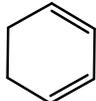
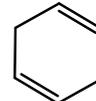
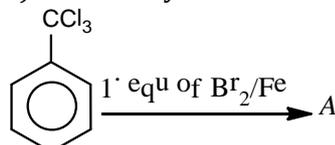
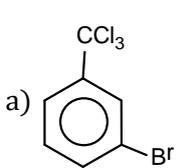
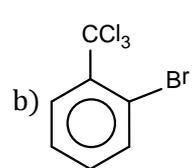
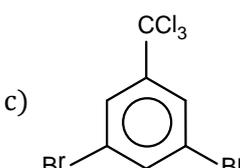
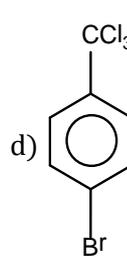


HALOALKANES AND HALOARENES

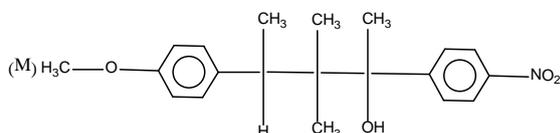
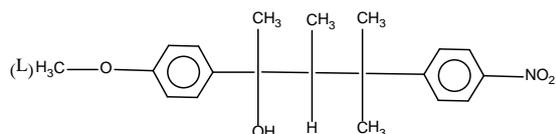
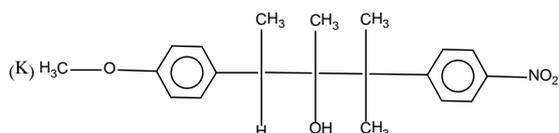
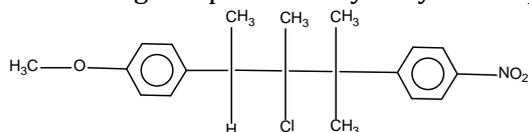
Single Correct Answer Type

- An alkyl halide may be converted into an alcohol by:
 - Addition
 - Substitution
 - Dehydrohalogenation
 - Elimination
- Methylene chloride on hydrolysis yields:
 - HCHO
 - CH₃CHO
 - CHCl₃
 - CH₃COCl
- The order of reactivities of methyl halides in the formation of Grignard reagent is
 - CH₃I > CH₃Br > CH₃Cl
 - CH₃Cl > CH₃Br > CH₃I
 - CH₃Br > CH₃Cl > CH₃I
 - CH₃Br > CH₃I > CH₃Cl
- The IUPAC name of the compound, (CH₃)₂CHCH₂CH₂Br is:
 - 2-methyl-3-bromopropane
 - 1-bromopentane
 - 2-methyl-4-bromobutane
 - 1-bromo-3-methylbutane
- Preparation of alkyl halides in laboratory is least preferred by:
 - Halide exchange
 - Direct halogenation of alkanes
 - Treatment of alcohols
 - Addition of hydrogen halides to alkenes
- Which reagent is useful in increasing the carbon chain of an alkyl halide?
 - HCN
 - KCN
 - NH₄CN
 - AgCN
- Carbon tetrachloride reacts with steam at 500°C to give:
 - COCl₂
 - CHCl₃
 - Both (a) and (b)
 - None of these
- When iodoform is heated with silver powder it forms:
 - Acetylene
 - Ethylene
 - Methane
 - Ethane
- Which is used as a general anaesthetic in place of diethyl ether?
 - CF₃—CHClBr
 - CF₃—CHCl₂
 - CF₃—CHBr₂
 - None of these
- $X + KCN \rightarrow CH_3CN \xrightarrow{2H_2/Ni} CH_3CH_2NH_2$,
What is (X)?
 - CH₃CH₂Cl
 - CH₃Cl
 - CH₃CH₂CH₂Cl
 - (CH₃)₂CHCl
- Which of the following statements is incorrect regarding benzyl chloride?
 - It gives white precipitate with alcoholic AgNO₃
 - It is an aromatic compound with substitution in the side chain
 - It undergoes nucleophilic substitution reaction
 - It is less reactive than vinyl chloride
- 1, 2-dibromo cyclohexane on dehydrogenation gives
 - 
 - 
 - 
 - None of these
- Which of the following will not respond to iodoform test?
 - Ethyl alcohol
 - Propanol-2
 - Propanol-1
 - Ethanal
- Which one of the following is not true for the hydrolysis of *t*-butyl bromide with aqueous NaOH?
 - Reaction occurs through the S_N1 mechanism.

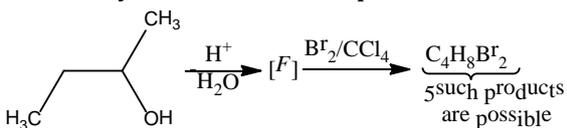
- b) The intermediate formed is a carbocation.
 c) Rate of the reaction doubles when the concentration of alkali is doubled.
 d) Rate of the reaction doubles when the concentration of *t*-butyl bromide is doubled.
15. Ethyl alcohol gives ethyl chloride on treatment with:
 a) NaCl b) SOCl₂ c) Cl₂ d) KCl
16. The S_N1 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
17. 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
18. In the following sequence of reactions

$$\text{CH}_3\text{---Br} \xrightarrow{\text{KCN}} \text{A} \xrightarrow{\text{H}_3\text{O}^+} \text{B} \xrightarrow[\text{Ether}]{\text{LiAlH}_4} \text{C}$$
 the end product (C) is:
 a) Acetaldehyde b) Ethyl alcohol c) Acetone d) Methane
19. 
 Compound A is
- a)  b)  c)  d) 
20. 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
21. 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
22. Which halide does not get hydrolysed by sodium hydroxide?
 a) Vinyl chloride b) Methyl Chloride c) Ethyl chloride d) Isopropyl chloride
23. Non-sticking frying pans are coated with:
 a) Ethylene
 b) Styrene
 c) Tetrafluoroethylene (Teflon)
 d) Chlorofluoro methane
24. The chemical formula of 'tear gas' is
 a) COCl₂ b) CO₂ c) Cl₂ d) CCl₃NO₂

