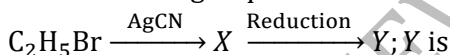
286. The major product of the following reaction is



287. Ethyl bromide and isopropyl chloride can be distinguished by:

- a) Alcoholic  $\text{AgNO}_3$   
b) Comparing their colours  
c) Burning the compound on spatula  
d) Aqueous KOH solution

288. In the following sequence of reactions



- a) *n*-propyl amine      b) Isopropylamine      c) Ethylamine      d) ethylmethyl amine

289. Which alkyl halide is preferentially hydrolysed by  $\text{S}_{\text{N}}1$  mechanism?

- a)  $\text{CH}_3\text{Cl}$       b)  $\text{CH}_3\text{CH}_2\text{Cl}$       c)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$       d)  $(\text{CH}_3)_2\text{C} \cdot \text{Cl}$

290. Treatment of ammonia with excess of ethyl chloride will yield:

- a) Diethyl amine  
b) Ethane  
c) Tetraethyl ammonium chloride  
d) Methyl amine

291. In a group of isomeric alkyl halides, the order of boiling points is

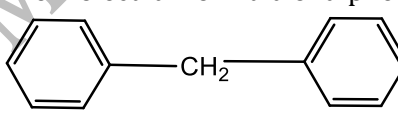
- a) primary < secondary < tertiary      b) primary > secondary < tertiary  
c) primary < secondary > tertiary      d) primary > secondary > tertiary

292. Ethylene dichloride and ethylidene chloride are isomeric compounds. Identify the statement which is not applicable to both of them?

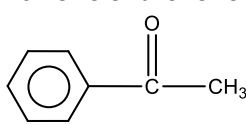
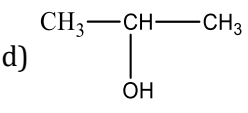
- a) React with alcoholic potash  
b) React with aqueous potash and give the same products  
c) Are dihalides  
d) Answer Beilstein's test

293. The  $\text{Mg}-\text{Br}$  bond in  $\text{CH}_3\text{CH}_2\text{MgBr}$  is:

- a) Ionic      b) Non-polar      c) Covalent      d) None of these

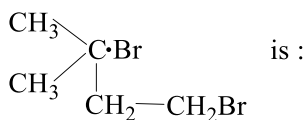
294. Chloroform is slowly oxidised by air in the presence of light and air to form  
 a) Formyl chloride      b) Trichloro methanol      c) Phosgene      d) Formaldehyde
295. Among the following the one that gives positive iodoform test upon reaction with  $I_2$  and  $NaOH$  is:  
 a)  $CH_3CH_2CH(OH)CH_2CH_3$   
 b)  $C_6H_5CH_2CH_2OH$   
 c)  $\begin{array}{c} CH_3 \\ | \\ CH_3-CHCH_2OH \end{array}$   
 d)  $PhCHOHCH_3$
296. 2-bromopentane is heated with potassium ethoxide in ethanol. The major product is:  
 a) *trans*-pent-2-ene      b) 2-ethoxy pentane      c) pent-1-ene      d) *cis*-pent-2-ene
297. Bottles containing  $C_6H_5I$  and  $C_6H_5CH_2I$  lost their original labels. They were labelled *A* and *B* for testing. *A* and *B* were separately taken in a test tube and boiled with  $NaOH$  solution. The end solution in each tube was made acidic with dilute  $HNO_3$  and then some  $AgNO_3$  solution was added. Substance *B* gave a yellow precipitate. Which one of the following statements is true for this experiment?  
 a) *A* was  $C_6H_5I$       b) *A* was  $C_6H_5CH_2I$   
 c) *B* was  $C_6H_5I$       d) Addition of  $HNO_3$  was unnecessary
298.  $2CHCl_3 + O_2 \xrightarrow{X} 2COCl_2 + 2HCl$   
 In the above reaction *X* stands for:  
 a) An oxidant      b) A reductant      c) Light and air      d) None of these
299. Identify the product (*A*) in following reaction series,  
 $CH_3CN \xrightarrow{Na/C_2H_5OH} (X) \xrightarrow{HNO_2} (Y) \xrightarrow{[O]} (Z) \xrightarrow{\text{Tollen's reagent}} (A)$   
 a)  $CH_3CHO$       b)  $CH_3CONH_2$       c)  $CH_3COOH$       d)  $CH_3-CH_2-NHOH$
300. Isocyanide test is used to detect:  
 a) Primary alcohols      b) Primary amines      c) Secondary amines      d) Secondary alcohols
301. Which would be obtained by boiling  $CHCl_3$  with caustic soda?  
 a)  $CH_3COONa$       b)  $HCOONa$       c)  $Na_2C_2O_4$       d)  $CH_3OH$
302. In the following sequences of reactions:  
 $CH_3CH_2CH_2I \xrightarrow{KOH(alc.)} (A) \xrightarrow{Br_2} (B) \xrightarrow{NaNH_2/NH_3} (C)$   
 the end product (*C*) is:  
 a) Alkene      b) Alkanol      c) Alkyne      d) Alkyl amine
303. Which of the following compound give yellow precipitate with  $I_2$  and  $NaOH$ ?  
 a)  $CH_3OH$       b)  $CH_3CH_2CH_2OH$       c)  $C_2H_5OC_2H_5$       d)  $CH_3CH_2OH$
304. In the reaction of phenol with  $CHCl_3$  and aqueous  $NaOH$  at  $70^\circ C$ , the electrophile attacking the ring is:  
 a)  $CHCl_3$       b)  $CHCl_2$       c)  $CCl_2$       d)  $COCl_2$
305. The product formed in the reaction of  $HX$  with  $(CH_3)_2C=CH_2$  is:  
 a)  $(CH_3)_2CXCH_3$       b)  $(CH_3)_2CH \cdot CH_2X$       c)  $(CH_3)_2CHCH_3$       d)  $(CH_3)_2CXCH_2X$
306. The molecular formula of diphenyl methane is  
 is  $C_{13}H_{12}$   
 How many structural isomers are possible when one of the hydrogen is replaced by a chlorine atom?  
 a) 6      b) 4      c) 8      d) 7
307. For the preparation of *p*-nitroiodobenzene from *p*-nitroaniline, the best method is  
 a)  $NaNO_2/HCl$  followed by  $KI$       b)  $NaNO_2/HCl$  followed by  $CuCN$   
 c)  $LiAlH_4$  followed by  $I_2$       d)  $NaBH_4$  followed by  $I_2$
308. Iodoform test is not given by  
 a)  $HCHO$       b)  $CH_3CHO$       c)  $CH_3COCH_3$       d)  $C_2H_5OH$

309. Fires result from the combustion of alkali metals can be extinguished by:  
 a)  $\text{CCl}_4$                                   b) Sand                                  c) Water                                  d) Kerosene
310. The reactivities of methyl chloride ( $A$ ) propyl chloride ( $B$ ) and chlorobenzene ( $C$ ) are in the order :  
 a)  $A > B > C$                                   b)  $C > B > A$                                   c)  $A > C > B$                                   d)  $B > A > C$
311. A sample of chloroform before being used as an anaesthetic is tested by:  
 a)  $\text{AgNO}_3$  solution  
 b)  $\text{AgNO}_3$  solution after boiling with alc. KOH  
 c) Fehling's solution  
 d) Ammoniacal  $\text{Cu}_2\text{Cl}_2$
312. Ethylene dichloride can be prepared by adding HCl to:  
 a) Ethane                                  b) Ethylene                                  c) Acetylene                                  d) Ethylene glycol
313. Which of the following can be obtained by halide exchange method?  
 a)  $\text{CH}_3\text{Cl}$                                   b)  $\text{C}_2\text{H}_5\text{Cl}$                                   c)  $\text{CH}_3\text{I}$                                   d)  $\text{CH}_3\text{Br}$
314. Grignard reagent undergoes:  
 a) Nucleophilic substitution  
 b) Nucleophilic addition  
 c) Both (a) and (b)  
 d) None of the above
315. Ethylene on treatment with chlorine gives:  
 a) Ethylene dichloride  
 b) Ethylene chlorohydrin  
 c)  $\text{CH}_4$   
 d)  $\text{C}_2\text{H}_6$
316. Ethylidene dichloride on treatment with aq. KOH gives:  
 a)  $\text{CH}_3\text{CHO}$                                   b)  $\begin{array}{c} \text{CH}_2\text{OH} \\ | \\ \text{CH}_2\text{OH} \end{array}$                                   c)  $\text{HCHO}$                                   d)  $\begin{array}{c} \text{CHO} \\ | \\ \text{CHO} \end{array}$
317. The bad smelling substance formed by the action of alcoholic caustic potash on chloroform and aniline is:  
 a) Phenyl isocyanide                                  b) Nitrobenzene                                  c) Acetylene                                  d) Chlorobenzene
318. In the reaction,  

$$2A + \text{dry oxide} \xrightarrow{\Delta} \text{ether} + 2\text{AgX}$$
 A is a/an  
 a) Primary alcohol                                  b) Acid                                  c) Alkyl halide                                  d) Alcohol
319. Ethyl alcohol is used as a preservative for chloroform because it  
 a) Prevents aerial oxidation of chloroform                                  b) Prevents decomposition of chloroform  
 c) Decomposes phosgene to  $\text{CO}$  and  $\text{Cl}_2$                                   d) Removes phosgene by converting it to ethyl carbonate
320. Anhydrous HCl gas, on passing through ethyl alcohol, in presence of anhy.  $\text{ZnCl}_2$  gives:  
 a) Ethane                                  b) Ethyl chloride                                  c) Ethene                                  d)  $\text{CCl}_4$
321. Which one of the isomers of cyclohexane hexachloride is strong pesticide?  
 a)  $\alpha$                                   b)  $\beta$                                   c)  $\gamma$                                   d)  $\delta$
322. Which one of the following does not give iodoform?  
 a)                                   b)  $\text{CH}_3\text{OH}$   
 c)  $\text{CH}_3\text{CH}_2\text{OH}$                                   d) 

323. The IUPAC name of the compound ,





- a) 1,3-dibromo-3-methylbutane  
 b) 3-methyl-1,2-bromobutane  
 c) 3-methyl-1,3-bromopropane  
 d) None of the above
324. Ethyl iodide on treatment with alcoholic potash gives:  
 a) Ethyl alcohol                      b) Ethane                      c) Acetylene                      d) Ethylene
325. Chloroform is used as an:  
 a) Antiseptic                      b) Anaesthetic                      c) Insecticide                      d) Antipyretic
326. Chlorination of toluene in presence of light and heat followed by treatment with aqueous NaOH gives  
 a) *o*-cresol                      b) *p*-cresol  
 c) mixture of *o*-cresol and *p*-cresol                      d) 1, 3, 5-trihydroxy toluene
327. 1, 2-dibromoethane reacts with alcoholic KOH to yield a product *X*. The hybridisation state of the carbons present in *X* respectively, are  
 a) *sp*, *sp*                      b) *sp*<sup>3</sup>, *sp*<sup>3</sup>                      c) *sp*<sup>3</sup>, *sp*<sup>2</sup>                      d) *sp*<sup>3</sup>, *sp*<sup>2</sup>
328. The phosphorus pentachloride reacts with ethanol to give:  
 a) Ethyl chloride                      b) Ethylene chloride                      c) Ethylidene chloride                      d) None of these
329. Elimination of bromine from 2-bromobutane results in the formation of  
 a) Predominantly 2-butyne                      b) Predominantly 1-butene  
 c) Predominantly 2-butene                      d) Equimolar mixture of 1 and 2-butene
330. The compound formed in carbylamine test is:  
 a) C<sub>6</sub>H<sub>5</sub>—C≡N                      b) C<sub>6</sub>H<sub>5</sub>—N≡C                      c) CH<sub>3</sub>—O—C≡N                      d) CH<sub>3</sub>—N=C=O
331. Best method of preparing alkyl chloride is  
 a) ROH + SOCl<sub>2</sub> →                      b) ROH + PCl<sub>5</sub> →  
 c) ROH + PCl<sub>3</sub> →                      d) ROH + HCl  $\xrightarrow{\text{Anhy. ZnCl}_2}$
332. CH<sub>2</sub>=CHCl reacts with HCl to form:  
 a) CH<sub>2</sub>Cl—CH<sub>2</sub>Cl                      b) CH<sub>3</sub>—CHCl<sub>2</sub>                      c) CH<sub>2</sub>=CHCl · HCl                      d) None of these
333. In dihalogen derivatives if two halogen atoms are attached to the same carbon atom, the compound is called:  
 a) Gem dihalide                      b) Vicinal dihalide                      c) Both (a) and (b)                      d) None of these
334. Vapour density of an organic compound is 23.0. It contains 52.17% of carbon and 13% of hydrogen. The compound gives iodoform test. The compound is:  
 a) Ethanol                      b) Dimethyl ether                      c) Acetone                      d) Methanal
335. An alkyl halide reacts with alcoholic ammonia in a sealed tube, the product formed will be  
 a) A primary amine                      b) A secondary amine  
 c) A tertiary amine                      d) A mixture of all the three
336. Chloropicrin is obtained by the reaction of  
 a) Steam on carbon tetrachloride                      b) Nitric acid on chlorobenzene  
 c) Chlorine on picric acid                      d) Nitric acid on chloroform
337. Which of the following solvent may be used instead of ether in the preparation of Grignard reagent?  
 a) THF                      b) C<sub>6</sub>H<sub>5</sub>OCH<sub>3</sub>                      c) C<sub>6</sub>H<sub>5</sub>N(CH<sub>3</sub>)<sub>2</sub>                      d) All are correct
338. Chloroform on reduction with Zn and HCl (alc.) gives:  
 a) Formic acid                      b) Chloroform                      c) Chloropicrin                      d) Methylene dichloride
339. Identify *X* and *Y* in the following sequence  
 C<sub>2</sub>H<sub>5</sub>Br  $\xrightarrow{X}$  product  $\xrightarrow{Y}$  C<sub>3</sub>H<sub>7</sub>NH<sub>2</sub>  
 a) *X* = KCN,                      *Y* = LiAlH<sub>4</sub>                      b) *X* = KCN,                      *Y* = H<sub>3</sub>O<sup>+</sup>  
 c) *X* = CH<sub>3</sub>Cl,                      *Y* = AlCl<sub>3</sub>/HCl                      d) *X* = CH<sub>3</sub>NH<sub>2</sub>,                      *Y* = HNO<sub>2</sub>
340. In alkyl nitrites the oxygen of —O—N=O group is linked with carbon. An alkyl nitrite is:

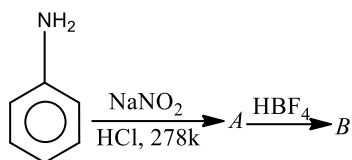
a) An ester

b) A nitro compound

c) An amide

d) A nitrile

341. In the chemical reactions,



The compounds '*A*' and '*B*' respectively are

a) Nitrobenzene and fluorobenzene

b) Phenol and benzene

c) Benzene diazonium chloride and fluorobenzene

d) Nitrobenzene and chlorobenzene

342. Chloroform, when kept open, is oxidised to

a)  $\text{CO}_2$

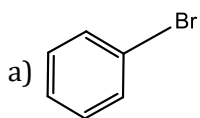
b)  $\text{COCl}_2$

c)  $\text{CO}_2, \text{Cl}_2$

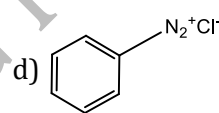
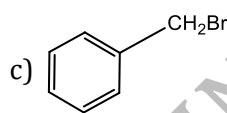
d) None of these

343.  $X \xrightarrow[\text{HNO}_3]{\text{AgNO}_3} Y$  Yellow or white ppt.

Which of the following cannot be *X*?



b)  $(\text{CH}_3)_2\text{CHCl}$



SMART ACHIEVERS LEARNING PVT. LTD.

# HALOALKANES AND HALOARENES

## CHEMISTRY

### : ANSWER KEY :

1)	d	2)	a	3)	b	4)	b	169)	b	170)	c	171)	d	172)	a
5)	a	6)	a	7)	a	8)	b	173)	a	174)	a	175)	d	176)	a
9)	a	10)	c	11)	a	12)	d	177)	b	178)	c	179)	d	180)	d
13)	b	14)	d	15)	b	16)	b	181)	d	182)	b	183)	d	184)	d
17)	c	18)	b	19)	a	20)	a	185)	c	186)	d	187)	b	188)	d
21)	a	22)	b	23)	b	24)	a	189)	d	190)	d	191)	a	192)	a
25)	b	26)	b	27)	a	28)	b	193)	d	194)	c	195)	b	196)	c
29)	d	30)	b	31)	b	32)	a	197)	d	198)	a	199)	d	200)	c
33)	d	34)	b	35)	d	36)	b	201)	d	202)	c	203)	a	204)	c
37)	a	38)	d	39)	c	40)	b	205)	a	206)	b	207)	c	208)	c
41)	d	42)	c	43)	a	44)	a	209)	d	210)	c	211)	a	212)	b
45)	b	46)	d	47)	a	48)	b	213)	c	214)	c	215)	c	216)	d
49)	d	50)	b	51)	b	52)	a	217)	b	218)	c	219)	a	220)	b
53)	b	54)	b	55)	a	56)	d	221)	a	222)	a	223)	c	224)	a
57)	a	58)	a	59)	d	60)	d	225)	d	226)	a	227)	b	228)	d
61)	b	62)	a	63)	a	64)	c	229)	d	230)	d	231)	a	232)	a
65)	a	66)	a	67)	d	68)	a	233)	b	234)	b	235)	a	236)	b
69)	c	70)	c	71)	d	72)	d	237)	c	238)	d	239)	c	240)	a
73)	c	74)	c	75)	a	76)	a	241)	d	242)	d	243)	c	244)	a
77)	c	78)	c	79)	d	80)	b	245)	b	246)	a	247)	a	248)	d
81)	c	82)	c	83)	b	84)	b	249)	b	250)	b	251)	a	252)	b
85)	a	86)	b	87)	b	88)	c	253)	b	254)	a	255)	a	256)	c
89)	b	90)	a	91)	b	92)	b	257)	d	258)	b	259)	d	260)	a
93)	c	94)	b	95)	c	96)	b	261)	c	262)	a	263)	d	264)	d
97)	a	98)	a	99)	c	100)	c	265)	c	266)	c	267)	b	268)	c
101)	a	102)	a	103)	a	104)	d	269)	a	270)	a	271)	b	272)	d
105)	a	106)	d	107)	d	108)	a	273)	b	274)	c	275)	c	276)	c
109)	c	110)	a	111)	c	112)	a	277)	a	278)	b	279)	b	280)	c
113)	b	114)	b	115)	d	116)	d	281)	c	282)	b	283)	b	284)	d
117)	b	118)	b	119)	a	120)	a	285)	a	286)	a	287)	a	288)	d
121)	a	122)	b	123)	d	124)	c	289)	d	290)	c	291)	d	292)	b
125)	d	126)	a	127)	d	128)	a	293)	a	294)	c	295)	d	296)	a
129)	a	130)	d	131)	a	132)	d	297)	a	298)	c	299)	c	300)	b
133)	a	134)	b	135)	b	136)	a	301)	b	302)	c	303)	d	304)	c
137)	b	138)	a	139)	c	140)	a	305)	a	306)	b	307)	a	308)	a
141)	c	142)	d	143)	b	144)	a	309)	a	310)	a	311)	b	312)	d
145)	c	146)	c	147)	c	148)	a	313)	c	314)	c	315)	a	316)	a
149)	a	150)	a	151)	d	152)	a	317)	a	318)	c	319)	d	320)	b
153)	d	154)	a	155)	c	156)	c	321)	c	322)	b	323)	a	324)	d
157)	c	158)	c	159)	d	160)	d	325)	b	326)	c	327)	a	328)	a
161)	a	162)	d	163)	d	164)	c	329)	c	330)	b	331)	a	332)	b
165)	c	166)	a	167)	b	168)	b	333)	a	334)	a	335)	d	336)	d

337) d    338) d    339) a    340) a |  
341) c    342) b    343) a

SMART ACHIEVERS LEARNING PVT. LTD.

# HALOALKANES AND HALOARENES

## CHEMISTRY

### : HINTS AND SOLUTIONS :

- 1 (d)  
For positive iodoform test, alcohol molecule must have  
CH<sub>3</sub> - CH - group.  

$$\begin{array}{c} | \\ \text{OH} \\ \text{Ph} - \text{CH} - \text{CH}_3 \xrightarrow{\text{I}_2 + \text{NaOH}} \text{CHI}_3 + \text{Ph} - \text{COO}^- \\ | \\ \text{OH} \end{array}$$
- 2 (a)  

$$\text{CH}_2\text{ClCH}_2\text{Cl} \xrightarrow{\text{KOH}(aq.)} \text{CH}_2\text{OHCH}_2\text{OH}$$
  
 Ethane-1,2-diol  

$$\text{CH}_3\text{CHCl}_2 \xrightarrow{\text{KOH}(aq.)} \text{CH}_3\text{CHO}$$
  
 Ethanal
- 3 (b)  

$$\text{R} - \text{X} \xrightarrow{\text{KOH}(aq.)} \text{R} - \text{OH}$$
- 4 (b)  

$$\text{CH}_3\text{CH}_2\text{Cl} \xrightarrow{\text{KOH}(alc.)} \text{CH}_2 = \text{CH}_2 + \text{HCl}$$
- 5 (a)  

$$\text{CS}_2 + 2\text{Cl}_2 \rightarrow \text{CCl}_4 + 2\text{S}$$
- 6 (a)  

$$\text{CH}_2\text{Cl}_2 \xrightarrow{\text{HOH}} \text{CH}_2(\text{OH})_2 \xrightarrow{-\text{H}_2\text{O}} \text{HCHO}$$
- 8 (b)  
 HI reacts with C<sub>2</sub>H<sub>5</sub>OH even in absence of ZnX<sub>2</sub>.  
 Larger is bond length, more is reactivity.
- 9 (a)  
 Among alkyl halides, iodides are least stable, hence these form Grignard reagent easily. Hence, the correct order of reactivity in formation of Grignard reagent is  
 CH<sub>3</sub>I > CH<sub>3</sub>Br > CH<sub>3</sub>Cl
- 10 (c)  
 The I<sub>2</sub> has antiseptic nature.
- 11 (a)  
 This is Wurtz reaction. 2-chloropropane and chloromethane reacts in presence of dry ether to form 2-methyl propane.  

$$\text{CH}_3\text{Cl} + 2\text{Na} + \text{Cl} - \text{CH} - \text{CH}_3 \xrightarrow{\text{Ether}}$$
  

$$\begin{array}{c} | \\ \text{CH}_3 \end{array}$$
- 13 (b)  
 Br is replaced by a nucleophile CN<sup>-</sup>.
- 15 (b)  
 A mixture of halides is formed.
- 16 (b)  
 DDT and 666 (C<sub>6</sub>H<sub>6</sub>Cl<sub>6</sub> or benzene hexachloride) is the pair of strongest pesticides.
- 17 (c)  
 Thus, decomposition of CHI<sub>3</sub> occurs.
- 18 (b)  

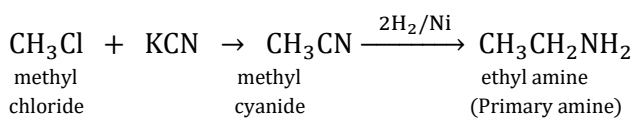
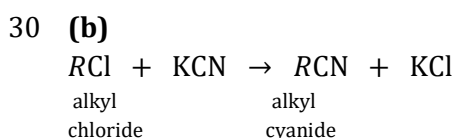
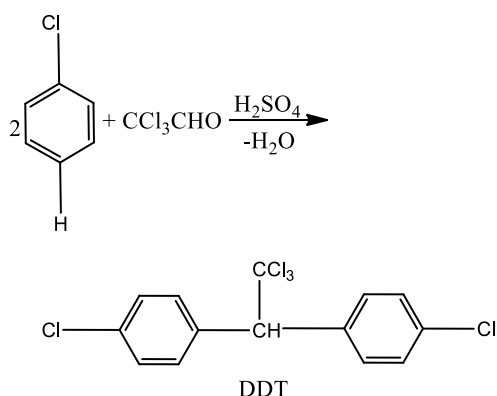
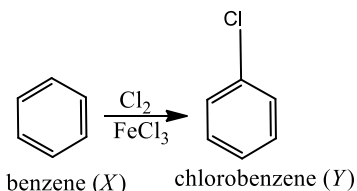
$$\text{CH}_3\text{X} + \text{KCN} \rightarrow \text{CH}_3\text{CN}$$
- 19 (a)  

$$\begin{array}{l} \text{CHCl}_3 + \text{HNO}_3 \\ \rightarrow \text{CCl}_3 \cdot \text{NO}_2 + \text{H}_2\text{O} \cdot \text{CCl}_3 \\ \cdot \text{NO}_2 \text{ is called chloropicrin.} \end{array}$$
- 20 (a)  
 Aryl halides show resonance in their structure.
- 21 (a)  

$$\text{CCl}_4 + \text{H}_2\text{O}(v) \rightarrow \text{COCl}_2 + 2\text{HCl}$$
- 23 (b)  
 In Wurtz reaction alkyl halide react with sodium in dry ether to produce alkane having double number of carbon atoms as in alkyl halide.  

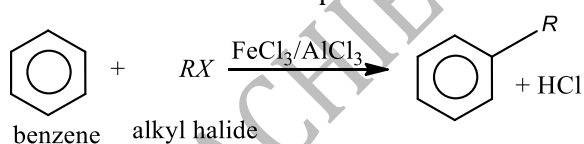
$$2\text{R} - \text{X} + 2\text{Na} \xrightarrow{\text{Dry ether}} \text{R} - \text{R} + 2\text{NaX}$$
  
 alkyl halide                                      alkane
- 24 (a)  

$$\text{CH}_3\text{I} + 6\text{Ag} + \text{I}_3\text{HC} \rightarrow \text{C}_2\text{H}_2 + 6\text{AgX}$$
- 26 (b)  
 This is the preparation method of DDT (dichloro diphenyl trichloroethane).

