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Class: 12
Subject: chemistry
Topic: Haloalkanes and haloarenes
No. of Questions: 25

1. Which of the following statements is incorrect for freons?

a. They are highly toxic and cause skin cancer if contacted.

b. They are rather inert substances but react with ozone.

c. They are used in extinguishing fire.

d. Their use in refrigerators has been banned.

Sol. (a) Freons are not toxic in nature.

2) Directions: The following question has four choices out of which ONLY ONE is correct.

The formation of 2-chlorine radicals from chlorine molecule is an example of

a. Heterolytic fission

b. Homolytic fission

c. Even cleavage

d. Uneven cleavage

Sol.(b) Homolytic fission is chemical bond dissociation of a neutral molecule generating two free radicals.That is, two electrons that are involved in the bond are distributed one by one to the two species. Each of the two covalently shared (see covalent bond) electrons are withdrawn by the bonded atoms. So the formation of 2-chlorine radicals from chlorine molecule is an example of Homolytic fission.

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3. Directions: The following question has four choices out of which ONLY ONE is correct.

Which of the following rules states that during the addition across unsymmetrical double bond, the negative part of the attacking reagent attaches itself to the carbon atom carrying lesser number of hydrogen atoms?

a. Markownikoff's rule

b. Anti-Markownikoff's rule

c. Saytzeff's rule

d. Kharasch rule

Sol(a). This rule explains the formation of secondary haloalkanes from unsymmetrical double bond.

4. Directions: The following question has four choices out of which ONLY ONE is correct.

Which of the following products is formed when propene is attacked by the Br atom in the presence of peroxide?

a. Bromopropane

b. 2-bromopropane

c. Iso- bromopropane

d. Neo-bromopropane

Sol.(a) The primary haloalkanes are formed in the presence of peroxide.

5. Directions: The following question has four choices out of which ONLY ONE is correct.

What is the end product of the reaction of propene with N-bromosuccinimide?

a. 3-bromoprop-1-ene

b. bromopropane

c. 2-bromopropane

d. 2-bromoprop-1-ene

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Sol.(a) This reaction leads to allylic substitution.

6. Directions: The following question has four choices out of which ONLY ONE is correct.

What are the end products of the following reaction as per the groove's process? Ethanol $\xrightarrow{+}$ HCl

a. Ethyl chloride and water

b. Ethene and HOCl

c. Ethanal and HCl

d. Ethene and water

Sol.(a) The process leads to the removal of -OH by Cl.

7. Directions: The following question has four choices out of which ONLY ONE is correct.

Wurtz reaction involves the reduction of alkyl halide with

a. Zn/HCl

b. HI in presence of red phosphorous

c. sodium in ether

d. Zn/Cu couple

Sol(c).Wurtz reaction involves the reduction of alkyl halide with sodium in ether.

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8. Directions: The following question has four choices out of which ONLY ONE is correct.

Aryl halides are less reactive towards Nucleophilic substitution reactions as compared to alkyl halides due to:

a. The Inductive effect

b. Longer Carbon halogen bond

c. Resonance stabilization and sp^2 hybridised carbon attached to halogen

d. All the above

Sol.(c) fact

9. Directions: The following question has four choices out of which ONLY ONE is correct.

Grove's method is used for the preparation of

a. C_2H_5Cl

b. C_2H_5Br

c. C_2H_5F

d. C_2H_5I

Sol (a). Grove's method is used for the preparation of C_2H_5Cl.

10. Directions: The following question has four choices out of which ONLY ONE is correct.

1, 1, 2, 2 -Tetrabromoethane on treatment with Zn dust yields an

a. alkene

b. alkane

c. alkyne

d. haloalkane

Sol (c). 1, 1, 2, 2 -Tetrabromoethane on treatment with Zn dust yields an alkyne.

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11. Directions: The following question has four choices out of which ONLY ONE is correct.

Fluorobenzene (C_6H_5F) can be synthesized in the laboratory

a. by reacting bromobenzene with NaF solution

b. by heating phenol with HF and KF

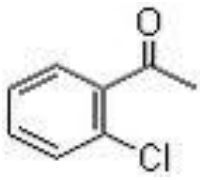
c. from aniline by diazotization followed by heating the diazonium salt with HBF_4

d. by direct fluorination of benzene with F_2 gas

Sol (c). Fluorobenzene (C_6H_5F) can be synthesized in the laboratory from aniline by diazotization followed by heating the diazonium salt with HBF_4

12. Directions: The following question has four choices out of which ONLY ONE is correct.

The IUPAC name of the given structure is



a. 2 - chloro acetophenone

b. 4 - chloro acetophenone

c. Chlorobenzene

d. Anisole

Sol(a). C_6H_5-OCH_3 is acetophenone and at 2-position of benzene, chlorine is present, so IUPAC name of the given structure is 2-chloro acetophenone.

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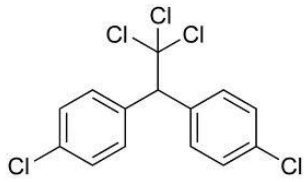
13. Directions: The following question has four choices out of which ONLY ONE is correct.

