


## Previous HSE questions from the chapter “Haloalkanes and Haloarenes”

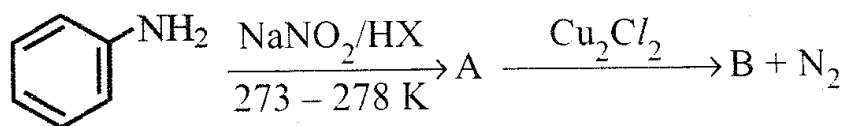
- Give one use each of Freon 12, DDT,  $\text{CCl}_4$  and  $\text{CHCl}_3$ . (2)
- Write equations showing Wurtz-Fittig reaction and Fittig reaction. (2) [SAY 2018]
- During the B-elimination reaction of 2-bromopentane in an alcoholic solution of KOH results Pent-2-ene as the major product and pent-1-ene as the minor product. State the rule to explain the reaction. (2)
- Complete the reactions:
 

(a)  $\text{CH}_3\text{CH}_2\text{Br} \xrightarrow{\text{AgCN}}$  .....

(b)  $\text{CH}_3\text{CH}_2\text{Br} \xrightarrow[\text{Dry ether}]{\text{Na}}$  .....

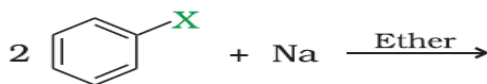


(2) [March 2018]
- On kinetic consideration nucleophilic substitution in aryl/alkyl halides may be  $\text{SN}^1$  or  $\text{SN}^2$  mechanisms.
  - Briefly explain  $\text{SN}^2$  mechanism with an example. (2)
  - In dehydrohalogenation of 2-Bromopentane why Pent-2-ene is major product and Pent-1-ene is minor product. (2) [SAY 2017]
- An ambident nucleophile is:
    - Ammonia
    - Ammonium ion
    - Chloride ion
    - Nitrite ion
 (1)
  - Haloalkanes and haloarenes are organohalogen compounds.
    - Suggest a method for the preparation of alkyl chloride. (1)
    - Aryl halides are less reactive towards Nucleophilic substitution reactions. Give reason. (2) [March 17]
- Haloalkanes and haloarenes are compounds containing halogen atom. They undergo many types of reactions.
  - Identify the product formed in the following reaction:
 
$$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{Cl} \xrightarrow{\text{alc. KOH}}$$
    - $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH}$
    - $\text{CH}_3\text{-CH(OH)-CH}_3$
    - $\text{CH}_3\text{-CH=CH}_2$
    - $\text{CH}_3\text{-C}\equiv\text{CH}$
 (1)
  - Chloroform is stored in closed dark coloured bottles completely filled up to the neck. Give reason. (1)
    - Write any two differences between  $\text{SN}^1$  and  $\text{SN}^2$  reactions. (2) [SAY 2016]
- Aryl halides are less reactive in nucleophilic substitution reactions.
  - Write any two reasons for less reactivity. (1)
    - Give one example for nucleophilic substitution reactions of aryl halides. (1)
  - Write a method for the preparation of alkyl halides.
  - Which of the following is not a polyhalogen compound?
    - Chloroform
    - Freon
    - Carbon tetrachloride
    - Chloro benzene
 (1) [March 2016]
- State Saytzeff rule. (1)
  - Identify the major and minor products obtained by the reaction between 2-bromobutane and alcoholic KOH. (1)
  - Write the product obtained by the reaction between 2-bromobutane and aqueous KOH. (1)
  - 2-Bromobutane exhibit optical isomerism. What is optical isomerism? (1) [SAY 2015]
- Among the following which one is chlorine containing insecticide?
    - DDT
    - Freon
    - Phosgene
    - Iodoform
 (1)
  - Haloarenes undergo Wurtz-Fittig reaction.
    - What is Wurtz-Fittig reaction? (1)
    -



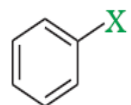
Write the formulae of A and B in the above reaction. (2) [March 2015]

