CHEMISTRY

BOOKS - MODERN PUBLISHERS CHEMISTRY (HINGLISH)

HALOALKANES AND HALOARENES

Solved Examples

1. Write the IUPAC names of the following compounds:

View Text Solution

2. Write the IUPAC names of the following compounds:

View Text Solution

3. Write structures of the following compounds:

(i) 2-Chloro-3-methylpentane

(ii) 1-Chloro-4-ethylcyclohexane

(iii) 4-tert. Butyl-3-iodoheptane

(iv) 1,4-Dibromobut-2-ene

(v) 1-Bromo-4-sec. butyl-2-methylbenzene.

Watch Video Solution

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

Watch Video Solution

5. Write structural formulae and give IUPAC names of isomers of $C_4H_8Cl_2$

Watch Video Solution

6. Write the structure of the major product and IUPAC name in each of the following reactions :

(i) $CH_3CH_2CH_2Cl + NaI \xrightarrow[\text{Heat}]{\text{Acetone}}$

(ii) $CH_3CH_2Cl + SbF_3 \xrightarrow{\text{Heat}}$

(iii) $CH_3CH_2CH_2OH + SOCl_2 \rightarrow$

(iv) $CH_3CH_2CH = CH_2 + HBr \xrightarrow{\text{Peroxide}}$

(v) $CH_3CH_2\underset{\underset{CH_3}{|}}{C} = CH_2 + HBr \xrightarrow{\text{No Peroxide}}$

(vi) $CH_3CH_2CH_2Br + Hg_2F_2 \rightarrow$

(vii) $CH_3CH_2C \equiv CH + HCl(\text{1-equiv}) \rightarrow$

(viii) $CH_3CH = CH_2 + Cl_2 \xrightarrow{773-873k}$

Watch Video Solution

7. Draw the structures of major monohalo products in each of the following reactions :

View Text Solution

8. Draw and name all monochloro products you would expect to obtain from free radical chlorination of 2-methyl pentane.

Watch Video Solution

9. Write the products of the following reactions :

(i) $CH_3CH_2 - CH = CH_2 + HCl \rightarrow$

(ii) $Me_2CHCH_2OH \xrightarrow{SOCl_2}$

(iii) 

(iv) $Me_2C = CMe_2 \xrightarrow{Br_2}$

(v) 

View Text Solution

10. Draw the structures of the major monohalo product in each of the following:

View Text Solution

11. Identify chiral and achiral molecules in each of the following pairs of compounds :

View Text Solution

12. (a) Out of  , which one is optically active and why?

(b) Which alkyl halide from the following pair undergoes faster S_N2 reaction with OH^-?

CH_3Br or CH_3I

(c) Which one of the following reacts faster in an S_N1 reaction?

(d) Out of S_N1 and S_N2 which occurs with

(i) Inversion of configuration

(ii) Racemisation

(e) Write the structure of alkene formed by dehydrohalogenation of 1-bromo-1-methylcyclohexane with alcoholic KOH.

View Text Solution

13. Complete the following reactions (giving major products):

(a) $CH_3CH_2COOAg \xrightarrow{Br_2} ? \xrightarrow{alc.KOH}$

(b) $? \xrightarrow{P, Br_2} CH_3\underset{\underset{Br}{|}}{C}HCH_3 \xrightarrow{alc.KOH} ? \xrightarrow[\text{Peroxide}]{HBr}$

(c) $CH_3CH_2CH_2Cl \xrightarrow{CH_3C\equiv CNa}$

(d) 

(e) $CH_3\underset{\underset{CH_3}{|}}{C}HI \xrightarrow[\text{Dry ether}]{Na}$

(f) $CH_3CH=CH_2 \xrightarrow{HBr} ? \xrightarrow{aq.KOH} ?$

(g) $CH_3CH_2Br + KOH(alc) \rightarrow$

View Text Solution

14. Predict the order of reactivity of the following compounds in S_N1 and S_N2 reactions :

(a) The four isomeric bromobutanes

(b)

$C_6H_5CH_2Br, C_6H_5CH(C_6H_5)Br, C_6H_5CH(CH_3)Br, C_6H_5C(CH_3)(C_6H$

Watch Video Solution

15. (a) In the following pairs of the halogen compounds, which would undergo S_N2 faster ?

(b) Which one of the following pairs undergoes S_N1 substitution reaction faster and why?

View Text Solution

16. Which compound in each of the following pairs will react faster in SN^2 reaction with HO^- ?

a. CH_3Br or CH_3I

b. $(CH_3)_3CCl$ or CH_3Cl

c. $CH_2 = CHBr$ or $CH_2 = CH - CH_2Br$

Watch Video Solution

17. Predict the order of reactivity of the following compounds in dehydrohalogenation:

(a)

$CH_3CH_2CH_2CH_2Cl, (CH_3)_2CHCH_2Cl, (CH_3)_2CH - CH_2Br, CH_3CH$

(b)

$CH_3CH(Br)CH_3, CH_3CH_2CH_2Br, (CH_3)_2CHCH_2Br, (CH_3)_3CCH_2Br$

Watch Video Solution

18. A chloro derivative (A) on treatment with zinc - copper couple gives a hydrocarbon with five C atoms. When 'A' is dissolved in ether and treated with sodium, 2,2,5,5-tetramethyl hexane is obtained. What is the original compound 'A' ?

Watch Video Solution

19. What products would you expect from the elimination of the following alkyl halides, which product will be major in each case :

(i) 2-Bromo-2-methylbutane (ii) 3-Bromo-2,3,5-trimethylhexane (iii) 

View Text Solution

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

Watch Video Solution

21. (a) Write the structure of the major product in each of the following:

 (b) Write the structure of the product formed when chlorobenzene is treated with methyl chloride in the presence of sodium metal and dry ether.

View Text Solution

22. How will you carry out the following conversions in not more than two steps:

(i) Toluene to benzyl alcohol (ii) Ethanol to ethyl fluoride (iii) Benzene to biphenyl

(iv) 1-Chlorobutane to n-octane (v) Benzyl alcohol to phenylethanenitrile

(vi) But-1-ene to But-2-ene

Watch Video Solution

23. Arrange the following in increasing order of their expected S_N1 reactivity :

(i)

$CH_3CH(Br)CH_3, CH_3CH_2Br, CH_2 = CHBr, CH_2 = CHCH(Br)CH_3$

(ii)

$ClCH_2CH = CHCH_2CH_3, CH_3C(Cl) = CHCH_2CH_3, CH_3CH = CHC$

(iii) $(CH_3)_3CCl, C_6H_5C(CH_3)_2Cl, (CH_3)_2CHCl, CH_3CH_2CH_2Cl$

Watch Video Solution

24. The following compounds ar given to you

2-Bromopentane,2-Bromo-2-methylbutane,1-Bromopentane

(a) Write the compound which is most reactive towards S_N^2 reaction.

(b) Write the compound which is optically active.

(c). Write the compound which is most reactive towards β-elimination reaction.

Watch Video Solution

25. Propose mechanism of the reaction taking place when

(a) (-)-2-Bromooctane reacts with sodium hydroxide to form (+)-octane-2-ol.

(b) 2-Bromopentane is heated with (alc.) KOH to form alkenes.

Watch Video Solution

26. How will you convert the following:

(i) Isopropyl chloride to n-propyl chloride (ii) Methyl bromide to ethylamine

(iii) Chlorobenzene to benzoic acid (iv) Methyl bromide to acetic acid

(v) Propane to allyl chloride (vi) 1-Bromopropane to 2-bromopropane

(vii) Propene to propyne (viii) Ethanol to but-1-yne

Watch Video Solution

27. How will you distinguish between the following (give one chemical test):

(a) Chlorobenzene and chlorocyclohexane

(b) Chlorobenzene and benzyl chloride

(c) Ethyl chloride and vinyl chloride

(d) Chlorobenzene and n-hexylchloride

(e) Chloroethane and bromoethane

(f) 3-Bromopropene and 1-bromopropane.

Watch Video Solution

Practice Problems

1. Give the structural formula and IUPAC names of (a) iso-butyl iodide (b) tert-amyl bromide (c) sec-butyl bromide.

Watch Video Solution

2. Write the structures of the following compounds and identify them as $1^{\circ}, 2^{\circ}$ or 3° halides.

(a) 1-Bromo-2-methylpropane (b) 2-Chloro-2-methylpropane (c) 2-Bromo-3-methylbutane

(d) 3-Bromopentane (e) 2-Bromo-2-methylbutane (f) Neopentyl chloride.

Watch Video Solution

3. Write the structures of the following dihaloalkanes and identify them as gem or vicinal, if any:

(a) 2, 3-Dichlorobutane (6) 2,2-Dichlorobutane (c) 1,4-Dichlorobutane

(d) 1,2-Dichlorobutane (e) 1,3-Dichloro-2-methylpropane.

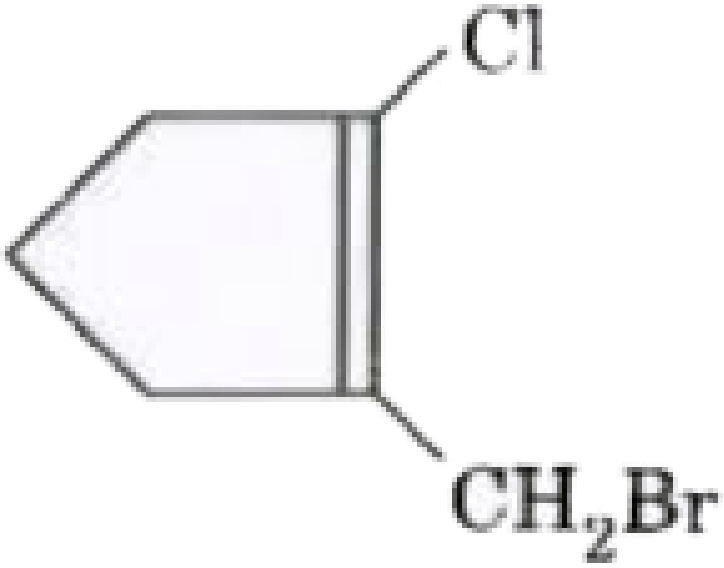
Watch Video Solution

4. Write all the possible isomers of compound C_4H_9Br and give their IUPAC names.

Watch Video Solution

5. Classify the following as alkyl, vinyl, allyl or aryl halides :

(i) $H_2C = CHCHI_2$ (ii) $CH_3CH = CFCH_2CH_3$ (iii)



(iv) $(CH_3)_2CClCH_2CH_3$ (v) $(CH_3)_2C=CHCH_2Br$ (vi) C_6H_5Br

Watch Video Solution

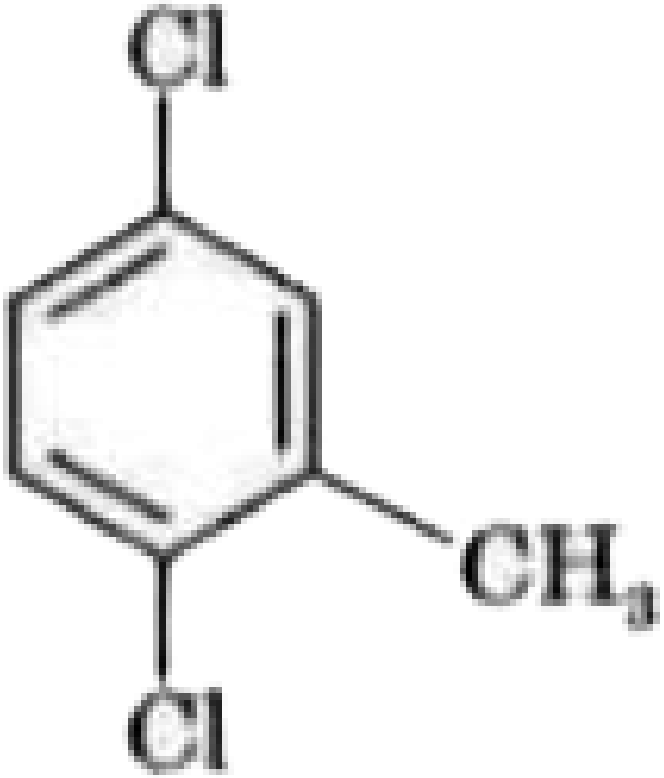
6. Write IUPAC names of the following compounds :

(i) $CHF_2CBrClF$ (ii) $ClCH_2C\equiv CCH_2Br$ (iii)

$$CH_3CH=CH-\underset{\underset{Br}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_3$$

(iv) $(CH_3)_2C=CHCH_2Cl$ (v)

$(CH_3)_3CCH(Cl)CH(CHBrCH_3)CH_2CH_2CH(CH_3)_2$



(vi)

(vii)

$$CH_3 - \overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}} - Cl$$

Watch Video Solution

7. Write IUPAC names of the following compounds :

(a) $CH_3CH(Cl)CH(Br)CH_3$

(b) $CHF_2CBrClF$

(c) $ClCH_2C \equiv CCH_2Br$

(d) $(CCl_3)_3CCl$

(e) $CH_3C(p - ClC_6H_4)_2CH(Br)CH_3$

(f) $(CH_3)_3CCH = C(Cl)C_6H_4I - p$

(g) $CH_3CHCl(CH_2)_2CCl_2C_2H_5$

Watch Video Solution

8. Identify all the possible monochloro structural isomers expected to be formed on free radical monochlorination of $(CH_3)_2CHCH_2CH_3$.

Watch Video Solution

9. From each of the following pairs, predict which compound will have higher boiling point:

(i) isopropyl bromide and n-propyl bromide (ii) bromoethane and iodoethane

(iii) tert-butyl chloride and tert-butyl iodide (iv) iso-propyl bromide and n-butyl bromide

Watch Video Solution

10. Arrange the following in the increasing order of boiling point:

(i) $(CH_3)_3CBr$ (ii) $CH\overset{Br}{\overset{|}{C}}HCH_2CH_3$ (iii) $CH_3CH_2CH_2CH_2Br$ (iv) $(CH_3)_3C-Cl$

Watch Video Solution

11. Which isomer of C_4H_9Cl will have the lowest boiling point?

Watch Video Solution

12. Which of the following metal is used in the preparation of Grignard's reagent?

Watch Video Solution

13. Which of the following is most reactive alcohol for its reaction with HCl ?

(a) $(CH_3)_3COH$ (b) $(CH_3)_2CHCH_2OH$ (c) $CH_3\underset{\underset{OH}{|}}{C}HCH_3$

Watch Video Solution

14. Name the reagents which can convert

(a). 1-Chloropropane into 1-Nitropropane (b) Bromoethane to But-1-yne

(c). Bromoethane to Butane.

Watch Video Solution

15. Select the compound in each of the following pairs that can be converted to corresponding alkyl bromide more rapidly on being treated with hydrogen bromide :

l(i) 1-butanol or 2-butanol (ii) 2-methyl-1-butanol or 2-butanol

(iii) 2-methyl-2-butanol or 2-butanol

Watch Video Solution

16. Which will be the main product when the following haloalkanes are treated with alcoholic KOH ?

(i) 2-bromobutane (ii) $CH_3CH_2C(CH_3)_2Cl$

Watch Video Solution

17. Predict all the alkenes that would be formed by dehydrohalogenation of the following halides with sodium ehoxide in ethanol and indentify major alkene.

a. $I-$ Bromo $-1-$ mehylecyclohexane

b. Chcolhexylmethyl bromide

c. $2-$ Chloro $-2-$ ilutane

d. $3-$ Bromopent $1-$ ene

e. $2, 2, 3-$ Trimethyl $3-$ bromopentane.

Watch Video Solution

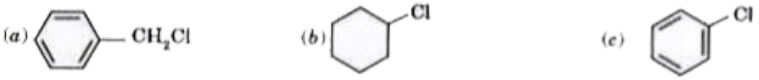
18. Which out of o-chloronitrobenzene and 2, 4, 6-trinitrochlorobenzene is more reactive towards nucleophilic substitution?

Watch Video Solution

19. Write the structure of diphenyl. How is it prepared from chlorobenzene?

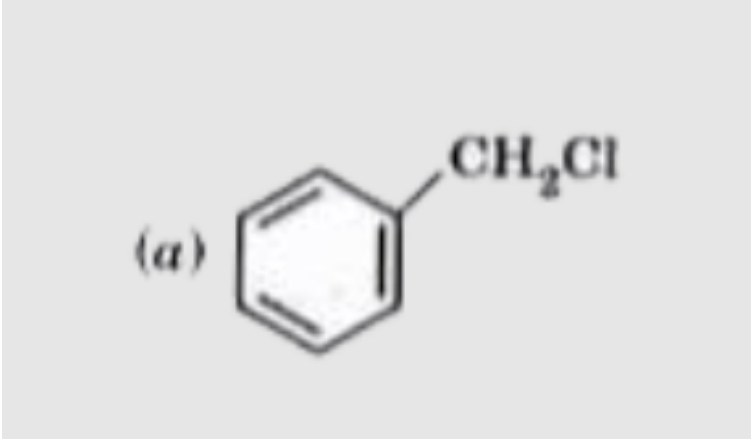
Watch Video Solution

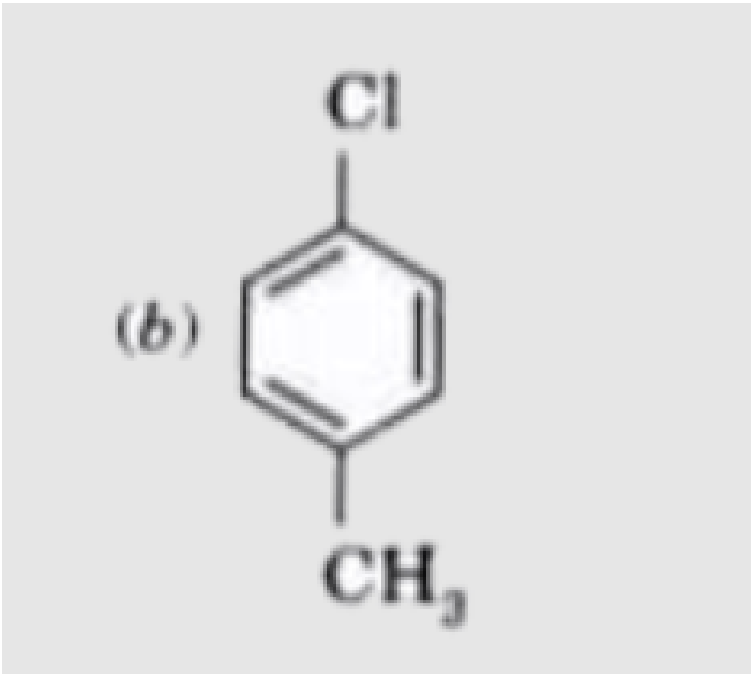
20. Which of the following is an aryl halide ?

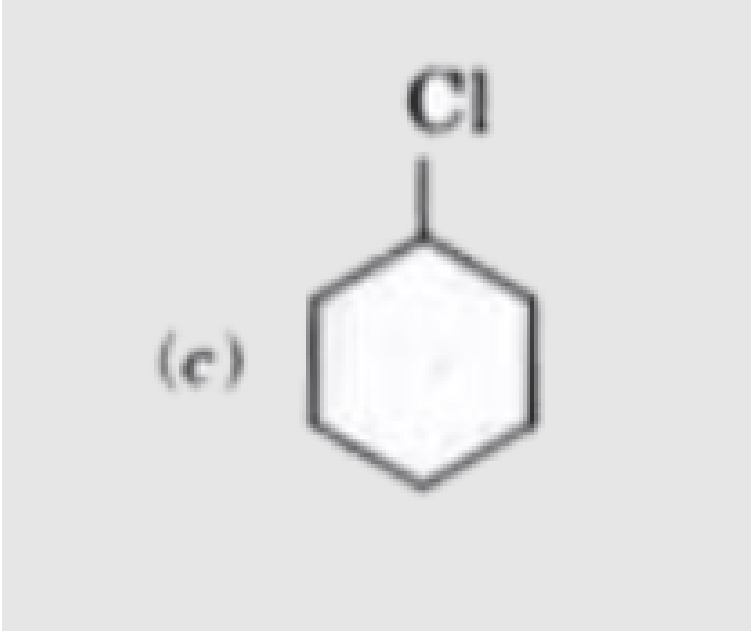


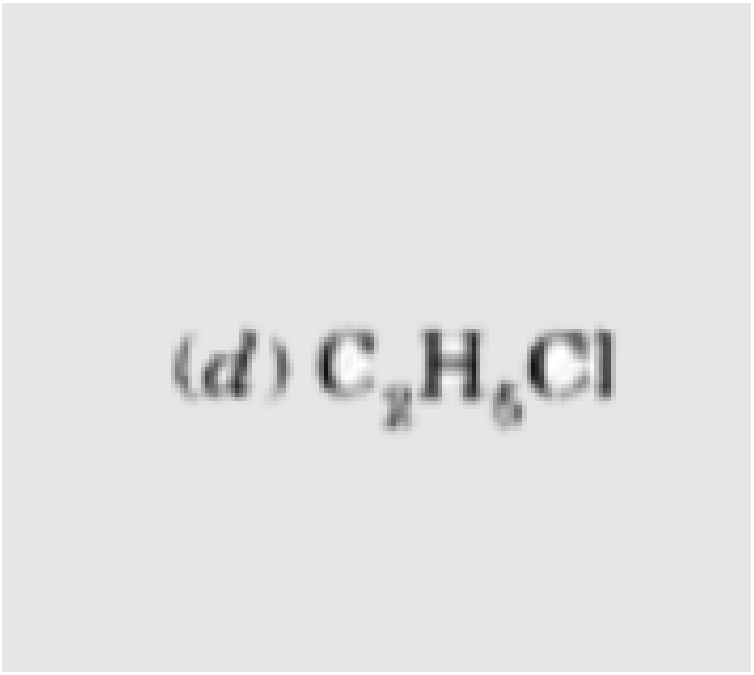
Watch Video Solution

21. Which of the following will be least reactive towards nucleophilic substitution reaction ?

A. 

