

CHEMISTRY

BOOKS - SURA CHEMISTRY (TAMIL ENGLISH)

HALOALKANES AND HALOARENES

Mcqs

1. The IUPAC name of 

A. 2-Bromo pent-3-ene

B. 4-Bromo pent-2-ene

C. 2-Bromo pent-4-ene

D. 4-Bromoe pent-1-ene

Answer: B



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2. Of the following compounds, which has, the highest boiling point?

- A. n-Butyl chloride
- B. Isobutyl chloride
- C. t-Butyl chloride
- D. n-propyl chloride

Answer: A



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3. Arrange the following compounds in increasing order of their density?



A. $D < C < B < A$

B. $C > B > A > D$

C. $A < B < C < D$

D. $C > A > B > D$

Answer: A

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4. With respect to the position of -Cl in the compound

$CH_3 - CH = CH - CH_2 - Cl$, it is classified as

A. Vinyl

B. Allyl

C. Secondary

D. Aralkyl

Answer: B

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5. What should be the correct IUPAC name of diethyl chloromethane?

- A. 3-Chloro pentane
- B. 1-Chloropentane
- C. 1-Chloro-1, 1,diethyl methane
- D. 1-Chloro-1-ethyl propane

Answer: A



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6. C-X bond is strongest in

A. Chloromethane

B. Iodomethane

C. Bromomethane

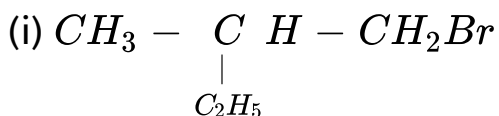
D. Fluoromethane

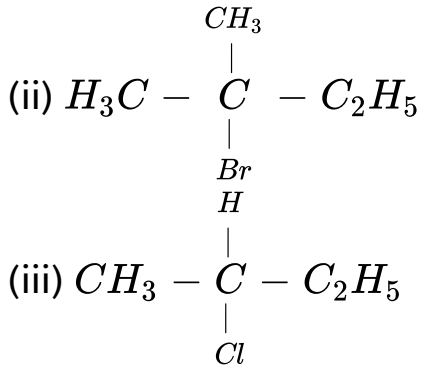
Answer: D



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7. Which of the following compounds will give racemic mixture on nucleophilic substitution by OH⁻ ion?





A. (i)

B. (ii) and (iii)

C. (iii)

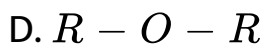
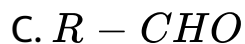
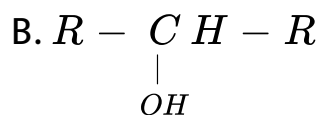
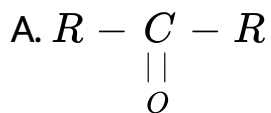
D. (i) and (ii)

Answer: C



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8. The treatment of ethyl formate with excess of RMgX gives



Answer: C



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9. Benzene reacts with Cl_2 in the presence of $FeCl_3$ and in absence of sunlight to form

- A. Chlorobenzene
- B. Benzyl chloride
- C. Benzal chloride
- D. Benzene hexachloride

Answer: A



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10. The name of $C_2F_4Cl_2$ is _____

A. Freon-112

B. Freon-113

C. Freon-114

D. Freon-115

Answer: C



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11. Which of the following reagent is helpful to differentiate ethylene dichloride and ethylidene chloride?

A. Zn/methanol

B. KOH/ethanol

C. aqueous KOH

D. $ZnCl_2$ /Con HCl

Answer: C



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12. Match the compounds given in column I with suitable items given in column II



A. A-2B-4C-1-D-3

B. A-3,B-2,C-4,D-1

C. A-1,B-2,C_3,D-4

D. A-3,B-1,C-4,D-2

Answer: D



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13. Assertion: IN mono haloarenes, electrophilic substitution occurs at ortho and para positions.

