
MULTIPLE CHOICE QUESTIONS

1. Identify the vinyl halide from the following.

   (i) $CH_2 = CH - Cl$

   (ii) $C_6H_5 - Cl$

   (iii) $CH_2{=}CHCH_2Cl$

   (iv) $CH_3 - CH_2 - CH_2 - Cl$

2. The best method for the conversion of an alcohol into an alkyl chloride is by treating the alcohol with:

   (i) PCl_3

   (ii) PCl_5

   (iii) $SOCl_2$

   (iv) HCl in the presence of anhydrous $ZnCl_2$

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

   (i) Electrophilic elimination reaction
   (ii) Electrophilic substitution reaction
   (iii) Free radical addition reaction
   (iv) Nucleophilic substitution reaction

4. Which of the following isomer has the highest melting point?

(i) 1,4-Dicholorbenzene (iii) 1,2-Dicholorbenzene

(ii) 1,3 -Dichlorobenzene (iv) All isomers have same melting points

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

(i) CH_3CH_2Cl (iii) $(CH_3)_2CHCl$

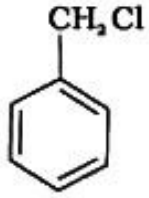
(ii) CH_3Cl (iv) $(CH_3)_3CCl$

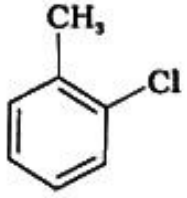
6. Which is the correct IUPAC name for $(CH_3)_3CCH_2Br$?

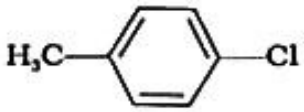
(i) 2-Bromo-1,1-dimethylpropane (iii) 1-Bromo-2-methylbutane

(ii) 2-Methyl-1-bromobutane (iv) 1-Bromo-2,2-dimethylpropane

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

(i) 

(ii) 

(iii) 

(iv) Mixture of (ii) and (iii)

8. Which of the following molecules does not contain a chiral carbon?

(i) 2-Bromobutane (iii) 2-Bromopropane

(ii) 1-Bromo-1-chlorobutane (iv) 2-Bromopentane

9. The major organic compound formed when 2-Bromobutane is heated with alcoholic KOH is

(i) Butan-2-ol (iii) 2-Bromopropane

(ii) But-2-ene (iv) But-1-ene

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

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

(i) Butane < 1-Chlorobutane < 1-Bromobutane < 1-Iodobutane

(ii) 1-Iodobutane < 1-Bromobutane < 1-Chlorobutane < Butane

(iii) Butane < 1-Iodobutane < 1-Bromobutane < 1-Chlorobutane

(iv) Butane < 1-Chlorobutane < 1-Iodobutane < 1-Bromobutane

Read the given passage and answer the questions that follow:

One or more hydrogen atoms of alkanes can be replaced by halogens. Halogenation takes place either at higher temperature (573-773 K) or in the presence of diffused sunlight or ultraviolet light. Free radical

chlorination or bromination of alkanes gives a complex mixture of isomeric mono- and polyhaloalkanes, which is difficult to separate as pure compounds. Consequently, the yield of any one compound is low.

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

12. Is halogenation of alkane in presence of UV an addition or substitution reaction?

13. Identify the final organic product if methane is treated with excess chlorine in UV.

14. How many monochlorides are formed when Butane undergoes halogenation in presence of UV?

15. Name the catalyst used when aryl chlorides are prepared by electrophilic substitution of arenes with chlorine.

Question – Answer Type:

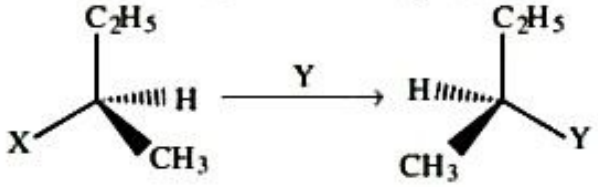
16. Why is it necessary to avoid even traces of moisture during the use of a Grignard reagent? **1**