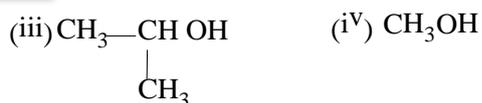
25. In order to convert aniline into chlorobenzene the reagent used is
 a) $\text{NaNO}_2/\text{HCl}, \text{CuCl}$ b) Cl_2/CCl_4 c) $\text{Cl}_2/\text{AlCl}_3$ d) CuCl_2
26. $\text{CaOCl}_2 + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + X$
 $X + \text{CH}_3\text{CHO} \rightarrow Y$
 $Y + \text{Ca(OH)}_2 \rightarrow \text{CHCl}_3$.
 What is 'Y'?
 a) $\text{CH}_3\text{CH(OH)}_2$ b) CH_2Cl_2 c) CCl_3CHO d) $\text{CCl}_3\text{COCH}_3$
27. Solvent used in dry-cleaning of clothes is:
 a) Alcohol b) Acetone c) Carbon tetrachloride d) freon
28. One of the following that cannot undergo dehydrohalogenation is
 a) *iso*-propyl bromide b) ethanol c) Ethyl bromide d) None of the above
29. CCl_4 is insoluble in water because:
 a) Water is non-polar
 b) CCl_4 is non-polar
 c) Water and CCl_4 are polar
 d) None of the above
30. 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)
31. $\text{CH}_3\text{Br} + \text{KCN(alc.)} \rightarrow X$
 $\xrightarrow[\text{Na+C}_2\text{H}_5\text{OH}]{\text{Reduction}} Y$
 What is Y in the series?
 a) CH_3CN b) $\text{C}_2\text{H}_5\text{CN}$ c) $\text{C}_2\text{H}_5\text{NH}_2$ d) CH_3NH_2
32. 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) CH_3CH_3
 d) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$

33. Alkyl halides react with dialkyl lithium cuprate to give:
 a) Alkenes b) Alkyl Cu halide c) Alkanes d) Alkenyl halide
34. 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
35. Ethyl bromide reacts with lead-sodium alloy to form:
 a) Tetraethyl lead b) Tetraethyl bromide c) Both (a) and (b) d) None of these
36. 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
37. Methyl bromide is not used:
 a) As an insecticide
 b) As disinfectant
 c) For dyeing clothes
 d) As disinfectant for young fruit trees
38. Hexachloroethane is also called
 a) Artificial sweetener b) Artificial camphor c) Artificial polymer d) None of these
39. Which of the following are arranged in decreasing order of dipole moment:
 a) CH_3Cl , CH_3Br , CH_3F b) CH_3Cl , CH_3F , CH_3Br c) CH_3Br , CH_3Cl , CH_3F d) CH_3Br , CH_3F , CH_3Cl
40. On warming with silver powder, chloroform is converted into
 a) Acetylene b) Hexachloroethane
 c) 1, 1, 2, 2-tetrachloroethane d) Ethylene
41. How many structures of *F* is possible?


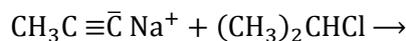
 a) 2 b) 5 c) 6 d) 3
42. Polymer of chloroethylene is:
 a) PVC b) Teflon c) Nylon d) Terylene
43. Chlorobenzene gives aniline with
 a) $\text{NH}_3/\text{Cu}_2\text{O}$ b) $\text{NH}_3/\text{H}_2\text{SO}_4$ c) NaNH_2 d) None of the above
44. The product of vinyl chloride and HCl is a
 a) *gem* chloride b) Ethylidene chloride
 c) 1, 1 dichloroethane d) All of the above are correct
45. Methyl chloride reacts with silver acetate to yield:
 a) Acetic acid b) Methyl acetate c) Acetyl chloride d) Acetaldehyde
46. Tertiary butyl alcohol gives tertiary butyl chloride on treatment with
 a) Conc. HCl/anhy. ZnCl_2 b) KCN c) NaOCl d) Cl_2
47. 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) $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{C}_6\text{H}_5$
48. Which of these compounds is synthesised by chloral?
 a) DDT b) BHC c) Chloroform d) Michlers ketones
49. Following compounds are given:
 (i) $\text{CH}_3\text{CH}_2\text{OH}$ (ii) CH_3COCH_3



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

- a) (i),(iii) and (iv) b) Only (ii) c) (i), (ii) and (iii) d) (i) and (ii)

50. In the reaction,



the product formed is:

- a) 4-methyl-2-pentyne b) Propyne c) Propyne and propene d) None of these

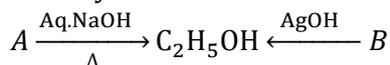
51. What happens if CCl_4 is treated with AgNO_3 ?

- a) A white ppt. of AgCl will form b) NO_2 will be evolved
c) CCl_4 will dissolve in AgNO_3 d) Nothing will happen

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

- a) Methanal b) Phenol c) Ethanol d) Methanol

53. Identify *A* and *B* in the following reactions



- a) $A = \text{C}_2\text{H}_2, B = \text{C}_2\text{H}_6$ b) $A = \text{C}_2\text{H}_5\text{Cl}, B = \text{C}_2\text{H}_4$
c) $A = \text{C}_2\text{H}_4, B = \text{C}_2\text{H}_5\text{Cl}$ d) $A = \text{C}_2\text{H}_5\text{Cl}, B = \text{C}_2\text{H}_5\text{Cl}$

54. 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

55. Which of the following will not give positive iodoform test?

- a) $\text{CH}_3\text{CH}_2\text{CHOHCH}_3$ b) $\text{CH}_3\text{CH}_2\text{CH}_2\text{COCH}_3$ c) $\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3$ d) $\text{CH}_3\text{COC}_6\text{H}_5$

56. *n*-propyl bromide reacts with ethanolic KOH to form:

- a) Propane b) Propene c) Propyne d) Propyl alcohol

57. The product of reaction between alcoholic silver nitrite with ethyl bromide is

- a) Ethene b) Ethane c) Ethyl nitrile d) Nitro ethane

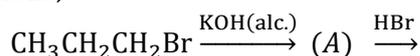
58. $(\text{CH}_3)_3\text{CMgCl}$ on reaction with D_2O gives:

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

59. Iodoform can be used in medicine as:

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

60. In the following sequences of reactions;



(B) $\xrightarrow{\text{KOH(aq.)}}$ (C) the end product (C) is :

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

61. Which one is liquid at room temperature?

- a) CH_3Cl b) $\text{C}_2\text{H}_5\text{Cl}$ c) CH_3Br d) $\text{C}_2\text{H}_5\text{Br}$

