Chemistry Class 12 NCERT Solutions: Chapter 10 Haloalkanes and Haloarenes Part 5

Q: 7. Write the equations for the preparation of 1-iodobutane from

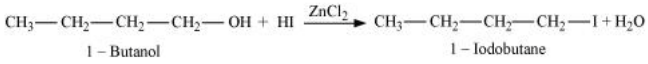
(i) 1-butanol

(ii) 1-chlorobutane

(iii) but-1-ene.

Answer:

(i)



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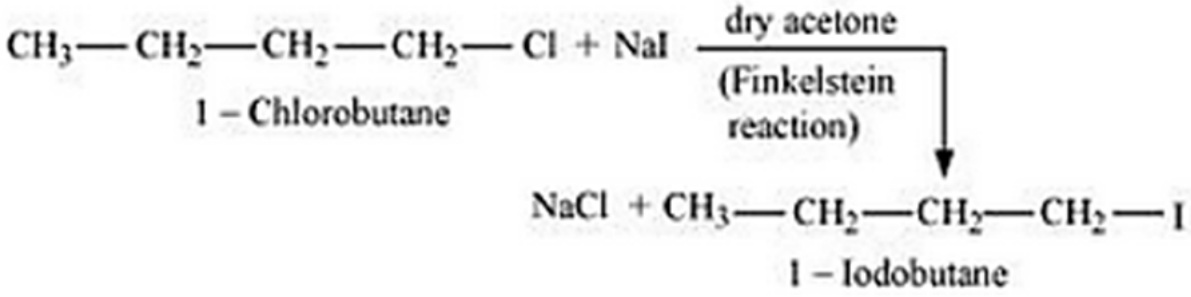

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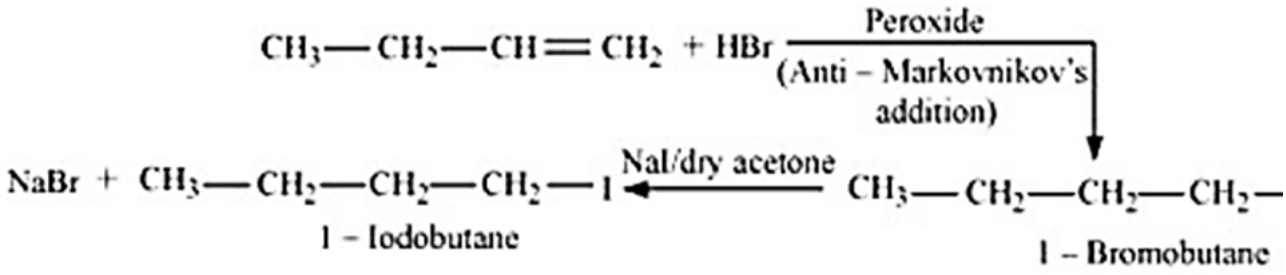
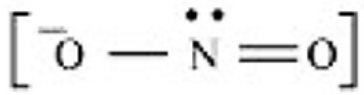


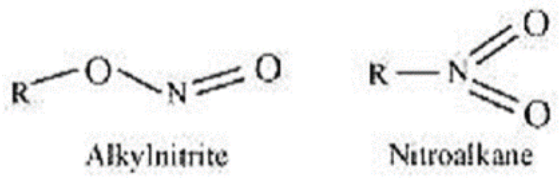
Q: 8. What are ambident nucleophiles? Explain with an example.

Answer:

Ambident nucleophiles are nucleophiles having two nucleophilic sites. Thus, ambident nucleophiles have two sites through which they can attack. For example, nitrite ion is an ambident nucleophile.



Nitrite ion can attack through oxygen resulting in the formation of alkyl nitrites. Also, it can attack through nitrogen resulting in the formation of nitroalkanes.



Q: 9. Which compound in each of the following pairs will react faster in S_N2 reaction with OH^- ?

(i) $CH_3\text{Br}$ or CH_3I

(ii) $(CH_3)_3\text{CCl}$ or CH_3Cl

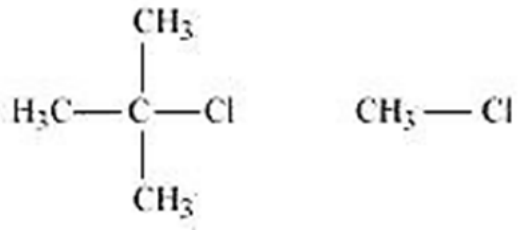
Answer:

(i) In the S_N2 mechanism, the reactivity of halides for the same alkyl group increases in the order. This happens because as the size increases, the halide ion becomes a better leaving group.

$$R-F \ll R-Cl < R-Br < R-I$$

Therefore, CH_3I will react faster than CH_3Br in S_N2 reactions with OH^-

(ii)



The S_N2 mechanism involves the attack of the nucleophile at the atom bearing the leaving group. But, in case of $(CH_3)_3CCl$, the attack of the nucleophile at the carbon atom is hindered because of the presence of bulky substituents on that carbon atom bearing the leaving group. On the other hand, there are no bulky substituents on the carbon atom bearing the leaving group in CH_3Cl . Hence, CH_3Cl reacts faster than $(CH_3)_3CCl$ in S_N2 reaction with OH^- .