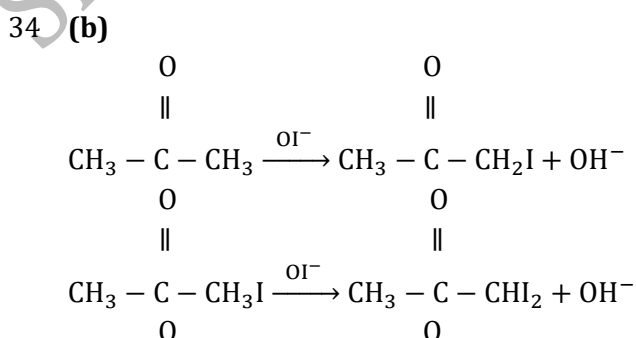


31 (b) An optically inactive compound forming optically active compound during a reaction always gives racemic mixture.

32 (a) **Friedel-Craft reaction** : In this reaction alkyl halides react with aromatic compounds in presence of  $\text{AlCl}_3$  or  $\text{FeCl}_3$  to form alkyl substituted aromatic compounds.

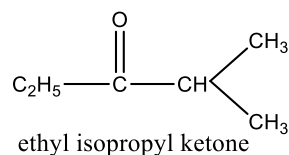


33 (d) Benzyl chloride is very reactive. It readily gives white precipitate with alcoholic  $\text{AgNO}_3$  at room temperature. It also readily undergoes nucleophilic substitution. Its structure is as follows

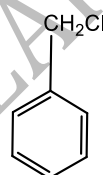


27 (a)  $\text{CF}_3\text{CHClBr}$ , i. e., haloethane is less hazardous and

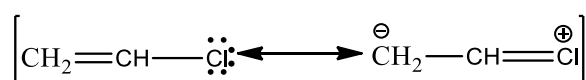
28 (b) All the except ethyl isopropyl ketone gives iodoform test in this question.

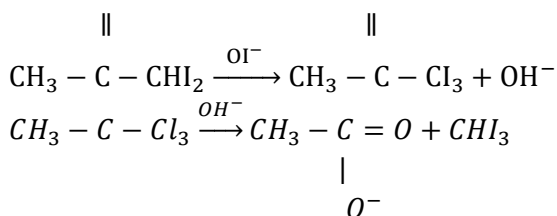


29 (d)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{I}$  and  $\text{CH}_3\text{CHICH}_3$ ; note the position of iodine.



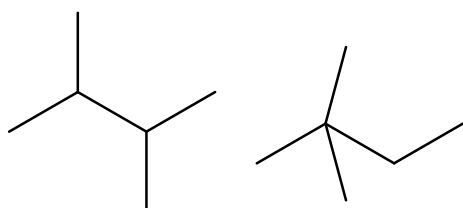
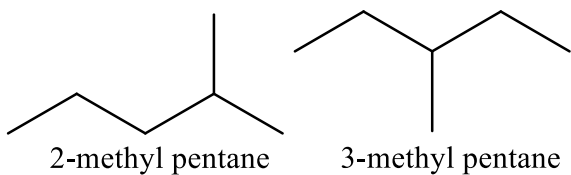
Vinyl chloride ( $\text{CH}_2 = \text{CH} \cdot \text{Cl}$ ), on the other hand, is less reactive than benzyl chloride due to resonance.





35 (d)

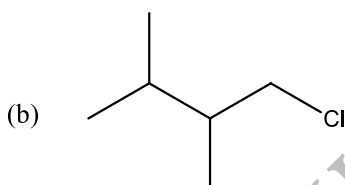
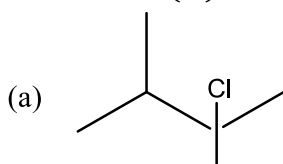
The possible isomers of hexane are



2,3-dimethyl butane      2,2-dimethyl butane

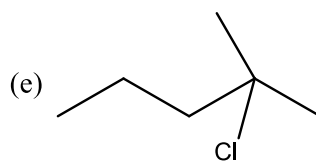
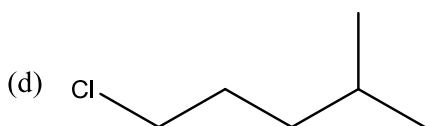
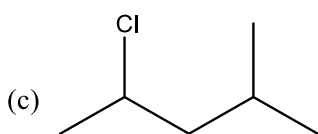
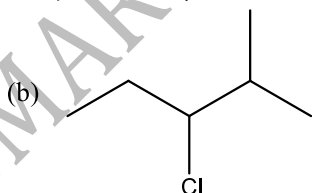
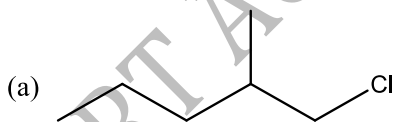
Out of these structure (iii) and (i) have respectively minimum and maximum number of monochloro derivatives

For structure (iii)



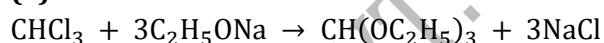
[Only 2 monochloro derivatives (minimum) are possible]

For structure (i)



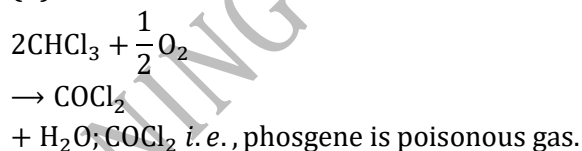
[5 monochloro derivatives (maximum) are possible]

37 (a)



Ethy ortho formate

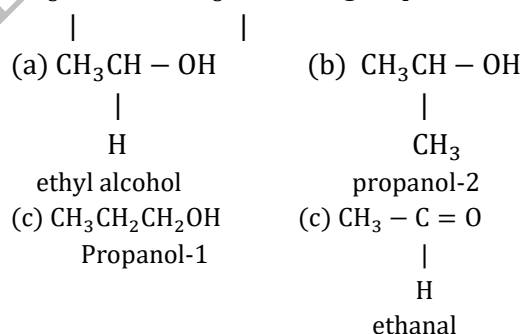
38 (d)



39 (c)

Iodoform test is given by only those compounds which contain either

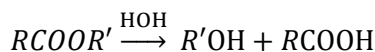
$\text{CH}_3\text{C} = \text{O}$  or  $\text{CH}_3\text{CH} - \text{OH}$  group



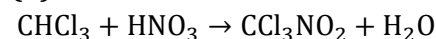
Hence, propanal-1 due to absence of above given groups, does not give positive iodoform test.

40 (b)

At higher temperature, esters undergoes hydrolysis to give alcohol and acid. In (b) ethyl alcohol is formed which respond for positive iodoform test.



41 (d)



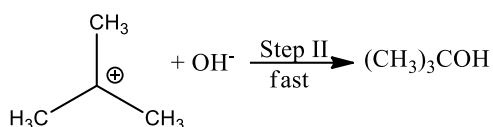
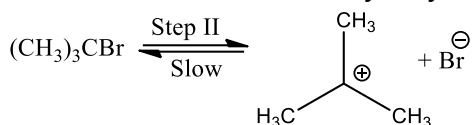
Chloroform    nitric acid    chloropicrin

Thus, the molecular formula of chloropicrin is  $\text{CCl}_3\text{NO}_2$ .

42 (c)

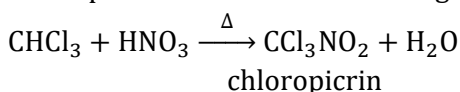
The reaction between *tert*-butyl bromide and hydroxide ion yields *tert*-butyl alcohol and follows the first order kinetics. The rate of

reaction depends upon the concentration of only one reactant, which is tertiary butyl bromide.



43 (a)

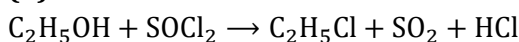
Chloroform reacts with conc.  $\text{HNO}_3$  to give chloropicrin which is used as tear gas.



44 (a)

More is the branching in molecule, lesser is surface area, lower is attraction, lower is b.p.

45 (b)



46 (d)

$\text{Cl}_2$  formed at anode reacts with  $\text{C}_2\text{H}_5\text{OH}$  in presence of  $\text{NaOH}$  (formed in reaction) to give haloform reaction.

47 (a)

Benzyl chloride is more reactive than alkyl halides. Benzyl carbocation is stabilised by resonance hence, benzyl chloride easily gives nucleophilic substitution reaction.

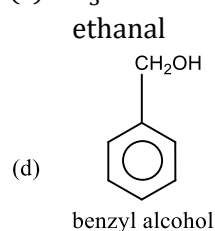
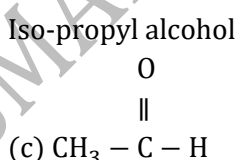
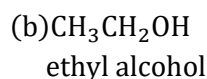
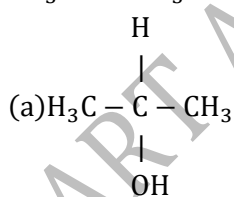
48 (b)

$\text{S}_\text{N}1$  order.

Benzyl > Allyl >  $3^\circ$  >  $2^\circ$  >  $1^\circ$  > Phenyl halide.

49 (d)

Iodoform test is given by compounds which have  $\text{CH}_3\text{CO}$  or  $\text{CH}_3\text{CHOH}$  group.



(i) iso-propyl alcohol, ethanol and ethanal all have

$\text{CH}_3\text{CO}$  or  $\text{CHOH}$  group, therefore they give iodoform test.

(ii) Benzyl alcohol does not have

$\text{CH}_3\text{CO}$  or  $\text{CHOH}$  group,



Therefore, it does not give iodoform test.

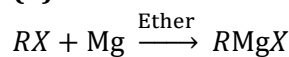
50 (b)

Follow Saytzeff's rule.

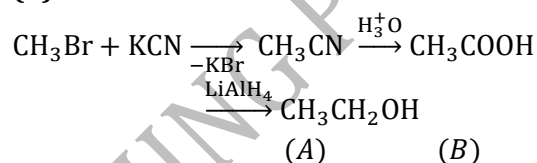
51 (b)

The lead deposited is exhausted out in the form of  $\text{PbBr}_2$ .

53 (b)



54 (b)

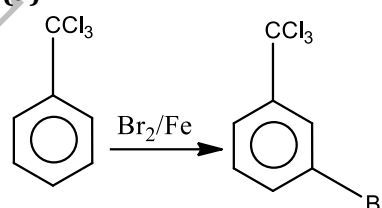


(C)

56 (d)

$(\text{CH}_3)_3\text{CCH}_2\text{CH}_2\text{Cl}$ ; halogen is attached on  $1^\circ$  carbon.

57 (a)

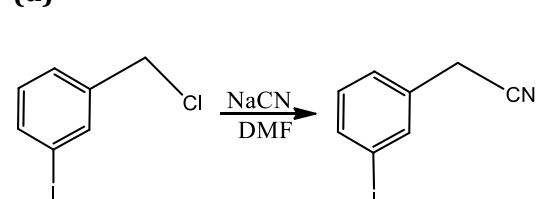


As- $\text{CCl}_3$  group is meta-directing.

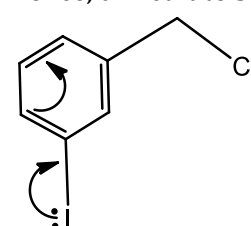
58 (a)

$\text{RMgF}$  are unstable compounds.

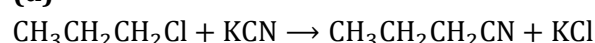
59 (d)



Chloride is on a  $1^\circ$  aliphatic carbon which is substituted easier in comparison to iodide which is aryl and more stable due to delocalisation hence, difficult to substitute.

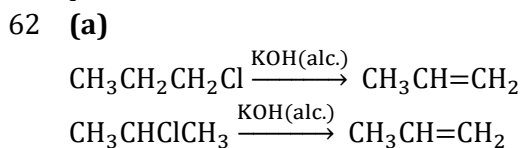


60 (d)

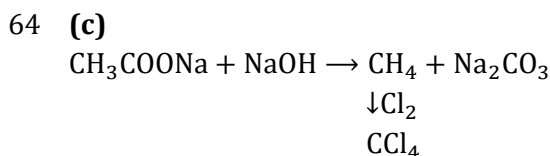




61 (b) Br is less reactive and more selective and thus, formation of 3° free radical will be the major product.



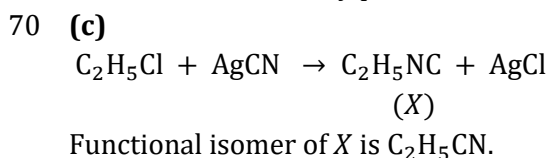
63 (a) Larger is C—X bond length; more is reactivity.



66 (a) In vinyl chloride, the C-Cl bond acquires some double bond character due to resonance.