62. Which compound is used in cooling?

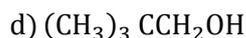
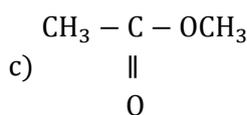
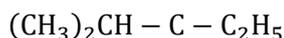
- a) CHCl_3 b) CCl_4 c) CF_4 d) CCl_2F_2

63. Which of the following alkyl halide is used as methylating agent?

- a) $\text{C}_2\text{H}_5\text{Cl}$ b) $\text{C}_2\text{H}_5\text{Br}$ c) $\text{C}_2\text{H}_5\text{I}$ d) CH_3I

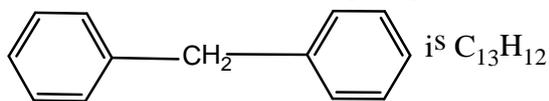


64. The product obtained on treatment of ethyl chloride with potassium cyanide is reduced by sodium and alcohol to give:
 a) Propyl amine b) Ethyl amine c) Diethyl amine d) Acetic acid
65. Phenol is heated with CHCl_3 and alcoholic KOH when salicylaldehyde is produced. The reaction is known as:
 a) Rosenmund's reaction
 b) Reimer-Tiemann reaction
 c) Friedel-Craft's reaction
 d) Sommelet reaction
66. Which of the following does not answer iodoform test?
 a) *N*-butyl alcohol b) *Sec*-butyl alcohol c) Acetophenone d) Acetaldehyde
67. Which compound is used as helminthicide for elimination of hook worms?
 a) CH_4 b) CHCl_3 c) $\text{C}_2\text{H}_2\text{Cl}_4$ d) CCl_4
68. A Grignard reagent is prepared by reacting magnesium with:
 a) Methyl amine b) Diethyl ether c) Ethyl iodide d) Ethyl alcohol
69. Which statement is correct?
 a) $\text{C}_2\text{H}_5\text{Br}$ reacts with alcoholic KOH to form $\text{C}_2\text{H}_5\text{OH}$
 b) $\text{C}_2\text{H}_5\text{Br}$ when treated with metallic sodium gives ethane
 c) $\text{C}_2\text{H}_5\text{Br}$ when treated with sodium ethoxide forms diethyl ether
 d) $\text{C}_2\text{H}_5\text{Br}$ with AgCN forms ethyl cyanide
70. An alkyl halide reacts with equivalent amount of NH_3 to give:
 a) Amide b) Cyanide c) Amine d) None of these
71. 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^{-4} b) 1×10^{-4} c) 5×10^{-5} d) 1×10^{-5}
72. A salt solution is treated with chloroform drops and is shaken with chlorine water. Chloroform layer becomes violet, solution contains:
 a) NO_2^- b) NO_3^- c) Br^- d) I^-
73. 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
74. Which is not present in Grignard reagent?
 a) Carboxylic radical represented by COOH
 b) Magnesium represented by Mg
 c) Alkyl radical represented by R
 d) Halide radical represented by X
75. $\text{C}_2\text{H}_5\text{Br}$ can be obtained in the laboratory by the action of ethyl alcohol with:
 a) KBr b) NH_4Br c) Br_2 d) KBr and conc. H_2SO_4
76. 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
77. Iodoform can be obtained on warming NaOH and iodine with
 a) $\text{CH}_3 - \text{CH}_2 - \text{CH}(\text{OH})\text{CH}_3$ b) $\begin{matrix} \text{O} \\ || \end{matrix}$



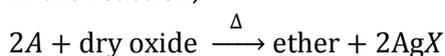
78. What mass of isobutylene is obtained from 37 g of tertiary butyl alcohol by heating with 20% H_2SO_4 at 363 K, if the yield is 65%?
- a) 16 g b) 18.2 g c) 20 g d) 22 g
79. In the dichlorination reaction of propane, mixture of products are obtained. How many isomers the mixture contains?
- a) 2 b) 3 c) 4 d) 5
80. $\text{RX} + \text{A} \rightarrow \text{RNC}$
A is
- a) AgCN b) KCN c) NaCN d) HCN
81. Chloretone used as a drug is prepared by the reaction of acetone with:
- a) Chlorine b) Ethyl chloride c) Chloroform d) Ethylene dichloride
82. The product formed on reaction of ethyl alcohol with bleaching powder is
- a) CHCl_3 b) CCl_3CHO c) CH_3COCH_3 d) CH_3CHO
83. 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
84. The reaction described below is:
- $$\begin{array}{c} \text{CH}_3(\text{CH}_2)_5 \\ \diagdown \\ \text{H}_3\text{C} - \text{C} - \text{Br}^+\text{OH}^- \\ \diagup \\ \text{H} \end{array}$$
- $$\begin{array}{c} (\text{CH}_2)_5\text{CH}_3 \\ \diagdown \\ \text{HO} - \text{C} - \text{CH}_3 \\ \diagup \\ \text{H} \end{array}$$
- a) $\text{S}_{\text{E}}1$ b) $\text{S}_{\text{N}}2$ c) $\text{S}_{\text{N}}1$ d) $\text{S}_{\text{E}}2$
85. The reagent used for dehalogenation of 1,2-dichloropropane is:
- a) Zn dust b) Zn—Hg c) Na d) Zn—Cu couple
86. 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
87. Carbon tetrachloride on treatment with $\text{Fe}/\text{H}_2\text{O}$ gives:
- a) Chloromethane b) Methane c) Chloroform d) Methylene chloride
88. Which one is correct?
- a) Freon-14 is CF_4 ; Freon-13 is CF_3Cl ; Freon-12 is CF_2Cl_2 and Freon-11 is CFCl_3
b) Freons are chlorofluorocarbons
c) Freons are used as refrigerants
d) All of the above
89. Reagent not used to prepare an alkyl halide from an alcohol is:
- a) $\text{HCl} + \text{ZnCl}_2$ b) NaCl c) PCl_5 d) SOCl_2
90. $\text{CH}_3\text{Br} + \text{OH}^- \rightarrow \text{CH}_3\text{OH} + \text{Br}^-$ reaction proceeds by $\text{S}_{\text{N}}2$ mechanism. Its rate is dependent on the concentration of
- a) $\text{CH}_3\text{Br}, \text{OH}^-$ b) CH_3Br only c) OH^- only d) $\text{CH}_3\text{Br}, \text{CH}_3\text{OH}$