B. 

C. 

D. 

Answer:

Watch Video Solution

22. Write the possible isomers of the aromatic compound having molecular formula C_7H_7Cl. Which of these will have weakest C-Cl bond ?

Watch Video Solution

23. Identify X, Y and Z in the following reactions :

(a) $C_6H_5NH_2 \xrightarrow[HCl]{NaNO_2} X \xrightarrow[HBr]{CuBr} Y \xrightarrow[623\ \text{K, pressure}]{NaOH} Z$

(b) $C_6H_6 \xrightarrow{Cl_2 . FeCl_3} X \xrightarrow{CuCN} Y \xrightarrow[H_2O]{dil . HCl} Z$

(c) $C_6H_5N_2^+Cl^- \xrightarrow[\text{warm}]{KI} X \xrightarrow{Cu} Y$

Watch Video Solution

24. Give reagents, inorganic or organic compound needed to convert benzyl bromide into

(i) benzyl iodide

(ii) benzyl ethyl ether

(iii) benzyl alcohol

(iv) benzyl cyanide

(v) benzyl acetate

(vi) (nitromethyl) benzene

Watch Video Solution

25. How are nitrochlorobenzene and chlorobenzene sulphonic acid are prepared from chlorobenzene?

Watch Video Solution

26. In each of the following pairs of compounds, which will give iodoform test ?

(a) Sec-butyl alcohol and tert-butyl alcohol (b) Ethyl alcohol and isopropyl alcohol

(c) Formaldehyde and acetaldehyde (d) Methylpropyl ketone and diethyl ketone.

Watch Video Solution

27. How will you distinguish between ethyl chloride and vinyl chloride?

Watch Video Solution

28. Name the product obtained when chloroform reacts with (a) nitric acid (b) silver powder (C) aniline in the presence of alcoholic KOH (d) acetone.

Watch Video Solution

29. Complete the following reactions :

(a) $CHCl_3 + 2H \xrightarrow{Zn, HCl}$ (b) $CCl_4 + H_2O \rightarrow$

(c) $CHI_3 + CH_3NH_2 + 3KOH \rightarrow$ (d)

$CH_3CH_2OH + I_2 + NaOH \rightarrow$

(e) $CHCl_3 + O_2 \xrightarrow{\text{Sunlight}}$

Watch Video Solution

30. Write the IUPAC names of isomers of $C_2H_4Cl_2$. Give one test to distinguish these.

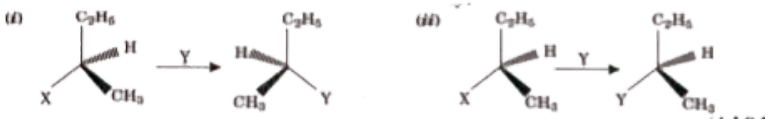
Watch Video Solution

Conceptual Questions

1. Out $CH_3 - \underset{\underset{CH_3}{|}}{CH} - CH_2 - Cl$ and $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - Cl$, which is more reactive towards S_N1 reaction and why?

Watch Video Solution

2. Which of the following two reactions is S_N2 and why?



Watch Video Solution

3. Chloroform contains chlorine but gives no reaction with $AgNO_3$ solution. Why?

Watch Video Solution

4. Out of HCl (g) and $SOCl_2$ which is preferred for converting ethanol into chloroethane?

Watch Video Solution

5. Chloroform is stored in dark coloured bottles. Explain in not more than two sentences.

Watch Video Solution

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

Watch Video Solution

7. The p-isomer of dichlorobenzene has higher melting point than o-and m-isomer. Why?

Watch Video Solution

8. Iodoform gives a precipitate with AgNO3 on heating but chloroform does not because -

Watch Video Solution

9. A small amount of ethyl alcohol is usually added to chloroform bottles. Why?

Watch Video Solution

10. Organic halogen compounds used in industry as solvents are chlorides rather than bromides and iodides. Explain.

Watch Video Solution

11. What effect should the following resonance of vinyl chloride have on its dipole moment?

$$CH_2 = CH - Cl \leftrightarrow H_2\overset{-}{C} - CH = \overset{+}{C}l$$

Watch Video Solution

12. Why is vinyl chloride less reactive than ethyl chloride ?

Watch Video Solution

13. Why is chloroform not used as anaesthetic these days? What is the commonly used anaesthetic?

Watch Video Solution

14. A hydrocarbon C_5H_{12} gives only one chlorination product. Identify the compound.

Watch Video Solution

15. Predict the order of reactivity of the following compounds in S_N1 reactions :

(i) (ii) (iii) (iv)

Watch Video Solution

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

Watch Video Solution

17. Write the various possible isomers of C_7H_7Cl containing benzene ring. Which of these has weakest C-Cl bond.

Watch Video Solution

18. An alkyl halide with molecular formula C_4H_9Br is optically active. What is its structure ?

Watch Video Solution

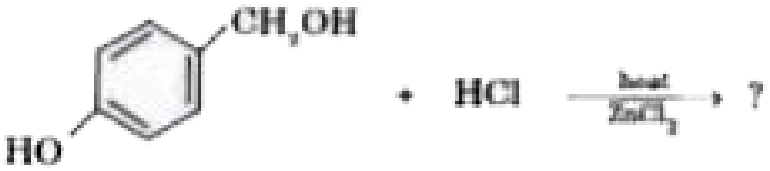
19. Which out of the two : 2-cyclopentenol or 3-cyclopentenol has chiral centre.

Watch Video Solution

20. Allyl chloride is hydrolysed more readily than n-propyl chloride. Why ?

Watch Video Solution

21. Write the structure of major monohalo product of the following reaction:



Watch Video Solution

22. Account for following:

(a) Use of DDT was banned in United States in 1973.

(b) Benzylic halides show high reactivity towards S_N1 reaction.

Watch Video Solution

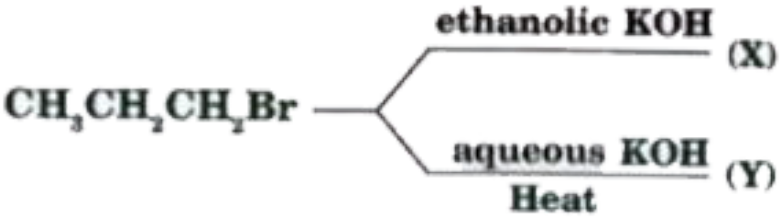
23. Why iodoform has appreciable antiseptic property?

Watch Video Solution

24. Primary alkyl halide C_4H_9Br (a) reacted with alcoholic KOH to give compound (b). Compound (b) is reacted with HBr to give (c) which is an isomer of (a). When (a) is reacted with sodium metal it gives compound (d), C_8H_{18} which is different from the compound formed when n-butyl bromide is reacted with sodium. Give the structural formula of (a) and write the equations for all the reactions.

Watch Video Solution

25. Identify (X) and (Y) in the following:



Watch Video Solution

Ncert In Text Questions

1. Write structures of the following compounds:

(i) 2-Chloro-3-methylpentane

(ii) 1-Chloro-4-ethylcyclohexane

(iii) 4-tert. Butyl-3-iodoheptane

(iv) 1,4-Dibromobut-2-ene

(v) 1-Bromo-4-sec. butyl-2-methylbenzene.

Watch Video Solution

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

Watch Video Solution

3. Write structures of different dihalogen derivatives of propane.

Watch Video Solution

4. Among the isomeric alkanes of molecular formula C_5H_{12}, identify the one that on photochemical chlorination yields

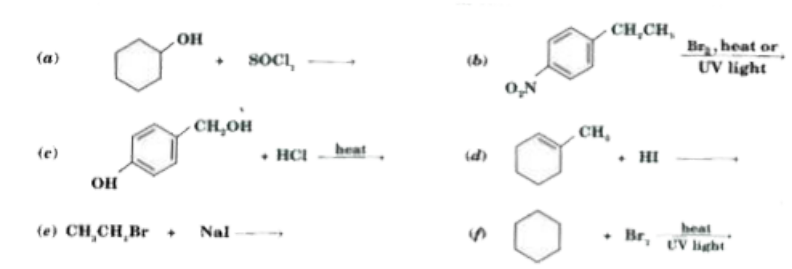
(i) A single monochloride.

(ii) Three isomeric monochlorides.

(iii) Four isomeric monochlorides.

Watch Video Solution

5. Draw the structure of major monohalo products in each of the following reactions :



Watch Video Solution

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

(i) Bromomethane, Bromoform, Chloromethane, Dibromomethane.

(ii) 1-Chloropropane, Isopropyl chloride, 1-Chlorobutane.

Watch Video Solution

7. Which alkyl halide from the following pairs would you expect to react more rapidly by an S_N2 mechanism? Explain your answer.

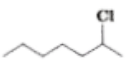
(i) $CH_3CH_2CH_2CH_2Br$ or $CH_3CH_2\underset{\underset{Br}{|}}{C}HCH_3$ (ii) $CH_3CH_2\underset{\underset{Br}{|}}{C}HCH_3$ or

$$H_2C-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-Br$$

Watch Video Solution

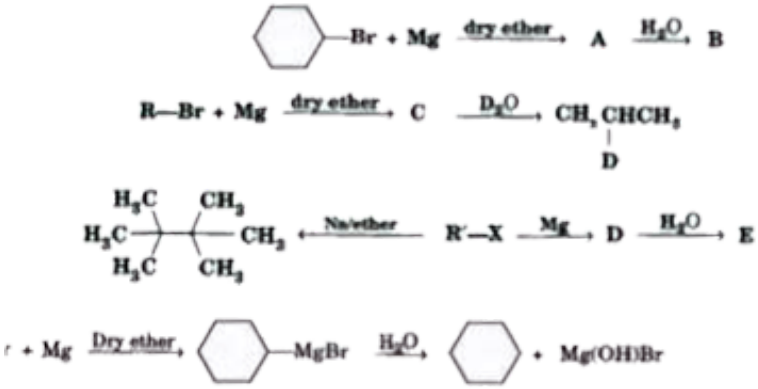
8. In the following pairs of halogen compounds, which compound undergoes faster S_N1 reaction?

(i)  and 

(ii)  and 

Watch Video Solution

9. Identity A, B, C, D, E, R and R' in the following:



Watch Video Solution

Ncert Textbooks Exercises

1. Name the following halides according to IUPAC system and classify them asalkyl, allyl, benzyl (primary, secondary, tertiary), vinyl or aryl halides:

(i) $(CH_3)_2CHCH(Cl)CH_3, (ii)CH_3CH_2CH(CH_3)CH(C_2H_5)Cl$

(iii) $CH_3CH_2C(CH_3)_2CH_2I$, $(iv)(CH_3)_3CCH_2CH(Br)C_6H_5$

(v) $CH_3CH(CH_3)CH(Br)CH_3$, $(vi)CH_3C(C_2H_5)_2CH_2Br$

$(vii)CH_3C(Cl)(C_2H_5)CH_2CH_3$, $(viii)CH_3CH=C(Cl)CH_2CH(CH_3)_2$

(ix) $CH_3CH=CHC(Br)(CH_3)_2(x)p-ClC_6H_4CH_2CH(CH_3)_2$

(xi)

$m-ClCH_2C_6H_4CH_2C(CH_3)_3$, (xii)$o-Br-C_6H_4CH(CH_3)CH_2CH_3$

Watch Video Solution

Ncert Textbooks Exercise

1. Give the IUPAC names of the following compounds:

(i)

$CH_3CH(Cl)CH(Br)CH_3(ii)CHF_2CBrClF(iii)ClCH_2C\equiv CCH_2Br$

$(iv)(CCl_3)_3CCl(v)CH_3C(p-ClC_6H_4)_2CH(Br)CH_3(vi)(CH_3)_3CCH=$

Watch Video Solution

2. Write the structures of the following organic halogen compounds.

(i) 2-Chloro-3-methylpentane (ii) p-Bromochlorobenzene ,

(iii) 1-Chloro-4-ethylcyclohexane (iv) 2-(2-Chlorophenyl)-1-iodooctane ,

(v) 2-Bromobutane (vi) 4-tert-Butyl-3-iodoheptane ,

(vii) 1-Bromo-4-sec-butyl-2-methylbenzene (viii) 1,4-Dibromobut-2-ene

Watch Video Solution

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

(i) CH_2Cl_2, $(ii)CHCl_3$, $(iii)CCl_4$

Watch Video Solution

4. A hydrocarbon C_5H_{10} does not react with chlorine in dark but gives a single monochloro compound C_5H_9Cl in bright sunlight. Identify the hydrocarbon.

Watch Video Solution

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

Watch Video Solution

6. Write the equations for the preparation of 1-iodobutane from

(i) 1-butanol , (ii) 1-chlorobutane , (iii) but-1-ene.

Watch Video Solution

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

Watch Video Solution

8. Which compound in each of the following pairs will react faster in S_N2 reaction with $.^{-}OH$?

(i) CH_3Br or CH_3I, $(ii)(CH_3)_3CCl$ or CH_3Cl

Watch Video Solution

9. Predict all the alkenes that would be formed by dehydrohalogenation of the following halides with sodium ethoxide in ethanol and identify the major alkene:

(i) 1-Bromo-1-methylcyclohexane , (ii) 2-Chloro-2-methylbutane

(iii) 2,2,3-Trimethyl-3-bromopentane

Watch Video Solution

10. आप निम्नलिखित परिवर्तन कैसे करेंगे ?

(i) Ethanol to but-1-yne

(ii) Ethane to bromethane

(iii) Propene to 1-nitropropane

(iv) Toluene to benzyl alcohol

(v) Propene to propyne

(vi) Ethanol to ethyl fluoride

(vii) Bromomethane to propanone

(viii) But-1-ene to but-2-ene

(ix) 1-chlorobutane to n-octane

(x) Benzene to biphenyl

Watch Video Solution

11. Explain why

(i) the dipole moment of chlorobenzene is lower than that of cyclohexyl chloride?

(ii) alkyl halides, though polar, are immiscible with water?

(iii) Grignard reagents should be prepared under anhydrous conditions?

Watch Video Solution

12. Give the uses of freon 12, DDT, carbon tetrachloride and iodoform.

Watch Video Solution

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

(i) $CH_3CH_2CH_2Cl + NaI \xrightarrow[\text{heat}]{\text{acetone}}$

(ii) $(CH_3)_3CBr + KOH \xrightarrow[\text{heat}]{\text{ethanol}}$

(iii) $CH_3CH(Br)CH_2CH_3 + NaOH \xrightarrow{\text{water}}$

(iv) $CH_3CH_2Br + KCN \xrightarrow{\text{aq. ethanol}}$

(v) $C_6H_5ONa + C_2H_5Cl \rightarrow$

(vi) $CH_3CH_2CH_2OH + SOCl_2 \rightarrow$

(vii) $CH_3CH_2CH = CH_2 + HBr \xrightarrow{\text{peroxide}}$

(viii) $CH3CH = C(CH3)2 + HBr \rightarrow$

Watch Video Solution

14. Write the mechanism of the following reaction:

nBuBr + KCN $\xrightarrow{EtOH - H_2O}$ nBuCN

Watch Video Solution

15. Arrange the compounds of each set in order of reactivity towards S_N2 displacement:

(i) 2-Bromo-2-methylbutane, 1-Bromopentane, 2-Bromopentane

(ii) 1-Bromo-3-methylbutane, 2-Bromo-2-methylbutane, 2-Bromo-3-methylbutane

(iii) 1-Bromobutane, 1-Bromo-2,2-dimethylpropane, 1-Bromo-2-methylbutane, 1-Bromo-3-methylbutane.

Watch Video Solution

16. Out of $C_6H_5CH_2Cl$ and $C_6H_5CHClC_6H_5$, which is more easily hydrolysed by aqueous KOH.

Watch Video Solution

17. p-Dichlorobenzene has higher m.p. and solubility than those of -and m-isomers. Discuss.

Watch Video Solution

Watch Video Solution

18. How the following conversions can be carried out?

(i) Propene to propan-1-ol

(ii) Ethanol to but-1-yne

(iii) 1-Bromopropane to 2-bromopropane (iv) Toluene to benzyl alcohol

(v) Benzene to 4-bromonitrobenzene

(vi) Benzyl alcohol to 2-phenylethanoic acid

(vii) Ethanol to propanenitrile

(viii) Aniline to chlorobenzene

(ix) 2-Chlorobutane to 3, 4-dimethylhexane

(x) 2-Methyl-1-propene to 2-chloro-2-methylpropane

(xi) Ethyl chloride to propanoic acid

(xii) But-1-ene to n-butyliodide

(xiii) 2-Chloropropane to 1-propanol

(xiv) Isopropyl alcohol to iodoform

(xv) Chlorobenzene to p-nitrophenol (xvi) 2-Bromopropane to 1-bromopropane

(xvii) Chloroethane to butane

(xviii) Benzene to diphenyl

(xix) tert-Butyl bromide to isobutyl bromide

(xx) Aniline to phenylisocyanide

Watch Video Solution

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

Watch Video Solution

20. Primary alkyl halide C_4H_9Br (a) reacted with alcoholic KOH to give compound (b). Compound (b) is reacted with HBr to give (c) which is an isomer of (a). When (a) is reacted with sodium metal it gives compound (d), C_8H_{18} which is different from the compound formed when n-butyl bromide is reacted with sodium. Give the structural formula of (a) and write the equations for all the reactions.

Watch Video Solution

21. What happens when

(i) n-butyl chloride is treated with alcoholic KOH,

(ii) bromobenzene is treated with Mg in the presence of dry ether,

(iii) chlorobenzene is subjected to hydrolysis,

(iv) ethyl chloride is treated with aqueous KOH,

(v) methyl bromide is treated with sodium in the presence of dry ether,

(vi) methyl chloride is treated with KCN?

Watch Video Solution

Ncert Examplar Problems Multiple Choice Questions Type I

1. The order of reactivity of following alcohols with halogen acids is.....

(A) $CH_3CH_2 - CH_2 - OH$ (B) $CH_{3CH_2 - \underset{CH_3}{\underset{|}{CH}} - OH}$

(C) $CH_3CH_2 - \underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}} - OH$

A. $(A) > (B) > (C)$

B. $(C) > (B) > (A)$

C. $(B) > (A) > (C)$

D. $(A) > (C) > (B)$

Answer: B

Watch Video Solution

2. Which of the following alcohol will yield the corresponding alkyl chloride on reaction with concentrated HCl at room temperature with fastest rate?

A. $CH_3CH_2 - CH_2 - OH$

B. $CH_3CH_2 - \underset{\underset{CH_3}{|}}{C}H - OH$

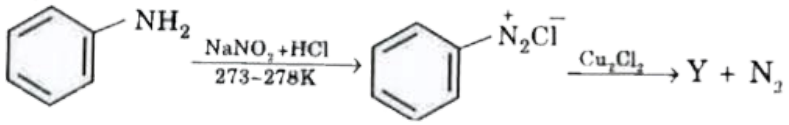
C. $CH_3CH_2 - \underset{\underset{CH_3}{|}}{C}H - CH_2OH$

D. $CH_3CH_2 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - OH$

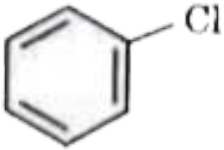
Answer: D

Watch Video Solution

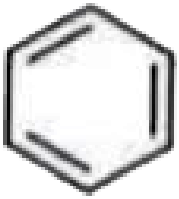
3. Identify the compound Y in the following reaction.



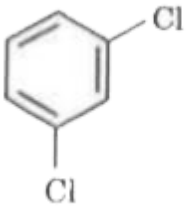
A.

