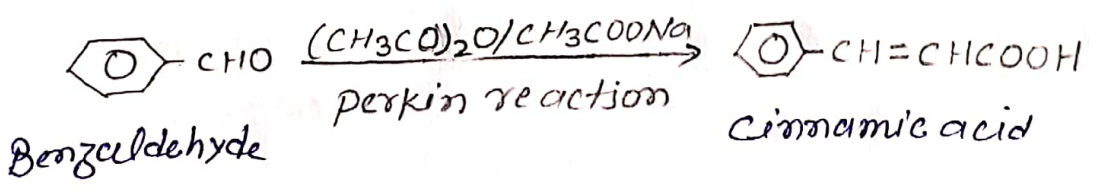


SUBJECT - CHEMISTRY
CLASS - B.Sc (Hons) PART - II
PAPER - IV GROUP - B
TOPIC - Perkin reaction

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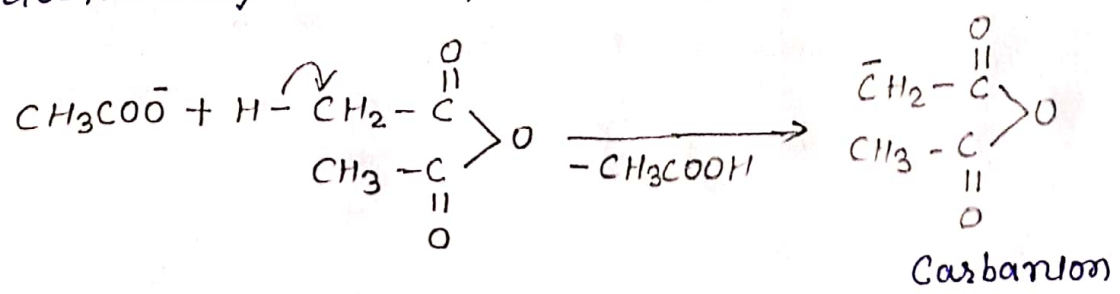
Perkin reaction

When an aromatic aldehyde Condenses with a Carboxylic acid anhydride containing atleast two α -H-atom in presence of Na or K Salt of the same acid as a catalyst an α - β unsaturated Compound is formed. This reaction is called Perkin reaction. It provides an excellent method for the Synthesis of α - β unsaturated Compounds which are of great Synthetic importance. A typical α - β unsaturated Compound cinnamic acid is prepared by heating benzaldehyde with acetic anhydride and Sodium acetate at about 180° for several hours -

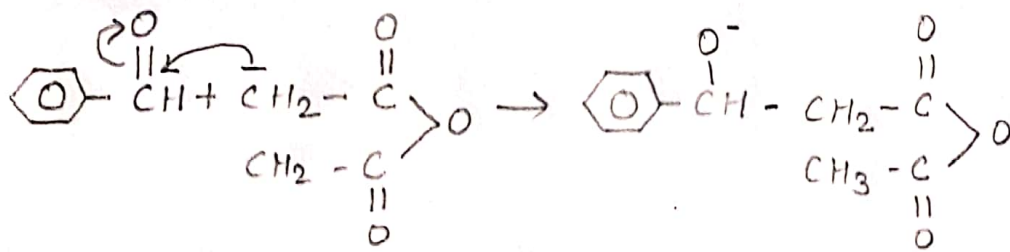


Mechanism:

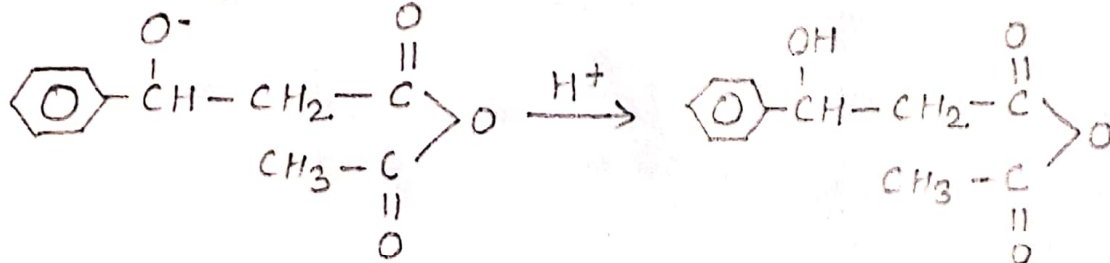
Firstly the acetate ion removes the acidic H-atom of acetic anhydride to form carbanion -



