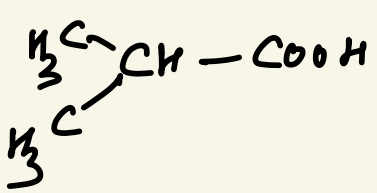

G
O
D
O
O
O
O
D

Some common names :-

$HCOOH$ — formic acid

$H_3C-COOH$ — Acetic acid

H_3C-CH_2-COOH — propionic acid

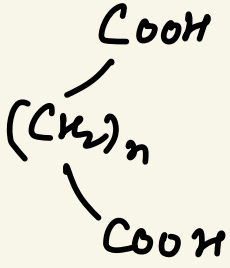


Isobutyric acid

$H_3C-CH_2-CH_2-COOH$ — Butyric acid

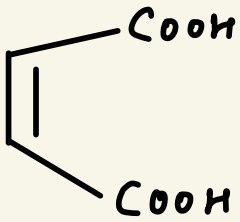
oxalic acid.

n		
0	O	oxalic
1	M	Malonic
2	S	Succinic
3	G	Glutaric
4	A	adipic

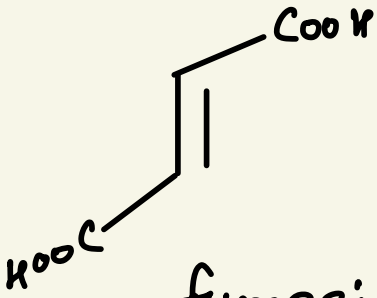


5 P Pimelic

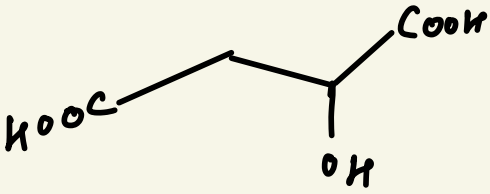
6 S Suberic



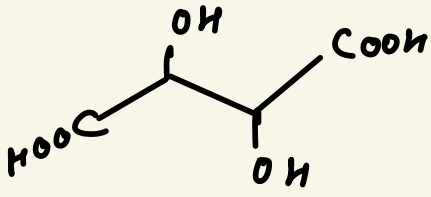
Maleic acid



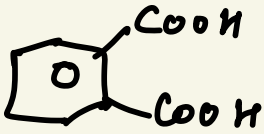
fumaric acid



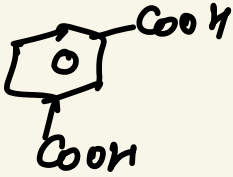
Malic acid



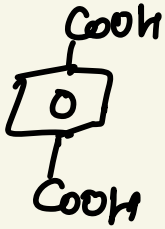
Tartaric acid



Phthalic acid.



Isophthalic acid



Terphthalic acid

Phenylacetic acid

General methods of Prep. of Carboxylic acid.

Oxidation :-

⊙ $R-CH_2-OH \xrightarrow[OR]{i)\ KMnO_4/H^{\oplus}} R-\overset{O}{\overset{\|}{C}}-OH$