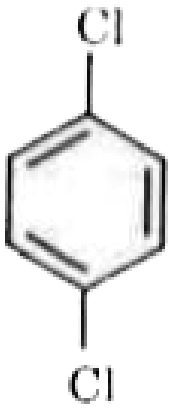


B.



C.



D. 

Answer: A

Watch Video Solution

4. Toluene reacts with a halogen in the presence of iron (III) chloride giving ortho- and para-halo compounds. The reaction is -

A. Electrophilic elimination reaction

B. Electrophilic substitution reaction

C. Free radical addition reaction

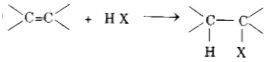
D. Nucleophilic substitution reaction

Answer: B

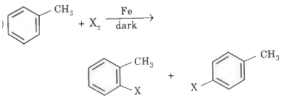
Watch Video Solution

5. Which of the following is halogen exchange reaction ?

A. $RX + NaI \rightarrow RI + NaX$

B. 

C. $R - OH + HX \xrightarrow{ZnCl_2} R - X + H_2O$

D. 

Answer: A

Watch Video Solution

6. Which reagent will you use for the following reaction ?

$CH_3CH_2CH_2CH_3 \rightarrow CH_3CH_2CH_2CH_2Cl + CH_3CH_2CHClCH_3$

A. Cl_2 / UV light

B. $NaCl + H_2SO_4$

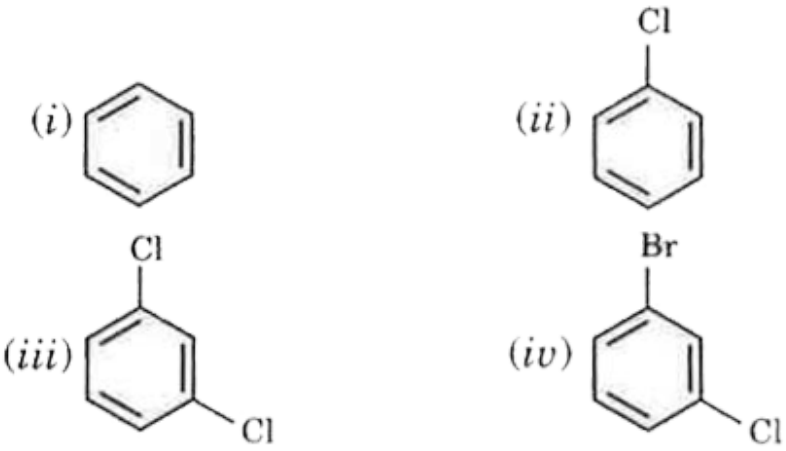
C. Cl_2 gas in dark

D. Cl_2 gas in the presence of iron in dark

Answer: A

Watch Video Solution

7. Arrange the following compounds in the increasing order of their densities



A. $(i) < (ii) < (iii) < (iv)$

B. $(i) < (iii) < (iv) < (ii)$

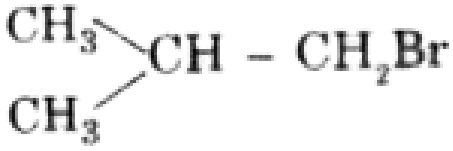
C. $(iv) < (iii) < (ii) < (i)$

D. $(ii) < (iv) < (iii) < (i)$

Answer: A

Watch Video Solution

8. Arrange the following compounds in increasing order of their boiling point

(i) 

(ii) $CH_3CH_2CH_2CH_2Br$

(iii) $H_3C - \underset{\underset{Br}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_3$

A. $(ii) < (i) < (iii)$

B. $(i) < (ii) < (iii)$

C. $(iii) < (i) < (ii)$

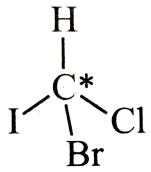
D. $(iii) < (ii) < (i)$

Answer: C

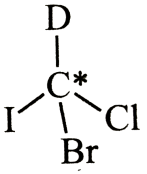
Watch Video Solution

9. In which of the following molecules carbon atom marked with asterisk (*) is asymmetric?

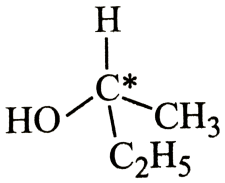
(I)



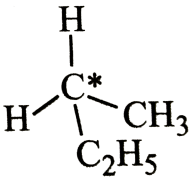
(II)



(III)



(IV)



A. (i), (ii), (iii), (iv)

B. (i), (ii), (iii)

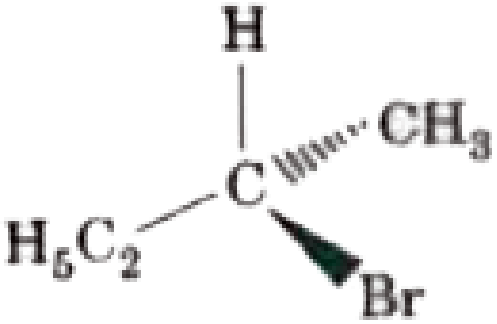
C. (ii), (iii), (iv)

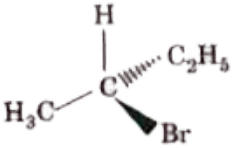
D. (i), (iii), (iv)

Answer: B

Watch Video Solution

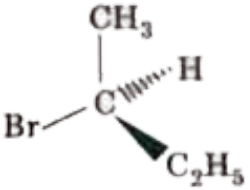
10. Which of the following structures is enantiomeric with the molecule (A) given below?



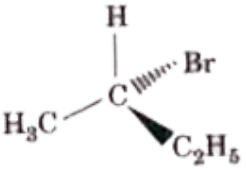


A.

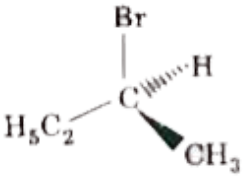
B.



C.



D.



Answer: A

Watch Video Solution

11. Which of the following is an example of vic-dihalide?

A. Dichloromethane

B. 1,2-dichloroethane

C. Ethylidene chloride

D. Allyl chloride

Answer: B

Watch Video Solution

12. The position of Br in the compound in $CH_3 = CHC(Br)(CH_3)_2$ can be classified as.....

A. Allyl

B. Aryl

C. Vinyl

D. Secondary

Answer: A

Watch Video Solution

13. Chlorobenzene is formed by reaction of chlorine with benzene in the presence of $AlCl_3$. Which of the following species attacks the benzene ring in this reaction?

A. Cl^-

B. Cl^+

C. $AlCl_3$

D. $[AlCl_4]^-$

Answer: B

Watch Video Solution

14. Ethylidene chloride is a/an.....

A. vic-dihalide

B. gem-dihalide

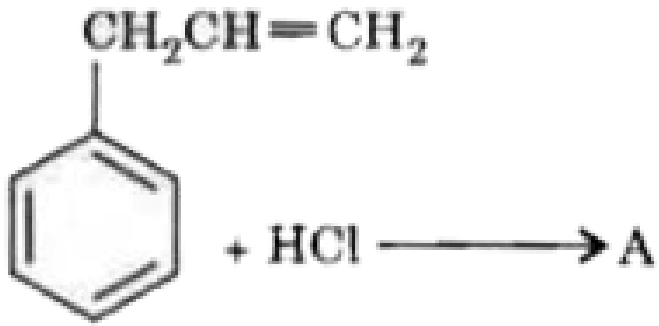
C. allylic halide

D. vinylic halide

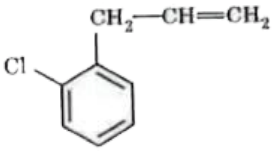
Answer: B

Watch Video Solution

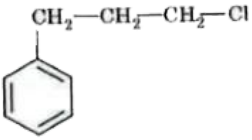
15. What is 'A' in the following reaction?

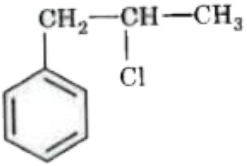


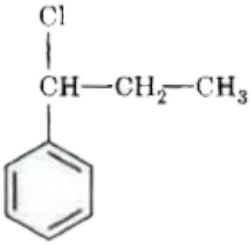
A.



B.



C. 

D. 

Answer: D

Watch Video Solution

16. A primary alkyl halide would prefer to undergo :-

A. S_N1 reaction

B. S_N2 reaction

C. α-Elimination

D. Racemisation

Answer: B

Watch Video Solution

17. Which of the following alkyl halides will undergo S_N1 reaction most readily ?

A. $(CH_3)_3C - F$

B. $(CH_3)_3C - Cl$

C. $(CH_3)_3C - Br$

D. $(CH_3)_3C - I$

Answer: D

Watch Video Solution

18. Which is the correct IUPAC name for $CH_3 - \underset{\underset{C_2H_5}{|}}{CH} - CH_2 - Br$?

A. 1-Bromo-2-ethylpropane

B. 1-Bromo-2-ethyl-2-methylethane

C. 1-Bromo-2-methylbutane

D. 2-Methyl-1-bromobutane

Answer: C

Watch Video Solution

19. What should be the correct IUPAC name for diethylbromomethane?

A. 1-Bromo-1, 1-diethylmethane

B. 3-Bromopentane

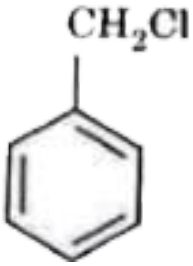
C. 1-Bromo-1-ethylpropane

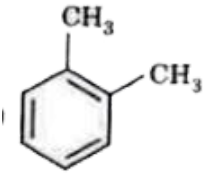
D. 1-Bromopantane

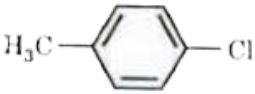
Answer: B

Watch Video Solution

20. The reaction of toluene with chlorine in the presence of iron and in the absence of light yields .....

A. 

B. 

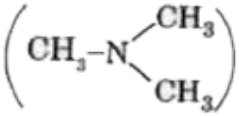
C. 

D. Mixture of (ii) and (iii)

Answer: D

Watch Video Solution

21. Chloromethane on treatment with excess of ammonia yields mainly

A. N, N-Dimethylmethanamine 

B. N-methylmethanamine $(CH_3 - NH - CH_3)$

C. Methanamine (CH_3NH_2)

D. Mixture containing all these in equal proportion

Answer: C

Watch Video Solution

22. Molecules whose mirror image is non-superimposable over them are known as chiral. Which of the following molecules is chiral in nature?

A. 2-Bromobutane

B. 1-Bromobutane

C. 2-Bromopropane

D. 2-Bromopropan-2-ol

Answer: A

Watch Video Solution

23. Reactions of $C_6H_5CH_2Br$ with aqueous sodium hydroxide follows.....

A. S_N1 mechanism

B. S_N2 mechanism

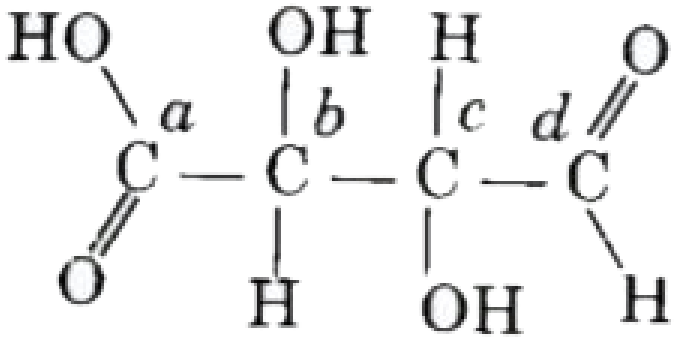
C. Any of the above two depending upon the temperature of reaction

D. Saytzeff rule

Answer: A

Watch Video Solution

24. Which of the carbon atoms present in the molecule given below are asymmetric?



A. a, b, c, d

B. b, c

C. a, d

D. a, b, c

Answer: B

Watch Video Solution

25. Which of the following compounds will give racemic mixture on nucleophilic substitution by OH^- ion ?

(I) $CH_3 - \underset{\underset{C_2H_5}{|}}{CH} - Br$

(II) $CH_3 - \underset{\underset{C_2H_5}{|}}{\overset{\overset{Br}{|}}{C}} - CH_3$

(III) $CH_3 - \underset{\underset{C_2H_5}{|}}{CH} - CH_2Br$

A. (i)

B. $(i), (ii), (iii)$

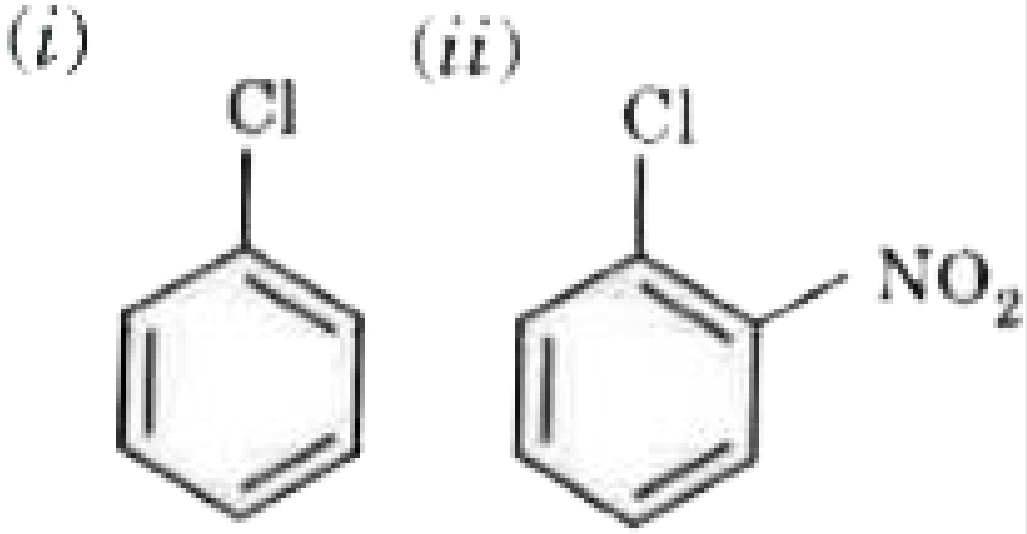
C. $(ii), (iii)$

D. $(i), (iii)$

Answer: A

Watch Video Solution

26. Arrange the compounds in increasing order of rate of reaction towards nucleophilic substitutions.



A. $(i) < (ii) < (iii)$

B. $(iii) < (ii) < (i)$

C. $(i) < (iii) < (ii)$

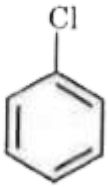
D. $(iii) < (i) < (ii)$

Answer: C

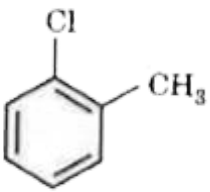
Watch Video Solution

27. Which of the following order is correct?

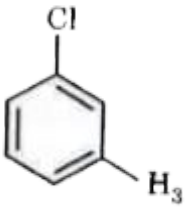
(i)



(ii)



(iii)



A. $(i) < (ii) < (iii)$

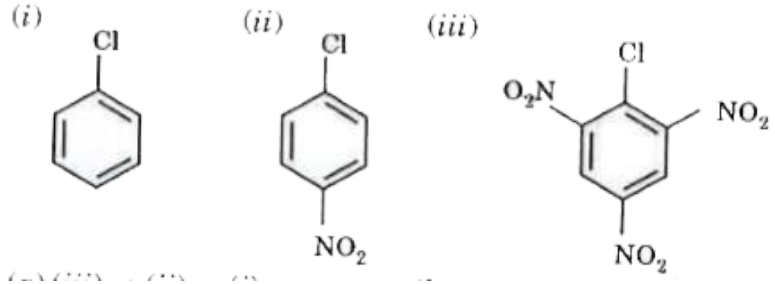
B. $(i) < (iii) < (ii)$

C. $(iii) < (ii) < (i)$

D. $(ii) < (iii) < (i)$

Answer: D

Watch Video Solution

28. 

A. $(iii) < (ii) < (i)$

B. $(ii) < (iii) < (i)$

C. $(i) < (iii) < (ii)$

D. $(i) < (ii) < (iii)$

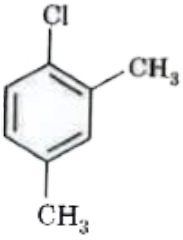
Answer: D

View Text Solution

29. Arrange the compounds in increasing order of rate of reaction towards nucleophilic substitutions.

(i) 

(ii) 

(iii) 

A. $(i) < (ii) < (iii)$

B. $(ii) < (i) < (iii)$

C. $(iii) < (ii) < (i)$

D. $(i) < (iii) < (ii)$

Answer: C

Watch Video Solution

30. Which of the correct increasing order of boiling points of the following compounds?

1-Iodobutane,1-Bromobutane,1-Chlorobutane, Butane

A. $\text{Butane} < \text{1-Chlorobutane} < \text{1-Bromobutane} < \text{1-Iodobutane}$

B. 1-Iodobutane $<$ 1-Bromobutane $<$ 1-Chlorobutane $<$ Butane

C. Butane $<$ 1-Iodobutane $<$ 1-Bromobutane $<$ 1-Chlorobutane

D. Butane $<$ 1-Chlorobutane $<$ 1-Iodobutane $<$ 1-Bromobutane

Answer: A

Watch Video Solution

31. Which is the correct increasing order of boiling points of the following compounds ?

1-Bromoethane, 1-Bromopropane, 1-Bromobutane, Bromobenzene

A.

Bromobenzene $<$ 1-Bromobutane $<$ 1-Bromopropane $<$ 1-Bromoeth

B.

Bromobenzene $<$ 1-Bromoethane $<$ 1-Bromopropane $<$ 1-Bromobut

C.

1-Bromopropane $<$ 1-Bromobutane $<$ 1-Bromoethane $<$ Bromobenz

D.

$$\text{1-Bromoethane} < \text{1-Bromopropane} < \text{1-Bromobutane} < \text{Bromobenz}$$

Answer: D

Watch Video Solution

Ncert Examplar Problems Multiple Choice Questions Type Ii

1. Which of the statements are correct about above reaction?

A. (i) and (v) both are nucleophiles.

B. In (iii) carbon atom is sp^3 hybridised.

C. In (iii) carbon atom is sp^2 hybridised.

D. (i) and (v) both are electrophiles.

Answer: A::C

View Text Solution

2. Which of the following statements are correct about this reaction?

A. The given reaction follows S_N2 mechanism.

B. (ii) and (iv) have opposite configuration.

C. (ii) and (iv) have same configuration.

D. The given reaction follows S_N2 mechanism.

Answer: A::B

Watch Video Solution

3. Which of the following statements are correct about the reaction intermediate ?

A. Intermediate (iii) is unstable because in this carbon is attached to 5 atoms.

B. Intermediate (iii) is unstable because carbon atom is sp^2 hybridised.

C. Intermediate (iii) is stable because carbon atom is sp^2 hybridised.

D. Intermediate (iii) is less stable than the reactant (ii).

Answer: A::D

Watch Video Solution

4. Which of the following statements are correct about the mechanism of this reaction ?

A. A carbocation will be formed as an intermediate in the reaction.

B. OH^- will attach the substrate (ii) from one side and CI^- will leave it simultaneously from other side.

C. An unstable intermediate will be formed in which OH^- and Cl^- will be attached by weak bonds.

D. Reaction proceeds through S_N1 mechanism.

Answer: A::D

Watch Video Solution

5. Which of the following statements are correct about the kinetics of this reaction ?

A. The rate of reaction depends on the concentration of only (ii).

B. The rate of reaction depends on concentration of both (i) and (ii).

C. Molecularity of reaction is one.

D. Molecularity of reaction is two.

Answer: A::C

Watch Video Solution

6. Haloalkanes contain halogen atom(s) attached to the sp^3hybridised carbon atom of an alkyl group. Identify haloalkene from the following compounds.

A. 2-Bromopentane

B. Vinyl chloride (chloroethene)

C. 2-chloroacetophenone

D. Trichloromethane

Answer: A::D

Watch Video Solution

7. Ethylene chloride and ethylidene chloride are isomers. Identify the correct statements.

A. Both the compounds form same product on treatment with alcoholic KOH.

B. Both the compounds form same product on treatment with aq. NaOH.

C. Both the compounds form same product on reduction.

D. Both the compounds are optically active.

Answer: A::C

Watch Video Solution

8. Which of the following compounds are gem-dihalides?

A. Ethylidene chloride

B. Ethylene dichloride

C. Methylene chloride

D. Benzyl chloride

Answer: A::C

Watch Video Solution

9. Which of the following are secondary bromides ?

A. $(CH_3)_2CHBr$

B. $(CH_3)_3CCH_2Br$

C. $CH_3CH(Br)CH_2CH_3$

D. $(CH_3)_2CBrCH_2CH_3$

Answer: A::C

Watch Video Solution

10. Which of the following compounds can beclassified as aryl halides ?

A. $p-ClC_6H_4CH_2CH(CH_3)_2$

B. $p-CH_3CHCl(C_6H_4)CH_2CH_3$

C. $o-BrH_2C-C_6H_4CH(CH_3)CH_2CH_3$

D. C_6H_5-Cl

Answer: A::D

Watch Video Solution

11. Alkyl halides are prepared from alcohols by treating with

A. $HCl + ZnCl_2$

B. $\text{Red}P + Br_2$

C. $H_2SO_4 + KI$

D. All of the above

Answer: A::B

Watch Video Solution

12. Alkyl fluorides are synthesised by alkyl chloride/bromide in presence of.....or..... .

A. CaF_2

B. CoF_2

C. Hg_2F_2

D. NaF

Answer: B::C

Watch Video Solution

Ncert Examplar Problems Short Answer Type Questions

1. Aryl chlorides and bromides can be easily prepared by electrophilic substitution of arenas with chlorine and bromine respectively in the presence of Lewis acid catalyst. But why does preparation of aryl iodides requires presence of an oxidising agent?