Reason: Halogen atom is a ring deactivator

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false

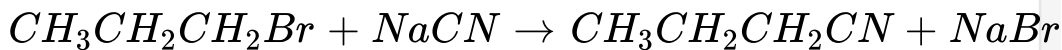
D. If both assertion assertion and reason are false

Answer: B



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14. Consider the reaction,



This reaction will be the fastest in

A. ethanol

B. methanol

C. DMF (N, N'-dimethyl formamide)

D. water

Answer: C



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15. Freon-12 is manufactured from tetrachloro methane
by

A. Wurtz reaction

B. Swartc reaction

C. Haloform reaction

D. Gattermann reaction

Answer: B



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16. The most easily hydrolysed molecule under SN_1 condition is

- A. allyl chloride
- B. ethyl chloride
- C. isopropylchloride
- D. benzyl chloride

Answer: D



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17. The carbo cation formed in SN_1 reaction of alkyl halide in the slow step is

A. sp^3 hybridised

B. sp^2 hybridised

C. sp hybridised

D. none of these

Answer: B



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18. The major products obtained when chlorobenzene is nitrated with HNO_3 and conc. H_2SO_4

- A. 1-chloro-4-nitrobenzene
- B. 1-chloro-2-nitrobenzene
- C. 1-chloro-3-nitrobenzene
- D. 1-chloro-1-nitrobenzene

Answer: A



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

A. 

B. 

C. 

D. 

Answer: D



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20. Ethylidene chloride on treatment with aqueous KOH gives

A. acetaldehyde

B. ethyleneglycol

C. formaldehyde

D. glyoxal

Answer: A



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21. The raw material for Rasching process

A. chloro benzene

B. phenol

C. benzene

D. anisole

Answer: C



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22. Chloroform reacts with nitric acid to produce

- A. nitro toluene
- B. nitro glycerine
- C. chloropicrin
- D. chloropicric acid

Answer: C



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23. acetone $\xrightarrow[\text{(ii) } H_2O / H^-]{\text{(i) } CH_3MgI}$ X, X is

- A. 2-propanol
- B. 2-methyl-2-propanol
- C. 1-propanol
- D. acetone

Answer: B

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24. Silverpropionate when refluxed with Bromine in carbon tetrachloride gives

A. propionic acid

B. chloro ethane

C. bromo ethane

D. chloro propane

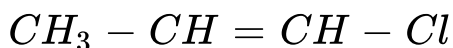
Answer: C



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Write Brief Answer

1. Classify the following compounds in the form of alkyl, allylic, vinyl, benzylic halides



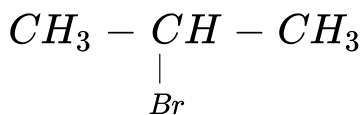
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2. Classify the following compounds in the form of alkyl, allylic, vinyl, benzylic halides



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3. Classify the following compounds in the form of alkyl, allylic, vinyl, benzylic halides



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4. Classify the following compounds in the form of alkyl, allylic, vinyl, benzylic halides



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5. Why chlorination of methane is not possible in dark?

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6. How will you prepare n-propyl iodide from n-propyl bromide?

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7. Which alkyl halide from the following pair is (i) chiral (ii) undergoes faster S_N2 reaction?



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8. How does chlorobenzene react with sodium in the presence of ether? What is the name of the reaction?

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9. Give reason for polarity of C-X bond in halo alkane.

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

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11. What happens when acetyl chloride is treated with excess of CH_3MgI ?

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12. Arrange the following alkyl halide in increasing order of bond enthalpy of RX

CH_3Br , CH_3F , CH_3Cl , CH_3I .

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13. What happens when chloroform react with oxygen in the presence of sunlight?

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14. Write down the possible isomers of $C_5H_{11}Br$ and give their IUPAC and common names.

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15. Mention any three methods of preparation of haloalkanes from alcohols.

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16. Compare S_N1 and S_N2 reaction mechanisms.

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17. Reagents and the conditions used in the reactions are given below. Complete the table by writing down the product and the name of the reaction.



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18. Discuss the aromatic nucleophilic substitutions reaction of chlorobenzene.

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19. Account for the following: t-butyl chloride reacts with aqueous KOH by S_N1 mechanism while n-butyl chloride reacts with S_N2 mechanism.

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20. Account for the following: p-dichloro benzene has higher melting point than those of o-and m-dichloro benzene.



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21. In an experiment ethyl iodide in ether is allowed to stand over magnesium pieces. Magnesium dissolves and product is formed.

