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(5) Aldol Condensation:

Two molecules of an aldehyde or a ketone undergo condensation in the presence of a base to yield a β-hydroxy-aldehyde or a β-hydroxyketone. This reaction is called the aldol Condensation. In general Carbonyl Compounds which Contain α-H atoms undergo aldol condensation with dil. NaOH. Aldol Contains both alcoholic and Carbonyl groups.

□ Mechanism of aldol Condensation:

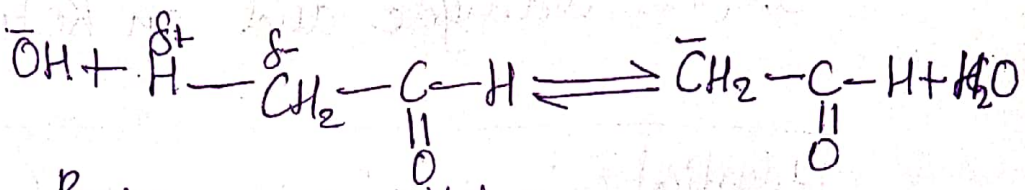
It takes place in the following two stages:

(a) Formation of Carbanion

(b) Combination of Carbanion with other aldehyde molecule.

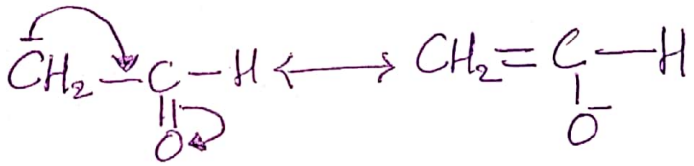
(a) Formation of Carbanion:

α-H atom of >C=O group are quite acidic which can be removed easily as proton, by a base.

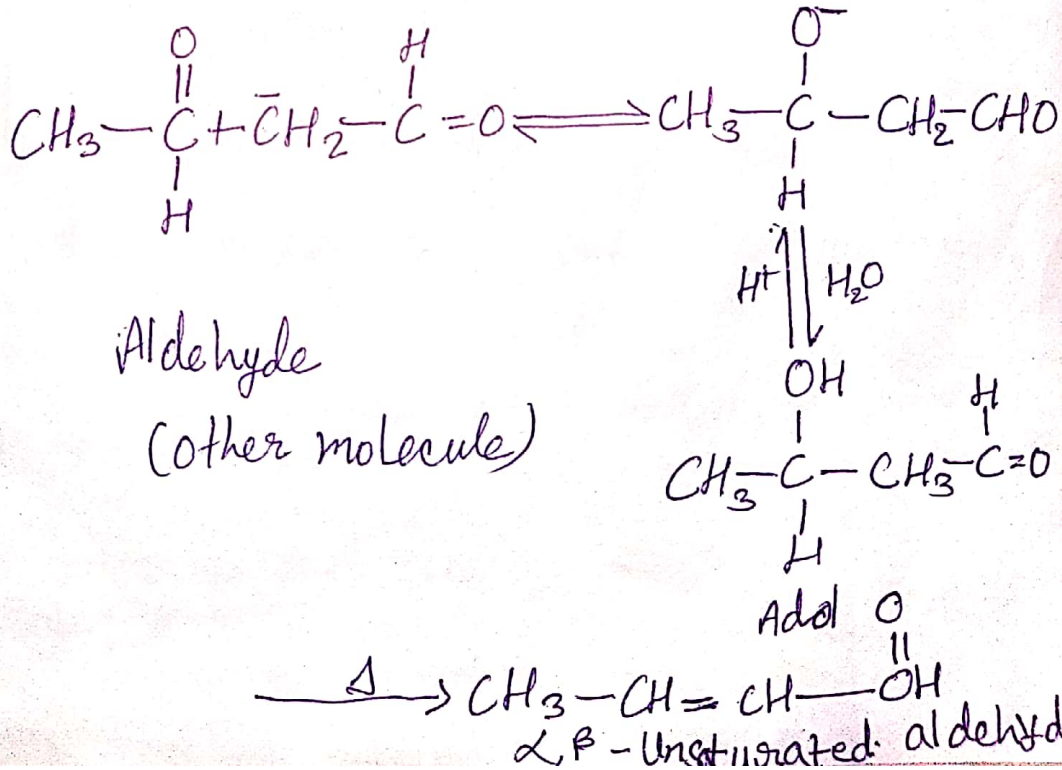


Base Acetaldehyde Carbanion

Carbanion thus formed is stable because of resonance :—



(b) Combination of Carbanion with other aldehyde molecule :



Aldehyde (other molecule)

α,β-Unsaturated aldehyde

Aldol Condensation is possible between,

1. Two aldehyde (same or different)
2. Two ket ones (same or different)
3. One aldehyde and on ketone

Identical carbonyl Compounds	⟶ Simple or self aldol Condensation.
Different Carbonyl Compounds	⟶ Mixed or Crossed aldol Condensation