Watch Video Solution

2. Out of o- and p-dibromobenzene which one has higher melting point and why?

Watch Video Solution

3. Which of the compounds will react faster in S_N1 reaction with ^-OH ion?

$CH_3 - CH_2 - Cl$ or $C_6H_5 - CH_2 - Cl$

Watch Video Solution

4. Why iodoform has appreciable antiseptic property?

Watch Video Solution

5. Haloarenas are less reactive than haloalkanes and haloalkenes. Explain.

Watch Video Solution

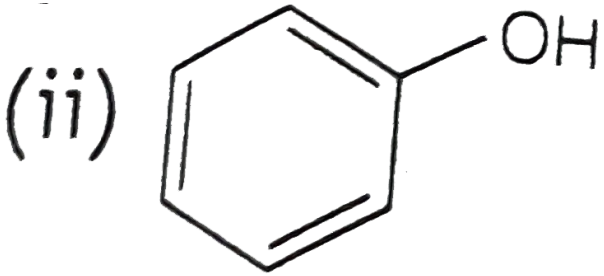
6. Discuss the role of Lewiis acids in the preparation of aryl bromides and chlorides in the dark.

Watch Video Solution

Watch Video Solution

7. Which of the following compounds (i) and (ii) will not react with a mixture of NaBr and H_2SO_4. Explain why ?

(i) $CH_3CH_2CH_2OH$ (ii)

(ii) 

Watch Video Solution

8. Allyl chloride is hydrolysed more readily than n-propyl chloride. Why ?

Watch Video Solution

9. Why is it necessary to avoid even traces of moisture during the use of a Grignard reagent?

Watch Video Solution

10. How do polar solvents help in the first step in S_N1 mechanism?

Watch Video Solution

11. Write a test to detect the presence of double bond in a molecule.

Watch Video Solution

12. Diphenyls are potential threat to the envioronment. How are these produced from aryl halides?

Watch Video Solution

13. What are the IUPAC names of the insecticide DDT and benzene hexachloride? Why is their use banned in India and other countries?

Watch Video Solution

14. Elimination reaction (especially β - elimination) are as common as the nucleophilic substitution reaction in case of alkyl halides. Specify the reagents used in both cases.

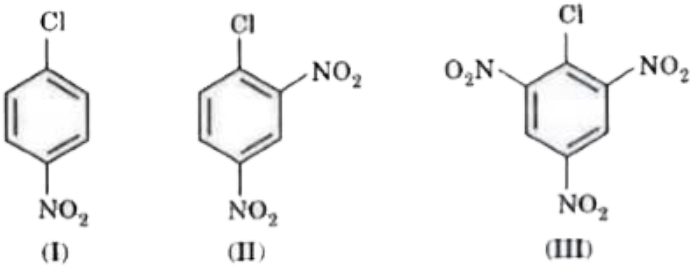
Watch Video Solution

15. How will you obtain monobromobenzene from aniline ?

Watch Video Solution

16. Aryl halides are extremely less reactive towards nucleophilie substitution. Predict and explain the order of reactivity of the following

compounds towards nucleophilic substitution:



Watch Video Solution

17. tert-Butylbromide reacts with aq. NaOH by S_N1 mechanism while n-butylbromide reacts by S_N1 mechanism. Why?

Watch Video Solution

18. Predict the major product formed when HCl is added to isobutylene, Explain the mechanism involved.

Watch Video Solution

19. Discuss the nature of C-X bond in the haloarenes.

Watch Video Solution

20. How can you obtain iodoethane from ethanol when no other iodine containing reagent except NAI is available in the laboratery?

Watch Video Solution

21. Cyanide ion acts as an ambident nucleophille. From which end it acts as a strong nucleophile in aqueous medium? Give reason for your answer.

Watch Video Solution

Ncert Examplar Problems Matching Type Questions

1. Match the compounds given in Column I with the effects given in Column II.

Column I	Column II
(*a*) Chloramphenicol	(*i*) Malaria
(*b*) Thyroxine	(*ii*) Anaesthetic
(*c*) Chloroquine	(*iii*) Typhoid fever
(*d*) Chloroform	(*iv*) Goiter
	(*v*) Blood substituent

Watch Video Solution

2. Match the items of Column I and Column II.

Column I	Column II
(*a*) S_N1 reaction	(*i*) *vic*-dibromides
(*b*) Chemicals in fire extinguisher	(*ii*) gem-dihalides
(*c*) Bromination of alkenes	(*iii*) Racemisation
(*d*) Alkylidene halides	(*iv*) Saytzeff rule
(*e*) Elimination of HX from alkylhalide	(*v*) Chlorobromocarbons

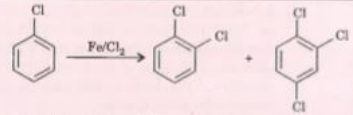
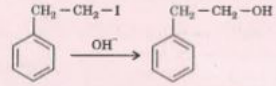
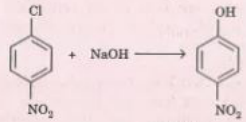
Watch Video Solution

3. Match the structures of compounds given in Column I with the classes of compounds given in Column II.

Column I	Column II
(a) $CH_3-\underset{\displaystyle X}{\underset{|}{CH}}-CH_3$	(i) Aryl halide
(b) $CH_2=CH-CH_2-X$	(ii) Alkyl halide
(c) 	(iii) Vinyl halide
(d) $CH_2=CH-X$	(iv) Allyl halide

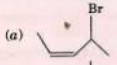
Watch Video Solution

4. Match the reactions given in Column I with the types of reactions given in Column II.

Column I	Column II
(a) 	(i) Nucleophilic aromatic substitution
(b) $CH_3-CH=CH_2 + HBr \longrightarrow CH_3-\underset{\displaystyle Br}{\underset{|}{CH}}-CH_3$	(ii) Electrophilic aromatic substitution
(c) 	(iii) Saytzeff elimination
(d) 	(iv) Electrophilic addition
(e) $CH_3CH_2\underset{\displaystyle Br}{\underset{|}{CH}}CH_3 \xrightarrow{\text{alc.KOH}} CH_3CH=CHCH_3$	(v) Nucleophilic substitution (S_N1)

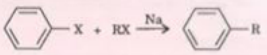
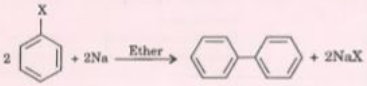
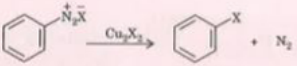
Watch Video Solution

5. Match the structures given in Column I with the names in Column II.

Column I	Column II
(a) 	(i) 4-Bromopent-2-ene
(b) 	(ii) 4-Bromo-3-methylpent-2-ene
(c) 	(iii) 1-Bromo-2-methylbut-2-ene
(d) 	(iv) 1-Bromo-2-methylpent-2-ene

Watch Video Solution

6. Match the reactions given in Column I with the names given in Column II.

Column I	Column II
(a) 	(i) Fittig reaction
(b) 	(ii) Wurtz Fittig reaction
(c) 	(iii) Finkelstein reaction
(d) $C_6H_5Cl + NaI \xrightarrow{\text{Dry acetone}} C_6H_5I + NaCl$	(iv) Sandmeyer reaction

Watch Video Solution

Ncert Examplar Problems Assertion And Reason Type Questions

1. Assertion (A) Phosphorus chlorides (tri and penta) are preferred over thionyl chloride for the preparation of alkyl chlorides from alcohols.

Reason (R) Phosphorus chlorides give pure alkyl halides.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason are both are wrong statements

C. Assertion is correct but reason is wrong

D. Assertion is wrong but reason is correct statement.

Answer: B

Watch Video Solution

2. Assertion(A) The boiling points of alkyl halides decrease in the order

$RI > RBr > RCl > RF$

Reason (R) The boiling points of alkyl chlorides, bromides and iodides are considerably higher than that of the hydrocarbon of comparable molecular mass.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason are both are wrong statements

C. Assertion is correct but reason is wrong

D. Assertion and reason both are correct statements but reason is not correct explanation of assertion

Answer: D

Watch Video Solution

3. Assertion: KCN reacts with methyl chloride to give methyl isocyanide

Reason: CN^- is an ambident nucleophile.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason are both are wrong statements

C. Assertion is correct but reason is wrong

D. Assertion is wrong but reason is correct statement.

Answer: D

Watch Video Solution

4. Assertion: tert-Butyl bromide undergoes Wurtz reaction to give 2,2,3,3-tetramethylbutane.

Reason: In Wurtz reaction, alkyl halides react with sodium in dry ether to give hydrocarbon containing double the number of carbon atoms present in the halide.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason are both are wrong statements

C. Assertion is correct but reason is wrong

D. Assertion is wrong but reason is correct statement.

Answer: D

5. Assertion: Presence of a nitro group at ortho or para position increases the reactivity of haloarenes towards nucleophilic substitution.

Reason: Nitro group, being an electron withdrawing group decreases the electron density over the benzene ring.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason are both are wrong statements

C. Assertion is correct but reason is wrong

D. Assertion is wrong but reason is correct statement.

Answer: A

Watch Video Solution

6. Assertion: In monohaloarenes, further electrophilic substitution occurs at ortho and para position

Reason: Halogen atom is a ring deactivator

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason are both are wrong statements

C. Assertion is correct but reason is wrong

D. Assertion and reason both are correct statements but reason is not correct explanation of assertion

Answer: D

Watch Video Solution

7. Assertion: Aryl iodides can be prepared by reaction of arenes with iodine in the presence of an oxidising agent.

Reason: Oxidising agent oxidises I_2 into HI.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason are both are wrong statements

C. Assertion is correct but reason is wrong

D. Assertion is wrong but reason is correct statement.

Answer: C

Watch Video Solution

8. Assertion: It is difficult to replace chlorine by $-OH$ in chlorobenzene in comparison to that in chloroethane

Reason: Chlorine-carbon (C-Cl) bond in chlorobenzene has a partial double bond character due to resonance.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason are both are wrong statements

C. Assertion is correct but reason is wrong

D. Assertion is wrong but reason is correct statement.

Answer: A

Watch Video Solution

9. Assertion: Hydrolysis of (-)-2- bromooctane proceeds with inversion of configuration.

Reason: This reaction prioceeds through the formation of a carbocation.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason are both are wrong statements

C. Assertion is correct but reason is wrong

D. Assertion is wrong but reason is correct statement.

Answer: C

Watch Video Solution

10. Assertion (A) Nitration of chlorobenzene leads to the formation of m-nitrochlorobenzene.

Reason (R) $-NO_2$ group is a m-directing group.

A. Assertion and reason both are correct and reason is correct explanation of assertion.

B. Assertion and reason are both are wrong statements

C. Assertion is correct but reason is wrong

D. Assertion is wrong but reason is correct statement.

Answer: D

Watch Video Solution

Memory Test A Say True Or False

1. The dipole moment of CH_3F is greater than that of CH_3Cl.

Watch Video Solution

2. In general, alkyl halides are more reactive than aryl halides.

Watch Video Solution

3. CH_3CH_2I is more reactive than CH_3CH_2Cl towards KCN.

Watch Video Solution

4. Carbon tetrachloride is inflammable.

Watch Video Solution

5. $CH_3CH = CHCl$ is more/less reactive than $CICH_2CH = CH_2$?.

Watch Video Solution

6. Give True or False. $2, 3, 4$- Trichloropentane has three asymmetric carbon atoms.

Watch Video Solution

7. Addition of $BrCCI_3$ to propene in the presence of peroxides gives 3-bromo-1, 1, 1-trichloro-2-methylpropane.

Watch Video Solution

8. Iodide is a better nucleophile than bromide.Explain

Watch Video Solution

9. Chlorobenzene gives a white precipitate with alcoholic silver nitrate solution.

Watch Video Solution

10. Explain why the addition of HI to 3,3-dimethylbut-1-ene gives 2-iodo-2,3-dimethylbutane as the major product and not the 2-iodo-3,3-dimethylbutane.

Watch Video Solution

11. Cheak Whatever given statement is true or False .Bromoethane reacts with silver nitrite to form ethyl nitrite.

Watch Video Solution

12. 1, 1-Dichloroethane reacts with aqueous KOH to give ethanal.

Watch Video Solution

13. Thioethers are obtained by reacting alkyl halides with sodium hydrosulphide.

Watch Video Solution

14. Boiling point of iodobenzene is more than that of bromobenzene. true or false?

Watch Video Solution

Memory Test B Complete The Missing Links

1. Isobutyl bromide is an example of ..... alkyl halide.

Watch Video Solution

2. Nitroalkanes are formed when alkyl alides react with___while alkyl nitrites are formed when alkyl halides are treated with____.

Watch Video Solution

3. Hydrolysis of 2-bromo-3-methylbutane gives ..... .the major product.

Watch Video Solution

4. Toluene reacts with CI_2 in the presence of $FeCl_3$ to give ..... .

Watch Video Solution

5. DDT is prepared by condensing chlorobenzene with

Watch Video Solution

6. Formation of phenol from chlorobenzene is an example of .... Aromatic substitution.

Watch Video Solution

7. Iodobenzene on heating with copper powder forms dipenyl. The reaction is called_____.

Watch Video Solution

8. Butanenitrile can be prepared by heating____with alcoholic KCN.

Watch Video Solution

9. With potassium cyanide, alkyl halides give____while with silver cyanide____are the major products.

Watch Video Solution

10. Alkyl halides are less soluble in water because

Watch Video Solution

11. BHC is

Watch Video Solution

Memory Test C Choose The Correct Alternative

1. Reaction of alkyl halide with potassium sulphide gives thioethers/thioalcohols.

Watch Video Solution

2. Boiling point of tert-butyl bromide is less/more than that of n-butylbromide.

Watch Video Solution

3. Aryl bromides can be prepared by reacting silver salt of aromatic acids with Br_2 in CCI_4. This reaction is called $\text{Hunsdiecker reaction/Balz-Schiemann}$ reaction.

Watch Video Solution

4. Dipole moment of CH_3F is less/more than that of CH_3CI.

Watch Video Solution

5. Dipole moment of o-dichlorobenzene is less/more than that of m-dichlorobenzene.

Watch Video Solution

6. S_N1 / S_N2 proceeds through the formation of a carbocation.`

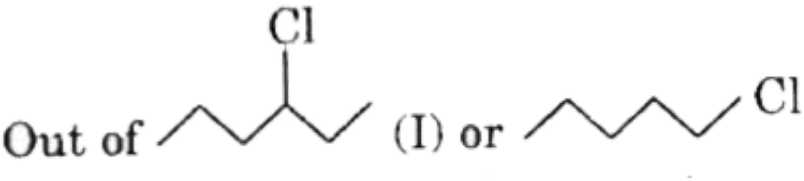
Watch Video Solution

7. CHBrCIF has chiral/achiral carbon atom.

Watch Video Solution

8. S_N2 reaction occurs with $\text{inversion of configuration/racemisation.}$

Watch Video Solution

9. Out of 

the compound I / II undergoes faster S_N1 reaction.

Watch Video Solution

10. Iodobenzene on heating with copper powder forms dipenyl. The reaction is called_____.

Watch Video Solution

11. C_6H_5Cl is less/more reactive than $C_6H_{11}Cl$.

Watch Video Solution

12. $\text{Tetrachloromethane/triiodomethane}$ has been used as antiseptic.

Watch Video Solution

Revision Exercise Objective Questions Multiple Choice Questions

1. The IUPAC name of $(CH_3)_3CCl$ is

A. 1-chloro-1, 1, 1-trichloromethane

B. 2-chloro-2-methylpropane

C. 2-chlorobutane

D. Trimethylchloromethane

Answer: B

Watch Video Solution

2. Which of the following is not a chiral ?

A. 3-Methylhexane

B. 2, 3-Dihydroxypropanoic acid

C. 2, 3-Dibromobutane

D. Butan-2-ol

Answer: C

Watch Video Solution

3. The reaction :

$RX + 2Na + RX \xrightarrow{\text{Dry ether}} R - R + 2NaX$ is called :

A. Sandmeyer's reaction

B. Fittig reaction

C. Wurtz reaction

D. Williamson's synthesis.

Answer: C

Watch Video Solution

4. In S_N1 reaction, the order of reactivity of halides is

A. $3^\circ > 2^\circ > 1^\circ > \text{methyl}$

B. $\text{methyl} > 1^\circ > 2^\circ > 3^\circ$

C. $3^\circ > 2^\circ 1^\circ > \text{methyl}$

D. $2^\circ > 1^\circ > \text{methyl} > 3^\circ$

Answer: A

Watch Video Solution

5. C—X bond is strongest in

A. CH_3Cl

B. CH_3Br

C. CH_3F

D. CH_3I

Answer: C

Watch Video Solution

6. Reactivity order of halides of dehydrohalogenation is

A. $R-F>R-Cl>R-Br>R-I$

B. $R-I>R-Br>R-Cl>R-F$

C. $R-I>R-Cl>R-Br>R-F$

D. $R-F>R-I>R-Br>R-Cl$

Answer: B

Watch Video Solution

7. Which one of the following gives only one monochloro derivative?

A. n-hexane

B. 2-methylpentane

C. 2,3-dimethylpentane

D. neo-pentane

Answer: D

Watch Video Solution

8. DDT is prepared by condensing chlorobenzene with

A. chloroform

B. chloral

C. aniline

D. chloropicrin.

Answer: B

Watch Video Solution

9. C_2H_5Cl on heating with alcoholic KOH will produce

A. C_2H_5OH

B. C_2H_4

C. C_2H_2

D. C_2H_6

Answer: B

Watch Video Solution

10. Alkyl halides are less soluble in water because

A. Low melting point

B. Do not form H-bond with H_2O

C. Viscous in nature

D. Have very strong C-X bond

Answer: B

Watch Video Solution

11. Among the following, which one is chlorine containing insecticide?

A. D.D.T.

B. Freon

C. Phosgene

D. Iodoform

Answer: A

Watch Video Solution

12. The boiling points of haloalkanes follow the order:

A. $RI > RBr > RCI$

B. $RCI > RBr > RI$

C. $RI > RCI > RBr$

D. $RBr > Rl > RCI$

Answer: A

Watch Video Solution

13. Which of the following has highest dipole moment:

A. CH_3F

B. CH_3Cl

C. CCl_4

D. CH_3I

Answer: B

Watch Video Solution

14. Which of the following is not a polyhalogen compound?

A. Chloroform

B. Freon

C. Carbon tetrachloride

D. Chlorobenzene

Answer: D

Watch Video Solution

15. The ease of dehydrohalogenation of alkyl halide with alcoholic KOH is-

A. $3^\circ < 2^\circ < 1^\circ$

B. $3^\circ > 2^\circ > 1^\circ$

C. $3^\circ < 2^\circ > 1^\circ$

D. None of these

Answer: B

Watch Video Solution

16. Alkyl halides are prepared from alcohol by treating with:

A. $HCl + ZnCl_2$

B. $H_2SO_4 + KI$

C. $NaCl + H_2SO_4$

D. None of these

Answer: A

Watch Video Solution

17. The organic chloro compound, which shows complete stereochemical inversion during a SN^2 reaction, is:

A. CH_3Cl

B. $(CH_3)_2CH - Cl$

C. $(CH_3)_3C - Cl$

D. None of these

Answer: A

Watch Video Solution

18. Which of the following reaction is most suitable for the preparation of n-propylbenzene?

A. Friedel-Crafts alkylation

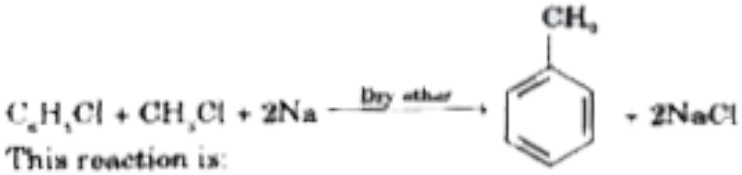
B. Wurtz reaction

C. Wurtz-Fitting reaction

D. Grignard reaction

Answer: A

View Text Solution

19. 