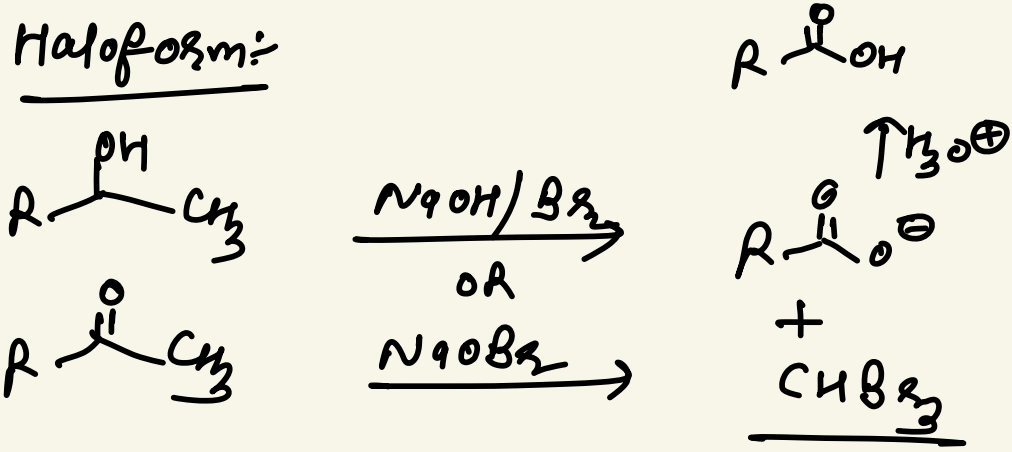
$\xrightarrow{K_2Cr_2O_7/H^{\oplus}}$

OR

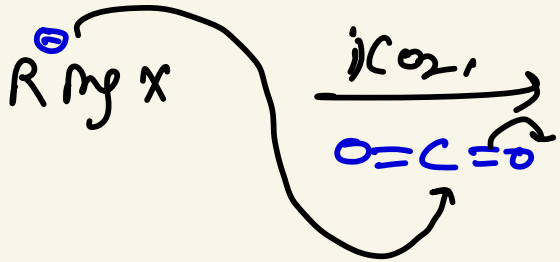
Jone's Reagent $\xrightarrow{[CrO_3\ /\ H_2SO_4}$

⊙ $R-\overset{O}{\overset{\|}{C}}-H \xrightarrow[\text{fehling}\\ \text{benedict}\\ \text{Schiff}]{\text{Tollen's}} R-\overset{O}{\overset{\|}{C}}-OH$

⊙ **Haloform:**



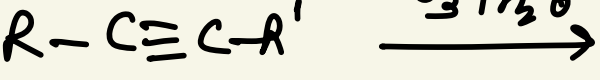
⊙

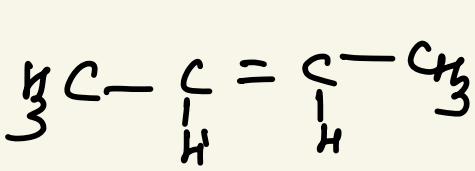


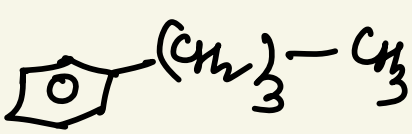
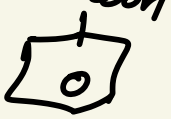
⊙