68 (a) RCl and RBr can be prepared by free radical halogenation of alkanes while RF and RI cannot be prepared. With F<sub>2</sub>, the reaction is not only explosive but also brings cleavage of C-C bonds while with I<sub>2</sub> the reaction is too slow to be of any practical value.



71 (d) Benzyl carbonium ion is most stable and thus, its chloride is most reactive.

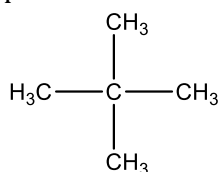
72 (d) Tear gas is chloropicrin. It is obtained by the reaction of chloroform with nitric acid.

$$\text{CHCl}_3 + \text{HNO}_3 \rightarrow \text{CCl}_3\text{NO}_2 + \text{H}_2\text{O}$$

chloropicric

73 (c) C—Cl bond is more polar due to more electronegativity difference.

76 (a) The number of monochloro derivatives of a compound depends upon the type of hydrogen present in the compound. The structure of *neo*-pentane is



∴ It contains only one type of hydrogens.  
∴ It will give only one monochloro derivative

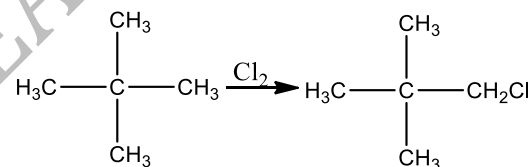
Vinyl chloride

Thus, it is very difficult to break C-Cl bond. Hence, vinyl chloride not get hydrolysed by NaOH.

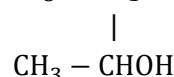
67 (d) Iodoform test is given by compounds which have (CH<sub>3</sub> - CO -) group or CH<sub>3</sub> - CH - group.



Hence, 2-pentanone, CH<sub>3</sub>CHO and C<sub>2</sub>H<sub>5</sub>OH give the test. But 3-pentanone does not give iodoform test. Actually, iodoform test can be used to distinguish methyl ketones from ketones.



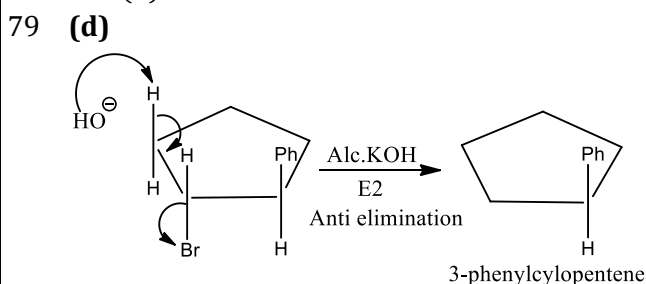
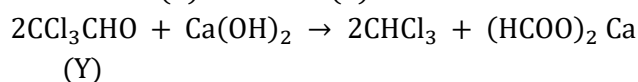
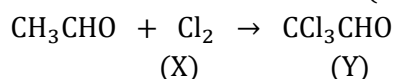
77 (c) An organic compound forms yellow precipitate of iodoform with I<sub>2</sub> in presence of alkali, if it has CH<sub>3</sub>CO - group directly or it has



78 (c)

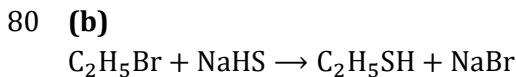
$$\text{CaOCl}_2 + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{Cl}_2$$

(X)



Anti-elimination, means -H and the -Br both departing group must be present at dihedral angle

of 180° (anti).



82 **(c)**  
 Allyl carbonium shows resonance and thus, allyl chloride is more reactive. Vinyl chloride shows resonance and thus, less reactive.



84 **(b)**  
 Ethanol cannot undergo dehydrohalogenation as it does not contain any halogen.

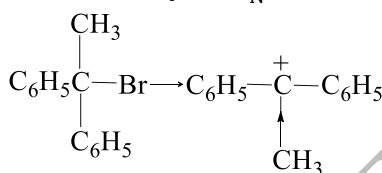
85 **(a)**  
 By haloform reaction.

86 **(b)**  
 $CH_3-CHCH_2CH_3$  has one asymmetric carbon atom.

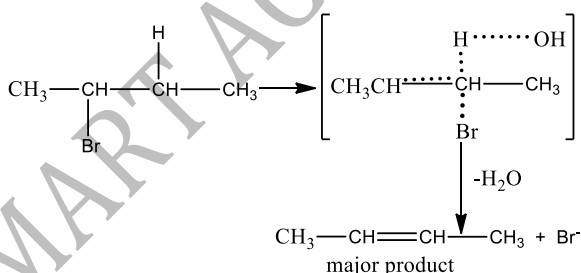


87 **(b)**  
 $CCl_4$  is non-polar;  $H_2O$  is polar.

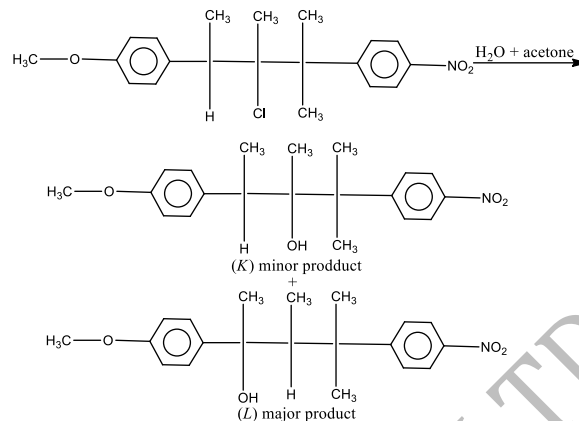
88 **(c)**  
 Most stable carbocation formation by halide shows more reactivity for  $S_N1$  reactions.



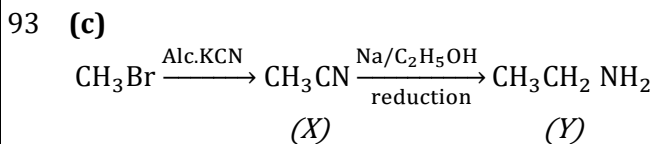
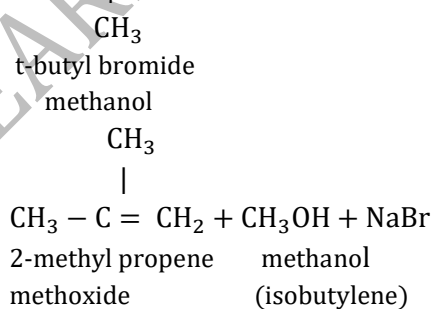
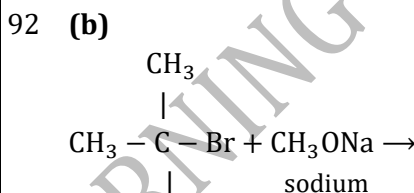
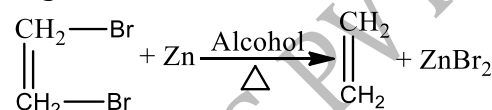
89 **(b)**  
 Alkyl halides on heating with alcoholic KOH give dehydrogenation reaction to yield alkene. If in reaction, more than one alkenes are formed, then according to Saytzeff, the most highly substituted alkene is the major product.



90 **(a)**  
 The product (K) is formed through simple substitution while major product (L) is formed through  $H^-$  shift via  $S_N1$  reaction and methoxy group stabilizes the carbocation intermediate of product (L).

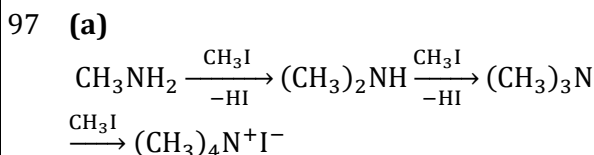
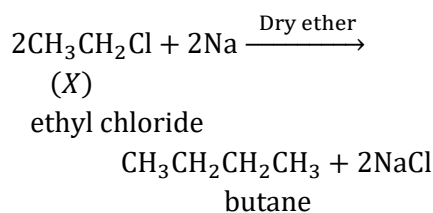


91 **(b)**  
 Zinc is used for debromination of dibromoalkane to give alkene.



95 **(c)**  
 Liberated iodine is absorbed by iodides to darken their colour.

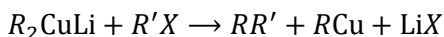
96 **(b)**  
 This is Wurtz reaction. In this reaction two molecules of alkyl halide react with each other to form alkane having double the number of carbon atoms.



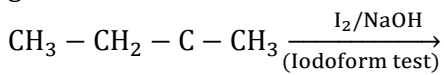
Hence, three molecules of  $\text{CH}_3\text{I}$  is used.

98 (a)  $\text{CHCl}_3$  will give positive carbylamine reaction.

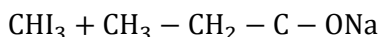
99 (c) This is corey house synthesis:



100 (c) When a carbonyl compound having the structure  $\text{CH}_3 - \text{CO} - R$  is reacted with a halogen in the presence of  $\text{NaOH}$ ,  $\text{KOH}$ ,  $\text{Na}_2\text{CO}_3$  or  $\text{K}_2\text{CO}_3$  solution, haloform is obtained. Thus, butanone-2 gives +ve iodoform test.

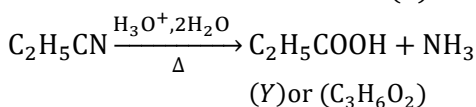


2-butanone



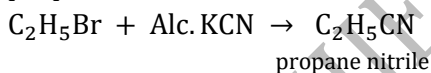
iodoform

101 (a)  $\text{C}_2\text{H}_5\text{Cl} + \text{KCN} \xrightarrow{\text{C}_2\text{H}_5\text{OH}} \text{C}_2\text{H}_5\text{CN} + \text{KCl}$   
(X)



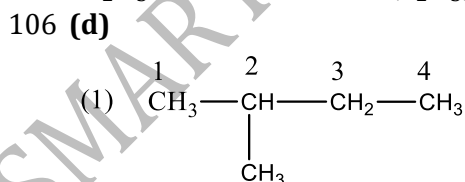
So, the molecular formula of the Y is  $\text{C}_3\text{H}_6\text{O}_2$ .

102 (a) When ethyl bromide reacts with alcoholic  $\text{KCN}$ , propane nitrile is obtained as main product.

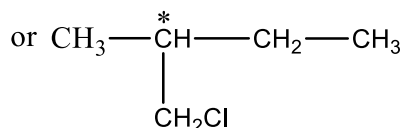
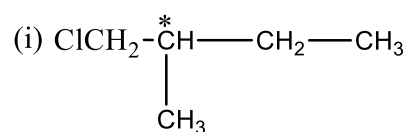


104 (d) Carbylamine reaction is characteristic reaction for primary amine and chloroform.

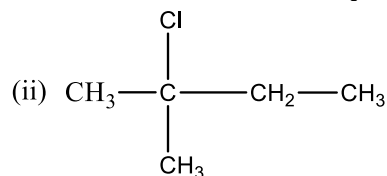
105 (a)  $4\text{C}_2\text{H}_5\text{Br} + 4\text{Na} - \text{Pb} \rightarrow (\text{C}_2\text{H}_5)_4\text{Pb} + 4\text{NaBr}$



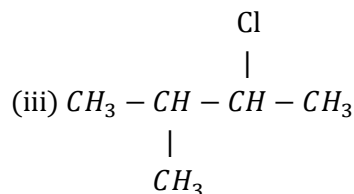
Its monochloro derivatives are follows



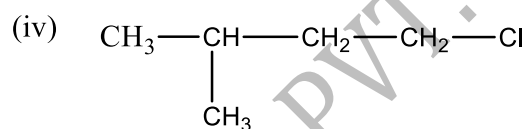
It will exist as enantiomers pair *d* and *l*-forms



no asymmetric C atom



It will exist as enantiomeric pair (*d*- and *l*- forms)



No asymmetric carbon atom

Hence, only two enantiomeric pairs will be obtained by the monochlorination of 2-methylbutane.

107 (d)  $\text{RX} + \text{Ag}_2\text{O} \rightarrow \text{R} \cdot \text{O} \cdot \text{R} + 2\text{AgX}$   
(Ether)

108 (a) Williamson's synthesis  
 $\text{C}_2\text{H}_5\text{ONa} + \text{ClC}_2\text{H}_5 \rightarrow \text{C}_2\text{H}_5\text{OC}_2\text{H}_5 + \text{NaCl}$   
diethyl ether

109 (c)  $\text{CaOCl}_2 + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{Cl}_2$  (Hydrolysis)  
 $\text{Cl}_2 + \text{C}_2\text{H}_5\text{OH} \rightarrow \text{CH}_3\text{CHO}$  (Oxidation)  
 $\text{CH}_3\text{CHO} + \text{Cl}_2 \rightarrow \text{CCl}_3\text{CHO}$  (Substitution)  
 $\text{CCl}_3\text{CHO} + \text{Ca(OH)}_2 \rightarrow \text{CHCl}_3 + (\text{HCOO})_2\text{Ca}$  (Hydrolysis)

110 (a) Iodoform test is given by the compounds containing either

$\begin{array}{c} | \\ \text{CH}_3\text{CO} - \text{roup or } \text{CH}_3\text{CHOH group.} \end{array}$

The structures of the given compounds are as

- $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$
- $\text{CH}_3\text{COC}_6\text{H}_5$
- $\text{CH}_3\text{CHO}$
- $\text{CH}_3\text{COC}_2\text{H}_5$

$\therefore n$  butyl alcohol does not give iodoform test because it does not possess the

CH<sub>3</sub>CO – or CH<sub>3</sub>CHOH group.