This reaction is:

The reaction is:

A. Stephen

B. Sandmeyer's

C. Fittig

D. Wurtz-Fitting

Answer: D

Watch Video Solution

20. In the given alkyl halides which one has minimum boiling point?

A. C_2H_5F

B. C_2H_5I

C. C_2H_5Cl

D. C_2H_5Br

Answer: A

Watch Video Solution

21. S_N2 reaction will be fastest in:

A. CH_3Br

B. CH_3Cl

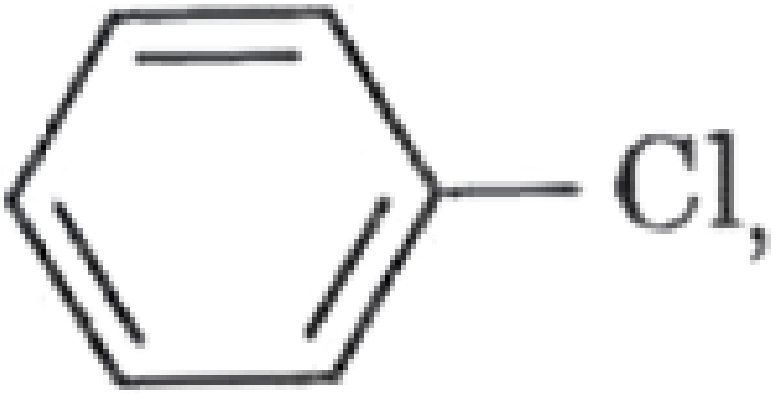
C. CH_3CH_2Cl

D. $(CH_3)_2CHCl$

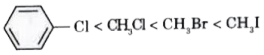
Answer: A

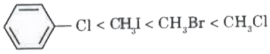
Watch Video Solution

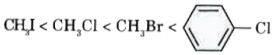
22. For the compounds, CH_3Cl, CH_3I, CH_3Br and

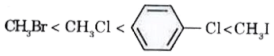


which of the following is the correct order of C-halogen bond length?

A. 

B. 

C. 

D. 

Answer: A

Watch Video Solution

23. Which of the following organic compounds are formed by Wurtz reaction?

A. Alcohols

B. Hydrocarbons

C. Haloalkanes

D. Haloarenes

Answer: B

Watch Video Solution

24. In the preparation of alkyl halide from alcohol which of the following reagents preferred?

A. $HX + ZnCl_2$

B. PX_3

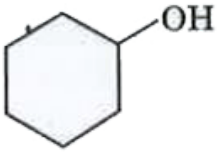
C. PCl_5

D. $SOCl_2$

Answer: D

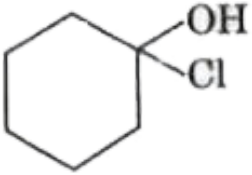
Watch Video Solution

25. Complete the following reaction

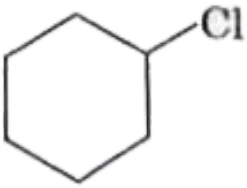


$+ SOCl_2 \rightarrow X + SO_2 + HCl$; what is X?

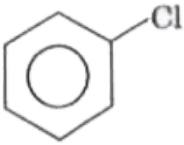
A.

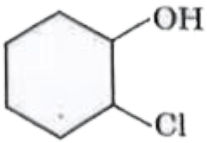


B.



C.

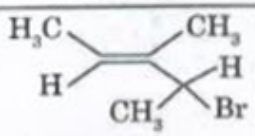
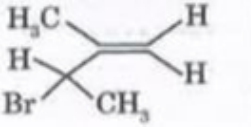


D. 

Answer: B

Watch Video Solution

26. Select the correct answer

Alkene	IUPAC name
(i) 	(A) 3-Bromo-2-methylbut-1-ene
(ii) 	(B) 3-Bromopent-2-ene
	(C) 4-Bromopent-2-ene
	(D) 4-Bromo-3-methylpent-2-ene

A. (i)-(C), (ii)-(A)

B. (i)-(B), (ii)-(A)

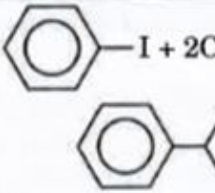
C. (i)-(C), (ii)-(B)

D. (i)-(D), (ii)-(A)

Answer: D

Watch Video Solution

27. Select the correct answer

Reaction	Name
(i) 2  $-I + 2Cu \rightarrow$	(A) Wurtz Fittig reaction
(ii) $C_6H_5Cl + 2Na + CH_3Cl \xrightarrow{Ether} C_6H_5CH_3$	(B) Wurtz reaction
	(C) Ullmann reaction
(iii) $2C_6H_5Cl \xrightarrow{Na} C_6H_5-C_6H_5$	(D) Fittig reaction

A. (i)-(C), (ii)-(A), (iii)-(D)

B. (i)-(D), (ii)-(A), (iii)-(C)

C. (i)-(B), (ii)-(A), (iii)-(D)

D. (i)-(C), (ii)-(D), (iii)-(A)

Answer: A

Watch Video Solution

28. Select the correct answer

Reaction	Main product
(i) $CH_3CH_2Br + AgNO_2 \rightarrow$	(A) $CH_3CH_2NO_2$
(ii) $CH_3CH_2Br \xrightarrow{\text{alc.KOH}}$	(B) CH_3CH_2ONO
	(C) CH_3CH_2OH
	(D) $CH_2=CH_2$

A. (i)-(A), (ii)-(B)

B. (i)-(B), (ii)-(C)

C. (i)-(B), (ii)-(D)

D. (i)-(A), (ii)-(C)

Answer: A

Watch Video Solution

29. Select the correct answer

Reaction	Example
(*i*) Raschig reaction	(A) $CH_3Br + AgF \rightarrow CH_3F + AgBr$
(*ii*) Finkelstein reaction	(B) $C_6H_5N_2^+Cl^- \xrightarrow{Cu_2Cl_2} C_6H_5Cl$
(*iii*) Sandmeyer's reaction	(C) $CH_3CH_2Cl + NaI \xrightarrow{\text{acetone}} CH_3CH_2I + NaCl$
(*iv*) Swarts reaction	(D) $2C_6H_6 + 2HCl + O_2 \xrightarrow[\Delta]{CuCl_2} 2C_6H_5Cl + 2H_2O$

A. (i)-(D), (ii)-(A), (iii)-(B), (iv)-(C)

B. (i)-(D), (ii)-(B), (iii)-(C), (iv)-(A)

C. (i)-(D), (ii)-(C), (iii)-(B), (iv)-(A)

D. (i)-(D), (ii)-(B), (iii)-(A), (iv)-(C)

Answer: C

Watch Video Solution

30. Select the correct answer

Reaction	Product (major)
(i) $(CH_3)_2CHCH(Br)CH_3 \xrightarrow{aq.\ KOH}$	(A) 3-Methylbutan-2-ol
(ii) $CH_3(CH_2)_2CH(Br)CH_3 \xrightarrow{alc.\ KOH}$	(B) 2-Methylbutan-2-ol
	(C) Pent-2-ene
	(D) Pent-1-ene

A. (i)-(C), (ii)-(B)

B. (i)-(B), (ii)-(C)

C. (i)-(A), (ii)-(D)

D. (i)-(A), (ii)-(C)

Answer: B

Watch Video Solution

Revision Exercise Objective Questions Passage Based Questions

1. Alkylhalides have polar C-X bond and undergo nucleophilic substitution reactions. These give a variety of products with nucleophiles such as $-OH,\ -OR,\ -NH_2,\ -CN,\ -NC,\ -NO_2,\ -ONO, RCOO^-,$ etc. They undergo mainly two types of nucleophilic substitution reactions, S_N1 and S_N2. S_N1 reactions are two steps reactions which proceed through the formation of carbocations while S_N2 reactions are one step reaction which proceeds through the formation of transition state. The stability of carbocation and transition state determine the reactivity of alkyl halides.

Write the main products A and B in the following reaction.

$A \xleftarrow{KNO_2} CH_3CH_2Br \xrightarrow{AgNO_2} B.$

Watch Video Solution

2. Alkylhalides have polar C-X bond and undergo nucleophilic substitution reactions. These give a variety of products with nucleophiles such as $-OH,\ -OR,\ -NH_2,\ -CN,\ -NC,\ -NO_2,\ -ONO, RCOO^-,$ etc. They undergo mainly two types of nucleophilic substitution reactions,

S_N1 and S_N2. S_N1 reactions are two steps reactions which proceed through the formation of carbocations while S_N2 reactions are one step reaction which proceeds through the formation of transition state. The stability of carbocation and transition state determine the reactivity of alkyl halides.

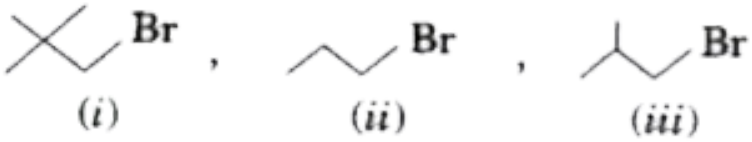
Complete the reaction:

$$CH_3CH_2Br \xrightarrow[\text{Heat}]{Ag_2O}$$

Watch Video Solution

3. Alkylhalides have polar C-X bond and undergo nucleophilic substitution reactions. These give a variety of products with nucleophiles such as $-OH,\ -OR,\ -NH_2,\ -CN,\ -NC,\ -NO_2,\ -ONO, RCOO^-$, etc. They undergo mainly two types of nucleophilic substitution reactions, S_N1 and S_N2. S_N1 reactions are two steps reactions which proceed through the formation of carbocations while S_N2 reactions are one step reaction which proceeds through the formation of transition state. The stability of carbocation and transition state determine the reactivity of alkyl halides.

Arrange the following in the increasing order of reactivity towards S_N2 reaction:



(i) , (ii) , (iii)

Watch Video Solution

4. Alkylhalides have polar C-X bond and undergo nucleophilic substitution reactions. These give a variety of products with nucleophiles such as $-OH,\ -OR,\ -NH_2,\ -CN,\ -NC,\ -NO_2,\ -ONO, RCOO^-$, etc. They undergo mainly two types of nucleophilic substitution reactions, S_N1 and S_N2. S_N1 reactions are two steps reactions which proceed through the formation of carbocations while S_N2 reactions are one step reaction which proceeds through the formation of transition state. The stability of carbocation and transition state determine the reactivity of alkyl halides.

Write the structure of isomer of compound C_4H_9Br which is most reactive towards S_N1 reaction.

Watch Video Solution

5. Alkylhalides have polar C-X bond and undergo nucleophilic substitution reactions. These give a variety of products with nucleophiles such as $-OH,\ -OR,\ -NH_2,\ -CN,\ -NC,\ -NO_2,\ -ONO, RCOO^-$, etc. They undergo mainly two types of nucleophilic substitution reactions, S_N1 and S_N2. S_N1 reactions are two steps reactions which proceed through the formation of carbocations while S_N2 reactions are one step reaction which proceeds through the formation of transition state. The stability of carbocation and transition state determine the reactivity of alkyl halides.

Which out of S_N1 or S_N2 results into inversion of configuration?

Watch Video Solution

6. Ethyl bromide reacts with alcoholic solution of KCN and AgCN to give different products having same molecular formula. These further react with other reagents to form different products.

Name the different products formed by reaction of ethyl bromide with KCN and AgCN.

Watch Video Solution

7. Ethyl bromide reacts with alcoholic solution of KCN and AgCN to give different products having same molecular formula. These further react with other reagents to form different products.

How are these two compounds related?

Watch Video Solution

8. Ethyl bromide reacts with alcoholic solution of KCN and AgCN to give different products having same molecular formula. These further react with other reagents to form different products.

Complete the reaction:

$$CH_3CH_2Br \xrightarrow{alc.KCN} A \xrightarrow{Na, C_2H_5OH} B$$

Watch Video Solution

9. Ethyl bromide reacts with alcoholic solution of KCN and AgCN to give different products having same molecular formula. These further react with other reagents to form different products.

How will you convert ethyl bromide into N-methyl aminoethane? Give reaction.

Watch Video Solution

10. Ethyl bromide reacts with alcoholic solution of KCN and AgCN to give different products having same molecular formula. These further react with other reagents to form different products.

How will you convert ethyl bromide into ethanamide? Give reaction.

Watch Video Solution

Revision Exercise Objective Questions Assertion Reason Questions

1. Assertion: Addition of Br_2 to 1-butane gives two optical isomers.

Reason: The product contains one asymmetric carbon atoms.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: A

Watch Video Solution

2. Assertion:S_N2 reactions proceed with inversion of configuration

Reason: S_N2 reactions occur in one step .

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: B

Watch Video Solution

3. A) Addition of bromine to trans-but-2-ene yields meso-2,3-dibromo butane.

R) Bromine addition to an alkene is an electrophilic addition.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: B

Watch Video Solution

4. Assertion: Benzyl bromide when kept in acetone water produces benzyl alcohol.

Reason: The reaction follows S_N2 mechanism.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: C

Watch Video Solution

5. Assertion (A) : The nucleophilic substitution of vinylchloride is difficult as compared to ethyl chloride.

Reason (R) : The vinyl group is electron donating in vinyl chloride.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: C

Watch Video Solution

6. Assertion: tert-butylbromide undergoes S_N1 nucleophilic substitution readily than n-butyl bromide.

Reason: It proceeds by the formation of stable carbocation.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: A

Watch Video Solution

7. Assertion : Treatment of chloroethane with a saturated solution of AgCN gives ethyl isocyanide as the major product.

Reason : Cyanide $\left(CN^{-}\right)$ is an ambident nucelophile

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: B

Watch Video Solution

8. Assertion : Alkyl iodide can be prepared by treating alkyl chloride/bromide with Nal in acetone .

Reason : NaCI/NaBr are soluble in acetone while Nal is not .

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: C

Watch Video Solution

Revision Exercise Very Short Answer Questions

1. how will you prepare 1-bromopropane from propene?

Watch Video Solution

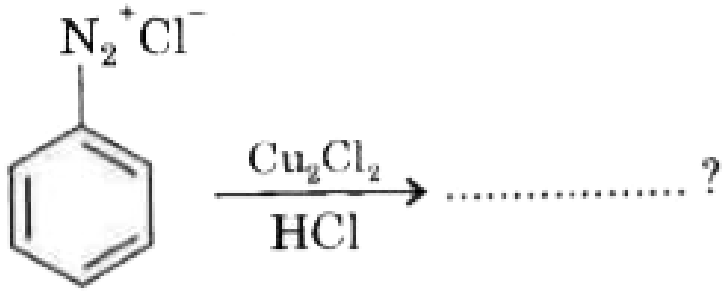
2. Write the structure of 2-chloro-3-methylpentane.

Watch Video Solution

3. Out of S_{N^1} and S_{N^2} reaction, which is accompanied by inversion of configuration?

Watch Video Solution

4.



Complete the reaction.

Watch Video Solution

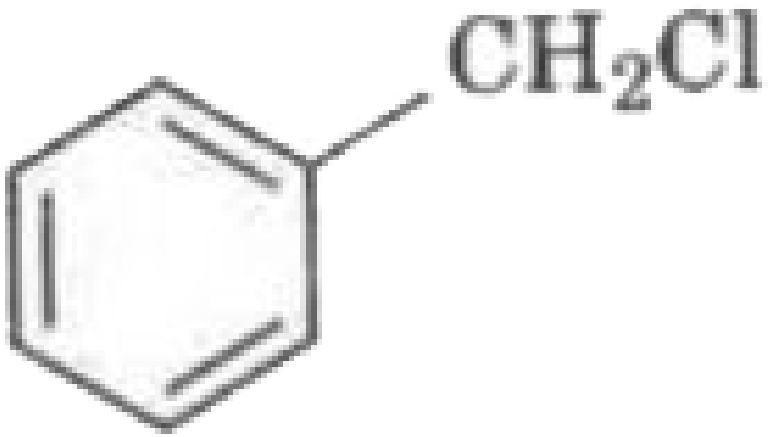
5. Define ambident nucleophile with an example.

Watch Video Solution

6. Write the structural formula of 4-chloropent-2-ene.

Watch Video Solution

7. Write the IUPAC name of



Watch Video Solution

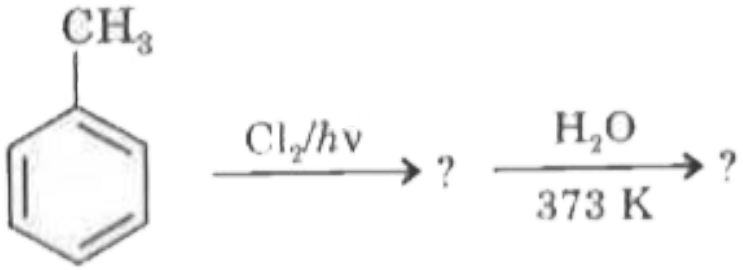
8. Out of o- and p-dibromobenzene which one has higher melting point and why?

Watch Video Solution

9. Write the chemical equation of Hunsdiecker reaction.

Watch Video Solution

10. Complete the following reaction:



Watch Video Solution

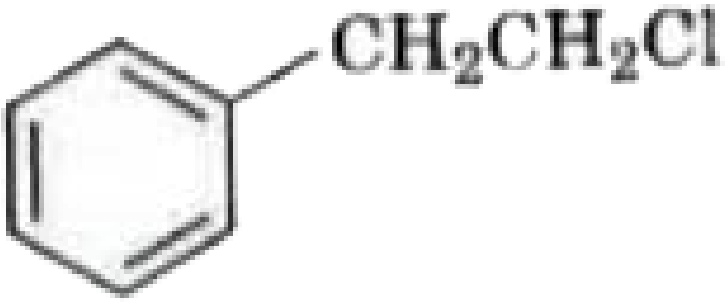
11. A solution of aqueous of KO hydrolysis $CH_3CHClCH_2CH_3$ and $CH_3CH_2CH_2CH_2Cl$. Which one of these is more easily hydrolysed.?

Watch Video Solution

12. Give an example of β -elimination reaction of alkyl halides.

Watch Video Solution

13. Write the IUPAC name of



Watch Video Solution

14. Which of the following is most reactive towards S_N2 reaction?

$CH_3Br, (CH_3)_2CHBr, (CH_3)_3CBr$

Watch Video Solution

15. WURTZ REACTION

Watch Video Solution

16. $H_3C - Br + AgF \rightarrow H_3C - F + AgBr.$

Name the reaction.

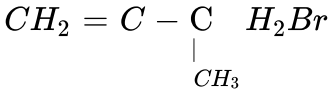
Watch Video Solution

17. Write the IUPAC name of the following compound :

$(CH_3)_3CCH_2Br$

Watch Video Solution

18. Give the IUPAC name of the following compound.



Watch Video Solution

19. Draw the structure of DDT.

Watch Video Solution

20. What happens when $CH_3 - Br$ is treated with KCN?

Watch Video Solution

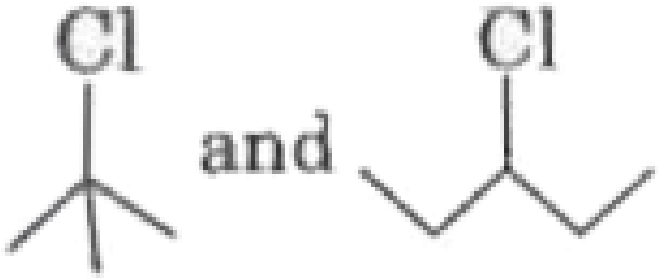
21. Write the IUPAC name of $CH_3CH = CH - \overset{\overset{CH_3}{|}}{\underset{\underset{Br}{|}}{C}} - CH_3$.

Watch Video Solution

22. Write the IUPAC name of $(CH_3)_2CHCH(CI)CH_3$.

Watch Video Solution

23. Which compound in the following pair undergoes faster S_N1



reaction?

Watch Video Solution

24. Arrange the following halides in order of increasing S_N2 reactivity:

$(CH_3)_3CCl, CH_3Cl, CH_3Br, CH_3CH_2Cl, (CH_3)_2CHCI$

Watch Video Solution

25. Which would undergo S_{N^2} reaction faster in the following pair and why?

$$CH_3 - CH_2 - Br \text{ and } CH_3 - \underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}} - Br.$$

Watch Video Solution

26. Out $CH_3 - \underset{\displaystyle CH_3}{\overset{|}{CH}} - CH_2 - Cl$ and $CH_3 - CH_2 - \underset{\displaystyle CH_3}{\overset{|}{CH}} - Cl$, which is more reactive towards S_N1 reaction and why?