91. The compound formed on heating chlorobenzene with chloral in the presence of concentrated sulphuric acid is
 a) Gammexane b) DDT c) Freon d) Hexachloroethane
92. The alkyl group of Grignard reagent acts as:
 a) Free radical b) Carbonium ion c) Carbanion d) None of these
93. 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
94. 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
95. The hydrogen atom in chloroform is:
 a) Acidic b) Basic c) Neutral d) None of these
96. In the following sequence of reactions
 $\text{C}_2\text{H}_5\text{Br} \xrightarrow{\text{AgCN}} \text{X} \xrightarrow{\text{Reduction}} \text{Y}; \text{Y is}$
 a) *n*-propyl amine b) Isopropylamine c) Ethylamine d) ethylmethyl amine
97. 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
98. 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
99. Bottles containing $\text{C}_6\text{H}_5\text{I}$ and $\text{C}_6\text{H}_5\text{CH}_2\text{I}$ 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 $\text{C}_6\text{H}_5\text{I}$ b) *A* was $\text{C}_6\text{H}_5\text{CH}_2\text{I}$
 c) *B* was $\text{C}_6\text{H}_5\text{I}$ d) Addition of HNO_3 was unnecessary
100. Isocyanide test is used to detect:
 a) Primary alcohols b) Primary amines c) Secondary amines d) Secondary alcohols
101. Which of the following compound give yellow precipitate with I_2 and NaOH?
 a) CH_3OH b) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ c) $\text{C}_2\text{H}_5\text{OC}_2\text{H}_5$ d) $\text{CH}_3\text{CH}_2\text{OH}$
102. The molecular formula of diphenyl methane is



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
103. Fires result from the combustion of alkali metals can be extinguished by:
 a) CCl_4 b) Sand c) Water d) Kerosene
104. Ethylene dichloride can be prepared by adding HCl to:
 a) Ethane b) Ethylene c) Acetylene d) Ethylene glycol
105. Ethylene on treatment with chlorine gives:
 a) Ethylene dichloride
 b) Ethylene chlorohydrin
 c) CH_4
 d) C_2H_6
106. In the reaction,



A is a/an

- a) Primary alcohol b) Acid c) Alkyl halide d) Alcohol

107. Which one of the isomers of cyclohexane hexachloride is strong pesticide?

- a) α b) β c) γ d) δ

108. Ethyl iodide on treatment with alcoholic potash gives:

- a) Ethyl alcohol b) Ethane c) Acetylene d) Ethylene

109. 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^3, sp^3 c) sp^3, sp^2 d) sp^3, sp^2

110. The compound formed in carbylamine test is:

- a) $C_6H_5-C\equiv N$ b) $C_6H_5-N\equiv C$ c) $CH_3-O-C\equiv N$ d) $CH_3-N=C=O$

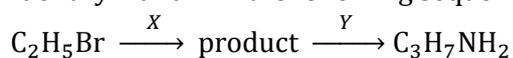
111. In dihalogen derivatives if two halogen atoms are attached to the same carbon atom, the compound is called:

- a) Gem dihalide b) Vicinal dihalide c) Both (a) and (b) d) None of these

112. 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

113. Identify X and Y in the following sequence



- a) $X = KCN, Y = LiAlH_4$ b) $X = KCN, Y = H_3O^+$
c) $X = CH_3Cl, Y = AlCl_3/HCl$ d) $X = CH_3NH_2, Y = HNO_2$

114. Chloroform, when kept open, is oxidised to

- a) CO_2 b) $COCl_2$ c) CO_2, Cl_2 d) None of these

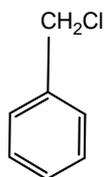
: ANSWER KEY :

1)	b	2)	a	3)	a	4)	d	5)	b	6)	b	7)	a	8)	a
9)	a	10)	b	11)	d	12)	b	13)	c	14)	c	15)	b	16)	b
17)	b	18)	b	19)	a	20)	d	21)	a	22)	a	23)	c	24)	d
25)	a	26)	c	27)	c	28)	b	29)	b	30)	a	31)	c	32)	b
33)	c	34)	a	35)	a	36)	a	37)	c	38)	b	39)	b	40)	a
41)	d	42)	a	43)	a	44)	d	45)	b	46)	a	47)	c	48)	a
49)	c	50)	a	51)	d	52)	c	53)	d	54)	d	55)	c	56)	b
57)	d	58)	a	59)	b	60)	d	61)	d	62)	d	63)	d	64)	a
65)	b	66)	a	67)	d	68)	c	69)	c	70)	c	71)	c	72)	d
73)	a	74)	a	75)	d	76)	d	77)	a	78)	b	79)	c	80)	a
81)	c	82)	a	83)	b	84)	b	85)	a	86)	b	87)	c	88)	d
89)	b	90)	a	91)	b	92)	c	93)	b	94)	b	95)	a	96)	d
97)	d	98)	c	99)	a	100)	b	101)	d	102)	b	103)	a	104)	d
105)	a	106)	c	107)	c	108)	d	109)	a	110)	b	111)	a	112)	d
113)	a	114)	b												

: HINTS AND SOLUTIONS :

- 1 (b)
 $R-X \xrightarrow{\text{KOH(aq.)}} R-OH$
- 2 (a)
 $\text{CH}_2\text{Cl}_2 \xrightarrow{\text{HOH}} \text{CH}_2(\text{OH})_2 \xrightarrow{-\text{H}_2\text{O}} \text{HCHO}$
- 3 (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
 $\text{CH}_3\text{I} > \text{CH}_3\text{Br} > \text{CH}_3\text{Cl}$
- 5 (b)
 A mixture of halides is formed.
- 6 (b)
 $\text{CH}_3\text{X} + \text{KCN} \rightarrow \text{CH}_3\text{CN}$
- 7 (a)
 $\text{CCl}_4 + \text{H}_2\text{O(v)} \rightarrow \text{COCl}_2 + 2\text{HCl}$
- 8 (a)
 $\text{CH}_3\text{I} + 6\text{Ag} + \text{I}_3\text{HC} \rightarrow \text{C}_2\text{H}_2 + 6\text{AgX}$
- 9 (a)
 CF_3CHClBr , *i.e.*, haloethane is less hazardous and rapid in action.
- 10 (b)
 $\text{RCl} + \text{KCN} \rightarrow \text{RCN} + \text{KCl}$
 alkyl chloride alkyl cyanide
- $\text{CH}_3\text{Cl} + \text{KCN} \rightarrow \text{CH}_3\text{CN} \xrightarrow{2\text{H}_2/\text{Ni}} \text{CH}_3\text{CH}_2\text{NH}_2$
 methyl chloride methyl cyanide ethyl amine (Primary amine)

