



“CULTIVATING EXCELLENCE IN EVERY STUDENT”

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Class:-XII (Sci.)

Name of Student.....

Subject:- Chemistry

10 YEAR QUESTIONS

Chapter-10

Haloalkanes & Haloarenes

- (a) Define the following terms : (i) Enantiomers (ii) Racemic mixture
(b) Why is chlorobenzene resistant to nucleophilic substitution reaction?
- Write the reaction involved in the Hoffmann bromamide degradation reaction.
- Give reasons for the following: (a) the presence of $-\text{NO}_2$ group at ortho or para position increases the reactivity of haloarenes towards nucleophilic substitution reactions. (b) p-dichlorobenzene has higher melting point than that of ortho or meta isomer. (c) Thionyl chloride method is preferred for preparing alkyl chloride from alcohols.
- (a) Write equation for preparation of 1-iodobutane from 1-chlorobutane. (b) Out of 2-bromopentane, 2-bromo-2-methylbutane and 1-bromopentane, which compound is most reactive towards elimination reaction and why?
- Why is chloroform kept in dark coloured bottles?
- (a) Out of C1CCCCC1Cl and C1CCCCC1CH2Cl, which one is more reactive towards S_N^2 reaction and why?
(b) Out of c1ccccc1Cl and O=[N+]([O-])c1ccc(Cl)cc1 which one is more reactive towards nucleophilic substitution reaction and why?
(c) Out of CC(C)CCO and CC(C)(O)CC which one is optically active and why?
- Out of Chlorobenzene and Cyclohexyl chloride, which one is more reactive towards nucleophilic substitution reaction and why?
- Among all the isomers of molecular formula $\text{C}_4\text{H}_9\text{Br}$, identify (a) the one isomer which is optically active. (b) The one isomer which is highly reactive towards S_N^2 . (c) The two isomers which give same product on dehydrohalogenation with alcoholic KOH.

9. (i) Out of $(\text{CH}_3)_3\text{C}-\text{Br}$ and $(\text{CH}_3)_3\text{C}-\text{I}$, which one is more reactive towards S_N^1 and why? (ii) Write the product formed when p-nitrochlorobenzene is heated with aqueous NaOH at 443 K followed by acidification. (iii) Why dextro and laevo – rotatory isomers of Butan-2-ol are difficult to separate by fractional distillation?

10. An aromatic compound 'A' on heating with Br_2 and KOH forms a compound 'B' of molecular formula $\text{C}_6\text{H}_7\text{N}$ which on reacting with CHCl_3 and alcoholic KOH produces a foul smelling compound 'C'. Write the structures and IUPAC names of compounds A, B and C.

11. Predict the major product formed when sodium ethoxide reacts with tert. Butyl chloride.

12. Which one of the following compounds is more reactive towards S_N^2 reaction and why? $\text{CH}_3\text{CH}(\text{Cl})\text{CH}_2\text{CH}_3$ or $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Cl}$

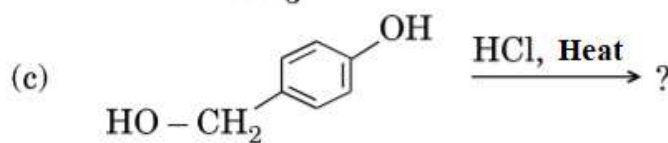
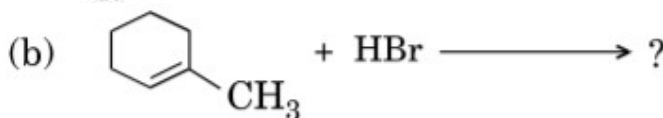
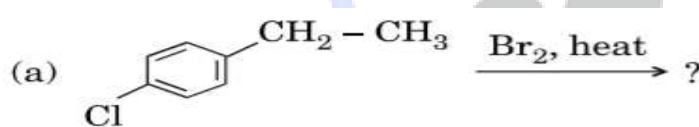
13. Write the product(s) formed when

(i) 2-Bromopropane undergoes dehydrohalogenation reaction.

(ii) Chlorobenzene undergoes nitration reaction.

(iii) Methyl bromide is treated with KCN .

14. Draw the structures of the major monohalo product for each of the following reactions :



15. Following compounds are given to you: 2-Bromopentane, 2-Bromo-2-methylbutane, 1-Bromopentane (i) write the compound which is most reactive towards S_N^2 reaction. (ii) Write the compound which is optically active. (iii) Write the compound which is most reactive towards β -elimination reaction.

16. Out of $\text{CH}_2=\text{CH}-\text{CH}_2\text{Cl}$ and $\text{CH}_3-\text{CH}_2-\text{CH}_2\text{Cl}$, which is more reactive towards $\text{S}_\text{N}1$ reaction ?

17. What happens when :

(i) 2, 4, 6 - trinitrochlorobenzene is treated with warm water.

(ii) 2-chlorobutane is treated with alcoholic KOH .

(iii) ethyl chloride is treated with Na metal in presence of dry ether.

Write the equation involved in the above reactions.

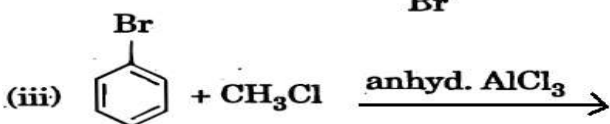
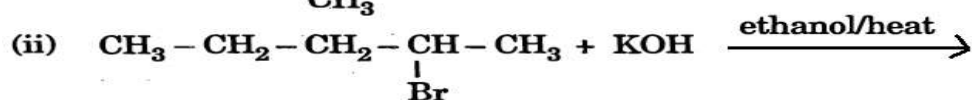
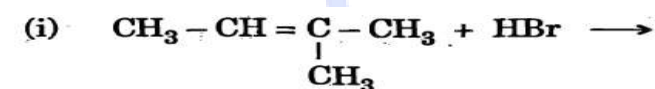
18. What happens when :

- (i) n-butyl chloride is treated with alcoholic KOH.
- (ii) 2-chloropropane is treated with sodium in the presence of dry ether.
- (iii) Chlorobenzene is treated with CH_3Cl in the presence of anhydrous AlCl_3 .

Write the chemical equations involved in the above reactions.

19. Give reasons: (i) C-Cl bond length in chlorobenzene is shorter than C-Cl bond length in $\text{CH}_3\text{-Cl}$. (ii) The dipole moment of chlorobenzene is lower than that of cyclohexyl chloride. (iii) $\text{S}_\text{N}1$ reactions are accompanied by racemization in optically active alkyl halides.

20. Write the structure of the major product in each of the following reactions:



21. Give reasons: (a) n-Butyl bromide has higher boiling point than t-butyl bromide. (b) Racemic mixture is optically inactive. (c) The presence of nitro group ($-\text{NO}_2$) at o/p positions increases the reactivity of haloarenes towards nucleophilic substitution reactions.

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