17. Write the IUPAC name of the following compound: **1**

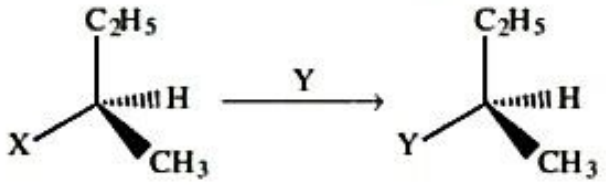
$$CH_2 = CHCH_2Br$$

18. Which of the following reactions is S_N1 type ? **1**

(i)



(ii)



19. Benzyl chloride is highly reactive towards S_N1 reaction. why? **1**

20. Arrange the following compounds in order of increasing boiling points. **1**

Bromomethane, Bromoform, Chloromethane, Dibromomethane.

21. Which compound in the following couples will react faster in S_N1 displacement and why? **2**

i) 1-Bromopentane or 2-bromopentane

ii) 1-Bromo-2-methylbutane or 2-bromo-2-methylbutane.

22. (i) Write the product formed when p-nitrochlorobenzene is heated with aqueous NaOH at 443 K followed by acidification. **2**

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

23. Out of Chlorobenzene and Cyclohexyl chloride, which one is more reactive towards nucleophilic substitution reaction and why? **2**

24. Complete the following reaction: **2**

i) $CH_3Cl + KCN \rightarrow$

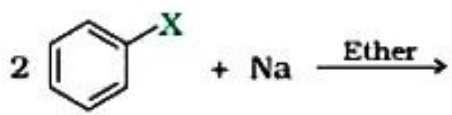
ii) $CH_3OH + SOCl_2 \rightarrow$

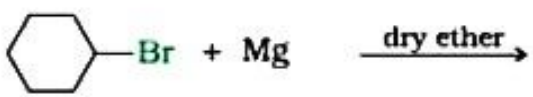
25. Give reasons: **2**

(a) Grignard reagent should be prepared under anhydrous conditions

(b) Alkyl halides are immiscible with water although they are polar.

26. Draw the structures of the major monohalo product for each of the following reactions: **3**

a) 

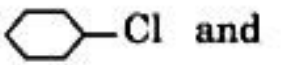
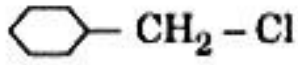
b) 

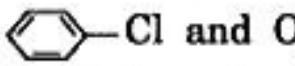
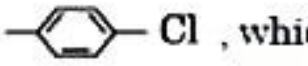
c) 

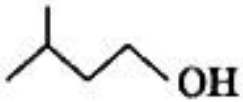
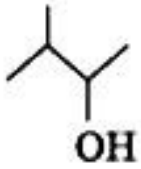
27. (a) Why are alkyl halides insoluble in water? **3**

(b) Why is Butan-1-ol optically inactive but Butan-2-ol is optically active?

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

28. (a) Out of  and  , which one is more reactive towards S_N2 reaction and why ? **3**

(b) Out of  and  , which one is more reactive towards nucleophilic substitution reaction and why ?

(c) Out of  and  , which one is optically active and why ?

29. Convert the following: **3**

i) Aniline to Chlorobenzene

ii) Bromomethane to Fluoromethane

iii) Chlorobenzene to Phenol

30. Among all the isomers of molecular formula C_4H_9Br, identify **3**

(a) the one isomer which is optically active.

(b) the one isomer which is highly reactive towards S_N1.

(c) the two isomers which give same product on dehydrohalogenation with alcoholic KOH.

31. Give reasons:

(a) Density of Chloroethane is greater than that of Chloromethane.

(b) Boiling points of alkyl halide are higher than their parent hydrocarbon

(c) Finkelstein reaction takes place in presence of dry acetone.