- 11 (d)
 Benzyl chloride is very reactive. It readily gives white precipitate with alcoholic AgNO_3 at room temperature. It also readily undergoes nucleophilic substitution. Its structure is as follows



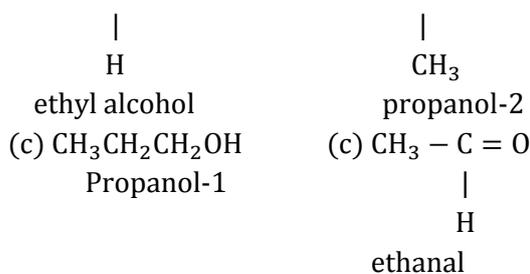
Vinyl chloride ($\text{CH}_2 = \text{CH} \cdot \text{Cl}$), on the other hand, is less reactive than benzyl chloride due to resonance.



- 13 (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



- (a) $\text{CH}_3\text{CH} - \text{OH}$ (b) $\text{CH}_3\text{CH} - \text{OH}$

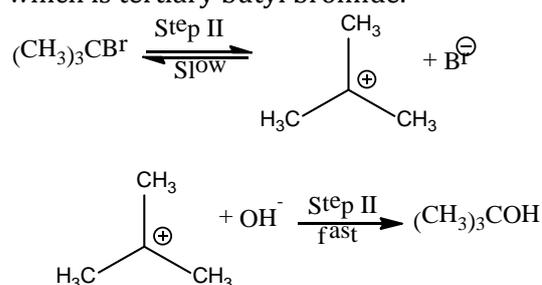


Hence, propanal-1 due to absence of above given groups, does not give positive iodoform test.

14

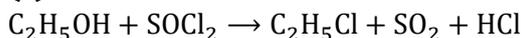
(c)

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.



15

(b)



16

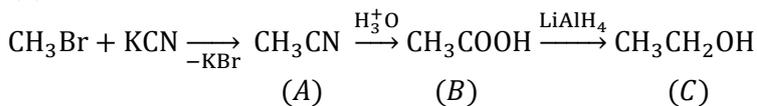
(b)

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

Benzyl > Allyl > 3° > 2° > 1° > Phenyl halide.

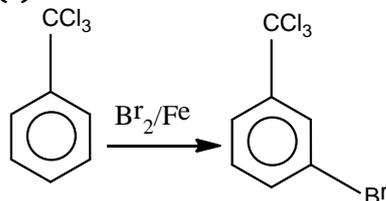
17

(b)



19

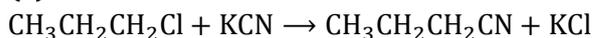
(a)



As- CCl_3 group is *meta*-directing.

20

(d)



21

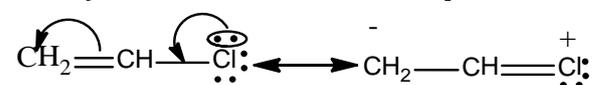
(a)

Larger is C—X bond length; more is reactivity.

22

(a)

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



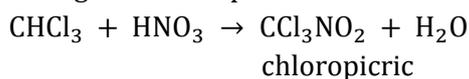
Vinyl chloride

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

24

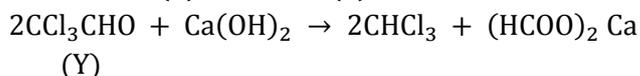
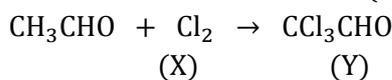
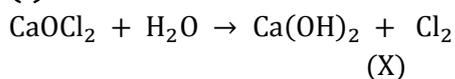
(d)

Tear gas is chloropicrin. It is obtained by the reaction of chloroform with nitric acid.



26

(c)



28

(b)

Ethanol cannot undergo dehydrohalogenation as it does not contain any halogen.

29

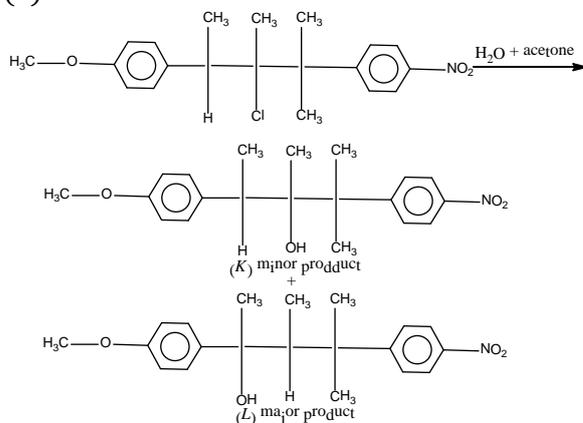
(b)

CCl_4 is non-polar; H_2O is polar.

30

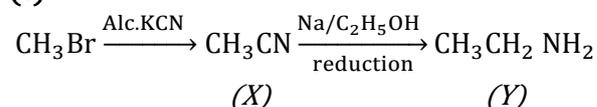
(a)

The product (K) is formed through simple substitution while major product (L) is formed through H^- shift *via* $\text{S}_{\text{N}}1$ reaction and methoxy group stabilizes the carbocation intermediate of product (L).



31

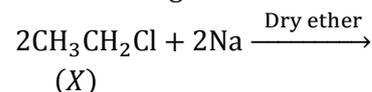
(c)



32

(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.



ethyl chloride

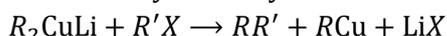


butane

33

(c)

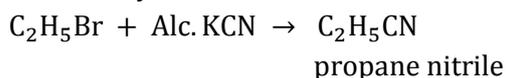
This is corey house synthesis:

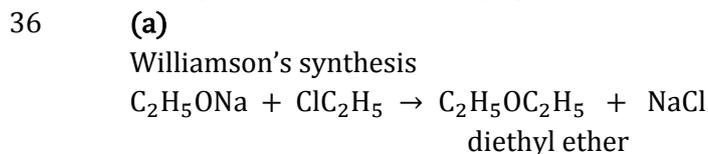
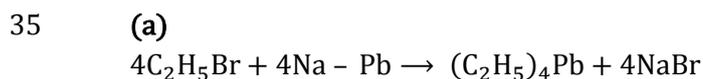


34

(a)

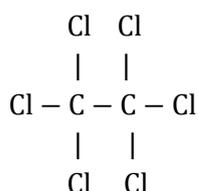
When ethyl bromide reacts with alcoholic KCN, propane nitrile is obtained as main product.



