



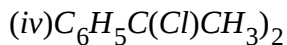
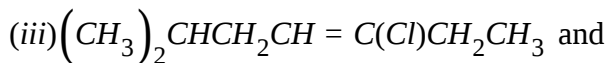
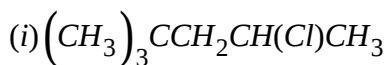
CHEMISTRY

JEE (MAIN AND ADVANCED) CHEMISTRY

ALKYL AND ARYL HALIDES

PROBLEMS

1. Give the IUPAC names of the compounds. Classify them as alkyl, allylic, benzylic, vinylic and aryl halides and also as primary, secondary and tertiary halides.



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2. Write the structures of the following compounds :

(i) 1-Iodo-4-methylcyclohexane

(ii) 2-(3-Chlorophenyl)but-2-ene and

(iii) 3-Bromomethylpropene.



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3. Give structural formulae and IUPAC names of the following compounds

:

(I) Tert-Amyl chloride ,

(ii) sec-buty, iodide ,

(iii) neo-Hexyl bromide and

(iv) Iso-pentyl chloride



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4. With molecular formula $C_5H_{11}Br$, there are eight structural isomers

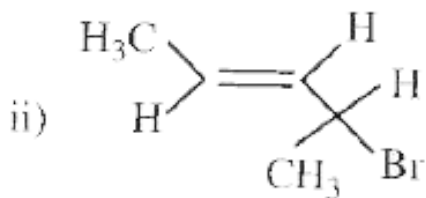
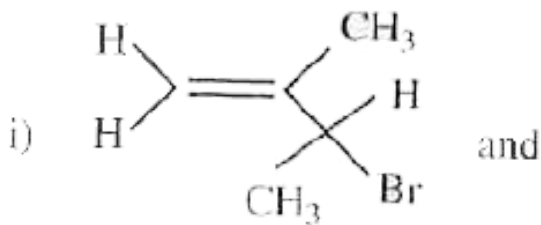
, Give the IUPAC name of each isomer and classify them as primart ,

secondary of tertiary bromides .



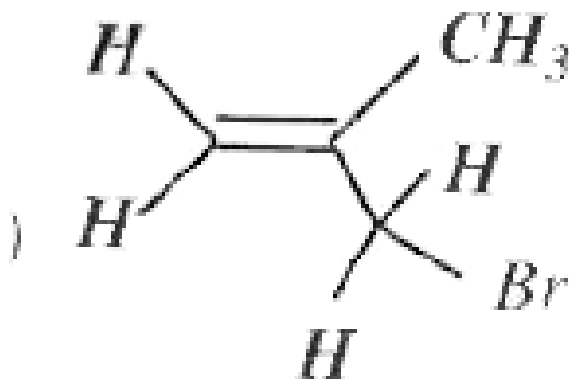
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5. Write IUPAC names of the following compounds :



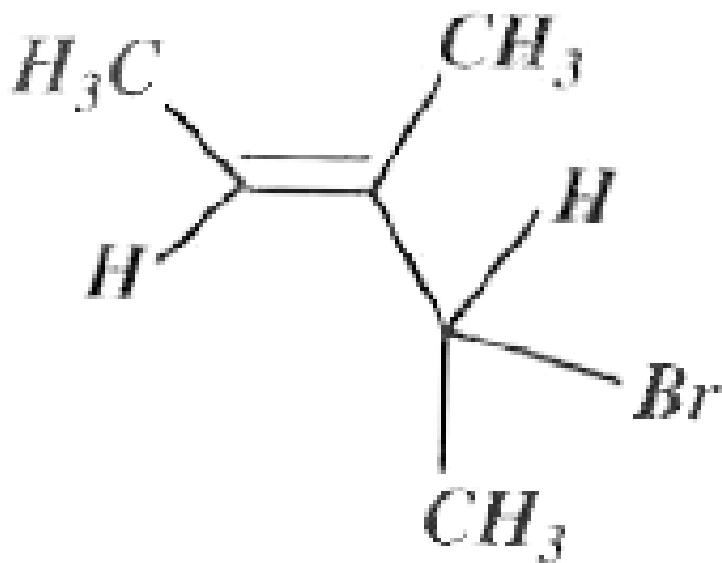
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6. Write IUPAC names of the following :



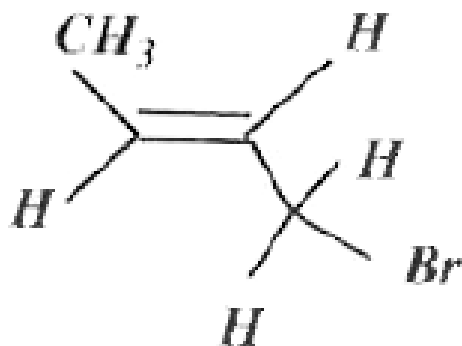
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7. Write IUPAC names of the following :



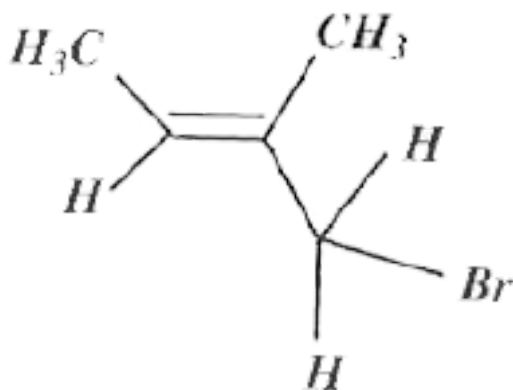
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8. Write IUPAC names of the following :



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9. Write IUPAC names of the following :



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10. A hydrocarbon , C_5H_{12} gives only one monochlorination product .Identify that hydrocarbon .



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11. Write the structures of all aromatic iodides with the formula C_7H_7I .



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12. Write all the possible monochloro structural isomers that are formed on monochlorination of $(CH_3)_2CHCH_2CH_3$



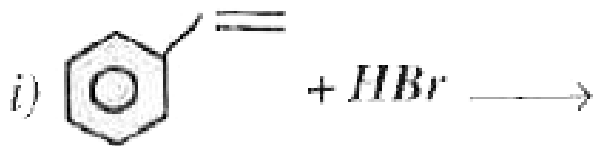
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13. During the reaction of alcohols with KI, why sulphuric acid is not used?



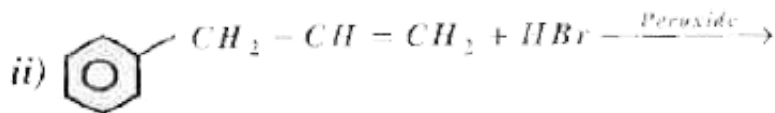
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14. Write the products of the following reactions:



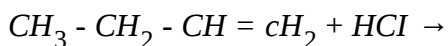
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15. Write the products of the following reactions:



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16. Write the products of the following reactions:



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17. Free radical bromination of n-butane yields 2-bromobutane as the major product. Why?



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18. Give the structures of the major organic products from 3-ethyl-2-pentene using (i) HBr in the presence of peroxide and (ii) HCl in the presence of peroxide.



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19. Among the three isomeric alkanes (C_5H_{12}), identify the one that on chlorination yields

Four isomeric monochlorides



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20. Among the three isomeric alkanes (C_5H_{12}), identify the one that on chlorination yields

Three isomeric monochlorides



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21. Among the three isomeric alkanes (C_5H_{12}), identify the one that on chlorination yields

A single monochloride



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22. How is 1-iodobutane obtained from 1-butene?



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23. Which isomer of $C_5H_{11}Cl$ has the highest boiling point and which has the least boiling point ? Explain.



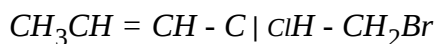
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24. The observed rotation of 10ml of a solution containing 2g of a compound when placed in 25cm long polarimeter tube is $+13.4^\circ$. What is the specific rotation of the compound?



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25. How many stereo isomers are possible for



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26. Haloalkanes react with KCN to form alkyl cyanides as main product while AgCN forms isocyanides as the chief product. Explain.



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



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28. R-Cl is hydrolysed to R-OH slowly but the reaction is rapid in presence of KI as catalyst. Explain.



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29. Optically active 2-iodobutane on treatment with sodium iodide in acetone gives a product which does not show optical activity. Explain

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30. Explain the formation of the two products in the following reaction :

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31. Why the chlorine atom in vinyl chloride is nonreactive?

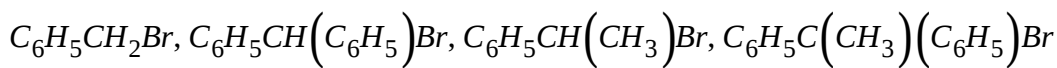
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32. Predict the order of reactivity of the following compounds in S_N1 and S_N2 reactions :

The four isomeric bromobutanes,

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33. Predict the order of reactivity of the compounds in S_N1 and S_N2 reactions .



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34. Allyl iodide can be obtained from allyl chloride. Explain.



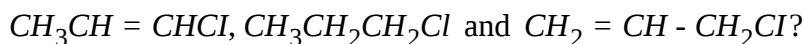
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35. Write the structures of major and minor products formed when 3-chloro-2-methylpentane is subjected to dehydrohalogenation.



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36. How do you distinguish between





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37. How will you distinguish between chloroform and carbon tetrachloride ?



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38. How iodoform is distinguished from chloroform?



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39. Among the three isomeric dichlorobenzenes , which has the highest boiling point and highest melting point ?



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40. Which product will form when optically active form of C_4H_9Br is subjected to dehydrohalogenation?



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41. Benzyl chloride undergoes nucleophilic substitution much more easily than chlorobenzene. Explain.



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SUBJECTIVE EXERCISE-1(SHORT ANSWER QUESTIONS)

1. Give IUPAC names of isobutyl chloride, secondary butyl chloride and tertiary butyl chloride.



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2. What type of isomerism can be exhibited by alkyl halides having three or more carbon atoms ?



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3. Explain the nature of C - X bond.



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4. Explain with examples the difference between primary, secondary and tertiary alkyl halides.



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5. Give the common names and IUPAC names along with structures of different isomers with the molecular formula, C_4H_9Cl .



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SUBJECTIVE EXERCISE-1(VERY SHORT ANSWER QUESTIONS)

1. What are geminal dihalides and vicinal dihalides ? Give examples.



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2. Give one example each for aryl halide and aryl alkyl halide.



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SUBJECTIVE EXERCISE-2(LONG ANSWER QUESTIONS)

1. a) Explain the preparation of ethyl chloride from (i) ethyl alcohol, (ii) ethylene and (iii) ethane.

b) Write three preparations and three important properties of ethyl chloride. Give any two uses.





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2. Discuss S_N1 mechanism



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3. Discuss the order of reactivity of primary, secondary and tertiary alkyl halides towards S_N1 and S_N2 mechanisms.



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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.



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5. Predict the major alkenes formed when the following halogen derivatives are subjected to dehydrohalogenation : a) 2-Bromo-2-methylbutane b) 2,2,3-Trimethyl-3-bromopentane c) 1-Chloro-1-methylcyclohexene



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6. Write the equations for the preparation of n-butyl iodide from a) 1-Butene b) n-Butyl chloride c) Butanol-1



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7. 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.



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SUBJECTIVE EXERCISE-2(SHORT ANSWER QUESTIONS)

1. Discuss the stereochemistry of the products formed through S_N1 mechanism and S_N2 mechanism.



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2. What happens when ethyl chloride reacts with (i) lithium aluminium hydride and (ii) sodium ethoxide ?



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3. How does ethyl chloride react with

(i) CH_3COOAg (ii) Mg in dry ether

(iii) C_6H_6 in presence of anhydrous $AlCl_3$ and

(iv) H_2 in the presence of Pt?



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4. Write all the equations for all the possible products formed when ethyl chloride reacts with ammonia.



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5. Explain Williamson synthesis and Wurtz reaction taking ethyl chloride as example.



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6. Discuss the action of PCl_3 , PCl_5 and thionyl chloride on ethyl alcohol with equations.



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7. Write any two physical properties of ethyl chloride.



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8. Write the important uses of ethyl chloride.



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SUBJECTIVE EXERCISE-2(VERY SHORT ANSWER QUESTIONS)

1. How does ethyl chloride react with aqueous KOH and alcoholic KOH ?

Give equations.



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2. What happens when ethyl chloride is treated with (i) aqueous ethanolic potassium cyanide and (ii) hot aqueous ethanolic silver nitrite ?



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3. How does ethyl chloride react sodium ethoxide ? What is the name of the reaction ?



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4. How ethyl acetate is formed from ethyl chloride ?



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5. How does ethyl chloride react with (i) NaBr and (ii) KI?



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6. Predict the product obtained by treating ethyl chloride with Mg followed by hydrolysis.



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7. What is Groves process ? Give equation.



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8. Write any two physical properties of ethyl chloride.



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SUBJECTIVE EXERCISE-3(LONG ANSWER QUESTIONS)

1. Give the toxic effects of polyhalogen compounds.



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2. How are the following prepared ? Write their uses.

(a) CHI_3 (b) CH_2Cl_2 (c) CCl_4 and (d) CF_2Cl_2



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SUBJECTIVE EXERCISE-3(SHORT ANSWER QUESTIONS)

1. Write a note on D.D.T.



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2. Write a note on freons ?



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SUBJECTIVE EXERCISE-3(VERY SHORT ANSWER QUESTIONS)

1. Why iodoform is replaced by other formulations as antiseptic ?



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2. The correct formula of Freon-12 is



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3. Which is non-biodegradable polyhalogen compound?



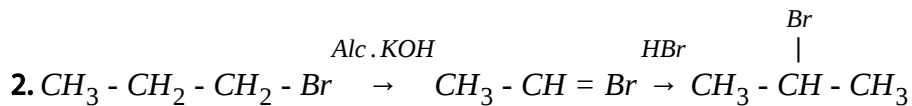
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CONVERSIONS

1. $2\text{CH}_3 - \text{CH}_2 - \text{Cl} + 2\text{Na} \rightarrow \text{ether } \text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$

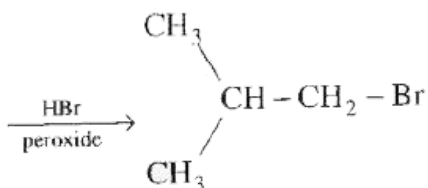
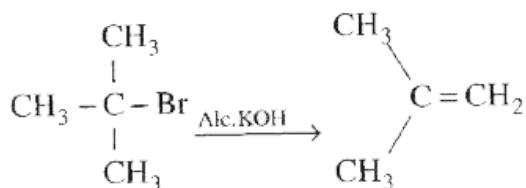


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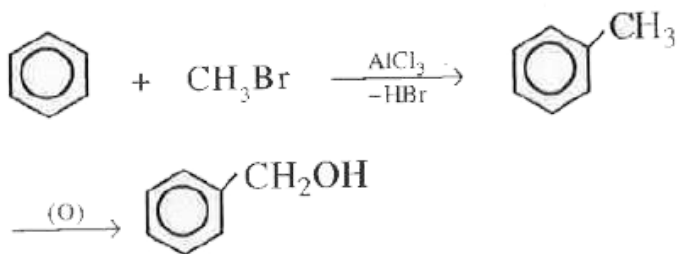


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3. Complete the following reaction



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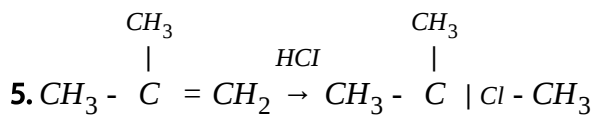
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give the

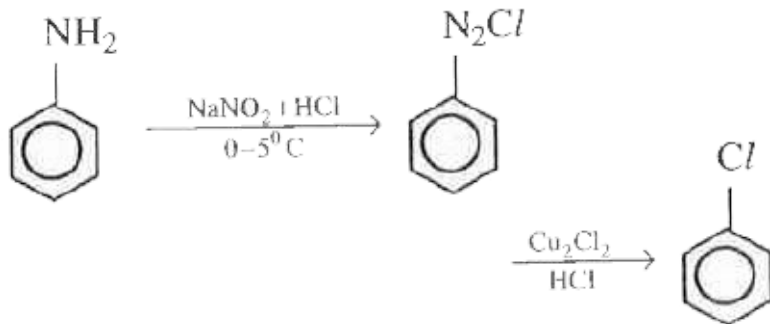
mechanism for the above reaction.



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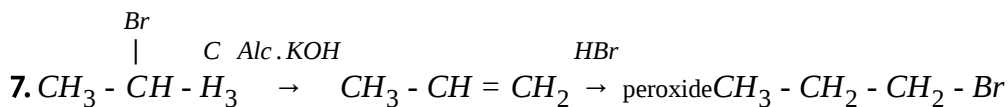


6.

give the

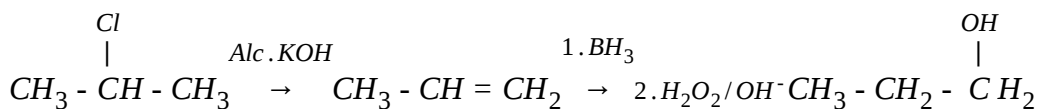
name of the reactions involved and mechanism.

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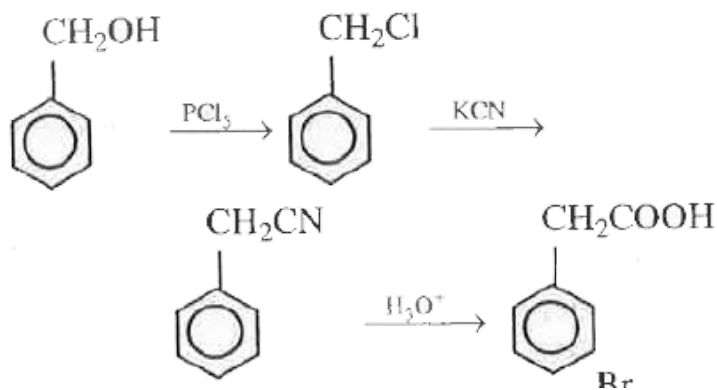
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8.



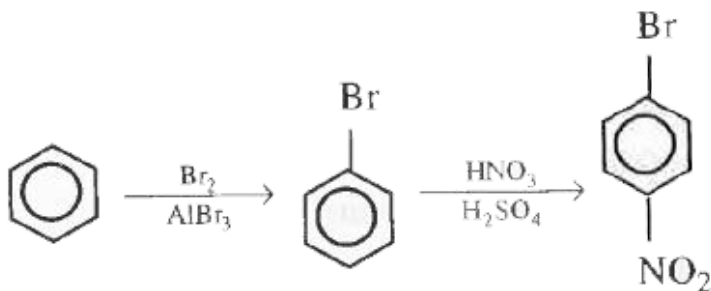
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9. Complete the following reaction



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10. Complete the following reaction



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11. Ethane to bromoethene



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12. Write the relevant chemical equations :

Propene to propyne



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13. Write the relevant chemical equations :

But-1-ene to but-2-ene



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14. Write the relevant chemical equations :

Ethanol to 1-butyne



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15. Write the relevant chemical equations :

Benzene to biphenyl



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16. Write the relevant chemical equations :

1-iodo butane to n-octane



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17. Write the relevant chemical equations :

Methyl bromide to propanone



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18. How will you carry out the conversion

Toluene to benzyl alcohol



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19. Write the relevant chemical equations :

Propene to nitropropane



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20. Write the relevant chemical equations :

Ethyl alcohol to ethyl fluoride



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21. Write the relevant chemical equations :

Propene to 1-propanol



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22. But-1-ene to 1-iodo butane



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23. Ethanol to propane nitrile



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24. Chloroethane to butane



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25. Chlorobenzene to p-chloroaniline



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26. Write the relevant chemical equations :

Isopropyl bromide to n-propyl bromide



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27. Write the relevant chemical equations :

tert-butyl bromide to isobutyl bromide



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28. How will you carry out the conversion

Toluene to benzyl alcohol



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29. Write the relevant chemical equations :

2-Methyl-1-propene to 2-chloro-2-methyl propane



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30. Explain how the conversions are carried out :

Aniline to chlorobenzene



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31. Write the relevant chemical equations :

Isopropyl bromide to n-propyl bromide



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32. Write the relevant chemical equations :

2-chloropropane to l-propanol



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33. Write the relevant chemical equations :

Benzyl alcohol to 2-phenylethanoic acid



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34. Write the relevant chemical equations :

Benzene to 4-bromonitrobenzene



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35. Ethane to bromoethene



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36. Write the relevant chemical equations :

Propene to propyne



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37. Write the relevant chemical equations :

But-1-ene to but-2-ene



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42. Write the relevant chemical equations :

Toluene to benzyl alcohol



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43. Write the relevant chemical equations :

Propene to nitropropane



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44. Write the relevant chemical equations :

Ethyl alcohol to ethyl fluoride



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45. Write the relevant chemical equations :

Propene to 1-propanol



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46. But-1-ene to 1-iodo butane



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47. Ethanol to propanenitrile



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48. Chloroethane to butane



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49. Write the relevant chemical equations :

Chlorobenzene to p-nitrophenol



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50. Write the relevant chemical equations :

n-propyl bromide to isopropyl bromide



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51. Write the relevant chemical equations :

tert-butyl bromide to isobutyl bromide



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52. Write the relevant chemical equations :

Toluene to benzyl alcohol



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53. Write the relevant chemical equations :

2-Methyl-1-propene to 2-chloro-2-methyl propane



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54. Write the relevant chemical equations :

Aniline to chlorobenzene



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55. Write the relevant chemical equations :

Isopropyl bromide to n-propyl bromide



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56. Write the relevant chemical equations :

2-chloropropane to 1-propanol



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57. Write the relevant chemical equations :

Benzyl alcohol to 2-phenylethanoic acid



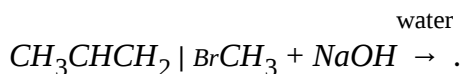
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58. Write the relevant chemical equations :

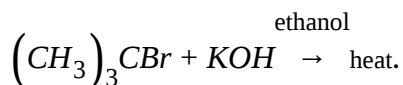
Benzene to 4-bromonitrobenzene

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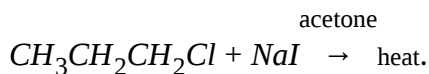
59. Write the structures of the major organic product in each of the following:

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60. Write the structures of the major organic product in each of the following:

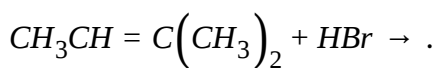
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61. Write the structures of the major organic product in each of the following:

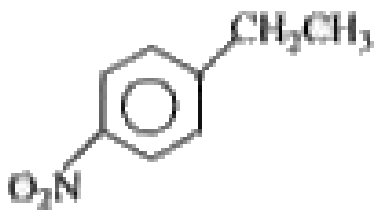


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62. Write the structures of the major organic product in each of the following:

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63. Write the structures of the major organic product in each of the following:

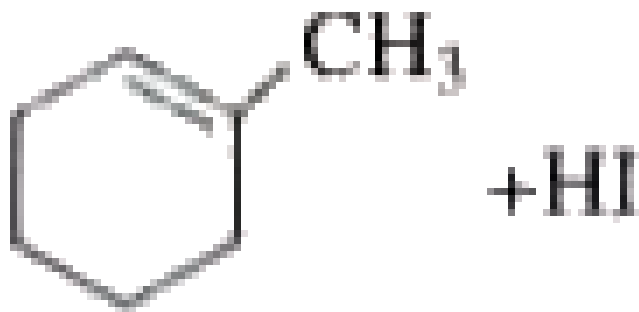
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64. Write the structures of the major organic product in each of the following:



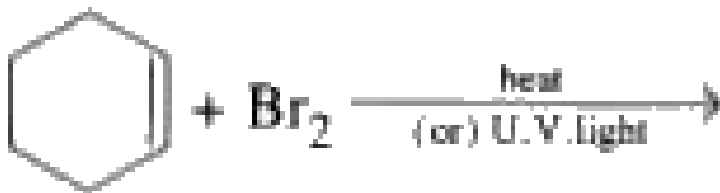
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65. Write the structures of the major organic product in each of the following:



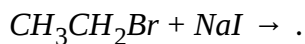
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66. Write the structures of the major organic product in each of the following:



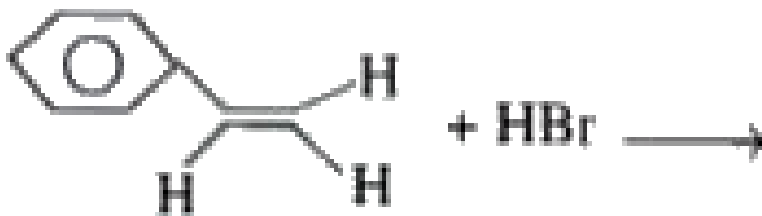
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67. Write the structures of the major organic product in each of the following:



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68. Write the structures of the major organic product in each of the following:



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69. Name reactions :

Swarts reaction.



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70. Explain the following name reactions :

Gatterman reaction



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71. Name reactions :

SaytZeff rule .



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72. Explain the following name reactions :

Sandmeyer reaction



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73. Name reactions :

Friedel Crafts alkylation and acylation.



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74. Name reactions :

Wurtz reaction.



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75. Name reactions :

Fitting reaction.



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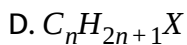
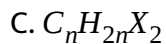
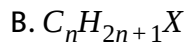
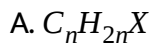
76. Explain Wurtz - Fitting reaction



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OBJECTIVE EXERCISE -1 (NOMENCLATURE & NATURE OF C-X BOND)

1. The general formula of alkyl halides is



Answer: B



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2. The hybridisation of carbon atoms in C_2H_5Cl are

A. sp^3 and sp^2

B. sp^3 and sp

C. sp^3 and sp^3

D. sp^2 and sp

Answer: C



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3. Ethyl chloride is

A. 1° alkyl halide

B. 2 ° alkyl halide

C. 3 ° alkyl halide

D. gem halide

Answer: A



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4. The C - Cl bond in Ethyl chloride is formed by overlapping

A. $sp^3 - s$

B. $sp^3 - p$

C. $sp^3d - p$

D. $sp^2 - p$

Answer: B



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5. IUPAC name of $(CH_3)_2CHCH_2CH_2Br$ is

- A. 1-Bromo-3-methylbutane
- B. 1-Bromo-3-methylpropane
- C. 1-Bromopentane
- D. 3-Bromopentane

Answer: A



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6. IUPAC name of $H_3C - HC(Br)_2$ is

- A. Ethylidene bromide
- B. Gem - dibromide
- C. Any of the above
- D. 1,1-Dibromo ethane

Answer: D



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7. n-Butyl chloride and iso butyl chloride are

- A. Position isomers
- B. Functional group isomers
- C. Chain isomers
- D. Metamers

Answer: C



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8. With increase in number of halogen atoms & atomic mass of halogen atoms, density of the compounds

- A. Decreases
- B. Increases
- C. Remains same
- D. Can't say

Answer: B



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9. Among the following, density is maximum for

- A. CH_3Cl
- B. CH_2Cl_2
- C. $CHCl_3$
- D. CCl_4

Answer: D



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10. For the same alkyl (or) aryl group, boiling point, is more for

A. RI

B. RBr

C. RCl

D. RF

Answer: A

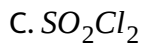
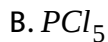


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OBJECTIVE EXERCISE -1 (PREPARATION OF C_2H_5Cl)

1. The following cannot be used for the preparation of ethyl chloride from ethyl alcohol

A. PCl_3



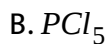
Answer: C



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2. The best reagent for the preparation of pure C_2H_5Cl from ethanol is

A. Lucas reagent



C. Thionyl chloride in Pyridine

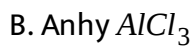
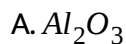
D. Red Phosphorous + Chlorine

Answer: C



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3. $CH_2 = CH_2 + HCl \xrightarrow{X} CH_3 - CH_2Cl$, What is 'X'?

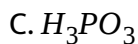
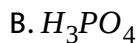
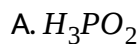


Answer: B



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4. $3C_2H_5OH + PCl_3 \rightarrow 3C_2H_5Cl + X$, where 'X' is



Answer: C



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5. $C_2H_5OH + SOCl_2 \xrightarrow{\text{Pyridine}} X + Y + Z$. In this reaction X, Y & Z are

A. $C_2H_4Cl_2, SOHCl$

B. C_2H_5Cl, SO_2, HCl

C. $C_2H_5Cl, SOCl, HCl$

D. C_2H_4, CO_2, Cl_2

Answer: B



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OBJECTIVE EXERCISE -1 (PROPERTIES OF ETHYL CHLORIDE)

1. What is 'X' in the following reaction ? $C_2H_5Cl + X \rightarrow C_2H_5OH + KCl$

A. KHCO_3

B. Alcoholic KOH

C. Aqueous KOH

D. K_2CO_3

Answer: C



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2. Metal present in Grignard reagent is

A. Na

B. Mg

C. Al

D. Zn

Answer: B



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3. When ethyl chloride is reacted with alcoholic KOH, ethylene is formed.

This is an example of reaction

- A. Addition
- B. Substitution
- C. Elimination
- D. Rearrangement

Answer: C



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4. Ethyl iodide when treated with dry silver oxide gives

- A. Ethanol
- B. Diethyl ether
- C. Ethylene

D. Ethane

Answer: B



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5. Alkyl halides are almost insoluble in water because

- A. They are covalent compounds
- B. They have low polarity
- C. They do not form hydrogen bonds with water
- D. They have tetrahedral geometry

Answer: C



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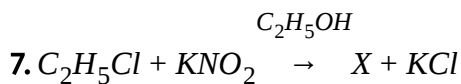
6. The major product formed when alcoholic $AgNO_2$ reacts with ethyl chloride is

- A. Ethyl nitrite
- B. Ethyl nitrate
- C. Nitroethane
- D. Ethyl dinitrate

Answer: C

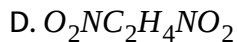


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Substance X' in the reaction is

- A. C_2H_5ONO
- B. C_2H_3NO
- C. $C_2H_5NO_2$

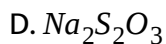
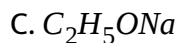
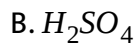


Answer: A



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8. Chloroethane reacts with X to form diethyl ether. What is X?

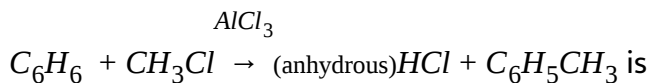


Answer: C



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9. The reaction



- A. Friedel - Crafts alkylation
- B. Addition reaction
- C. Friedel - Crafts acylation
- D. Friedel Crafts benzoylation

Answer: A



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10. The solvent used in the preparation of Grignard reagent is

- A. dry ether
- B. dry acetone
- C. dry alcohol

D. dry chloroform

Answer: A



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11. Ethyl chloride does not react with

A. Sodium in dry ether

B. $AgNO_3$ solution

C. KCN

D. Magnesium in dry ether

Answer: B



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12. Ethyl chloride reacts with sodium metal in presence of dry ether and forms

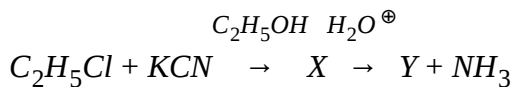
- A. Isobutane
- B. n-butane
- C. Neopentane
- D. Tertiary butyl chloride

Answer: B



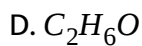
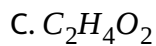
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13. In the reaction sequence,



What is the molecular formula of 'Y' ?

- A. $C_3H_6O_2$
- B. C_3H_5N



Answer: A



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14. Ethyl chloride is not used in

A. Preparation of T.E.L.

B. Local anaesthesia

C. General anaesthesia

D. Ethylating agent

Answer: C



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15. The IUPAC name of CHCl_3 is

- A. Chloroform
- B. Trichloromethane
- C. Chloromethane
- D. Dichloromethane

Answer: B



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16. The hybridisation of carbon in CHCl_3 is

- A. sp^3
- B. sp^2
- C. sp
- D. sp^3d

Answer: A



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17. The shape of chloroform molecule is

- A. Tetrahedral
- B. Pyramidal
- C. Planar trigonal
- D. Distorted tetrahedral

Answer: D



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OBJECTIVE EXERCISE -1 (CHLOROFORM)

1. Which of the following poisonous gases is formed when chloroform is exposed to light and moist air?

- A. Mustard gas
- B. Phosgene
- C. Chlorine
- D. Carbon monoxide

Answer: B



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2. Match the following columns

LIST - 1

- A) CCl_4
- B) CHCl_3
- C) Gemdihalide
- D) Vicinaldihalide

LIST - 2

- 1) CH_3CHCl_2
- 2) Solvent
- 3) $\text{CH}_2\text{ClCH}_2\text{Cl}$
- 4) Anaesthetic
- 5) Toluene

- | | | | | |
|----|----------|----------|----------|----------|
| | <i>A</i> | <i>B</i> | <i>C</i> | <i>D</i> |
| A. | 5 | 3 | 1 | 2 |
-
- | | | | | |
|----|----------|----------|----------|----------|
| | <i>A</i> | <i>B</i> | <i>C</i> | <i>D</i> |
| B. | 1 | 4 | 3 | 2 |
-
- | | | | | |
|----|----------|----------|----------|----------|
| | <i>A</i> | <i>B</i> | <i>C</i> | <i>D</i> |
| C. | 5 | 3 | 2 | 1 |
-
- | | | | | |
|----|----------|----------|----------|----------|
| | <i>A</i> | <i>B</i> | <i>C</i> | <i>D</i> |
| D. | 2 | 4 | 1 | 3 |

Answer: D



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3. Give the decreasing boiling points of ortho para and metadichlorobenzene

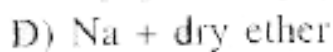
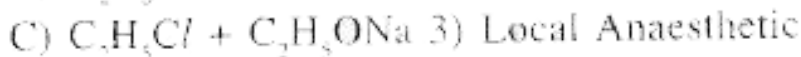
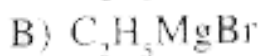
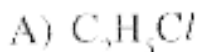
- A. ortho < para < meta
- B. meta < ortho = para
- C. ortho > para = meta
- D. meta = para = ortho

Answer: C

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4. Match the following columns

LIST - 1



LIST - 2

1) Williamson synthesis

2) Wurtz reaction

3) Local Anaesthetic

4) Antiseptic

5) Grignard reagent

A B C D

A. 3 5 1 2

A B C D

B. 5 3 1 2

A B C D

C. 3 4 1 2

A B C D

D. 3 5 1 4

Answer: A

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5. Match the following

| Reactants | Products |
|---|---------------------------------|
| A) C_2H_5Cl , moist Ag_2O | i) CH_3CH_2ONO |
| B) C_2H_5Cl , aqueous ethanolic $AgCN$ | ii) C_2H_4 |
| C) C_2H_5Cl , aqueous ethanolic $AgNO_3$ | iii) C_2H_5OH |
| D) C_2H_5Cl , ethanolic KOH | iv) CH_3CH_2NC v) C_2H_6 |

the correct match is

- A. $A \ B \ C \ D$
 $v \ iii \ iv \ i$
- B. $A \ B \ C \ D$
 $i \ ii \ iii \ iv$
- C. $A \ B \ C \ D$
 $iii \ iv \ i \ ii$
- D. $A \ B \ C \ D$
 $iv \ i \ ii \ iv$

Answer: C



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6. Match the following columns

LIST - 1

LIST - 2

- | | |
|------------------------|--|
| A) Dehydrohalogenation | 1) $\text{Na} + \text{C}_2\text{H}_5\text{OH}$ |
| B) Dehalogenation | 2) conc. H_2SO_4 |
| C) Dehydration | 3) aq. KOH |
| D) Hydrolysis | 4) alc. KOH |
| | 5) Ethanolic zinc |

A.

| | | | |
|---|---|---|---|
| A | B | C | D |
| 2 | 5 | 1 | 3 |

B.

| | | | |
|---|---|---|---|
| A | B | C | D |
| 4 | 5 | 2 | 3 |

C.

| | | | |
|---|---|---|---|
| A | B | C | D |
| 1 | 5 | 2 | 3 |

D.

| | | | |
|---|---|---|---|
| A | B | C | D |
| 3 | 5 | 1 | 2 |

Answer: B



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OBJECTIVE EXERCISE -1 (OPTICAL ISOMERISM)

1. Which of the following is an optically active compound ?

A. 1-Butanol

B. 1-Propanol

C. 2-Chlorobutane

D. 4-Hydroxyheptane

Answer: C



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2. Optical isomers which are non-superimposable mirror images of each other are called

A. Enantiomers

B. Diastereomers

C. Tautomers

D. Geometrical isomers

Answer: A

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3. Optically active isomers but not mirror images are called

- A. enantiomers
- B. mesomers
- C. tautomers
- D. diastereomers

Answer: D

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4. An organic molecule necessarily shows optical activity if it

- A. contains asymmetric carbon atom
- B. is non polar
- C. is non-superimposable on its mirror image

D. is superimposable on its mirror image

Answer: C



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5. A molecule is said to be chiral if it

A. contains a plane of symmetry

B. contains a centre of symmetry

C. cannot be superimposed on its mirror image

D. exists as cis-trans-isomers

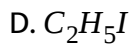
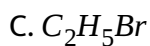
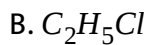
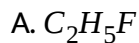
Answer: C



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OBJECTIVE EXERCISE -1 (MECHANISM OF NUCLEOPHILIC SUBSTITUTIONS)

1. Amongst the following the most reactive alkyl halide is



Answer: D



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2. S_N1 reactions occur through the intermediate formation of

A. Carbocations

B. Carbanions

C. Free radicals

D. None of these

Answer: A



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3. The reaction $(CH_3)_3C - Br \xrightarrow{H_2O} (CH_3)_3C - OH$ is

- A. elimination
- B. substitution
- C. free radical
- D. displacement

Answer: B



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4. An optically active halide when allowed to react with CN^- gives a racemic mixture. The halide is most likely to be

A. 1°

B. 2°

C. 3°

D. 4°

Answer: C



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5. A dextrorotatory optically active alkyl halide undergoes hydrolysis by S_N2 mechanism. The resulting alcohol is.

