

CHEMISTRY STUDY MATERIALS FOR CLASS 12 (NCERT BASED REVISION NOTES OF CHAPTER -10)

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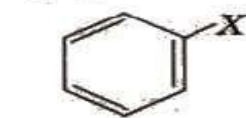
DATE:- 09/03/2021

Haloalkanes and Haloarenes

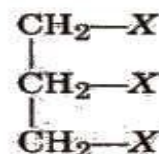
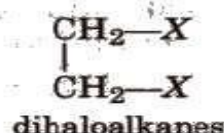
The replacement of hydrogen atom(s) in hydrocarbon, aliphatic or aromatic, by halogen atom(s) results in the formation of alkyl halide (haloalkane) and aryl halide (Haloarenes), respectively.

Classification of Halogen Derivatives

On the basis of number of halogen atoms present, halogen derivatives are classified as mono, di, tri, tetra, etc., halogen derivatives, e.g.,

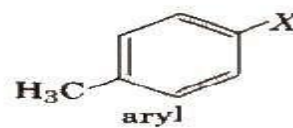
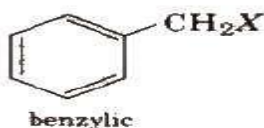
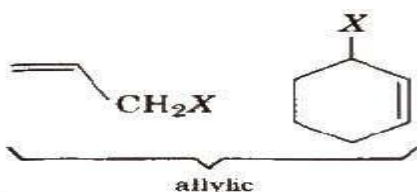
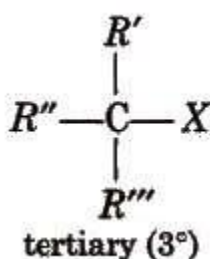
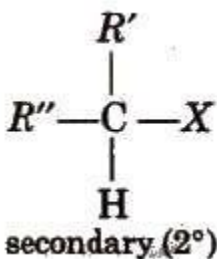
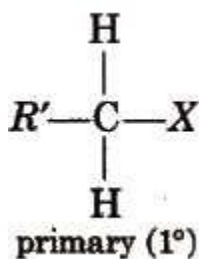


monohaloarene



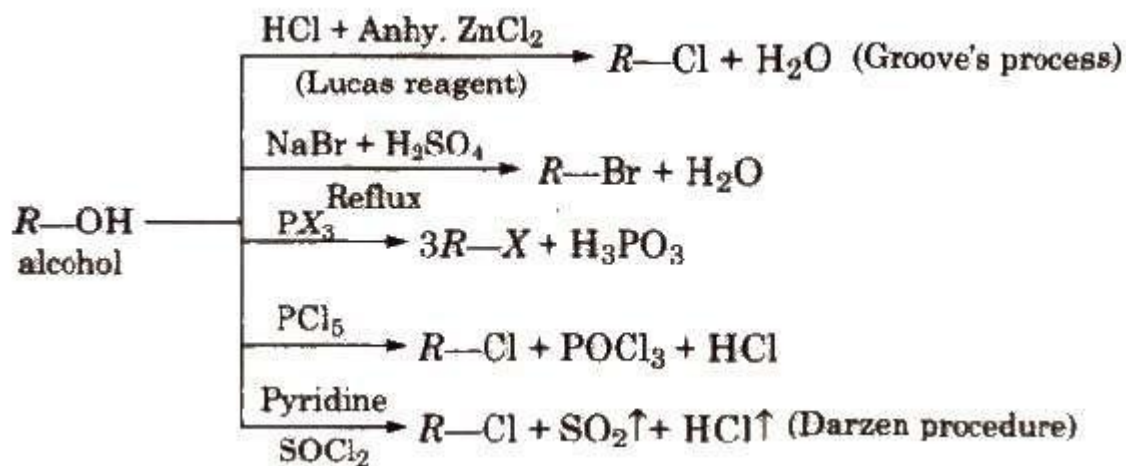
trihaloalkane

On the basis of the nature of the carbon to which halogen atom is attached, halogen derivatives are classified as 1°, 2°, 3°, allylic, benzylic, vinylic and aryl derivatives, e.g.,