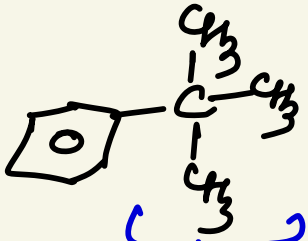
⊙

⊙

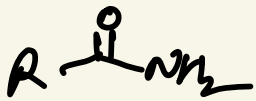


①  $\xrightarrow[\Delta\,(\text{Heat})]{KMnO_4/H^{\oplus}}$ 

②  $\xrightarrow{KMnO_4\,(H^{\oplus}/OH^{\ominus})}$ 

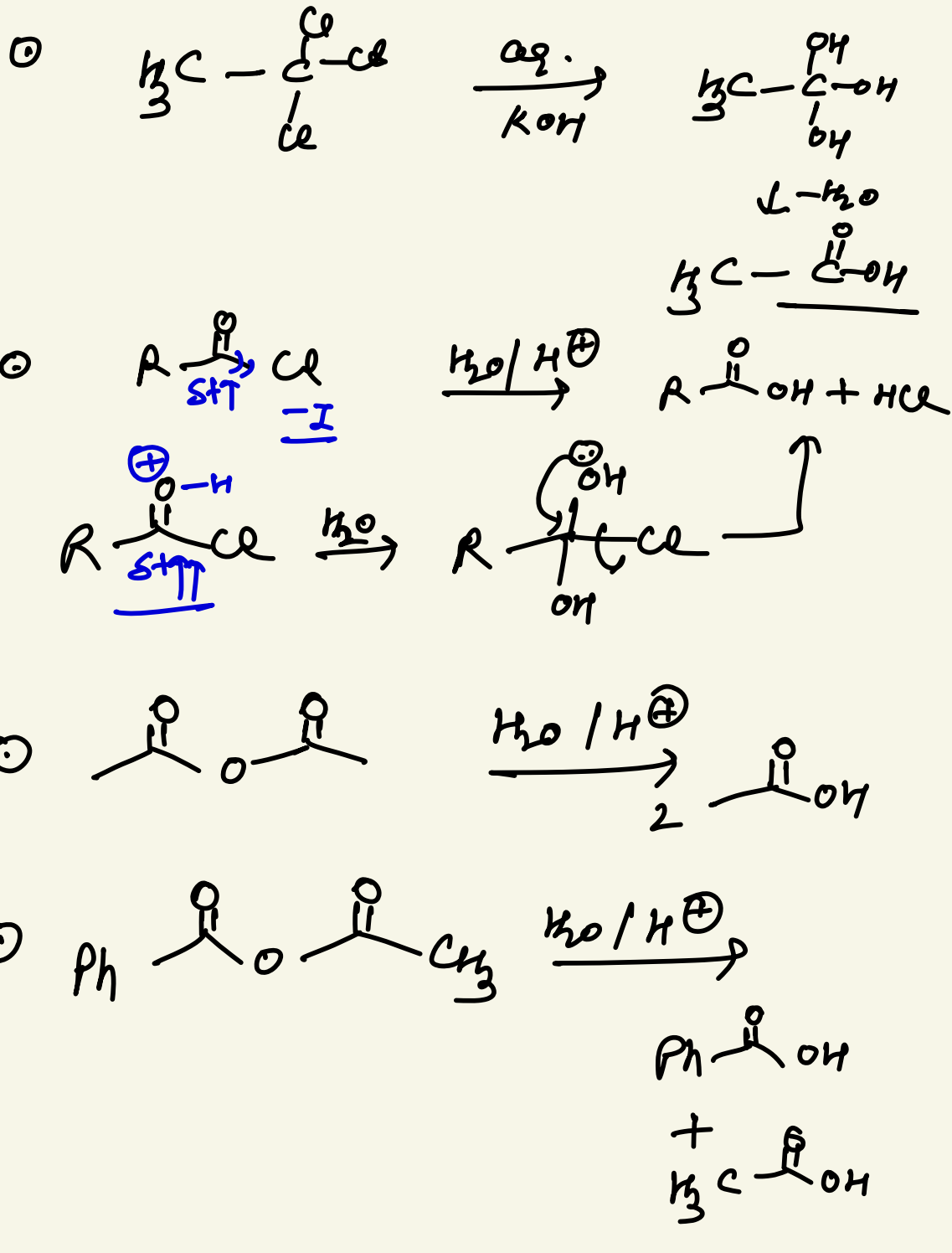
③  $\xrightarrow{KMnO_4\,(H^{\oplus}/OH^{\ominus})}$ No Rxn

must Contain at least one α-H.

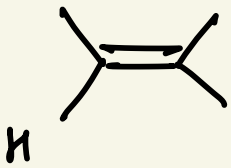
④ $R-C\equiv N \xrightarrow[\text{partial}]{H_3O^+}$ 

$\xrightarrow[\text{Complete}]{H_3O^+}$  $+\ NH_3$

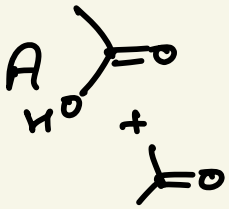
⑤  Ester $\underset{-H_2O}{\overset{H_3O^+}{\rightleftharpoons}}$  acid $+\ R'OH$ alcohol


aq. KOH
-H2O
SN1
-I
H2O/H⊕
SN1
H2O
H2O/H⊕
2
H2O/H⊕

Q.



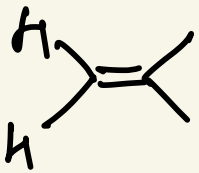
$\xrightarrow[\Delta]{KMnO_4/H^{\oplus}}$



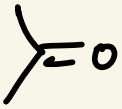
$\xrightarrow[\text{alkaline}]{1\%\ KMnO_4/\text{cold}}$ (Baeyer's Reagent)