Name the product and write the equation for the reaction.



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22. In an experiment ethyl iodide in ether is allowed to stand over magnesium pieces. Magnesium dissolves and product is formed.

Why all the reagents used in the reaction should be dry?

Explain.

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23. Write a chemical reaction useful to prepare the following: Freon-12 from carbon tetrachloride.

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24. Write a chemical reaction useful to prepare the following: Carbon tetrachloride from carbon disulphide.

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25. What are Freons? Discuss their uses and environmental effects



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26. Predict the products when bromoethane is treated with the following



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27. Predict the products when bromoethane is treated with the following





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28. Explain the mechanism of S_N1 reaction by highlighting the stereo chemistry behind it



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29. Write short notes on the following

(i) Raschig process.

(ii) Dows process.

(iii) Darzens process.



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30. Starting from CH_3MgI , how will you prepare the following?

(i) Acetic acid

(ii) Acetone

(iii) Ethyl acetate

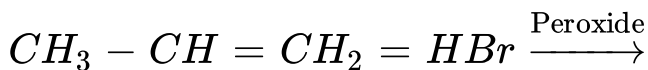
(iv) Iso propyl alcohol

(v) Methyl cyanide.



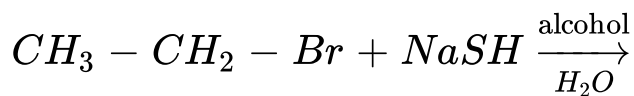
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31. Complete the reaction below:



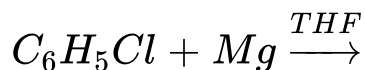
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32. Complete the reaction below:



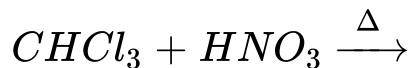
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33. Complete the reaction below:



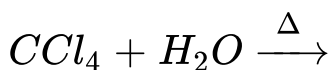
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34. Complete the reaction below:



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35. Complete the reaction below:



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36. Explain the preparation of the following compounds

(i) DDT

(ii) Chloroform

(iii) Biphenyl

(iv) Chloropicrin

(v) Freon-12.

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37. An organic compound (A) with molecular formula C_2H_5Cl reacts with KOH gives compounds (B) and with alcoholic KOH gives compound (C). Identify (A), (B) and (C).

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38. Simplest alkene (A) reacts with HCl to form compound (B). Compound (B) reacts with ammonia to form compound (C) of molecular formula C_2H_7N . Compound (C) undergoes carbylamine test. Identify (A), (B), and (C).

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39. A hydrocarbon C_3H_6 (A) reacts with HBr to form compound (B). Compound (B) reacts with aqueous potassium hydroxide to give (C) of molecular formula C_3H_8O . What are (A) (B) and (C). Explain the reactions.

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40. Two isomers (A) and (B) have the same molecular formula $C_2H_4Cl_2$. Compound (A) reacts with aqueous KOH gives compound (C) of molecular formula C_2H_4O . Compound (B) reacts with aqueous KOH gives compound (D) of molecular formula $C_2H_6O_2$. identify (A), (B), (C) and (D).

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Additional Questions Mcqs

1. Which of the following is an example of aryl alkyl halide?

- A. Benzyl chloride
- B. Benzoyl chloride
- C. Chloro benzene
- D. Methyl chloride

Answer: A



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2. Hunsdiecker reaction is used to prepare alkyl chloride and alkyl bromide starting from

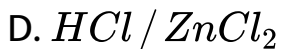
- A. diazonium salt
- B. silver salts of carboxylic acid
- C. sodium salt of carboxylic acid
- D. alcohol

Answer: B



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3. The best reagent for converting an alcohol into the corresponding chloride is

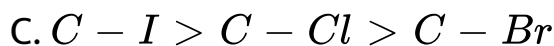
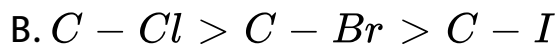
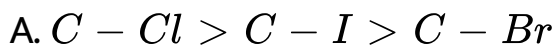


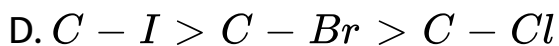
Answer: C



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4. The order of correct bond energy of C-X bond is





Answer: B



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5. Identify the compound possessing highest boiling point.