A. Dextrorotatory

B. Laveorotatory

C. Optically inactive due to racemisation

D. may be dextro (or) laevorotatory

Answer: D

OBJECTIVE EXERCISE -1 (HALO ARENES (CHLOROBENZENE))

1. Aryl halides are less reactive towards nucleophilic substitution reaction as compared to alkyl halides due to

- A. The formation of less stable carbanion
- B. Resonance stabilization of aryl halides
- C. Longer - carbon halogen bond
- D. Inductive effect

Answer: B

2. Chlorobenzene is

- A. More reactive than ethyl chloride
- B. More reactive than isopropyl chloride
- C. As reactive as methyl chloride
- D. Less reactive than benzyl chloride

Answer: D



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3. The conditions that are necessary in the preparation of aryl halides from arenes

- A. Low temperature
- B. Absence of sunlight
- C. Presence of halogen carrier
- D. all of the above

Answer: D

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4. Aryl halides can be prepared by

- A. Sand mayer's method
- B. Friedel - craft reaction
- C. Gattermann's reaction
- D. 1 and 3

Answer: D

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5. Flouro benzene cannot be prepared by direct flourination since

- A. F_2 is highly reactive
- B. F_2 is inert
- C. Reaction with F_2 reversible

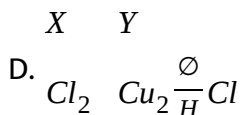
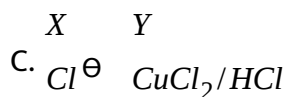
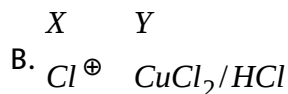
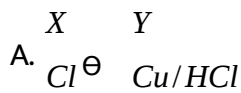
D. F_2 reacts slowly

Answer: A



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6. In Gattermann reaction, a diazonium group is replaced by X using Y. X and Y are

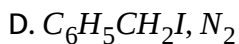
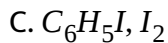
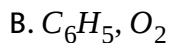
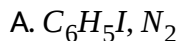
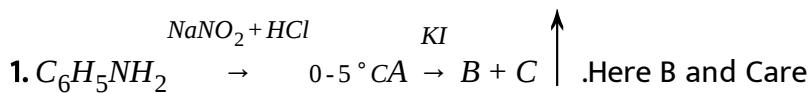


Answer: A



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OBJECTIVE EXERCISE -1 (PROPERTIES OF CHLOROBENZENE)



Answer: A



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2. Chlorobenzene on fusing with solid NaOH follwed by acidification gives

A. Benzene

B. Benzoic acid

C. Phenol

D. Benzene chloride

Answer: C



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3. Chlorobenzene on reaction with CH_3Cl in the presence of $AlCl_3$ will give

A. Toluene

B. m - Chloro toluene

C. p - Chloro toluene

D. A mixture of o - and p - chlorotoluene

Answer: D



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4. Chlorobenzene reacts with Mg in dry ether to give a compound (A) which further reacts with ethanol to yield

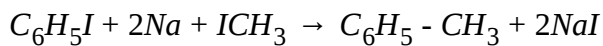
- A. Ethylbenzene
- B. Phenol
- C. Phenylmethyl ether
- D. Benzene

Answer: D



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5. The reaction given below is known as



- A. Wurtz reaction
- B. Fittig reaction
- C. Wurtz - Fittig reaction

D. Ullmann reaction

Answer: C



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6. On sulphonation of C_6H_5Cl

- A. m-chlorobenzenesulphonic acid
- B. Benzenesulphonic acid is formed
- C. o-chlorobenzenesulphonic acid is formed
- D. o-and p-chlorobenzenesulphonic acids are formed

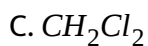
Answer: D



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OBJECTIVE EXERCISE -1 (POLY HALOGEN COMPOUNDS)

1. Which of the following is used for metal cleaning and finishing



Answer: C



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2. First chlorinated insecticide is

A. DDT

B. Gammaxene

C. BHC

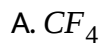
D. Pyrene

Answer: A



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3. The correct formula of Freon-12 is



Answer: C



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OBJECTIVE EXERCISE -1 (ASSERTION AND REASON TYPE)

1. (A) Pure chloroform does not give precipitate with $AgNO_3$ solution.

(R) $CHCl_3$ is covalent compound.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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2. (A) Towards S_N2 reaction, order of reactivity is $CH_3Br > CH_3CH_2Br > (CH_3)_2CHBr > (CH_3)_3CBr$.

(R) Greater the stability of carbocation, greater will be its ease of formation from alkyl halide and faster will be the rate of S_N1 reaction.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B



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3. (A): p-Nitrochlorobenzene is more reactive than chlorobenzene in nucleophilic substitution reactions.

(R): Electron withdrawing groups like $-NO_2$, increase the reactivity of haloarenes in nucleophilic substitution.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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4. (A): Alkyl halides on reaction with KCN, the major product is nitrile, but with AgCN, the major product is isonitrile.

(R): Mainly KCN is more ionic, but AgCN is more covalent than KCN.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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5. (A) Addition of bromine to 2-butene yields 2,3-dibromobutane.

(R) Bromine addition to an alkene in the presence of CCl_4 is an electrophilic addition.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B



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6. (A): CCl_4 can be used as a fire extinguisher.

(R): CCl_4 is insoluble in water.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B



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7. (A) Thionyl chloride reacts with primary alcohols to form pure alkyl halides in the presence of pyridine.

(R) In the reaction between SOCl_2 and R-OH , SO_2 escapes from the reaction mixture and HCl is absorbed by pyridine.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B



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8. (A): The dipole moment of CH_3Cl is greater than CH_3F .

(R): Bond length of C-Cl bond is less than C-F bond.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: C



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9. (A): $\text{S}_{\text{N}}2$ reaction takes place in single step.

(R): $\text{S}_{\text{N}}2$ reaction involves the reactivity order of alkyl halides as $1^\circ > 2^\circ > 3^\circ$ halides.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B



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OBJECTIVE EXERCISE -2 (INTRODUCTION ,NOMENCLATURE , NATURE OF C-X BOND)

1. Tertiary alkyl halide among the following is

A. 2 - Chlorobutane

B. Secondary butyl chloride

C. Isobutyl chloride

D. 3-Chloro-3-methyl pentane

Answer: D



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2. In the chloroethene, the carbon bearing halogen is bonded to... hydrogen(s).It is called __alkylhalide.

- A. Two, primary
- B. Three, primary
- C. Two, secondary
- D. One, Tertiary

Answer: A



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3. Which of the following is a primary alkyl halide ?

- A. Isobutyl bromide
- B. neo - Pentyl chloride
- C. Isopentyl bromide
- D. All are primary halides

Answer: D



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4. Among the following perhaloalkane is

- A. SCl_4
- B. $CHCl_3$
- C. C_2Cl_6
- D. $CF_3CHClBr$

Answer: C



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5. Which one of the following has highest boiling point?

- A. 1-Chloropentane
- B. Isopentyl chloride
- C. ter-Pentyl chloride
- D. All have equal boiling point

Answer: A



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6. $C_2H_5ClNa \xrightarrow{\text{dry ether}} NaClA$. A on monochlorination gives how many isomers?

- A. 1
- B. 2
- C. 3

D. 4

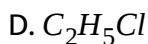
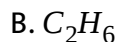
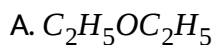
Answer: C



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OBJECTIVE EXERCISE -2 (PREPARATION AND PROPERTIES OF ETHYL CHLORIDE)

1. Hydrogen chloride and So, are the by products in the reaction of ethanol with thionyl chloride. Which of the following is the main product in this reaction ?

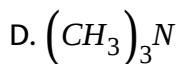
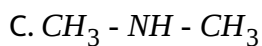
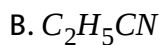
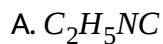


Answer: D



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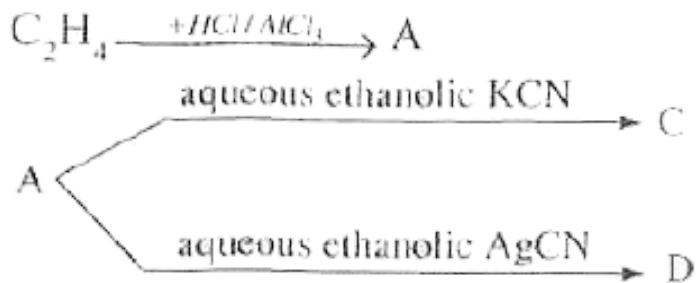
2. Ethyl chloride on heating with silver cyanide forms a compound X. The functional isomer of X is



Answer: B



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3.

Covalence of carbon in the functional group of C and D are

A. 3, 3

B. 4, 4

C. 4, 3

D. 3, 4

Answer: C



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A. 4

B. 3

C. 2

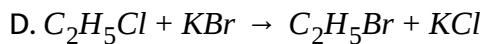
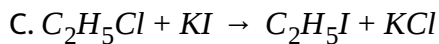
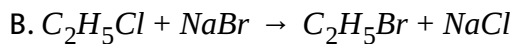
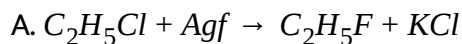
D. 1

Answer: A



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5. Which one of the following reaction is Swart reaction ?



Answer: A



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6. $\text{CH}_3\text{COOAg} + \text{C}_2\text{H}_5\text{Cl} \rightarrow \text{A}$ (organise) Wrong statement about 'A' is

- A. A is an ester
- B. IUPAC name of 'A' is ethylethanoate
- C. Functional group isomer of 'A' is butyric acid
- D. All carbons in 'A' are sp^2 hybridised

Answer: D



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7. Ethyl chloride can be converted into ethane by reacting with

- A. $\text{Zn} + \text{HCl}$
- B. LiAlH_4
- C. H_2/Ni
- D. All the above

Answer: D



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8. What are the reagent and reaction conditions used for converting ethyl chloride to ethyl nitrite (as the major product) ?

A. $\text{KNP}_2, \text{C}_2\text{H}_5\text{OH}, \text{H}_2\text{O}, \Delta$

B. $\text{NaNO}_2, \text{HCl}, 0^\circ \text{C}$

C. $\text{KCN}, \text{H}_2\text{O}, \Delta$

D. $\text{AgNO}_2, \text{C}_2\text{H}_5\text{OH}, \text{H}_2\text{O}, \Delta, \Delta$

Answer: A



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OBJECTIVE EXERCISE -2 (CHLOROFORM)

1. Chloroform can be used as

- A. Production of freon refrigerant
- B. solvent for fats and alkaloids
- C. General anaesthetic
- D. All the above

Answer: D



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2. Among the following a refrigerant is

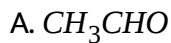
- A. CHCl_3
- B. CH_2F_2
- C. CCl_4
- D. CCl_4F_2

Answer: D

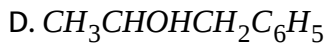
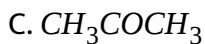


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3. Iodoform test is not answered by



B. 3-pentanone



Answer: B



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OBJECTIVE EXERCISE -2 (MECHANISM OF NUCLEOPHILIC SUBSTITUTION REACTIONS)

1. Characteristic reactions of alkyl halides are

- A. electrophilic substitution reactions
- B. electrophilic addition reactions
- C. nucleophilic addition reactions
- D. nucleophilic substitution reactions

Answer: D



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2. Which one of the following is more readily hydrolysed by S_N1 mechanism?

- A. $CH_3 - Br$
- B. $CH_3CH_2 - Br$
- C. $CH_3CH_2CH_2 - Br$
- D. $(CH_3)_3C - Br$

Answer: D



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3. In S_N1 reactions, rate of reaction depends on

- a) Concentration of alkyl halide
- b) Concentration of nucleophile
- c) Nature of alkyl halide

A. All

B. 'a' and 'c' only

C. 'a' and 'b' only

D. 'c' only

Answer: B



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4. In S_N1 (substitution, nucleophilic unimolecular) reaction, the racemization takes place. It is due to

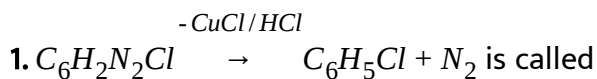
- A. inversion of configuration
- B. retention of configuration
- C. conversion of configuration
- D. both 1 and 2 Haloarenes

Answer: D



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OBJECTIVE EXERCISE -2 (HALOARENES)



- A. Etard reaction
- B. Sandmeyer reaction

C. Wurtz-Fittig's reaction

D. Perkin's reaction

Answer: B



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2. Which of the following reactions does not result in the formation of new C-C bond?

A. Wurtz-Fittig reaction

B. Fittig reaction

C. Williamson synthesis

D. Wurtz reaction

Answer: C



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OBJECTIVE EXERCISE -2 (POLYALOGEN COMPOUNDS)

1. How many trichloroethanes would be produced when 1, 1-dichloroethane reacts with chlorine ?

- A. One
- B. Two
- C. Three
- D. Four

Answer: B



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PRACTICE EXERCISE

1. Number of possible isomers with the molecular formula C_3H_9Cl is

A. 3

B. 4

C. 5

D. 6

Answer: C



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2. Incorrect statement among the following is

A. n-propylchloride and isopropyl chloride are position isomers

B. n-butyl chloride and iso butyl chloride are chain isomers

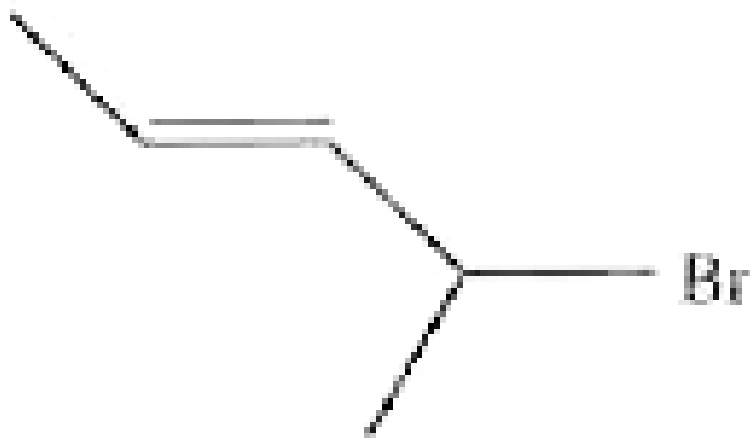
C. sec butyl chloride and ter-butyl chloride are chain isomers

D. isobutyl chloride and ter-butyl chloride are chain isomers

Answer: D



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3.

IUPAC name

is

A. 4 - bromo pent - 3- ene

B. 4 - bromo pent - 2- ene

C. 2 - bromo pent - 3- ene

D. 3 - bromo bute - 2- ene

Answer: B



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4. The halogen atom is on the sp² hybridised carbon which itself is attached to an aromatic ring, is called as

- A. Allylic halide
- B. Benzyl halide
- C. Polyhalo alkane
- D. Aryl halide

Answer: B



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5. C - X bond is strongest in

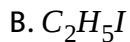
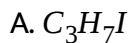
- A. CH_3Cl
- B. CH_3Br
- C. CH_3F
- D. CH_3I

Answer: C



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6. Which of the following alkyl halides has the maximum density ?



Answer: A



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7. $C_2H_5OH + HCl \xrightarrow{ZnCl_2, 200^\circ C} C_2H_5Cl + H_2O$ In this reaction, anhydrous $ZnCl_2$ acts as

- A. dehydrating agent
- B. dehydrogenating agent
- C. dehalogenating agent
- D. dehydrohalogenating agent

Answer: A



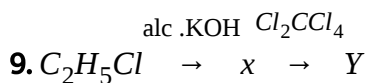
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8. The hybridization state of carbon atoms in the product formed by the reaction of ethyl chloride with aqueous KOH is

- A. sp
- B. sp^2
- C. sp^3
- D. sp^3d

Answer: C

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Correct statement about compound 'y' is

- A. It is an example of gem dihalide
- B. It is an example of vic dihalide
- C. Hybridisation of carbon is sp^2
- D. It is an unsaturated compound

Answer: B

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10. For the preparation of ethyl propionate from ethyl bromide, the other reactant required is

- A. Silver acetate

B. Propionic anhydride

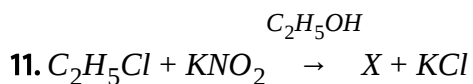
C. Propanoyl chloride

D. Silver propionate

Answer: D



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Substance X' in the reaction is

A. C-N

B. C-O

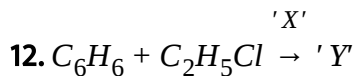
C. C - H

D. C - C

Answer: B



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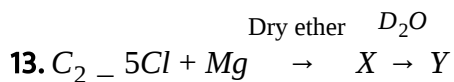
Wrong statement among the following is

- A. 'X' is Lewis acid
- B. In 'Y', all carbons undergo sp^2 hybridization
- C. For 'Y', four aromatic isomers are possible
- D. Homologue of 'Y' is toluene

Answer: B

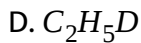


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Here the final product 'Y' is

- A. C_2H_6
- B. $C_2H_4D_2$



Answer: D



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14. $C_2H_5Cl \xrightarrow{X} C_2H_6$, $BCl_3 + X \rightarrow B_2H_6$ IUPACE name of compound 'X' is

- A. Lithiumaluminium hydride
- B. Lithium tetrahydridoaluminium (III)
- C. Lithium tetrahydridoaluminate (III)
- D. Tetrahydridoaluminium (III) lithium

Answer: C



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15. Butanenitrile is formed by reaction of KCN with

- A. Propyl alcohol
- B. Butyl chloride
- C. Butyl alcohol
- D. Propyl chloride

Answer: D



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16. Which of the following reagents when heated with ethyl chloride forms ethylene?

- A. Aqueous KOH
- B. Zn/HCl
- C. Alcoholic KOH
- D. HI

Answer: C



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17. $C_2H_5Cl \xrightarrow{\text{Dry}} Ag_2OA \xrightarrow{Al_2O_3} 360^\circ CB \xrightarrow{S_2Cl_2} C$ In the above sequence of reactions, identify compound C

- A. Chloretone
- B. Chloropicrin
- C. Mustard gas
- D. Lewisite gas

Answer: C



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18. Reagent used for detecting $CHCl_3$ is

A. aq. $AgNO_3$ solution

B. 1° amine

C. 1° amine + $KOH_{(alc)}$

D. 1 % C_2H_5OH solution

Answer: C



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19. The following are some statements about ethyl chloride i) it is used as refrigerant ii) it is used to prepare diethyl ether iii) it is used to prepare tetra ethyl lead

A. all are correct

B. only i and ii are correct

C. only ii is correct

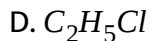
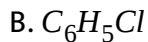
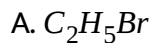
D. only ii and iii are correct

Answer: A



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20. Which of the following alkyl halides is used as a methylating agent ?



Answer: C



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21. Which of the following is formed when the product of oxidation of chloroform is treated with ethyl alcohol ?

- A. Ethyl chloride
- B. Ethyl carbonate
- C. Chloral hydrate.
- D. Chloral

Answer: B



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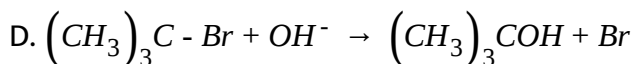
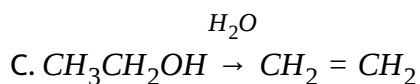
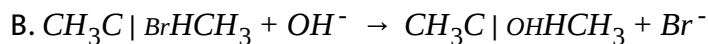
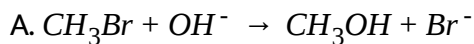
22. In the chemical reaction

$. CH_3CH_2NH_2 + CHCl_3 + 3KOH \rightarrow (A) + (B) + 3H_2O$ (A) and (B) are

- A. C_2H_5NC & $3KCl$
- B. C_2H_5CN & $3KCl$
- C. $CH_3CH_2CONH_2$ & $3KCl$
- D. C_2H_5NC & K_2CO_3

Answer: A

23. Which of the following is an example of S_N2 reaction ?



Answer: A

24. Most reactive halide towards S_N1 reaction is

A. n-Butyl chloride

B. sec-butyl chloride

C. ter-Butyl chloride

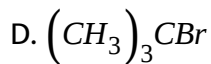
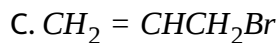
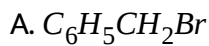
D. Allyl chloride

Answer: D



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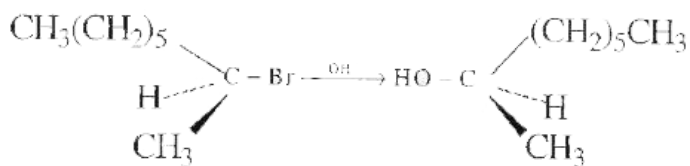
25. Which of the following alkyl halides is hydrolysed by S_N1 mechanism ?



Answer: B



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26.

this is described as

A. S_E^2

B. S_n^1

C. S_n^2

D. S_n^0

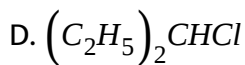
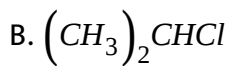
Answer: C



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27. The organic chloro compound , which shows complete stereo chemical inversion during S_N^2 reaction is

A. $(\text{CH}_3)_3\text{CCl}$



Answer: C



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28. The reaction of an alkyl halide with $RCOOAg$ produces

A. ester

B. ether

C. aldehyde

D. ketone

Answer: A



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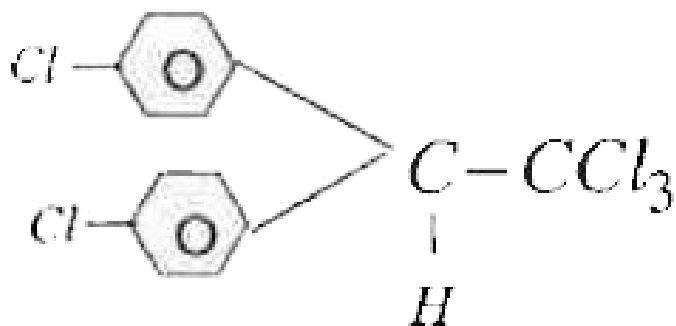
29. Which of the following statements is not correct?

- A. Chlorobenzene is more reactive than benzene towards electrophilic substitution reaction
- B. C-Cl bond in chlorobenzene is less polar than in CH_3Cl
- C. Chlorobenzene is less reactive than CH_3Cl towards nucleophilic substitution reactions
- D. In chlorobenzene, further substitution takes place at ortho and para position

Answer: A



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30.

The above structural formula refers to

A. BHC

B. DNA

C. DDT

D. RNA

Answer: C



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31. Antiseptic properties of Iodoform is due to liberation of

A. HI

B. I_2

C. H_2O

D. CHI_3

Answer: B



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32. Freon -12 is prepared from

A. $CHCl_3$

B. CCl_4

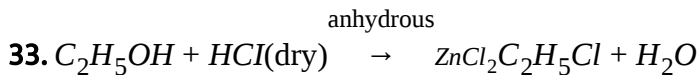
C. CH_2Cl_2

D. DDT

Answer: B



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In this reaction, the function of $ZnCl_2$ is

- A. To help the formation of Cl^-
- B. To speed up the formation of C_2H_5Cl
- C. To prevent the backward reaction
- D. To form $C_2H_5^{(+)}$ from C_2H_5OH

Answer: C



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34. The elimination of HX from an alkyl halide forms an alkene. Give the order of the elimination reaction

- A. 1° halide $>$ 2° halide $>$ 3° halide
- B. 2° halide $>$ 1° halide $>$ 3° halide

C. 3° halide $>$ 2° halide $>$ 1° halide

D. 1° halide $=$ 2° halide $>$ 3° halide

Answer: C



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35. Which of the following compounds would be hydrolysed most easily ?

A. C_2H_5Cl

B. C_2H_5Br

C. C_2H_5F

D. C_2H_5I

Answer: D



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36. The reagents required to obtain 1-iodobutane from 1-butene is

A. I_2/RedP

B. KI

C. HI/H_2O_2

D. Hbr/H_2O_2 and KI / acetone

Answer: D



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37. $C_2H_5Cl + x \rightarrow C_2H_5F$, here 'X' cannot be

A. AgF

B. Hg_2F_2

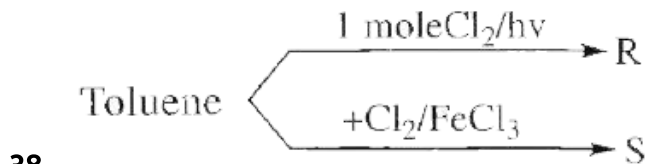
C. SbF_3

D. NaF

Answer: D



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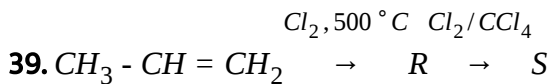
Here R and S are respectively

- A. Benzyl chloride, p-chlorobenzene
- B. Benzoyl chloride, p-chlorobenzene
- C. p-Chlorobenzene, p-chlorobenzene
- D. o-Chlorobenzene, p-chlorobenzene

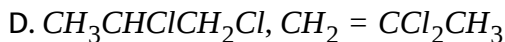
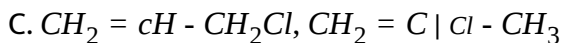
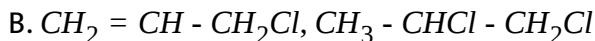
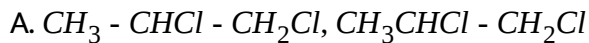
Answer: A



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'R' and 'S' are respectively



Answer: B



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40. Which of the following possess highest melting point

A. Chlorobenzene

B. o-Dichlorobenzene

C. m-Dichlorobenzene

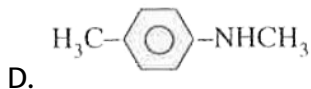
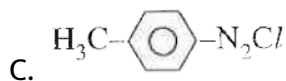
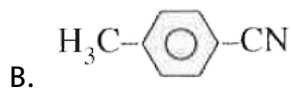
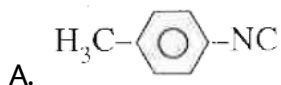
D. p-Dichlorobenzene

Answer: D



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41. The reaction of chloroform with alcoholic KOH and p-toluidine forms



Answer: B



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42. An alkyl iodide on standing darkens due to

- A. hydrolysis
- B. conversion into ether
- C. liberation of I_2
- D. formation of alkane

Answer: C



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43. The compound formed on heating chlorobenzene with chloral in the presence of conc. sulphuric acid is

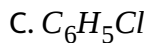
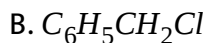
- A. Gammexene
- B. Hexa chloro ethane
- C. freon
- D. DDT

Answer: D



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44. The halide which will not react with benzene in presence of anhydrous $AlCl_3$ is



Answer: C



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45. Iodoform gives yellow ppt. on heating with aq. $AgNO_3$ solution but chloroform does not. This is because

- A. iodoform is ionic while chloroform is covalent
- B. C-Cl bond in chloroform is much weaker than C-I bond in iodoform
- C. C-I bond in iodoform is weaker than C-Cl bond in chloroform
- D. Chloroform is a liquid while iodoform is a solid

Answer: C



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46. Configuration of a chiral molecule can be changed by

- A. rotation around a sigma bond
- B. cooling to 73°K
- C. breaking a bond at chiral centre and reforming it
- D. reacting it with an acid.

Answer: C



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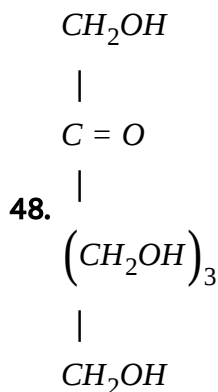
47. A similarity between optical and geometrical isomerism is that

- A. each forms equal number of isomers for a given compound
- B. if in a compound, one is present then so is the other
- C. both are included in stereoisomerism
- D. they have no similarity

Answer: C



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Total number of possible configurational stereo isomers

A. 2

B. 4

C. 8

D. 16

Answer: C



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49. The number of isomers (geomctrical and optical) possible for the compound with the structure $CH_3CH = CH - CH = CH - CH_2CHOHCH_3$ is

A. 2

B. 4

C. 6

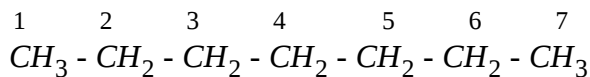
D. 8

Answer: C



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50. Consider the following organic compound,



To make it chiral compound, the attack should be on carbon

A. 1

B. 3

C. 4

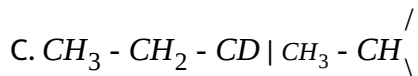
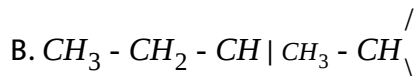
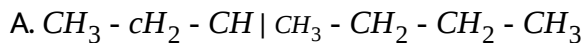
D. 7

Answer: B



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51. The chiral alkane of the lowest molecular mass not containing a ring and isotopes is



D. Both (1) and (2)

Answer: D



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52. A compound with molecular formula, C_7H_{16} shows optical isomerism, the compound will be

A. 2, 3-dimethylpentane

B. 2, 2-dimethylpentane

C. 2-methylhexane

D. None of these

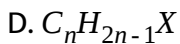
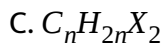
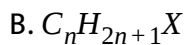
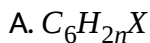
Answer: A



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LEVEL-I (EXERCISE-I (NOMENCLATURE AND NATURE OF C-X BOND))

1. The general formula of alkyl halides is



Answer: B



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2. The hybridisation of carbon atoms in C_2H_5Cl are

A. sp^3 and sp^2

B. sp^3 and sp

C. sp^3 and sp^3

D. sp^2 and sp

Answer: C



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3. Ethyl chloride is

A. 1° alkyl halide

B. 2° alkyl halide

C. 3° alkyl halide

D. gem halide

Answer: A



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4. The C - Cl bond in Ethyl chloride is formed by overlapping

A. $sp^3 - s$

B. $sp^3 - p$

C. $sp^3d - p$

D. $sp^2 - p$

Answer: B



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5. IUPAC name of $(CH_3)_2CHCH_2CH_2Br$ is

- A. 1-Bromo - 3 -methyl butane
- B. 1-Bromo - 3-methyl propane
- C. 1-Bromo pentane
- D. 3-Bromo pentane

Answer: A



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6. IUPAC name of $H_3C - HC(Br)_2$ is

- A. Ethylidene bromide
- B. Gem - dibromide
- C. In IUPAC name it is know as 1,1-dibromo ethane
- D. Any of the above

Answer: D



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7. n-Butyl chloride and iso butyl chloride are

- A. position isomers
- B. Functional group isomers
- C. Chain isomers
- D. Metamers

Answer: C



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8. With increase in number of halogen atoms & atomic mass of halogen atoms density of the compounds

- A. Decrease
- B. Increase
- C. Remains same

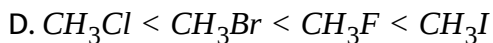
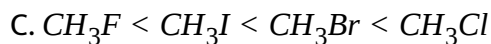
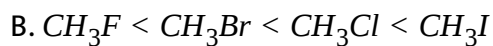
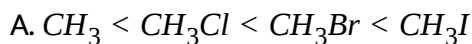
D. Can't say

Answer: B



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9. For the compounds CH_3Cl , CH_3Br , CH_3I and CH_3F , the correct order of increasing C-halogen bond length is :

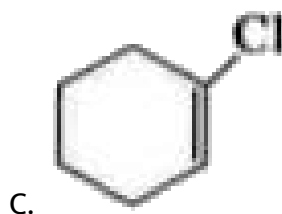
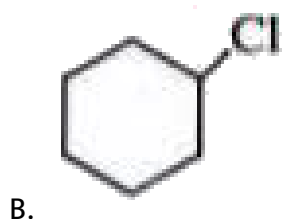
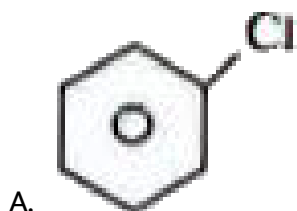


Answer: A



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10. Which of the following is an alkyl halide



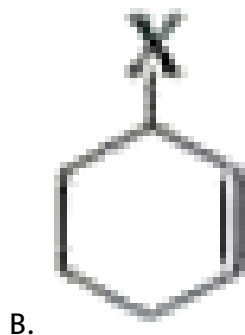
D. All the above

Answer: B



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11. Which of the following is an allylic halide

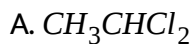


Answer: B

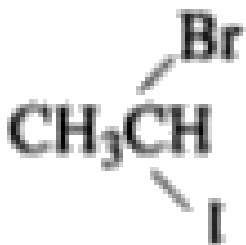


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12. Which of the following is most appropriately be called as geminal halide



B.



C.



D.

Answer: A



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13. Which of the following statements is right regarding CH_3CHCl_2

- A. It is known as ethylidene chloride
- B. It is gem - halide
- C. In IUPAC, it is known as 1,1 - dichloroethane
- D. All the above

Answer: D



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14. The number of structural isomers possible for $C_5H_{11}Br$ is

- A. ten
- B. eight
- C. six
- D. four

Answer: B



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15. Minimum number of carbon atom in an alkyl chloride to exhibit optical activity is

A. 4

B. 3

C. 5

D. 6

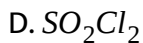
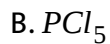
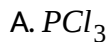
Answer: A



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LEVEL-I (EXERCISE-I (PREPARATIONS OF ALKYL HALIDES))

1. Which of the following reagents is not useful to prepare ethyl chloride from ethyl alcohol

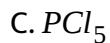
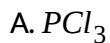


Answer: D



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2. Which of the following reagents is the best for preparation of alkyl chloride from an alcohol in pure form

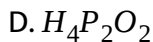
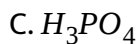
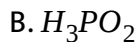
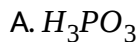


D. chlorine and red P

Answer: B

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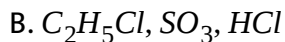
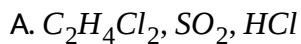
3. $C_2H_5OH \xrightarrow{PCl_5} C_2H_5Cl + X$, X in the above reaction is



Answer: A

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4. $C_2H_5OH + SOCl_2 \rightarrow X + Y + Z$, what are X,Y, Z



C. C_2H_5Cl , SO_2 , HCl

D. C_2H_4 , SO_2 , Cl_2

Answer: C



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5. In which of the following reactions, the product is 1-chlorobutane ?

A. 1-Butene + HCl

B. 2- Butene + HCl

C. 1- Butene + HCl , $ROOR$

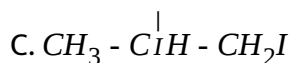
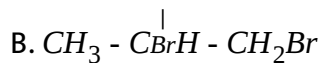
D. None of the above

Answer: D



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6. Which of the following vicinal halide is unstable



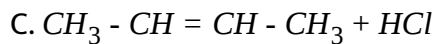
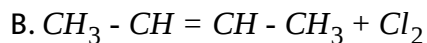
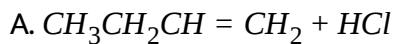
D. all are unstable

Answer: C



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7. In which of the following reactions the product is 2-chlorobutane



D. both 1 and 3

Answer: D



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8. Groove's method is used for preparation of alkyl halides from alcohols using HX and $ZnCl_2$. The order of reactivity is

A. $HCl > HBr > HI$

B. $HI > HBr > HCl$

C. $HCl > HI > HBr$

D. $HI > HCl > HBr$

Answer: B



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9. Hunsdiecker reaction involves the conversion of

- A. RCOOAg to RCI using Cl_2
- B. RCOOAg to $(\text{RCO})_2\text{O}$ using RCOCl
- C. RCOOAg to RCOOR using I_2
- D. All the above

Answer: A



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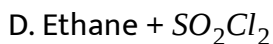
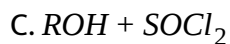
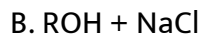
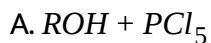
10. Which of the following reagent is used for conversion of an alkane into alkyl chloride

- A. SOCl_2
- B. SO_2Cl_2
- C. PCl_3
- D. PCl_5

Answer: B

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11. In which of the following reactions, alkyl chloride is not formed



Answer: B

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12. $C_2H_5Cl + X \rightarrow C_2H_5OH + KCl$ X in the above reaction is

A. aqueous KOH

B. moist Ag_2O

C. alcoholic KOH

D. aqueous NaOH

Answer: A



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13. Ethyl chloride on reaction with alcoholic KOH give ethylene. This is an example of — reaction

A. Substitution

B. Addition

C. Elimination

D. Rearrangement

Answer: C



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14. A primary alkyl iodide on treatment with dry silver oxide gives

- A. Diethyl ether
- B. Ethyl methyl ether
- C. An alcohol
- D. An ether

Answer: D



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15. Chloroethane on reaction with 'X' to give diethyl ether. 'X' is

- A. NaOH
- B. H_2SO_5
- C. C_2H_5ONa
- D. CH_3ONa

Answer: C



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16. $C_6H_6 + CH_3Cl \xrightarrow{AlCl_3} + C_6H_5CH_3 + HCl$. The reaction is known as

- A. Friedel – Crafts alkylation
- B. Friedel – Crafts acylation
- C. Wurtz – Fittig reaction
- D. fittig reaction

Answer: A



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17. The best and most suitable solvent used in the preparation of Grignand reagent is

- A. dry acetone
- B. dry ether
- C. dry alcohol
- D. dry chloroform

Answer: B



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18. Alkyl halides reacts with alcoholic KCN to give

- A. alkyl cyanides
- B. Alkyl isocyanides
- C. Alkane
- D. Alkene

Answer: A



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19. Ethyl chloride on reaction with moist silver oxide to give

- A. An ether
- B. diethyl ether
- C. Ethyl alcohol
- D. Ethylene

Answer: C



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20. The charge carried by carbon atom bonded to magnesium metal in the Grignand reagent is

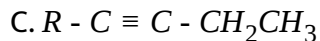
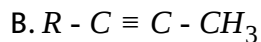
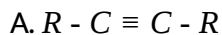
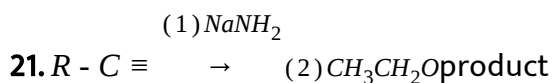
- A. positive charge
- B. negative charge
- C. no charge

D. cannot be predicted

Answer: B



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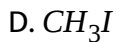


Answer: C



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22. Which of the following alkyl halides possesses highest density

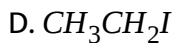
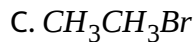
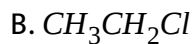
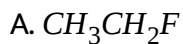


Answer: D



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23. Which of the following is likely to have highest boiling point



Answer: D



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24. The alkyl halide which possesses highest dipole moment is



Answer: B



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25. The order of dipole moments of

$\text{CHF}_3(\text{I})$, $\text{CHCl}_3(\text{II})$, $\text{CHBr}_3(\text{III})$, $\text{CHI}_3(\text{IV})$ is

A. $\text{II} > \text{III} > \text{IV} > \text{I}$

B. $\text{IV} > \text{III} > \text{II} > \text{I}$

C. $\text{II} > \text{I} > \text{III} > \text{IV}$

D. I gt IV gt II gt III

Answer: A



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26. Which of the following isomeric alkyl halides possesses highest boiling point

A. n-Butyl chloride

B. iso - Butyl chloride

C. Sec - Butylchloride

D. tert - Butyl chloride

Answer: A



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27. Which of the following statements is right in a compound

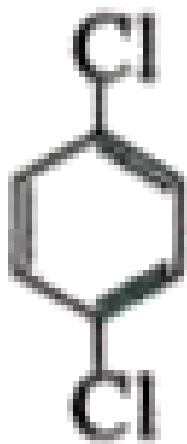
- A. a halogen atom bonded to sp^3 carbon atom is an alkyl halide
- B. a halogen atom bonded to sp^2 carbon atom is an alkylhalide
- C. a halogen atom bonded to sp -carbon atom is an alkylhalide
- D. a halogen atom bonded to any type of carbon - atom is an alkyl halide

Answer: A

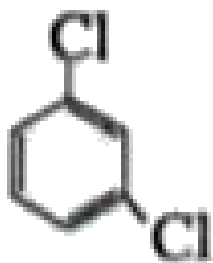


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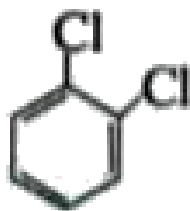
28. Which of the following is likely to have highest boiling point



A.



B.



C.

D. All posses same m.p. as they are isomers

Answer: A



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29. Finkelstein reaction is used to prepare

- A. alkyl chlorides
- B. alkyl bromides
- C. alkyl iodides
- D. alkyl fluorides

Answer: C



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30. Reactivity order with respect to alkyl group of Hunsdicker reaction is

- A. $1^\circ > 2^\circ > 3^\circ$
- B. $3^\circ > 2^\circ > 1^\circ$
- C. $3^\circ = 2^\circ > 1^\circ$
- D. $1^\circ = 2^\circ > 3^\circ$

Answer: A



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6. COLUMN - I

- A) Chloroform, phenol & alkali
- B) Ethyl alcohol, bleaching powder
- C) Chloroform, aniline & alkali
- D) Acetone, iodine & caustic soda

The correct match is

| | A | B | C | D |
|----|---|---|---|---|
| 1) | 2 | 4 | 3 | 1 |
| 3) | 4 | 3 | 1 | 2 |

COLUMN - II

- 1) Carbylamine reaction
- 2) Reimer - Tiemann reaction
- 3) Iodoform test
- 4) Chloroform

| | A | B | C | D |
|----|---|---|---|---|
| 2) | 2 | 4 | 1 | 3 |
| 4) | 1 | 4 | 2 | 3 |

31.