111 (c)

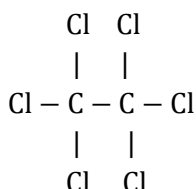
It is not a colouring material.

113 (b)

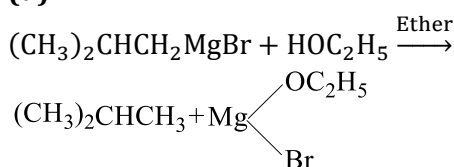
Alkyl halides are less soluble in water. They are polar but fail to form H-bonds with water.

114 (b)

Hexachloroethane is also called artificial camphor. Its structure is



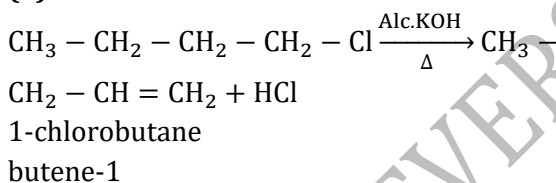
115 (d)



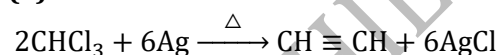
117 (b)

Dipole moment of CH<sub>3</sub>Cl is more than CH<sub>3</sub>F due to larger C—X bond. Also electronegativity of Br being less than F and Cl and thus inspite of larger C—X bond dipole moment of CH<sub>3</sub>Br is lowest.

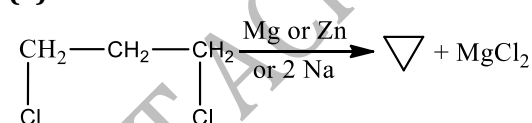
119 (a)



120 (a)

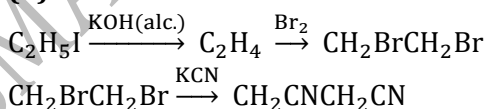


121 (a)

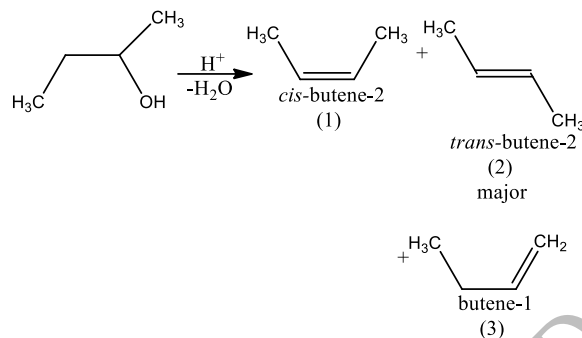


α and ω-dihalogen derivative of an alkane on treatment with Mg or Zn or Na gives cycloalkane.

122 (b)



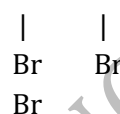
123 (d)



In [F] order of quantity of alkene 2 > 1 > 3

These on addition with Br<sub>2</sub>/CCl<sub>4</sub> to give their addition products which have C<sub>4</sub>H<sub>6</sub> Br<sub>2</sub> as molecular formula.

(1) CH<sub>3</sub> - CH - CH - CH<sub>3</sub>



(2) CH<sub>3</sub> - CH - CH - CH<sub>3</sub>



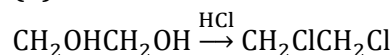
(3) BrH<sub>2</sub>C - CH - CH<sub>2</sub> - CH<sub>3</sub>



(4) BrH<sub>2</sub>C - CH<sub>2</sub> - CHBr - CH<sub>2</sub>

(5) CH<sub>2</sub>Br - CH<sub>2</sub> - CH<sub>2</sub> - CH<sub>2</sub>Br

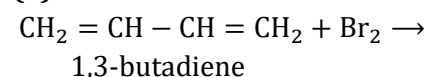
125 (d)



127 (d)

Tertiary carbonium is most stable.

128 (a)



(i) CH<sub>2</sub> = CH - CH - CH<sub>2</sub>



3,4-dibromo butane

(ii) CH<sub>2</sub> - CH = CH - CH<sub>2</sub>

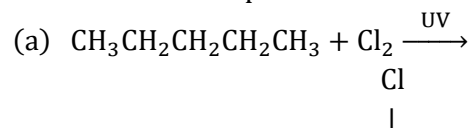


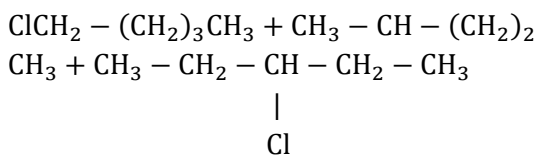
1,4-dibromo-2-butene

1,4-adduct is more stable than the 1,2-adduct.

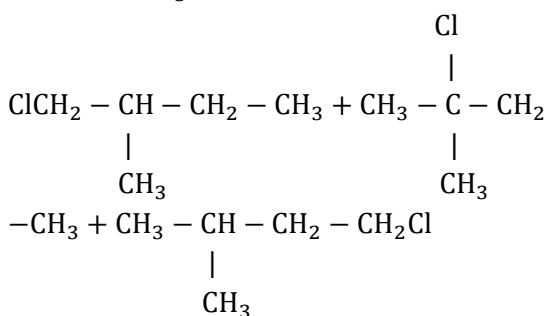
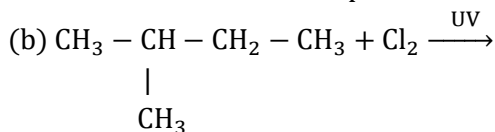
130 (d)

Write chlorination reaction for all of them to find which gives of the maximum number of monochlorination product.

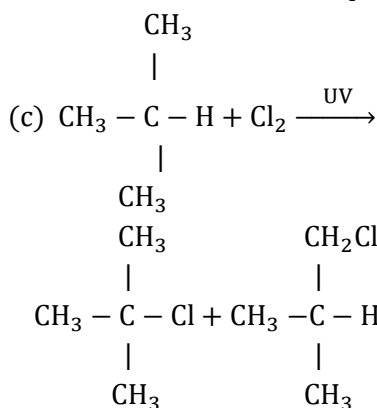




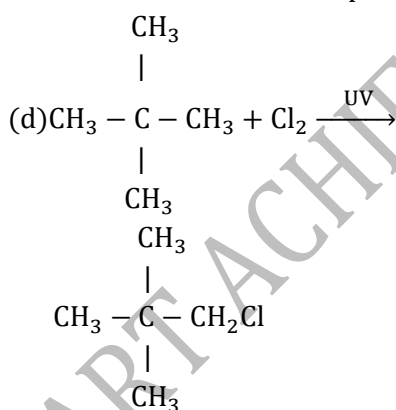
∴ Total 3 monochlorinated products are formed.



∴ Total 3 monochlorinated products are formed.

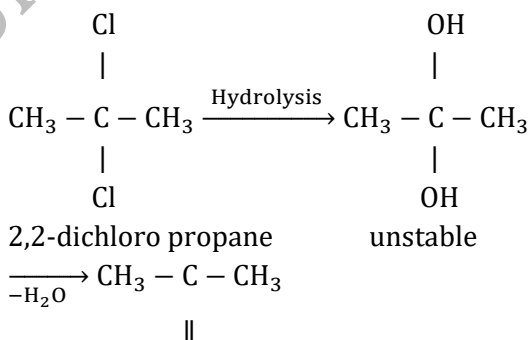


∴ Total 3 monochlorinated products are formed.



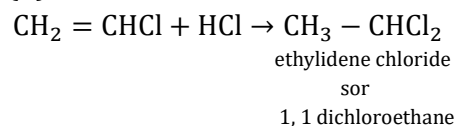
∴ Only one monochlorinated products formed.

131 (a)



O  
acetone

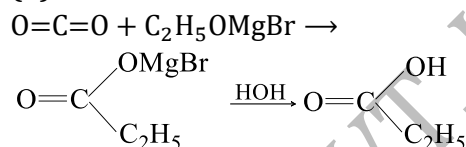
132 (d)



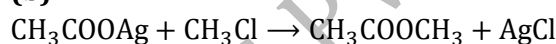
133 (a)

$$\mu_{\text{CCl}_4} = 0; \mu_{\text{CHCl}_3} = 1.0 \text{ D}; \mu_{\text{CH}_2\text{Cl}_2} = 1.6 \text{ D}, \mu_{\text{CH}_3\text{Cl}} = 1.86 \text{ D}$$

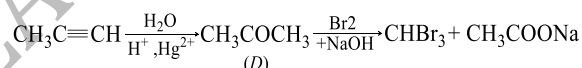
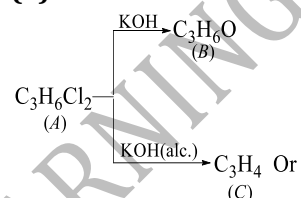
134 (b)



135 (b)



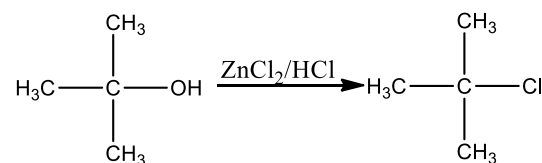
136 (a)



Since, B and D are different thus, B is  $\text{CH}_3\text{CH}_2\text{CHO}$  and so A is  $\text{CH}_3\text{CH}_2\text{CHCl}_2$ .

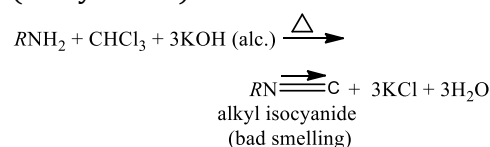
138 (a)

Tertiary alcohols readily react with Lucas reagent ( $\text{ZnCl}_2/\text{conc. HCl}$ ) to give white turbidity due to the formation of halide.



140 (a)

Carbylamine test is a characteristic test of aliphatic and aromatic primary amines. In this test, amine is heated with chloroform and alcoholic potash when a bad smelling isocyanide (carbylamine) is formed.



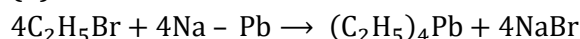
142 (d)

The density order is:

Iodine > Bromide > Chloride > Fluoride.

Higher is the molecular weight, more is b.p, m.p.

143 (b)



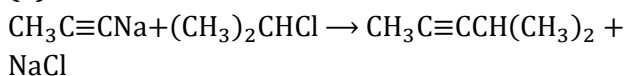
147 (c)

Follow iodoform test.

148 (a)

Chloral + Chlorobenzene → DDT

150 (a)



151 (d)

Solvolysis of haloalkanes follows first order kinetics. During this process an intermediate carbocation is formed. Therefore, the haloalkane which gives more stable carbocation undergoes solvolysis readily.

153 (d)

$\text{CCl}_4$  is a covalent compound, therefore, it does not ionise to give  $\text{Cl}^-$  ions hence, it does not give white ppt. of  $\text{AgCl}$  when treated with  $\text{AgNO}_3$  solution. There is no reaction to evolve  $\text{NO}_2$ .  $\text{CCl}_4$  will form a separate layer as it is immiscible with water.

154 (a)

$\text{C}-\text{X}$  bond in benzyl bromide is much weaker than in vinyl bromide and bromobenzene since the benzyl cation left after the removal of the bromide ion is stabilized by resonance. Further,  $\text{C}-\text{Br}$  is weaker than  $\text{C}-\text{Cl}$  bond. Therefore,  $\text{C}_6\text{H}_5\text{CH}_2\text{Br}$  has the weakest  $\text{C}-\text{X}$  bond.

155 (c)

5. 2-methylpentane  $\xrightarrow{\text{Cl}_2}$  five types of monochlorinated compounds

6. 3-methylpentane  $\xrightarrow{\text{Cl}_2}$  four types of monochlorinated compounds

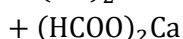
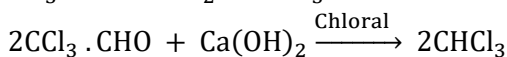
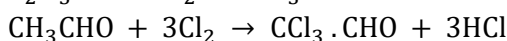
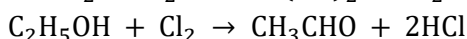
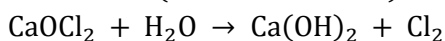
7. 2, 2-dimethylbutane  $\xrightarrow{\text{Cl}_2}$  three types  
.....

8. 2, 3-dimethylbutane  $\xrightarrow{\text{Cl}_2}$  two types ....

9. *n*-hexane  $\xrightarrow{\text{Cl}_2}$  three types ....

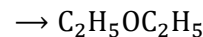
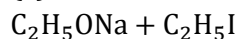
156 (c)

Ethanol on reaction with bleaching powder, gives chloroform (trichloromethane).