Watch Video Solution

27. What product is obtained when toluene is treated with Cl in the presence of light.

Watch Video Solution

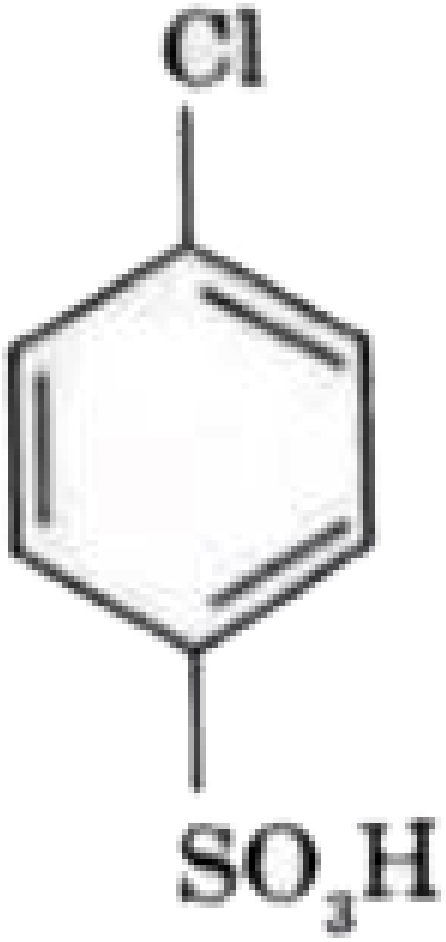
28. Write the structure of 1-Bromo-4-chlorobut-2-ene

Watch Video Solution

29. Write the structure of 3-Bromo-2-methylprop-1-ene

Watch Video Solution

30. Write IUPAC name of the given compound:



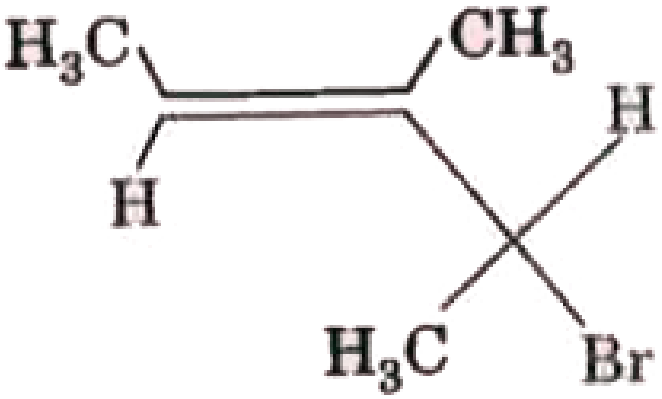
Watch Video Solution

31. Write one stereochemical difference between S_N1 and S_N2 reactions.

Watch Video Solution

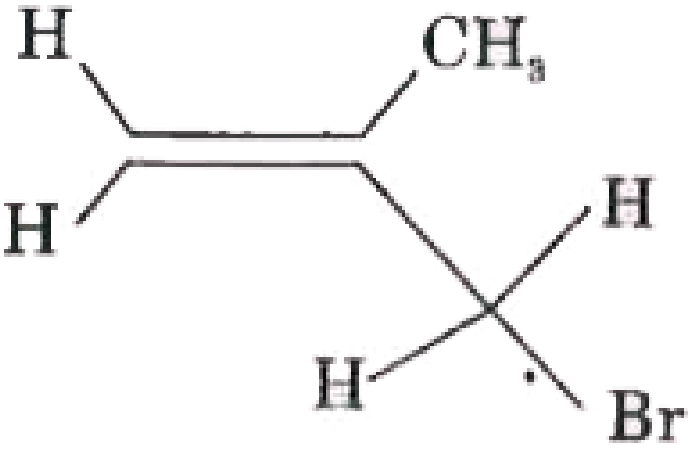
Revision Exercise Very Short Answer Questions Cbse Qs

1. Give the IUPAC name of the following compound:



Watch Video Solution

2. Write IUPAC name of the following :



Watch Video Solution

3. Write the ItJP AC name of the following compound :

$$CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_2}{|}}{C}} - \underset{\underset{Cl}{|}}{CH} - CH_3$$

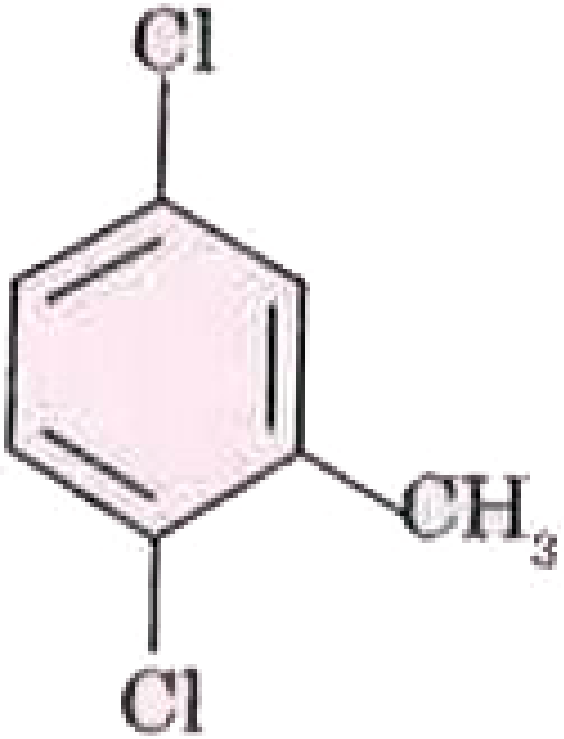
Watch Video Solution

4. Write the IUPAC name of the following compound:

$$CH_3 - \underset{\underset{Br}{|}}{CH} - CH_2 - \underset{\underset{Cl}{|}}{CH} - CH_3$$

Watch Video Solution

5. Write IUPAC name of the following compound:

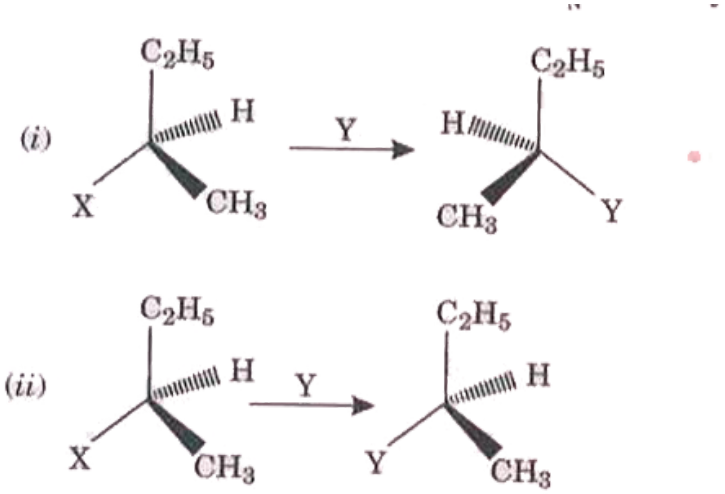


Watch Video Solution

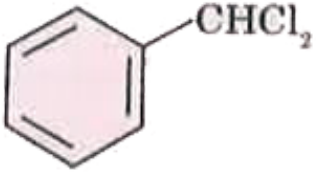
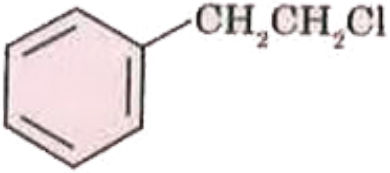
6. Identify the chiral molecule in the following pair:

Watch Video Solution

7. Which of the following two reactions is S_N2 and why?



Watch Video Solution

8. Out of  and  , which is an example of a benzylic halide?

Watch Video Solution

9. Out of  , which is an example of vinylic halide?

View Text Solution

10. Out of  , which is an example of allylic halide?

View Text Solution

Revision Exercise Short Answer Questions

1. How is ethyl bromide converted into

(a) ethanol (b) ethyl acetate

(c) diethyl amine (d) propanoic acid ?

Watch Video Solution

2. How will you convert:

(i) n-propyl bromide to iso-propyl bromide

(ii) 1-Bromopropane into propene

(iii) 2-Propanol into 1-bromopropane

(iv) 2-Chlorobutane into butanol ?

Watch Video Solution

3. How will you distinguish between

(i) Vinyl chloride and ethyl chloride

(ii) Chlorobenzene and cyclohexyl chloride

(iii) Ethyl chloride and ethyl bromide ?

Watch Video Solution

4. (a) Haloarenes undergo electrophilic substitution reaction at ortho and para position. Explain.

(b) Complete the following reaction:

$CH_2Br \xrightarrow{\text{Dry ether}} A \xrightarrow{Na, C_2H_5OH} B.$

Watch Video Solution

5. How will you bring about the following conversions?

(a) Toluene to benzyl alcohol.

(b) But-1-ene to but-2-ene.

(c) tert-Butyl bromide to isobutyl bromide.

Watch Video Solution

6. Explain as to why haloarenes are much less reactive than halo-alkanes towards nucleophilic substitution reactions.

Watch Video Solution

7. Which compound in each of the following pairs will react faster in S_N2 reaction with -OH ? Why?

(i) CH_3Br or CH_3I (ii) $(CH_3)_3CCl$ or CH_3Cl

Watch Video Solution

8. Write the equations for the steps in S_N1 mechanism of the conversion of tert-Butyl bromide into tert-Butyl alcohol.

(a) Explain Fitting reaction.

(b) Name the reagent used in the dehydrohalogenation of haloalkanes.

Watch Video Solution

9. (i)State one use each of DDT and iodoform.

(ii) Which compound in the folloeing couples will react faster in `S_(N)2 displacement and why?

(a)1-Bromopentane or2-bromopentane

(b) 1-Bromo -2 methylbutane or 2-bromo-2-methylbutane.

Watch Video Solution

10. Explain why

(i) the dipole moment of chlorobenzene is lower than that of cyclohexyl chloride?

(ii) alkyl halides, though polar, are immiscible with water?

(iii) Grignard reagents should be prepared under anhydrous conditions?

Watch Video Solution

11. Answer the following:

(i) Haloalkanes easily dissolve in organic solvents, why?

(ii) What is known as a racemic mixture ? Give an example.

(iii) Of the two bromoderivatives, $C_6H_5CH(CH_3)Br$ and $C_6H_5CH(C_6H_5)Br$, which one is more reactive in S_{n^1} substitution reaction and why?

Watch Video Solution

12. Althrough chlorine is an electron withdrawing group, yet it is ortho-para-directing in electrophilic aromatic substitution reactions. Explain why it is so ?

Watch Video Solution

13. (a) Explain why thionyl chloride ($SOCI_2$) method is preferred for preparing alkylchlorides from alcohols.

(b) Forisomerichaloalkanes, the boiling point decreases with branching of chain. Why?

Watch Video Solution

14. How will you convert the following (any two)? Give chemical equations only:

(i) Ethane to bromoethene

(ii) Benzene to biphenyl

(iii) Aniline to chlorobenzene.

Watch Video Solution

15. Explain S_N2 reaction mechanism of haloalkane. Arrange the reactivity of $1^\circ, 2^\circ \text{ and } 3^\circ$ haloalkane towards S_N2 reaction.

Watch Video Solution

16. (a) Explain why haloarenes undergoes electrophilic substitution reactions at ortho and para positions only

(b) The p-isomer of dichloro benzene has higher melting point than its ortho and meta-isomers. Explain.

Watch Video Solution

17. (a). Complete the reaction:

$CH_3CH_2Br + KOH(alc.)$

(b). Explain why the use of chloroform as Anaesthetic is decreasing

(c). What happens when bromobenzene is treated with magnesium is the presence of dry ether?

Watch Video Solution

18. Explain why :

(i) Sulphuric acid is not used during the reaction of alcohols with KI?

(ii) Allyl chloride is more reactive than n-propyl chloride towards nucleophilic substitution reactions?

Watch Video Solution

19. Following compounds are given to you :

2-Bromopentane, 2-Bromo-2-methylbutane, 1-Bromopentane

(i) Write the compound which is most reactive towards S_N2 reaction

(ii) Write the compound which is optically active

(iii) Write the compound which is most reactive towards β-elimination reaction

Watch Video Solution

20. (a) Alkyl halides react with $AgNO_2$ and KNO_2 to give $R-NO_2$ and R-ONO respectively. Why?

(b) Haloarenes are insoluble in water but are soluble in benzene. Why?

Watch Video Solution

21. (a) Write the following reaction:

(i) Wurtz Fittig reaction

(ii) Balz-Schiemann reaction

(iii) Friedal Crafts Alkylation reaction

(b) Why is solubility of haloalkanes in water very low?

(c) Give one use of Feron.

Watch Video Solution

22. (a) Why are haloarenes less reactive than haloalkanes? (explain with resonance and hybridization).

(b) Explain substitution nucleophilic bimolecular (S_N2) reaction.

(c) Define Optical activity.

Watch Video Solution

23. (a) Haloalkanes react with potassium cyanide (KCN) to give alkyl cyanide but gives alkyl isocyanide with silver cyanide (AgCN).

(b) Why are haloarenes more stable than haloalkanes?

Watch Video Solution

24. Give reasons:

(a) n-Butyl bromide has higher boiling point than t-butyl bromide.

(b) Racemic mixture is optically inactive.

(c) The presence of nitro group ($-NO_2$) at op positions increases the reactivity of haloarenes towards nucleophilic substitution reactions.

Watch Video Solution

25. Explain S_N2 reaction mechanism of haloalkanes.

Watch Video Solution

26. (a) Aryl halides are less reactive in nucleophilic substitution reactions.

(i) Write any two reasons for less reactivity.

(ii) Give one example for nucleophilic substitution reactions of aryl halides

(b) Write a method for the preparation of alkyl halides.

(c) Which of the following is not a polyhalogen compound.

(i) Chloroform (ii) Freon

(iii) Carbon tetrachloride (iv) Chlorobenzene

Watch Video Solution

27. Give reasons:

(i). $C-Cl$ bond length in chlorobenzene is shorter than $C-Cl$ bond length in CH_3-Cl

(ii). The dipole moment of chlorobenzene is less than of cyclohexyl chloride.

(c). S_{N^1} reactions are are accompanied by racemisation is optically active alkyl halides.

Watch Video Solution

28. (a) Write the equations for the steps involved in the S_N1 mechanism of hydrolysis of 2-bromo-2-methylpropane.

(b) (i) Name the product formed for the reaction of isopropyl iodide on alcoholic KOH.

(ii) What is the condition to be satisfied for a compound to be chiral?

(c) What is racemic mixture?

Watch Video Solution

29. (a) Complete the reaction:

(i) $CH_3CH_2Br \xrightarrow{AgCN}$

(ii) $CH_3CH_2Br \xrightarrow[\text{Dry ether}]{Na}$

(b) During the B-elimination reaction of 2-bromopentane in an alcoholic solution of KOH results pent-2-ene as major product and pent-1-ene as minor product. State the rule to explain the reaction.

Watch Video Solution

30. (i) Out of $(CH_3)_3$, C-Br and $(CH_3)_3$ C-I, which one is more reactive towards S_N1 and why?

(ii) Write the product formed when P-nitrochlorobenzene is heated with aqueous NaOH at 443K followed by acidification.

(iii) Why dextro and laevo-rotatory isomers of Butan-2-ol are difficult to separate by fractional distillation?

Watch Video Solution

Revision Exercise Short Answer Questions Cbse Qs

1. How would you differentiate between S_N1 and S_N2 mechanisms of substitution reactions? Give one example of each.

Watch Video Solution

2. (a) How would you convert the following:

(i) Prop-1-ene to 1-fluoropropane

(ii) Chlorobenzene to 2-chlorotoluene

(b) Write the main product when

(i) n-Butyl chloride is treated with alcoholic KOH.

(ii) 2, 4, 6- trinitrochlorobenzene is subjected to hydrolysis.

(iii) methyl chloride is treated with AgCN.

Watch Video Solution

3. Out of chlorobenzene and chloroethane which is more readily hydrolysed with aqueous KOH?

Watch Video Solution

Revision Exercise Long Answer Questions

1. (a) An organic compound 'A' having molecular formula C_4H_8 on treatment with dil. H_2SO_4 gives B. B on treatment with conc. HCI and anhydrous $ZnCI_2$ gives secondary halide C. Write all the reactions and identify A, B and C.

(b) Convert ethyl chloride into methyl chloride.

Watch Video Solution

2. (a) A hydrocarbon 'A' (C_4H_8) is added with HBr in accordance with Markovnikov's rule to give compound 'B' which on hydrolysis with aqueous alkali forms tertiary alcohol 'C' ($C_4H_{10}O$). Identify A, B and C.

(b) Convert chlorobenzene into phenol.

Watch Video Solution

3. (a) How will you differentiate between S_N1 and S_N2 reactions?

(b) Why does the treatment of alkyl chloride with silver nitrate form nitroalkane and with potassium nitrite form alkyl nitrite?

Watch Video Solution

4. (a) An ambident nucleophile is:

(i) Ammonia (ii) Ammonium ion

(iii) Chloride ion (iv) Nitrite ion

(b) Haloalkanes and haloarenes are organohalogen compounds.

(i) Suggest a method for the preparation of alkyl chloride.

(ii) Aryl halides are less reactive towards nucleophilic substitution reactions. Give reasons.

Watch Video Solution

Higher Order Thinking Skills

1. Why alkyl halides are generally not prepared in the laboratory by free radical halogenation of alkanes?

Watch Video Solution

2. Propose reaction for the preparation of: (i) allyl iodide and (ii) allyl fluoride from prop-1-ene.

Watch Video Solution

3. (R)-2-Bromooctane reacts with hydrogen sulphide (HS^-) ion and gives (S)-2-octanethiol with inversion of configuration at the stereocentre. Can we plan to get (R)-2-octanethiol from (R)-2-bromooctane?

View Text Solution

4. RCI is hydrolysed to ROH slowly but the reaction is rapid if a catalytic amount of KI is added to the reaction mixture. Explain.

Watch Video Solution

5. Optically active 2-iodo butane on treatment with NaI in acetone gives a product which does not show optical activity. Explain briefly.

Watch Video Solution

6. An alkyl halide $(X)$of the folmula $C_6H_{13}Cl$ on treatment with potassium tertiary butoxide gives two isomeric alkenes (Y) and $(Z)(C_6H_{12})$. Both the alkenes on hydrogenation give $2,3-$ dimethyl butane. Perdict the structures of (X), (Y) , and (Z)

Watch Video Solution

7. A dihalogen derivative (A) of a hydrocarbon having two carbon atoms reacts with alcoholic potash and forms another hydrocarbon which gives a red precipitate with ammoniacal cuprous chloride. Compound A gives an aldehyde when treated with aqueous KOH. Write down the name and formula for the organic compound.

Watch Video Solution

8. A hydrocarbon with formula C_8H_{18} gives one monochloro derivative. The hydrocarbon can be:

Watch Video Solution

Watch Video Solution

9. If relative rates of substitution of 1° and 2° H are in the ratio 1 : 3.8, show that in the presence of light at 298 K, the chlorination of n-butane gives a mixture of 72% 2-chlorobutane and 28% 1-chlorobutane.

Watch Video Solution

10. $C_6H_5CH_2CH(Cl)C_6H_5 \xrightarrow[\text{Heat}]{\text{KOH(alc.)}} [A]$

Watch Video Solution

11. Which S_N1 reaction would you expect to take place more rapidly ?

(a) (i) $(CH_3)_3CCl + H_2O \rightarrow (CH_3)_3COH + HCl$

Or

(ii) $(CH_3)_3CBr + H_2O \rightarrow (CH_3)_3COH + HBr$

(b) (i) $(CH_3)_3CCl + H_2O \rightarrow (CH_3)_3COH + HCl$

Or

(ii) $C_5H_5Cl + H_2O \rightarrow C_5H_5OH + HCl$

(c) (i) $(CH_3)_3CCl + H_2O \rightarrow (CH_3)_3COH + HCl$

Or

(ii) $(CH_3)_3CCl + CH_3OH \rightarrow (CH_3)_3COCH_3 + HCl$

(d) (i)

$(CH_3)_3CCl(1.0M) + CH_3CH_2O^-(1.0M) \xrightarrow{C_2H_2OH} (CH_3)_3COCH_2CH_3 +$

Or

(ii)

$(CH_3)_3CCl(1.0M) + CH_3CH_2O^-(2.0M) \xrightarrow{C_2H_2OH} (CH_3)_3COCH_2CH_3 +$

Watch Video Solution

12. Hydrolysis of 2-bromo-3-methyl butane (2°) yields only 2-methy-2-butanol (3°), explain.

Watch Video Solution

13. Why do alkenes prefer to undergo electrophilec addition reaction while arenes prefer electrophilic substitution reactions ? Explain.