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7. COLUMN - I

- A) Dehydrohalogenation
- B) Dehalogenation
- C) Dehydration
- D) Hydrolysis

The correct match is

| | A | B | C | D |
|----|---|---|---|---|
| 1) | 4 | 1 | 3 | 2 |
| 3) | 1 | 4 | 2 | 3 |

COLUMN - II

- 1) Ethanolic zinc.
- 2) conc. H_2SO_4
- 3) aq. KOH
- 4) alc. KOH

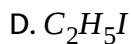
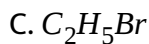
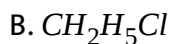
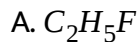
| | A | B | C | D |
|----|---|---|---|---|
| 2) | 4 | 1 | 2 | 3 |
| 4) | 3 | 1 | 4 | 2 |

32.



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1. Amongst the following the most reactive alkyl halide is



Answer: D



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2. S_N1 reactions occur through the intermediate formation of

A. Carbocations

B. Carbanions

C. Free radicals

D. None of these

Answer: A



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3. The reaction $(CH_3)_3C - Br \xrightarrow{H_2O} (CH_3)_3C - OH$ is

- A. Nucleophilic substitution reaction
- B. A Free radical substitution reaction
- C. Electrophilic substitution reaction
- D. Any of the above

Answer: A



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4. An optically active halide when allowed to react with CN^- gives a racemic mixture. The halide is most likely to be

A. 1°

B. 2°

C. 3°

D. 4°

Answer: C



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5. A dextrorotatory optically active alkyl halide undergoes hydrolysis by S_N2 mechanism. The resulting alcohol is.

A. Dextrorotatory

B. Laveorotatory

C. Optically inactive due to racemisation

D. may be dextro (or) laevorotatory

Answer: D



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LEVEL-I (EXERCISE-I (HALO ARENES (CHLOROBENZENE)))

1. Aryl halides are less reactive towards nucleophilic substitution reaction as compared to alkyl halides due to

- A. The formation of less stable carbanion
- B. Resonance stabilization of aryl halides
- C. Longer - carbon halogen bond
- D. Inductive effect

Answer: B



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2. Chlorobenzene is

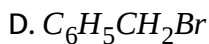
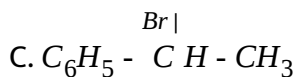
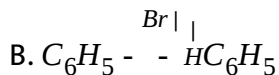
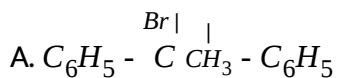
- A. More reactive than ethyl bromide
- B. More reactive than isopropyl chloride
- C. As reactive as methyl chloride
- D. Less reactive than benzyl chloride

Answer: D



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3. Which of the following is most reactive towards SN^1 reaction



Answer: A



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4. Aryl halides can be prepared by

- A. Sandmeyer's method
- B. Friedel - crafts reaction
- C. Gattermann reaction
- D. 1 and 3

Answer: D



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5. Which of the following statements regarding an optically active halide is correct

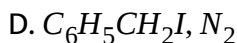
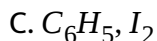
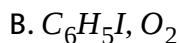
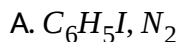
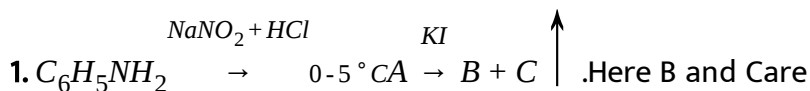
- A. SN^2 reaction gives a racemic mixture
- B. SN^1 reaction gives a racemic mixture
- C. SN^2 reaction, give a product with opposite optical rotation of that of reactant
- D. SN^1 reaction gives a single stereoisomer

Answer: B



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6. In Gattermann reaction, a diazonium group is replaced by X using Y. X, Y are :

X**Y****Watch Video Solution****LEVEL-I (EXERCISE-I (PROPERTIES OF CHLOROBENZENE))**

Answer: A



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2. Chlorobenzene on fusing with solid NaOH followed by acidification gives

- A. Benzene
- B. Benzoic acid
- C. Phenol
- D. Benzene Chloride

Answer: C



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3. Chlorobenzene on reaction with CH_3Cl in the presence of $AlCl_3$ will give

A. Toluene

B. m - Chloro toluene

C. p - Chloro toluene

D. A mixture of o - and p - chlorotoluene

Answer: D



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4. Bromobenzene reacts with Mg in dry ether to give a compound (A) which further reacts with ethanol to yield

A. Ethylbenzene

B. Phenol

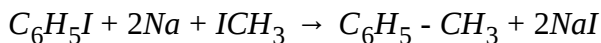
C. Phenylmethyl ether

D. Benzene

Answer: D

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5. The reaction given below is known as



- A. Wurtz reaction
- B. Fittig reaction
- C. Wurtz - Fittig reaction
- D. Ullmann reaction

Answer: C

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6. On sulphonation of C_6H_5Cl

- A. m-chlorobenzenesulphonic acid
- B. Benzenesulphonic acid is formed

C. o-chlorobenzenesulphonic acid is formed

D. o-and p-chlorobenzenesulphonic acid is formed

Answer: D



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LEVEL-I (EXERCISE-I (POLY HALOGEN COMPOUNDS))

1. Which of the following is used for metal cleaning and finshing

A. $CHCl_3$

B. CCl_4

C. CH_2Cl_2

D. CHI_3

Answer: C



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2. First chlorinated insecticide is

- A. DDT
- B. Gammaxene
- C. BHC
- D. Pyrene

Answer: A



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3. The correct formula of Freon-12 is

- A. CF_4
- B. CF_3Cl
- C. CF_2Cl_2
- D. $CFCl_2$

Answer: C



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4.

The above

conversion can be brought about by

A. NaBH_4

B. LiAlH_4

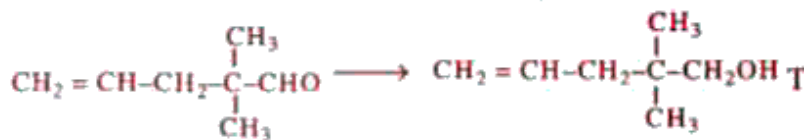
C. HI and red P

D. Zn-Hg and HCl and Δ

Answer: B



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5.

The above

conversion can be brought about by

A. NaBH_4

B. LiAlH_4

C. H_2 - raney Ni

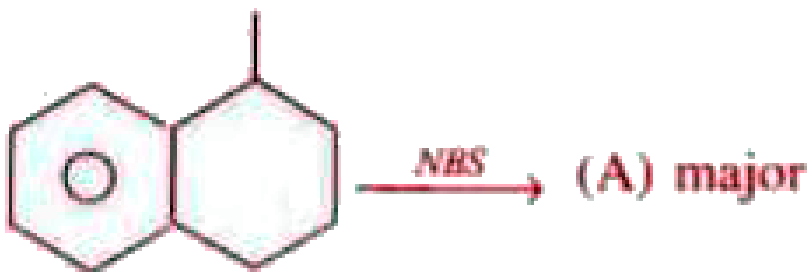
D. HI and red P

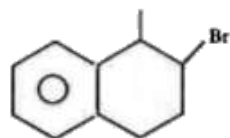
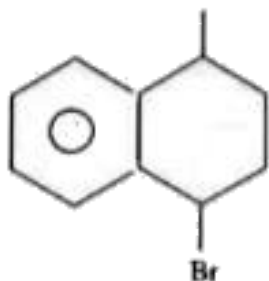
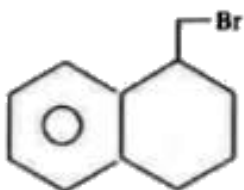
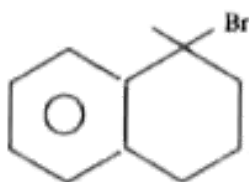
Answer: A::B



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6.





Answer: A



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7. Which of the following is correct regarding nucleophilicity of the species given

- A. OH^- stronger nucleophilic than CH_3COO^-
- B. OH^- stronger nucleophilic than H_2O
- C. $(\text{CH}_3)_3\text{CO}^-$ is a strong base but a weak nucleophile s
- D. NH_2^- is stronger nucleophile than NH_3

Answer: A::B::C::D



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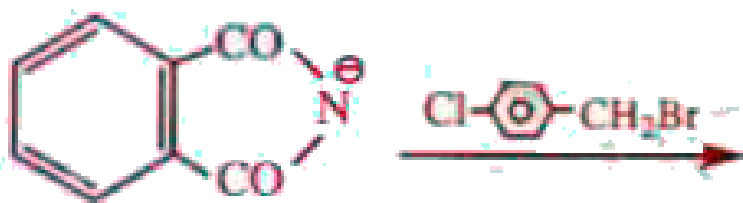
8. Which of the following is gammexane

- A. Benzene hexachloride
- B. Hexachlorobenzene
- C. Benzene hexabromide
- D. Hexabromobenzene

Answer: A



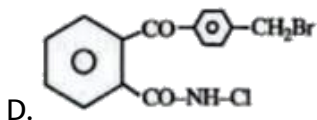
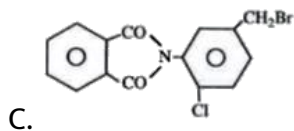
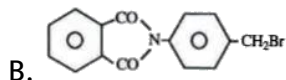
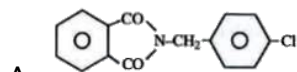
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9.

The

product. The structure of the product is

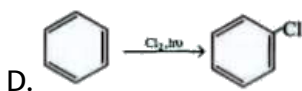
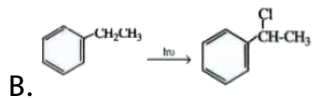
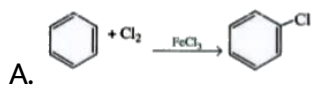


Answer: A



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10. Which of the following reactions is correctly represented



Answer: A::B



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11. Triodo methane is used as

A. an antiseptic

B. antipyretic

C. analgeric

D. antimalarial

Answer: A



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12. Which of the following is used as fire extinguisher

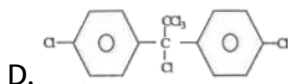
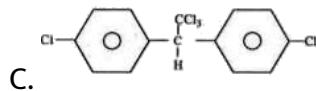
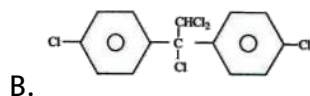
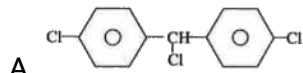


Answer: D



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13. The formula of DDT is



Answer: C



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LEVEL-I (EXERCISE-II (INTRODUCTION, NOMENCLATURE, NATURE OF C-X BOND))

1. Tertiary alkyl halide among the following is

A. 2 - chlorobutane

B. Secondary butyl chloride

C. Isobutyl chloride

D. 3 - chloro - 3 - methyl pentane

Answer: D



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2. Number of possible structural isomers with the molecular formula C_4H_9Cl are

A. 3

B. 4

C. 5

D. 6

Answer: B



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3. In the chloroethene, the carbon bearing halogen is bonded to... hydrogen(s).It is called__alkylhalide.

- A. Two, primary
- B. Three, primary
- C. Two, secondary
- D. One, Tertiary

Answer: A



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4. Which of the following is a primary alkyl halide ?

- A. Isobutyl bromide
- B. Neo - Pentyl chloride
- C. Isopentyl bromide
- D. All are primary halides

Answer: D



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5. Incorrect statement among the following

- A. n-propylchloride and isopropyl chloride are position isomers
- B. n-butyl chloride and iso butyl chloride are chain isomers
- C. sec butyl chloride and ter-butyl chloride are chain isomers
- D. isobutyl chloride and ter-butyl chloride are chain isomers

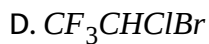
Answer: D



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6. Among the following perhaloalkane is

- A. SCl_4



Answer: C



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7.



A. 4 - bromo pent - 3- ene

B. 4 - bromo pent - 2- ene

C. 2 - bromo pent - 3- ene

D. 3 - bromo bute - 2- ene

Answer: B



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8. The halogen atom is on the sp² hybridized carbon which itself is attached to an aromatic ring, is called as

- A. Allylic halide
- B. Benzylhalide
- C. Perhalo alkane
- D. Aryl halide

Answer: B



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9. Which of the following has the lowest boiling point ?

- A. 1 - Chloropentane
- B. isopentyl chloride

C. tert-pentyl chloride

D. All have equal boiling point

Answer: A



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10. C - X bond is strongest in

A. CH_3Cl

B. CH_3Br

C. CH_3F

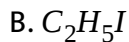
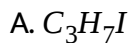
D. CH_3I

Answer: C



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11. Which of the following alkyl halides has the maximum density ?



Answer: A



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12. $C_2H_5ClNa \xrightarrow{\text{dry ether}} NaClA$. A on monochlorination gives how many isomers ?

A. 1

B. 2

C. 3

Answer: B



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LEVEL-I (EXERCISE-II (C_2H_5Cl (PREPARATION AND PROPERTIES))

1. $C_2H_5OH + HCl \xrightarrow{ZnCl_2} 200^\circ C C_2H_5Cl + H_2O$ In this reaction, anhydrous $ZnCl_2$ acts as

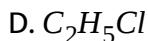
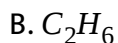
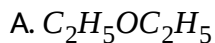
- A. dehydrating agent
- B. dehydrogenating agent
- C. dehalogenating agent
- D. dehydrohalogenating agent

Answer: A



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2. Hydrogen chloride and SO_2 are the by products in the reaction of ethanol with thionyl chloride. Which of the following is the main product in this reaction ?



Answer: D



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3. The hybridization state of carbon atoms in the product formed by the reaction of ethyl chloride with aqueous KOH is



B. sp^2

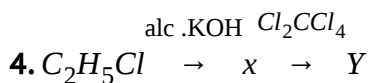
C. sp^3

D. sp^3d

Answer: C



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Correct statement about compound 'y' is

A. It is an example of gem dihalide

B. It is an example of vic dihalide

C. Hybridisation of carbon in 'y' is sp^2

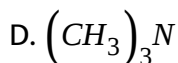
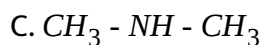
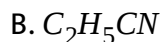
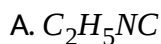
D. It is an unsaturated compound

Answer: B



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5. Ethyl chloride on heating with silver cyanide forms a compound X. The functional isomer of X is



Answer: B



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6. For the preparation of ethyl propionate from ethyl bromide, the other reactant required is

A. Silver acetate

B. Propionic anhydride

C. Propanoyl chloride

D. Silver propionate

Answer: D



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7. Which of the following alkyl halides mainly undergo reaction by SN^2 mechanism.

A. CH_3Cl

B. $(CH_3)_2CHCl$

C. $(CH_3)_3CCl$



D.

Answer: A



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8. Correct order of reactivity of alkyl bromides towards SN^2 reaction is

$CH_3Br(I)$, $CH_3CH_2Br(II)$, $(CH_3)_2CHBr(III)$, $(CH_3)_3C.Br(IV)$

A. IV gt II gt III gt I

B. I gt II gt III gt IV

C. I gt IV gt II gt III

D. IV gt III gt II gt I

Answer: B



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9. Which of the statements regarding SN^2 reaction is correct

A. Overall order of reaction is two

B. Molecularity of the reaction is two

C. Primary halides mainly undergo SN^2 reaction

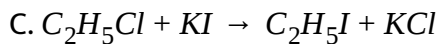
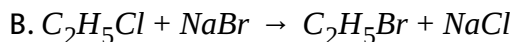
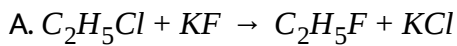
D. All the above

Answer: D



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10. Which one of the following reaction is not possible



Answer: A



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11. $C_6H_6 + C_2H_5Cl \xrightarrow{X} Y$ Wrong statement among the following is

- A. 'X' is Lewis acid
- B. In 'Y' all carbons are sp^2 hybridised
- C. For 'Y' four aromatic isomers are possible
- D. Its homologue is toluene

Answer: B



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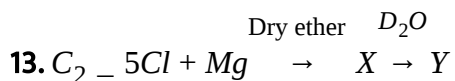
12. $CH_3COOAg + C_2H_5Cl \rightarrow$ (org.) Wrong statement about 'A' is

- A. A is an ester
- B. IUPAC name of 'A' is ethylethanoate
- C. Functional isomers of 'A' is butyric acid
- D. All carbons in 'A' are sp^2 hybridised

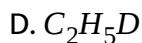
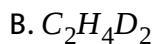
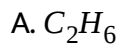
Answer: D



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Here the final product 'Y' is



Answer: D



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14. Ethyl chloride can be converted into Ethane by reacting with

A. $\text{Zn} + \text{HCl}$

B. LiAlH_4

C. H_2/Ni

D. all the above

Answer: D



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15. Which compound is most reactive towards S_N^2 reaction

A. $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$

B. $\text{CH}_2 = \text{CH} - \text{CH}_2\text{Cl}$

C. $\text{CH} \equiv \text{C} - \text{CH}_2\text{Cl}$

D.



Answer: C



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16. Butanenitrile is formed by reaction of KCN with

- A. Propyl alcohol
- B. Butyl chloride
- C. Butyl alcohol
- D. Propyl chloride

Answer: D



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17. What are the reagent and reaction conditions used for converting ethyl chloride to ethyl nitrite (as the major product) ?

- A. KNO_2 , C_2H_5OH , H_2O , Δ
- B. $NaNO_2$, HCl , $0^\circ C$

C. KCN, H_2O, Δ

D. $AgNO_2, C_2H_5OH, H_2O, \Delta$

Answer: A



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18. Which of the following reagents when heated with ethyl chloride, form ethylene ?

A. Aqueous KOH

B. Zn/HCl

C. Alcoholic KOH

D. HI

Answer: C



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19. $C_2H_5Cl \xrightarrow{aq} Ag_2OA \xrightarrow{Al_2O_5} 360^\circ CB \xrightarrow{S_2Cl_2}$. In the above sequence of reactions, identify 'C'

- A. Chloretone
- B. Chloropicrin
- C. Mustard gas
- D. Lewisite gas

Answer: C



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LEVEL-I (EXERCISE-II (PREPARATIONS OF $CHCl_3$))

1. Chloroform is prepared on large scale by the reduction of CI_4 with

- A. $Zn + HCl$ alc
- B. Fe filings and water

C. LiAlH_4

D. H_2 + red P

Answer: B



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2. Chloroform can be prepared by the reaction of $\text{C}_2\text{H}_5\text{OH}$ with bleaching powder. In the above method, the reaction taking place

A. Chlorination

B. Hydrolysis

C. Oxidation

D. All the above

Answer: D



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3. The number of moles of bleaching powder required to get one mole of $CHCl_3$ from C_2H_5OH is

A. 1

B. 2

C. 3

D. 4

Answer: D



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4. $CH_3 - \overset{O}{\underset{||}{C}} - CCl_3 \xrightarrow{Ca(OH)_2} CHCl_3 + X$. What is X ?

A. $(CH_3COO)_2Ca$

B. $(HCOO)_2Ca$

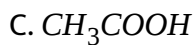
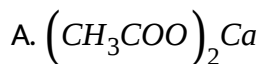
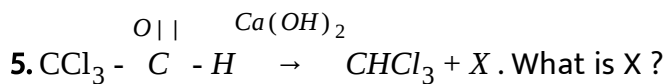
C. CH_3COOH

D. $CaCl_2$

Answer: A



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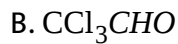


Answer: B



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6. What is the product obtained when chlorine reacts with ethyl alcohol in KOH?



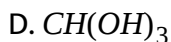
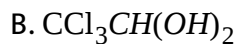
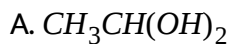
D. none

Answer: A



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7. Among the following which is stable



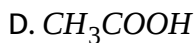
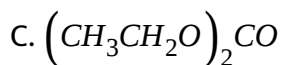
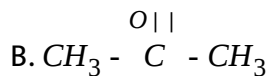
Answer: B



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LEVEL-I (EXERCISE-II (PROPERTIES OF $CHCl_3$))

1. When 1% C_2H_5OH is added to chloroform, the phosgene present in chloroform is converted into.



Answer: C



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2. $(CH_3)_3CCl(I)$ & $(CD_3)_3CCl(II)$ Both undergo reaction by SN^1 mechanism. Which statements below is correct

- A. Both have same reactivity
- B. I undergoes faster than II
- C. I undergo slower than II
- D. Reactivity cannot be predicted

Answer: B



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3. The number of moles of Ag metal to be reacted with CHCl_3 to get 1 mole of C_2H_2 is

- A. 1
- B. 2
- C. 4
- D. 6

Answer: D

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4. $CHCl_3 + C_6H_5OH \xrightarrow{NaOH} X + NaCl + H_2O$ the principal functional group in the compound X' is

A. -OH

B. -CHO

C. -COOH

D. -Cl

Answer: B

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5. $C_6H_5NH_2 + CHCl_3 + KOH(alc) \xrightarrow{\Delta} A$ (or g) Covalence of C and N in the functional group of 'A' is

A. 4,3

B. 3,4

C. 4,4

D. 3,3

Answer: A



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6. Chloroform reacts with 'X' and forms a compound having offensive smell in the presence of base, 'X' is

A. 1° amine

B. 2° amine

C. 3° amine

D. 4° amine

Answer: A



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7. Isocyanide test is used to identify

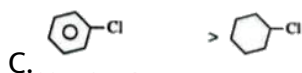
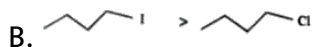
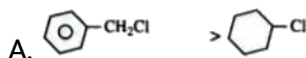
- A. Aromatic secondary amines
- B. Aromatic tertiary amines
- C. Aromatic and aliphatic primary amines
- D. Quaternary ammonium compound

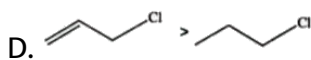
Answer: C



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8. In the following pairs which is represented correctly towards SN^2 reaction





Answer: A



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9. Which of the following is most reactive towards SN^1 reaction

- A. 1-Bromobutane
- B. 2-Bromobutane
- C. 1- Bromo - 2 - methyl butane
- D. 2- Bromo - 2 - methyl butane

Answer: A



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10. Reagent used for detecting $CHCl_3$ is

A. aq. $AgNO_3$

B. 1° - amine

C. 1° amine + KOH (aq)

D. 1 % C_2H_5OH

Answer: A



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11. Iodoform test is not answered by

A. CH_3CHO

B. 3-pentanone

C. CH_3COCH_3

D. $CH_3CHOHCH_2C_6H_5$

Answer: C



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12. The following are some statements about ethyl chloride i) it is used as refrigerant ii) it is used to prepare diethyl ether iii) it is used to prepare tetra ethyl lead

- A. all are correct
- B. only i and ii are correct
- C. only ii is correct
- D. only ii and iii are correct

Answer: D



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13. $\text{CCl}_4 + 2\text{HF} \xrightarrow{\text{SbF}_3}$ the carbon compound formed will be

- A. Teflon
- B. Pyrine

C. Freon -1, 2

D. All of these

Answer: C



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LEVEL-I (EXERCISE-II (MECHANISM OF NUCLEOPHILIC SUBSTITUTION REACTIONS))

1. Characteristic reactions of alkyl halides are

A. electrophilic substitution reactions

B. electrophilic addition reactions

C. nucleophilic addition reactions

D. nucleophilic substitution reactions

Answer: D



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2. Most reactive halide towards S_N1 reaction is

- A. n - Butyl chloride
- B. sec - Butyl chloride
- C. tert - Butyl chloride
- D. Allyl Chloride

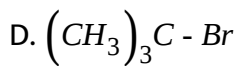
Answer: C



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3. Which of the following alkyl halides is hydrolysed by S_N1 mechanism ?

- A. $CH_3 - Br$
- B. $CH_3CH_2 - Br$
- C. $CH_3CH_2CH_2 - Br$

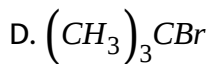
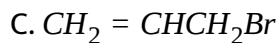
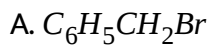


Answer: D



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4. Which of the following alkyl halides is hydrolysed by SN^2 mechanism ?



Answer: B



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5. In S_N1 reactions, rate of reaction depends on

a) Concentration of alkyl halide

b) Concentration of nucleophile

c) Nature of alkyl halide

A. all

B. 'a' and 'c' only

C. 'a', 'b' only

D. 'c' only

Answer: B



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6. SN^1 reactions never occur on

A. $sp^3C - X$

B. $sp^2C - sp^3C - X$

C. $sp^3C - X$

D. any of these

Answer: C



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7. The reaction described is



A. SE^2

B. SN^1

C. SN^2

D. SN^0

Answer: C



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8. In S_N1 (substitution, nucleophilic unimolecular) reaction, the racemization takes place. It is due to

- A. inversion of configuration
- B. retention of configuration
- C. conversion of configuration
- D. both 1 and 2

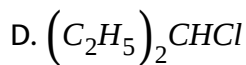
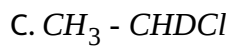
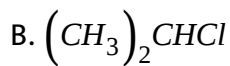
Answer: D



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9. The organic chloro compound, which shows complete stereo chemical inversion during S_N2 reaction is

- A. $(CH_3)_3CCl$



Answer: C



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LEVEL-I (EXERCISE-II (HALOARENES))



1.

. This

reaction is feasible only in the presence of



C. reductant $NaBH_4$

D. both 1 and 2

Answer: D



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2. $C_6H_2N_2Cl \xrightarrow{-CuCl/HCl} C_6H_5Cl + N_2$ is called

A. Etard reaction

B. Sandmeyer reaction

C. Wurtz-fittig's reaction

D. perkin's reaction

Answer: B



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3. The reaction of an alkyl halide with $RCOOAg$ produces

- A. ester
- B. ether
- C. aldehyde
- D. ketone

Answer: A



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4. Which of the following statements are not correct?

- A. Chlorobenzene is more reactive than benzene towards electrophilic substitution reactions
- B. C - Cl bond in chlorobenzene is less polar than in CH_3Cl

C. Chlorobenzene is less reactive than $CH_3C\ I$ towards nucleophilic substitution reactions

D. In chlorobenzene further substitution take place at ortho and para position

Answer: A



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5. Which of the following reactions does not result in the formation of new C-C bond?

A. Wurtz-fittig reaction

B. fittig reaction

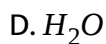
C. Williamson synthesis

D. Wurtz reaction

Answer: C

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6. Which of the following is more nucleophilic in protic solvent



Answer: A

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7. The most nucleophilic species among the following in aprotic solvent



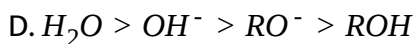
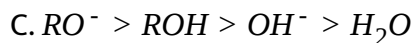
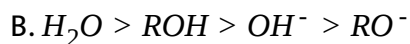
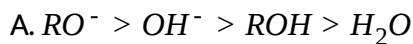
D. I^-

Answer: A



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8. Order of nucleophilicity of oxygen containing nucleophiles

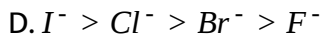
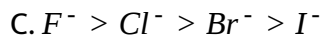
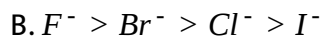
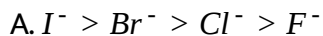


Answer: A



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9. Order of nucleophilicity of halide ions in aprotic solvent

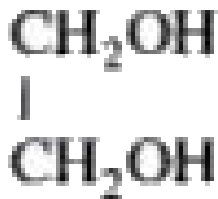


Answer: C

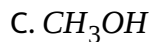


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10. Which of the following is/are protic solvents



B.



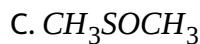
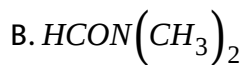
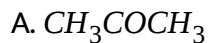
D. all the above

Answer: D



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11. Which of the following is /are aprotic solvents



D. all the above

Answer: D





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12. Which of the following is the best leaving in a nucleophilic substitution reaction

A. $F_3CSO_3^-$ (triflate)

B. $H_3CSO_3^-$ (mesylate)

C.  (Brosylate)

D.  (Tosylate)

Answer: A



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13. In which of the following solvents, SN^2 is most favourable

A. Polar protic solvents

B. Polar aprotic solvents

C. Non - polar solvents

D. Any of the above

Answer: B



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14. Which of the following statements regarding SN reaction is right

- A. Weak bases are better leaving groups
- B. Strong bases tend to be better nucleophiles
- C. tertiary halides mainly undergo by SN^1 mechanism
- D. Primary halides mainly undergo by SN^2 mechanism

Answer: A::B::C::D



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15. The IUPAC name of chloroform is

- A. Trihaloethane
- B. Trichloromethane
- C. Trihalomethane

D. Trichloroethane

Answer: C



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16. Chloroform is prepared from

- A. ethyl alcohol + Bleaching powder
- B. ethyl alcohol + Cl_2 + NaOH
- C. Moist acetone + Bleaching powder
- D. All the above

Answer: D



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17. Which of the following statements is right regarding chlorform

- A. It is an alkyl halide
- B. It is used as solvent
- C. Its shape is distorted tetrahedral
- D. All the above

Answer: D



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18. The hybridisation of carbon atom in chloroform is

- A. sp^3
- B. sp^2
- C. sp
- D. sp^3d

Answer: A



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19. Pure chloroform is prepared by

- A. Hydrolysis of chloral hydrate
- B. ethyl alcohol on treatment with bleaching powder
- C. Acetone on treatment with Cl_2 & NaOH
- D. any of the above

Answer: A



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20. Chloral hydrate is dissolved in NaOH solution and distilled.

Compounds obtained are

- A. CH_3Cl , $NaCl$
- B. CH_3Cl , CH_3COONa
- C. $CHCl_3$, $HCOONa$

D. C_2H_5Cl , CH_3COONa

Answer: C



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21. Number of moles of nascent hydrogen atoms required for the reduction of one mole of $CHCl_3$ to CH_4 with $Zn + H_2O$ is

A. two

B. four

C. six

D. three

Answer: C



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22. Chloroform on exposed to light and air, oxidise to produce

- A. COCl_2 and HCl
- B. HCOOH and H_2O
- C. $(\text{C}_2\text{H}_5)_2\text{CO}_3$
- D. COCl_2

Answer: A



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23. For storing chloroform, generally the compound added is

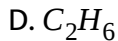
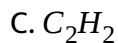
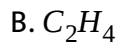
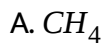
- A. ethyl alcohol
- B. pyridine
- C. acetaldehyde
- D. acetone

Answer: A



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24. The compound formed when chloroform reacts with silver powder is

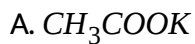


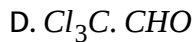
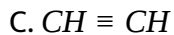
Answer: C



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25. Hydrolysis of chloroform with aqueous KOH gives finally



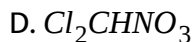
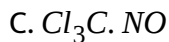
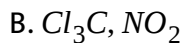
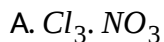


Answer: B



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26. Chloroform reacts with nitric acid to produce chloropicrin, the formula of chloropicrin is



Answer: B



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27. Acetone reacts with chloroform to give

- A. Chlorophenone
- B. Chloretone
- C. nitrochloroform
- D. Acetylchloroform

Answer: B



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28. Chloroform reacts with phenol in presence of KOH to give

- A. o - Chlorophenol
- B. o-Hydroxybenzoic acid
- C. p-Chlorobenzoic acid
- D. o-hydroxybenzaldehyde

Answer: D



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29. Conversion of phenol to salicylaldehyde in presence of KOH is called

- A. Carbylamine reaction
- B. Reimer – Tiemann reaction
- C. Shicmann reaction
- D. None of the above

Answer: B



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30. In Reimen – Tiemann reaction which of the following is correct

- A. Dichlorocarbene is involved as electrophile

- B. The reaction involves electrophilic substitution
- C. The gem halide hydrolysis is involved
- D. All the above

Answer: D



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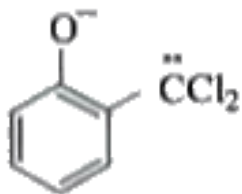
31. In the mechanism of Reimer – Tiemann reaction, the species not involved is



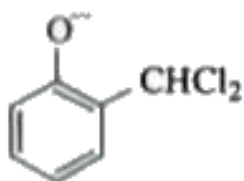
A.



B.



C.



D.

Answer: C



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32. Formation of dichlorocarbene from chloroform is

A. α - β - elimination

B. 1,2 -elimination

C. α - elimination

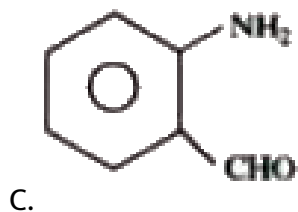
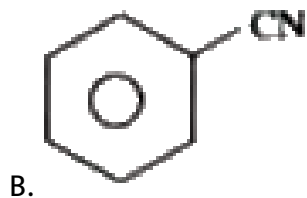
D. α - elimination of HCl

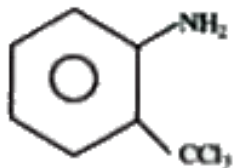
Answer: D



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33. Chloroform reacts with aniline in presence of KOH to give





D.

Answer: A



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34. Carbylamine reaction is used for detection of

A. Primary amines

B. Secondary amines

C. Tertiary amines

D. Any of the above

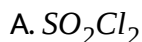
Answer: A



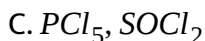
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LEVEL - II (LECTURE SHEET (EXERCISE - I) (SINGLE AND ONE OR MORE THAN ONE CORRECT ANSWERS))

1. Which of the following reagents is used for replacement of - OH group in an alcohol by - Cl group?



B. aqueous HCl

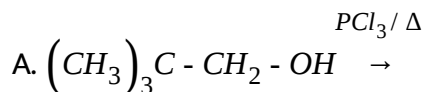


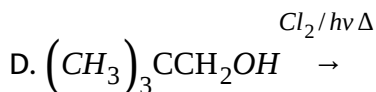
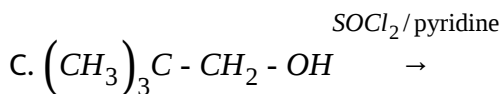
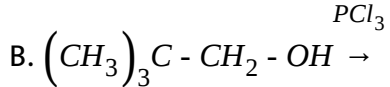
Answer: C



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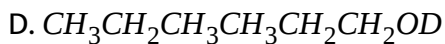
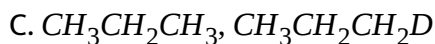
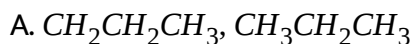
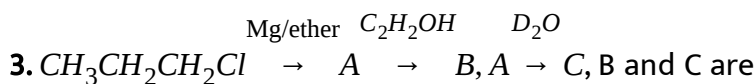
2. Which of the following is not suitable to prepare neopentyl chloride ?





Answer: D

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Answer: C

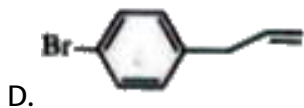
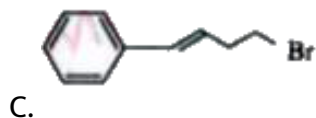
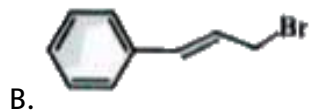
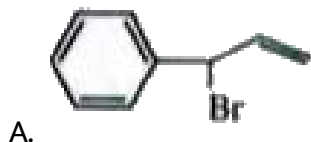
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4.

product.

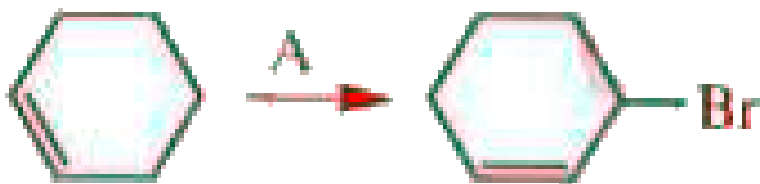
Which of the following is the structure of the product



Answer: A



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5.

A. $Br_2/h\nu$

B. PCl_5

C. $SOBr_2$

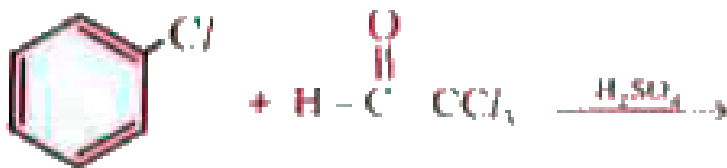
D. HBr

Answer: A



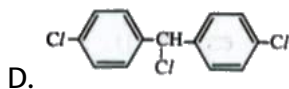
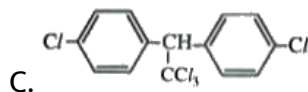
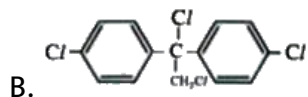
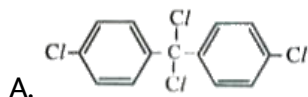
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6.



. The major

product formed is :



Answer: C



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7. Chlorination of toluene with excess of chlorine in presence of light produces

A. o-chlorotoulene

B. p- chlorotoulene

C. benzyl chloride

D. benzotrichloride

Answer: D



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8. Chlorination of benzene proceeds via

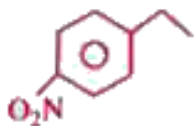
- A. nucleophilic substitution mechanism
- B. elimination-addition mechanism
- C. electrophilic substitution mechanism
- D. Free radical substitution mechanism

Answer: C

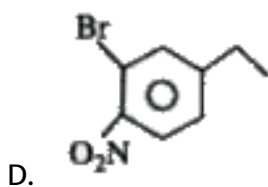
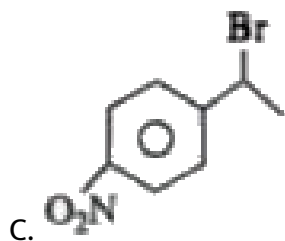
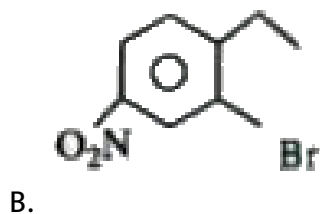
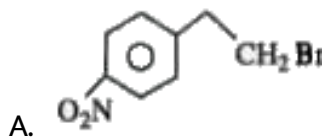


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9.



$\xrightarrow[\Delta]{\text{Br}_2}$ product. The product is



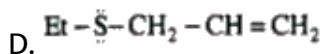
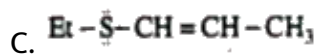
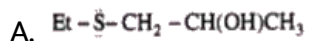
Answer: C



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10. The major product formed in the reaction is,

$$\text{Et-S-CH}_2\text{-CH(Cl)CH}_3 \xrightarrow{\text{aq. KOH}}$$



Answer: B



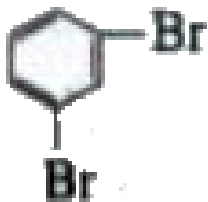
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11.



A.





B.



C.



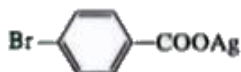
D.

Answer: B



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12. Silver Benzoate on reaction with Bromine in Acetone form

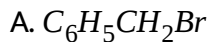


Answer: B



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13. In a nucleophilic substitution reaction : $R - Br + Cl^- \xrightarrow{DMF} R - Cl + Br^-$, which one of the following undergoes complete inversion of configuration ?



Answer: B



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14. The Compound $C_6H_5CH_2CH(CH_3)Cl$ on heating with alc. KOH gives

A. 2- phenylpropene

B. 1- phenylpropene

C. 3- phenylpropene

D. 1- phenylpropan-2-ol

Answer: B



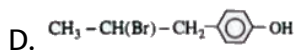
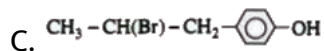
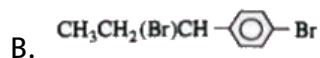
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15. The reaction of



with HBr

gives

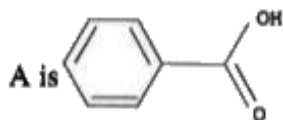


Answer: A



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16. 



A.

B. B is CHI_3

C. B is HCOOH

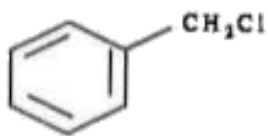
D. 

Answer: A::B

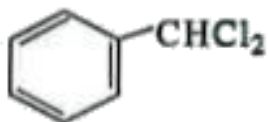


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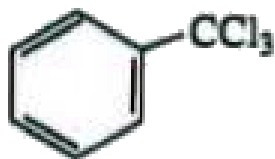
17. In which of the following compounds more meta product is obtained on electrophilic substitution



A.