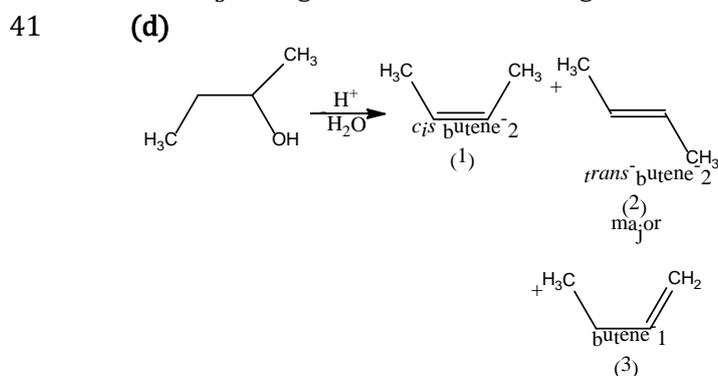
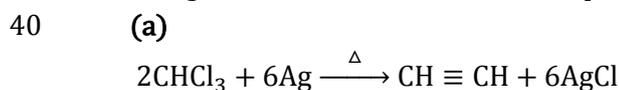


37 (c)
 It is not a colouring material.

38 (b)
 Hexachloroethane is also called artificial camphor. Its structure is

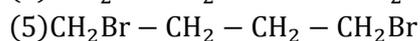
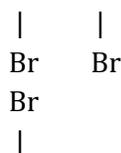


39 (b)
 Dipole moment of CH_3Cl is more than CH_3F due to larger C—X bond. Also electronegativity of Br being less than F and Cl and thus inspite of larger C—X bond dipole moment of CH_3Br is lowest.



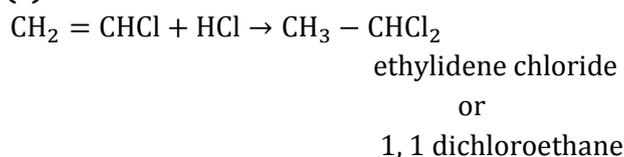
In [F] order of quantity of alkene $2 > 1 > 3$

These on addition with Br_2/CCl_4 to give their addition products which have $\text{C}_4\text{H}_6\text{Br}_2$ as molecular formula.



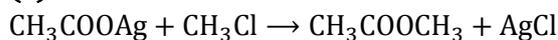
42

(d)



43

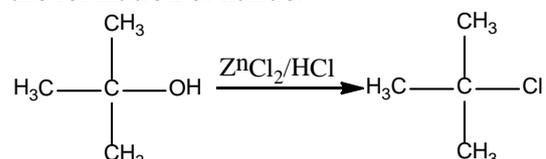
(b)



46

(a)

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



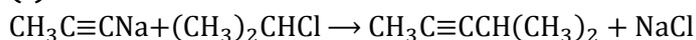
49

(c)

Follow iodoform test.

50

(a)



51

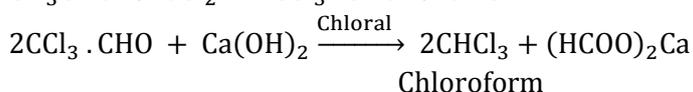
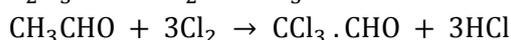
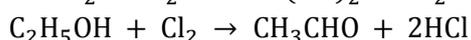
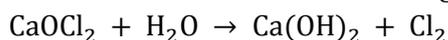
(d)

CCl_4 is a covalent compound, therefore, it does not ionise to give Cl^- ions hence, it does not give white ppt. of AgCl when treated with AgNO_3 solution. There is no reaction to evolve NO_2 . CCl_4 will form a separate layer as it is immiscible with water.

52

(c)

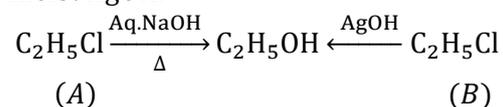
Ethanol on reaction with bleaching powder, gives chloroform (trichloromethane).



53

(d)

Ethyl chloride can be converted into ethanol either by its alkaline hydrolysis or by its reaction with moist AgOH .



54

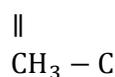
(d)

In CHCl_3 , carbon is sp^3 -hybridised.

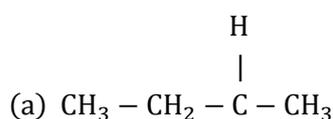
55

(c)

Iodoform test is positive for compounds which have O



group or 2° alcohol group.



$$\begin{array}{c} | \\ \text{OH} \end{array}$$

has 2° alcoholic group

$$\begin{array}{c} \text{O} \\ || \end{array}$$

(b) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{C} - \text{CH}_3$
has $\text{CH}_3\text{CO} -$ group

$$\begin{array}{c} \text{O} \\ || \end{array}$$

(d) $\text{CH}_3 - \text{C} - \text{C}_6\text{H}_5$
has $\text{CH}_3\text{CO} -$ group

∴ Compounds in choice (a), (b) and (d) give positive iodoform test.

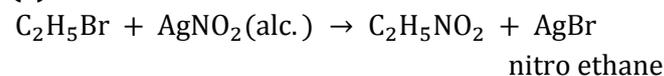
$$\begin{array}{c} \text{O} \\ || \end{array}$$

$\text{CH}_3 - \text{CH}_2 - \text{C} - \text{CH}_2 - \text{CH}_3$

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

∴ It does not give positive iodoform test.

57

(d)

59

(b)

I_2 possesses antiseptic nature.

61

(d)

CH_3Cl , $\text{C}_2\text{H}_5\text{Cl}$ and CH_3Br are gases at room temperature.

62

(d)

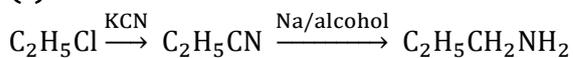
Freon, CCl_2F_2 is used in cooling.

63

(d)

RX are called alkylating agent. CH_3X is methylating agent; $\text{C}_2\text{H}_5\text{X}$ is ethylating agent.

