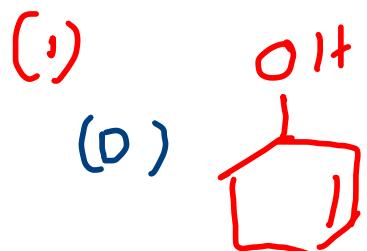
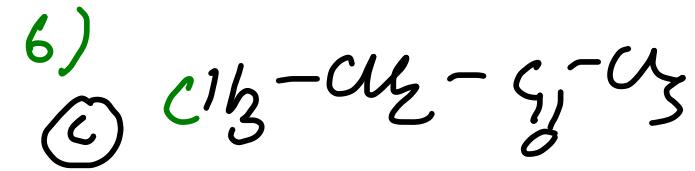


: Exercise - 0-1:



oppaneur ✓  
oxicarbonyl

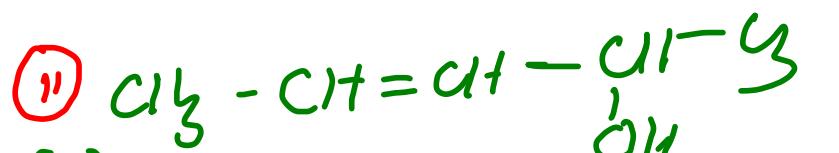


Se² 2f



Dimethyl glyoxal.

(2) done



(c) Allylic  
position -OH ✓

(7)  $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{OH}$  ✓  
 $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{OH}$

3) done



Monocarbonyl  
system

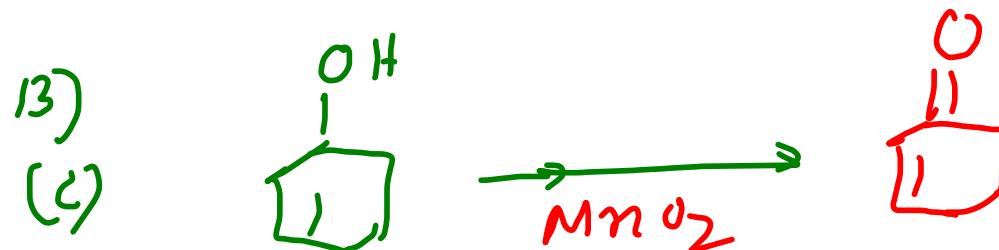
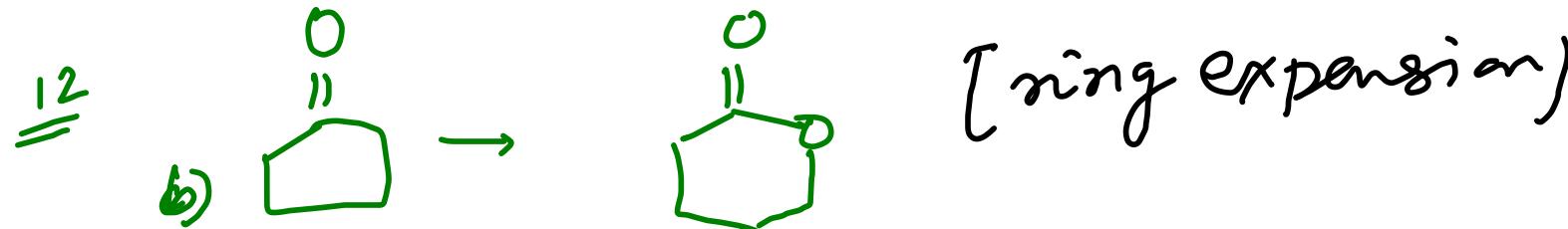
5) a, b, c



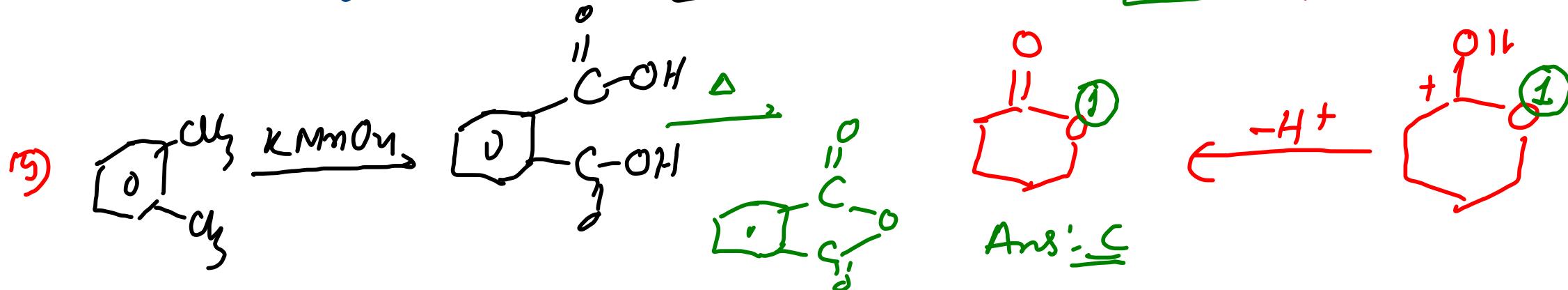
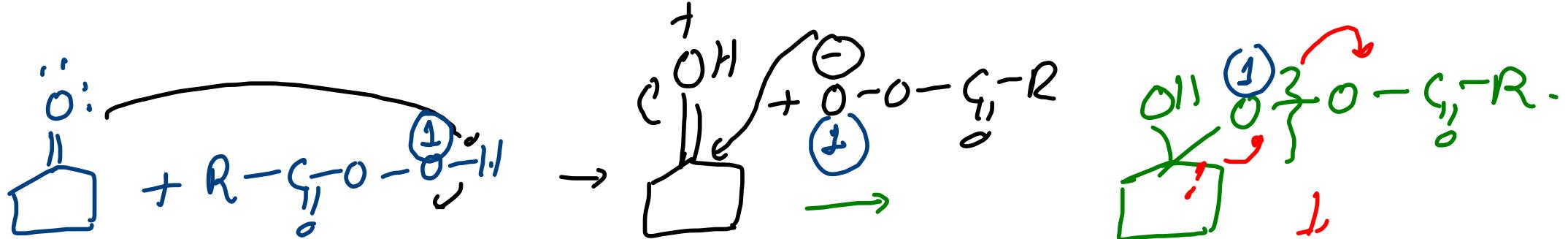
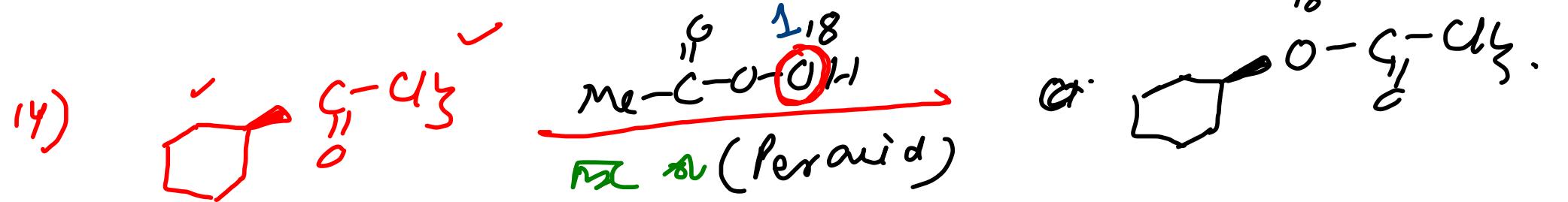
(5) all.

10) Schiff = Tollens reagent.

11).