B.



C.



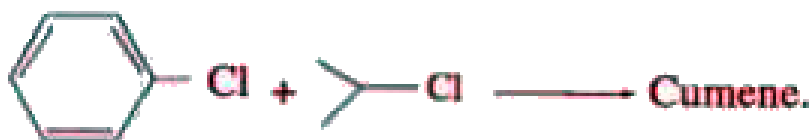
D.

Answer: C



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18.



Cumene.

The reaction is known as

A. Wurtz - reaction

B. Wurtz - fittig reaction

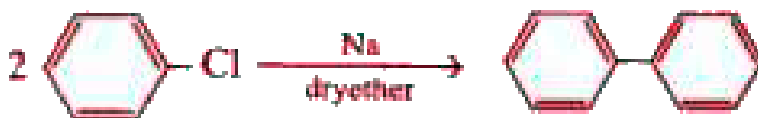
C. fittig reaction

D. Ullmann reaction

Answer: B



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The

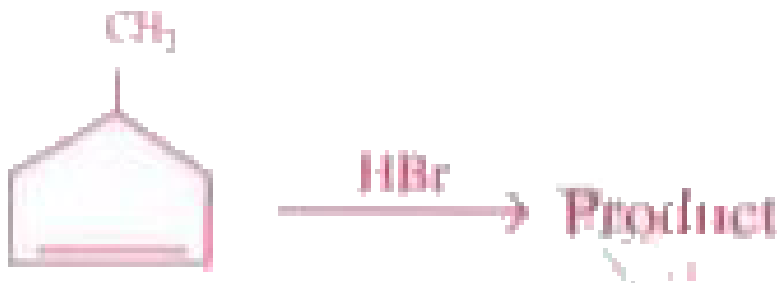
reaction is known as

- A. Ullmann reaction
- B. Fittig reaction
- C. Wurtz-Fittig reaction
- D. Wurtz reaction

Answer: B



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20.

Product

which of the statements is correct regarding the product

- A. Product is 1-Bromo-3-methyl cyclopentane
- B. Product contains two chiral centres
- C. Total number of stereoisomers possible is four
- D. The reaction is an electrophilic addition

Answer: A::B::C::D



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21. the structure of the product is

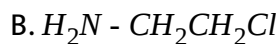
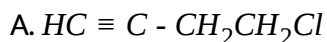


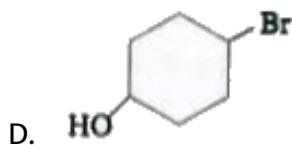
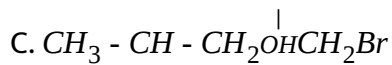
Answer: A::B



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22. Which of the following does not form Grignard reagent :



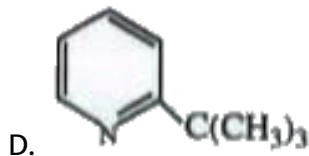


Answer: A::B::C::D



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23. Which of the following react with CH_3I , at SN^2 conditions

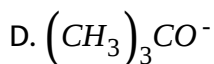
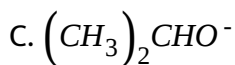
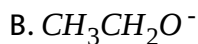


Answer: A



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24. Which of the following is a strongest base a weak nucleophile



Answer: D



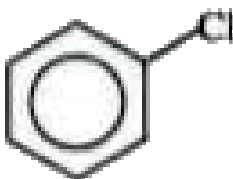
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25. The less reactive alkyl halide towards S_N^2 reaction than ethyl chloride



A.

B. 



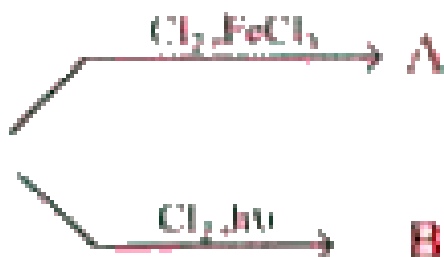
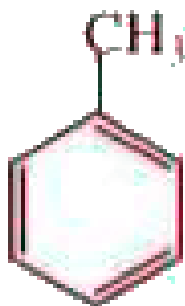
C.

D. CH_3Cl

Answer: A::B::C



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26.

The

products A and B respectively are

A. 

B. 


C. 

D. 

Answer: D



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27.  B, C and D can be distinguished with

A. Baeyer's reagent

B. Lucas reagent

C. Tollen's reagent

D. Schiff's reagent

Answer: B



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28. $2C_6H_5I \xrightarrow{Cu} \Delta C_6H_5 - C_6H_5 + Cu_2I_2$ The reaction is known as

- A. fittig reaction
- B. ullmann reaction s
- C. Wurtz-Fittig reaction
- D. Shiemann reaction

Answer: B



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29. Which of the following reagents is useful to distinguish between chlorobenzene and benzyl chloride

- A. $AgNO_3$ solution
- B. Fehling's solution
- C. $NaHSO_3$ solution

D. Any one of the above

Answer: A



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30. Aniline is converted into chlorobenzene by using

A. Balz - Shiemann reaction

B. Perkin reaction

C. Gattermann reaction

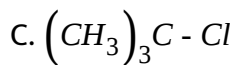
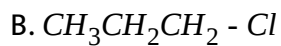
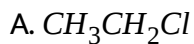
D. Sandmeyer reaction

Answer: C::D



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31. Which of the following is likely to have smallest dipole moment



D.

Answer: D



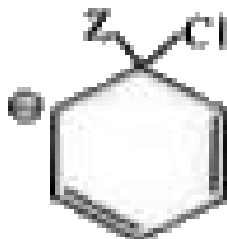
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32. Which of the following is the correct resonance structure, of the species formed in the nucleophilic substitution of chlorobenzene with Z (a nucleophile)





B.



C.

D.

Answer: A::B::C



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33. Which of the following is the most reactive towards nucleophilic substitution by NaOH

A.

B. 

C. 

D. 

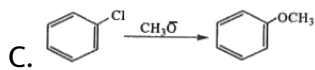
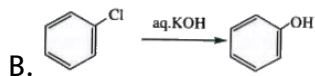
Answer: D



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34. Which of the following reactions does not go to completion to give the stated product

A. 



D. 

Answer: A::B::C



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35. Which of the following statements is right regarding cis and trans-1,4-dibromo cyclohexane

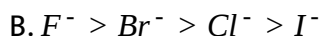
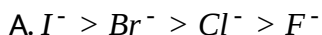
- A. They are diastereoisomers
- B. Both are optically inactive
- C. Trans - compound is more stable than cis compound
- D. Cis-compound is more stable than trans-compound

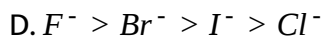
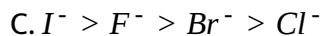
Answer: A::B::C



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36. Which of the following correct order of nucleophilicity in gaseous phase



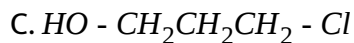
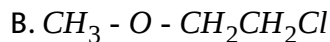
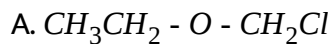


Answer: B



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37. Which of the following undergo SN reaction at a fastest rate than others



Answer: A



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38.  x, and y moles consumed value of $x + y =$

A. 5

B. 6

C. 7

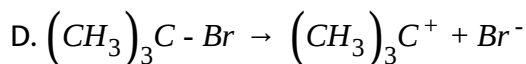
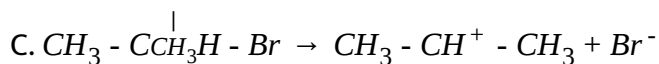
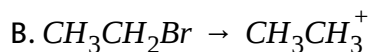
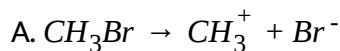
D. 8

Answer: D



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39. Which of the following reactions possess highest ΔH value



Answer: A



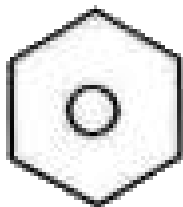
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40. Which of the following is / are polar aprotic solvents

A. CH_3COCH_3 (acetone)

B. CH_3SOCH_3 (DMSO)

C. $\text{HCON}(\text{CH}_3)_2$ (DMF)



D.

Answer: A::B::C



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41. The number of dichloro derivatives of propane is

- A. one
- B. two
- C. three
- D. four

Answer: D



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42. In which of the following compounds C-X bond length is shortest

A. 

B. 



D. 

Answer: B



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43. Which of the following statements regarding chlorobenzene is correct, in electrophilic substitution reaction

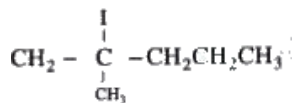
- A. Less reactive than benzene due to inductive effect of chlorine
- B. Orientation of substitution is controlled by resonance effect
- C. More reactive than benzene due to resonance effect
- D. Less reactive than benzene due to resonance effect

Answer: A::B



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44. $CH_2 = \overset{|}{CMe} - CH_2CH_2CH_3 \xrightarrow{IBr}$ The structure of the product is



A.

B. 

C. 

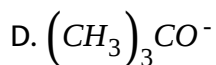
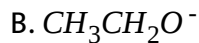
D. 

Answer: B



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45. Which of the following alkoxide nucleophiles is most reactive towards S_{N}^2 reaction

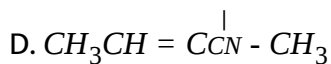
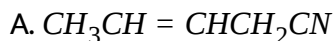


Answer: A



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46. $\text{CH}_3\text{CH}=\text{CHCH}_2\text{Cl} \xrightarrow{\text{KCN}}$ The possible products is / are

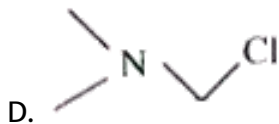
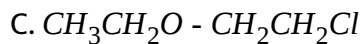
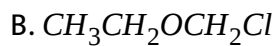


Answer: A::B



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47. Which of the following primary halides is most reactive towards SN^1 reaction



Answer: D



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48. Characteristic reactions of alkyl halides are

A. Electrophilic substitution reactions

B. Addition reactions

C. Nucleophilic substitution reactions

D. Free radical substitution reactions

Answer: C



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49. Which of the following is / are the characteristic properties of SN^2 reaction

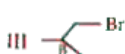
- A. Follows second order kinetics
- B. Rearrangements do not occur
- C. Inversion of configuration takes place
- D. Order of reactions of halides $1^\circ > 2^\circ > 3^\circ$

Answer: A::B::C::D



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50. Arrange the following in the increasing order of effect of β - branches on the rate of SN^2 reactions



A. I gt III gt II gt IV

B. I gt II gt III gt IV

C. IV gt III gt II gt I

D. I = II lt III = IV

Answer: B



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List - I

A) CCl_4

B) CHCl_3

C) CH_3CHCl_2

D) $\text{ClCH}_2\text{CH}_2\text{Cl}$

a) A - 2, B - 4, C - 1, D - 3

c) A - 2, B - 1, C - 4, D - 3

List - II

1) Gem - halide

2) Perhalogen compound

3) Vicinal halide

4) Anaesthetic

b) A - 2, B - 3, C - 4, D - 1

d) A - 1, B - 3, C - 4, D - 2

51.



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List - I

- A) $\text{CH}_3\text{CH}_2\text{Cl}$
 B) $\text{CH}_3\text{CH}_2\text{MgCl}$
 C) $\text{C}_2\text{H}_5\text{Cl} + \text{C}_2\text{H}_5\text{ONa}$
 D) Na + dry ether
 a) A - 2, B - 4, C - 1, D - 3
 c) A - 3, B - 4, C - 1, D - 2

52.

List - II

- 1) Williamson's synthesis
 2) Reagent for Wurtz reaction
 3) 1° alkyl halide
 4) Grignard reagent
 b) A - 2, B - 3, C - 2, D - 4
 d) A - 1, B - 3, C - 4, D - 2

**Watch Video Solution****List - I**

- A) $\text{C}_2\text{H}_5\text{Cl}$, Moist Ag_2O
 B) $\text{C}_2\text{H}_5\text{Cl}$, Alcoholic KOH
 C) $\text{C}_2\text{H}_5\text{Cl} + \text{Na}$, dry ether
 D) $\text{C}_2\text{H}_5\text{Cl}$, Ammonia
 a) A - 2, B - 4, C - 1, D - 3
 c) A - 3, B - 4, C - 1, D - 2

53.

List - II

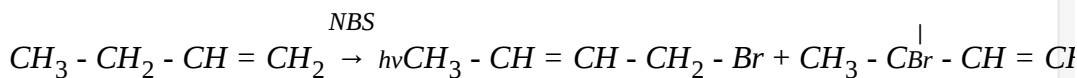
- 1) C_2H_4
 2) $\text{C}_2\text{H}_5\text{MH}_2$
 3) $\text{C}_2\text{H}_5\text{OH}$
 4) C_4H_{10}
 b) A - 3, B - 1, C - 4, D - 2
 d) A - 1, B - 3, C - 4, D - 2

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LEVEL - II (LECTURE SHEET (EXERCISE - II) (LINKED COMPREHENSION TYPE QUESTIONS))

1. Olefins can be halogenated in the allylic position by number of reagents of which N-bromo succinimide (NBS) is the most common. When this

reagent is used the reaction is known as WohlZiegler bromination. Other N-bromoamides have also been used. To a much lesser extent allylic chlorination has been carried out with N-chloro-succinimide. N-Chloro-N-cyclohexyl benzene sulphonamide or t-hypochlorite when the allylic radical intermediate is unsymmetrical allylic rearrangement takes place so that the mixture of both possible products is obtained.



NBS is also a highly regioselective brominating agent at other positions, including positions α to a carbonyl group.

Which of the following is allylic chlorinating agent ?

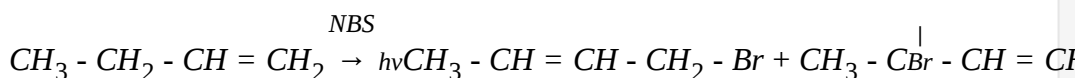
- A. N-Chlorosuccinimide
- B. Chloro-N-cyclohexyl benzene sulphonamide
- C. $SO_2Cl_2/h\nu$
- D. All of these

Answer: D

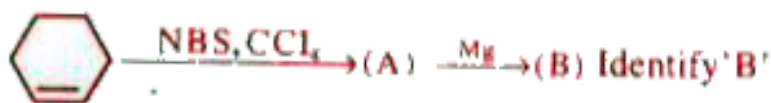


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2. Olefins can be halogenated in the allylic position by number of reagents of which N-bromo succinimide (NBS) is the most common. When this reagent is used the reaction is known as WohlZiegler bromination. Other N-bromoamides have also been used. To a much lesser extent allylic chlorination has been carried out with N-chloro-succinimide. N-Chloro-N-cyclohexyl benzene sulphonamide or t-hypochlorite when the allylic radical intermediate is unsymmetrical allylic rearrangement takes place so that the mixture of both possible products is obtained.



NBS is also a highly regioselective brominating agent at other positions, including positions α to a carbonyl group.

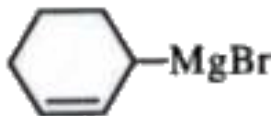


A.

B.



C.



D.



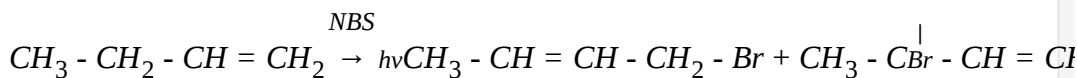
Answer: C



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3. Olefins can be halogenated in the allylic position by number of reagents of which N-bromo succinimide (NBS) is the most common. When this reagent is used the reaction is known as WohlZiegler bromination. Other N-bromoamides have also been used. To a much lesser extent allylic chlorination has been carried out with N-chloro-succinimide. N-Chloro-N-

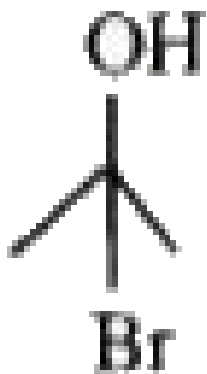
cyclohexyl benzene sulphonamide or t-hypochlorite when the allylic radical intermediate is unsymmetrical allylic rearrangement takes place so that the mixture of both possible products is obtained.



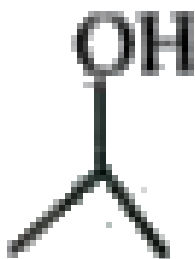
NBS is also a highly regioselective brominating agent at other positions, including positions α to a carbonyl group.



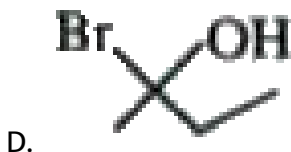
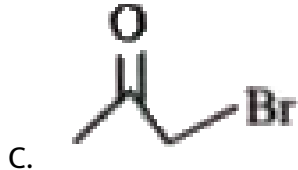
Identify 'A'



A.



B.



Answer: C

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4. An organic compound with molecular formula C_5H_5Cl exists in two optically active forms A and B . A on hydrogenation in presence of a catalyst gives an optically inactive compound (C). While B gives an optically active compound D.

Which of the following is the correct IUPAC name of compound D

A. 1-chloro-2-methylpentane

B. 2-chloro-2-methylpentane

C. 1-chloro-3-methylbutane

D. 1-chloro-2-methylbutane

Answer: D



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5. An organic compound with molecular formula C_5H_5Cl exists in two optically active forms A and B . A on hydrogenation in presence of a catalyst gives an optically inactive compound (C). While B gives an optically active compound D.

Which of the following is the correct IUPAC name of compound C.

A. 1-chloro-2-methylbutane

B. 2-chloropentane

C. 3-chloropentane

D. 2-chloro-2-methylbutane

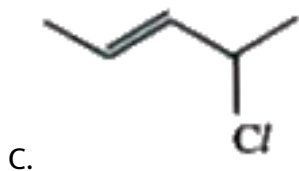
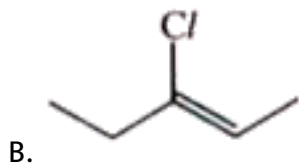
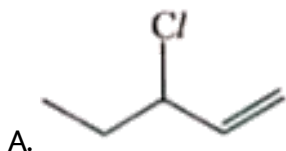
Answer: C



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6. An organic compound with molecular formula C_5H_5Cl exists in two optically active forms A and B. A on hydrogenation in presence of a catalyst gives an optically inactive compound (C). While B gives an optically active compound D.

The structure of A is

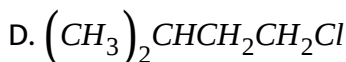
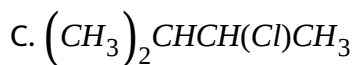
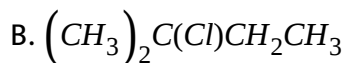
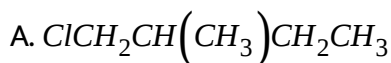


Answer: A

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7. A hydrocarbon with molecular formula C_5H_{12} on mono chlorination in presence of light gives four compounds A,B,C,D. A is optically inactive and dehydrohalogenation gives E(major) which on ozonolysis gives acetone and acetaldehyde. B is optically active gives on dehydrohalogenation E also gives E as the major product. Further C is optically active while D is optically inactive. All compounds A,B,C,D on reduction give 2-methyl butane.

Which of the following is the correct structure of A

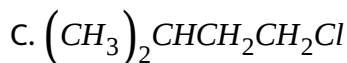
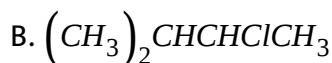
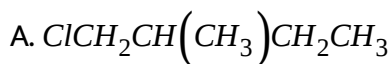


Answer: B

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8. A hydrocarbon with molecular formula C_5H_{12} on mono chlorination in presence of light gives four compounds A,B,C,D. A is optically inactive and dehydrohalogenation gives E(major) which on ozonolysis gives acetone and acetaldehyde. B is optically active gives on dehydrohalogenation E also gives E as the major product. Further C is optically active while D is optically inactive. All compounds A,B,C,D on reduction give 2-methyl butane.

Which of the following is likely structure of C



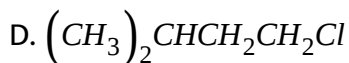
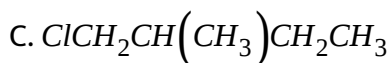
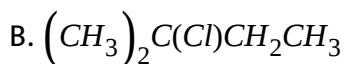
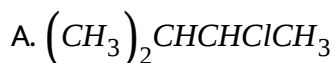
Answer: B



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9. A hydrocarbon with molecular formula C_5H_{12} on mono chlorination in presence of light gives four compounds A,B,C,D. A is optically inactive and dehydrohalogenation gives E(major) which on ozonolysis gives acetone and acetaldehyde. B is optically active gives on dehydrohalogenation E also gives E as the major product. Further C is optically active while D is optically inactive. All compounds A,B,C,D on reduction give 2-methyl butane.

The structure B is



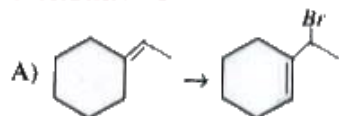
Answer: A



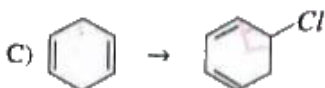
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LEVEL - II (LECTURE SHEET (EXERCISE - III) (MATCH THE FOLLOWING QUESTIONS))

COLUMN - I



B) cis-But-2-ene \rightarrow
(\pm)-Dibromo derivatives



D) cis-2, 3-Dibromobut-2-ene
with H_2/Ni

COLUMN - II

p) $SO_2Cl_2/h\nu$

q) Racemic mixture

r) NBS/hv

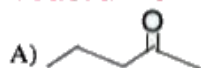
s) Meso compound

1.



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COLUMN - I



with $I_2/NaOH$

B) $CCl_3-CH=O$
with $NaOH$

C) $I-CH_2-CH_2-OH$
with $I_2/NaOH$

D) $HCH=O$
with $NaOH$

COLUMN - II

p) Yellow ppt

q) Haloform reaction

r) $CHCl_3$

s) Disproportionation

2.

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LEVEL - II (LECTURE SHEET (EXERCISE - IV) (INTEGER ANSWER TYPE QUESTIONS))

1. Number of possible isomers for $C_2H_2Cl_2$

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2. How many primary halides(excluding stereo isomers) are possible for the molecular formula $C_5H_{11}Br$?

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3. How many chlorobenzenes are possible for compound having molecular formula C_7H_7Cl ?

[View Text Solution](#)

4. Total number of isomers formed when 2-methyl butane is subjected to monochlorination (including stereoisomers)



[View Text Solution](#)

5. How many possible alkene isomers are formed, when 2-bromo, 3-methyl butane is treated with alc. KOH ?



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PRACTICE SHEET - 1 (SINGLE ANSWER QUESTIONS)

1. The number of isomers including stereoisomers possible for dibromobutane is

A. six

B. eight

C. four

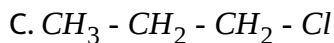
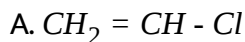
D. ten

Answer: D



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2. In which of the following C-X bond has highest bond dissociation enthalpy



Answer: A



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3. The compound with highest B.P. is

A. n- pentylchloride

B. isopentyl chloride

C. n - pentylbromide

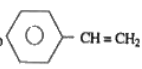
D. isopentylbromide

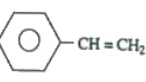
Answer: C




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4. In which of the following reactions, the product is racemic mixture

A. Addition of HCl to 

B. Addition of Br₂ to 

C. Reaction of  with cold alkaline KMnO₄

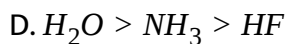
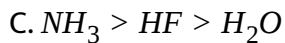
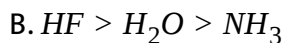
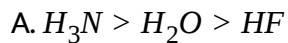
D. all the above

Answer: D



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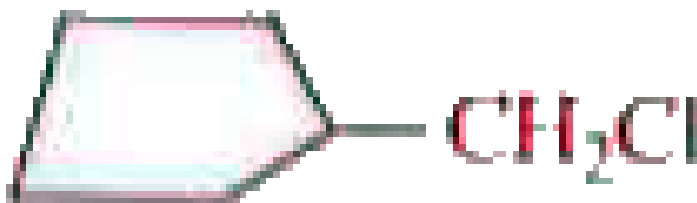
5. The relative nucleophilicity of NH_3 , H_2O and HF towards bromoethane is



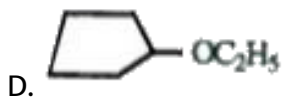
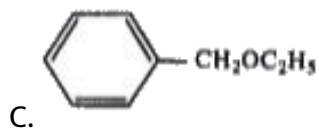
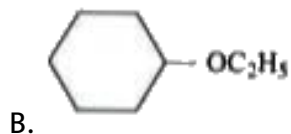
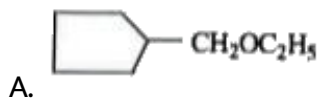
Answer: A



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6. _____ is heated with $\text{C}_2\text{H}_5\text{ONa}$ in ethyl alcohol. The product is

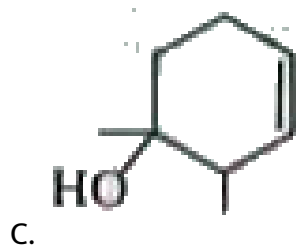
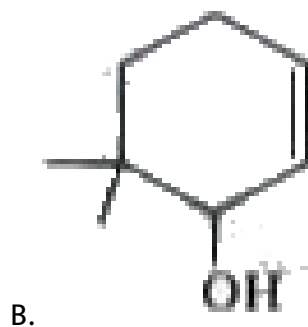
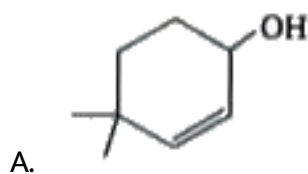
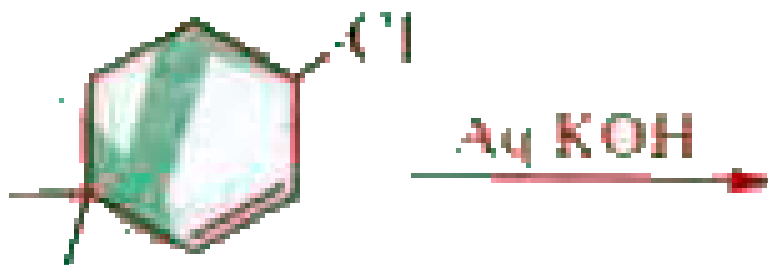


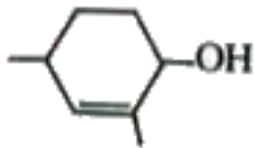
Answer: A



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7. Which of the following products is not obtained in the reaction





D.

Answer: D



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8. Which of the statements is correct

A. SN^2 reactivity of alkyl halides is mainly controlled by steric factors

B. SN^2 reactions are more favourable in polar protic solvents

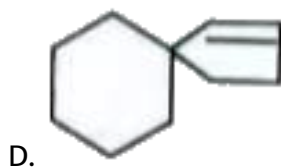
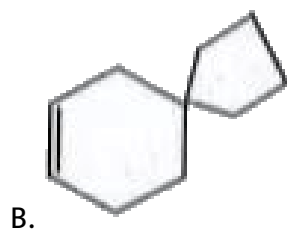
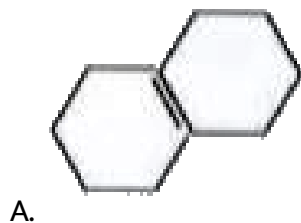
C. SN^2 reactivity order of alkyl halides is $RI > RBr > RCl$

D. Both A & C

Answer: D



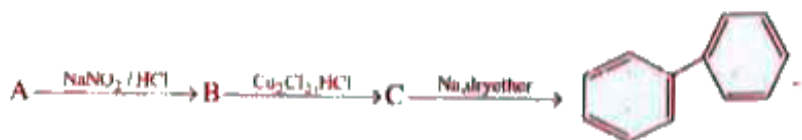
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Answer: A



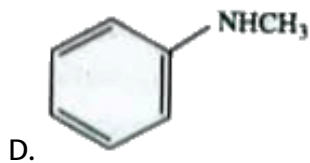
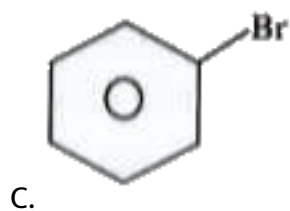
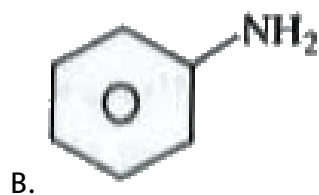
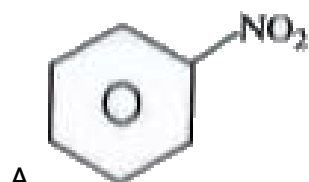
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10.

The

reactant 'A' in the above sequence is



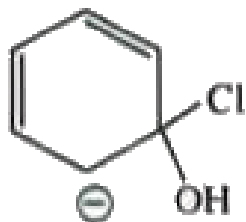
Answer: B



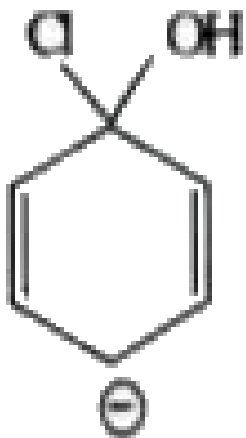
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PRACTICE SHEET - 1 (MORE THAN ONE CORRECT ANSWER QUESTIONS)

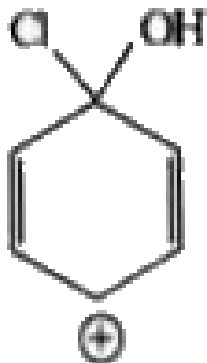
1. Which of the following species is involved in the mechanism of OH^- substitution of chlorobenzene



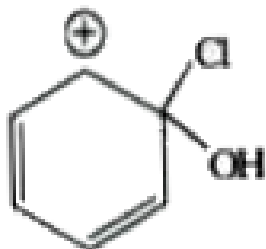
A.



B.



C.



D.

Answer: A::B



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2. Which statements is/are right regarding SN^1 reactions is false

A. The rate of reaction is influenced by Conc of nucleophile

B. The reaction takes places in two steps

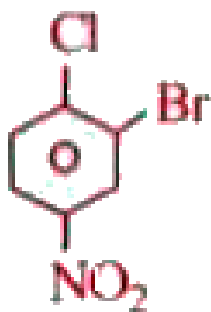
C. Racemization takes place

D. Molecularity of the reaction is two

Answer: B::C



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3.

product.

The product mixture is treated with $AgNO_3$ solution, correct statement is

A. A pale yellow precipitate of $AgBr$ is formed

B. A white precipitate of $AgCl$ is formed

C. No precipitate is formed

D. It is a nucleophilic substitution reaction

Answer: B::D



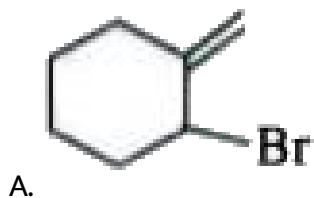
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4.

The

possible products formed in the reaction are

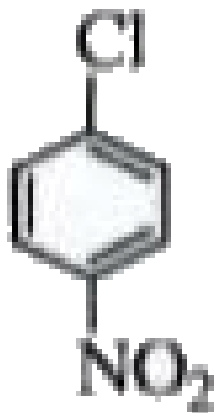




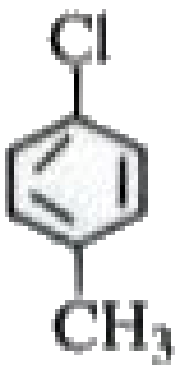
Answer: A::B::C

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5. Which of the following under go nucleophilic substitution faster than that of chlorobenzene



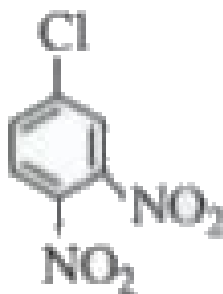
A.



B.



C.



D.

Answer: A::C::D



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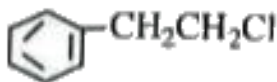
PRACTICE SHEET - 1 (LINKED COMPREHENSION TYPE QUESTIONS)

1. Aliphatic nucleophilic substitution mainly takes place by two mechanisms (i.e) SN^1 & SN^2 . Primary halides mainly undergo by SN^2 mechanism and are favourable in polar aprotic solvents. SN^1 reactions take place mainly by tertiary halide and are more favourable in polar protic solvents. In case of tertiary halides, E_1 comes in competition to SN^1 reaction. Keeping in view of these general points, answer the following questions

Which of the following reactions, the reaction takes place by SN^1 mechanism mainly.



A.



B.



C.



Answer: A



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2. Aliphatic nucleophilic substitution mainly takes place by two mechanisms (i.e) SN^1 & SN^2 Primary halides mainly undergo by SN^2 mechanism and are favourable in polar aprotic solvents. SN^1 reactions takes place mainly by tertiary halide and are more favourable in polar protic solvents, In case of tertiary halides, E_1 comes competition to SN^1 reaction. Keeping in view of these general points, answer the following questions

$(+)\text{C}_6\text{H}_5\text{CH}(\text{CH}_3)\text{Cl} \rightarrow (\pm)\text{C}_6\text{H}_5\text{CH}(\text{OH})\text{CH}_3$ in which of the following solvents, the above reaction is most favourable

A. 75% water + 25% CH_3OH

B. 25% water + 75% methanol

C. 100% methanol

D. 10% water + 90% methanol

Answer: A



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3. Aryl halides are less reactive than alkyl halides due to the presence partial double character of C - X bond in aryl halides. Aryl halides undergo nucleophilic substitution reactions, if electron withdrawing groups are introduced in ortho & para - positions in aryl halides. The reaction mechanism involves two steps. Keeping these points in view answer the following questions.

Which of the following is the correct order of reactivity of the aryl halides with a given nucleophile



A. I > II > III > IV

B. IV > III > II > I

C. I = II = III = IV

D. I > II = III = IV

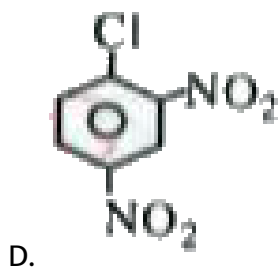
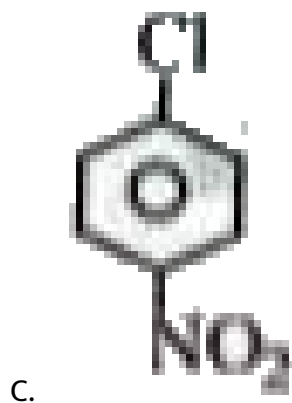
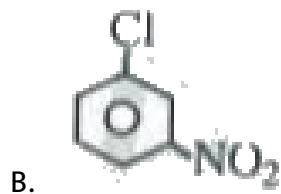
Answer: D



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4. Aryl halides are less reactive than alkyl halides due to the presence of partial double character of C - X bond in aryl halides. Aryl halides undergo nucleophilic substitution reactions, if electron withdrawing groups are introduced in ortho & para - positions in aryl halides. The reaction mechanism involves two steps. Keeping these points in view answer the following questions.

Which compound undergo nucleophilic substitution under mild conditions



Answer: D



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5. Aryl halides are less reactive than alkyl halides due to the presence partial double character of C - X bond in aryl halides. Aryl halides undergo nucleophilic substitution reactions, if electron withdrawing groups are introduced in ortho & para - positions in aryl halides. The reaction mechanism involves two steps. Keeping these points in view answer the following questions.

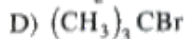
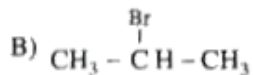
The number of resonance structure possible for chlorobenzene is

- A. three
- B. four
- C. five
- D. two

Answer: C



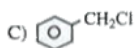
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COLUMN - I**COLUMN - II**p) undergoes E_2 reactionq) undergoes SN^2 reaction

r) carbocation is formed

s) undergoes SN^1 reaction

1.

**Watch Video Solution****2. Match the following Columns****COLUMN - I****COLUMN - II**p) undergoes free radical substitution with $\text{Cl}_2 - h\nu$

q) nucleophilic substitution under normal conditions

r) nucleophilic substitution under drastic condition

s) undergoes electrophilic substitutions

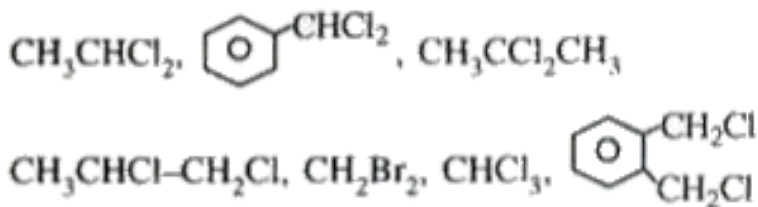
**Watch Video Solution****PRACTICE SHEET - 1 (INTEGER ANSWER TYPE QUESTIONS)**

1. The number of stereoisomeric compounds possible for 1,2,3,4 – tetra-chlorobutane



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2. How many of the following on heating with aqueous KOH, give carbonyl compound



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3. Ethane and chlorine when allowed to react in presence of light, the total possible products (excluding stereoisomers if any)



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4. Number of dichloro derivatives of tetramethylbutane is




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5. Number of structural isomers obtained by mono chlorination of methyl cyclohexane is

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6. How many of the following give iodoform on reaction with $I_2, NaOH$

CH_3CHO , CH_3COCH_3 , , $CH_3CHOHCH_3$, $CH_3CH_2COCH_2OH$

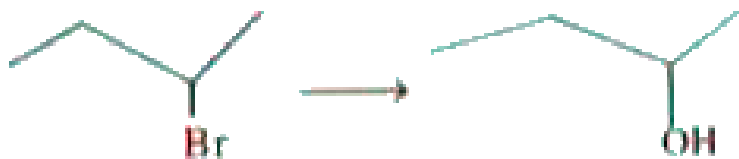
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7. Number of chlorine atoms present gammaxine

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PRACTICE SHEET - 2 (SINGLE ANSWER QUESTIONS)

1. Using which of the sequence of reactions given, the following conversion can be carried out



A. H_3O^+ , BH_3 - THF, $H_2O_2/NaOH$

B. *t* - BuOK, BH_3 - THF, $H_2O_2/NaOH$

C. H_2 - Ni, $Hg(OAc)_2/H_2O$, $NaBH_4$

D. *t* - BuOK, $Hg(OAc)_2/H_2O$, $NaBH_4$

Answer: D



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2. Which of the following statements is correct?

- A. Alkyl iodides possess higher b.p than alkyl chlorides of comparable molecular mass.
- B. Alkyl halides are less reactive than aryl halides. towards nucleophilic substitution reaction
- C. C-X bond alkyl halides possess more energy than C X bond in aryl halides
- D. All the above

Answer: A



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3. Which of the following undergoes dehydrobromination at a fastest rate?





B.



C.

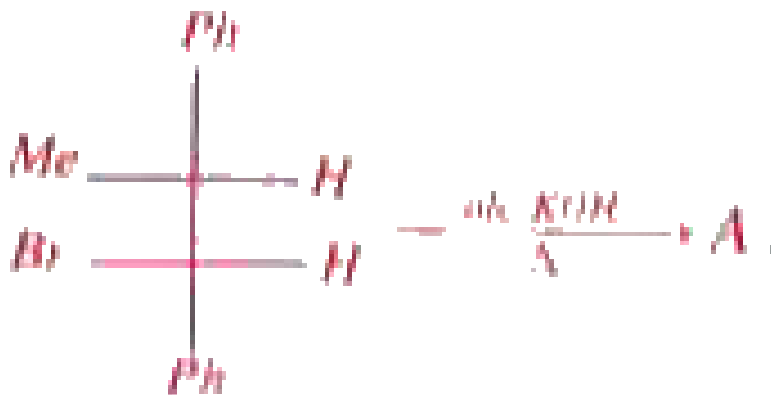


D.