64

(a)

66

(a)

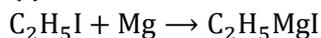
n-butyl alcohol ($\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$) does not give iodoform test because it does not possess the $\text{CH}_3\text{CO} -$ or CH_3CHOH group.

67

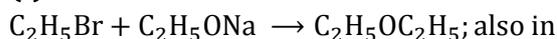
(d)

CCl_4 is used as medicine in this form.

68

(c)

69

(c)

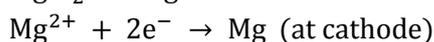
(a) C_2H_4 is formed; in (b) C_4H_{10} is formed, in

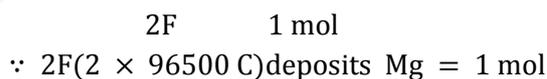
(d) $\text{C}_2\text{H}_5\text{NC}$ is formed.

70

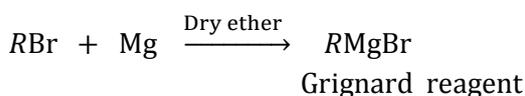
(c)

71

(c)



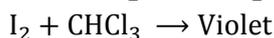
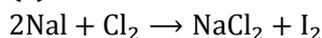
$$\therefore 9.65 \text{ C charge will deposit Mg} = \frac{1 \times 9.65}{2 \times 96500} = 5 \times 10^{-5} \text{ mol}$$



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.

72

(d)



73

(a)

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

74

(a)

Grignard reagent is $RMgX$.

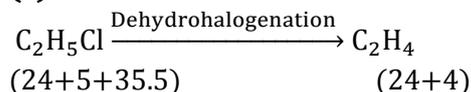
75

(d)

KBr and conc. H_2SO_4 gives HBr, which reacts with $\text{C}_2\text{H}_5\text{OH}$ to give $\text{C}_2\text{H}_5\text{Br}$.

76

(d)



64.5 g of $\text{C}_2\text{H}_5\text{Cl}$ forms = 28 g C_2H_4

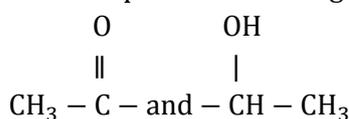
$$\therefore 32.25 \text{ g of } \text{C}_2\text{H}_5\text{Cl} \text{ will form} = \frac{28}{64.5} \times 32.25 = 14 \text{ g } \text{C}_2\text{H}_4$$

$$\begin{aligned} \text{yield of alkene} &= 50\% \text{ of } 14 \text{ g} \\ &= \frac{50}{100} \times 14 = 7 \text{ g} \end{aligned}$$

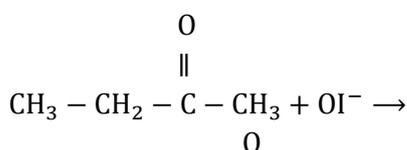
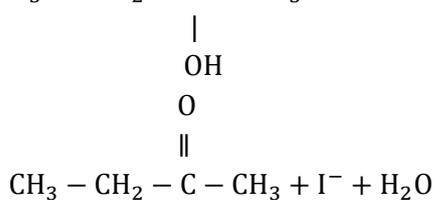
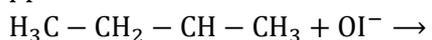
77

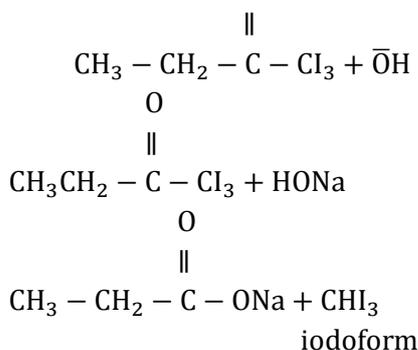
(a)

The compound containing

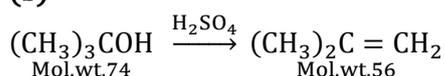


groups on heating with sodium hypoiodite (NaOI) or I_2 with aq. NaOH or aq. Na_2CO_3 gives yellow ppt. of iodoform and the reaction is known as iodoform.





78 (b)

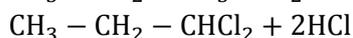
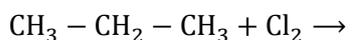


$$\therefore \% \text{ yield} = 65$$

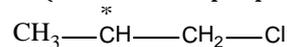
$$\therefore \text{Real yield} = \frac{56}{74} \times 37 \times \frac{65}{100} = 18.2 \text{ g}$$

79 (c)

There are four isomers obtained.



(1,1,dichloro propane)

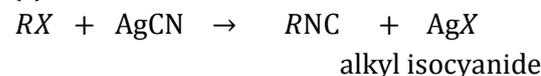


1,2-dichloro propane
(Optically active)
d and l form



1,3-dichloro propane

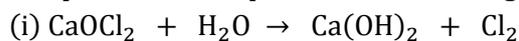
80 (a)



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

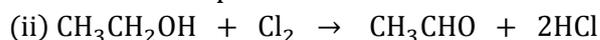
82 (a)

Chloroform (CHCl_3) is formed on reaction of ethyl alcohol with bleaching powder. The reaction is complex and takes place in the following steps

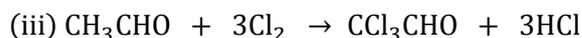


bleaching

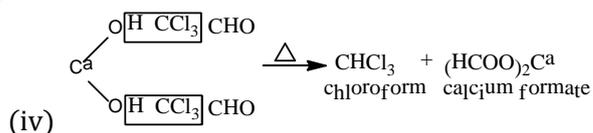
powder



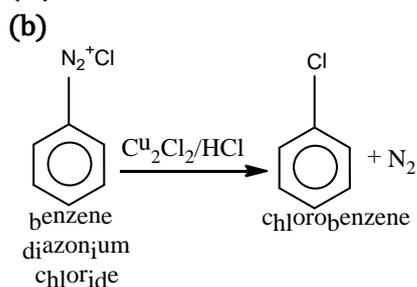
(oxidation step)



(chloral
chlorination step)



83

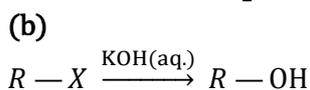


This reaction is known as Sandmeyer's reaction.

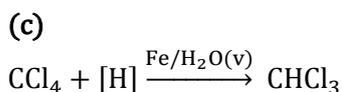
85

(a) Zn dust removes X_2 from molecule.