A. 1-Chloropentance

B. 2-Chloropentane

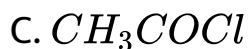
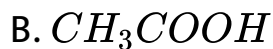
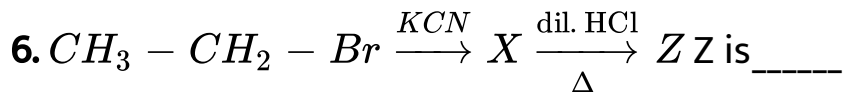
C. 3-Chloropentance

D. Tetra chlormethane

Answer: D



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Answer: A



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7. NBS is a specific reagent for

A. Nucleophilic substitution reaction

B. Electrophilic substitution

C. Electrophilic addition

D. Allylic substitution

Answer: D



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8. Which of the following does not form grignard reagent on reaction with Mg in the presence of ether?

A. Chloro ethane

B. 1-Chloro propane

C. Vinyl chloride

D. Bromo benzene

Answer: C



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9. Ethyl bromide reacts with sodium lead alloy to form ____

A. ethane

B. sodium ethoxide

C. ethanol

D. Tetra ethyl lead

Answer: D



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10. Which of the following is secondary alkyl halide?

- A. Iso butyl chloride
- B. Isopentyl chloride
- C. Neopentyl chloride
- D. isopropyl chloride

Answer: D



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11. Identify the aryl halide among the following

A. 

B. 

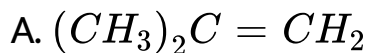
C. 

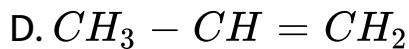
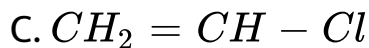
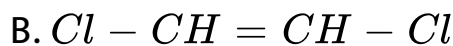
D. 

Answer: D

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12. The _____ readily undergoes addition reaction with HBr.

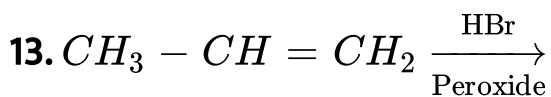




Answer: A



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The above reaction undergoes

A. Electrophilic substitution

B. Nucleophilic substitution

C. Markovnikoff's addition

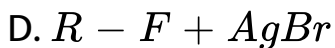
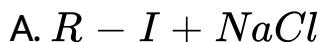
D. Anti-Markovnikoff's addition

Answer: D



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14. Which of the following halogen exchange reaction will occur in acetone?



Answer: C



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15. An S_N1 reaction at an asymmetric carbon of compound always gives

- A. an enantiomer of the substance
- B. a product with opposite optical rotation
- C. a mixture of diastereomers
- D. a product with 100% inversion

Answer: D



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16. Grignard reagent is prepared by the reaction between_____

- A. zinc and alkyl halide
- B. Magnesium and alkyl halide
- C. Magnesium and alkane
- D. Copper and aromatic hydrocarbon

Answer: B



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17. Among the following, which is not an allylic halide?

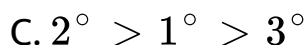
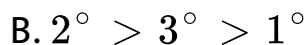
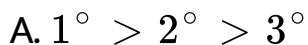
- A. 3-bromo-2-methyl propene
- B. 4-bromo but-1-ene and
- C. 3-bromo-2-methyl but-1-ene
- D. all of these

Answer: A



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18. The order of stability of the carbonium ion is-



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

Answer: D

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19. CH_3CH_2Cl undergoes hydrolysis by

A. S_N1

B. S_N2

C. both S_N1 and S_N2

D. E_1

Answer: B

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20. Statement I: Primary alkyl halides on oxidation with DMSO gives aldehydes.

Statement II: DMSO is used as polar aprotic solvent.

A. Both statement I and statement II are true

individually and statement II explains statement I.

B. Both statement I and statement II are true

individually but statement II does not explain

statement I.

C. Only statement I is true, but statement II is false.

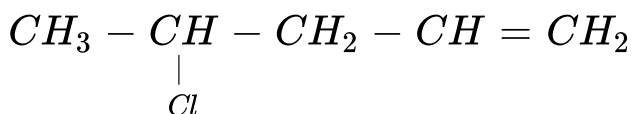
D. Both statement I and II are false.