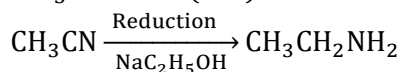
chloroform

157 (c)



+ NaI; Williamson's synthesis.

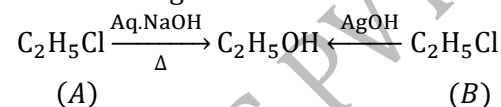
158 (c)



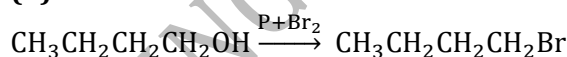
ethylamine

159 (d)

Ethyl chloride can be converted into ethanol either by its alkaline hydrolysis or by its reaction with moist  $\text{AgOH}$ .

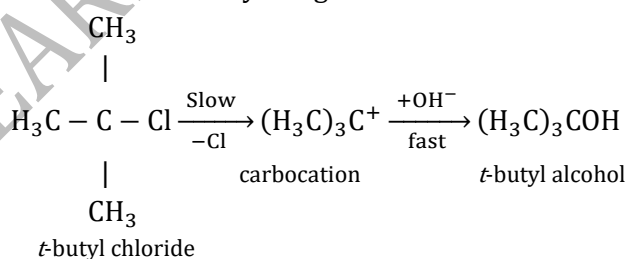


160 (d)



161 (a)

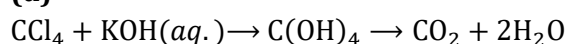
Tertiary halide preferentially undergo  $\text{S}_{\text{N}}1$  substitution as they can give stable carbocation.



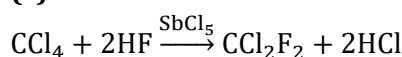
162 (d)

In  $\text{CHCl}_3$ , carbon is  $sp^3$ -hybridised.

163 (d)



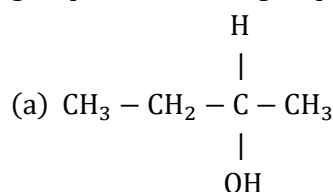
164 (c)



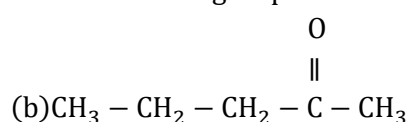
165 (c)

Iodoform test is positive for compounds which have O

$\text{CH}_3-\text{C}$   
group or  $2^\circ$  alcohol group.



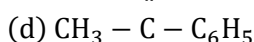
has  $2^\circ$  alcoholic group



has  $\text{CH}_3\text{CO}$  - group

O

||

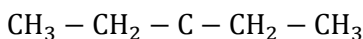


has  $\text{CH}_3\text{CO}$  - group

$\therefore$  Compounds in choice (a), (b) and (d) give positive iodoform test.

O

||



$\therefore$  This compound doesn't have  $\text{CH}_3\text{CO}$  - or  $2^\circ$  alcoholic group.

$\therefore$  It does not give positive iodoform test.

166 (a)

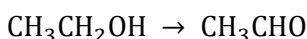
In  $\text{C}_6\text{H}_5\text{Cl}$ , Cl is firmly attached to  $\text{C}_6\text{H}_6$  nucleus.

167 (b)

For iodoform reaction, we need an oxidising agent

which is provided by only  $\frac{\text{I}_2}{\text{KOH}}$ , i.e.,  $\text{IO}^-$  ion.

Hypoiodide ion first oxidises



and then brings about iodination of

$\text{CH}_3\text{CHO}$  to  $\text{I}_3\text{C} \cdot \text{CHO}$ . Alkaline hydrolysis of

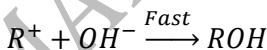
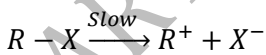
$\text{Cl}_3\text{CHO}$  then gives  $\text{CHI}_3$ . The other three reagents

do not contain any oxidising species and hence,

fail to give iodoform test.

169 (b)

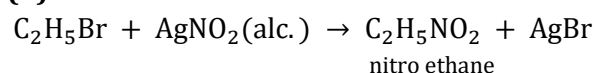
Statement (b) is not correct regarding the  $\text{S}_{\text{N}}1$  reaction for alkyl halide because in  $\text{S}_{\text{N}}1$  reaction no inversion takes place. The removal of  $\text{X}$  and the attachment of  $\text{OH}^-$  will take place from the same side.



170 (c)

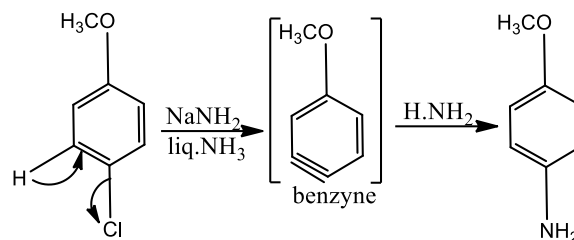
Alkyl halides are soluble in organic solvents.

171 (d)



173 (a)

This reaction follows benzyne mechanism.

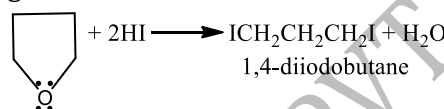


175 (d)

Grignard reagent give nucleophilic addition (of  $\text{R}^-$ ) at +ve centre.

176 (a)

Tetrahydrofuran when treated with excess HI, give 1, 4-diiodobutane.



177 (b)

$\text{I}_2$  possesses antiseptic nature.

179 (d)

Wurtz's reaction involves the reduction of alkyl halide with Na in ether.

181 (d)



182 (b)

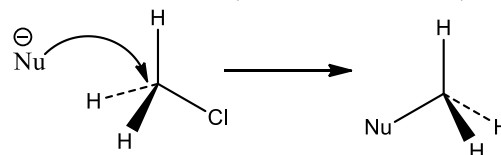
Straight chain alkyl halides have greater boiling point than their isomers. Therefore,  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Cl}$  has highest boiling point.

183 (d)

$\text{CH}_3\text{Cl}$ ,  $\text{C}_2\text{H}_5\text{Cl}$  and  $\text{CH}_3\text{Br}$  are gases at room temperature.

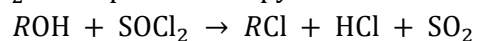
184 (d)

Nucleophilic substitution bimolecular ( $\text{S}_{\text{N}}2$ ) prefers less sterically hindered site to attack. Lesser the steric hindrance better the  $\text{S}_{\text{N}}2$  reaction. So, ease of reaction is  $1^\circ > 2^\circ > 3^\circ$ .  $\text{S}_{\text{N}}2$  involves inversion of configuration stereochemically (Walden inversion)



185 (c)

The best method for the conversion of an alcohol into an alkyl chloride is by treating the alcohol with  $\text{SOCl}_2$  in the presence of pyridine.

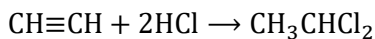


The other products being gases escape leaving behind pure alkyl halide.

186 (d)

Freon,  $\text{CCl}_2\text{F}_2$  is used in cooling.

187 (b)



188 (d)

$\text{Cl}^-$  is replaced by  $\text{OH}^-$ , i.e., nucleophilic substitution.

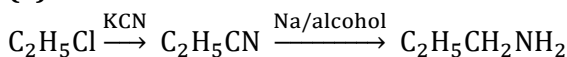
189 (d)

$\text{RX}$  are called alkylating agent.  $\text{CH}_3\text{X}$  is methylating agent;  $\text{C}_2\text{H}_5\text{X}$  is ethylating agent.

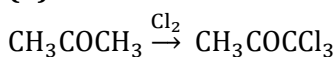
191 (a)

Methyl iodide is more reactive for nucleophilic substitution of II order.

192 (a)

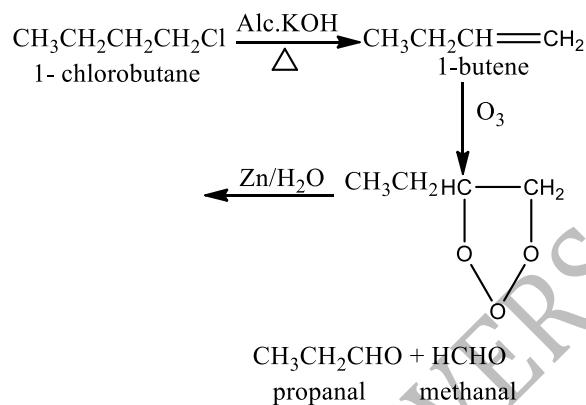


193 (d)



194 (c)

1-chlorobutane gives butene-1 on reaction with alc. KOH (dehydrohalogenation) which on ozonolysis yields methanal and propanal. The reaction is as follows



197 (d)

Carbon tetrachloride is not inflammable. It is used as fire-proof agent under the name 'pyrene'.

198 (a)

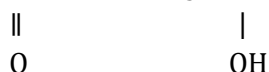
$n$ -butyl alcohol ( $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$ ) does not give iodoform test because it does not possess the  $\text{CH}_3\text{CO}$  or  $\text{CH}_3\text{CHOH}$  group.

199 (d)

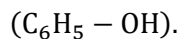
Grignard reagents are highly reactive and react with any source of proton to give hydrocarbons. It is therefore necessary to avoid even traces of moisture from a Grignard reagent.

200 (c)

Iodoform test is given by those compounds which has



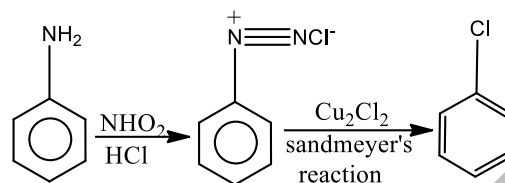
Hence, this test is not given by phenol



201 (d)

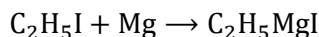
$\text{CCl}_4$  is used as medicine in this form.

202 (c)

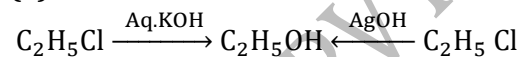


(Diazotization)

204 (c)



205 (a)



206 (b)

Due to less stable nature of  $\text{CH}_3\text{I}$ .

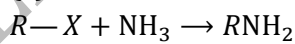
207 (c)

$\text{C}_2\text{H}_5\text{Br} + \text{C}_2\text{H}_5\text{ONa} \rightarrow \text{C}_2\text{H}_5\text{OC}_2\text{H}_5$ ; also in (a)  $\text{C}_2\text{H}_4$  is formed; in (b)  $\text{C}_4\text{H}_{10}$  is formed, in (d)  $\text{C}_2\text{H}_5\text{NC}$  is formed.

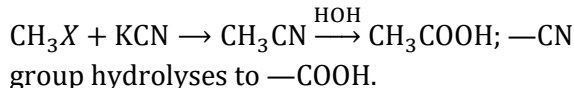
208 (c)

Phosgene is  $\text{COCl}_2$ .

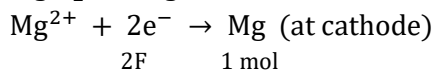
210 (c)



212 (b)

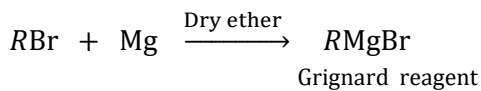


213 (c)



$$\therefore 2\text{F}(2 \times 96500 \text{ C}) \text{ deposits Mg} = 1 \text{ mol}$$

$$\therefore 9.65 \text{ C charge will deposit Mg} = \frac{1 \times 9.65}{2 \times 96500} = 5 \times 10^{-5} \text{ mol}$$

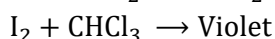
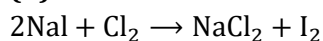


In order to prepare Grignard reagent, one mole of Mg is used per mole of reagent obtained. Thus, by  $5 \times 10^{-5} \text{ mol Mg}$ ,  $5 \times 10^{-5} \text{ mole}$  of Grignard reagent is obtained.

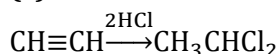
215 (c)

$\text{C}_2\text{H}_5\text{CN}$  (A) on hydrolysis gives  $\text{C}_2\text{H}_5\text{COOH}$ .

216 (d)



218 (c)



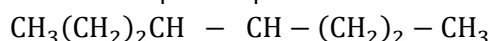
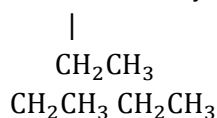
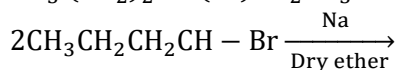
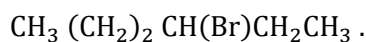


219 (a)

Allyl carbonium shows resonance and thus, allyl chloride is more reactive. Vinyl chloride shows resonance and thus, less reactive.

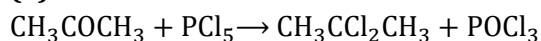
220 (b)

Since, the alkyl halide  $RX$  gives 4, 5-diethyloctane, when reacts with Na, it must be



The reaction is known as Wurtz reaction.