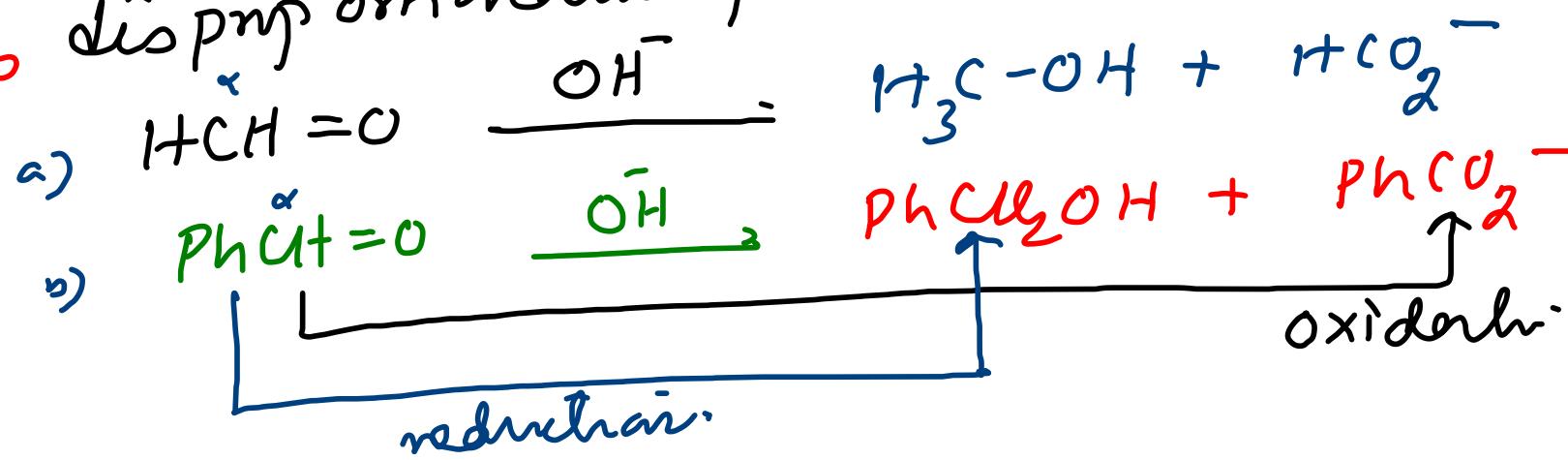


retention of configuration  
takes place

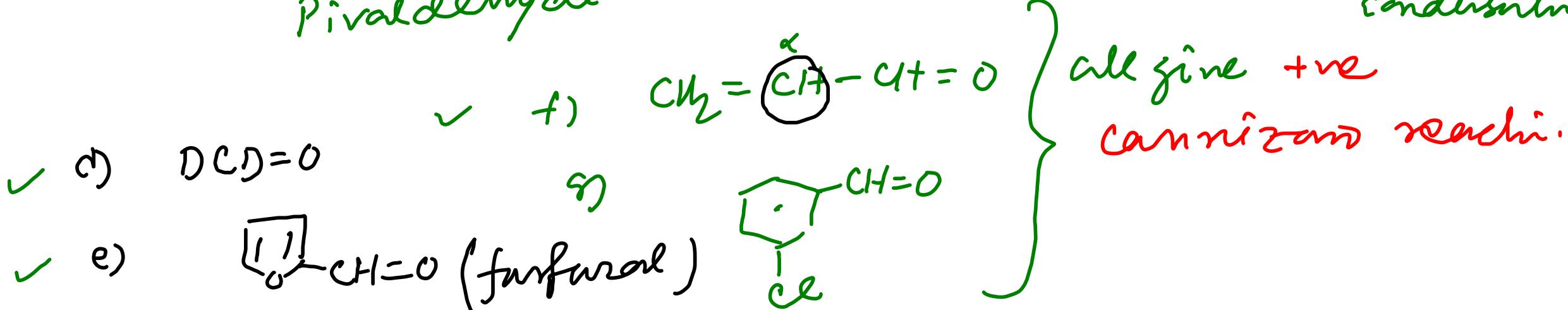
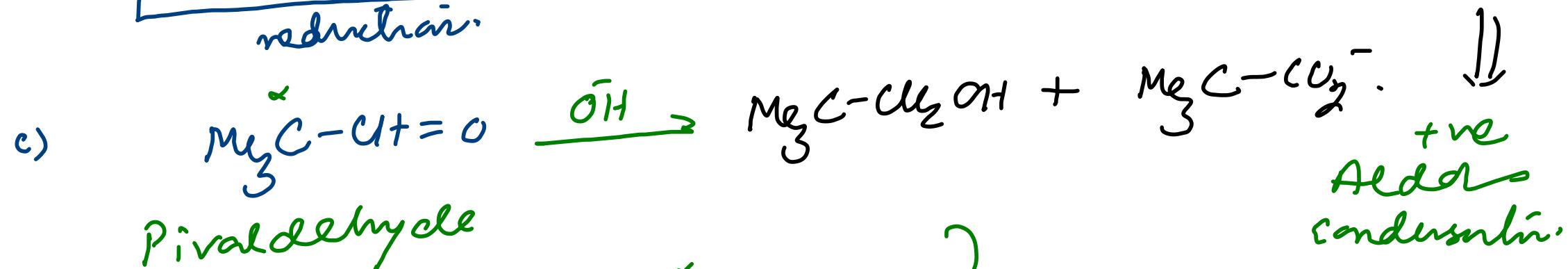


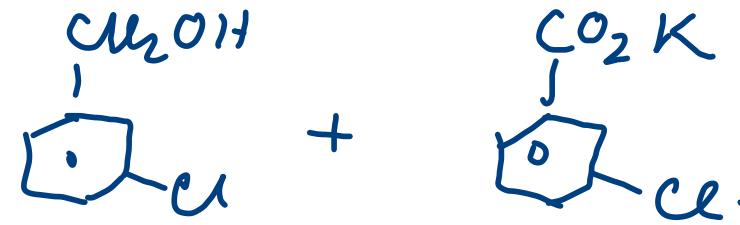
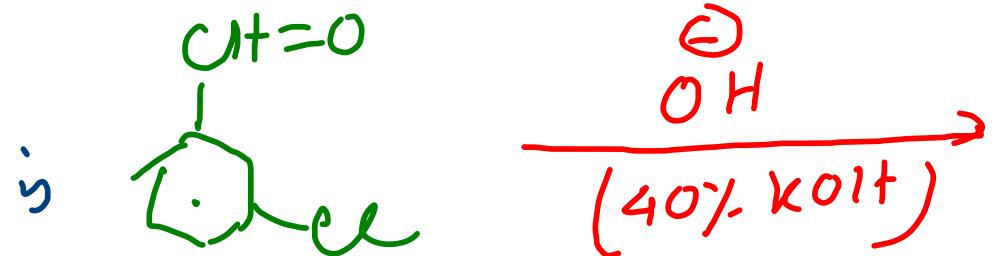
Cannizzaro reaction:  
Aldehyde having no  $\alpha$ H, in presence of conc.  $\text{OH}^-$  ( $\text{NaOH} \mid \text{KOH}$ )

gives dispmp orthionate products.



i)  $\text{CD}_3\text{CH=O}$   
ii)  $\text{HCD}_2-\text{CH=O}$   
iii)  $\text{DCD}_2-\text{CH=O}$   
-ve Cannizzaro