Answer: B



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21. Write the IUPAC name of



A. 2-chloro-pent-4-ene

B. 4-chloro-pent-1-ene

C. 4-chloro-pent-1-one

D. none of these

Answer: C



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22. When alkyl halides are heated with dry Ag_2O they give,

A. diethyl ether

B. ester

C. ketone

D. aldehyde

Answer: A



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23. In S_N1 , the rate of the reaction depends on the ____

A. nucleophile

B. medium

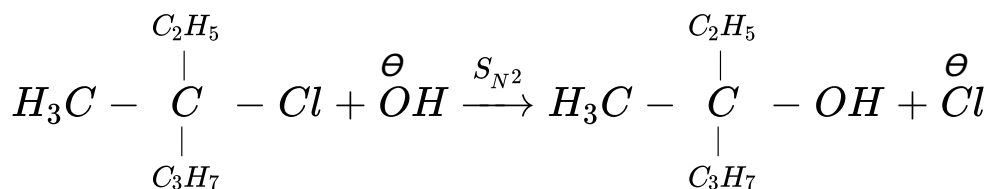
C. concentration of the substrate

D. none of these

Answer: C

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24.



What is the stereo chemistry of the above reaction?

A. complete racimisation

B. complete inversion

C. maximum inversion with partial racemisation

D. maximum racemisation with partial inversion

Answer: D



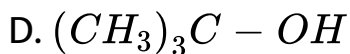
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25. For reacting with HCl, the alcohol which does not require $ZnCl_2$ is _____

A. CH_3CH_2OH

B. $CH_3 - CH_2CH_2OH$

C. $CH_3 - CHOH$



Answer: D



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26. Match the list I with list II and select the correct answer using the code given below the lists.



A. A-1,B-2,C-3,D-4

B. A-3,B_1,C-4,D-2

C. A-2,B-3,C-1,D-4

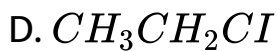
D. A-4,B-2,C-3,D-1

Answer: B



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27. Which is a sweet-smelling liquid?

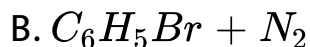
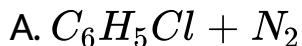


Answer: C



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28. How does diazonium salt $(C_6H_5N_2^+ Cl^-)$ decompose ?



C. only b

D. both a & b

Answer: D



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29. _____ is used in the treatment of goitre

A. Halothane

B. Benzoquinone

C. Chloromycetin

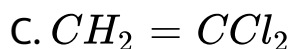
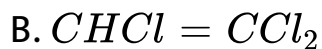
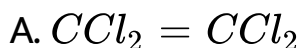
D. Thyroxine

Answer: D



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30. _____ is used in fire extinguishers



D. CCl_4

Answer: D



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31. Chlorobenzene reacts with $CuCN$ at 523 K in the presence of ____

- A. $NaOH$
- B. pyrrole
- C. Pyridine
- D. Na

Answer: C



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32. Mild oxidation of benzyl chloride with $Cu(NO_3)_2$

gives_____

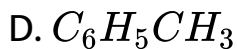
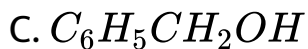
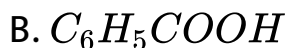
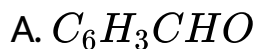
- A. Benzoic acid
- B. Benzene
- C. benzaldehyde
- D. Benzyl alcohol

Answer: C



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33. Oxidation of $C_6H_5CH_2Cl$ with alk, $KMnO_4$ gives _____



Answer: B



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34. Markovnikov's rule is followed for the addition of HCl to _____

- A. symmetrical alkene
- B. unsymmetrical alkene
- C. symmetrical alkane
- D. unsymmetrical alkane

Answer: B



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35. Chloropicrin is prepared by adding nitric acid to _____

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

D. none of these

Answer: C



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36. Which one serve as starting materials for many organic synthesis?