221 (a)

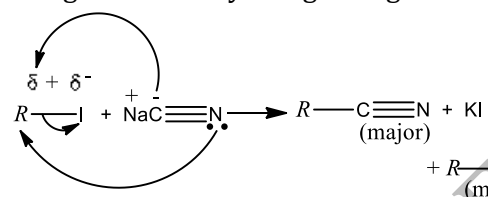


222 (a)

Grignard reagent is  $\text{RMgX}$ .

223 (c)

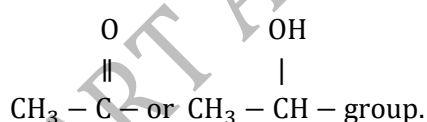
$\text{CN}^-$  (cyanide) is an ambidentate ligand, *i. e.*, it can donate electrons to the alkyl iodide either by using carbon or by using nitrogen.



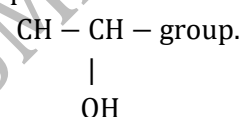
In principle, the reaction can occur either through carbon or nitrogen. But in practice, the reaction mainly occurs through carbon as carbon behave like a strong nucleophile.

224 (a)

The iodoform test is given by compounds which have



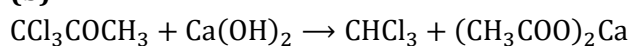
In this given compounds only  $\text{CH}_3\text{CH}_2\text{OH}$  gives positive iodoform test as it has



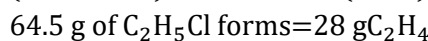
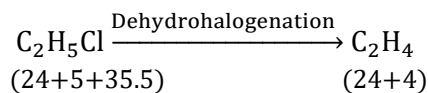
225 (d)

$\text{KBr}$  and conc.  $\text{H}_2\text{SO}_4$  gives  $\text{HBr}$ , which reacts with  $\text{C}_2\text{H}_5\text{OH}$  to give  $\text{C}_2\text{H}_5\text{Br}$ .

227 (b)



228 (d)



$$\therefore 32.25 \text{ g of } \text{C}_2\text{H}_5\text{Cl will form} = \frac{28}{64.5} \times 32.25 = 14 \text{ g } \text{C}_2\text{H}_4$$

yield of alkene = 50% of 14 g

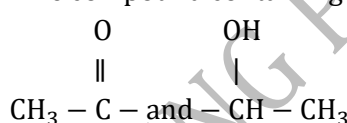
$$= \frac{50}{100} \times 14 = 7 \text{ g}$$

229 (d)

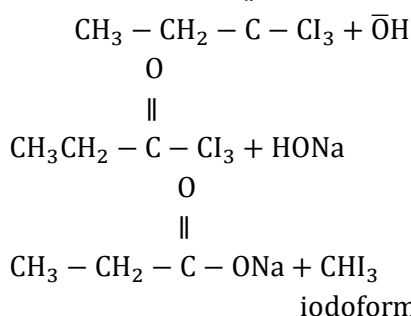
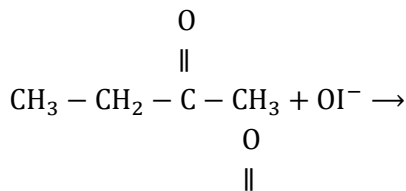
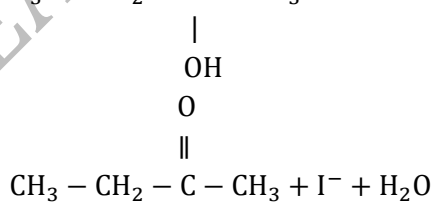
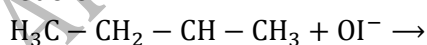
*p*-dichlorobenzene molecule has symmetrical structure. It can fit well in its crystal lattice. The intermolecular forces of attraction are strong. Hence, it possesses highest melting point.

231 (a)

The compound containing

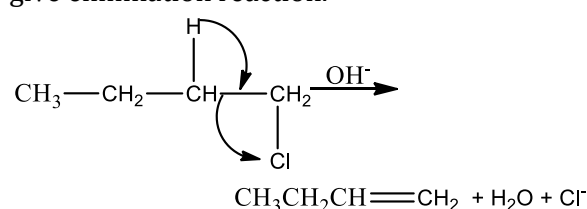


groups on heating with sodium hypiodite ( $\text{NaOI}$ ) or  $\text{I}_2$  with aq.  $\text{NaOH}$  or aq.  $\text{Na}_2\text{CO}_3$  gives yellow ppt. of iodoform and the reaction is known as iodoform.

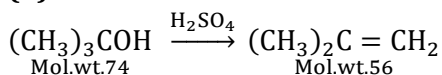


232 (a)

Alkyl halides in presence of strong alcoholic alkali give elimination reaction.



234 (b)

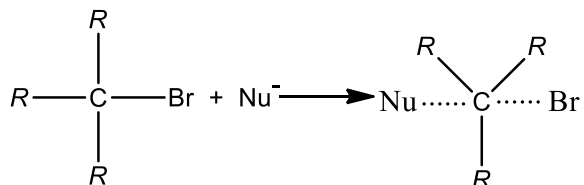


$$\therefore \% \text{ yield} = 65$$

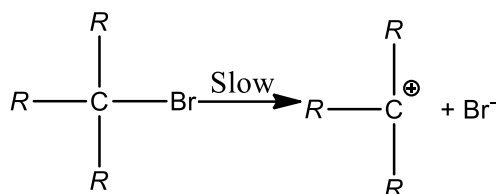
$$\therefore \text{Real yield} = \frac{56}{74} \times 37 \times \frac{65}{100} = 18.2 \text{ g}$$

235 (a)

In  $\text{S}_{\text{N}}2$  reaction, nucleophile and alkyl halide react in one step.

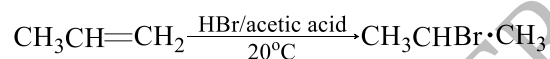
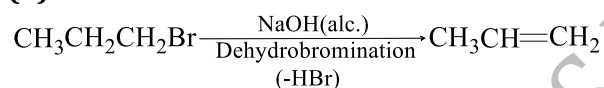


Thus, tertiary carbon is under steric hindrance thus reaction does not take place until (C-Br) bond breaks



Which is the  $\text{S}_{\text{N}}1$  reaction.

236 (b)



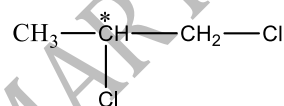
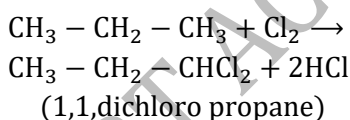
Acc. To Markownikoff's rule.

$\text{NaOH(aq.)}$  will lead to the formation of  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ ; in

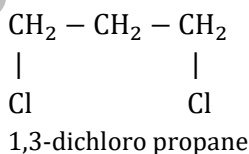
(d)  $\text{CH}_3\text{CHBrCH}_2\text{Br}$  will be formed.

237 (c)

There are four isomers obtained.



1,2-dichloro propane  
(optical active)  
*d*- and *l*-form



238 (d)

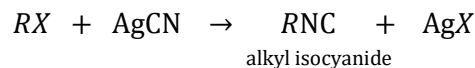
Two optical and two geometrical.

239 (c)

Industrial preparation of  $\text{CHCl}_3$  is carried out by

the action of bleaching powder over acetone.

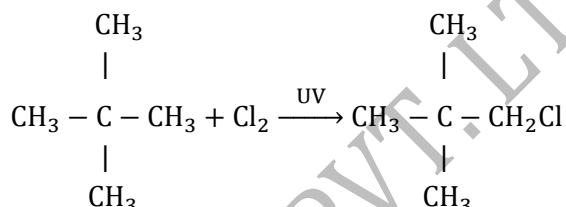
240 (a)



When alkyl halide reacts with silver cyanide, isocyanides are obtained. It is due to nucleophilic substitution in presence of  $\text{Ag}^+$ .

241 (d)

Neo-pentane gives only one monochloro derivative.



242 (d)

$\text{R-X} + \text{Zn} \longrightarrow \text{R-R} + \text{ZnX}_2$ ; if Zn is used in place of Na, the reaction is called Frankland's reaction.

244 (a)

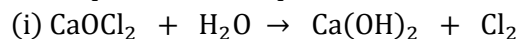
A gem dihalide possesses two halogens on same carbon atom.

245 (b)

$\text{R-MgX}$  are obtained as ethereal solution.

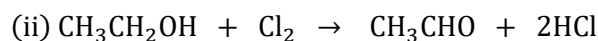
246 (a)

Chloroform ( $\text{CHCl}_3$ ) is formed on reaction of ethyl alcohol with bleaching powder. The reaction is complex and takes place in the following steps

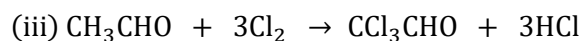


bleaching

powder

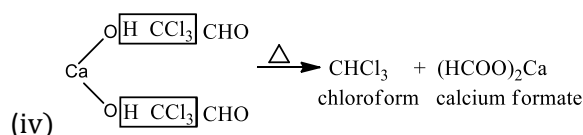


oxidation step



chloral

chlorination step



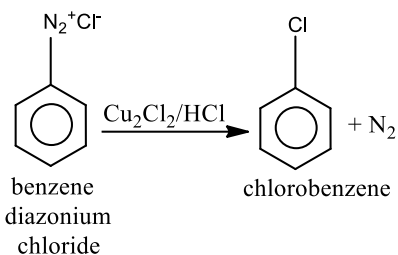
247 (a)

Chloral is commercial name of  $\text{CCl}_3\text{CHO}$ .

248 (d)

C-I bond is broken easily as well as ease of reaction is *t*-alkyl halide > *s*-alkyl halide > *p*-alkyl halide.

249 (b)



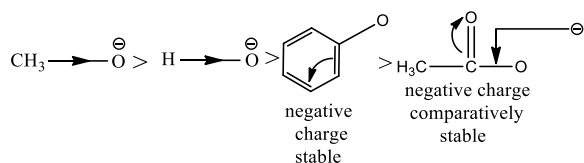
This reaction is known as Sandmeyer's reaction.

250 (b)

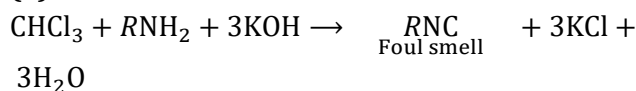
$(\text{CH}_3)_2\text{CHCH}_2\text{Cl}$  and  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Cl}$ ; only chain is different.

251 (a)

Nucleophilicity order is ;



254 (a)



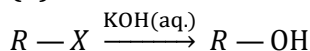
255 (a)

Zn dust removes  $X_2$  from molecule.

257 (d)

Order of reactivity of alkyl halide iodide > bromide > chloride > fluoride and tertiary > secondary > primary

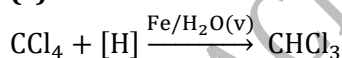
258 (b)



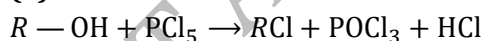
259 (d)

Reactivity of *t*-alkyl halides to show  $\text{S}_{\text{N}}2$  mechanism is least due to steric hindrance.

261 (c)



262 (a)



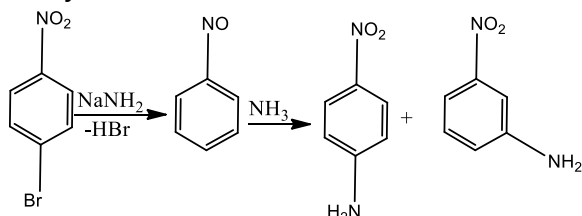
265 (c)

$\text{R}-\text{I} > \text{R}-\text{Br} > \text{R}-\text{Cl} > \text{R}-\text{F}$ ; reactivity order due to halogen atom.

$3^\circ > 2^\circ > 1^\circ$ ; reactivity order due to alkyl group.

266 (c)

Aryl halides in presence of strong base like  $\text{NaNH}_2$ , gives nucleophilic substitution reaction through benzyne intermediate.



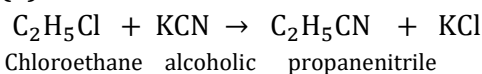
267 (b)

Rest all replace  $-\text{OH}$  by  $-\text{Cl}$ .

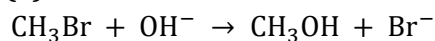
268 (c)

$-\text{OH}$  group is converted into  $-\text{Cl}$  group by  $\text{SOCl}_2$  or anhydrous  $\text{ZnCl}_2/\text{conc. HCl}$  or  $\text{HCl}$  etc.

269 (a)



270 (a)

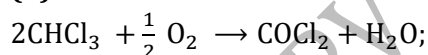


This reaction proceeds by  $\text{S}_{\text{N}}2$  mechanism.

Rate  $\propto$  [substrate][nucleophile]

Rate  $\propto$   $[\text{CH}_3\text{Br}][\text{OH}^-]$

271 (b)



$\text{COCl}_2$ , *i. e.*, phosgene is poisonous gas.

272 (d)

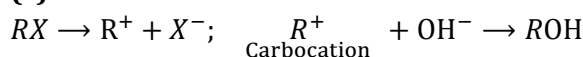
Westrosol is formed during addition of  $\text{Cl}_2$  on  $\text{CH}\equiv\text{CH}$  followed with action of lime. It is a very good solvent.