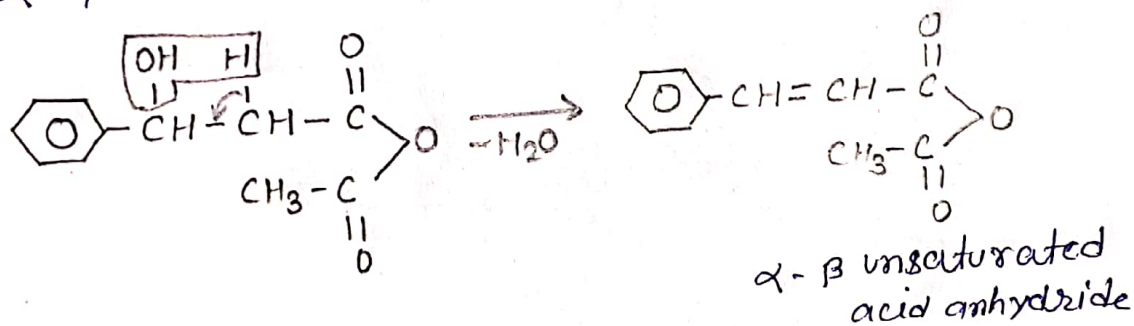
Now the carbanion attacks on the carbonyl carbon atom of the aldehyde to form an oxyanion -



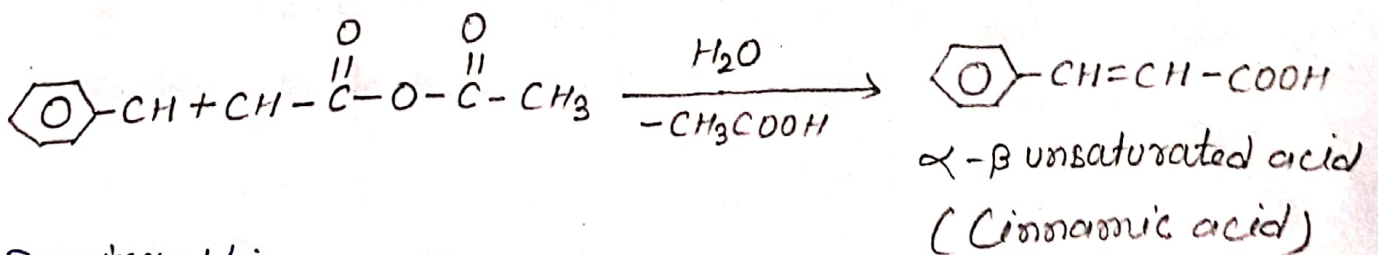
The oxyanion so formed, takes up proton to form hydroxy acid anhydride -



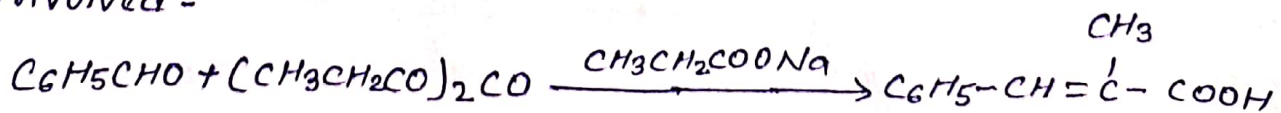
The dehydration of hydroxy compound takes place to form α - β unsaturated acid anhydride -



The α - β unsaturated acid anhydride hydrolyses to give an α - β unsaturated acid -



During this reaction only α -H atoms of anhydride are involved -



α -methyl cinnamic acid

The catalyst (Sodium Salt of the acid) may be replaced by other bases such as Na_2CO_3 , pyridine, quinoline and triethyl amine. Perkin reaction occurs more readily when the aldehyde has an electron attracting group on the aromatic ring e.g.