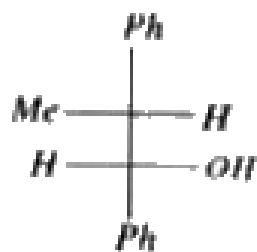
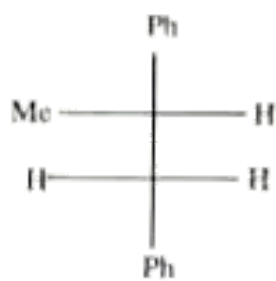
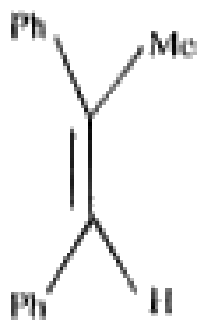
Answer: D



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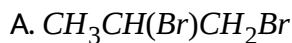
4.



Answer: A

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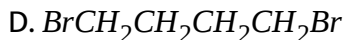
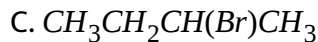
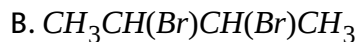
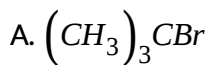
5. A Compound 'X' has molecular formula $C_3H_6Br_2$ reacts with NaI and acetone to form a substance which turns starch solution blue. 'X' is



Answer: A

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6. An unknown alkylhalide (A) reacts with alcoholic KOH to produce C_4H_8 which on ozonolysis gives one mole of propanone and one mole of formaldehyde. The structure of 'A' is



Answer: A



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7. Consider the following compounds.

I) DDT II) Gammexane III) Carbon tetrachloride IV) Chlorobenzene

The correct sequence of these compounds in the increasing order of percentage of chlorine in them is

A. III, II, I, IV

B. IV, II, I, III

C. III, I, II, IV

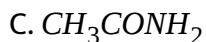
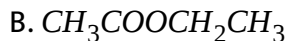
D. IV, I, II, III

Answer: D



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8. Which of the following will give yellow precipitate with $I_2/NaOH$?



Answer: D



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9. Among the three possible isomers of dibromo benzenes, the highest melting point is possessed by

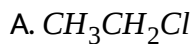
- A. o-dibromobenzene
- B. p-dibromobenzene
- C. m-dibromobenzene
- D. Both b and c

Answer: B



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10. Which of the following compounds are more reactive towards NaOH.



B.



C.



Answer: B



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PRACTICE SHEET - 2 (MORE THAN ONE CORRECT ANSWER QUESTIONS)

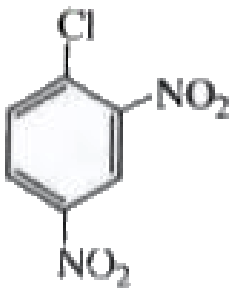
1. Which of the following compounds undergoes replacement of $-Cl$ by $-OH$ by merely warming the compound with aqueous $NaOH$?



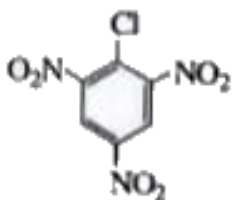
A.



B.



C.

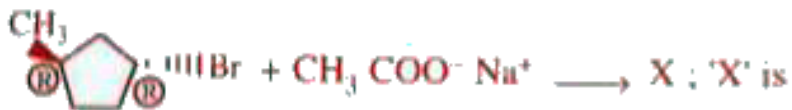


D.

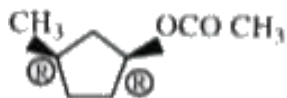
Answer: D



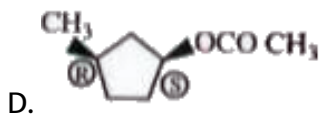
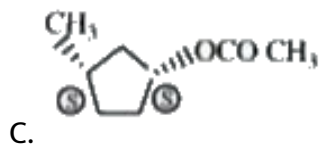
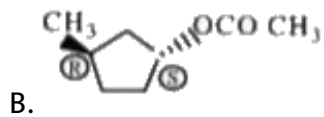
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2.

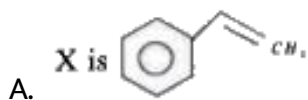


A.



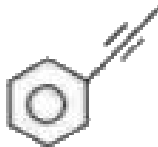
Answer: D

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B.

Y is



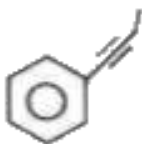
C.

X is



D.

Y is

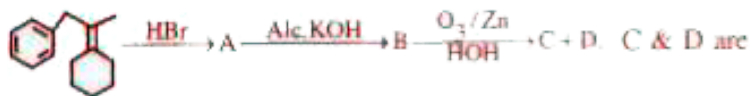


Answer: C::D



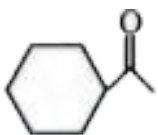
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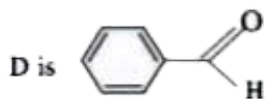
4.



A.

C is





B.



C.



D.

Answer: A::B



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5. The product obtained by reduction of Benzyl bromide with $LiAlH_4$ is



D.


Answer: C





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6. Which of the following reactions does not take place to give the product

A. 

B.  + $\text{CH} \equiv \text{C} - \text{Br} \xrightarrow{\text{AlCl}_3}$

C.  + $\text{CH}_2 = \text{CH} - \text{CH}_2\text{Cl}$

D.  + $\text{CH}_2 = \text{CH}_2\text{CH}_2\text{Cl}$

Answer: A::B



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correct

order of rate of SN^2 reaction for A, C and D will be

A. 1. $A > C > D$

B. 2. $C > D > A$

C. 3. $A > D > C$

D. 4. $C = A = D$

Answer: B

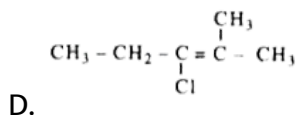
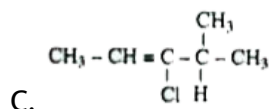
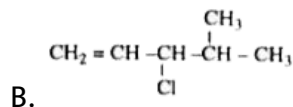
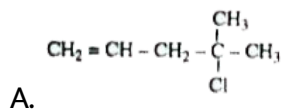
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PRACTICE SHEET - 2 (LINKED COMPREHENSION TYPE QUESTIONS)

1. Compound A ($\text{C}_6\text{H}_{11}\text{Cl}$), decolourise bromine in CCl_4 , Catalytic reduction of A gave 2-methyl, 3-Chloro pentane. A on reaction with

alc.KOH gave B as only product. B on ozonolysis gave $HCHO$, $CHOCHO$ and CH_3COCH_3 . Follow the sequence of reactions and answer the following questions

Which of the following is the structure of 'A'



Answer: B

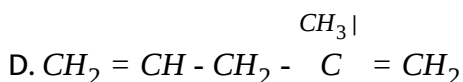
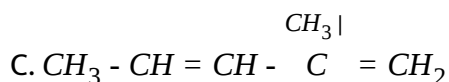
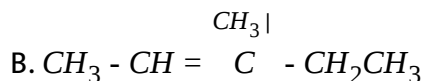
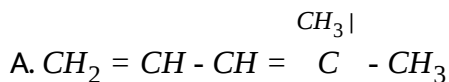


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2. Compound A ($C_6H_{11}Cl$), decolourise bromine in CCl_4 , Catalytic reduction of A gave 2-methyl, 3-Chloro pentane. A on reaction with

alc.KOH gave B as only product. B on ozonolysis gave $HCHO$, $CHOCHO$ and CH_3COCH_3 . Follow the sequence of reactions and answer the following questions

The structure of 'B' is



Answer: A



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3. Compound A ($C_6H_{11}Cl$), decolourise bromine in CCl_4 , Catalytic reduction of A gave 2-methyl, 3-Chloro pentane. A on reaction with alc.KOH gave B as only product. B on ozonolysis gave $HCHO$, $CHOCHO$ and CH_3COCH_3 . Follow the sequence of reactions and answer the

following questions

Number of stereoisomers of compound A is

A. three

B. four

C. two

D. zero

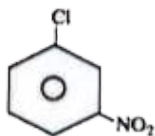
Answer: C



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4. The nucleophilic substitution reactions taking place in aromatic system are designated as S_NAr . In fact, aryl halides do not easily undergo nucleophilic substitution under ordinary conditions. However, introduction of electron-withdrawing groups in o, p – positions makes the reaction to go faster. Keeping these general points in view, answer the following questions

Which of the following undergo nucleophilic substitution at a faster rate with a given nucleophile

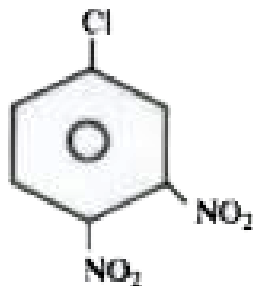


A.



B.

C. 



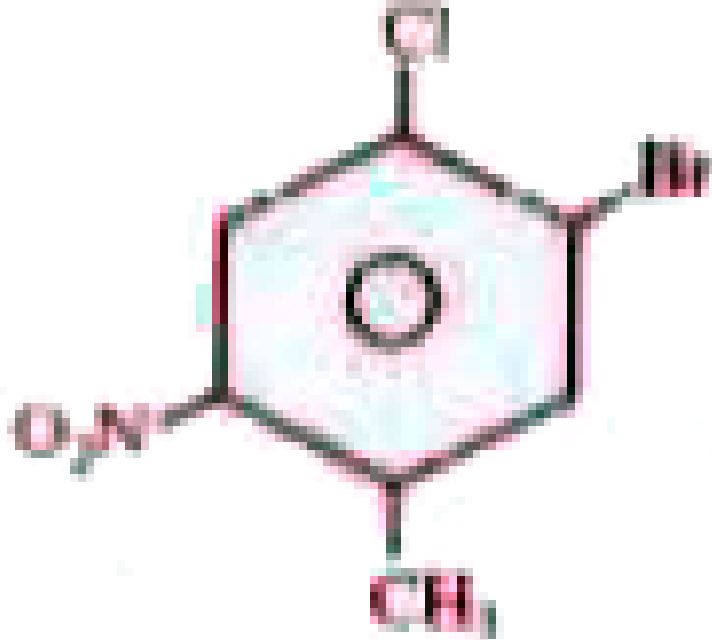
D.

Answer: D



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5. The nucleophilic substitution reactions taking place in aromatic system are designated as S_NAr . In fact aryl halides do not easily undergo nucleophilic substitution under ordinary conditions. However, introduction of electron-withdrawing groups in o, p – positions makes the reaction to go faster. Keeping these general points in view answer the following questions



product. The

solution is treated with $AgNO_3$ solution. Which of the following is correct

- A. A white precipitate of $AgCl$ is formed
- B. A pale yellow precipitate of $AgBr$ is formed
- C. No precipitate of any kind is observed
- D. A mixture of $AgCl + AgBr$ formed

Answer: B



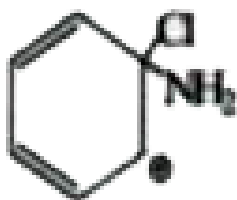
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6. The nucleophilic substitution reactions taking place in aromatic system are designated as S_NAr . In fact aryl halides do not easily undergo nucleophilic substitution under ordinary conditions. However, introduction of electron-withdrawing groups in o, p – positions makes the reaction to go faster. Keeping these general points in view answer the following questions

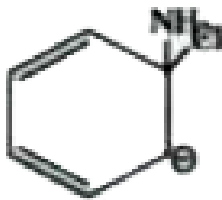
Which of the following structures is correct in the mechanism of the



reaction

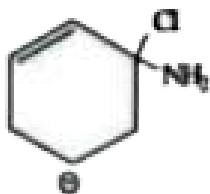


A.



B.

C. 



D.

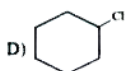
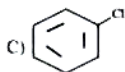
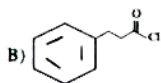
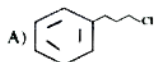
Answer: B



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PRACTICE SHEET - 2 (MATCH THE FOLLOWING QUESTIONS)

4. COLUMN - I



COLUMN - II

p) Friedel - Crafts reaction

q) Electrophilic substitution

r) Nucleophilic substitution (under normal conditions)

s) Dehydrohalogenation

1.



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2.



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PRACTICE SHEET - 2 (INTEGER ANSWER TYPE QUESTIONS)

1. When isopentane is monohalogenated, the number of isomers formed (including stereo isomers)–



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2. When acetaldehyde reacts with I_2 in KOH, Iodoform is formed. How many molecules of KOH are required for the reaction to give a molecule of CHI_3



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3. When 1,3-butadiene reacts with HBr, how many products are formed (including stereo isomers)?



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4. Number of isomers for the compound with the molecular formula $C_2BrClFI$ is ----



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5. Number of stereoisomers for 2-chloro-3-pentene



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6. The number of stereoisomers possible for 2,3,4 – trichloropentane



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PRACTICE SHEET - 3 (SINGLE ANSWER QUESTIONS)

1. The stereochemistry of SN^1 reaction of an alkyl halides is

- A. Complete inversion of configuration takes place
- B. Racemization takes place
- C. No inversion of configuration takes place
- D. Any of the above

Answer: B



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2. The order of reactivities of the following alkyl halides for a S_N2 reaction is

A. $RF \gt RCl \gt RBr \gt RI$

B. $RF \gt RBr \gt RCl \gt RI$

C. $RCl \gt RBr \gt RF \gt RI$

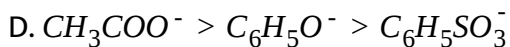
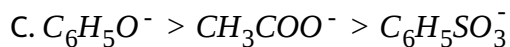
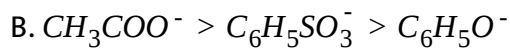
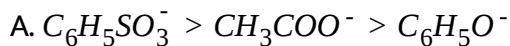
D. $RI \gt RBr \gt RCl \gt RF$

Answer: D



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3. Which of the following is correct order of leaving ability of the species



Answer: A



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4. In the following groups -Oac(I), -OMe(II), -SO₂Me(III)OSO₂CF₃(IV) , the order of leaving group ability is

A. I gt II gt III gt IV

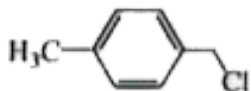
B. IV gt III gt I gt II

C. III gt II gt I gt IV

D. IV gt III gt II gt I

Answer: B

5. Which one of the following is more reactive towards S_N2 reaction?

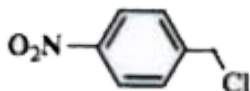


A.

B. 



C.



D.

Answer: D

6. Which of the following statements regarding the S_N1 reaction shown by alkyl halide is incorrect ?

- A. The added nucleophile plays no kinetic role in SN^1 reaction
- B. The SN^1 reaction involves the inversion of the stereochemistry around carbon atom of the substrate
- C. The SN^1 reaction on the chiral starting material ends up with the racemization of the product.
- D. The more stable the carbocation intermediate, the faster the SN^1 reaction

Answer: B



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7. Which of the following statements regarding the SN^2 reaction shown by alkyl halide is incorrect ?

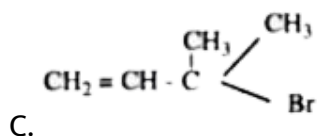
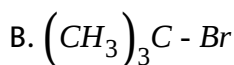
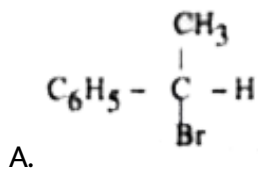
- A. The reaction takes place in a single step

- B. The SN^2 reaction involves the inversion of the stereochemistry around carbon atom of the substrate
- C. The rate of reaction depends on the steric bulk of the alkyl groups
- D. The nucleophilicity of halides follows the order $Cl^- > Br^- > I^-$

Answer: D

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8. Which of the following compounds give racemic mixture in nucleophilic substitution reaction with H_2O



D. 

Answer: A



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9. Which of the following compounds is most reactive towards SN^1 reaction



A.



B.

C. 

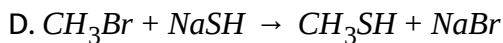
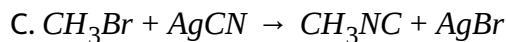
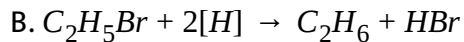
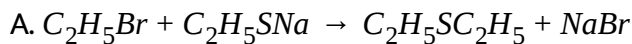
D. 

Answer: C



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10. The reaction which is not nucleophilic substitution is



Answer: B



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11. Arrange the following in decreasing order of SN^2 reaction



A. S gt R gt P gt Q

B. S gt R gt Q gt P

C. R gt S gt Q gt P

D. S gt P gt R gt Q

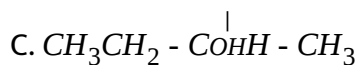
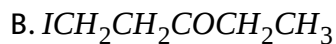
Answer: A



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PRACTICE SHEET - 3 (MORE THAN ONE CORRECT ANSWER QUESTIONS)

1. Which of the following compounds give iodoform on reaction with I_2 & NaOH



Answer: A::C::D



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2. The minimum number of carbon atoms to be present in monohalogen derivative of alkane to be optically active is

- A. four
- B. five
- C. three
- D. six

Answer: A

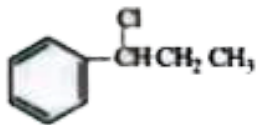


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3. The major compound obtained by mono-chlorination of n-propyl benzene using chlorine in presence of light is ?

A. 

B.



C.

D. 

Answer: C



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4. Which of the following are polar protic solvents

A. Water

B. Dimethyl sulfoxide

C. Dimethyl formamide (DMF)

D. Formic acid

Answer: A::D



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5. $\text{CH}_3 - \overset{\text{Cl}}{\underset{|}{\text{C}}} \text{H} - \text{CH}_2\text{CH}_3 \xrightarrow{\text{Cl}_2, h\nu}$ 2,3-dichloro-butane which statement is right regarding the product obtained above

- A. Two stereoisomeric products are obtained
- B. Both of them are optically active
- C. They are diastereoisomers
- D. One is optically active and the other is inactive

Answer: A::C::D



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PRACTICE SHEET - 3 (LINKED COMPREHENSION TYPE QUESTIONS)

1. S_N^2 reactions of alkyl halides is a bimolecular reaction which take place through formation of a transition state. The rate of reaction depends on the concentration of alkyl halide and nucleophile. The reaction is favoured by strong nucleophile in polar aprotic solvents.

Which of the following undergo substitution by SN^2 mechanism at a faster rate from other



D. all the above

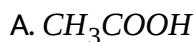
Answer: C

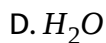
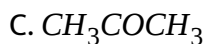
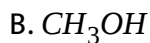


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2. SN^2 reactions of alkyl halides is a bimolecular reaction which take place through formation of a transition state. The rate of reaction depends on the concentration of alkyl halide and nucleophile. The reaction is favoured by strong nucleophile in polar aprotic solvents.

In which of the following solvents SN^2 reaction is more favourable






Answer: C



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3. SN^2 reactions of alkyl halides is a bimolecular reaction which take place through formation of a transition state. The rate of reaction depends on the concentration of alkyl halide and nucleophile. The reaction is favoured by strong nucleophile in polar aprotic solvents.

In the transition state in the SN^2 reaction is represented as . The central carbon atom is



D. sp^3d

Answer: A



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4. An optically active alkyl chloride having molecular formula 'A' ($C_6H_{13}Cl$) on dehydrohalogenation gave two isomeric alkenes B & C (C_6H_{12}). Ozonolysis of B gave formaldehyde and D ($C_5H_{10}O$), while ozonolysis of C gave acetone. Reduction A gave 2,2-dimethyl butane.

The structure of A is

A. 2-chloro-3,3-dimethyl butane

B. 1-chloro-3,3-dimethyl butane

C. 2-chloro-2,3-dimethyl butane

D. 1-chloro-2,3-dimethyl butane

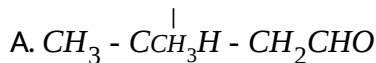
Answer: A



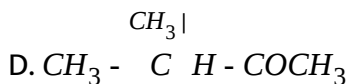
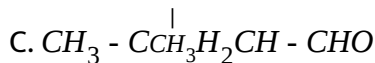
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5. An optically active alkyl chloride having molecular formula 'A' ($C_6H_{13}Cl$) on dehydrohalogenation gave two isomeric alkenes B & C (C_6H_{12}). Ozonolysis of B gave formaldehyde and D ($C_5H_{10}O$), while ozonolysis of C gave acetone. Reduction A gave 2,2-dimethyl butane.

The structure of 'D' is



B. 



Answer: D



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6. An optically active alkyl chloride having molecular formula 'A' ($C_6H_{13}Cl$) on dehydrohalogenation gave two isomeric alkenes B & C (C_6H_{12}). Ozonolysis of B gave formaldehyde and D ($C_5H_{10}O$), while ozonolysis of C gave acetone. Reduction A gave 2,2-dimethyl butane.

Which of the following is not correct regarding B and C

- A. Both are alkenes
- B. 'C' is highly substituted alkene
- C. Hydrogenation of B give 2,3 -dimethyl butane
- D. B & C both exhibit geometrical isomerism

Answer: D



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PRACTICE SHEET - 3 (MATCH THE FOLLOWING QUESTIONS)

COLUMN - I

- A) Phosgene
 B) Chloropicrin
 C) Chloretone

COLUMN - II

- p) $(\text{C}_2\text{H}_5\text{O})_2\text{CO}$
 q) $\text{Cl}_3\text{C}.\text{NO}_2$
 r) $\text{CH}_3-\overset{\text{OH}}{\underset{\text{CH}_3}{\text{C}}}-\text{CCl}_3$
 s) COCl_2

1. D) Diethylcarbonate



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COLUMN - I

- A) SN^2 reaction
 B) SN^1 reaction
 C) E_1 reaction
 D) E_2 reaction

COLUMN - II

- p) Racemization observed
 q) Inversion of configuration
 r) Reactivity order is $\text{RI} > \text{RBr} > \text{RCl}$
 s) Carbocation formed

2.



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PRACTICE SHEET - 3 (INTEGER ANSWER TYPE QUESTIONS)

1. The number of stereoisomeric products of 2,3,4-trichlorohexane



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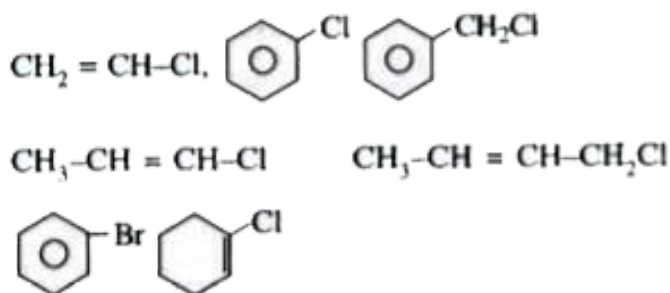
2. The number of structural isomers obtained on mono chlorination of 4,4-dimethylcyclohexane

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3. The number of structural isomers possible for dibromination of tetramethyl butane

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4. How many of the following does not undergo nucleophilic substitution easily under normal conditions





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5. Number of total possible structural isomers of dichloro ethane



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6. Total per halo compounds possible for ethane is



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7. Total dichloro compounds possible for cyclohexane (excluding stereoisomers) is



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PRACTICE SHEET - 4 (SINGLE ANSWER QUESTIONS)

1. In the reaction on $C_2H_5OH + HX \xrightarrow{ZnX_2} C_2H_5X + H_2O$ the order of reactivity of HX is

A. HBr gt HI gt HCl

B. HI gt HCl gt HBr

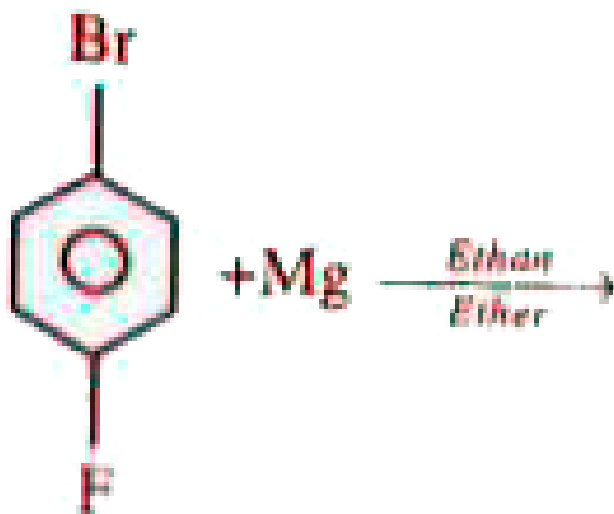
C. HCl gt HBr gt HI

D. HI gt HBr gt HCl

Answer: D



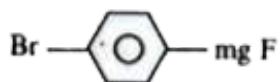
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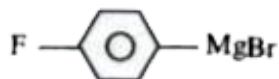
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A.



B.



C.



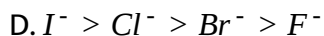
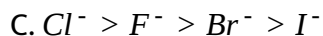
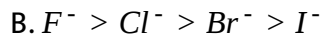
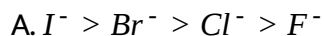
D.

Answer: C



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3. Correct order of leaving group tendency is

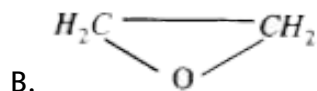
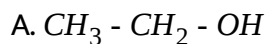


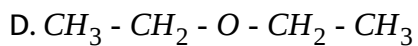
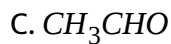
Answer: A



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4. When ethyl iodide is heated with dry silver oxide the product formed is



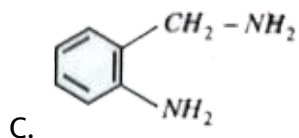
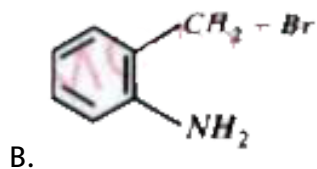
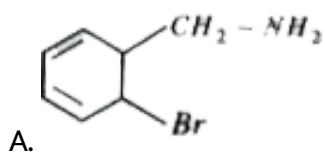


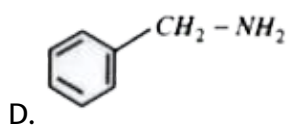
Answer: D



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5. What is the major product of following reaction





Answer: A

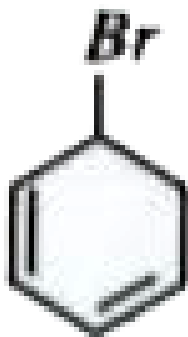


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6. The rate of SN^2 will be negligible in



A.



B.



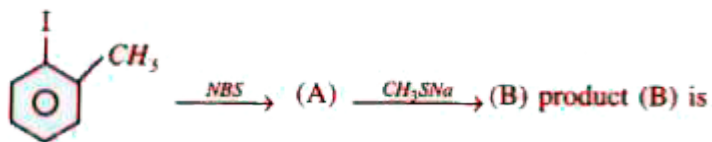
C.



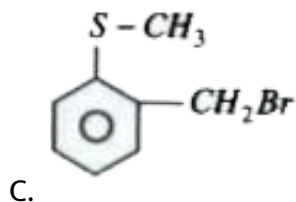
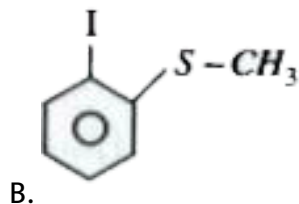
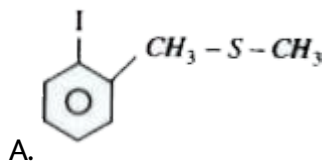
D.

Answer: C





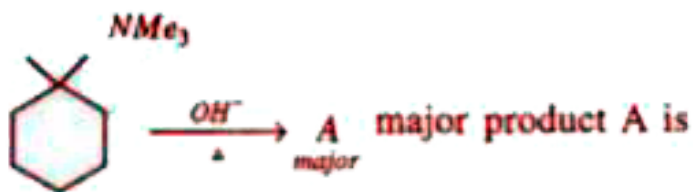
7.



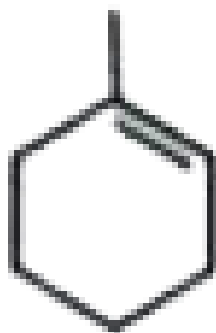
D. none of these

Answer: A

8.



A.



B.



C.





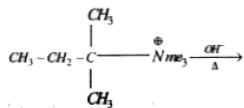
D.

Answer: B

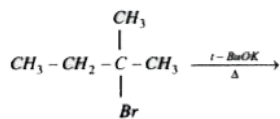
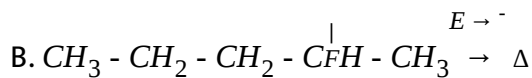


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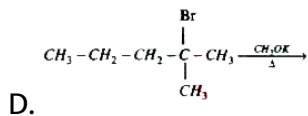
9. In which of the following reaction saytzeff alkene is major product.



A.



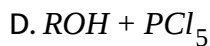
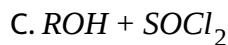
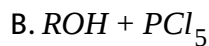
C.



Answer: D

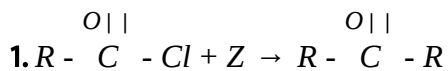
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10. Which reaction is termed as Darzen's reaction

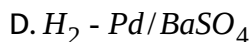
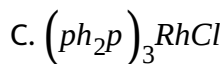
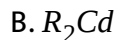
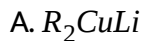


Answer: C

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The reagent Z is

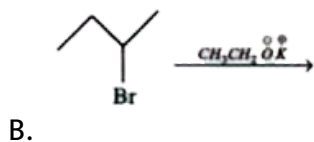
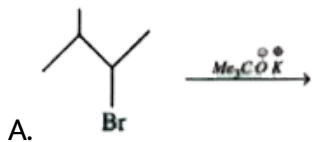


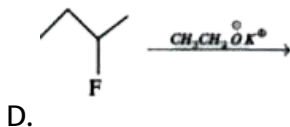
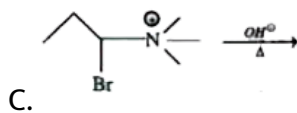
Answer: A::B



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2. In which product formation takes place according to Hofmann's rule

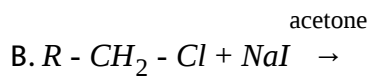




Answer: A::C::D

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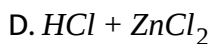
3. Alkyl Iodide can be prepared by



Answer: A::B::C

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4. Which of the following reagents can be used to prepare alkylhalide from an alcohol



Answer: B::C::D



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5. Which of the following is the weakest nucleophile in aprotic solvent.

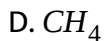
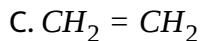
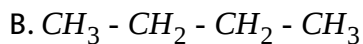
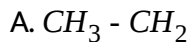


Answer: D



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6. $\text{CH}_3 - \text{CH}_2 - \text{Cl} \xrightarrow{\text{Na/ether}} \Delta$ which of the following products may not be formed



Answer: D

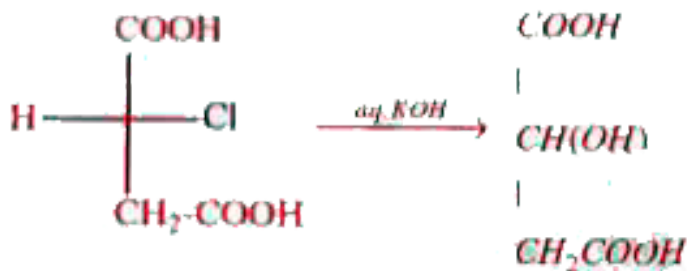


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PRACTICE SHEET - 4 (LINKED COMPREHENSION TYPE QUESTIONS)

1. SN^1 reaction is given by alkylhalide which forms stable carbocation during reaction. The carbocation, has sp^2 hybridisation. In SN^1 reaction, the attack of the nucleophile to carbocation intermediate is from either side. In SN^2 reaction the attacking nucleophile attacks from the back leading to the formation of inversion complex. Alcohol reacts with PCl_5 to give alkyl chloride by an internal attack of nucleophile within the molecule.

In the following reaction



- A. Retention in configuration occurs
- B. Racemisation occurs
- C. Inversion in configuration occurs
- D. Simple substitution

Answer: C



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2. SN^1 reaction is given by alkylhalide which forms stable carbocation during reaction. The carbocation, has sp^2 hybridisation. In SN^1 reaction, the attack of the nucleophile to carbocation intermediate is from either side. In SN^2 reaction the attacking nucleophile attacks from the back leading to the formation of inversion complex. Alcohol reacts with PCl_5 to give alkyl chloride by an internal attack of nucleophile within the molecule.

In the following reaction



A. Inversion in configuration occurs

B. Retention in configuration occurs

C. Racemisation occurs

D. Racemisation with LiHle innerion in configuration

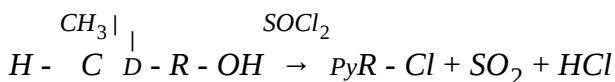
Answer: C



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3. SN^1 reaction is given by alkylhalide which forms stable carbocation during reaction. The carbonation, has sp^2 hybridisation. In SN^1 reaction, the attack of the nucleophile to carbocation inter mediate is from either side. In SN^2 reaction the attacking nucleophile attacks from the back leading to the formation of inversion complex. Alcohol reacts with PCI_5 to give alkyl chloride by an internal attack of nucleophile with in the molecule.

In the following reaction . If R is



A. There is no change in configuration

B. The configuration is inverted

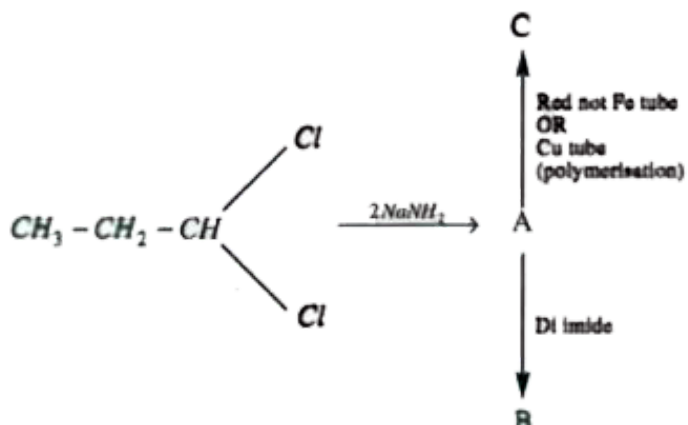
C. Racemisation occurs

D. Racemisation with inversion

Answer: B



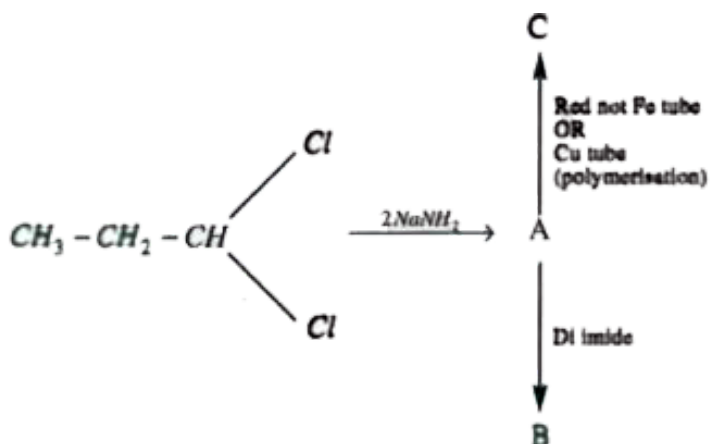
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Answer: A

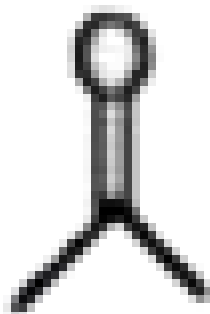
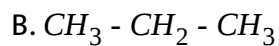


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5.

B is



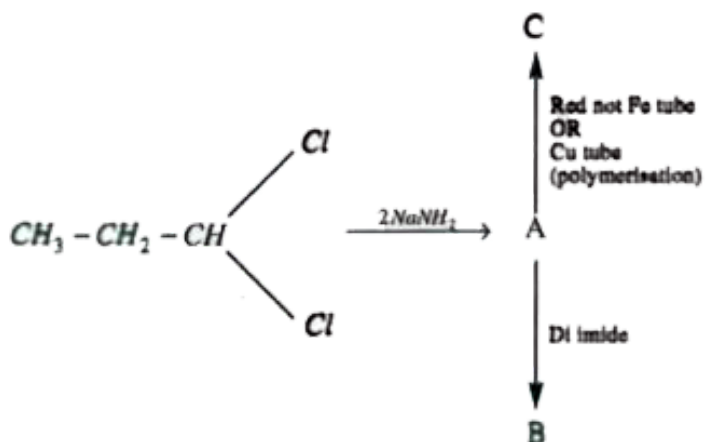
C.

D. $\text{CH}_3 - \text{CH}_3$

Answer: A



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6.

C is

A. mesitylene

B. benzene

C. cyclo octatetraene

D. benzaldehyde

Answer: A



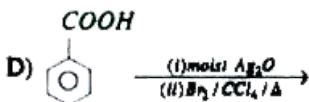
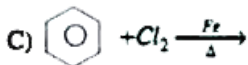
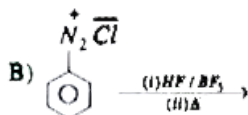
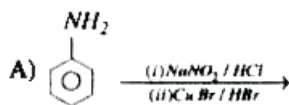
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PRACTICE SHEET - 4 (MATCH THE FOLLOWING QUESTIONS)

1. Match the following columns

COLUMN - I

reaction



COLUMN - II

Type of reaction



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2. Match the following columns

COLUMN - I
reaction

A) SN^1

B) SN^2

C) E_1

D) E_2

COLUMN - II
Type of reaction

p) 3° alkylhalide > 2° alkylhalides > 1° alkylhalides

q) 1° alkylhalide > 2° alkylhalides > 3° alkylhalide

r) high concentration of strong base

s) polar protic solvent



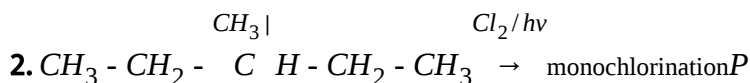
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PRACTICE SHEET - 4 (INTEGER ANSWER TYPE QUESTIONS)

1. When isopentane is subjected to mono chlorination, what will be the number of mono chlorinated products contain chiral carbon



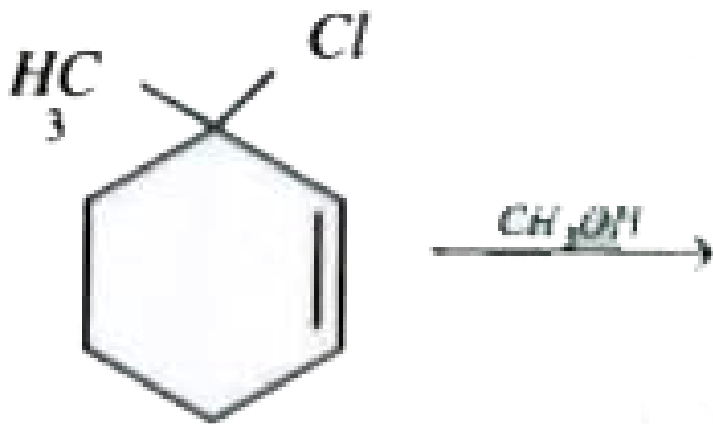
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How many number of isomeric produces (P) are formed.

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3. How many organic compounds are formed in the reaction (including stereo)

[Watch Video Solution](#)

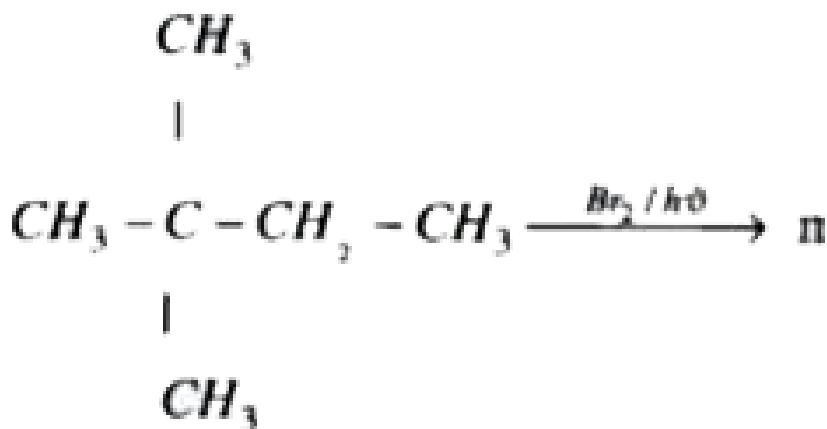
4. How many isomers are possible for Bromo methyl cyclopentane (Ignoring chirality)

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5. How many isomers on monochlorination can be obtained from $(CH_3)_3C - Et$



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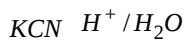


6.