B

Q



$\xrightarrow[\Delta]{KMnO_4/H^{\oplus}}$



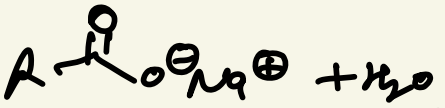
$+$

$CO_2 + H_2O$

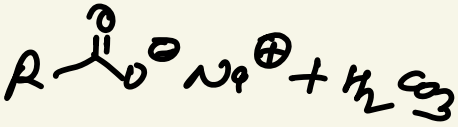
Reaction of Carboxylic acid:-

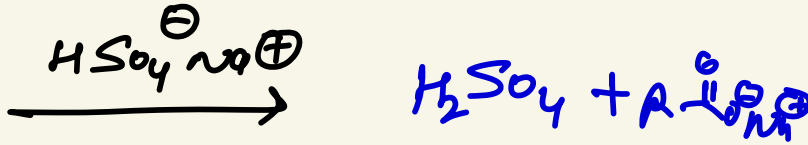
Acid- Base Rxn:-

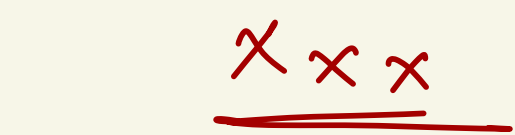
$\xrightarrow{NaOH}$

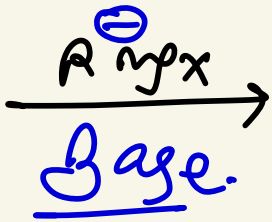


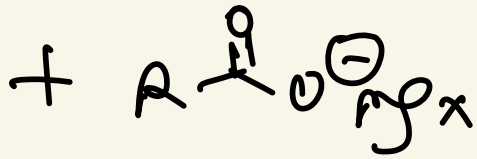
$\xrightarrow{NaHCO_3}$



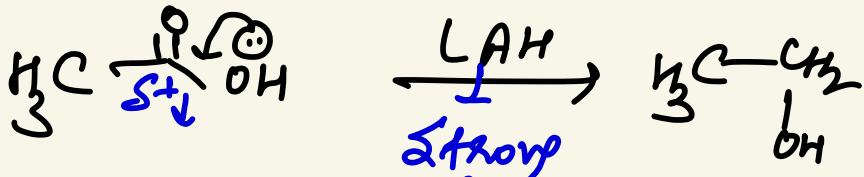








Reduction :-



$\xrightarrow{NaBH_4}$ No Rxn

$\xrightarrow{B_2H_6 (BH_3)}$ H_3C-CH_2-OH

$\xrightarrow{H_2 (Ni)}$ ✗

formation of acid derivatives :-

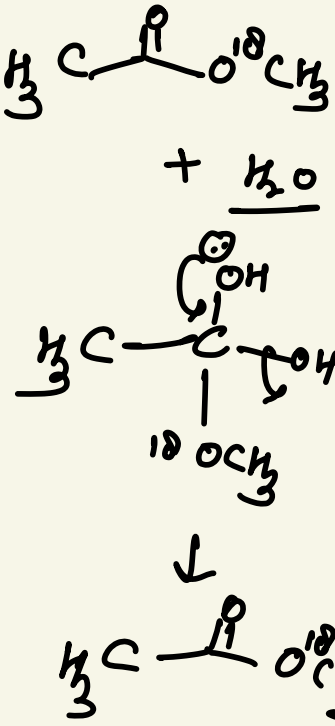
$$R-\overset{O}{\overset{\|}{C}}-OH + SOCl_2 \text{ or } PCl_5 \text{ or } PCl_3 \longrightarrow R-\overset{O}{\overset{\|}{C}}-Cl$$

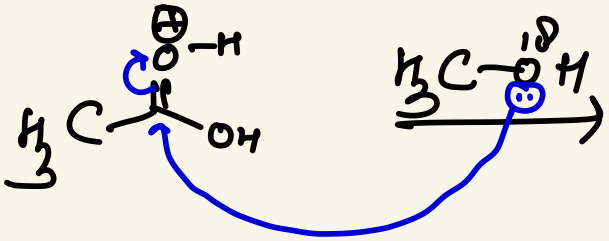
Esterification

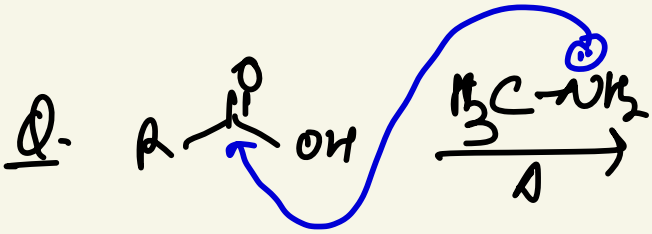
$$R-\overset{O}{\overset{\|}{C}}-OH + R'-CH_2-OH \longrightarrow R-\overset{O}{\overset{\|}{C}}-O-CH_2R' + H_2O$$