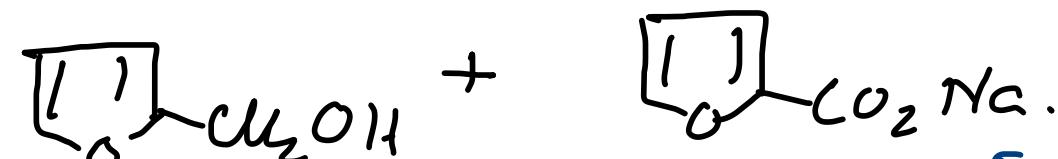
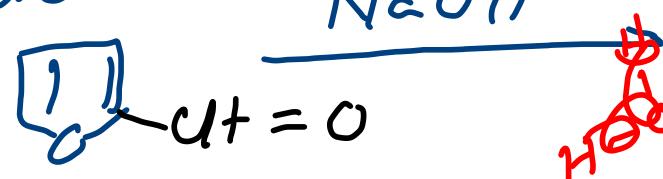


Example g  
Cannizaro.  
(self)

m-chlorobenzaldehyde

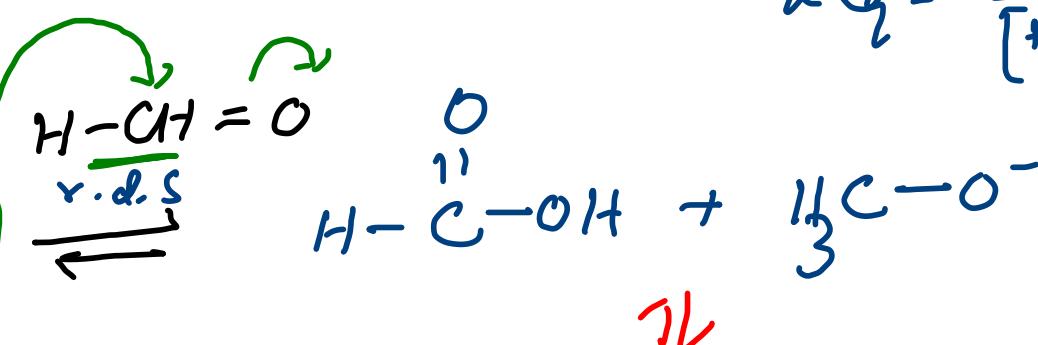
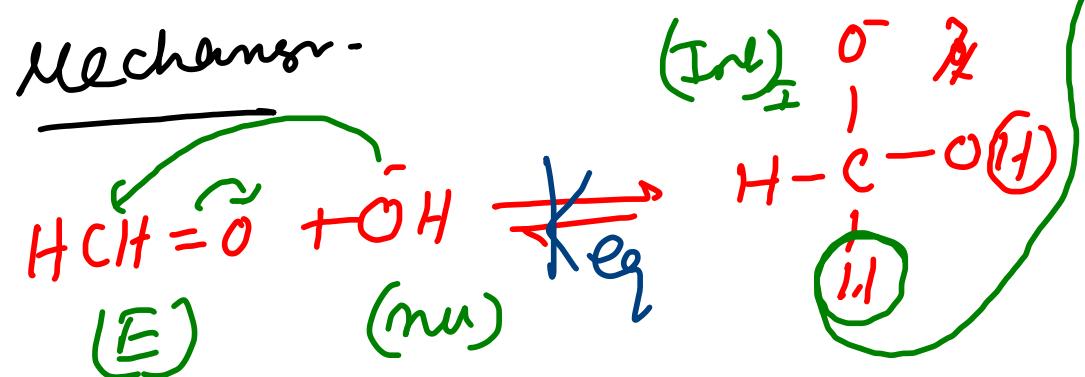
Mechanism

ii)



$$K_{\text{eq}} = \frac{[\text{Int}]}{[\text{HCHO}][\text{OH}^-]}$$

Mechanism-



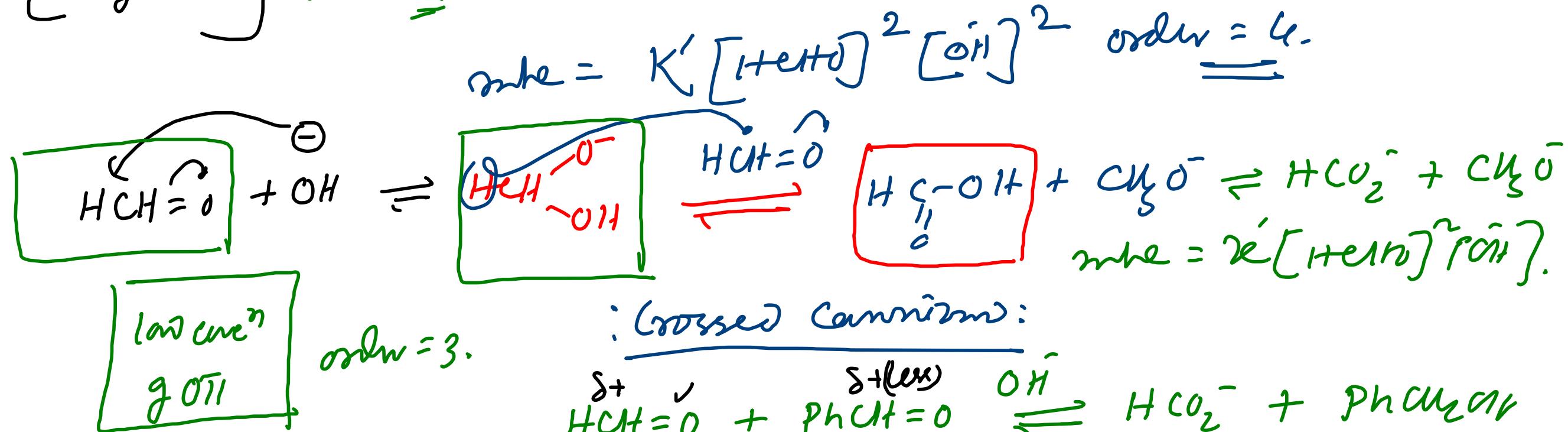
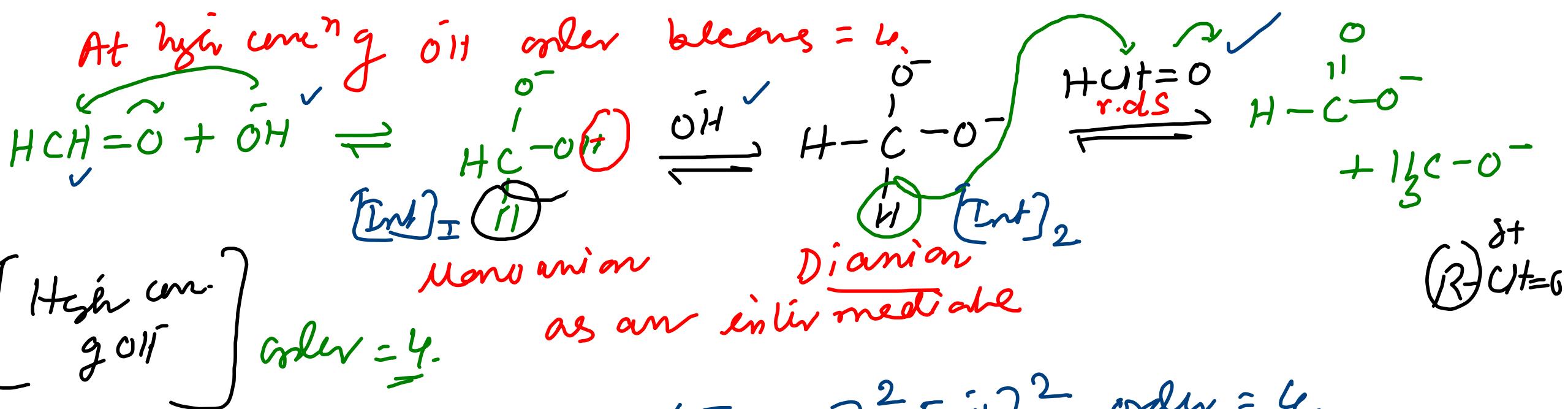
$\Rightarrow$  2nd step is r.d.s;  $\text{H}^\ominus$  shift takes place.  $\text{HCO}_2^- + \text{H}-\overset{\text{O}}{\underset{\text{C}}{\text{C}}}-\text{O}^-$

$\Rightarrow$  1st step: nucleophilic addition reaction.