11. a) Most important chemical reactions of halo alkanes are their substitution reactions.
- What is  $S_N1$  reaction? (1)
  - Arrange the four isomeric bromobutanes in the increasing order of reactivity towards  $S_N1$  reaction. (2)
- b) How will you prepare chlorobenzene from benzene diazonium chloride? (1) [March 2014]
12. a) i) Write 'Saytzeff rule' (1)
- The products A and B of the following reaction are two isomeric alkanes. Identify A & B.  
 $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH(Br)-CH}_3 \xrightarrow{\text{alc. KOH}}$  A + B
- b) Identify the main products of the following reactions? Suggest whether the reaction is  $S_N1$  or  $S_N2$ ?
- i)  $\text{CH}_3\text{-}\overset{\text{Br}}{\underset{\text{CH}_3}{\text{C}}}\text{-CH}_3 \xrightarrow{\text{aq. NaOH}}$
- ii)  $\text{C}_6\text{H}_5\text{-CH}_2\text{-Br} \xrightarrow{\text{aq. NaOH}}$
- (1×2=2 Scores)
13. a) For the preparation of alkyl chlorides from alcohols, thionyl chloride ( $\text{SOCl}_2$ ) is preferred. Give reason. (1)
- b) Halo alkanes undergo  $\beta$ -elimination reaction in presence of alcoholic potassium hydroxide.
- Which is the major product obtained by the  $\beta$ -elimination of 2-bromo pentane. ( $\frac{1}{2}$ )
  - Name the rule, which leads to the product in the above elimination reaction. (1)
- c) Write the chemical equation for the preparation of toluene by Wurtz-Fittig reaction. ( $1\frac{1}{2}$ ) [March 2013]
14. Haloarenes undergo nucleophilic and electrophilic substitution reactions.
- Write two examples for ambident nucleophiles. (1)
  - Write one example for nucleophilic substitution reaction of chlorobenzene. (1)
  - Write any 2 examples of electrophilic substitution reaction of chlorobenzene. (2) [SAY 2012, 2013 & March 10]
15. Nucleophilic substitution reactions are of two types –  $S_N1$  reactions and  $S_N2$  reactions.
- Write any 2 differences between  $S_N1$  and  $S_N2$  reactions. (2)
  - Write any 2 reasons for the less reactivity of aryl halides towards nucleophilic substitution reactions (2) [March 12]
16. Haloalkanes and haloarenes react with metals to give hydrocarbons or products from which hydrocarbons are obtained easily.

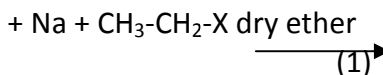


a) Identify the product and the name of the reaction:

(1)

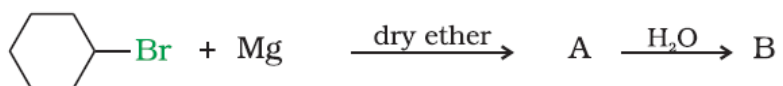


b) Identify the product and the name of the reaction:



(1)

c) Identify A & B.



(2) [March 2011]

17. Alkyl halides are the starting materials for the synthesis of a number of organic compounds. How are the following compounds obtained from alkyl halide  $\text{CH}_3\text{-CH}_2\text{-Br}$ ?

- a) Ethane (1)  
b) Ethanol (1)  
c) Butane (1)  
d) Ethoxy ethane (1) [SAY 2011]
18. a) Most of the organic chlorides, bromides and iodides react with certain metals to give compounds containing carbon – metal bonds.  
i) Give one example for such compound. (1)  
ii) How will you prepare the above compound? (1)  
iii) How many chiral carbon and optical isomers are there for lactic acid? (1) [March 2010]
19. a)  $\text{CH}_3\text{-CH}_2\text{-Br} \xrightarrow{?} \text{CH}_3\text{-CH}_2\text{-I}$  (1)  
b)  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-Br} \xrightarrow{\text{alc. KOH}} ?$  (1)  
c) Freons are known with respect to ozone layer depletion.  
i) What are freons? (1)  
ii) How can you prepare a Freon from  $\text{CCl}_4$ ? (1) [March 2009]
10. a) You want to prepare  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-Br}$  from  $\text{CH}_3\text{-CH-CH}_2$ . What are the reagents you require? (1)  
b)  $\text{C}_6\text{H}_5\text{-CH}_2\text{-Cl}$  can be converted to  $\text{C}_6\text{H}_5\text{-CH}_2\text{-OH}$  by boiling with aqueous alkali. However  $\text{C}_6\text{H}_5\text{-Cl}$  cannot be converted to  $\text{C}_6\text{H}_5\text{-OH}$  by this method. Explain. (3) [March 2008]
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