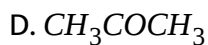
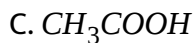
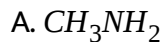
monobromo compound (X) major. The number of possible stereo isomers X can have



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1. $CH_3 - Cl \rightarrow A \rightarrow B$ the compound B is

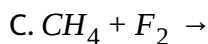
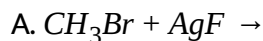


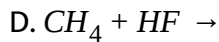
Answer: C



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2. Which of the following is correct method of preparation of methyl fluoride?



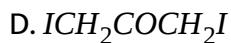
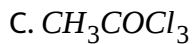
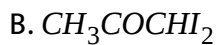
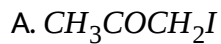


Answer: A



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3. Which of the following compounds is not formed in iodoform reaction of acetone

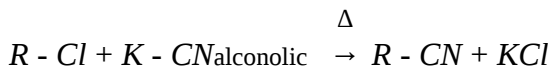


Answer: D



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4. Following is the substitution reaction in which -CN is replaced by -Cl



To obtain propane nitrite, R - Cl should be

- A. chloro ethane
- B. 1 - chloro propane
- C. chloro methane
- D. 2 -chloro propane

Answer: A



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5. In which of the following compounds carbon exhibits valency of 4 but oxidation state - 2

A. $HCHO$

B. CH_3Cl



Answer: B



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6. Which one of the following does not undergo iodoform reaction

A. secondary butylalcohol

B. Isopropyl alcohol

C. Diethyl ketone

D. Ethyl alcohol

Answer: C



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7. Which of the following halo alkane is most reactive towards SN^1

A. 1-chloro propane

B. 1-Bromo propane

C. 2-chloro propane

D. 2-Bromo propane

Answer: D



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8. Among the halogen the one which is oxidised to Nitric acid is

A. fluorine

B. iodine

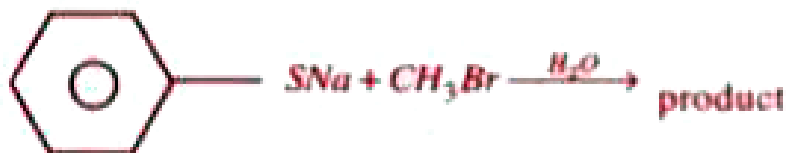
C. chlorine

D. Bromine

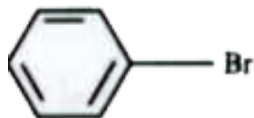
Answer: B

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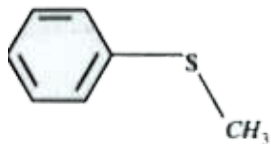
9. What is the major product obtained in the following reaction



A.



B.



C.



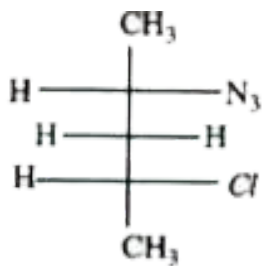
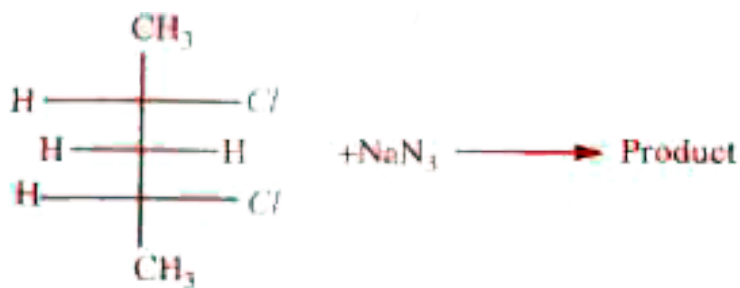
D.

Answer: C

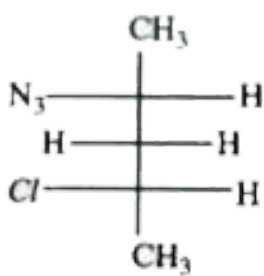


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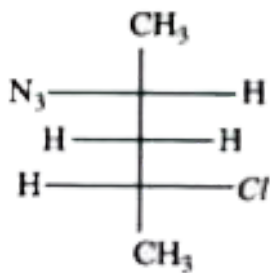
10. What is the principal product of the following reaction



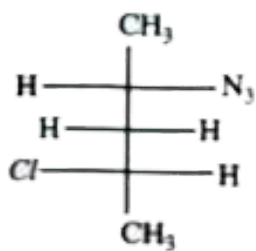
A.



B.



C.



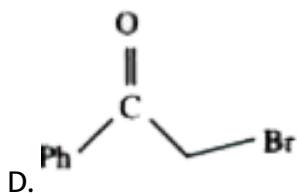
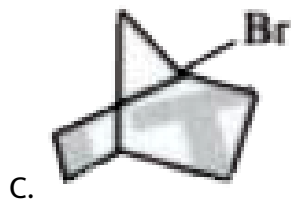
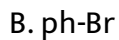
D.

Answer: C



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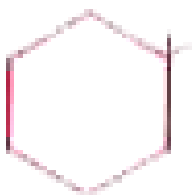
1. Which of the following compounds do not readily give SN^2 reaction



Answer: A::B::C



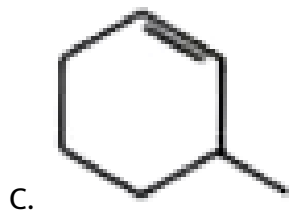
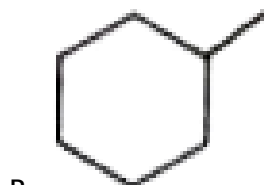
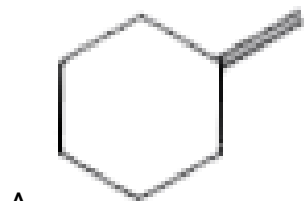
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2.

A+B, where

B is major product. Product B is

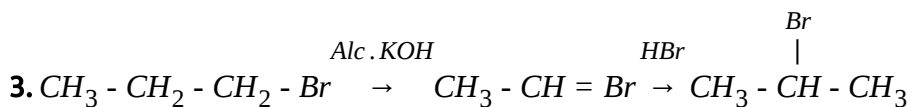




D.

Answer: A

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A. X = dilute NaOH, 20°C , Y = HBr/acetic acid, 20°C

B. X = Concentrated alcoholic NaOH, 80°C , Y = HBr/acetic acid, 20°C

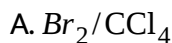
C. X = dilute NaOH, 20°C , Y = HBr/ CH_3 , 0°C

D. X = Concentrated alcoholic NaOH, 80°C , Y = HBr/ CHCl_3 , 0°C

Answer: B

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4. Reagents which cannot be used to distinguish Allylbromide from n - propyl bromide are



B. Shaking with an aqueous solution of $AgNO_3$

C. Boiling with alcoholic KOH solution followed by acidification with HNO_3 and addition of $AgNO_3$ solution

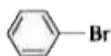
D. Fusion with sodium metal followed by acidification with dil HNO_3 and addition of $AgNO_3$ solution

Answer: A::B::C::D

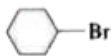


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5. Incorrect order of hydrolysis of the following in increasing order is



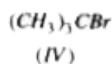
(I)



(II)



(III)



A. I It II It III It IV

B. I It IV It II It III

C. IV It III It II It I

D. I It II It IV It III

Answer: A::C::D



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6. Dows reaction involves

A. Electro prilic addition

B. Nucleophilic addition

C. Electro prilic substitution

D. Nucleophilic substitution

Answer: D

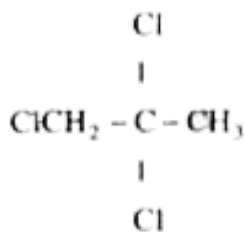


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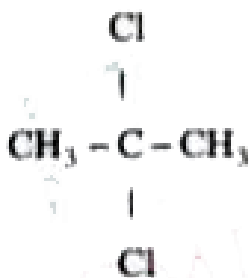
PRACTICE SHEET - 5 (LINKED COMPREHENSION TYPE QUESTIONS)

1. In the study of chlorination of propane four products (A,B,C and D) (structural isomerism) of the formula $C_3H_6Cl_2$ were isolated. Each was further chlorinated to provide trichloro products ($C_3H_5Cl_3$) It was found that A provide one trichloro produce, B gave two and C and D each gave three. It is found that D is optically active.

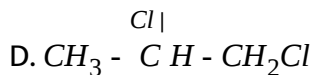
Formula of the compound A is



A.



B.



Answer: B



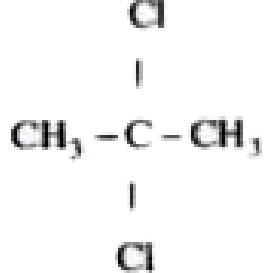
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2. In the study of chlorination of propane four products (A,B,C and D) (structural isomerism) of the formula $\text{C}_3\text{H}_6\text{Cl}_2$ were isolated. Each was further chlorinated to provide trichloro products ($\text{C}_3\text{H}_5\text{Cl}_3$) It was found that A provide one trichloro produce, B gave two and C and D each gave three. It is found that D is optically active.

Correct formula of the product of chlorination of B is



C. both a and b



D.

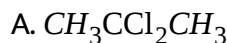
Answer: B

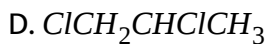


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3. In the study of chlorination of propane four products (A,B,C and D) (structural isomerism) of the formula $C_3H_6Cl_2$ were isolated. Each was further chlorinated to provide trichloro products ($C_3H_5Cl_3$) It was found that A provide one trichloro produce, B gave two and C and D each gave three. It is found that D is optically active.

Correct formula of the compound D is

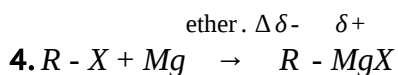




Answer: D

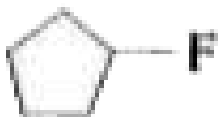


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Grignand reagent may be prepared from 1°, 2° and 3° halides as well as from Vinyl and Aryl halide, vicinal dihalides are those halides which contain acidic tail do not form Grignand reagent.

Which of the following halide is most reactive for preparation of Grignand reagent



A.

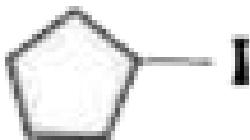


B.

C.



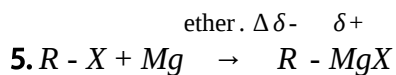
D.



Answer: D

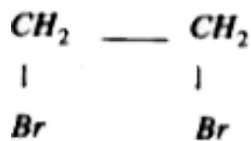


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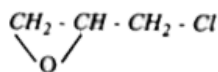


Grignand reagent may be prepared from 1°, 2° and 3° halides as well as from Vinyl and Aryl halide, vicinal dihalides are those halides which contain acidic tail do not form Grignand reagent.

Which of the following compounds can form Grignand reagent on reaction with mg/ether



A.



B.



C.

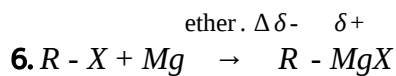


D.

Answer: C

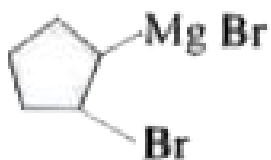
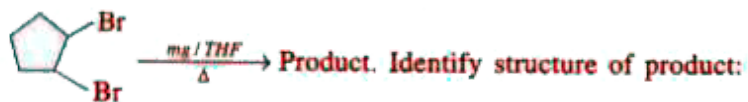


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Grignand reagent may be prepared from 1°, 2° and 3° halides as well as from Vinyl and Aryl halide, vicinal dihalides are those halides which

contain acidic tail do not form Grignand reagent.



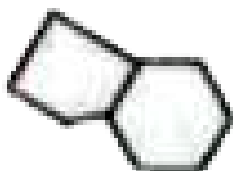
A.



B.



C.



D.

Answer: B

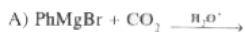
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PRACTICE SHEET - 5 (MATCH THE FOLLOWING QUESTIONS)

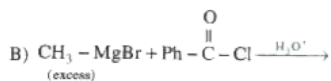
1. Match the following columns

COLUMN - I

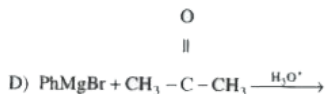
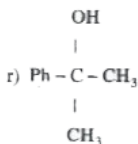
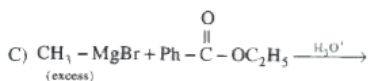
COLUMN - II



p) Nucleophilic addition reaction



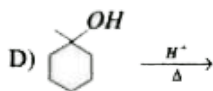
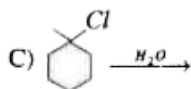
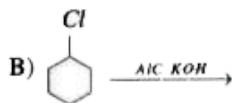
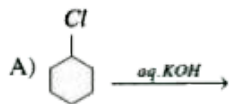
q) Nucleophilic addition elimination reaction



s) PhCOOH

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COLUMN - I
reaction



COLUMN - II
Type of reaction

p) SN^1

q) SN^2

r) E_1

s) E_2

2.



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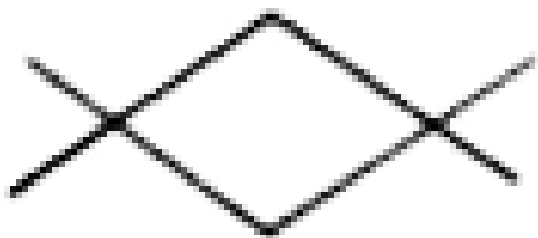
PRACTICE SHEET - 5 (INTEGER ANSWER TYPE QUESTIONS)

1. Total number of mono chlorinated compounds are possible for cumene (including stereo isomers)



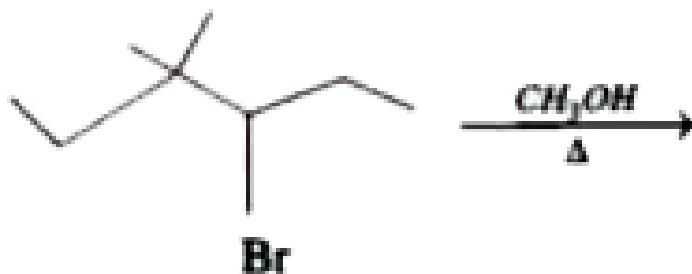
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2. How many mono chlorinated isomers are possible (including stereo isomers) from the following compound on mono chlorination with $Cl_2/h\nu$
 [Assume no ring opening]



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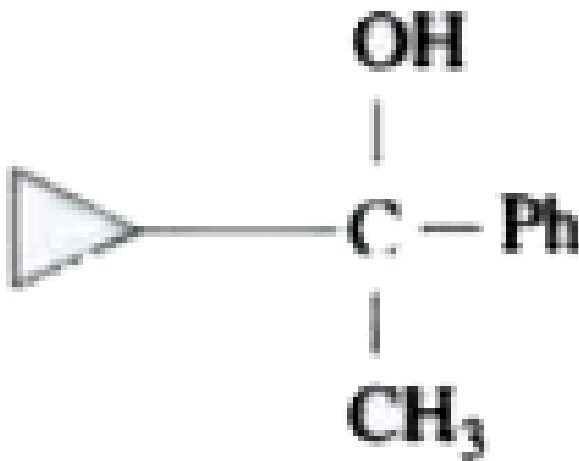
3. Find out number of possible E_1 products from following reaction (excluding stereo)





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4. How many set of carbonyl compound and R-mgx can produce 3°



alcohol



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5. $\text{Cl} - \overset{\text{O}}{\parallel} \text{C} - \text{OC}_2\text{H}_5 \xrightarrow{(1) \text{xRMgX}} \text{NH}_4\text{Cl} \text{ } 3^\circ \text{ alcohol}$ find our value of x



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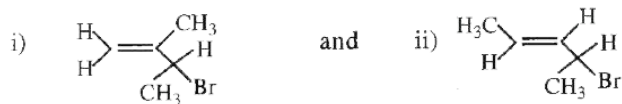
6. products.

The number of possible monochloro substituted structural isomeric products (excluding stereo isomers) are

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Problem

1. Write IUPAC names of the following compounds:



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2. Write the structures of the following compounds :

(i) 1-Iodo-4-methylcyclohexane

(ii) 2-(3-Chlorophenyl)but-2-ene and

(iii) 3-Bromomethylpropene.



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3. Give structural formulae and IUPAC names of the following compounds

:

(I) Tert-Amyl chloride ,

(ii) sec-buty, iodide ,

(iii) neo-Hexyl bromide and

(iv) Iso-pentyl chloride



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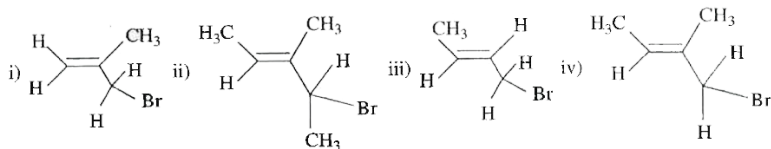
4. With molecular formula $C_5H_{11}Br$, there are eight structural isomers

, Give the IUPAC name of each isomer and classify them as primart ,

secondary of tertiary bromides .

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5. Write IUPAC names of the following



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6. A saturated hydrocarbon C_6H_{14} gives two monochloro compounds on chlorination. Identify the hydrocarbon

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7. Write the structures of all aromatic iodides with the formula C_7H_7I .

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8. How is 1-iodobutane obtained from 1-butene?



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9. What is the major product obtained by mono-chlorination of 2-methylbutane



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10. Give the structures of the product of obtained by addition HBr is presence of peroxide to allyl chloride ($CH_2 = CH - CH_2Cl$)



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11. During the reaction of alcohols with KI, why sulphuric acid is not used?



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12. Among the three isomeric alkanes (C_5H_{12}), identify the one that on chlorination yields (a) Four isomeric monochlorides, (b) Three isomeric monochlorides, (c) A single monochloride



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13. Give the structures of the major organic products from 3-ethyl-2-pentene using (i) HBr in the presence of peroxide and (ii) HCl in the presence of peroxide.



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14. Which isomer of $C_5H_{11}Cl$ has the highest boiling point and which has the least boiling point ? Explain.



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



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16. Haloalkanes react with KCN to form alkyl cyanides as main product while AgCN forms isocyanides as the chief product. Explain.



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17. ROH cannot be converted into RCl on treatment with KCl, however reaction takes place on treatment with HCl. Explain



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18. Optically active 2-iodobutane on treatment with sodium iodide in acetone gives a product which does not show optical activity. Explain

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

The four isomeric bromobutanes,

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20. There are three outcome of a substitution reaction at an asymmetric carbon of alkylhalide. Explain

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21. How do you distinguish between

$CH_3CH = CHCl$, $CH_3CH_2CH_2Cl$ and $CH_2 = CH - CH_2Cl$?

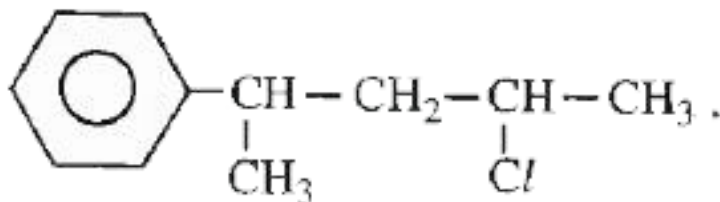
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22. Explain the formation of the two products in the following reaction :



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23. Predict the major product obtained by dehydrochlorination of



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24. Why the chlorine atom in vinyl chloride is nonreactive?



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25. Allyl iodide can be obtained from allyl chloride. Explain.



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26. Write the structures of major and minor products formed when 3-chloro-2-methylpentane is subjected to dehydrohalogenation.



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

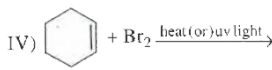
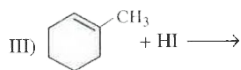
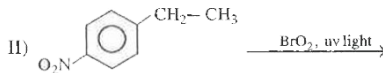
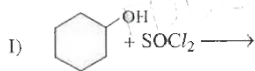
(I) (a) Bromomethane, (b) Bromoform, (c) Chloromethane and (d) Dibromomethane

(II) (p) 1-chloropropane , (q) Isopropyl chloride and (r) 1-Chlorobutane



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28. Draw the structures of major products in each of the following reactions

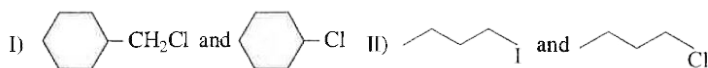


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29. 2-Bromo-2, 3-dimethylbutane is treated with alcoholic potash. Write the major product

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30. In the following pairs of halogen compounds which would undergo $\text{S}_{\text{N}}2$ reaction faster?



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31. Chloroform is treated with aqueous silver nitrate. What happens?



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32. How do you distinguish between

$CH_3CH=CHCl$, $CH_3CH_2CH_2Cl$ and $CH_2=CH-CH_2Cl$?



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33. How iodoform is distinguished from chloroform?



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34. How will you distinguish between chloroform and carbon tetrachloride?



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35. What is teflon? How is it prepared?



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36. What are freons? How are they prepared?



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37. Among the three isomeric dichlorobenzenes , which has the highest boiling point and highest melting point ?



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38. Benzyl chloride undergoes nucleophilic substitution much more easily than chlorobenzene. Explain.



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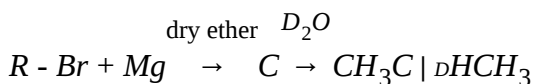
39. Which product will form when optically active form of C_4H_9Br is subjected to dehydrohalogenation?

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40. Nucleophilic substitution in aryl halides is facilitated by electron withdrawing groups while electrophilic substitution is facilitated by electron releasing groups. Why?

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41. Identify A, B, C, D, E, R and R' in the following



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42. What happens when iodobenzene is heated with copper powder at 200°C ?



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Exercise-1.1.1

1. What are geminal dihalides and vicinal dihalides? Give examples.



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2. Give one example each for aryl halide and aryl alkyl halide.



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3. Give IUPAC names of isobutyl chloride, secondary butyl chloride and tertiary butyl chloride.



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4. What type of isomerism can be exhibited by alkyl halides having three or more carbon atoms?



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5. Give the names and structures of different isomers with formula C_4H_9Cl



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6. Discuss the polarity of carbon-halogen bond in alkyl halides



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Exercise-1.1.2

1. Explain the preparation of ethyl chloride from (i) ethyl alcohol, (ii) ethylene and (iii) ethane



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2. Write two preparations and two important properties of ethyl chloride



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3. How does ethyl chloride react with aqueous KOH and alcoholic KOH ?
Give equations.



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4. What happens when ethyl chloride is treated with (i) aqueous ethanolic potassium cyanide and (ii) hot aqueous ethanolic silver nitrite ?



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5. Discuss the mechanisms of nucleophilic substitution reactions, S_N1 and S_N2



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6. Discuss the order of reactivity of primary, secondary and tertiary alkyl halides towards S_N1 and S_N2 mechanisms.



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7. Discuss the stereochemistry of the products formed through S_N1 mechanism and S_N2 mechanism.



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8. How does ethyl chloride react sodium ethoxide ? What is the name of the reaction ?



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9. Write the reaction products of ethyl chloride with ammonia. Give equations



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10. How ethyl acetate is formed from ethyl chloride ?



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11. Write the important uses of ethyl chloride.





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12. How does ethyl chloride react with

(i) NaBr and KI

write the chemical equations.



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13. Predict the product obtained by treating ethyl chloride with Mg followed by hydrolysis.



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14. What is Groves process ? Give equation.



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1. Give the toxic effects of polyhalogen compounds.



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2. Write the series of reactions of chloroform with hot aqueous solution of potassium hydroxide



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3. Write notes on carbylamine reaction and Reimer-Tiemann reaction



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4. Give important uses and tests for chloroform



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5. Write a note on freons ?



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6. How are the following prepared ? Write their uses.

(a) CHI_3 (b) CH_2Cl_2 (c) CCl_4 and (d) CF_2Cl_2



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7. Write a note on D.D.T.



Watch Video Solution

8. Which is non-biodegradable polyhalogen compound?



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1. How chlorobenzene is prepared from

(i) aniline and (ii) phenol ?



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2. How phenol is obtained from chlorobenzene ?



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3. Discuss the effect of nitro group in chloro benzene towards nucleophilic substitution reaction.



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4. Describe with suitable examples the Wurtz-Fittig reaction and Fittig reaction.



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5. Explain electrophilic substitution reactions of chloro benzene .



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6. Compare the reactivity of benzene and chlorobenzene towards electrophilic substitution reactions.



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7. How Iodobenzene is prepared ?



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8. Give any two uses of chloro benzene?



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Exercise-1.2

1. Explain the hybridisation of carbon to which halogen atom is attached in alkyl halides, vinyl halides, aryl halides and aryl alkyl halides



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2. Differentiate between aryl halides and arylalkyl halides



Watch Video Solution

3. Write the common names and IUPAC names of all isomers of the formula, C_4H_9Cl



Watch Video Solution

4. Write all the possible structural isomers with the formula, $C_5H_{11}Br$



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5. Give the bond line structures of (i) Allyl chloride (ii) Butylene chloride and (iii) 2-chloro-2-phenylbutane



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6. How ethyl bromide is formed by Hunsdiecker reaction?



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7. How do the boiling points vary in alkyl halides with increase in the size of the alkyl group for the given halide and also of the halide for the given alkyl group?



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8. Ethyl chloride is more reactive than vinyl chloride towards nucleophilic substitution. Explain



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9. Give the nucleophilic substitution mechanism with allylic and benzylic halides?



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10. What happens when an optically active alkyl halide undergoes nucleophilic substitution?



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11. Why S_N1 reactions are favourable in polar solvents?



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12. Differentiate between nucleophilicity and basicity with suitable examples



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13. Explain Saytzeff rule with suitable examples



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14. Write a note on elimination reactions of alkyl halides



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15. How the formation of poisonous phosgene can be prevented from chloroform?



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[Watch Video Solution](#)

16. What are the consequences when human beings are exposed to carbon tetrachloride?



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17. In aqueous potassium hydroxide nucleophilic substitution takes place, however in alcoholic potassium hydroxide elimination takes place. Account for the observation with suitable example



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18. Discuss the effect of the nucleophile and substrate on the mechanism of nucleophilic substitution



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19. Which test is useful to distinguish between 2-pentanone and 3-pentanone?



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20. Electron withdrawing groups in benzene ring facilitate nucleophilic substitution. Substantiate



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21. What are the disadvantages of freons?



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22. Give the IUPAC name of D.D.T why is it banned in some countries?



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23. Give the equation for the formation of chlorobenzene by Raschig method.



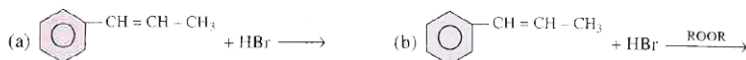
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24. Halogen atom present in benzene ring is ortho, para directing, but deactivating. Why?



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25. Predict the product(s) of the following reaction



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26. Tertiary halides mainly undergo elimination rather than substitution. Justify

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27. $CH_3CH_2CH_2OH \xrightarrow{PBr_3 \text{ alcoholic}} A \xrightarrow{KOH} B \xrightarrow{HBr} C \xrightarrow{NH_3} D$. Write the formula for the final product D

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28. $(CH_3)_3CC(CH_3)_3 \xrightarrow{Na, \text{ ether}} R' - X \xrightarrow{Mg} D \xrightarrow{H_2O} E$. What is E?

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29. $CH_3CH_2MgBr \xrightarrow{CH_3CHO} H_2OX \xrightarrow{HBr} Y$. Write the product obtained when compound Y is subjected to dehydrohalogenation

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30. $\text{CH}_3\text{CH}_2\text{CH}_2\text{I} \xrightarrow{\text{alc. KOH}} \text{A} \xrightarrow{\text{H}^+, \text{H}_2\text{O}} \text{B} \xrightarrow{\text{SOCl}_2} \text{C} \xrightarrow{[\text{H}]} \text{D}$. Write the molecular weight compound D

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31. A hydrocarbon C_5H_{10} does not react with chlorine in dark but gives a single monochloro-compound $\text{C}_5\text{H}_9\text{Cl}$ in bright sunlight . Identify the hydrocarbon .

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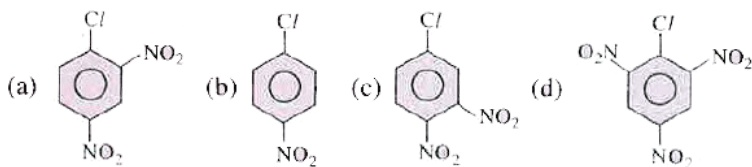
32. In the reaction,
 $\text{CH}_3 - \text{CHCH}(\text{Br}) - (\text{CH}_3) \xrightarrow{\text{Alc. KOH}} (\text{A}) \xrightarrow{\text{HBr}} \text{peroxide}(\text{B}) \xrightarrow{\text{NaI}} \text{Acetone}(\text{C})$. The compound (C) is

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33. 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.

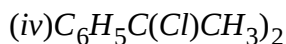
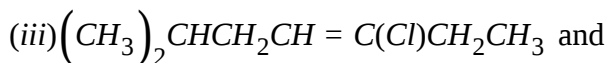
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34. Predict the order of reactivity of the following compounds towards nucleophilic substitution



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1. Give the IUPAC names of the compounds. Classify them as alkyl, allylic, benzylic, vinylic and aryl halides and also as primary, secondary and tertiary halides.



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2. Write the structures of the following compounds :



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3. Give structural formulae and IUPAC names of the following compounds

:

(i) Tert-Amyl chloride ,

(ii) sec-buty, iodide ,

(iii) neo-Hexyl bromide and

(iv) Iso-pentyl chloride



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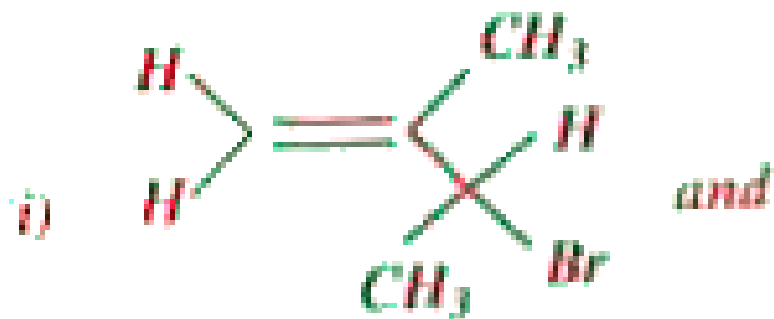
4. With molecular formula $C_5H_{11}Br$, there are eight structural isomers

, Give the IUPAC name of each isomer and classify them as primary ,
secondary or tertiary bromides .



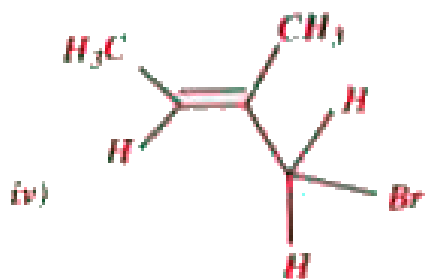
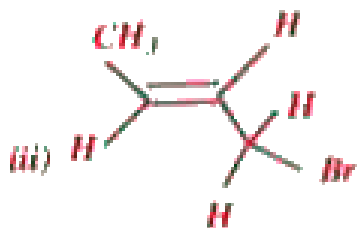
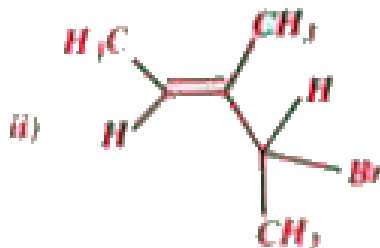
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5. Write IUPAC names of the following compounds :



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6. Write IUPAC names of the following



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7. A hydrocarbon C_5H_{12} gives only one monochlorination product. Identify that hydrocarbon.



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8. Write the structures of all aromatic iodides with the formula C_7H_7I .



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9. Write all the possible monochloro structural isomers that are formed on monochlorination of $(CH_3)_2CHCH_2CH_3$



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10. During the reaction of alcohols with KI, why sulphuric acid is not used?



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11. Write the products of the following reactions :



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12. Free radical bromination of n-butane yields 2-bromobutane as the major product. Why?

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13. Give the structures of the major organic products from 3-ethyl-2-pentene using (i) HBr in the presence of peroxide and (ii) HCl in the presence of peroxide.

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14. Among the three isomeric alkanes (C_5H_{12}), identify the one that on chlorination yields

- a) Four isomeric monochlorides
- b) Three isomeric monochlorides
- c) A single monochloride



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15. How is 1-iodobutane obtained from 1-butene?



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16. Which isomer of $C_5H_{11}Cl$ has the highest boiling point and which has the least boiling point ? Explain.



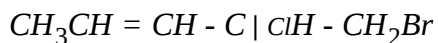
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17. The observed rotation of 10ml of a solution containing 2g of a compound when placed in 25cm long polarimeter tube is $+13.4^\circ$. What is the specific rotation of the compound?



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18. How many stereo isomers are possible for



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19. Haloalkanes react with KCN to form alkyl cyanides as main product while AgCN forms isocyanides as the chief product. Explain.



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



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21. R-Cl is hydrolysed to R-OH slowly but the reaction is rapid in presence of KI as catalyst. Explain.



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22. Optically active 2-iodobutane on treatment with sodium iodide in acetone gives a product which does not show optical activity. Explain.



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23. Explain the formation of the two products in the following reaction :





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24. Why the chlorine atom in vinyl chloride is nonreactive?



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25. Allyl iodide can be obtained from allyl chloride. Explain.



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

(i) The four isomeric bromobutanes,

(ii)

C_6H_5CHBr , $C_6H_5(C_6H_5)Br$, $C_6H_5CH(CH_3)Br$ and $C_6H_5C(CH_3)(C_6H_5)Br$

.



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27. Write the structures of major and minor products formed when 3-chloro-2-methylpentane is subjected to dehydrohalogenation.

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28. How do you distinguish between

$CH_3CH=CHCl$, CH_3CH_2Cl and $CH_2=CH-CH_2Cl$?

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29. In the following pairs of halogen compounds, which would undergo S_N2 reaction faster?



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

(i) The four isomeric bromobutanes,

(ii)

C_6H_5CHBr , $C_6H_5(C_6H_5)Br$, $C_6H_5CH(CH_3)Br$ and $C_6H_5C(CH_3)(C_6H_5)Br$

.



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31. 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_2Br (A) or $CH_3CH_2CHCH_3 | Br$ (B)

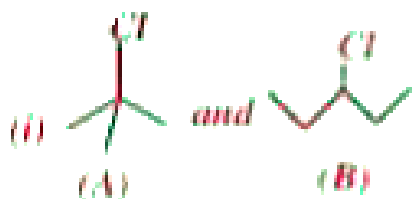
(ii) $CH_3CH_2CHCH_3 | Br$ (C) or $H_3C - C - Br | CH_3$ (D)

(iii) $CH_3CHCH_2CH_2Br | CH_3$ (E) or $CH_3CH_2CHCH_2Br | CH_3$ (F)



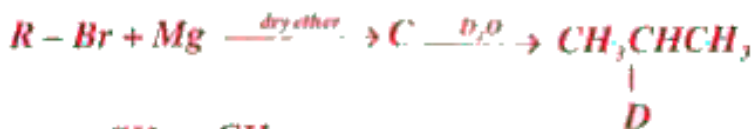
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32. In the following pairs of halogen compounds, which compound undergoes faster S_N1 reaction?



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33. Identify A, B, C, D, E, R and R' in the following:



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34. What is teflon ? How is it prepared ?



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35. How will you distinguish between chloroform and carbon tetrachloride ?



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36. How iodoform is distinguished from chloroform?



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37. Among the three isomeric dichlorobenzenes , which has the highest boiling point and highest melting point ?



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38. Which product will form when optically active form of C_4H_9Br is subjected to dehydrohalogenation?



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39. Benzyl chloride undergoes nucleophilic substitution much more easily than chlorobenzene. Explain.



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40. Nucleophilic substitution in aryl halides is facilitated by electron withdrawing groups while electrophilic substitution is facilitated by electron releasing groups. Why?



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1. Give IUPAC names of isobutyl chloride, secondary butyl chloride and tertiary butyl chloride.



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2. What type of isomerism can be exhibited by alkyl halides having three or more carbon atoms?



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3. Explain the nature of C - X bond.



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4. Explain with examples the difference between primary, secondary and tertiary alkyl halides.



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5. Give the common names and IUPAC names along with structures of different isomers with the molecular formula, C_4H_9Cl .



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6. Give one example each for aryl halide and aryl alkyl halide.



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SUBJECTIVE EXERCISE - 1 (VERY SHORT ANSWER QUESTIONS)

1. What are geminal dihalides and vicinal dihalides ? Give examples.



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SUBJECTIVE EXERCISE - 2 (LONG ANSWER QUESTIONS)

1. a) Explain the preparation of ethyl chloride from (i) ethyl alcohol, (ii) ethylene and (iii) ethane.

b) Write three preparations and three important properties of ethyl chloride. Give any two uses.



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2. Discuss the mechanisms of nucleophilic substitution reactions, S_N1 and S_N2



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3. Discuss the order of reactivity of primary, secondary and tertiary alkyl halides towards S_N1 and S_N2 mechanisms.



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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 .



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5. Predict the major alkenes formed when the following halogen derivatives are subjected to dehydrohalogenation : a) 2-Bromo-2-methylbutane b) 2,2,3-Trimethyl-3-bromopentane c) 1-Chloro-1-methylcyclohexene



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6. Write the equations for the preparation of n-butyl iodide from a) 1-Butene b) n-Butyl chloride c) Butanol-1



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7. 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.



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SUBJECTIVE EXERCISE - 2 (SHORT ANSWER QUESTIONS)

1. Discuss the stereochemistry of the products formed through S_N1 mechanism and S_N2 mechanism.



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2. What happens when ethyl chloride reacts with (i) lithium aluminium hydride and (ii) sodium ethoxide ?



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3. How does ethyl chloride react with

(i) CH_3COOAg (ii) Mg in dry ether

(iii) C_6H_6 in presence of anhydrous AlCl_3 and

(iv) H_2 in the presence of Pt ?



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4. Write all the equations for all the possible products formed when ethyl chloride reacts with ammonia.



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5. Explain Williamson synthesis and Wurtz reaction taking ethyl chloride as example.



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6. Discuss the action of PCl_3 , PCl_5 and thionyl chloride on ethyl alcohol with equations.



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7. Discuss briefly the physical properties of ethyl chloride.



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8. Write the important uses of ethyl chloride.



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9. How does ethyl chloride react with

(i) $NaBr$ and KI

write the chemical equations.



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SUBJECTIVE EXERCISE - 2 (VERY SHORT ANSWER QUESTIONS)

1. How does ethyl chloride react with aqueous KOH and alcoholic KOH ?

Give equations.



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2. What happens when ethyl chloride is treated with (i) aqueous ethanolic potassium cyanide and (ii) hot aqueous ethanolic silver nitrite ?



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3. How does ethyl chloride react sodium ethoxide ? What is the name of the reaction ?



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4. How ethyl acetate is formed from ethyl chloride ?



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5. Arrange the following in the increasing order of boiling points :

Bromomethane, Bromoform, Chloromethane and dibromoethane .



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6. Predict the product obtained by treating ethyl chloride with Mg followed by hydrolysis.



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7. What is Groves process ? Give equation.