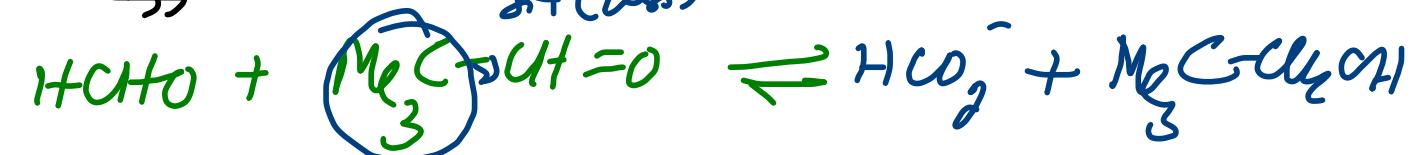
$\Rightarrow$  Redox; disproportionation reaction.  
 $\Rightarrow$  3rd order kinetics.

$$rate = k[\text{HCHO}][\text{Int}]_I$$

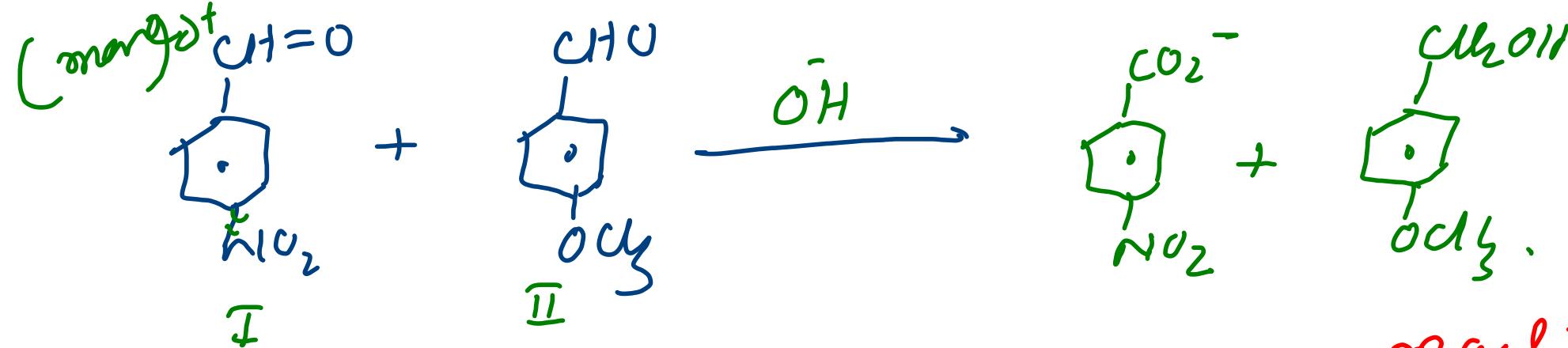
$$= K' [\text{HCHO}]^2 [\text{OH}^-] = k[\text{HCHO}]^2 K_{\text{eq}} \frac{[\text{HCHO}]}{[\text{OH}^-]}$$



The carbonyl having more  $\delta+$  charge on carbon is oxidised always.

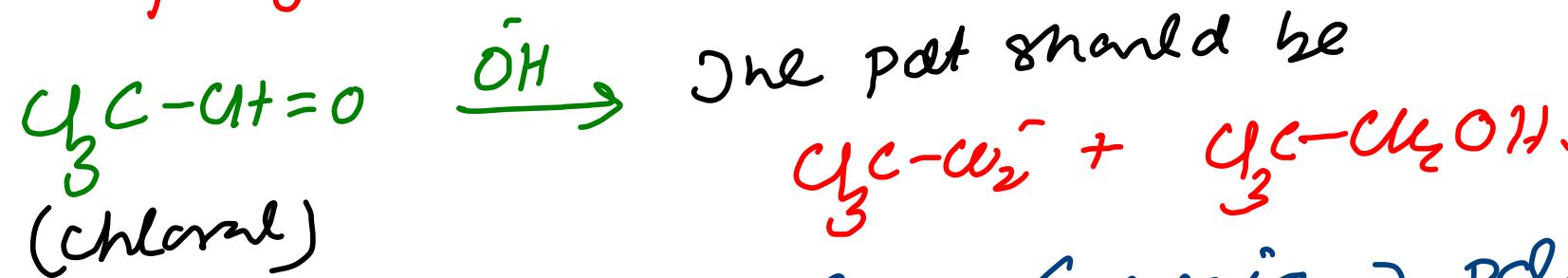




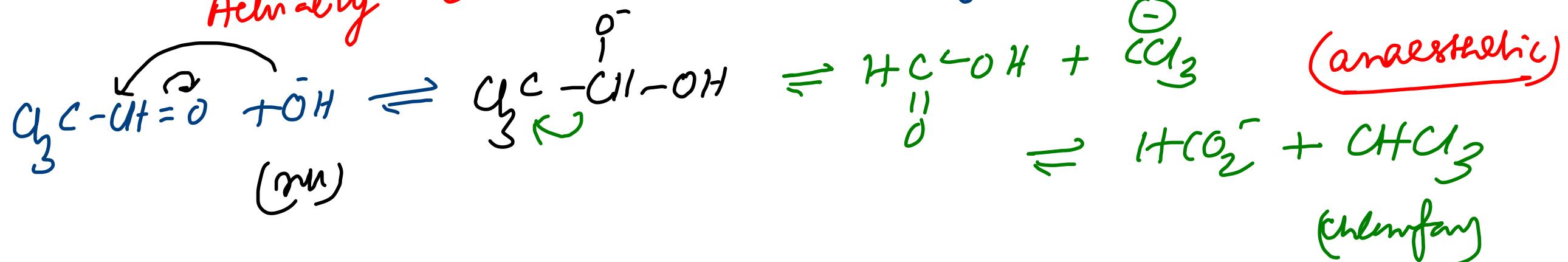


Crossed Cannizzaro is example of redox reaction but it is  
 not example of disproportionation reaction.