A. Haloalkanes

B. Haloalkenes

C. Halokynes

D. Haloarenes

Answer: A



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37. Match the column



A. A-1,B-2,C-3,D-4

B. A-2,B-1,C-3,D-4

C. A-3,B-2,C-1,D-4

D. A-4,B-3,C-2,D-1

Answer: A



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38. Mixture of Con. HCl and anhydrous $ZnCl_2$ is called_____

- A. Bayer's reagent
- B. Lucas reagent
- C. Grignard reagents
- D. Tollens reagents

Answer: B



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39. Assertion (A): Carbon halogen bond is a polar bond.

Reason (R): Halogens are more electonegative than

carbon.

A. Both (A) and (R) are true and (R) is the correct explanation of (A).

B. Both (A) and (R) are true and (R) is not the correct explanation of (A).

C. (A) true but (R) false.

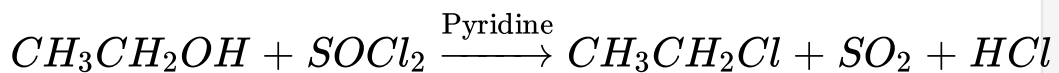
D. Both (A) and (R) are false.

Answer: A



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40.



. The above equation is known as

- A. Hunsdiccker reaction
- B. Swarts reaction
- C. Darzen's halogenation
- D. Fitting reaction

Answer: C



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41. Which of the following is incorrect?

- A. Alkanes react with halogens in the presence of ultra violet light to form haloalkene.
- B. This reaction is an electrophilic substitution reaction
- C. This gives a mixture of poly substituted haloalkane.
- D. all the above are incorrect

Answer: B

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42. Assertion (A): Pure haloalkanes are colourless.

Reason (R): Bromo and iodo alkanes are colour in the presence of light.

- A. Both (A) and (R) are true.
- B. (A) true but (R) false.
- C. (A) false but (R) true.
- D. Both (A) and (R) are false.

Answer: A



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43. Haloalkane reacts with aqueous solution of KOH or moist silver oxide to form _____

- A. Alcohol
- B. Aldehyde

C. Ketone

D. Acid

Answer: A



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44. Which of the following is incorrect statement about S_N2 reaction mechanism?

A. It follows second order kinetics

B. It occurs in one step

C. This reaction does not involves the formation of a transition state

D. all the above are incorrect

Answer: C



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45. Dehydrohalogenation reaction is also known as _____.

A. Addition

B. α -dehydration

C. β -elimination

D. Substitution

Answer: C



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46. Which of the following is correct?

- A. Carbontetrachloride is used as dry cleaning agent
- B. It is used as a solvent for alcohols
- C. as the vapour of CCl_4 is combustible.
- D. all the above are correct.

Answer: A



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47. Formaldehyde reacts with grignard reagent to give ___ products.

A. Addition

B. Substitution

C. Condence

D. Elimination

Answer: A



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48. Assertion (A): Chloro benzene is prepared by Sandmayer reaction or Gattermann reaction using

benzene diazonium chloride.

Reason (R): When aqueous solution of benzene diazonium chloride is warmed with Cu_2Cl_2 in HCl give chloro benzene.

- A. Both (A) and (R) are true.
- B. (A) true but (R) false.
- C. (A) false but (R) true.
- D. Both (A) and (R) are false.

Answer: A



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49. What is the name of the Freon which have the formula $C_2F_3Cl_3$?

- A. Freon-11
- B. Freon-12
- C. Freon-112
- D. Freon-113

Answer: D



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Additional Questions Very Short Answers Questions

1. How would you prepare haloalkane through halogen exchange reactions?

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2. What is Hunsdiecker reaction?

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3. Write a brief note on ammonolysis of haloalkane.

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4. Define Walden inversion.

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5. Write a short note on β -elimination reaction.

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6. How does the haloalkanes react with metals?

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7. How does benzene diazonium chloride react with BF_3 ?

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8. Write a note on carbylamine reaction.

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9. What happens when HI reacts with tert. Butyl alcohol?

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1. How does bromo ethane react with the following?

(i) Silver Oxide (oxide)

(ii) Sodium hydrogen sulphide

(iii) Potassium cyanide.

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2. Haloalkanes produce mixture of olefins-say true or false and justify your answer.