274 (c)

$\text{C}-\text{Mg}$  bond is covalent but polar.

275 (c)



277 (a)

10. Iodoform test is done to detect presence of  $\text{CH}_3\text{CO}$  group in organic compounds.

11. Fehling solution identifies aldehydes.

12. Tollen's reagent identifies aldehydes.

13. Schiff's reagent identifies aldehydes.

O

||

Methyl ketone is  $\text{CH}_3 - \text{C} - \text{R}$ .

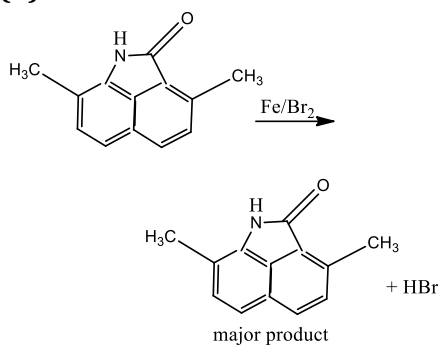
O

||

$\therefore$  It has  $\text{CH}_3 - \text{C}$  group. It is tested by using iodoform test.

The compound having  $\text{CH}_3\text{CO}$  group give yellow ppt. on reaction with  $\text{I}_2$  and aqueous alkali.

278 (b)



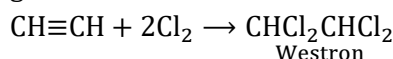
It is electrophilic substitution, so electrophile must be attacked on *o/p*-position due to higher electron density on this position. In this ring, the attached -NH- group will have high electron density due to resonance and *ortho* position is blocked, so electrophile is attached on *para* position.

280 (c)

$\text{CCl}_4$  is covalent compound.

282 (b)

Westrosol is formed during addition of  $\text{Cl}_2$  on  $\text{CH}\equiv\text{CH}$  followed with action of lime. It is a very good solvent.

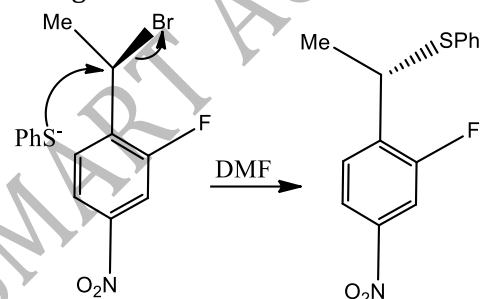


283 (b)

Elimination reaction.

286 (a)

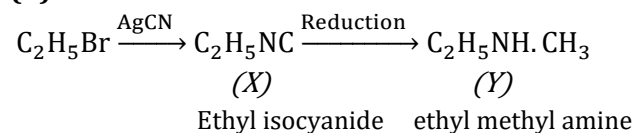
$\text{PhS}^-$  is a strong nucleophile and dimethyl formamide (DMF) is a highly polar aprotic solvent. Condition indicates that nucleophilic substitution ( $\text{S}_\text{N}2$ ) takes place at  $2^\circ$  benzylic place, stereochemically, it involves inversion of configuration.



287 (a)

$\text{C}_2\text{H}_5\text{Br}$  gives yellow ppt. of  $\text{AgBr}$  whereas,  $(\text{CH}_3)_2\text{CHCl}$  gives white ppt. if  $\text{AgCl}$ .

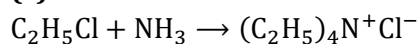
288 (d)



289 (d)

$\text{S}_\text{N}1$  order is  $\text{TH} > \text{SH} > \text{PH}$ .

290 (c)

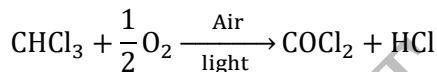


292 (b)

$\text{CH}_3\text{CHCl}_2$  gives aldehyde;  $\text{CH}_2\text{ClCH}_2\text{Cl}_2$  gives glycol.

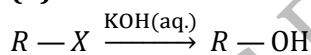
294 (c)

Chloroform is oxidised by air in the presence of light to form phosgene or carbonyl chloride which is poisonous gas.



Chloroform                      phosgene

295 (d)



296 (a)

$\text{CH}_3\text{CHBrCH}_2\text{CH}_2\text{CH}_3 \xrightarrow{\text{C}_2\text{H}_5\text{OK}} \text{CH}_3\text{CH}=\text{CHCH}_2\text{CH}_3$   
 $\alpha$ -, $\beta$ - elimination gives *trans*-isomers as main product.

298 (c)

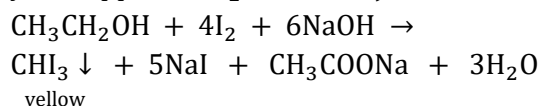
Oxidation of  $\text{CHCl}_3$  occurs in air and light.

301 (b)



303 (d)

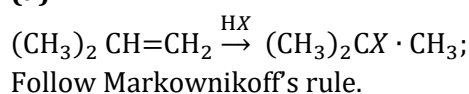
Ethyl alcohol gives positive iodoform test (*i.e.*, yellow ppt. with  $\text{I}_2$  and  $\text{NaOH}$ ).



304 (c)

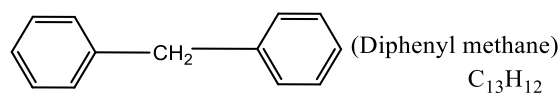
Reimer-Tiemann reaction.

305 (a)

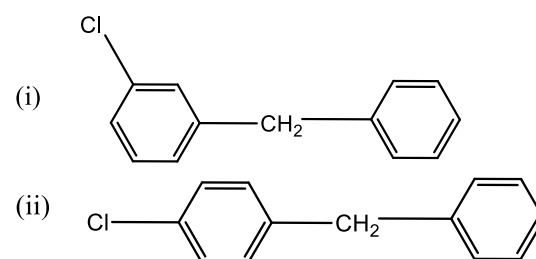


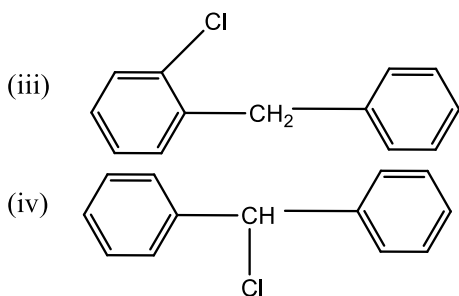
306 (b)

The molecular formula of diphenyl methane shows four isomers in form of monochloro derivatives.



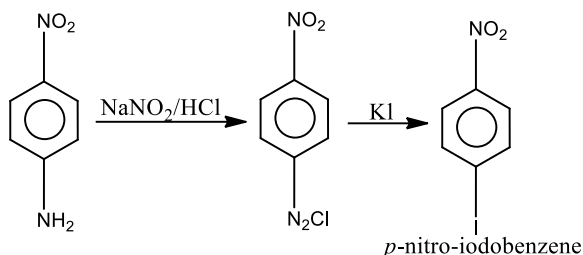
**Monochloro derivatives**





307 (a)

*p*-nitroiodobenzene can be prepared from *p*-nitroaniline as follows



308 (a)

Iodoform test is given by those compounds which have - CH<sub>3</sub>CO group or on oxidation yields this group. HCHO does not give this test.

309 (a)

CCl<sub>4</sub> is fire extinguisher used under the name pyre

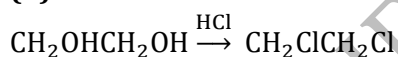
310 (a)

Among the primary halides reactivity order is CH<sub>3</sub>X > C<sub>2</sub>H<sub>5</sub>X > C<sub>3</sub>H<sub>7</sub>X, also chlorobenzene is less reactive due to resonance.

311 (b)

A white ppt. of AgCl is obtained if CHCl<sub>3</sub> is impure.

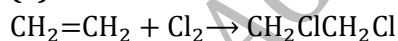
312 (d)



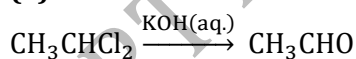
313 (c)

Only iodides and fluorides are obtained.

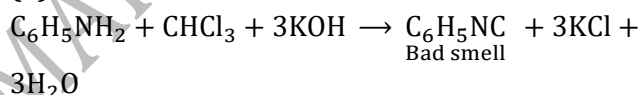
315 (a)



316 (a)

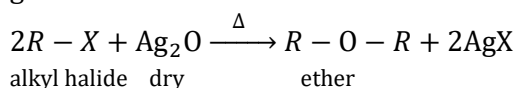


317 (a)



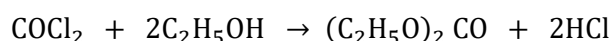
318 (c)

An alkyl halide on heating with dry silver oxide gives ether.



319 (d)

Ethyl alcohol converts phosgene to ethyl carbonate.



phosgene

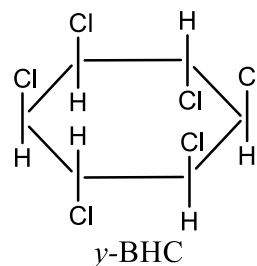
ethyl carbonate

320 (b)



321 (c)

$\gamma$ -isomer of cyclohexane hexachloride is strong pesticide. It is also known as lindane.



322 (b)

Methyl alcohol (CH<sub>3</sub>OH) does not give iodoform test.

324 (d)

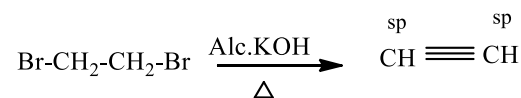
Elimination of HCl by alc. KOH.

325 (b)

Vapours of chloroform on inhaling causes unconsciousness.

327 (a)

Alkyl halides give elimination reaction with alcoholic KOH and yield an alkene or alkyne (from dihalides) *e.g.*,

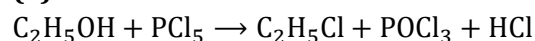


1,2-dibromo ethane

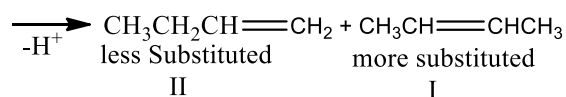
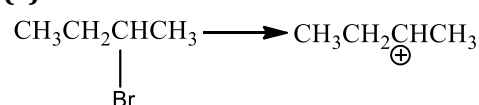
acetylene

Hence, product has both *sp*-hybridised carbon.

328 (a)

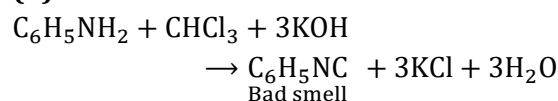


329 (c)



Stability of I > II hence, I is predominant.

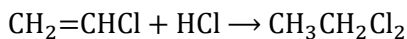
330 (b)



331 (a)

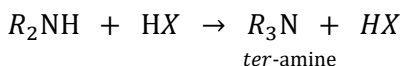
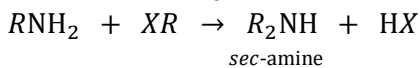
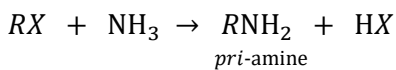
$\text{ROH} + \text{SOCl}_2 \rightarrow \text{RCl} + \text{SO}_2 \uparrow + \text{HCl} \uparrow$   
 $\therefore \text{SO}_2$  and  $\text{HCl}$  are gaseous by-products and can be removed easily to get pure alkyl halide.  
 $\therefore$  It is best method for preparation of alkyl halide.

332 (b)



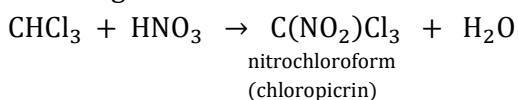
335 (d)

When an alkyl halide reacts with alcoholic ammonia in a sealed tube then a mixture of primary, secondary and tertiary amine is formed.



336 (d)

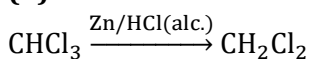
Chloroform on reaction with nitric acid give chloropicrin (nitro chloroform) according to following reaction



337 (d)

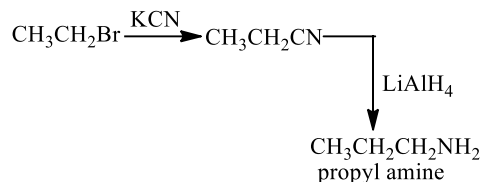
$\text{RMgX}$  is soluble in each.

338 (d)



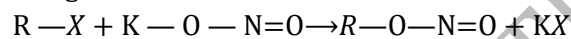
339 (a)

Ethyl bromide on treating with KCN, gives ethyl cyanide, which on reduction gives propyl amine.



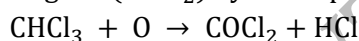
340 (a)

The compounds of oxyacids in which H-atom of —OH group is replaced by an alkyl group are called inorganic esters.

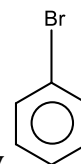


342 (b)

Chloroform is oxidised to a poisonous gas, phosgene ( $\text{COCl}_2$ ) by atmospheric oxidation.



343 (a)



The above reaction is not given by bromobenzene because in bromobenzene, halogen is directly attached with the benzene ring.