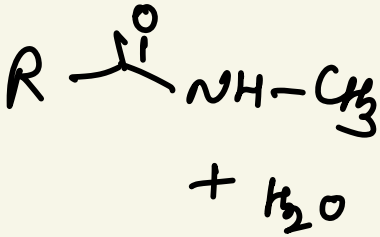
Q-

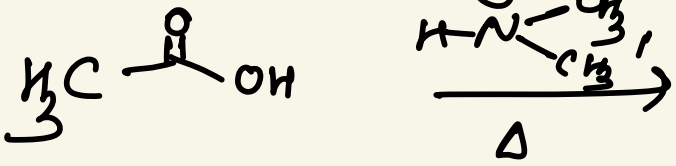
$$H_3C-\overset{O}{\overset{\|}{C}}-OH + H_3C-O^{18}H \xrightarrow{H^{\oplus}}$$

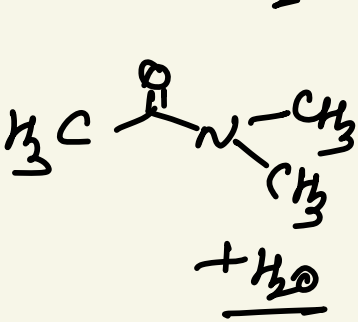




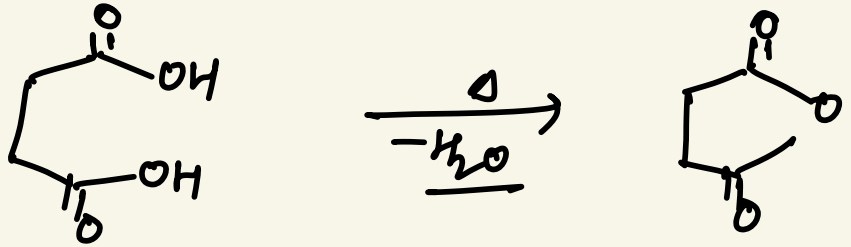






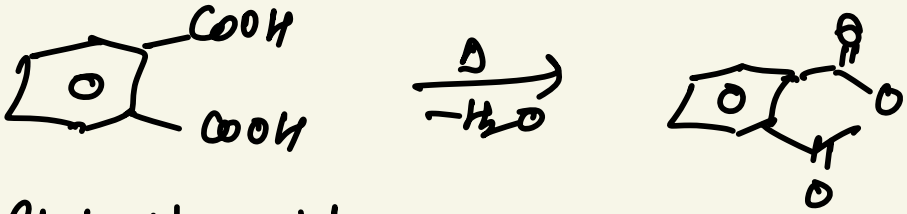


Heating :-



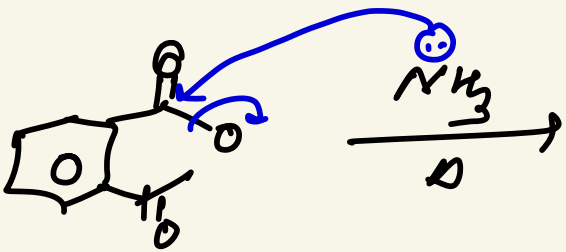
Succinic acid

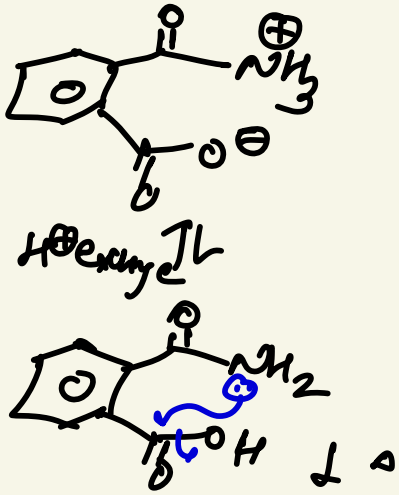
Succinic anhydride.

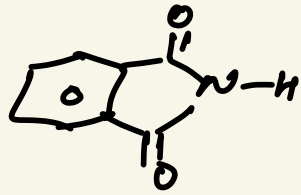


Phthalic acid

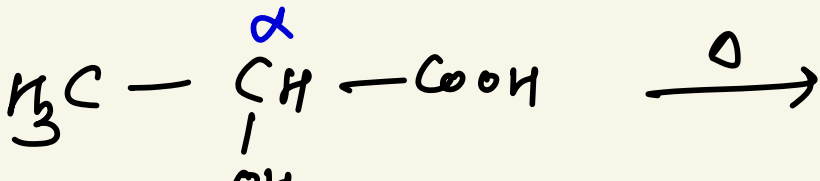
phthalic anhydride.