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8. Write any two physical properties of ethyl chloride.



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SUBJECTIVE EXERCISE - 3 (LONG ANSWER QUESTIONS)

1. Give the toxic effects of polyhalogen compounds.



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2. How are the following prepared ? Write their uses.

(a) CHI_3 (b) CH_2Cl_2 (c) CCl_4 and (d) CF_2Cl_2



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SUBJECTIVE EXERCISE - 3 (SHORT ANSWER QUESTIONS)

1. Write a note on D.D.T.



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2. Write a note on freons ?



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SUBJECTIVE EXERCISE - 3 (VERY SHORT ANSWER QUESTIONS)

1. Why iodoform is replaced by other formulations as antiseptic ?



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2. The correct formula of Freon-12 is



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3. Which is non-biodegradable polyhalogen compound?



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SUBJECTIVE EXERCISE - 4 (SHORT ANSWER QUESTIONS)

1. How chlorobenzene is prepared from

(i) aniline and (ii) phenol ?



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2. How phenol is obtained from chlorobenzene ?



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3. Discuss the nucleophilic substitution reactions of chlorobenzene.



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4. Discuss the effect of nitro group in chloro benzene towards nucleophilic substitution reaction.



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5. Describe with suitable examples the Wurtz-Fittig reaction and Fittig reaction.



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6. Discuss the directive influences of halogen on the electrophilic substitution reactions of chlorobenzene.



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7. Compare the reactivity of benzene and chlorobenzene towards electrophilic substitution reactions.



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8. Write a note on Sandmeyer's reaction.



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SUBJECTIVE EXERCISE - 4 (VERY SHORT ANSWER QUESTIONS)

1. Explain the following name reactions :

Gatterman reaction



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2. How Iodobenzene is prepared ?



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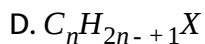
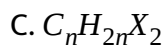
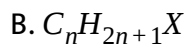
3. Give any two uses of chloro benzene?



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OBJECTIVE EXERCISE - 1 (NOMENCLATURE, NATURE OF C - X BOND)

1. The general formula of alkyl halides is



Answer: B



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2. The hybridisation of carbon atoms in C_2H_5Cl are

A. sp^3 and sp^2

B. sp^3 and sp

C. sp^3 and sp^3

D. sp^2 and sp

Answer: C



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3. Ethyl chloride is

A. 1° alkyl halide

B. 2° alkyl halide

C. 3° alkyl halide

D. gem halide

Answer: A



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4. The C - Cl bond in Ethyl chloride is formed by overlapping

A. $sp^3 - s$

B. $sp^3 - p$

C. $sp^3d - p$

D. $sp^2 - p$

Answer: B



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5. IUPAC name of $(CH_3)_2CHCH_2CH_2Br$ is

A. 1-Bromo-3-methylbutane

B. 1-Bromo-3-methylpropane

C. 1-Bromopentane

D. 3-Bromopentane

Answer: A



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6. IUPAC name of $(CH_3)_2CHCH_2CH_2Br$ is

A. Ethylidene bromide

B. Gem - dibromide

C. Any of the above

D. 1,1-Dibromo ethane

Answer: D



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7. n-Butyl chloride and iso butyl chloride are

- A. Position isomers
- B. Functional group isomers
- C. Chain isomers
- D. Metamers

Answer: C



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8. With increase in number of halogen atoms & atomic mass of halogen atoms density of the compounds

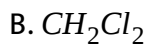
- A. Decreases
- B. Increases
- C. Remains same
- D. Can't say

Answer: B



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9. Among the following, density is maximum for



Answer: D



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10. For the same alkyl (or) aryl group, boiling point, is more for



B. RBr

C. RCl

D. RF

Answer: A



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OBJECTIVE EXERCISE - 1 (PREPARATION OF ETHYLCHLORIDE)

1. Which of the following reagents is not useful to prepare ethyl chloride from ethyl alcohol

A. PCl_3

B. PCl_5

C. SO_2Cl_2

D. $SOCl_2$

Answer: C



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2. The best reagent for the preparation of pure C_2H_5Cl from ethanol is

A. Lucas reagent

B. PCl_5

C. Thionyl chloride in Pyridine

D. Red Phosphorous + Chlorine

Answer: C



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3. $CH_2 = CH_2 + HCl \xrightarrow{x} CH_3 - CH_2Cl$, What is 'X'?

A. Al_2O_3

B. Anhy. $AlCl_3$

C. $NaCl$

D. $MgCl_2$

Answer: B



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4. $3C_2H_5OH + PCl_3 \rightarrow 3C_2H_5Cl + X$, where 'X' is

A. H_3PO_2

B. H_3PO_4

C. H_3PO_3

D. $H_4P_2O_7$

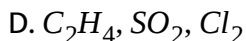
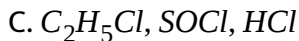
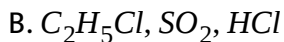
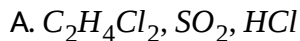
Answer: C



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Pyridine

5. $C_2H_5OH + SOCl_2 \rightarrow X + Y + Z$. In this reaction X, Y & Z are

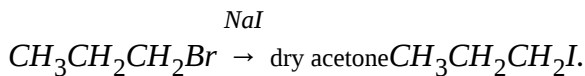


Answer: B



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6. What is the name of the following reaction ?



A. Sandmeyer Reaction

B. Gatterman Reaction

C. Finkelstein Reaction

D. Swarts Reaction

Answer: C



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7. Reactivity of order of halides for 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



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8. Which of the following statements is true in case of alkyl halides ?

- A. They are polar in nature
- B. They can form hydrogen bonds
- C. They are highly soluble in water
- D. They undergo addition reactions

Answer: A



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OBJECTIVE EXERCISE - 1 (PROPERTIES OF ETHYL CHLORIDE)

1. Ethyl iodide when treated with dry silver oxide gives

- A. Ethanol
- B. Diethyl ether
- C. Ethylene
- D. Ethane

Answer: B



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2. Alkyl halides are almost insoluble in water because

- A. They are ionic compounds
- B. They have medium polarity
- C. They do not form hydrogen bonds with water
- D. A They have tetrahedral geometry

Answer: C



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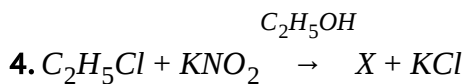
3. The major product formed when alcoholic AgNO_2 reacts with ethyl chloride is

- A. Ethyl nitrite
- B. Ethyl nitrate
- C. Nitroethane
- D. Ethyl dinitrate

Answer: C



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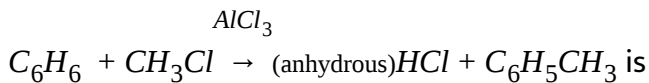
Substance X' in the reaction is

- A. $\text{C}_2\text{H}_5\text{ONO}$
- B. $\text{C}_2\text{H}_5\text{NO}$
- C. $\text{C}_2\text{H}_5\text{NO}_2$
- D. $\text{O}_2\text{NC}_2\text{H}_4\text{NO}_2$

Answer: A

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5. The reaction



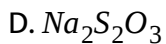
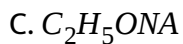
- A. Friedel - Crafts alkylation
- B. Addition reaction
- C. Friedel - Crafts acylation
- D. Friedel Crafts benzylation

Answer: A

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6. Chloroethane reacts with X to form diethyl ether. What is X?

- A. $NaOH$
- B. H_2SO_4



Answer: C



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7. The solvent used in the preparation of Grignard reagent is

A. dry ether

B. dry acetone

C. dry alcohol

D. dry chloroform

Answer: A



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8. Ethyl chloride does not react with

A. Na, dry ether

B. Aq. $AgNO_3$

C. KCN

D. Mg, dry ether

Answer: B



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9. Ethyl chloride reacts with sodium metal in presence of dry ether and forms

A. Isobutane

B. n-butane

C. Neopentane

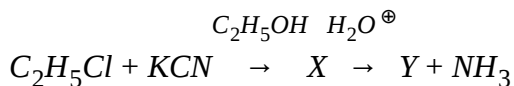
D. Tertiary butyl chloride

Answer: B

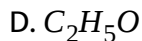
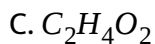
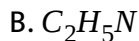
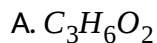


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10. In the reaction sequence,



What is the molecular formula of 'Y' ?



Answer: A



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11. Ethyl chloride is not used in

A. Preparation of T.E.L.

B. Local anaesthesia

C. General anaesthesia

D. Ethylating agent

Answer: C



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12. Metal present in Grignard reagent is

A. Na

B. Mg

C. Al

D. Zn

Answer: B



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13. When ethyl chloride is reacted with alcoholic KOH, ethylene is formed.

This is an example of reaction

- A. Addition
- B. Substitution
- C. Elimination
- D. Rearrangement

Answer: C



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14. What is 'X' in the following reaction ? $C_2H_5Cl + X \rightarrow C_2H_5OH + KCl$

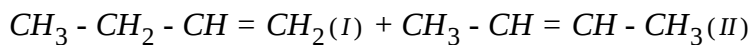
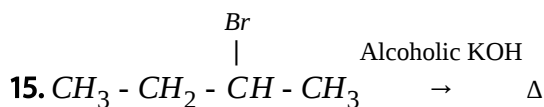
- A. $KHCO_3$
- B. Alcoholic KOH
- C. Aqueous KOH

D. K_2CO_3

Answer: C



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Which of the following statement are correct

- 1) I is the major product of the reaction
- 2) II is the major product of the reaction
- 3) Formation of I is in accordance with Saytzeff rule.
- 4) II is more stable because it is more substituted

A. a, c

B. b, c

C. a, b

D. b, d

Answer: D



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OBJECTIVE EXERCISE - 1 (CHLOROFORM)

1. The IUPAC name of CHCl_3 is

- A. Chloroform
- B. Trichloromethane
- C. Chloromethane
- D. Dichloromethane

Answer: B



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LIST - 1

A) CCl_4

B) CHCl_3

2. C) Gemdihalide

D) Vicinaldihalide

LIST - 2

1) CH_3CHCl_2

2) Solvent

3) $\text{CH}_2\text{ClCH}_2\text{Cl}$

4) Anaesthetic

5) Toluene

A B C D

A. 5 3 1 2

A B C D

B. 1 4 3 2

A B C D

C. 5 3 2 1

A B C D

D. 2 4 1 3

Answer: D



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LIST - 1

A) $\text{C}_2\text{H}_5\text{Cl}$

B) $\text{C}_2\text{H}_5\text{MgBr}$

3. C) $\text{C}_2\text{H}_5\text{Cl} + \text{C}_2\text{H}_5\text{ONa}$

D) Na + dry ether

LIST - 2

1) Williamson synthesis

2) Wurtz reaction

3) Local Anaesthetic

4) Antiseptic

5) Grignard reagent

- | | | | | |
|----|---|---|---|---|
| | A | B | C | D |
| A. | 3 | 5 | 1 | 2 |
-
- | | | | | |
|----|---|---|---|---|
| | A | B | C | D |
| B. | 5 | 3 | 1 | 2 |
-
- | | | | | |
|----|---|---|---|---|
| | A | B | C | D |
| C. | 3 | 4 | 1 | 2 |
-
- | | | | | |
|----|---|---|---|---|
| | A | B | C | D |
| D. | 3 | 5 | 1 | 4 |

Answer: A



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4. Give the decreasing boiling points of ortho para and metadichlorobenzene

- A. ortho > para > meta
- B. meta > ortho = para
- C. ortho > para = meta
- D. meta = para = ortho

Answer: C



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Reactants

Products

A) $C_2H_5Cl, NaOH$

i) $CH_3CH_2NO_2$

B) $C_2H_5Cl, AgCN$

ii) C_2H_4

5. C) C_2H_5OH

iii) C_2H_5OH

D) $C_2H_5Cl, \text{ethanolic KOH}$

iv) CH_3CH_2NC

v) C_2H_6

A. A B C D
v iii iv i

B. A B C D
i ii iii iv

C. A B C D
iii iv i ii

D. A B C D
iv i ii iv

Answer: C



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List - 1

List - 2

6. A) Dehydrohalogenation 1) $\text{Na} + \text{C}_2\text{H}_5\text{OH}$
B) Dehalogenation 2) *conc.* H_2SO_4
C) Dehydration 3) *aq.* KOH
D) Hydrolysis 4) *alc.* KOH
5) Ethanolic zinc

A. A B C D
 2 5 1 3

B. A B C D
 4 5 2 3

C. A B C D
 1 5 2 3

D. A B C D
 3 5 4 2

Answer: B



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7. The shape of chloroform molecule is

A. Tetrahedral

B. Pyramidal

C. Planar trigonal

D. Distorted tetrahedral

Answer: D



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8. The hybridisation of carbon in CHCl_3 is

A. sp^3

B. sp^2

C. sp

D. sp^3d

Answer: A



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9. Which of the following poisonous gases is formed when chloroform is exposed to light and moist air?

- A. Mustard gas
- B. Phosgene
- C. Chlorine
- D. Carbon monoxide

Answer: B



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OBJECTIVE EXERCISE - 1 (OPTICAL ISOMERISM)

1. Which of the following is an optically active compound ?

- A. 1-Butanol
- B. 1-Propanol

C. 2-Chlorobutane

D. 4-Hydroxyheptane

Answer: C



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2. Optical isomers which are non-superimposable mirror images of each other are called

A. Enantiomers

B. Diastereomers

C. Tautomers

D. Geometrical isomers

Answer: A



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3. Optically active isomers but not mirror images are called

- A. enantiomers
- B. mesomers
- C. tautomers
- D. diastereomers

Answer: D



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4. An organic molecule necessarily shows optical activity if it

- A. contains asymmetric carbon atom
- B. is non polar
- C. is non-superimposable on its mirror image
- D. is superimposable on its mirror image

Answer: C



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5. A molecule is said to be chiral if it

- A. contains a plane of symmetry
- B. contains a centre of symmetry
- C. cannot be superimposed on its mirror image
- D. exists as cis-trans-isomers

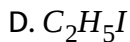
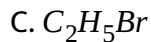
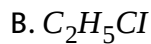
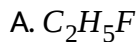
Answer: C



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OBJECTIVE EXERCISE - 1 (MECHANISM OF NUCLEOPHILIC SUBSTITUTIONS)

1. Amongst the following the most reactive alkyl halide is



Answer: D



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2. The order of reactivity of alkyl halides depends upon:

A. nature of alkyl group

B. nature of halogen atom

C. nature of both alkyl group and halogen atoms

D. none of the above

Answer: C



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3. The order of reactivities of the following alkyl halides for a S_N2 reaction is

A. $RF \gt RCl \gt RBr \gt RI$

B. $RF \gt RBr \gt RCl \gt RI$

C. $RCl \gt RBr \gt RF \gt RI$

D. $RI \gt RBr \gt RCl \gt RF$

Answer: D



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4. S_N1 reactions occur through the intermediate formation of

A. Carbocations

B. Carbanions

C. Free radicals

D. None of these

Answer: A



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5. The reaction $(CH_3)_3C - Br \xrightarrow{H_2O} (CH_3)_3C - OH$ is ----- reaction.

A. elimination

B. substitution

C. free radical

D. displacement

Answer: B



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6. An optically active halide when allowed to react with CN^- gives a racemic mixture. The halide is most likely to be

A. 1°

B. 2°

C. 3°

D. 4°

Answer: C



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7. A dextrorotatory optically active alkyl halide undergoes hydrolysis by S_N2 mechanism. The resulting alcohol is.

A. Dextrorotatory

B. Laveorotatory

C. Optically inactive due to racemisation

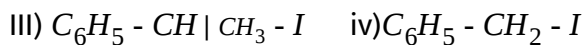
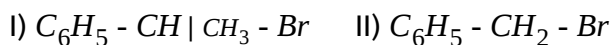
D. May be dextro (or) laevorotatory

Answer: D



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8. Following is the list of four halides. Select correct sequence of decreasing order of reactivity for S_N1 reaction using the codes given below



A. III gt I gt IV gt II

B. III gt I gt II gt IV

C. I gt III gt IV gt II

D. I gt III gt II gt IV

Answer: A



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9. In the reaction, $R-Br + Cl \rightarrow R-Cl + Br^-$. The rates of SN_2 reaction of ethyl bromide (I), n-propyl bromide (II), isobutyl bromide (III) and neopentyl bromide (IV) follow the order:

A. IV gt III gt II gt I

B. I gt II gt III gt IV

C. I gt III gt II gt IV

D. III gt II gt IV gt I

Answer: B

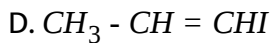
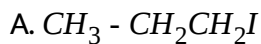


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10. In the reaction,

$$CH_3 - CHCH_2Br - (CH_3) \xrightarrow{\text{Alc. KOH}} (A) \xrightarrow{HBr} \text{peroxide}(B) \xrightarrow{NaI} \text{Acetone}(C).$$

The compound (C) is

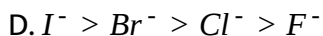
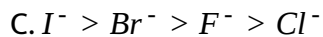
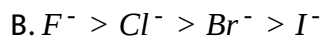
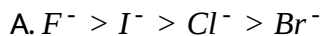


Answer: A



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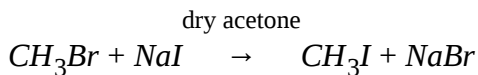
11. The order of the nucleophilicity of F^- , Cl^- , Br^- and I^- in protic solvents is



Answer: D

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12. Identify the name of the following reaction



A. Finkelstein reaction

B. Gatterman Reaction

C. Sandmeyer reaction

D. Wurtz reaction

Answer: A

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OBJECTIVE EXERCISE - 1 (HALOARENES (CHLOROBENZENE))

1. Fluoro benzene cannot be prepared by direct fluorination since

- A. F_2 is highly reactive
- B. F_2 is inert
- C. Reaction with F_2 reversible
- D. F_2 reacts slowly

Answer: A



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2. In Gattermann reaction, a diazonium group is replaced by X using Y. X and Y are

- A. $\begin{matrix} X & Y \\ Cl^{\ominus} & Cu/HCl \end{matrix}$
- B. $\begin{matrix} X & Y \\ Cl^{\oplus} & CuCl_2/HCl \end{matrix}$
- C. $\begin{matrix} X & Y \\ Cl^{\ominus} & CuCl_2/HCl \end{matrix}$
- D. $\begin{matrix} X & Y \\ Cl_2 & Cu_2O/HCl \end{matrix}$

Answer: A



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3. Aryl halides are less reactive towards nucleophilic substitution reaction as compared to alkyl halides due to

- A. The formation of less stable carbanion
- B. Resonance stabilization of aryl halides
- C. Longer C-halogen bond
- D. Inductive effect

Answer: B



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4. Towards, nucleophilic substitution chlorobenzene is

- A. More reactive than ethyl chloride
- B. More reactive than isopropyl chloride

- C. As reactive as methyl chloride
- D. Less reactive than benzyl chloride

Answer: D



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5. Aryl halides can be prepared by

- A. Sand mayer's method
- B. Friedel - craft reaction
- C. Gattermann's reaction
- D. 1 and 3

Answer: D



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6. The conditions that are necessary in the preparation of aryl halides from arenes

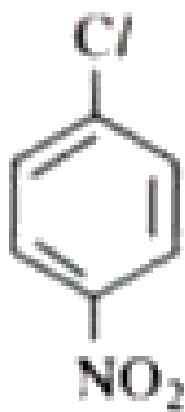
- A. Low temperature
- B. Absence of sunlight
- C. Presence of halogen carrier
- D. All of the above

Answer: D

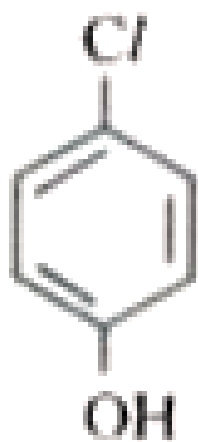


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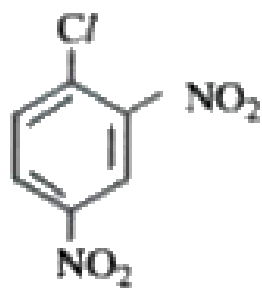
7. Which of the following is least reactive towards nucleophilic substitution with aqueous KOH?



A.



B.



C.



D.

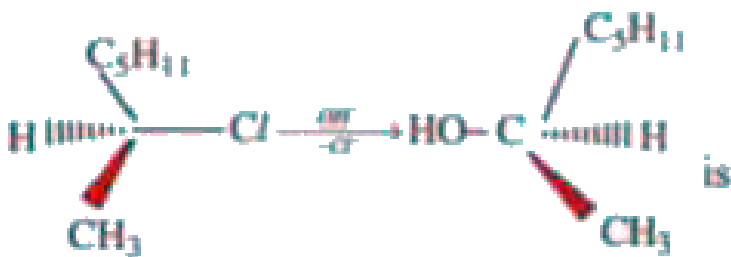
Answer: B



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OBJECTIVE EXERCISE - 1 (PROPERTIES OF CHLOROBENZENE)

1. The reaction given



A. S_N1

B. S_N2

C. E_1

D. E_2

Answer: B



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2. $C_2H_5Cl \xrightarrow{aq} Ag_2OA \xrightarrow{Al_2O_5} 360^\circ CB \xrightarrow{S_2Cl_2} \text{ .}$ In the above sequence of reactions, identify 'C'

A. Chloretone

B. Chloropicrin

C. Mustard gas

D. Lewisite gas

Answer: C



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3. When an alkyl halide is heated with dry Ag_2O , it produces

- A. ester
- B. ether
- C. ketone
- D. alcohol

Answer: B



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4. On sulphonation of C_6H_5Cl

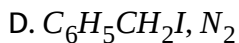
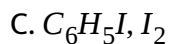
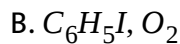
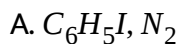
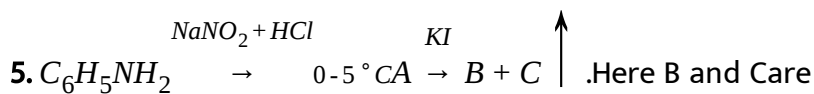
- A. m-chlorobenzenesulphonic acid
- B. Benzenesulphonic acid is formed
- C. o-chlorobenzenesulphonic acid is formed

D. o-and p-chlorobenzenesulphonic acids are formed

Answer: D



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Answer: A



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6. Chlorobenzene on fusing with solid NaOH followed by acidification gives

- A. Benzene
- B. Benzoic acid
- C. Phenol
- D. Benzene chloride

Answer: C



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7. Chlorobenzene on reaction with CH_3Cl in the presence of AlCl_3 will give

- A. Toluene
- B. m - Chloro toluene
- C. p - Chloro toluene
- D. A mixture of o- and p - chlorotoluene

Answer: D



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8. Chlorobenzene reacts with Mg in dry ether to give a compound (A) which further reacts with ethanol to yield

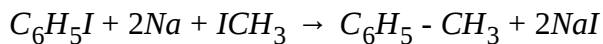
- A. Ethylbenzene
- B. Phenol
- C. Phenylmethyl ether
- D. Benzene

Answer: D



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9. The reaction given below is known as



- A. Wurtz reaction
- B. Fittig reaction
- C. Wurtz - Fittig reaction
- D. Ullmann reaction

Answer: C



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10. Halide most readily hydrolyses is (SN_1)

- A. C_6H_5Cl
- B. $(C_6H_5)_2CHCl$
- C. $C_6H_5CH_2Cl$
- D. $(C_6H_5)_3CCl$

Answer: D



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11. Correct statement about the electrophilic substitution in benzene ring is

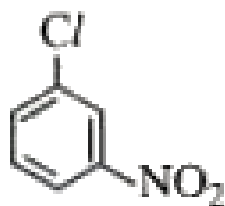
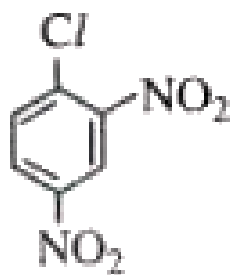
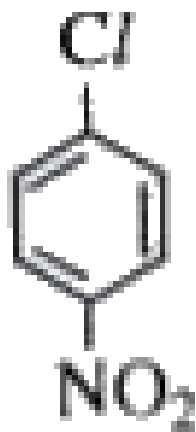
- A. Halogens are benzene ring deactivating groups due to resonance.
- B. Halogens are ortho and para directing groups due to their - I effect.
- C. Halogens are ortho and para directing and benzene ring activating groups.
- D. Halogens are benzene ring deactivating groups due to their - I effect.

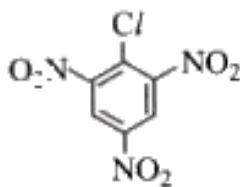
Answer: D



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12. Which one of the following is most reactive in nucleophilic substitution ?





D.

Answer: D



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OBJECTIVE EXERCISE - 1 (POLYHALOGEN COMPOUNDS)

1. Which of the following is used for metal cleaning and finshing

A. $CHCl_3$

B. CCl_4

C. CH_2Cl_2

D. CHI_3

Answer: C



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2. First chlorinated insecticide is

- A. DDT
- B. Gammaxene
- C. BHC
- D. Pyrene

Answer: A



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3. IUPAC name of DDT is

- A. 1,1,1-Trichloro-2, 2-bis (4-chlorophenyl) ethane
- B. p,p' -Dichloro diphenyl trichloro ethane
- C. p,p' -Dichloro diphenyl trichloro benzene

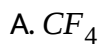
D. Dichloro diphenyl tetrachloro ethane

Answer: A



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4. The correct formula of Freon-12 is

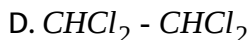
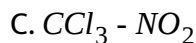
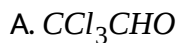


Answer: C



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5. Which one of the following is chloropicrin ?



Answer: C



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6. Match the List I with List II and select the correct answer using the codes given below the lists:

List - I

List - II

A) Teflon

i) Ozone layer depletion

B) Pyrene

ii) Non-biodegradable insecticide

C) DDT

iii) Non-stick cookwares and insulator

D) Freon

iv) Fire extinguisher

A B C D

A. *i ii iii iv*

A B C D

B. *iv iii i ii*

A B C D

C. *iii iv ii i*

A B C D
D. ii i iv iii

Answer: C



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7. Identify the correct statements from the following

- a) Dichloromethane is used as a solvent
- b) Freons are used for refrigeration
- c) CCl_4 causes depletion of ozone layer
- d) Electrophilic substitution reactions halobenzenes occur faster than those of benzene

A. b, c, d

B. c, d

C. a, b, c

D. a, c

Answer: C



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OBJECTIVE EXERCISE - 2 A (INTRODUCTION, NATURE OF C-X BOND)

1. Tertiary alkyl halide among the following is

- A. 2 - Chlorobutane
- B. Secondary butyl chloride
- C. Isobutyl chloride
- D. 3-Chloro-3-methyl pentane

Answer: D



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2. In chloroethane, the carbon bearing halogen is bonded to ---- hydrogen(s). It is called --- alkyl halide

- A. Two, primary
- B. Three, primary
- C. Two, secondary
- D. One, Tertiary

Answer: A



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3. Which of the following is a primary alkyl halide ?

- A. isobutyl bromide
- B. neo - Pentyl chloride
- C. isopentyl bromide
- D. all are primary halides

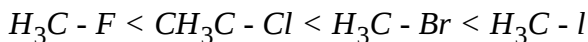
Answer: D



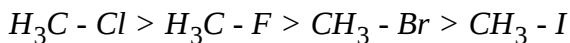
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4. Which of the following order is correct among the following ?

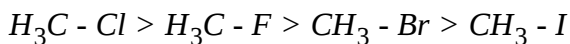
C - X Bond length order is



(ii) C - X Bond enthalpies order is



(III) C-X Bond dipole moment order is



A. Only I & II

B. Only II & III

C. Only I & III

D. All are correct

Answer: D



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5. Which of the following has the highest boiling point ?

- A. 1 - chloropentane
- B. isopentyl chloride
- C. ter-Pentyl chloride
- D. all have equal boiling point

Answer: A



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6. $C_2H_5ClNa \xrightarrow{\text{dry ether}} NaClA$. A on monochlorination gives how many isomers ?

- A. 1
- B. 2
- C. 3

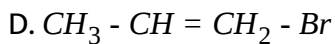
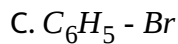
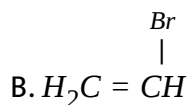
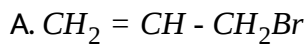
D. 4

Answer: C



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7. Allyl bromide is



Answer: A



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8. In which of the following, chlorine is least reactive ?

- A. Ethyl chloride
- B. Chlorobenzene
- C. Allyl chloride
- D. Methyl chloride

Answer: B



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9. Which of the following statement is correct?

- A) Decreasing order of density of alkyl halides is $\text{RI} > \text{RBr} > \text{RCI} > \text{RF}$
- B) The stability order of alkyl halides is $\text{RF} > \text{RCI} > \text{RBr} > \text{RI}$
- C) Among isomeric alkyl halides the decrease in boiling point is $1^\circ > 2^\circ > 3^\circ$

- A. A only
- B. B only
- C. C only

D. All

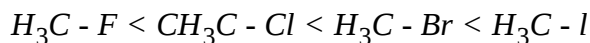
Answer: D



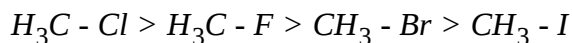
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10. Which of the following order is correct among the following ?

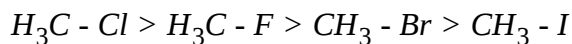
C - X Bond length order is



(ii) C - X Bond enthalpies order is



(III) C-X Bond dipole moment order is



A. Only I & II

B. Only II & III

C. Only I & III

D. All are correct

Answer: D



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11. Of the five isomeric hexanes, the isomer which can give two mono chlorinated compounds is

A. 2,2-dimethyl pentane

B. 2,3-dimethyl butane

C. n-hexane

D. 2-methyl pentane

Answer: B

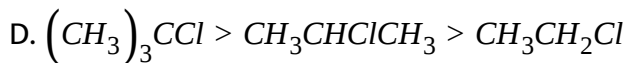
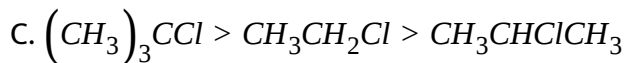
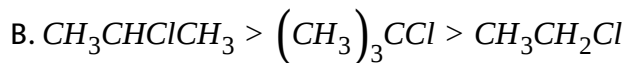


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12. The correct order of reactivity of alkyl halides:

CH_3CH_2Cl , $CH_3CHClCH_3$ and $(CH_3)_3CCl$ towards dehydrohalogenation

?



Answer: D



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13. Which of the following compounds will react readily with ethanolic KCN ?

A. Chlorobenzene

B. Vinyl Chloride

C. Allyl Chloride

D. 4-Chlorotoluene

Answer: C



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14. In which one of the following halides, $C_{sp^2} - X$ bond is present?

- A. Allyl halides
- B. Benzyl halide
- C. Aryl halide
- D. alkyl halide

Answer: C



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15. IUPAC name of the compound with the molecular formula C_4H_9Br and least possible boiling point is

A. 2-Bromo-2-methylpropane

B. 2-Bromobutane

C. 1-Bromobutane

D. 1-Bromo-2-methylpropane

Answer: A



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16. $CH_3 - Br \xrightarrow[\text{ether}]{Mg} X \xrightarrow{(CH_3)_3C-OH}$ A. Product A is

A. CH_4

B. $(CH_3)_3CH$

C. $(CH_3)_3C - O - Br$

D. $(CH_3)_3C - O - CH_3$

Answer: A



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17. An alkyl halide on reaction with sodium in the presence of ether gives 2, 2, 5, 5, - tetramethyl hexane. The alkyl halide possibly

- A. 1 - Chloropentane
- B. 1 - Chloro - 2, 2 - dimethylpropane
- C. 3 - Chloro - 2, 2 - dimethylbutane
- D. 2 - Chloro - 2 - methylbutane

Answer: B

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18. 2-chloro-1-Phenylpropane when treated with alcoholic KOH gives ... as the major product

- A. 1 - Phenylpropene-1

B. 3 - Phenylpropene-1

C. 1 - Phenyl - 2 - propanol

D. 3 - Phenyl - 1 - propanol

Answer: A



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19. Which branched chain isomer of the hydrocarbon with molecular mass 72u gives only one isomer of mono substituted alkyl halide ?

A. Tertiary butyl chloride

B. Neopentane

C. Isohexane

D. Neohexane

Answer: B



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20. 1-Butene + $HBr \rightarrow$ $h\nu$ 1-Bromobutane

The above reaction follows

- A. Markownikoff's rule
- B. Saytzeff's rule
- C. AntiMarkownikoff's rule
- D. Hoffmann's rule

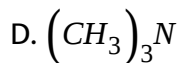
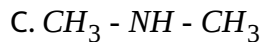
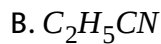
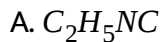
Answer: C



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OBJECTIVE EXERCISE - 2 A (PREPARATION AND PROPERTIES OF ETHYL CHLORIDE)

1. Ethyl chloride on heating with silver cyanide forms a compound X. The functional isomer of X is

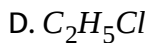
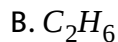
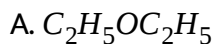


Answer: B



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2. Hydrogen chloride and SO_2 are the by products in the reaction of ethanol with thionyl chloride. Which of the following is the main product in this reaction ?



Answer: D



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3.

Covalence of carbon in the functional group of C and D are

A. 3, 3

B. 4, 4

C. 4, 3

D. 3, 4

Answer: C



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4. C_2H_5Cl $\xrightarrow{NH_3alc}$ A_{final} Covalence of 'N' in 'A' is

A. 4

B. 3

C. 2

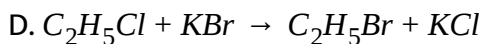
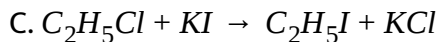
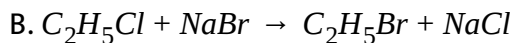
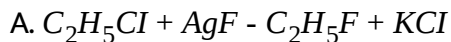
D. 1

Answer: A



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5. Which one of the following reaction is Swart reaction ?



Answer: A



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6. $CH_3COOAg + C_2H_5Cl \rightarrow A$ (organise) Wrong statement about 'A' is

- A. A is an ester
- B. IUPAC name of 'A' is ethylethanoate
- C. Functional isomer of 'A' is butyric acid
- D. All carbons in 'A' are sp^2 hybridised

Answer: D



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7. Ethyl chloride can be converted into ethane by reacting with

- A. $Zn + HCl$

B. LiAlH_4

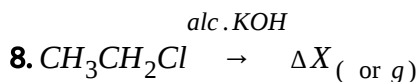
C. H_2/Ni

D. All the above

Answer: D



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Wrong statement about the above reaction

A. Hybridization of 'C' changed from sp to sp^2

B. C-C bond length is decreased

C. C-H bond length is increased

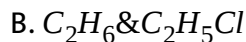
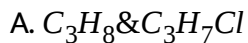
D. Bond angle increased

Answer: C



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9. Identify Z in the following series $C_2H_5I \xrightarrow{Alc. KOH} X \xrightarrow{Br_2} Y \xrightarrow{KCN} Z$

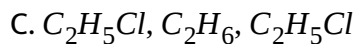
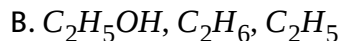
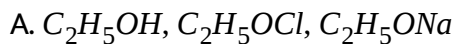


Answer: B



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10. Compound A reacts with PCl_5 to give B which on treatment with KCN followed by hydrolysis gave propionic acid. What are A & B respectively?



D. C_2H_5OH , C_2H_5ONa , C_2H_5Cl

Answer: D



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11. The carbon compound "A" forms "B" with sodium metal and again forms "C" with PCl_5 , but "B" reacts with "C" to form diethyl ether. Therefore A, B and C are respectively.

A. C_2H_5OH , C_2H_5OCl , C_2H_5ONa

B. C_2H_5OH , C_2H_6 , C_2H_5

C. C_2H_5Cl , C_2H_6 , C_2H_5Cl

D. C_2H_5OH , C_2H_5ONa , C_2H_5Cl

Answer: D



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12. 1-Bromopropane on reaction with $LiAlH_4$ yields

- A. Propane
- B. Hexane
- C. Propene
- D. Propyne

Answer: A



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13. $CH_3 - CH_2 - CH_2 - Cl \xrightarrow{alc} KOH \xrightarrow{HBr} C \xrightarrow{Na} ether \xrightarrow{D}$. In the above sequence the product D is

- A. Propane
- B. Dimethylbutane
- C. Hexane
- D. Allyl bromide

Answer: B



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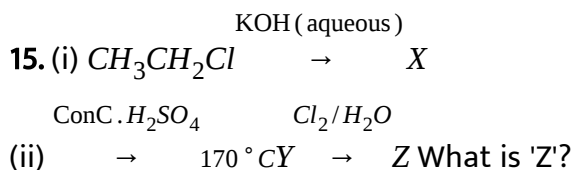
14. Ethyl bromide reacts with lead-sodium alloy to form

- A. Tetraethyl lead
- B. Tetramethyl bromide
- C. Both (1) and (2)
- D. None of these

Answer: A



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A. Ethylene chlorohydrin

B. 1,2-Dichloroethane

C. Ethylene glycol

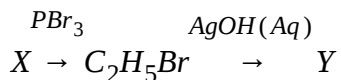
D. Ethyl chloride

Answer: A



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16. What are X and Y respectively in the following reaction?



A. CH_3OH , C_2H_6

B. C_2H_5OH , C_2H_5Br

C. CH_3COOH , CH_3CH_2OH

D. C_2H_5OH , C_2H_5OH

Answer: D

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17. $C_2H_5Cl + Mg \xrightarrow{H_2O} x \rightarrow Y$. $C_2H_5Cl \xrightarrow{LiAlH_4} z$, then y and z are

- A. same alkanes
- B. Different alkynes
- C. Same alkanes
- D. Alkynes

Answer: C

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18. What are the reagent and reaction conditions used for converting ethyl chloride to ethyl nitrite (as the major product) ?

