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MJC - 6 (T)

Unit - 1

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Reactions of Alcohols i.e.:

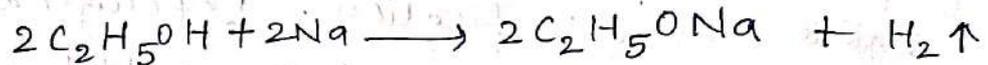
Chemical Properties of Alcohols:

① Reaction with Na (sodium) OR with Active metals — Acidic character of alcohols.

Alcohols react with active metals like Na and K to give alkoxide of the metal and liberating hydrogen gas.



example:



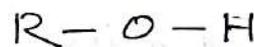
Sodium ethoxide

Thus, H-atom of the -OH group of alcohols is displaced by active metals. This reaction shows that the H-atom of the -OH group in alcohols is acidic in nature. The acidic nature of alcohols is due to the polar character of the O-H bond. However, alcohols are weaker acids than water. This can be explained as follows! -

Water and alcohol molecules have similar structures:



In water -OH gr.
attached with H-atom



In alcohol -OH gr.
attached with R (alkyl)
group.

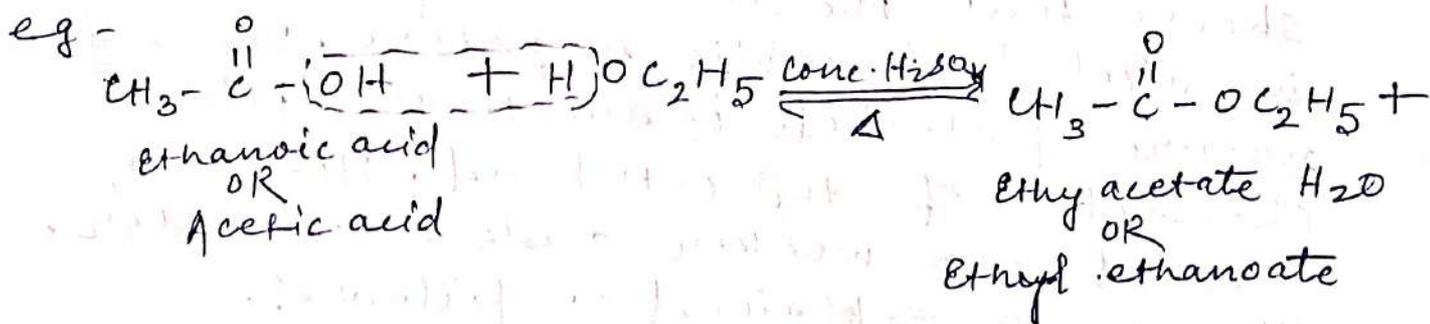
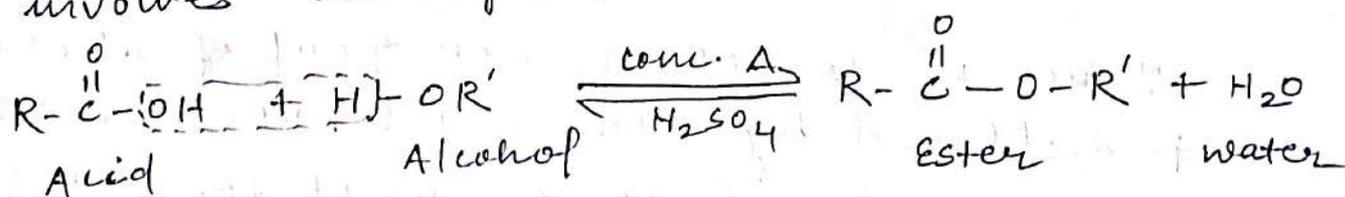
(2)

Alkyl (R) groups are electron releasing groups. eg - $R \rightarrow O^{-\delta} - H^{+\delta}$

So, the presence of an alkyl group in alcohol increases the electron density at the O atom. As a result, O atom shows tendency to withdraw electrons from H-atom. This decreases the polarity of the O-H bond, and therefore, breaking of the O-H bond becomes difficult. Thus alcohols are weaker acids than water.

(2nd) Reaction with carboxylic acids: Esterification

Alcohols react with carboxylic acids in presence of conc. H_2SO_4 to form esters. This reaction is known as 'Esterification'. Esterification involves cleavage of the O-H bond in alcohol.



The esterification reaction is reversible. So, the reaction should be carried out in the presence of a dehydrating agent like conc. H_2SO_4 . Sulphuric acid removes water as soon as it is formed.