Watch Video Solution

A Multiple Choice Questions With Only One Correct Answer

1. The IUPAC nane of the compound

$CH_3 - CH = CH - CH_2Br$ is

A. 1-Bromobut-2-ene

B. 1-Bromobut-3-ene

C. 2-Butene-1-bromide

D. 4-Bromobut-2-ene.

Answer: A

Watch Video Solution

2. In the reaction :

$CH_3CHCl_2 \xrightarrow{\text{aq. KOH}} \text{Intermediate} \rightarrow X, X$ is :

A. CH_3CHO

B. $(CH_3)_2CO$

C. CH_3CH_2OH

D. $\underset{OH}{\overset{|}{C}}H_2 - \underset{OH}{\overset{|}{C}}H_2$

Answer: A

Watch Video Solution

3. Identify Z, in the following reaction.

$C_2H_5I \xrightarrow{\text{alc. KOH}} X \xrightarrow{Br_2} Y \xrightarrow{\text{KCN}} Z$

A. CH_3CH_2CN

B. $CNCH_2CH_2CN$

C. $BrCH_2CH_2CN$

D. $BrCH = CHCN$

Answer: B

Watch Video Solution

4. In the reaction ,

$$CH_3 - \underset{\underset{Br}{|}}{CH} - CH_3 \xrightarrow{alc.KOH} (A) \xrightarrow[\text{Peroxide}]{HBr} (B) \xrightarrow[\text{Acetone}]{NaI} (C)$$

The compound (C) is :

A. $CH_3CH_2CH_2I$

B. $\underset{\underset{I}{|}}{CH_3CH} - CH_3$

C. $CH_3 = \underset{\underset{I}{|}}{CHI}$

D. $\underset{\underset{I}{|}}{CH_3CHCH_2I}$

Answer: A

Watch Video Solution

5. The reagents for the following conversions is/are :

A. alcoholic KOH

B. $Zn \mid CH_3OH$

C. aq. KOH followed by $NaNH_2$

D. alcoholic KOH followed by $NaNH_2$.

Answer: D

View Text Solution

6. In the following reaction:

The major product obtained is

A. 

B. 

C. 

D. 

Answer: A

View Text Solution

7. In the adddition of HBr to propene in the absence of peroxides, the first step involves the addition of-s

A. $H^{\bullet}$

B. $Br^{\bullet}$

C. H^{+}

D. Br^{-}

Answer: C

Watch Video Solution

8. The major product in the reaction is

$$CH_3 - \underset{\underset{CH_3}{|}}{C}H - CH_2Br \xrightarrow[CH_3OH]{CH_3O^-}$$

A. $CH_3 - \underset{\underset{OCH_3}{|}}{C}\ H - CH_2CH_3$

B. $CH_3 - \underset{\underset{CH_3}{|}}{C}\ = CH_2$

C. $CH_3 - \underset{\underset{CH_3}{|}}{C}\ HCH_2OCH_3$

D. $CH_3 - \underset{\underset{OCH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_3$

Answer: B

Watch Video Solution

9. In the reaction:

$$\underset{\text{(Major)}}{A} \xleftarrow{C_2H_5OH} (CH_3)_3CBr \xrightarrow[C_2H_5OH]{C_2H_5O^-Na^+} \underset{\text{(Major)}}{B}$$

A and B are respectively:

A. A is $(CH_3)_2C = CH_2$ and B is $(CH_3)_3COC_2H_5$

B. A is $(CH_3)_3COC_2H_5$ and B is $(CH_3)_2C = CH_2$

C. Both A and B are $(CH_3)_2C = CH_2$

D. Both A and B are $(CH_3)_3COC_2H_5$.

Answer: B

Watch Video Solution

10. The product of the reaction of alcoholic silver nitrite with ethyl bromide is:

A. Ethylene

B. Ethyl nitrite

C. Nitroethane

D. Ethyl alcohol.

Answer: C

Watch Video Solution

11. When ethyl iodide and n-propyl iodide are allowed to react with sodium in the presence of dry ether, the number of alkanes that would be produced is

A. only one

B. two alkanes

C. three alkanes

D. four alkanes

Answer: C

Watch Video Solution

12. 1,3-Dibromopropane reacts with metallic zinc to form

A. Propene

B. Propane

C. Cyclopropane

D. Hexane

Answer: C

Watch Video Solution

13. Identify the set of reagents/ reaction condition 'X' and 'Y' in the following set of transformations :

$$CH_3 - CH_2 - CH_2Br \xrightarrow{X} \text{Product} \xrightarrow{Y} CH_3 - \underset{\underset{Br}{|}}{CH} - CH_3$$

A. X = dilute aqueous solution, $20^\circ C$,

$Y = \text{HBr} / \text{acetic acid at } 20^\circ C$

B. X = dilute aqueous NaOH, $20^\circ C$,

$Y = \text{HBr} / \text{acetic acid at } 20^\circ C$

C. X = dilute aqueous NaOH, $20^\circ C$,

$Y = Br / CHCl_3, 0^\circ C$

D. X = concentrated alcoholic NaOH, $80^\circ C$,

$$Y = Br/CHCl_3, 0^\circ C$$

Answer: B

Watch Video Solution

14. Butanenitrile 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.

Answer: D

Watch Video Solution

15. Which of the following is least reactive in a nucleophilic substitution reaction?

A. $CH_3CH_2CH_2Cl$

B. $(CH_3)_3CCl$

C. $CH_2 = CHCH_2Cl$

D. $CH_2 = CHCl$

Answer: D

Watch Video Solution

16. The most reactive nucleophile among the following is

A. CH_3O^-

B. $C_6H_5O^-$

C. $(CH_3)_2CHO^-$

D. $(CH_3)_3CO^-$

Answer: A

Watch Video Solution

17. In the reaction, the major product 'X' is

A. 

B. 

C. 

D. 

Answer: B

View Text Solution

18. Chlorobenzene can be obtained from benzene diazonium chloride by

A. Gattermann's reaction

B. Friedel Crafts reaction

C. Wurtz reaction

D. Fittig reaction. Amers

Answer: A

Watch Video Solution

19. Which of the following is most reactive toward nucleophilic substitution reaction ?

A. C_6H_5Cl

B. $CH_2 = CHCl$

C. $ClCH_2CH = CH_2$

D. $CH_3CH = CHCl$

Answer: C

Watch Video Solution

20. The reaction fo toluenec with Cl_2 in presence of $FeCl_3$ gives prediominantly

A. Benzoyl chloride

B. m-chloro toluene

C. Benzyl chloride

D. o- and p-chlorotoluene.

Answer: D

Watch Video Solution

21. Which of the following sequence of reaction (reagents) can be used for conversion of $C_6H_5CH_2CH_3$ into $C_6H_5CH=CH_2$?

A. $SOCl_2$, alc. KOH

B. $Cl_2 / hv, H_2O$

C. SO_2Cl_2, aq. KOH

D. SO_2Cl_2, alc. KOH

Answer: D

Watch Video Solution

22. The increasing order of hydrolysis of the following compounds is

A. $A < D < B < C$

B. $A < B < D < C$

C. $D < C < B < A$

D. $A < B < C < D$

Answer: D

View Text Solution

23. Arrange the following compounds in order of increasing dipole moment .

Toluene (I) m-dichlorobenzene (II)

o-dichlorobenzene (III) . P-dichlorobenzene (IV) .

A. $I < IV < II < III$

B. $IV < I < II < III$

C. $IV < I < III < II$

D. $IV < II < I < III$

Answer: B

Watch Video Solution

24. In the following sequence of reactions, B is

$$C_6H_6 \xrightarrow[FeCl_3]{Cl_2} A \xrightarrow{Na} B$$

A. chlorobenzene

B. benzyl chloride

C. diphenyl

D. chlorophenylmethane

Answer: C

Watch Video Solution

25. 2-Phenyl-2-chloropropane on treatment with alc. KOH gives mainly

A. 2-Phenylpropene

B. 3-Phenylpropene

C. 1-Phenylpropan-2-ol

D. 1-Phenylpropan-3-ol

Answer: A

Watch Video Solution

26. The major product (Z) in the following reaction is :

A. Benzamide

B. Benzoic acid

C. 2-Phenylethanoic acid

D. Xylene

Answer: C

View Text Solution

27. Fluorobenzene is prepared by treating benzene diazonium chloride with fluoroboric acid and heating the product obtained. This reaction is known as:

A. Schiemann reaction

B. Sandmeyer reaction

C. Gattermann reaction

D. Ullmann reaction.

Answer: A

Watch Video Solution

28. Chlorobenzene is prepared commercially by :

A. Etard reaction

B. Wurtz Fittig reaction

C. Raschig reaction

D. Grignard reaction.

Answer: C

Watch Video Solution

29. When chlorobenzene is treated with NH_3 in presence of Cu_2O in xylene is 570 K. The product obtained is

A. Aniline

B. Diphenyl

C. Diphenylamine

D. Phenyl isocyanide

Answer: A

Watch Video Solution

30. The structure of the major product formed in the reaction is

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

31. Which of the following will give yellow precipitateon shaking with an aqueous solution of NaOH followed by acidification with dil. HNO_3 and addition of $AgNO_3$ solution?

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

32. Freon-12 is commonly used as

A. an insecticide

B. a refrigerant

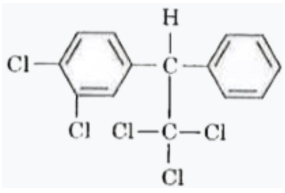
C. a solvent

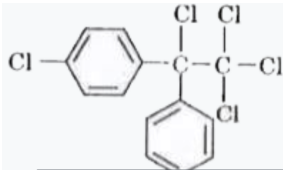
D. fire extinguisher.

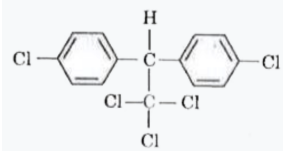
Answer: B

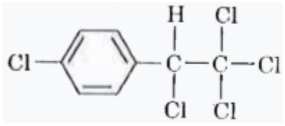
Watch Video Solution

33. Which of the following is the correct structure of D.D.T.?

A. 

B. 

C. 

D. 

Answer: C

Watch Video Solution

34. Benzene hexachloride (BHC) is used as :

A. Dye

B. Antimalarial drug

C. Antibiotic

D. Insecticide.

Answer: D

Watch Video Solution

35. what happens when chloroform is exposed to air in presenc of sunlight ? Explain with suitable mechanism.

A. Carbon tetrachloride

B. Carbonyl chloride

C. Mustard gas

D. Carbon monoxide.

Answer: B

Watch Video Solution

B Multiple Choice Questions From Competitive Examinations

1. In a S_N2 substitution reaction of the type

$$R - Br + Cl^- \xrightarrow{\text{DMF}} R - Cl + Br^+$$

which one of the following has the highest relative rate?

A. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}\ H - CH_2Br$

B. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}\ - CH_2Br$

C. CH_3CH_2Br

D. $CH_3 - CH_2 - CH_2Br$

Answer: C

Watch Video Solution

2. $H_3C - \underset{\underset{CH_3}{|}}{CH} - CH = CH_2 + HBr \rightarrow A.$

A is predominantly

A. $CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{Br}{|}}{C}}\ - CH_2CH_3$

B. $CH_3 - \underset{\underset{Br}{|}}{CH} - \underset{\underset{CH_3}{|}}{C}\ H - CH_3$

C. $CH_3 - \underset{\underset{CH_3}{|}}{C}\ H - \underset{\underset{Br}{|}}{CH} - CH_3$

D. $CH_3 - \underset{\underset{CH_3}{|}}{C}H - CH_2 - CH_2Br$

Answer: A

Watch Video Solution

3. The hydrolysis of 2-bromo-3-methylbutane by S_{N1} mechanism gives mainly:

A. 3-methyl-2-butanol

B. 2-methyl-2-butanol

C. 2,2-dimethyl-2-propanol

D. 2-methyl-1-butanol

Answer: B

Watch Video Solution

4. A dihalogen dervative 'X' of a hydrocarbon with three carbon atoms reacts with alcoholic KOH and produces another hydrocarbon which forms a red precipitate with ammoniacal Cu_2Cl_2. $'X'$ gives an aldehyde on reaction with aqueous KOH. The compound 'X' is :

A. 1,3-Dichloropropane

B. 1,2-Dichloropropane

C. 2,2-Dichloropropane

D. 1,1-Dichloropropane

Answer: D

Watch Video Solution

5. When neopentyl bromide is subjected to Wurtz reaction, the product formed is

A. 2, 2, 4, 4-tetramethylhexane

B. 2,2, 4, 4-tetramethylpentane

C. 2, 2, 5, 5-tetramethylhexane

D. 2, 2, 3, 3-tetramethylhexane

Answer: C

Watch Video Solution

6. Which one is most reactive towards S_N1 reactions ?

A. $C_6H_5C(CH_3)(C_6H_5)Br$

B. $C_6H_5CH_2Br$

C. $C_6H_5CH(C_6H_5)Br$

D. $C_6H_5CH(CH_3)Br.$

Answer: A

Watch Video Solution

7. The correct order of increasing reactivity of C-X bond towards nucleophile in the following compounds is :

A. $IV < III < I < II$

B. $III < II < I < IV$

C. $I < II < IV < III$

D. $II < III < I < IV$

Answer: C

View Text Solution

8. The reaction of toluene with Cl_2 in the presence of $FeCl_3$ gives X and the reaction in the presence of light gives Y. Thus, X and Y are :

A. X = benzyl chloride, Y = m-chlorotoluene

B. X = benzal chloride, Y = o-chlorotoluene

C. X = m-chlorotoluene, Y = p-chlorotoluene

D. X = o- and p-chlorotoluene, Y = trichloromethyl benzene

Answer: D

Watch Video Solution

9. Arrange the following in order of decreasing tendency towards S_{N^2} reaction :

$\underset{(I)}{CH_3CH_2CH_2CH_2Cl}$, $\underset{(II)}{CH_3CH_2CHClCH_3}$,

$\underset{(III)}{(CH_3)_2CHCH_2Cl}$, $\underset{(IV)}{(CH_3)_3C-Cl}$

A. $I > III > II > IV$

B. $III > IV > II > I$

C. $II > I > III > IV$

D. $IV > III > II > I$

Answer: A

Watch Video Solution

10. An alkyl halide with molecular formula $C_6H_{13}Br$ on dehyrohalogenation gives two isomeric alkenes X and Y with molecular formula C_6H_{12}. On reductive ozonolysis X and Y gives four compounds CH_3COCH_3, CH_3CH_2CHO and $(CH_3)_2CHCHO$. The alkyl halide is

A. 2-bromohexane

B. 2,2-dimethyl-1-bromobutane

C. 4-bromo-2-methylpentane

D. 3-bromo-2-methylpentane

Answer: D

Watch Video Solution

11. The compound that does not undergo hydrolysis by S_{N^1} mechanism is :

A. $CH_2 = CHCH_2Cl$

B. C_6H_5Cl

C. $C_6H_5CH_2Cl$

D. $C_6H_5CH(CH_3)Cl$

Answer: B

Watch Video Solution

12. The major product formed when 2-bromo-2-methylbutane is refluxed with ethanolic KOH is:

A. 2-methylbut-2-ene

B. 2-methylbutan-1-ol

C. 3-methylbutan-2-ol

D. 2-methylbutan-2-ol

Answer: A

Watch Video Solution

13. Which of the following compounds will undergo racemisa- tion when solution of KOH hydrolyses ?

A. (i) and (ii)

B. (ii) and (iv)

C. (iii) and (iv)

D. (iv)

Answer: D

View Text Solution

14. In the reaction with HCl, an alkene reacts in accordance with Markownikoff's rule to give a product 1-chloro-1-methylcyclohexane. The possible alkene is:

A. 

B. 

C. (A) and (B)

D. 

Answer: C

Watch Video Solution

15. In an $S_N1$reaction on chiral centres, there is

A. 100% retention

B. 100% inversion

C. 100% racemization

D. inversion more than retention leading to partial recemization.

Answer: D

Watch Video Solution

16. Which of the following reaction(s) can be used for the preparation of alkyl halides?

(I) $CH_3CH_2OH + HCl \xrightarrow{\text{anhyd.}ZnCl_2}$

(II) $CH_3CH_2OH + HCl \rightarrow$

(III) $(CH_3)_3COH + HCl \rightarrow$

(IV) $(CH_3)_2CHOH + HCl \xrightarrow{\text{anhyd.}ZnCl_2}$

A. (IV) only

B. (III) and (IV) only

C. (I), (III) and (IV) only

D. (I) and (II) only

Answer: C

Watch Video Solution

17. Which of the following is the most correct electron displacement for a nucleophilic reaction to take place?

A. 

B. 

C. 

D. 

Answer: A

View Text Solution

18. The reaction of $C_6H_5CH = CHCH_3$ with HBr produces :

A. $C_6H_5CH_2CH_2CH_2Br$

B. 

C. $C_6H_5\underset{\underset{Br}{|}}{C}HCH_2CH_3$

D. $C_6H_5\underset{\underset{Br}{|}}{C}H_2CHCH_3$

Answer: C

Watch Video Solution

19. In which of the following compounds, the C-Cl bond ionisation shall give most stable carbonium ion?

A. 

B. 

C. 

D. 

Answer: D

View Text Solution

20. What is the possible number of stereoisomerism for 2,3-dibromobutane?

A. 2

B. 4

C. 0

D. 3

Answer: D

Watch Video Solution

21. Which of the following organohalogen compound when heated with alcoholic KOH does not undergo dehydrohalogenation reaction :

A. Secondary butyl chloride

B. Isopropyl chloride

C. Neopentyl chloride

D. Isobutyl chloride

Answer: C

Watch Video Solution

22. Consider the reaction :

$$CH_3CH_2CH_2Br + NaCN \rightarrow CH_3CH_2CH_2CN + NaBr$$

This reaction will be the fastest in :

A. ethanol

B. methanol

C. N, N' -dimethylformamide (DMF)

D. water.

Answer: C

Watch Video Solution

23. Which of the following biphenyls is optically active?

A. 

B. 

C. 

D. 

Answer: D

Watch Video Solution

24. Identify A and predict the type of reaction.

A. 

B. 

C. 

D. 

Answer: D

View Text Solution

25. Hydrocarbon (A) reacts with bromine by substitution to form an alkyl bromide which by Wurtz reaction is converted to gaseous hydrocarbon containing less than four carbon atoms (A) is

A. $CH \equiv CH$

B. $CH_2 = CH_2$

C. $CH_3 - CH_3$

D. CH_4

Answer: C

Watch Video Solution

26. The compound C_7H_8 undergoes the following reactions :

$$C_7H_8 \xrightarrow{3Cl_2/\Delta} A \xrightarrow{Br_2/Fe} B \xrightarrow{Zn/HCl} C$$

The product 'C' is

A. m-bromotoluene

B. o-bromotoluene

C. 3-bromo-2,4,6-trichlorotoluene

D. p-bromotoluene

Answer: A

Watch Video Solution

27. Among the following the reaction that produce through an electrophilic substitution is :

A. 

B. 

C. 

D. 

Answer: C

Watch Video Solution

28. Consider the following bromides:

The correct order of S_N1 reactivity is:

A. $C > B > A$

B. $A > B > C$

C. $B > C > A$

D. $B > A > C$

Answer: C

View Text Solution

29. The alkene that will give the same product with HBr in the presence as well as in the presence of peroxide is

A. 2-butene

B. 1-butene

C. propene

D. 1-hexene

Answer: A

Watch Video Solution

30. When 3-phenylpropene reacts with HBr in the presence of peroxide, the major product formula is:

A. 2-bromo-1-phenylpropane

B. 1,2-dibromo-3-phenylpropane

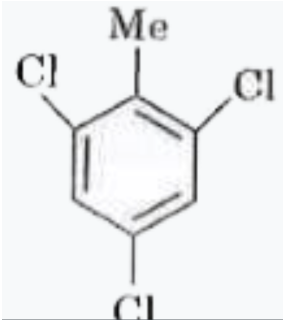
C. 3-(o-bromophenyl)propene

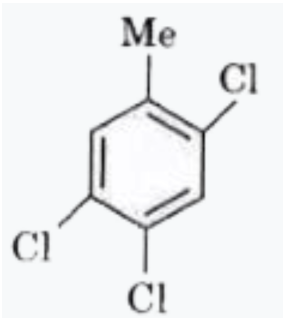
D. 1-bromo-3-phenylpropane

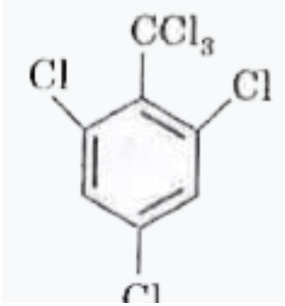
Answer: D

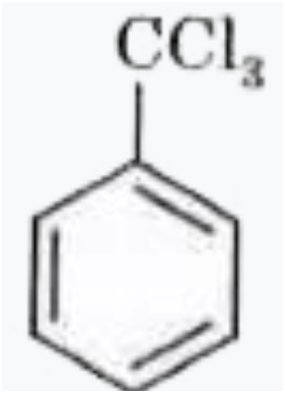
Watch Video Solution

31. By passing excess of Cl_2(g) in boiling toluene, which one of the following compounds is exclusively formed?

A. 