General Methods of Preparation of Haloalkanes

1. From Alcohols

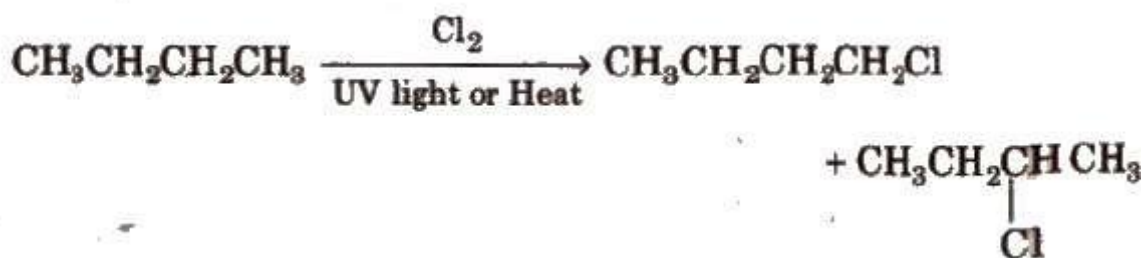


In Groove's method, $ZnCl_2$ is used to weaken the C-OH bond. In case of 3° alcohols, $ZnCl_2$ is not required.

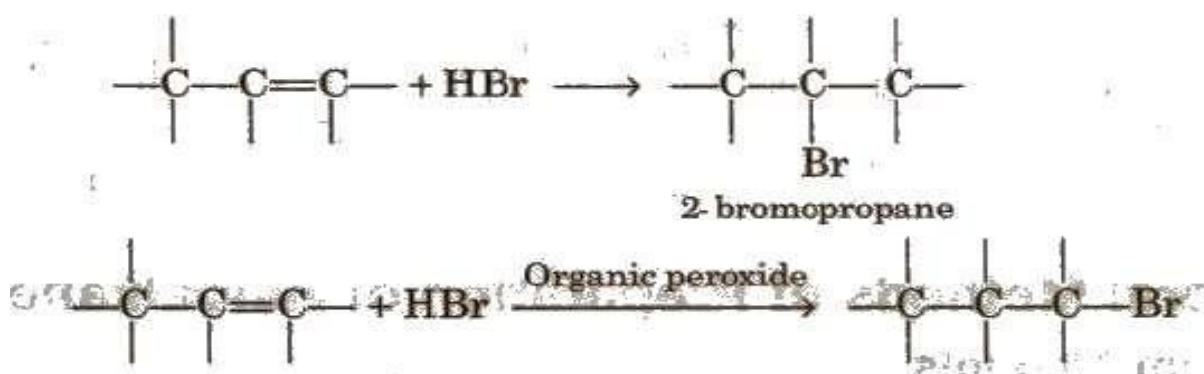
The reactivity order of halogen acids is $HI > HBr > HCl$.

Darzen procedure is the best method for preparing alkyl halides from alcohols since both the by products (SO_2 and HCl) are gaseous and escape easily.

2. Free Radical Halogenation of Alkanes



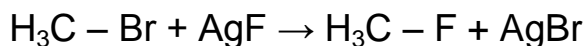
Addition of Hydrogen Halides on Alkenes



1. Finkelstein Reaction

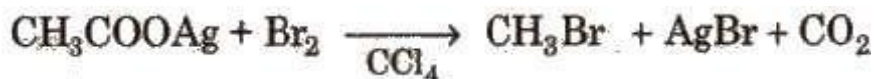


2. Swarts Reaction



Hg₂F₂, COF₂ and SbF₃ can also be used as a reagent for Swarts reaction.

3. Hunsdiecker Reaction

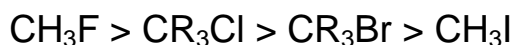


Physical Properties of Haloalkanes

1. Boiling point orders

1. R - I > R - Br > R - Cl > R - F
2. CH₃ - (CH₂)₂ - CH₂Br > (CH₃)₂ CHCH₂Br > (CH₃)₃CBr
3. CH₃CH₂CH₂X > CH₃CH₂X > CH₃X

2. Bond strength of haloalkanes decreases as the size of the halogen atom increases. Thus, the order of bond strength is



3. Dipole moment decreases as the electronegativity of the halogen decreases.

4. Haloalkanes though polar but are insoluble in water as they do not form hydrogen bonding with water.

5. Density order is