Identify the given structure:



a. DDT

b. Chlorobenzene

c. 4-methyl chlorobenzene

d. Catechol

Sol. (a)The given structure is of dichlorodiphenyltrichloroethane which is commonly known as DDT.

14. Alkyl halides on treatment with a suspension of Ag_2O (dry), gives

a. alkanal

b. alkanol

c. alkanes

d. alkoxy alkane

Sol.(d) $RX + Ag_2O\ (dry) \rightarrow ROR + 2AgX$

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15. Directions: The following question has four choices out of which ONLY ONE is correct.

Which of the following is correct?

a. Reduction of any aldehyde gives secondary alcohol.

b. Reaction of vegetable oil with H_2SO_4 gives glycerine.

c. Alcoholic iodine with NaOH gives iodoform.

d. Sucrose on reaction with NaCl gives invert sugar

.

Sol. (c) Alcoholic iodine with NaOH gives iodoform.

16. Directions: The following question has four choices out of which ONLY ONE is correct.

Which of the following is an allyl bromide?

a. $CH_2=CHCH_2Br$

b. $CH_3CH_2CH_2Br$

c. $CH_2=CHCH_2I$

d. $CH_2=CHCH_2Cl$

Sol.(a). Allyl bromide is a compound in which bromine atom is bonded to an sp^3 hybridised carbon atom next to carbon-carbon double bond(C=C) i.e., to an allylic carbon $H_2C=CHCH_2Br$.

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17. Directions: The following question has four choices out of which ONLY ONE is correct.

Which one of the following compounds has the highest boiling point ?

a. RF

b. RCI

c. RBr

d. RI

Sol. (d)Boiling point of alkyl halides increases with the increase in size and mass of halogen atom.

Atomic mass of Iodine is maximum so, it has the highest boiling point.

18. Directions: The following question has four choices out of which ONLY ONE is correct.

The molecular formula of chloropicrin is

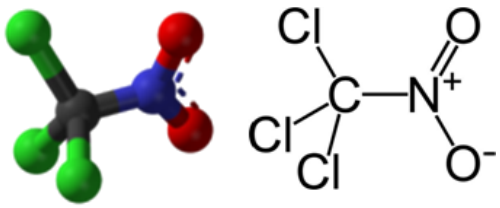
a. $CHCl_3NO_2$

b. CCl_3NO_3

c. CCl_2NO_2

d. CCl_3NO_2

Sol.(d)Chloropicrin, also known as PS, is a chemical compound with the structural formula Cl_3CNO_2.



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19. Directions: The following question has four choices out of which ONLY ONE is correct.

Ethyl bromide is industrially prepared from

a. ethyl alcohol + HBr

b. ethanol + Br_2

c. alcohol + HBr

d. None of the above

Sol.(a) Ethyl bromide can prepared at large scale by industrial process.
Industrial preparation of ethyl bromide By refluxing the alchol with constant boiling HBr (48%) in presence of little concentrated Sulphuric acid

$$\underset{\text{ethyl alcohol}}{C_2H_5OH} + HBr \xrightarrow[\text{reflux}]{H_2SO_4(CONC)} \underset{\text{ethyl bromide}}{C_2H_5Br} + H_2O$$

20. Directions: The following question has four choices out of which ONLY ONE is correct.

At normal room temperature, iodoform is a

a. volatile liquid

b. thick viscous liquid

c. gas

d. solid

Sol.(d) At room temp. Iodoform is a solid.

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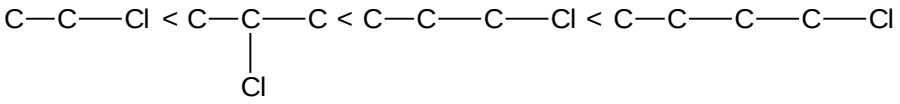
21. Arrange each of following sets of compounds in order of increasing boiling points:Chloromoethane, 1 – chloropropane, isopropyl chloride, 1 – chlorobutane.

Sol. Since boiling point increase with increasing molecular mass due to greater magnitude of Vander Waal's forces of attraction, the boiling points of these compounds increase in the order:



22. Give IUPAC name of:

(a) $(CCl_3)_3CCl$ (b) $CHF_2CBrClF$

Sol.(a) 2 – trichloromethyl – 1, 1, 1, 2, 3, 3, 3 – hepta chloropropane

(b) 1 – bromo – 1 – chloro – 1, 2, 2 – trifluoroethane

23. Explain why KCN reacts with R – I to give alkyl cyanide, while Silver cyanide forms isocyanide as a major product.

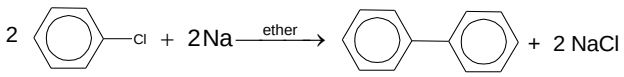
Sol. $KCN \rightleftharpoons K^+ + CN^-$

CN^- is ambient nucleophile and can attack from either side and RCN is formed predominantly but AgCN being insoluble can attack only from N side hence RNC is major product.

24. How will you bring about following conversion?

Chlorobenzene to biphenyl

Sol.



Biphenyl

25. entify the possible alkenes that would be formed on dehydrohalogenation of

1 – Chloropentene

Sol. $CH_3CH_2CH_2CH_2CH_2Cl \xrightarrow[\Delta]{KOH\ (alc.)} CH_3CH_2CH_2CH=CH_2$

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