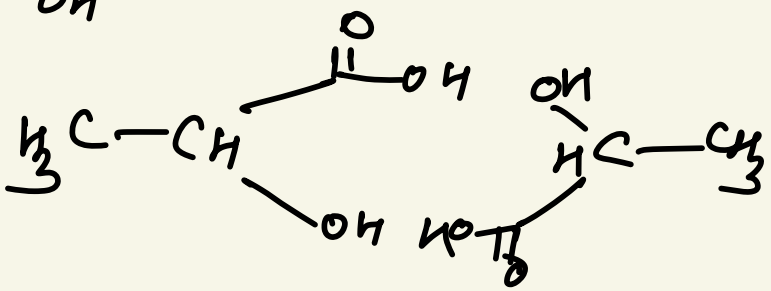




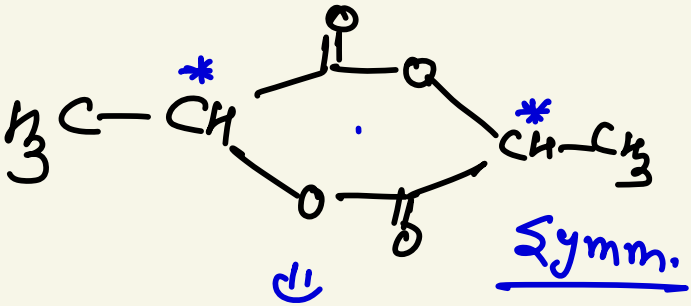


α-Hydroxy Carboxylic acid :-





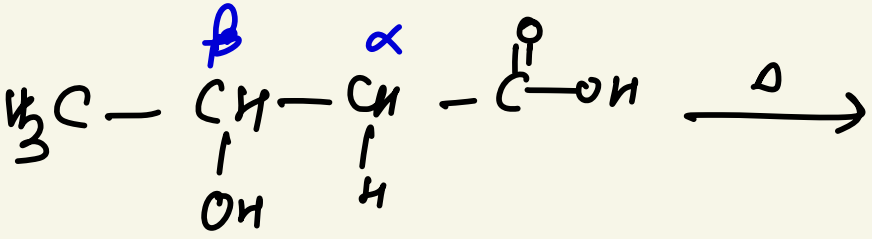
$-2H_2O$ | Δ

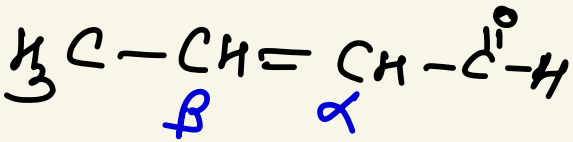


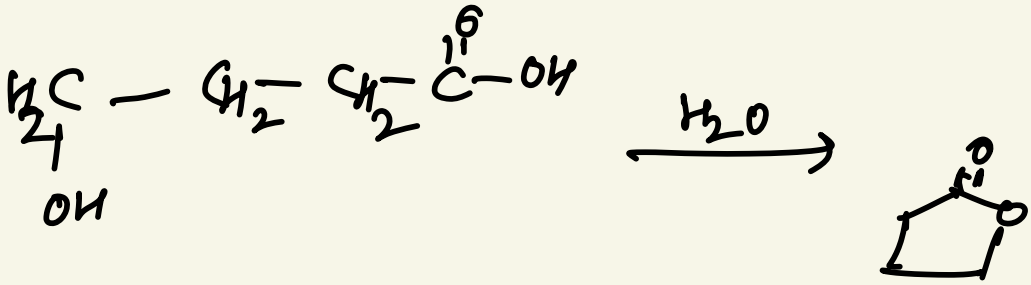
Symm.

(1)

