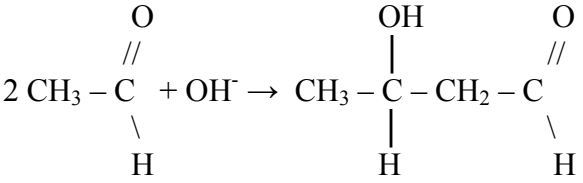
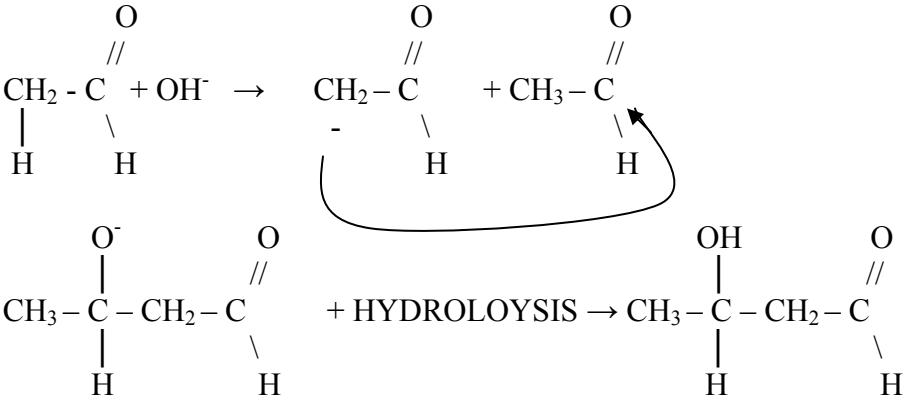
ALDOL CONDENSATION OF ALDEHYDE

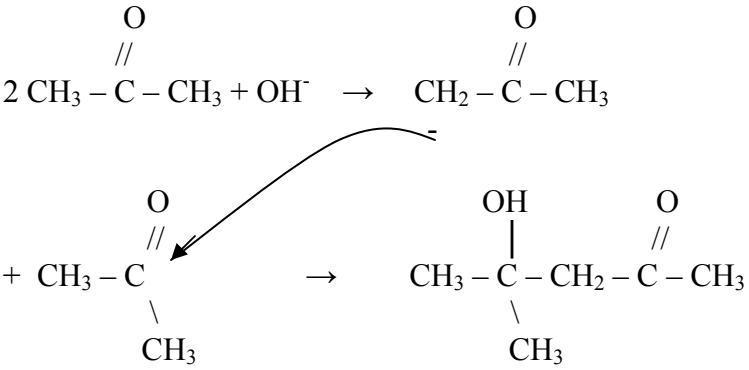


"aldol", "2 – hydroxybutanal"

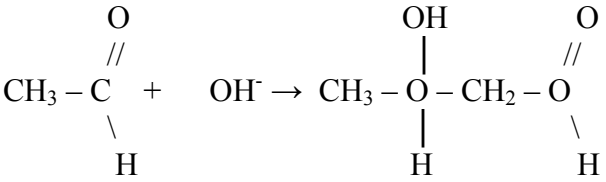
Mechanism: "β – hydroxybutyraldehyde"



ALDOL CONDENSATION OF KETONE



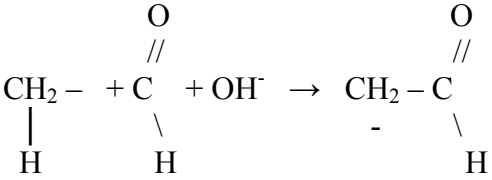
ALDOL CONDENSATION:

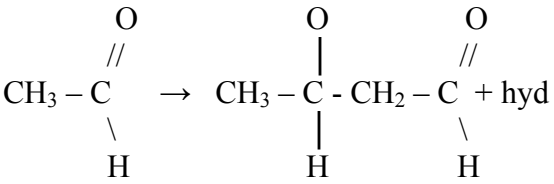


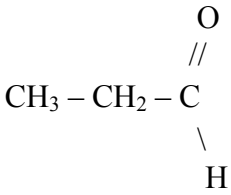
2 Similar aldehydes or ketones w/OH^-
add to each other

Common name – "aldol"
sci – "2 hydroxybutanal"
β – hydroxy aldehyde

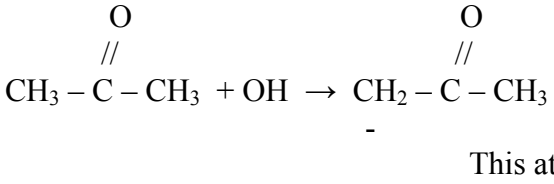
Mechanism:



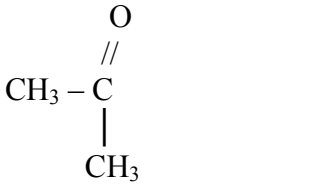




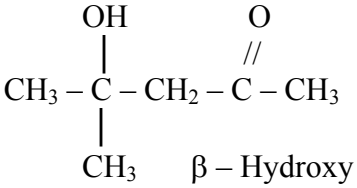
At home: Take this and go through Aldol condensation



This attacks



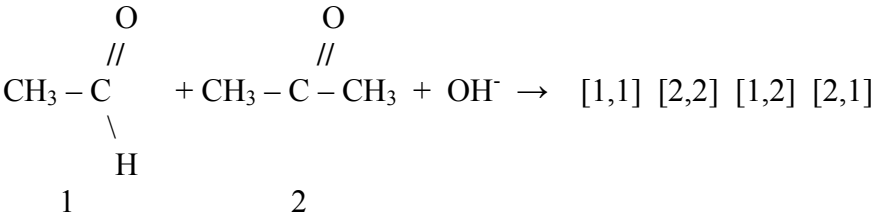
FINAL PRODUCT:

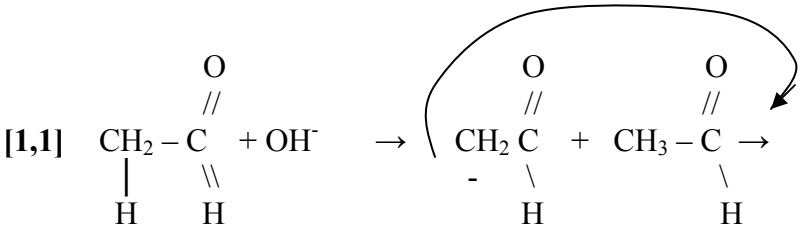


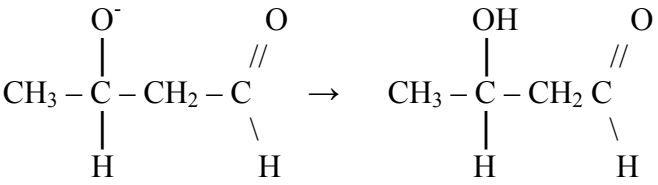
β – Hydroxy ketone

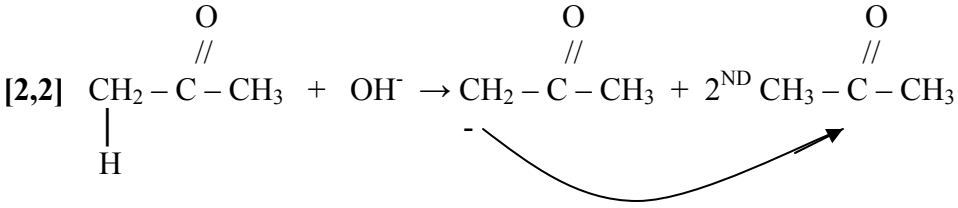
4 hyrdroxy - 4 methyl - 2 pentanone

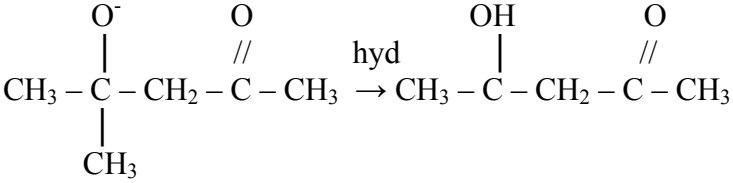
CROSSED ALDOL CONDENSATION



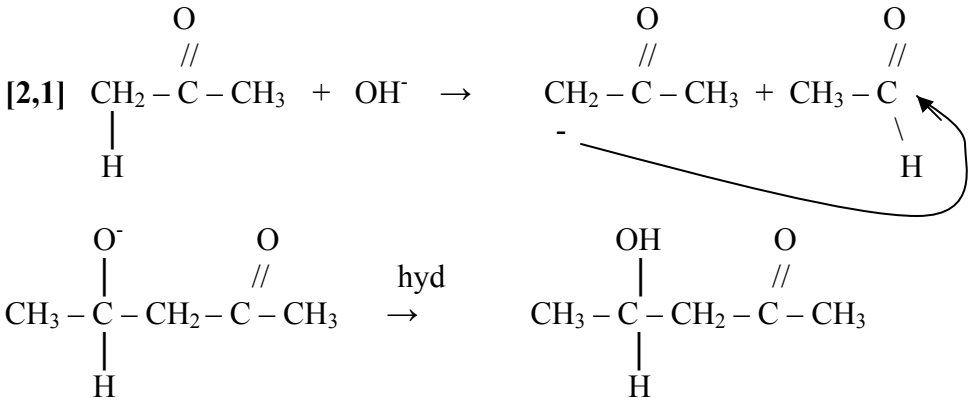




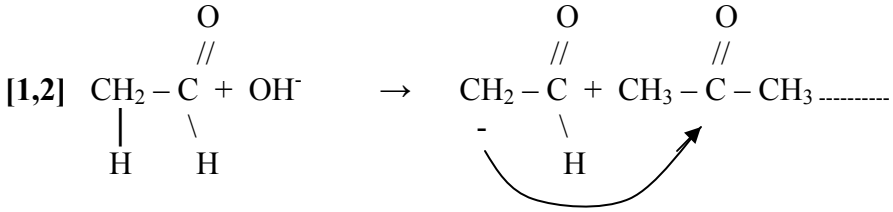


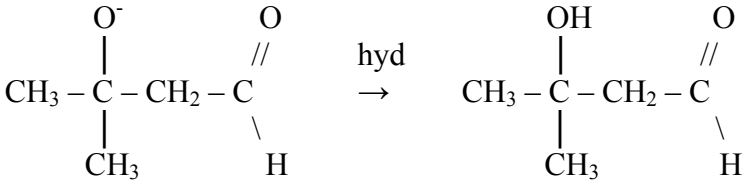


[2,1]



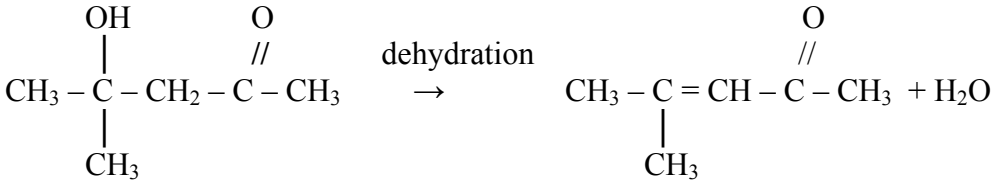
[1,2]

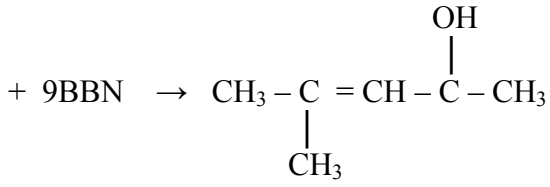


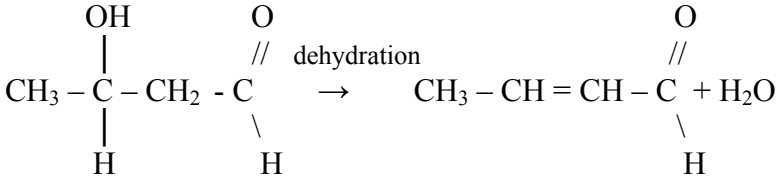


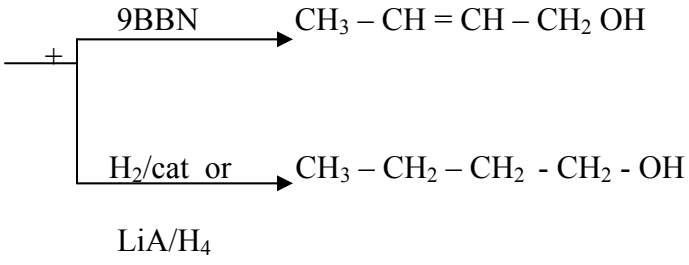
POSSIBILITIES WITH PRODUCT OF ALDOL CONDENSATION:

(with Ketone)









If you take a ketone under H^+ or OH^- conditions and add Br_2, the substitution reaction takes place exclusively on one of the α - hydrogens.

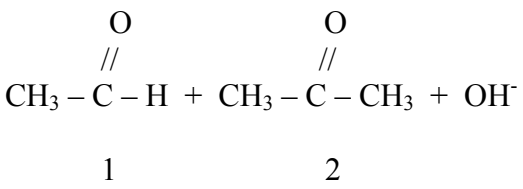
Kinetics indicate that ROR depends on concentration of acid and ketone, BUT NOT ON [Br].

R α [Ketone] [H^+ or OH^-]

e.g. changing concentration of Br $\neq$ affect the rate of reaction.

CROSSED ALDOL CONDENSATION:

BAD if both have are different -- possibility of 4 products



1 2

Possibilities DO THIS!

1 + 1
2 + 2 + means "x" compound condenses upon "y" compound
2 + 1
1 + 2

On paper looks OK, but it's messy to separate, so use aldehyde without any alpha hydrogen, so it can't condense upon itself.