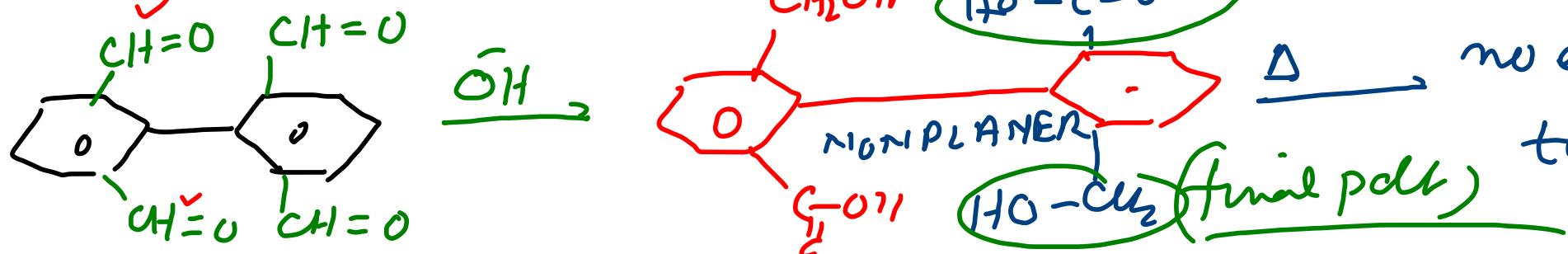
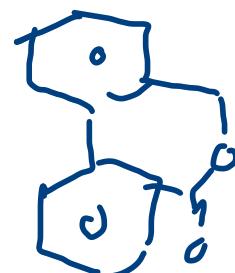
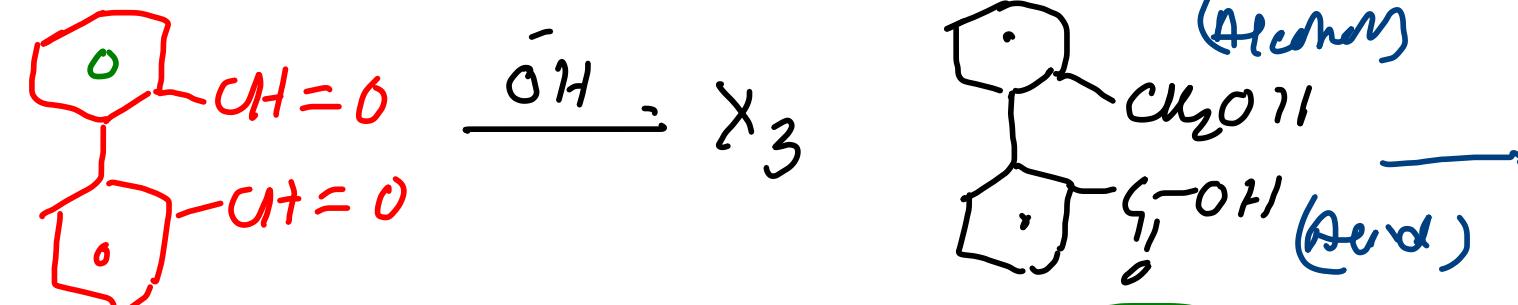
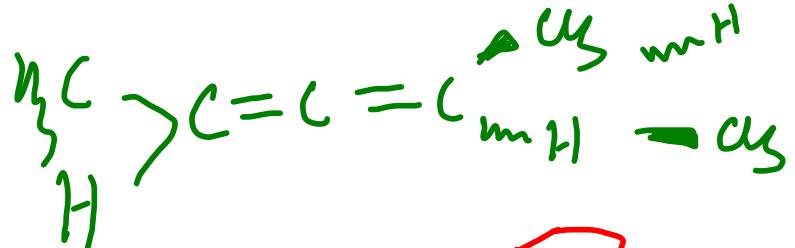
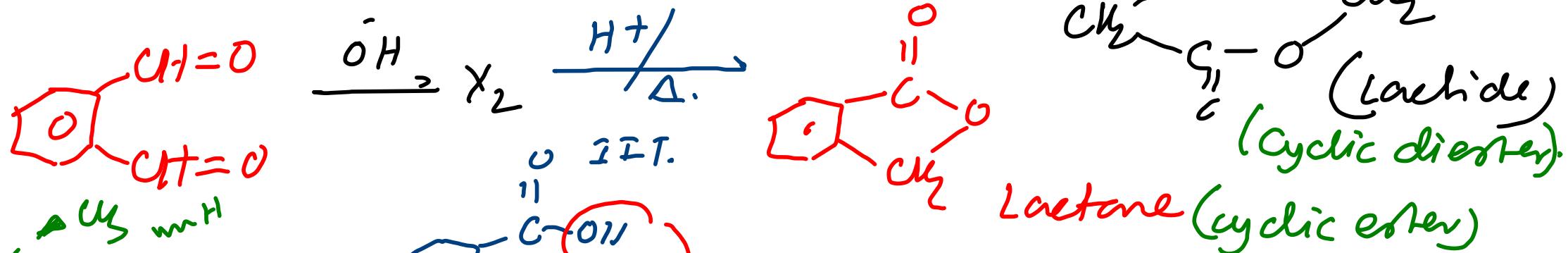
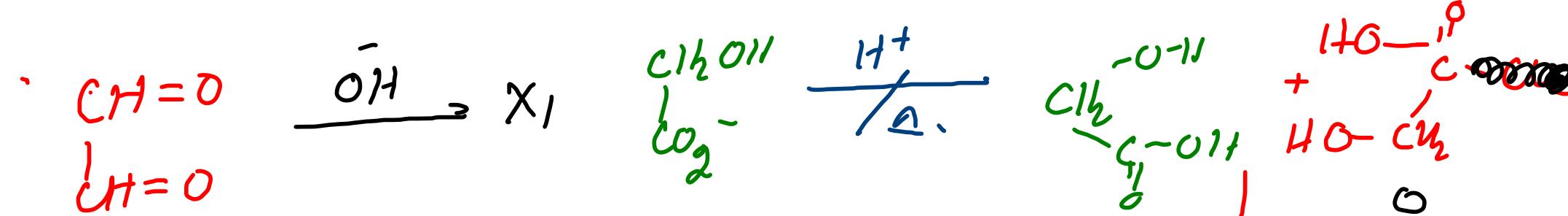
: except:

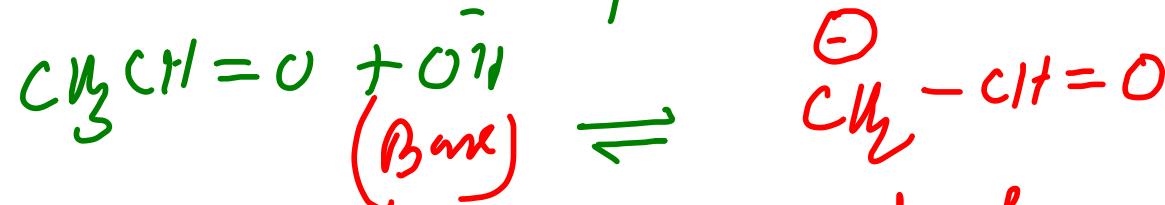
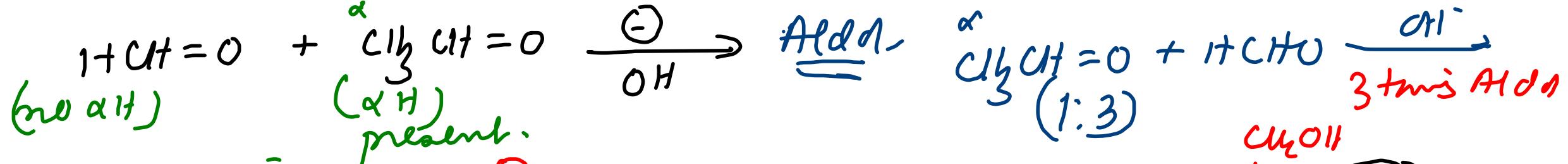


Achirally chloral does not undergo Cannizzaro prod.