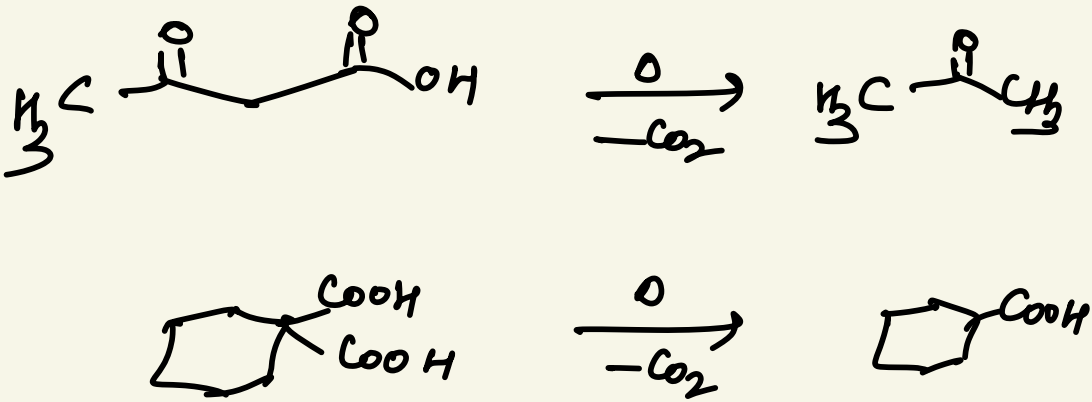
No. of Stereoisomer ?