86



87



89

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

90

(a)
$$\text{CH}_3\text{Br} + \text{OH}^- \rightarrow \text{CH}_3\text{OH} + \text{Br}^-$$

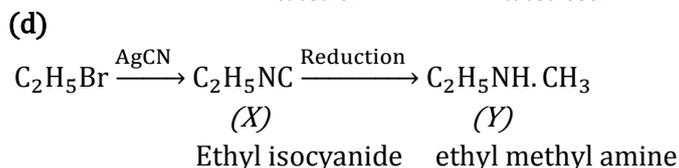
 This reaction proceeds by S_N2 mechanism.
 Rate \propto [substrate][nucleophile]
 Rate \propto $[\text{CH}_3\text{Br}][\text{OH}^-]$

94

(b) Westrosol is formed during addition of Cl_2 on $\text{CH}\equiv\text{CH}$ followed with action of lime. It is a very good solvent.

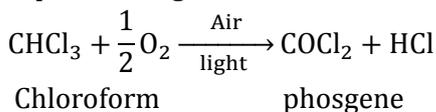


96



98

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



101

(d) Ethyl alcohol gives positive iodoform test (*i. e.*, yellow ppt. with I_2 and NaOH).

$$\text{CH}_3\text{CH}_2\text{OH} + 4\text{I}_2 + 6\text{NaOH} \rightarrow$$

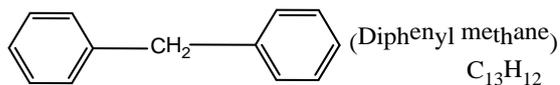
$$\text{CHI}_3 \downarrow + 5\text{NaI} + \text{CH}_3\text{COONa} + 3\text{H}_2\text{O}$$

 Yellow

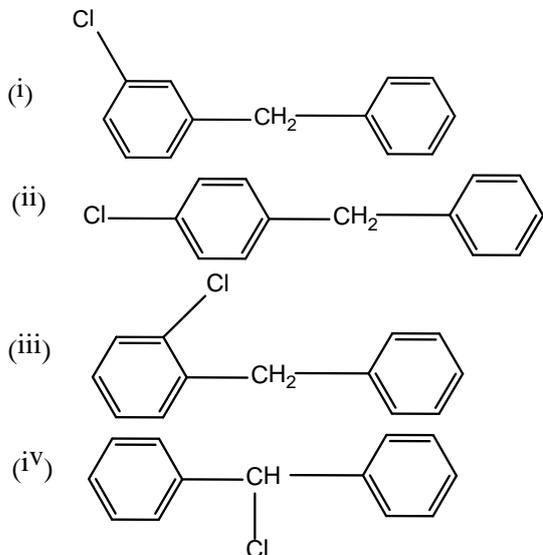
102

(b)

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



Monochloro derivatives



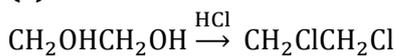
103

(a)

CCl_4 is fire extinguisher used under the name pyrene.

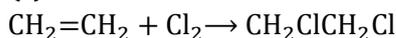
104

(d)



105

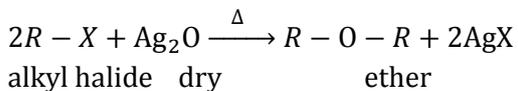
(a)



106

(c)

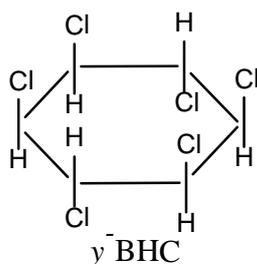
An alkyl halide on heating with dry silver oxide gives ether.



107

(c)

γ -isomer of cyclohexane hexachloride is strong pesticide. It is also known as lindane.



108

(d)

Elimination of HCl by alc. KOH.

109

(a)

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

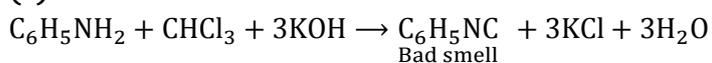


1,2-dibromo ethane acetylene

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

110

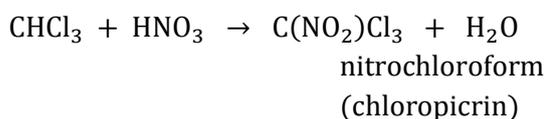
(b)



112

(d)

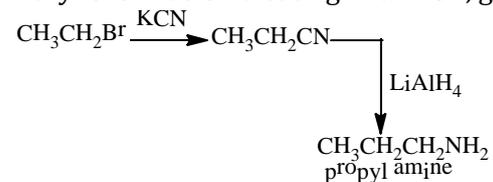
Chloroform on reaction with nitric acid give chloropicrin (nitro chloroform) according to following reaction



113

(a)

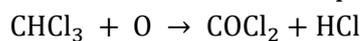
Ethyl bromide on treating with KCN, gives ethyl cyanide, which on reduction gives propyl amine.



114

(b)

Chloroform is oxidised to a poisonous gas, phosgene (COCl_2) by atmospheric oxidation.



Matrix Match Type

This section contain(s) 1 question(s). Each question contains Statements given in 2 columns which have to be matched. Statements (A, B, C, D) in **columns I** have to be matched with Statements (p, q, r, s) in **columns II**.

1. Match the following. The correct match is

Column-I		Column- II	
(A) C_2H_5Cl , moist Ag_2O		(1) CH_3CH_2ONO	
(B) C_2H_5Cl , aqueous ethanolic $AgCN$		(2) C_2H_4	
(C) C_2H_5Cl , aqueous ethanolic $AgNO_2$		(3) CH_3CH_2OH	
(D) C_2H_5Cl , ethanolic KOH		(4) CH_3CH_2NC	
		(5) C_2H_6	

CODES :

	A	B	C	D
a)	5	3	4	1
b)	1	2	3	4
c)	3	4	1	2
d)	4	1	2	5



: ANSWER KEY :

1)	c
----	---

: HINTS AND SOLUTIONS :

1 (c)

Reactants	Products
A. C_2H_5Cl , moist Ag_2O	(iii) CH_3CH_2OH
B. C_2H_5Cl , aqueous ethanolic $AgCN$	(iv) CH_3CH_2NC
C. C_2H_5Cl , aqueous ethanolic $AgNO_2$	(i) CH_3CH_2ONO
D. C_2H_5Cl , ethanolic KOH	(ii) C_2H_4