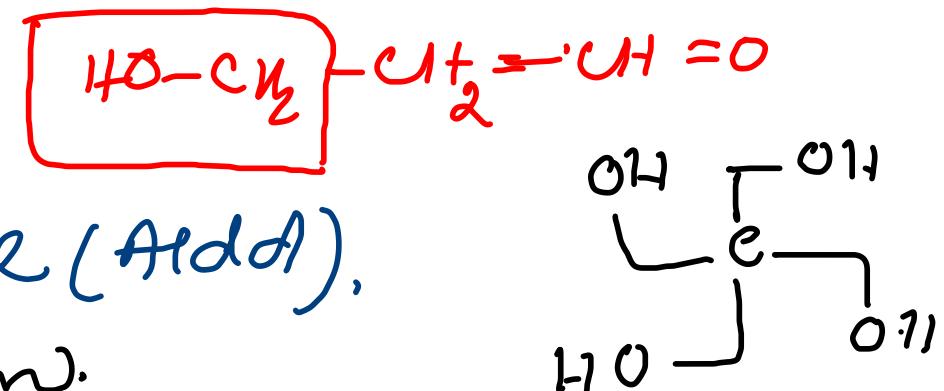
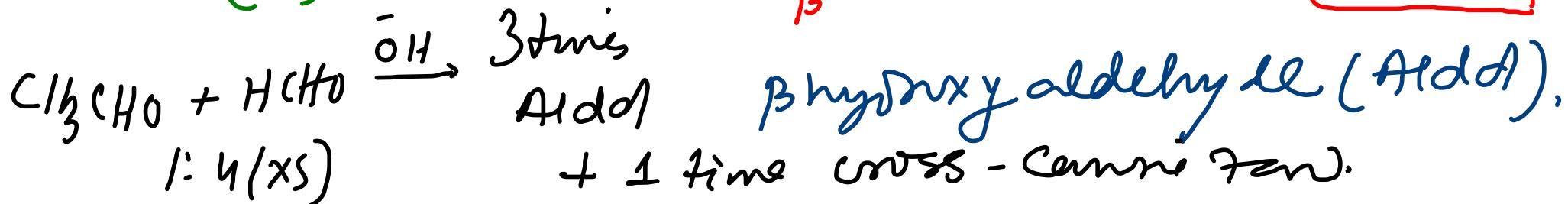
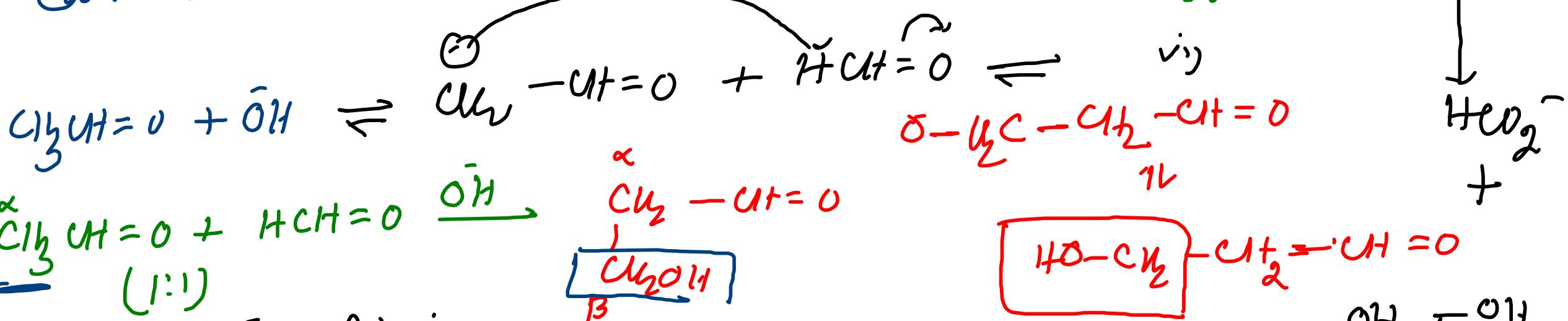


Intra  
Cannizzaro





Acid Base reaction is fast.  
In presence of Aldehyde type of reaction,  
Cannizzaro reaction never happens.

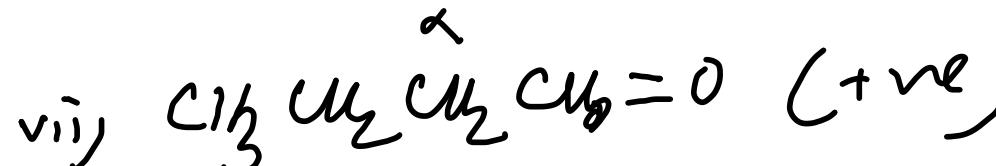
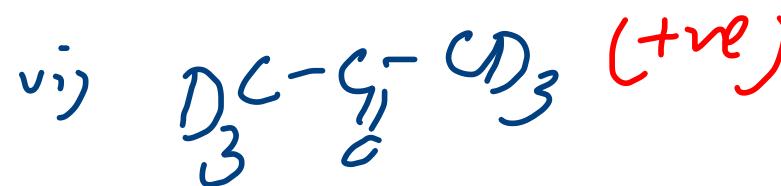
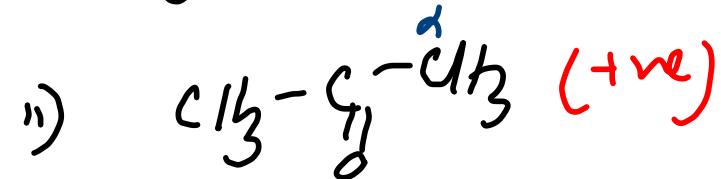
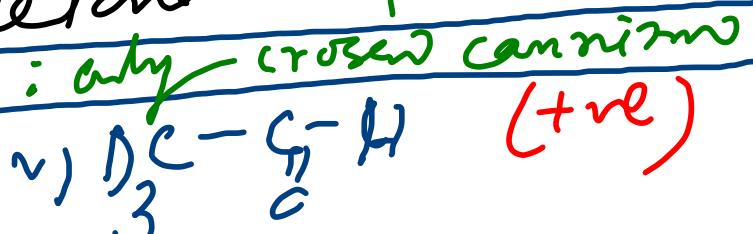
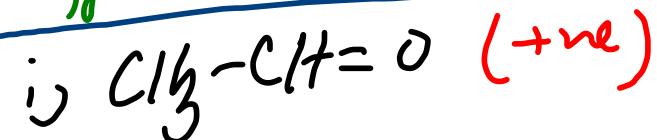


## Aldol Condensati: / Aldol reacti:

aldehyde & ketone having  $\alpha$ -hydrogen undergo reaction with  $\text{O}^-$  to give ester for aldo/ketone + more or less reactive it give  $\alpha, \beta$  unsat'd aldoh/ketone.

turning aldehyde / ketone.

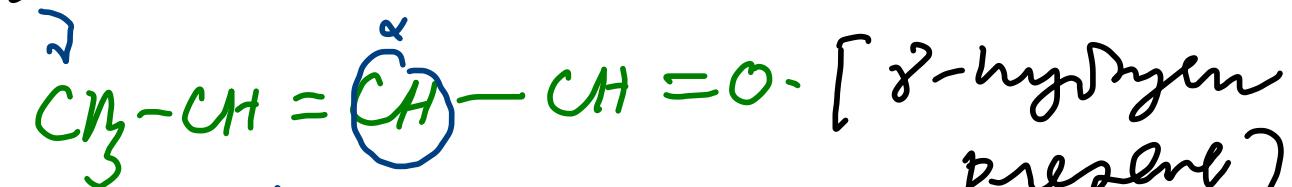
different Aldehyde (reactant): only crossed cannizzio



Butanal.



x)