- A. $KNO_2, C_2H_5OH, H_2O, \Delta$

B. $\text{NaNO}_2, \text{HCl}, 0^\circ \text{C}$

C. $\text{KCN}, \text{H}_2\text{O}, \Delta$

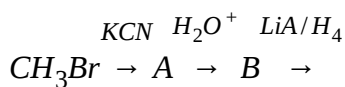
D. $\text{AgNO}_2, \text{C}_2\text{H}_5\text{OH}, \text{H}_2\text{O}, \Delta$

Answer: A



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19. In the following sequence of reactions



A. Acetone

B. Ethyl alcohol

C. Methane

D. Acetaldehyde

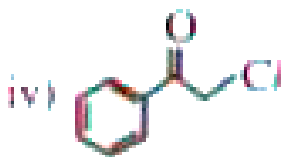
Answer: B



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20. The reactivity order of below compounds with KI in acetone is :

i) $\text{CH}_3 - \text{CHCl} - \text{CH}_3$ ii) $\text{CH}_3\text{OCH}_2\text{Cl}$



A. iii gt iv gt ii gt i

B. ii gt iii gt iv gt i

C. iv gt ii gt iii gt i

D. iv gt iii gt ii gt i

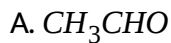
Answer: D



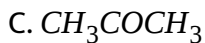
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OBJECTIVE EXERCISE - 2 A (CHLOROFORM)

1. Iodoform test is not answered by



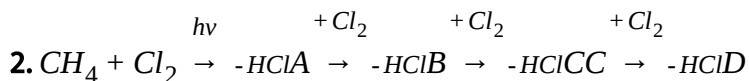
B. 3-pentanone



Answer: B



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Correct order of Dipole moments is

A. D gt C gt B gt A

B. C gt B gt A gt D

C. A gt C gt B gt D

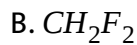
D. A gt B gt C gt D

Answer: D



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3. Among the following a refrigerant is



Answer: D



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1. In S_N1 reactions, rate of reaction depends on

a) Concentration of alkyl halide

b) Concentration of nucleophile

c) Nature of alkyl halide

A. all

B. 'a' and 'c' only

C. 'a' and 'b' only

D. 'c' only

Answer: B



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2. Isopropyl chloride undergoes hydrolysis by

A. S_N1 mechanism

B. S_N2 mechanism

C. S_N1 and S_N2 mechanisms

D. Either S_N1 or S_N2 mechanism

Answer: D



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

A. Benzyl bromide

B. Bromobenzene

C. Vinyl bromide

D. Benzyl chloride

Answer: A



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4. The order of reactivities of the following alkyl halides for a S_N2 reaction is

A. $RF \gt RCl \gt RBr \gt RI$

B. $RF \gt RBr \gt RCl \gt RI$

C. $RCl \gt RBr \gt RF \gt RI$

D. $RI \gt RBr \gt RCl \gt RF$

Answer: D



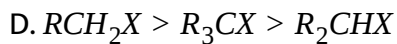
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5. Which of the following is the correct order of decreasing S_N2 reactivity? (X=a halogen)

A. $RCH_2X \gt R_2CHX \gt R_3CX$

B. $R_3CH \gt R_2CHX \gt RCH_2X$

C. $R_2CHX \gt R_3CX \gt RCH_2X$



Answer: A



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6. The ratio of relative rates of isopropyl bromide and ethyl bromide in S_N1 reaction is

A. 11 : 1

B. 1 : 11

C. 1 : 100

D. 1 : 1000

Answer: A



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7. Tertiary alkyl halides are practically inert to substitution by S_N2 mechanism because of

- A. Insolubility
- B. Instability
- C. Inductive effect
- D. Steric hindrance

Answer: D



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8. Arrange the following

$CH_3CH_2CH_2Cl(I)$, $CH_3CH_2-CHCl-CH_3(II)$, $(CH_3)_2CHCH_2Cl(III)$ and $(CH_3)_3CCl(IV)$ in order of decreasing tendency towards S_N2 reaction

- A. I > III > II > IV
- B. III > IV > II > I

C. II gt I gt III gt IV

D. IV gt III gt II gt I

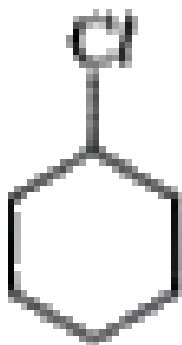
Answer: A



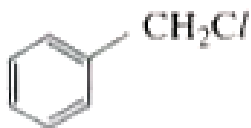
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9. Which of the following will be the least reactive towards nucleophilic substitution?

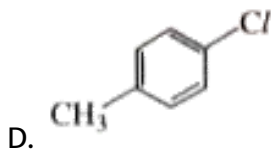
A. C_2H_5Cl



B.



C.



Answer: D

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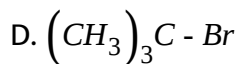
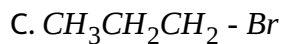
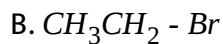
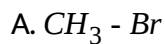
10. Characteristic reactions of alkyl halides are

- A. Electrophilic substitution reactions
- B. Electrophilic addition reactions
- C. Nucleophilic addition reactions
- D. Nucleophilic substitution reactions

Answer: D

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11. Which of the following alkyl halides is hydrolysed by S_N^1 mechanism ?

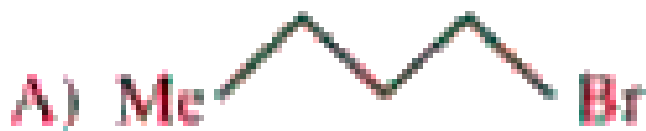


Answer: D



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12. Consider the following bromides



The correct

order of S_N1 reactivity is

A. A gt B gt C

B. B gt C gt A

C. B gt A gt C

D. C gt B gt A

Answer: B



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13. Which of the following is the correct order of decreasing reactivity towards nucleophilic substitution reaction ?

- A. n-Propyl chloride gt Allyl chloride gt Vinyl chloride
- B. Allyl chloride gt n-Propyl chloride gt Vinyl chloride
- C. Allyl chloride gt Vinyl chloride gt n-Propyl chloride
- D. Vinyl chloride gt Allyl chloride gt n-Propyl chloride

Answer: B



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14. S_N2 reactions are

- A. Stereospecific but not stereoselective
- B. Stereoselective but not stereospecific
- C. Stereoselective as well as stereospecific
- D. Neither stereoselective nor stereospecific

Answer: C



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15. Which of the following halides would undergo nucleophilic substitution most readily (SN_1)?

- A. 1 - Chloro - 1 - butene
- B. 2 - Chloro - 1 - butene
- C. 3 - Chloro - 1 - butene
- D. 4 - Chloro - 1 - butene

Answer: C



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16. Incorrect statement about nucleophilic substitution reaction is

- A. Reactivity of halides towards SN mechanism is $3^\circ > 2^\circ > 1^\circ$ alkyl halides
- B. Polar solvents favour S_N1 reactions
- C. Reactivity of halides towards S_N2 mechanism is $1^\circ > 2^\circ > 3^\circ$
- D. alkyl halide Low concentration of nucleophile favours S_N2 mechanism

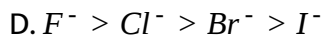
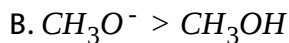
Answer: D



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17. In reactions the incorrect order of reactivity of nucleophiles is

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



Answer: D



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18. Incorrect statement about nucleophilic substitution reactions is

A. A bulky nucleophile prefers elimination

B. Benzyl halides are more reactive in S_N^1 reactions

C. Aryl halides are more reactive than alkyl halides

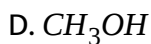
D. Nucleophile has no influence on the rate of S_N^1 reactions

Answer: C



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19. In the reaction with CH_3I , the most reactive nucleophile among the following is

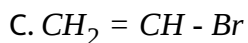
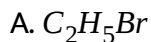


Answer: C



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20. Which of the following compounds would be hydrolysed most easily (SN_1)?





Answer: D



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21. Which of the following is least reactive towards nucleophilic displacement reaction when treated with aqueous KOH ?

A. 2, 4, 6-Trinitrochlorobenzene

B. 2, 4-Dinitrochlorobenzene

C. 4-Nitrochlorobenzene

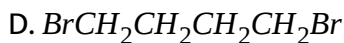
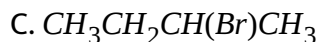
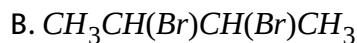
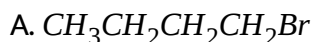
D. 3-Nitrochlorobenzene

Answer: D



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22. An unknown alkyl halide (A) reacts with alcoholic KOH to produce a hydrocarbon (C_4H_8). Ozonolysis of the hydrocarbon forms one mole of propionaldehyde and one mole of formaldehyde. Suggest which organic structure among the following is the correct structure of the above alkyl halide (A) ?



Answer: A



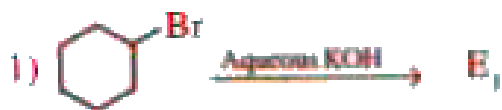
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23. Match the following set-I with appropriate one from the set-2

Reaction

Reaction [Set-1]

Mechanism [Set-2]



A. $(1 - E_1), (2 - SN^2), (3 - SN^1), (4 - E_2)$

B. $(1 - E_2), (2 - SN^1), (3 - E_1), (4 - SN^2)$

C. $(1 - SN^2), (2 - E_2), (3 - SN^1), (4 - E_1)$

D. $(1 - SN^2), (2 - E_2), (3 - E_1), (4 - SN^1)$

Answer: D



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24. The correct order of reactivity of the following compounds towards S_N1 reaction is



A. I gt IV gt III gt II

B. II gt III gt IV gt I

C. I gt IV gt II gt III

D. IV gt III gt I gt II

Answer: B



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OBJECTIVE EXERCISE - 2 A (HALOARENES)

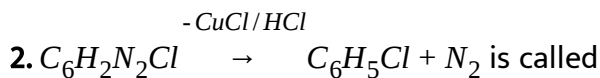
1. The reaction of toluene with Cl_2 in presence of $FeCl_3$ gives predominantly

- A. m - Chloro toluene
- B. Benzoyl chloride
- C. Benzyl chloride
- D. o - & p - Chloro toluenes

Answer: D



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- A. Etard reaction
- B. Sandmeyer reaction
- C. Wurtz-Fittig's reaction
- D. Perkin's reaction

Answer: B



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3. Which of the following reactions does not result in the formation of new C-C bond?

A. Wurtz-Fittig reaction

B. Fittig reaction

C. Williamson synthesis

D. Wurtz reaction

Answer: C



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4. Identify the correct order of reactivity of the following towards the nucleophilic substitution



A. 1 gt 3 gt 2 gt 4

B. 4 gt 3 gt 2gt 1

C. 3 gt 1 gt 4 gt 2

D. 2 gt 3 gt 4 gt 1

Answer: A



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5. How many trichloroethanes would be produced when 1, 1-dichloroethane reacts with chlorine ?

A. One

B. Two

C. Three

D. Four

Answer: B



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6. 'Pyrene' is the trade name of which is used as fire extinguisher

A. CO_2

B. $CHCl_3$

C. CCl_4

D. CH_5Cl_2

Answer: C



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7. What is DDT among the following

- A. Greenhouse gas
- B. A fertilizer
- C. Biodegradable pollutant
- D. Non-biodegradable pollutant

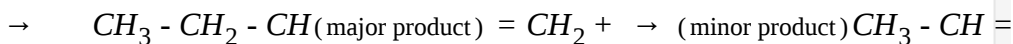
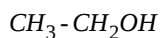
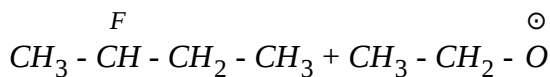
Answer: D



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OBJECTIVE EXERCISE - 2B

1. In the given E_2 reaction



The transition state has

- A. carbanion-like character
- B. carbocation-like character
- C. free radical character
- D. much like alkene character

Answer: A



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2. Wrong statement of the following is

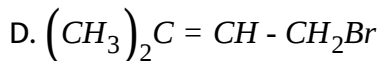
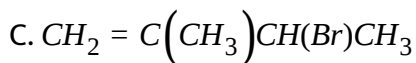
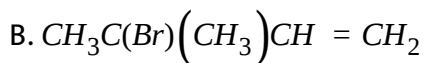
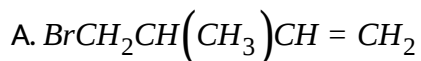
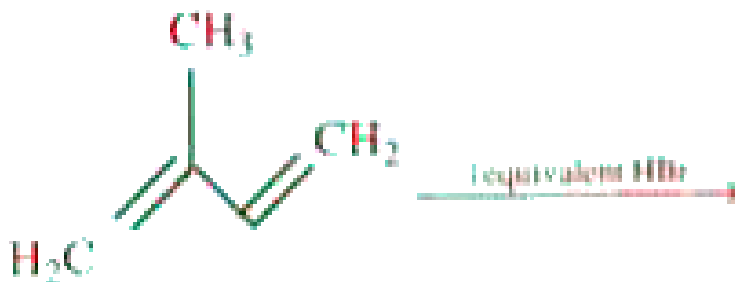
- A. E_2 elimination is favoured by strong bronsted base
- B. Reactivity order of alkyl halides towards E_1 elimination is $3^\circ > 2^\circ > 1^\circ$
- C. In E_{1CB} reaction carbocation is formed as intermediate
- D. Hofmann product is the major product with bulky base in E_2 elimination

Answer: C



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3. In the following reaction, the major product (thermodynamically stable) is



Answer: D



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4. Maximum number of mono chloro derivatives possible for structural only)



- A. 4
- B. 6
- C. 8
- D. 14

Answer: C



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5. Pick up the incorrect statement

A. sp^2 - triplet carbene is more stable than sp^2 singlet carbene

B. Compounds containing poor leaving group with B-hydrogen highly acidic, will undergo E_1CB reaction

C. $CH_3 - CH_2 - \overset{\overset{Br}{|}}{CH} - (CH_3) \xrightarrow{(CH_3)_2OK / \Delta}$ forms major Hofmann elimination product than Saytzeff's product

D. E_2 reaction is carried out with low concentration of a weak base

Answer: D

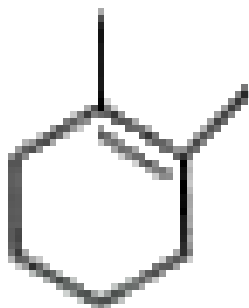


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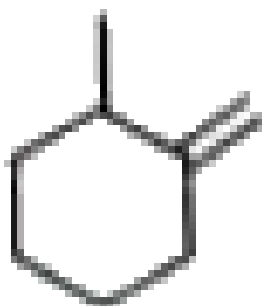
6.



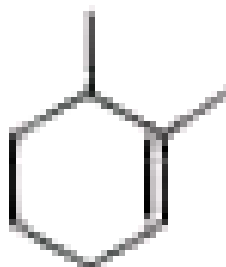
$\xrightarrow{\text{Zn dust}}$
B(major) \rightarrow Ethanoic C. The final product 'C' is



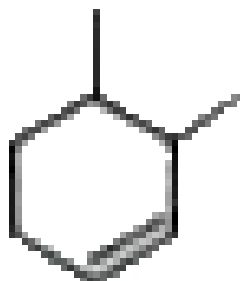
A.



B.



C.



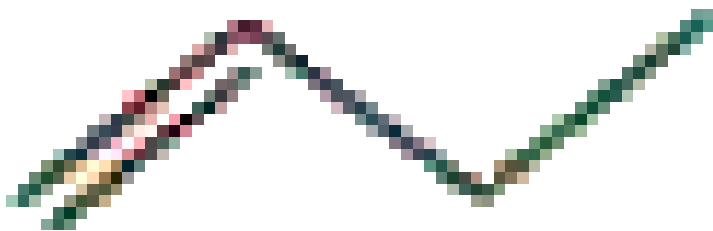
D.

Answer: A



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7. Maximum number of isomers formed when



is treated

with N-Bromo succinamide is

A. 1

B. 2

C. 3

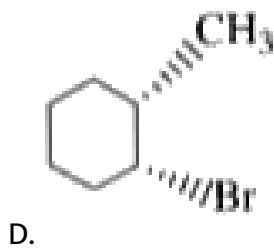
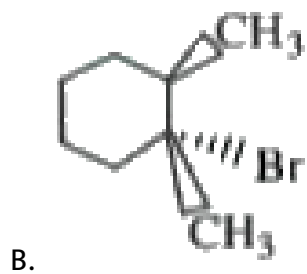
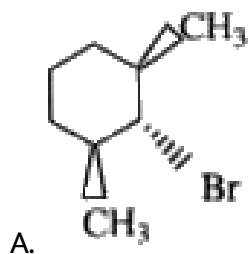
D. 4

Answer: D



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8. Rate of Dehydrobromination is more in $[E_2]$

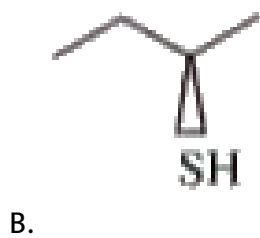
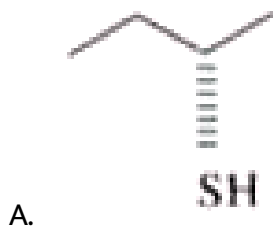


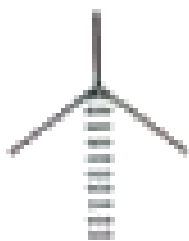
Answer: B



9.

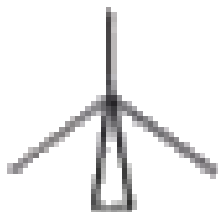
Here the product 'X' is





SH

C.



SH

D.

Answer: B



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10. . Maximum number of wurtz reaction products formed are

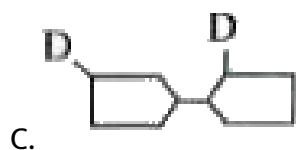
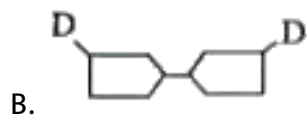
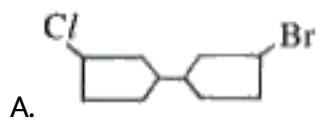
- A. 2
- B. 3
- C. 4
- D. 8

Answer: B



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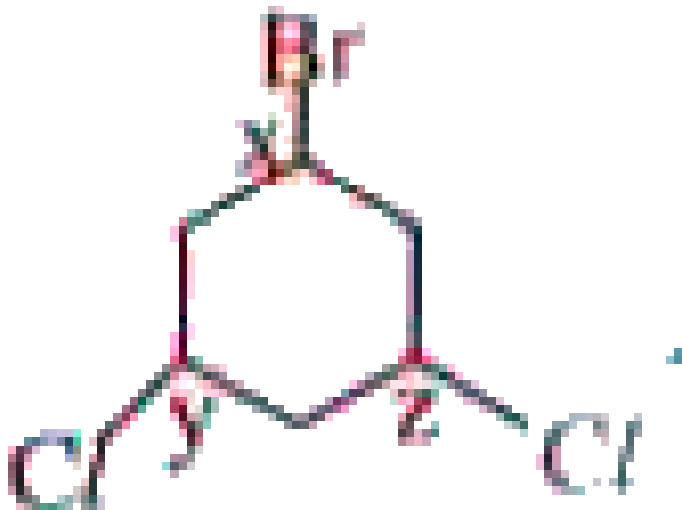
11. Identify the product 'X' in the reaction



Answer: B



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12.

In the above molecule, the chiral centres are

A. both x and y

B. both y and z

C. both x and z

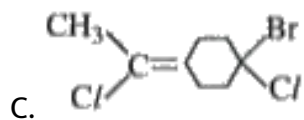
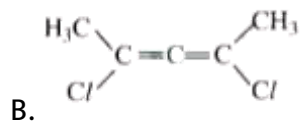
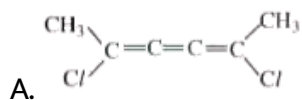
D. x, y and z

Answer: B



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13. Among the following which cannot exhibit optical isomerism



Answer: A



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14. For the following reactions



The correct decreasing order of enthalpy of formation of carbocation is

A. $\Delta H_1 > \Delta H_2 > \Delta H_3 > \Delta H_4$

B. $\Delta H_4 > \Delta H_1 > \Delta H_2 > \Delta H_3$

C. $\Delta H_3 > \Delta H_2 > \Delta H_1 > \Delta H_4$

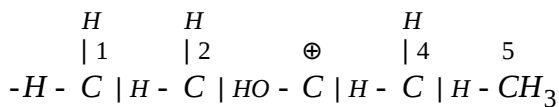
D. $\Delta H_2 > \Delta H_1 > \Delta H_4 > \Delta H_3$

Answer: B



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15. In the following carbocation, H/CH_3 that is most likely to migrate to the positively charged carbon is



A. CH_3 at C - 4

B. H at C - 4

C. CH_3 at C - 2

D. H at C - 2

Answer: D



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16. Among the following the strongest nucleophile is

A. SH^-

B. OH^-

C. CN^-

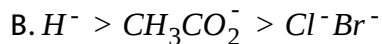
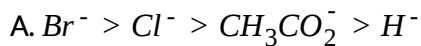
D. I^-

Answer: A



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17. The correct order of leaving group ability in a nucleophilic substitution reaction is



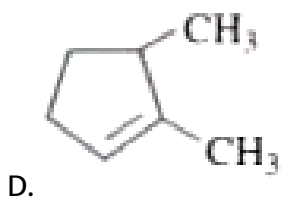
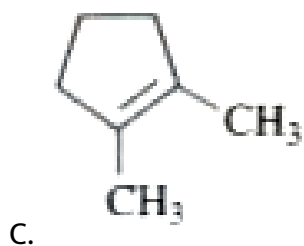
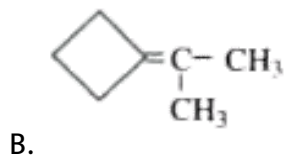
Answer: A



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The major elimination product 'X' is :



Answer: C



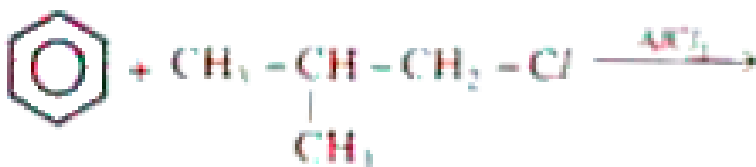
19. An internal nucleophilic substitution reaction involves the

- A. Complete retention
- B. Complete inversion
- C. Formation of Racemic mixture
- D. Change in Absolute configuration

Answer: A

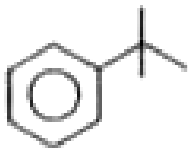


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20.

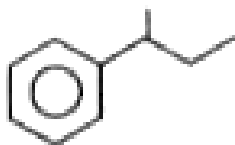
The final organic product is



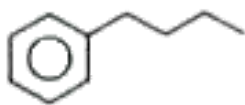
A.



B.



C.

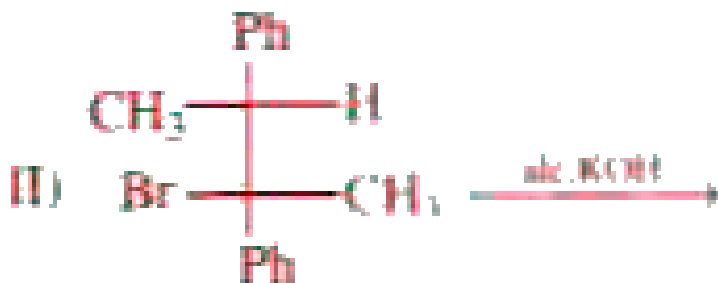
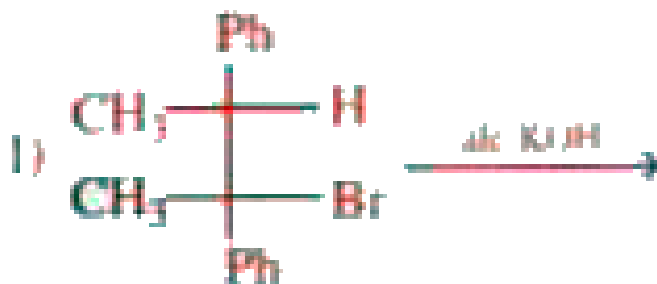


D.

Answer: A



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21.

Products of reactions (I) and (II) are

A. cis , cis

B. cis , trans

C. trans, cis

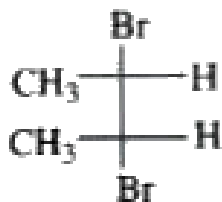
D. trans , trans

Answer: C

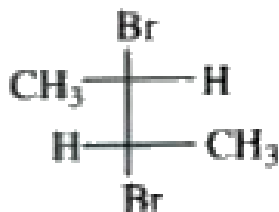


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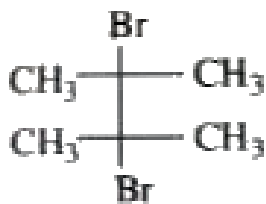
22. Which among the following on dehalogenation will give trans-alkene ?



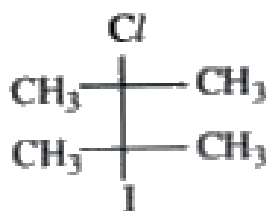
A.



B.



C.



D.

Answer: A



23. $R_2CH - C \mid X - R_2 + , B^- R_2C = CR + H - B + X^-$. This reaction is an example of

- A. E_1 reaction
- B. E_2 reaction
- C. E_1cb reaction
- D. First order reaction

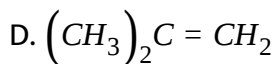
Answer: B



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24. $CH_3 - \text{uBrnderst}(\mid)(CH) - CH_2 - CH_3 \xrightarrow{Me_3COK} X$. The product 'X' is

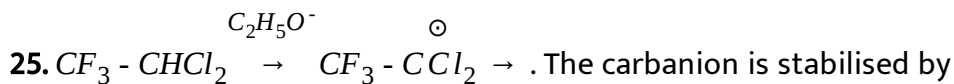
- A. $CH_2 = CH - CH_2 - CH_3$
- B. $CH_3 - CH = CH - CH_3$



Answer: A



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a) $-I$ effect of CF_3

b) $+I$ effect of CF_3

c) d-orbital resonance of Cl atm.

A. a only

B. both b and c

C. both a and c

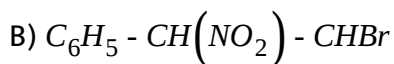
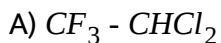
D. c only

Answer: C



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26. El_{CB} reaction is given by which of the following



A. A only

B. B only

C. Neither A nor B

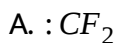
D. Both A and B

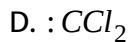
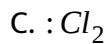
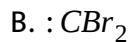
Answer: D



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27. Which of the following singlet carbene is most stable



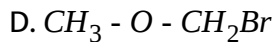
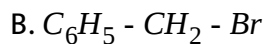


Answer: A



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28. Which one of the following halides is most reactive for S_N2 reaction



Answer: C



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29. Which of the following solvent useful to carry S_N2 reaction ?

- A. Acetone
- B. DMF
- C. DMSO
- D. Any of the above

Answer: D



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30. Correct statement regarding S_N2 reaction is

- A) rate = $K[\text{substrate}][N\bar{u}]$
- B) stronger nucleophiles cause faster rate
- C) favored by aprotic solvents

- A. A only
- B. A and B

C. A and C

D. A, B and C

Answer: D



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31. Optically pure 2(S)-butanol is subjected to the following reaction 2 (S) -

Butanol $\xrightarrow{CH_3I} NaX \rightarrow$, which of the following statements is correct for stereo chemical outcome of the reaction

A. The reaction proceeds with inversion

B. The reaction proceeds with racemisation

C. The reaction proceeds with complete retention of configuration

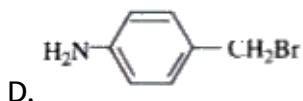
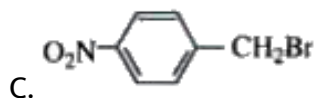
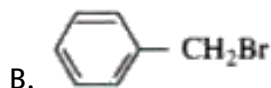
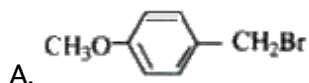
D. The reaction leads to destruction of chirality in the molecule

Answer: C



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32. Which of the following compounds under goes predominantly S_N2 reaction with a NaOH in polar aprotic solvents

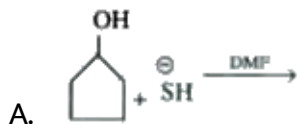


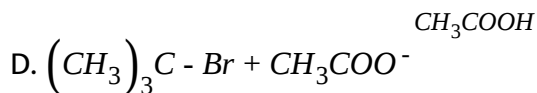
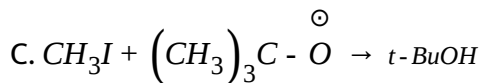
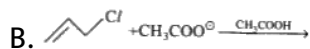
Answer: A



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33. Which of the following is not an example of S_N2 reaction ?

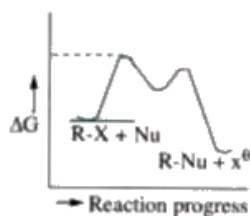




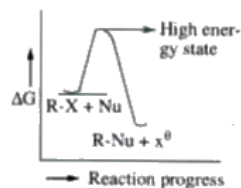
Answer: D

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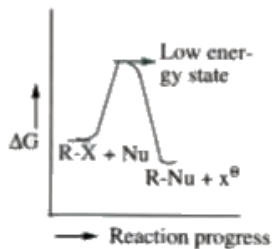
34. Which of the following indicates the correct energy diagram for S_N^2 reaction



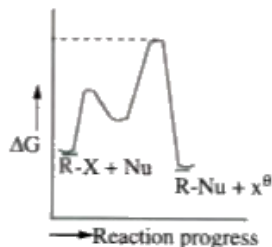
A.



B.



C.



D.

Answer: B



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35. Correct statement(s) about SN^2 and SN^1 reactions is/are

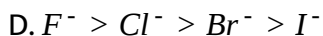
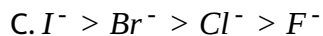
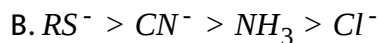
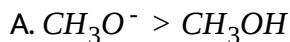
- A. SN^1 reaction is stereospecific and stereo selective
- B. SN^2 reaction is non stereospecific but stereo selective
- C. SN^2 reaction is stereoselective and stereo specific
- D. In SN^1 reaction complete inversion takes place

Answer: C



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36. Which of the following is incorrect order of reactivity of nucleophiles towards SN^2 reaction carried out in presence of acetone



Answer: D

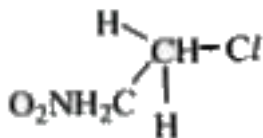


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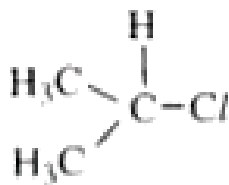
37. In which of the following compounds, the C-Cl bond ionization shall give most stable carbonium ion?



A.



B.



C.



D.

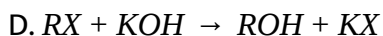
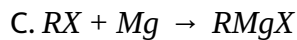
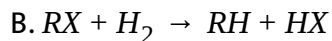
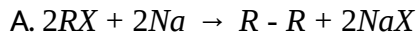
Answer: D



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OBJECTIVE EXERCISE - 3 (PREVIOUS NEET/AIPMT QUESTIONS)

1. Which of the following reactions is an example of nucleophilic substitution reaction?



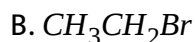
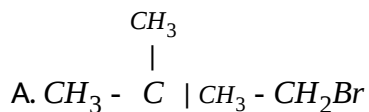
Answer: D

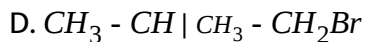


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2. In a S_N2 substitution reaction of the type $R-Br + Cl^- \xrightarrow{DMF} R-Cl + Br^-$.

Which one of the following has the highest relative rate ?



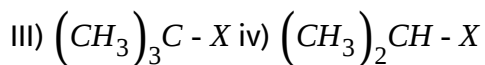
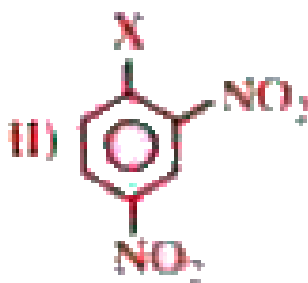


Answer: B



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



A. I lt II lt IV lt III

B. II lt III lt I lt IV

C. IV lt III lt I lt II

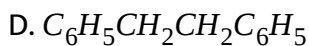
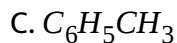
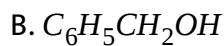
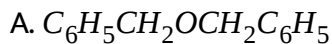
D. III It II It I It IV

Answer: A



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4. In the reaction: $C_6H_5CH_2Br \xrightarrow{1. Mg, Ether} 2. H_3O^+ X$, the product 'X' is



Answer: C



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5. Two possible stereo - structures of $CH_3CHOHCOOH$, which are optically active, are called

- A. atropisomers
- B. enantiomers
- C. mesomers
- D. diastereomers

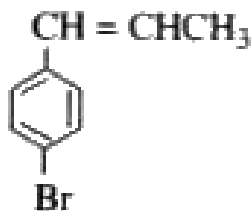
Answer: B

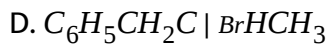
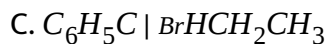


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6. The reaction of $C_6H_5CH = CHCH_3$ with HBr produces

- A. $C_6H_5CH_2CH_2Br$



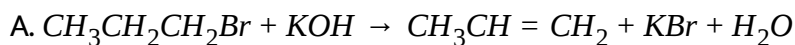


Answer: C



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7. For the following reactions



Which of the following statements is correct?

A. A is elimination, B and C are substitution reactions

B. A is substitution, B and C are addition reactions

C. A and B are elimination reactions and C is addition reaction

D. A is elimination, B is substitution and C is addition reaction

Answer: D



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8. In an S_N1 reaction on chiral centres, there is

A. Inversion more than retention leading to partial racemisation

B. 100% retention

C. 100% inversion

D. 100 % racemisation.

Answer: A



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9. Which of the following can be used as the halide component for Friedel Crafts reaction ?

- A. Chlorobenzene
- B. Bromobenzene
- C. Chloroethene
- D. Isopropyl chloride

Answer: D



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10. Consider the reaction : $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br} + \text{NaCN} \rightarrow \text{CH}_3\text{CH}_2\text{CN} + \text{NaBr}$.

The reaction will be the fastest in

- A. Ethanol
- B. Methanol
- C. N, N'-dimethylformamide (DMF)

D. Water

Answer: C

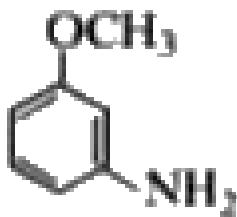
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11. Identify A and predict the type of reaction

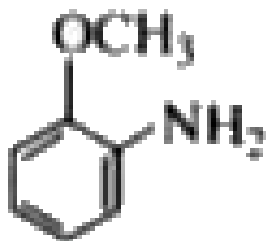


A.

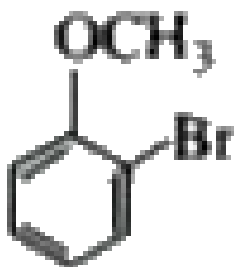
and cine substitution reaction



B. and substitution reaction



C. and elimination addition



D. and cine substitution reaction

Answer: B



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12. The compound A on treatment with Na gives B and with PCl_5 gives C. B and C react together to give diethyl ether. A, B and C are in the order

A. C_2H_5Cl , C_2H_6 , C_2H_5OH

B. C_2H_5OH , C_2H_5Cl , C_2H_5ONa

C. C_2H_5OH , C_2H_6 , C_2H_5Cl

D. C_2H_5OH , C_2H_5ONa , C_2H_5Cl

Answer: D



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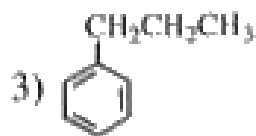
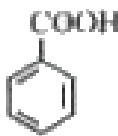
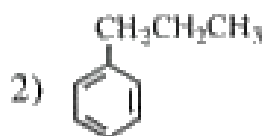
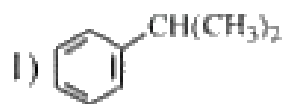
13. Identify the major products P, Q and R in the following sequence of reactions



P

Q

R



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OBJECTIVE EXERCISE - 4 (ASSERTION (A) & REASON (R) TYPE QUESTIONS)

1. (A) Towards S_N2 reaction, order of reactivity is $CH_3Br > CH_3CH_2Br > (CH_3)_2CHBr > (CH_3)_3CBr$.

(R) Greater the stability of carbocation, greater will be its ease of formation from alkyl halide and faster will be the rate of S_N1 reaction.

A. Both (A) and (R) are correct and (R) is the correct explanation of (A)

B. Both (A) and (R) are correct but (R) is not the correct explanation of

(A)

C. (A) is True but (R) is False

D. Both (A) and (R) are false

Answer: B



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2. (A) Pure chloroform does not give precipitate with $AgNO_3$ solution.

(R) $CHCl_3$ is covalent compound.

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False
- D. Both (A) and (R) are false

Answer: A



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3. (A) Addition of bromine to 2-butene yields 2,3-dibromobutane.

(R) Bromine addition to an alkene in the presence of CCl_4 is an electrophilic addition.

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False

D. Both (A) and (R) are false

Answer: B



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4. (A) Thionyl chloride reacts with primary alcohols to form pure alkyl halides in the presence of pyridine.

(R) In the reaction between SOCl_2 and R-OH , SO_2 escapes from the reaction mixture and HCl is absorbed by pyridine.

A. Both (A) and (R) are correct and (R) is the correct explanation of (A)

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)

C. (A) is True but (R) is False

D. Both (A) and (R) are false

Answer: A



5. (A) The boiling points of alkyl halides decrease in the order $RI > RBr > RCl > RF$

(R) The boiling points of alkyl halides are considerably higher than those of the hydrocarbons of comparable molecular mass.

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False
- D. Both (A) and (R) are false

Answer: B



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6. (A) KCN reacts with methyl chloride to give methyl cyanide and methyl isocyanide as products

(R) CN^- is an ambident nucleophile.

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False
- D. Both (A) and (R) are false

Answer: A



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7. (A) In monohaloarenes, further electrophilic substitution occurs at ortho and para positions.

(R) In haloarenes, halogen atom is a ring deactivator.

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False
- D. Both (A) and (R) are false

Answer: B



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8. (A) Benzonitrile is prepared by the action of chlorobenzene with KCN

(R) Cyanide ion (CN) is a weak nucleophile

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False

D. Both (A) and (R) are false

Answer: D



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9. (A) Styrene on reaction with HBr gives 1-bromo-1-phenyl ethane.

(R) Benzyl radical is more stable than alkyl radical

A. Both (A) and (R) are correct and (R) is the correct explanation of (A)

B. Both (A) and (R) are correct but (R) is not the correct explanation of

(A)

C. (A) is True but (R) is False

D. Both (A) and (R) are false

Answer: A



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10. (A) NBS is a specific reagent for allylic bromination

(R) Allylic bromination occurs through free radical intermediates.

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False
- D. Both (A) and (R) are false

Answer: B



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11. (A) Benzyl bromide when kept in acetone - water, produces benzyl alcohol.

(R) The reaction follows S_N2 mechanism

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)

- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False
- D. Both (A) and (R) are false

Answer: C



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12. (A) 2-Bromobutane on reaction with sodium ethoxide in ethanol gives 1-butene as a major product

(R) 1-Butene is more stable than 2-butene

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False
- D. Both (A) and (R) are false

Answer: D



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13. (A) Chloral reacts with phenyl chloride to form DDT

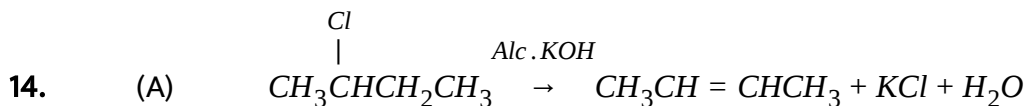
(R) It is an electrophilic substitution reaction.

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False
- D. Both (A) and (R) are false

Answer: A



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Dehydrohalogenation reaction of 2-chlorobutane gives 2-butene

(R) Elimination reaction takes place according to Saytzeff's rule

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False
- D. Both (A) and (R) are false

Answer: A



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15. (A) Addition of HBr on but-2-ene gives two structural isomeric products

(R) Addition of HBr on but-2-ene follows Markownikoff's rule.

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False
- D. Both (A) and (R) are false

Answer: D



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16. (A) The nature of the solvent can influence the rotation of plane polarised light

(R) Rotation of the plane polarised light depends up on the nature and concentration of the substance.

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)

C. (A) is True but (R) is False

D. Both (A) and (R) are false

Answer: A



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17. (A) S_N2 reactions are exothermic

(R) S_N2 reactions are thermochemically favored by stronger nucleophiles

A. Both (A) and (R) are correct and (R) is the correct explanation of (A)

B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)

C. (A) is True but (R) is False

D. Both (A) and (R) are false

Answer: A



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18. (A) Chloroform can be used as general anaesthetic.

(R) In presence of sunlight and air chloro-form is slowly oxidised to phosgene.

A. Both (A) and (R) are correct and (R) is the correct explanation of (A)

B. Both (A) and (R) are correct but (R) is not the correct explanation of

(A)

C. (A) is True but (R) is False

D. Both (A) and (R) are false

Answer: B



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19. (A) Ethyl chloride gives C_2H_5CN as major product with alc. KCN but C_2H_5CN with alc. AgCN.

(R) KCN is ionic compound, where AgCN is covalent compound.

- A. Both (A) and (R) are correct and (R) is the correct explanation of (A)
- B. Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- C. (A) is True but (R) is False
- D. Both (A) and (R) are false

Answer: A



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