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3. Enlist the applications of haloalkanes.



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4. Among ortho, meta and para substituted dihalobenzenes which has high melting point? Give reason with example.



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5. Explain the following reactions:

Wurtz fitting reaction.



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6. Explain the following reactions:

Fitting Reaction.



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7. Show that ethylene dichloride undergoes

(i) Hydrolysis

(ii) Dehalogenation

(iii) Dehydrohalogenation.



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8. Discuss preparation of:

Gem-dihalides:



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9. Discuss preparation of:

Vic-dihalides.



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Additional Questions Long Answer Questions

1. Explain the mechanism involved in a bimolecular nucleophilic substitution reaction.



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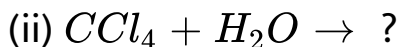
2. How will you convert t-butyl bromide into t-butyl alcohol? Explain the process through the mechanism in stepwise manner.

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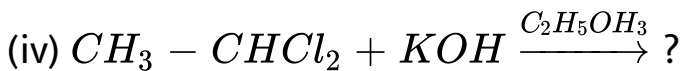
3. Give a detailed account on the different mechanisms followed in elimination reaction.

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4. Predict the product:



(iii) Chloral+



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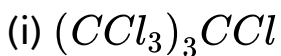
5. Explain S_N2 mechanism with suitable examples.



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Creative Questions Hots

1. Write the IUPAC names of the following compounds.



(ii) $(CH_3)_3CCH = C(Cl)C_6H_4I - p.$

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2. Write structure of the compound 4-tert-butyl-3-iodoheptane and 1,4-dibromo but-2-ene.

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3. Write the isomers of the compound whose molecular formula is $C_4H_9Br.$

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4. Why does preparation of aryl iodides requires the presence of an oxidising agent ?

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Creative Questions Hots 3 Mark

1. A hydrocarbon C_5H_{10} does not react with chlorine in dark but gives C_5H_9Cl in bright sunlight. Identify the hydrocarbon.

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2. Give reason for the following:

Ethyl iodide undergoes S_N2 reaction faster than ethyl bromide.

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3. Give reason for the following.

n-butyl bromide has higher boiling point than t-butyl bromide.

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4. How will you bring about the following conversions?

Propene to propane-1-ol.



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5. How will you bring about the following conversions?

Propene to propyne



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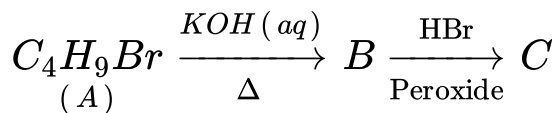
6. How will you bring about the following conversions?

Propene to 1-nitro propane.



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7. Identify A,B and C from the following equation.



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Creative Questions Hots 5 Mark

1. Predict the major product formed when HCl is added to iso-butylene.

(ii) What happens when $CH_3 - Br$ is treated with KCN?

(iii) Identify the chiral molecule in the following pair.



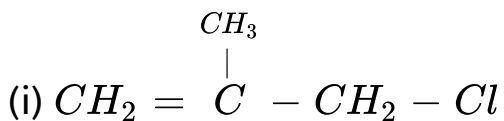
(iv) Arrange the compounds in the order of reactivity towards S_N2 displacement.

2-Bromo-2-methylbutane, 1-bromopentane, 2-Bromo
pentane.

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Evaluate Yourself

1. Write the IUPAC name of the following



(ii) 

(iii) 

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2. Write the structure of the following compounds

(i) 1-Bromo-4-ethyl cyclohexane

(ii) 1,4-Dichlorobut-2-ene

(iii) 2-Chloro-3-methyl pentane.

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3. Write all possible chain isomers with molecular formula $C_5H_{11}Cl$.

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4. Neo-pentyl bromide undergoes nucleophilic substitution reactions very slowly-justify.



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5. Why Grignard reagent should be prepared in anhydrous condition?



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6. Haloalkanes undergo nucleophilic substitution reaction whereas haloarenes undergo electrophilic substitution reaction. Comment.



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7. Chloroform is kept with a little ethyl alcohol in a dark coloured bottle why?



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8. What is the IUPAC name of the insecticide DDT?

Why is their use banned in most of the countries?



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