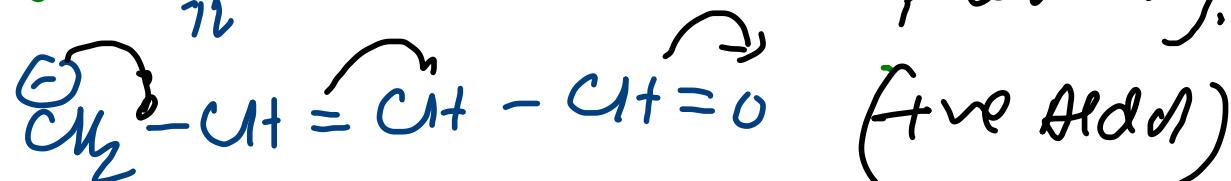


In presence of Aldol, Cannizzio reaction never takes place

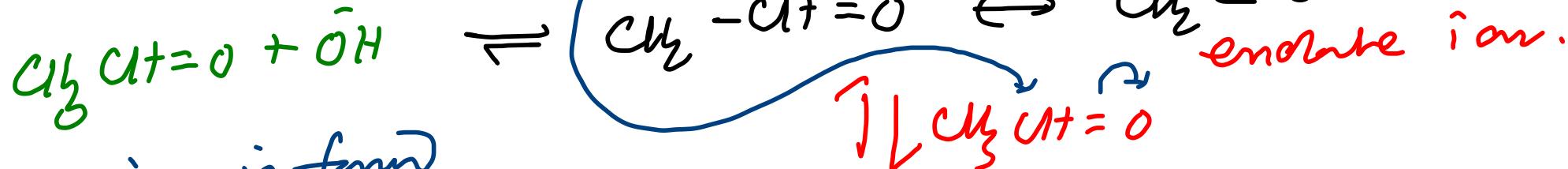
Cannizzio:  $\text{OH}$   
Nucleophile.

Aldol  
reacti: Base.

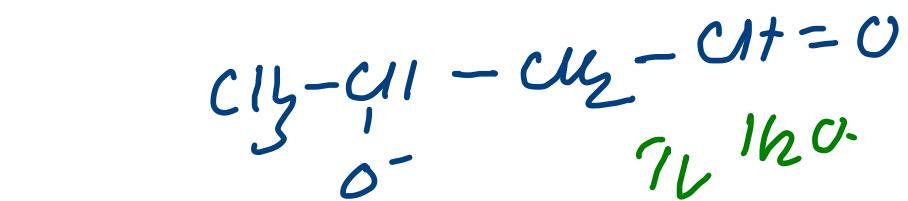
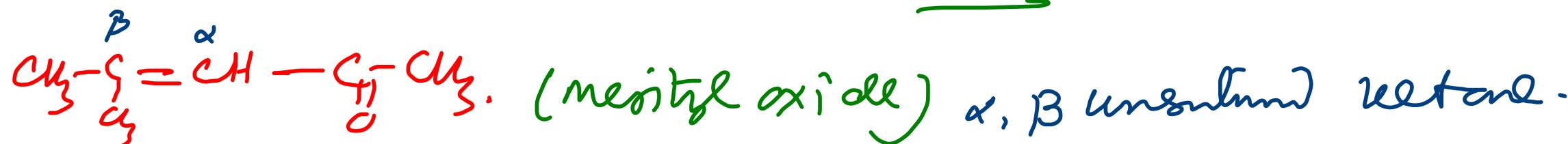
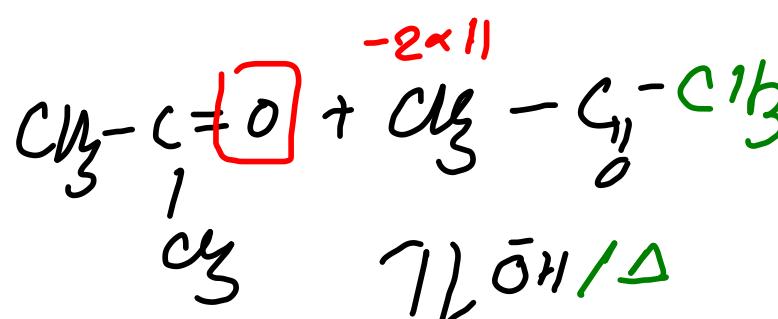
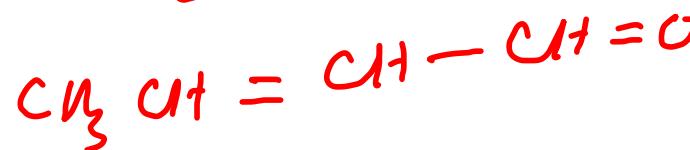
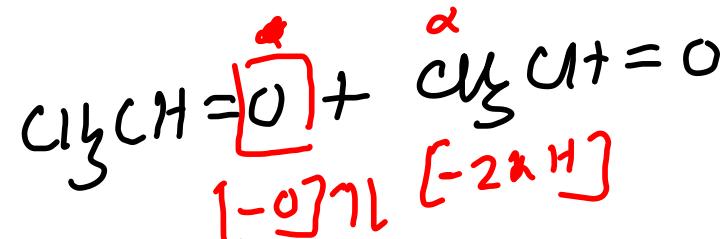
Aldol  
>(Cannizzio)



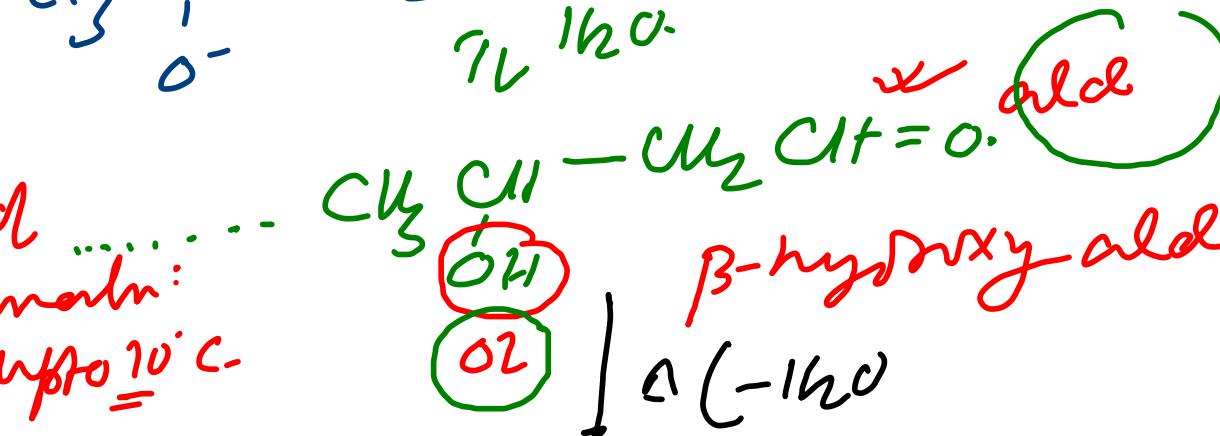
## Mechanism:



$\Rightarrow$  carbanion is formed as intermediate



Alcohol  
formaldehyde  
upto  $10^\circ\text{C}$

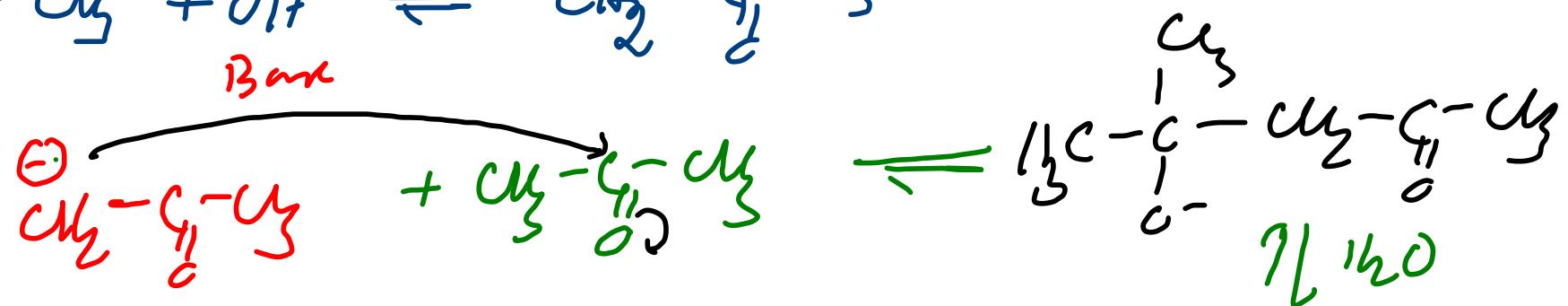
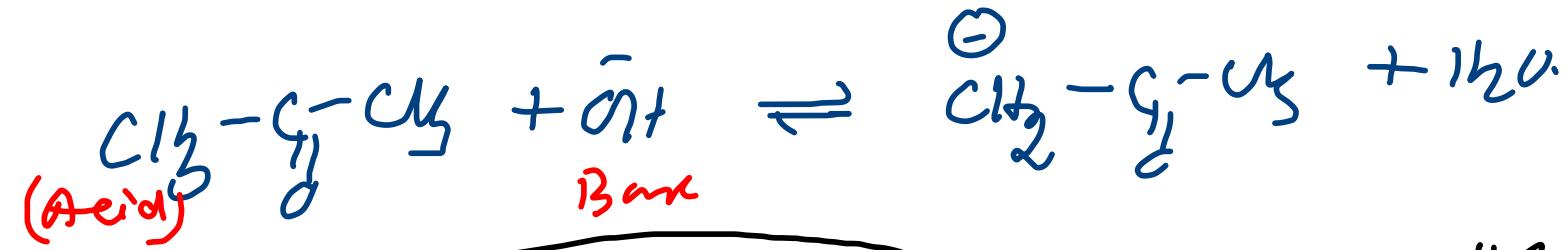


$\beta$ -hydroxy aldehyde  
[aldehyde]

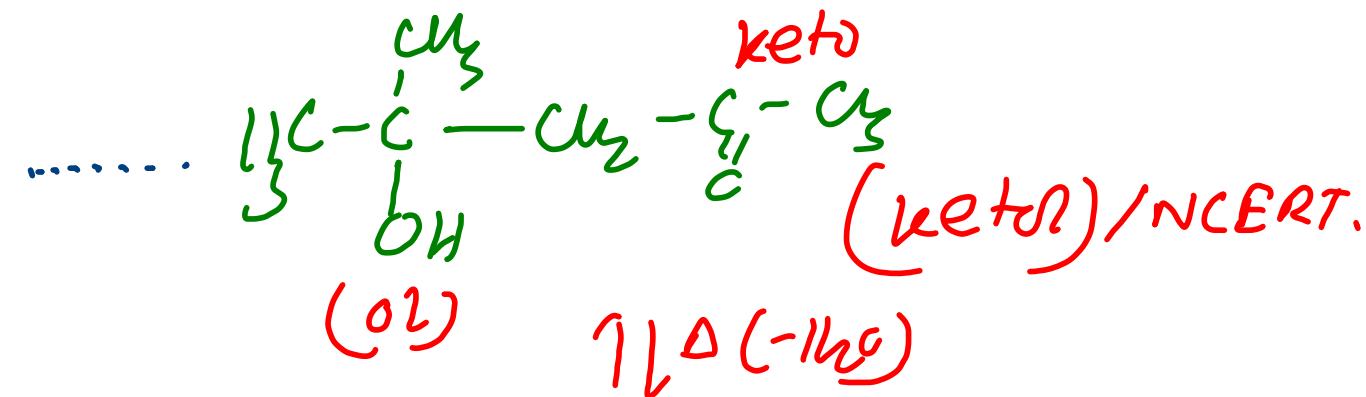


Aldehydes  
condensations  
crossing

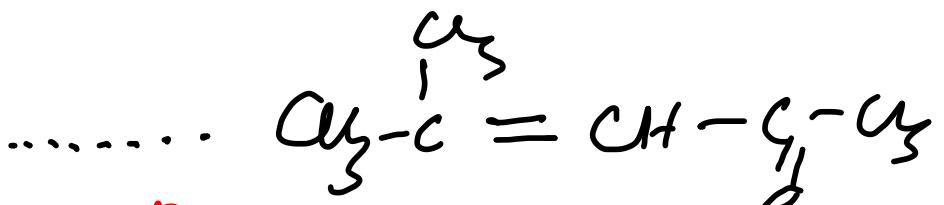
$\alpha, \beta$  unsaturated carbonyl  
(methylidene ketone)



(Ketone formate)

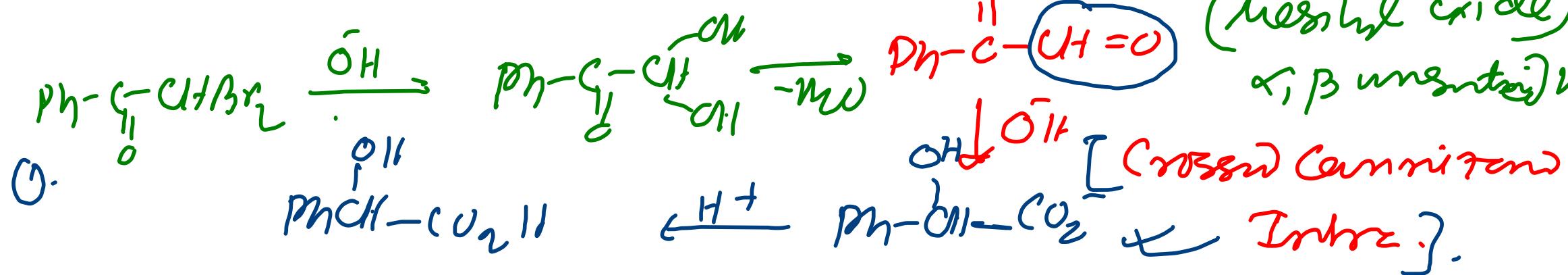


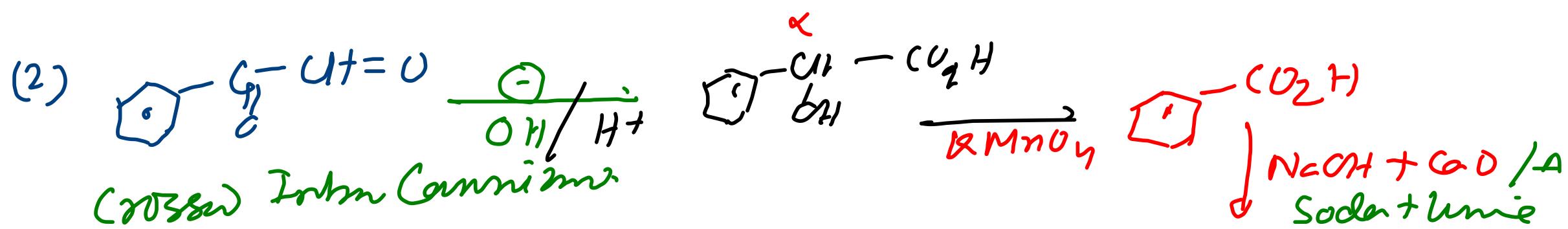
(Ketol condensation)



(residual carbonyl)

$\alpha, \beta$  unsaturated ketone





[decarboxylation]