B. 

C. 

D. 

Answer: D

View Text Solution

32. How many chiral compounds are possible on monochlorination of 2-methyl butane

A. 2

B. 4

C. 6

D. 8

Answer: A

Watch Video Solution

33. A solution of (+)-1-chloro-1-phenylethane in t toluene racemises slowly in the presence of a small amount of $SbCl_5$ due to the formation of

A. free radical

B. carbanion

C. carbene

D. carbocation

Answer: D

Watch Video Solution

34. An alkyl bromide (X) reacts with sodium in ether to form 4,5-diethyloctane. The compound 'X' is

A. $CH_3(CH_2)_3Br$

B. $CH_3(CH_2)_5Br$

C. $CH_2(CH_2)_3CH(Br)CH_3$

D. $CH_3-(CH_2)_2-CH(Br)-CH_2-CH_3$

Answer: D

Watch Video Solution

35. In S_N2 reaction, the correct order of reactivity for following compounds

$CH_3Cl, CH_3CH_2Cl, (CH_3)_2CHCl, (CH_3)_3C-Cl$ is

A. $(CH_3)_2CHCl > CH_3CH_2Cl > CH_3Cl > (CH_3)_3CCl$

B. $CH_3Cl > (CH_3)_2CHCl > CH_3CH_2Cl > (CH_3)_3CCl$

C. $CH_3Cl > CH_3CH_2Cl > (CH_3)_2CHCl > (CH_3)_3CCl$

D. $CH_3CH_2Cl > CH_3Cl > (CH_3)_2CHCl > (CH_3)_3CCl$

Answer: C

Watch Video Solution

36. In the reaction

The product (E) is

A. 

B. 

C. 

D. 

Answer: A

View Text Solution

37. The synthesis of alkyl fluoride is best accomplished by:

A. Finkelstein reaction

B. Swart's reaction

C. Free radical fluorination

D. Sandmeyer's reaction.

Answer: B

Watch Video Solution

38. The hydrolysis of optically active 2-bromobutane with aqueous NaOH result in the formation of :

A. (-)-butan-2-ol

B. ($\pm$)-butan-2-ol

C. (+)-butan-2-ol

D. (±)-butan-1-ol

Answer: B

Watch Video Solution

39. 

The product of the above reaction is

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

40. The absolute configuration of  is

A. (2R, 3S)

B. (2S, 3R)

C. (2S, 3S)

D. (2R, 3R)

Answer: B

View Text Solution

41. 2-chloro-2-methylpentane on reaction with sodium methoxide in methanol yields:

(a) $C_2H_5CH_2\underset{CH_3}{\overset{CH_3}{\underset{|}{\overset{|}{C}}}} - OCH_3$ (b) $C_2H_5CH_2\underset{CH_3}{\underset{|}{C}} = CH_2$ (c) $C_2H_5CH_2 = \underset{CH_3}{\underset{|}{C}} - CH_3$

A. all of these

B. (I) and (III)

C. III only

D. I and II

Answer: A

Watch Video Solution

42. The major product obtained by the addition reaction of HBr to 4-methylpent-1-ene in the presence of peroxide is:

A. 1-bromo-4-methylpentane

B. 4-bromo-2-methylpentane

C. 2-bromo-4-methylpentane

D. 3-bromo-2-methylpentane

Answer: A

Watch Video Solution

43. The major product P formed in the following reaction is

A. 

B. 

C. 

D. 

Answer: B

View Text Solution

44. The increasing order of reactivity of the following halides for the S_N1 reaction is

I.$CH_3CH(CI)CH_2CH_3$

$II.\ CH_3CH_2CH_2Cl$

III. $p.\ -H_3CO-C_6H_4-CH_2Cl$

A. $(III) < (II) < (I)$

B. $(II) < (I) < (III)$

C. $(I) < (III) < (II)$

D. $(II) < (III) < (I)$

Answer: B

Watch Video Solution

45. 3-methyl-pent-2-ene on reaction with HBr in presence of peroxide forms an addition product. The number of possible stereoisomers for the product is

A. Six

B. Zero

C. Two

D. Four

Answer: D

Watch Video Solution

46. The major product obtained in the following reaction is:

A. $(\pm)C_6H_5CH\left(O^tBu\right)CH_2C_6H_5$

B. $C_6H_5CH=CHC_6H_5$

C. $(+)C_6H_5CH\left(O^tBu\right)CH_2C_6H_5$

D. $(-)C_6H_5CH\left(O^tBu\right)CH_2C_6H_5$

Answer: B

View Text Solution

47. The major product of the following reaction is :

A. 

B. 

C. 

D. 

Answer: B

View Text Solution

48. Tertiary alkyl halides are practically inert to substitution by S_N^2 mechanism because of –

A. insolubility

B. instability

C. inductive effect

D. steric hindrance.

Answer: D

Watch Video Solution

49. The number of possible organobromine compounds which can be obtained in the allylic bromination of 1 - butene with N - bromosuccinimide is

A. 1

B. 2

C. 3

D. 4

Answer: D

Watch Video Solution

50. Which of the following halides undergoes hydrolysis on warming with water/aqueous NaOH?

A.

B.

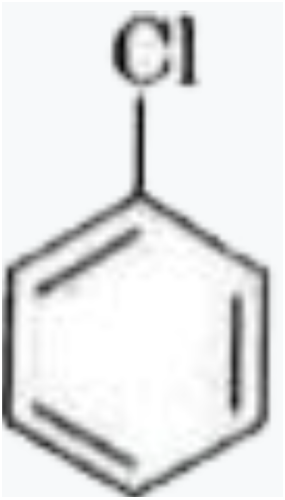
C.

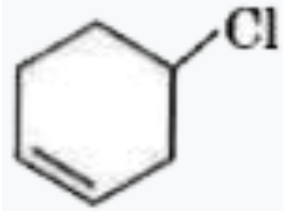
D.

Answer: D

View Text Solution

51. The compound having longest $C - Cl$ bond is

A. 

B. 

C. 

D. $CH_2 = CH-Cl$

Answer: B

Watch Video Solution

52. The alkyl halides require to prepare  by Wurtz reaction are

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

53. The neopentyl halide in ethanol yields alkenes by E_1 mechanism due to

A. low concentration of solvent

B. absence of base

C. it is a primary halide

D. steric factor which prevents E_2 mechanism

Answer: D

View Text Solution

54. The major product of the following reaction is :

A. 

B. 

C. 

D. 

Answer: B

View Text Solution

55. Increasing order of reactivity of the following compounds for S_N1 substitution is :

A. $(B) < (C) < (D) < (A)$

B. $(A) < (B) < (D) < (C)$

C. $(B) < (A) < (D) < (C)$

D. $(B) < (C) < (A) < (D)$

Answer: C

View Text Solution

56. Heating of 2-chloro-1-phenylbutane with EtOK/EtOH gives X as the major product. Reaction of X with $Hg(PAc)_2 / H_2O$ followed by gives Y as the major product. Y is :

A. 

B. 

C. 

D. 

Answer: D

Watch Video Solution

57. The major product of the following reaction is :

A. 

B. 

C. 

D. 

Answer: D

View Text Solution

58. The correct IUPAC name of the following compound is:

A. 5-chloro-4-methyl-1-nitrobenzene

B. 2-methyl-5-nitro-l-chlorobenzene

C. 3-chloro-4-methyl-1-nitrobenzene

D. 2-chloro-1-methyl-4-nitrobenzene

Answer: D

View Text Solution

59. The major product 'Y' in the following reaction is :

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

60. The major product of the following reaction is :

A. 

B. 

C. 

D. 

Answer: A

View Text Solution

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

A. The compound is optically active

B. The compound possesses centre of symmetry

C. The compound possesses plane of symmetry

D. The compound possesses axis of symmetry

Answer: A

View Text Solution

62. KI in acetone, undergoes S_N2 reaction with each of P, Q, R and S. The rates of the reaction vary as

A. $P > Q > R > S$

B. $S > P > R > Q$

C. $P > R > Q > S$

D. $R > P > S > Q$

Answer: B

View Text Solution

63. In the following reaction, the major product is

A. 

B. 

C. 

D. 

Answer: D

View Text Solution

C Multiple Choice Questions With More Than One Correct Answers

1. Dipole moment is shown by

A. Benzoyl chloride

B. cis-1, 2-dichloroethene

C. trans-1, 2-dichloroethene

D. trans -1, 2-dichloropent-2-ene

Answer: A::B::D

View Text Solution

2. $A \xrightarrow{I_2 / NaOH}$ Iodoform + Sod. Succinate In the above sequence A can be

A. Pentane -2-one

B. Acetophenone

C. Hexane-2,5-dione

D. 4-keto pentanoic acid

Answer: C::D

Watch Video Solution

3. Benzylchloride $(C_6H_5CH_2Cl)$ can be prepared from toluene by chlorination with :

A. SO_2Cl_2

B. $SOCl_2$

C. Cl_2, hv

D. NaOCl.

Answer: A::C

Watch Video Solution

4. A new carbon-carbon bond formation is possible in the following reaction/reactions:

A. $C_6H_6 + CH_3Cl \xrightarrow{AlCl_3}$

B. $CH_3CH_2Br + CH_3CH_2NH_2 \rightarrow$

C. $CH_3CH_2Br + Na^+{}^-OCH_3 \rightarrow$

D. $CH_3CH_2Br + KCN(alc.) \rightarrow$

Answer: A::D

Watch Video Solution

5. Which of the following statements are correct ?

A. Benzyl halides are more reactive than vinyl and aryl halides

B. Vinyl halides are more reactive than alkyl halides

C. Aryl halides are less reactive than alkyl halides

D. Aryl halides are more reactive than benzyl halides

Answer: B::C

Watch Video Solution

6. Which of the following contain sp^2 hybridised carbon bonded to X?

A. 

B. 

C. $CH_2 = CH - CH_2 - X$

D. 

Answer: B::D

Watch Video Solution

7. Compound(s) that on hydrogenation produce(s) optically inactive compound(s) is(are)

A. 

B. 

C. 

D. 

Answer: B::D

View Text Solution

8. The IUPAC name(s) of the following compound is (are)

A. 1-chloro-4-methylbenzene

B. 4-chlorotoluene

C. 1-methyl-4-chlorobenzene

D. 4-methylchlorobenzene.

Answer: A::B

View Text Solution

9. For the following compounds, the correct statement(s) with respect to nucleophilic substitution reactions is (are)

A. I and II follow S_N2 mechanism

B. compound IV undergoes inversion of configuration

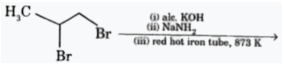
C. the order of reactivity for I, III, and IV is : $IV > I > III$

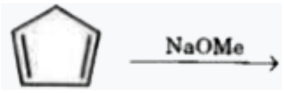
D. I and III follow S_N1 mechanism.

Answer: A::B::D

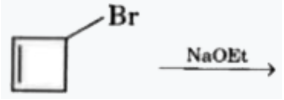
View Text Solution

10. Choose the correct option(s) that give(s) an aromatic compound as the major product.

A. 

B. 

C. 

D. 

Answer: A::B

View Text Solution

D Multiple Choice Questions Based On The Given Passage Comprehension

1. Alkyl halides undergo nucleophilic substitution reactions in which halogen atom is replaced by other atom.

$RX + Nu:^- \rightarrow Nu - R + X^-$

These reactions follow S_N1 and S_N2 type mechanism, in which S_N1 takes place in two steps while S_N2 takes place in single step. Due to their tendency to undergo substitution by a large number of nucleophiles, they form a variety of products.

In which of the following pairs, the first nucleophile is stronger?

A. Cl^-, I^-

B. CH_3OH, CH_3S^-

C. $(CH_3CH_2)_2NH, (CH_3CH_2)_3N$

D. $(CH_3)_2O, (CH_3)_3N$

Answer: C

Watch Video Solution

2. Alkyl halides undergo nucleophilic substitution reactions in which halogen atom is replaced by other atom.

$RX + Nu:^- \rightarrow Nu - R + X^-$

These reactions follow S_N1 and S_N2 type mechanism, in which S_N1 takes place in two steps while S_N2 takes place in single step. Due to their tendency to undergo substitution by a large number of nucleophiles, they form a variety of products.

Which of the following is least reactive towards S_N2 mechanism ?

A. $(CH_3)_2CHCH_2Br$

B. $(CH_3)_3CBr$

C. CH_3CH_2Br

D. $(CH_3)_2CHBr$

Answer: B

Watch Video Solution

3. Alkyl halides undergo nucleophilic substitution reactions in which halogen atom is replaced by other atom.

$RX + Nu:^- \rightarrow Nu - R + X^-$

These reactions follow S_N1 and S_N2 type mechanism, in which S_N1 takes place in two steps while S_N2 takes place in single step. Due to their tendency to undergo substitution by a large number of nucleophiles, they form a variety of products.

In which of the following pairs, the first compound is better S_N2 substrate ?

A. 1-bromo-1-methyl cyclohexane, cyclohexyl bromide

B. 1-iodo-2, 2-dimethyl propane, isopropyl iodide

C. 2, 2,-dimethyl-1-chlorobutane, 2-chloro butane

D. isopropyl bromide, 2-bromobutane

Answer: D

Watch Video Solution

4. Alkyl halides undergo nucleophilic substitution reactions in which halogen atom is replaced by other atom.

$RX + Nu:^- \rightarrow Nu - R + X^-$

These reactions follow S_N1 and S_N2 type mechanism, in which S_N1 takes place in two steps while S_N2 takes place in single step. Due to their tendency to undergo substitution by a large number of nucleophiles, they form a variety of products.

In which of the following nucleophilic substitution reaction, the product formed is racemic mixture ?

A. $(CH_3)_3CBr$

B. CH_3CH_2Br

C. $(CH_3CH_2)_2CHBr$

D. $C_6H_5CH_2Br$

Answer: A

Watch Video Solution

5. Alkyl halides undergo nucleophilic substitution reactions in which halogen atom is replaced by other atom.

$RX + Nu:^- \rightarrow Nu - R + X^-$

These reactions follow S_N1 and S_N2 type mechanism, in which S_N1 takes place in two steps while S_N2 takes place in single step. Due to their tendency to undergo substitution by a large number of nucleophiles, they form a variety of products.

Which of the following has highest nucleophilicity?

A. SH^-

B. H_2O

C. OH^-

D. F^-

Answer: A

Watch Video Solution

6. A chloro derivative (A) on treatment with zinc - copper couple gives a hydrocarbon with five C atoms. When 'A' is dissolved in ether and treated with sodium, 2,2,5,5-tetramethyl hexane is obtained. What is the original compound 'A' ?

A. 1-chloro-2, 2-dimethyl propane

B. 1-chloro-2, 2-dimethyl butane

C. 1-chloro-2-methyl butane

D. 2-chloro-2-methyl butane

Answer: A

Watch Video Solution

7. A chlorocompound (A) on reduction with Zn-Cu and ethanol gives the hydrocarbon (B) with five carbon atoms. When (A) is dissolved in dry ether and treated with sodium metal it gave 2,2,5,5,-tetramethylhexane. The treatment of A as

$A \xrightarrow{alc.KCN} C$

The reaction of C with Na, C_2H_5OH gives

A. $(CH_3)_3CCH_2CONH_2$

B. $(CH_3)_3CNH_2$

C. $(CH_3)_3CCH_2NH_2$

D. $(CH_3)_2CHCH_2NH_2$

Answer: C

Watch Video Solution

8. A chlorocompound (A) on reduction with Zn-Cu and ethanol gives the hydrocarbon (B) with five carbon atoms. When (A) is dissolved in dry ether

and treated with sodium metal it gave 2,2,5,5,-tetramethylhexane. The treatment of A as

$A \xrightarrow{alc.KCN} C$

The reaction of C with Na, C_2H_5OH is called

A. Gilman reaction

B. Mendius reaction

C. Grooves process

D. Swart's reaction

Answer: B

Watch Video Solution

9. A chlorocompound (A) on reduction with Zn-Cu and ethanol gives the hydrocarbon (B) with five carbon atoms. When (A) is dissolved in dry ether and treated with sodium metal it gave 2,2,5,5,-tetramethylhexane. The treatment of A as

$A \xrightarrow{alc.KCN} C$

The reation of A with aq. KOH will preferably favour

A. S_N1 mechanism

B. S_N2 mechanism

C. E_1 mechanism

D. E_2 mechanism

Answer: A

Watch Video Solution

Integer Type Questions

1. The number of compounds showing enantiomers among the following compounds is

Butan-2-ol, 2-Hydroxypropanoic acid, 2-Methylhexane, 2-Chlorobutane, 2-Bromo-2-chlorobutane,

2-Methylbutanoic acid, isopropyl chloride

Watch Video Solution

2. The number of reactions proceeding through free radical mechanism are

(i) $C_2H_5Br + Na^{+}{}^{-}OCH_3$

(ii) $C_2H_5Br + AgCN$

(iii) $C_6H_5CH_3 + Cl_2(hv)$

(iv) $CH_3CH = CH_2 + HBr$ (peroxides)

(v) $C_2H_5Br + alc.\ KOH$

(vi) $CH_3CH = CH_2 + HCl$(peroxide)

(vii) $C_2H_5Br + H_2(Ni \text{or} Pd)$

(viii) $C_2H_6 + Cl_2(hv)$

(ix) $C_2H_5Br + NaSH$

Watch Video Solution

3. In how many pairs the first compound reacts faster than the second in S_N2 reaction with OH^- ?

(i) CH_3Br, CH_3I

(ii) $CH_3CH_2Br, (CH_3)_2CHBr$

(iii) $CH_3Cl, (CH_3)_3CCl$

View Text Solution

4. The possible number of isomeric alkanes having the molecular formula $C_5H_{11}-$ is

Watch Video Solution

5. The total number of alkenes possible by dehydrobromination of 3-bromo-3-cyclopentylhexane using alcoholic KOH is

Watch Video Solution

6. In the following monobromination reaction, the number of possible chiral products is

View Text Solution

Unit Practice Test

1. The hydrolysis of 2-bromo-3-methylbutane by S_{N1} mechanism gives mainly:

A. 2-Methylbutan-1-ol

B. 2-Methylbutan-2-ol

C. 2, 2-Dimethylpropan-2-ol

D. Pentan-1-ol

Answer: B

Watch Video Solution

2. Butane nitrile can be prepared by heating

A. propyl chloride with alc. KCN

B. butyl chloride with alc. KCN

C. propyl chloride with alc. AgCN

D. butyl chloride with alc. AgCN

Answer: C

Watch Video Solution

3. The correct order of boiling points is

A. $CH_3F < CH_3Cl < CH_3Br < CH_3I$

B. $CH_3F < CH_3I < CH_3Br < CH_3Cl$

C. $CH_3I < CH_3Br < CH_3Cl < CH_3F$

D. $CH_3F < CH_3Br < CH_3Cl < CH_3I$

Answer: D

Watch Video Solution

4. Assertion (A) : The nucleophilic substitution of vinylchloride is difficult as compared to ethyl chloride.

Reason (R) : The vinyl group is electron donating in vinyl chloride.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: A

Watch Video Solution

5. Assertion: In the reaction of tert-butyl bromide with aq. KOH, rate becomes double by increasing the concentration of both aq. KOH and tert-butyl bromide

Reason: Rate of reaction is, rate = k(tert butyl bromide) $\left[OH^{-}\right]$.

A. Assertion and reason both are correct statements and reason is correct explanation for assertion.

B. Assertion and reason both are correct statements but reason is not correct explanation for assertion.

C. Assertion is correct statement but reason is wrong statement.

D. Assertion is wrong statement but reason is correct statement.

Answer: B

View Text Solution

6. Which isomer of C_4H_9Cl will have the lowest boiling point?

View Text Solution

7. Write the formula of the main product formed in the reaction :

$(CH_3)_2CHCl \xrightarrow[\text{Dry ether}]{Na}$

Watch Video Solution

8. Out of $C_6H_5CH_2Cl$ and $C_6H_5CHClC_6H_5$, which is more easily hydrolysed by aqueous KOH? Why?

View Text Solution

9. How do the products differ when ethyl bromide react with KCN and AgCN? Give reasons.

Watch Video Solution

10. How will you convert:

(a) Ethyl chloride to propanoic acid.

(b) 1-Bromopropane to 2-bromopropane

(c) tert-butyl bromide to isobutyl bromide

Watch Video Solution

11. (a) Why are haloarenes less reactive than haloalkanes? Explain.

(b) Predict the alkenes that would be formed by dehydrohalogenation of the following halides with sodium ethoxide in ethanol and predict the major alkene:

(i) 2-Chloro-2-methylbutane

(ii) 3-bromo-2, 2, 3-trimethylpentane

(c) How is chlorobenzene prepared from benzenediazonium chloride?

View Text Solution