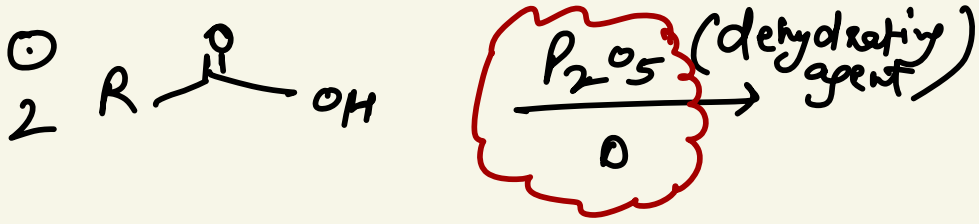


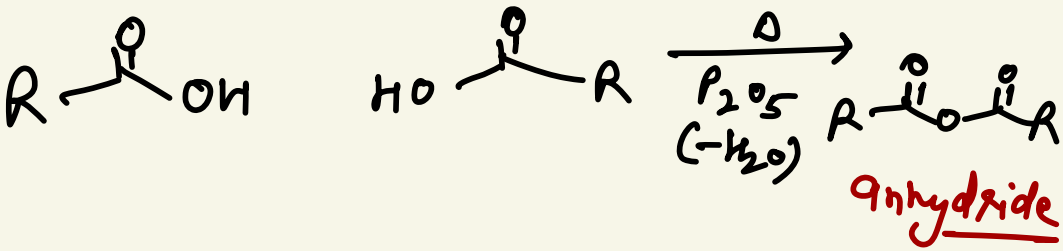




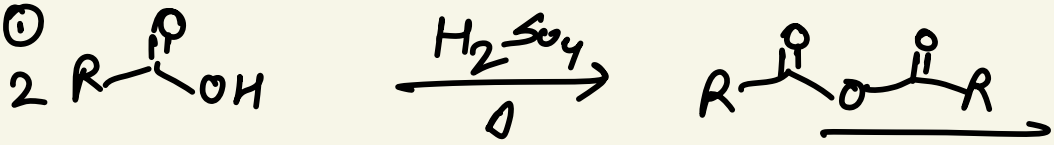
* **β-keto acid**

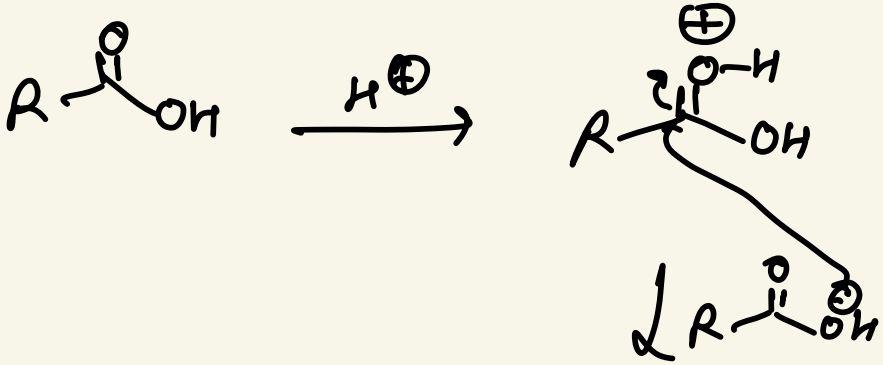


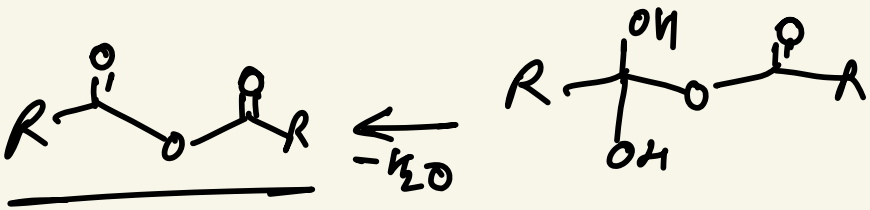

2
R
OH
P_2O_5
(dehydrating agent)
Δ


R
OH
HO
R
Δ
P_2O_5
$(-H_2O)$
R
R

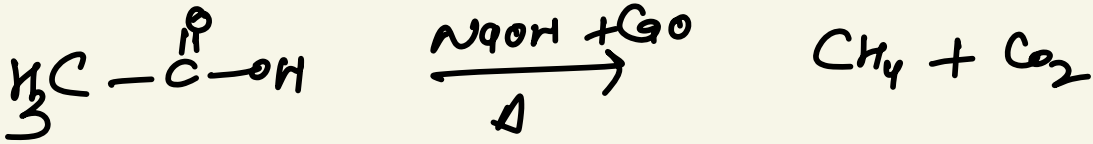
anhydride


2
R
OH
H_2SO_4
Δ
R
R


R
OH
$H^{\oplus}$
$\oplus$
H
R
OH
R
OH

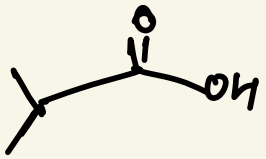

R
R
$-H_2O$
OH
R
OH
OH
R

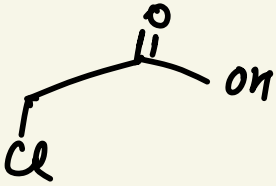
Soda-lime decarboxylation:

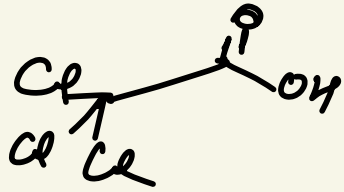


Q- Rate of Soda-lime decarboxylation

i) 

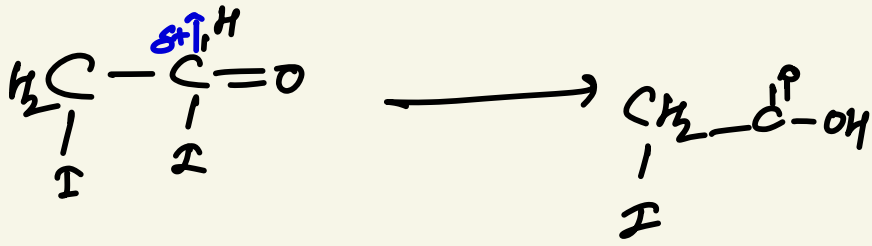
ii) 

iii) 

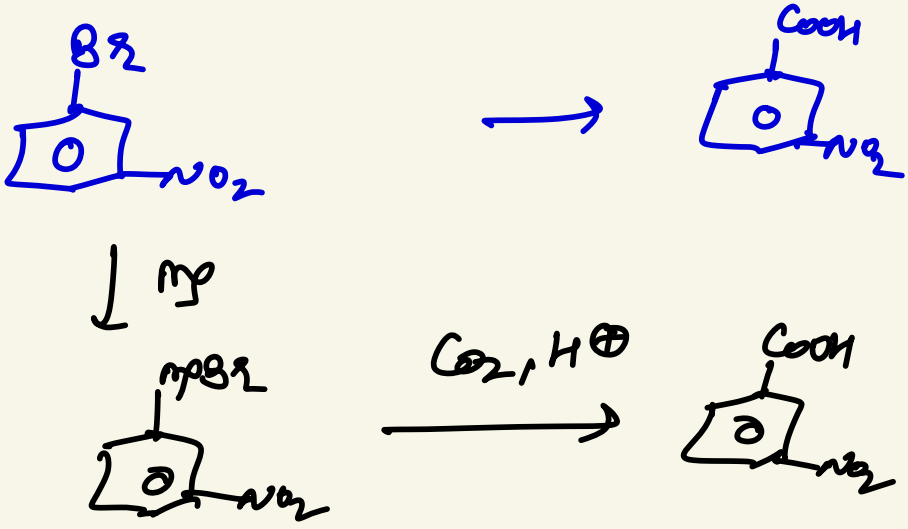
iv) 

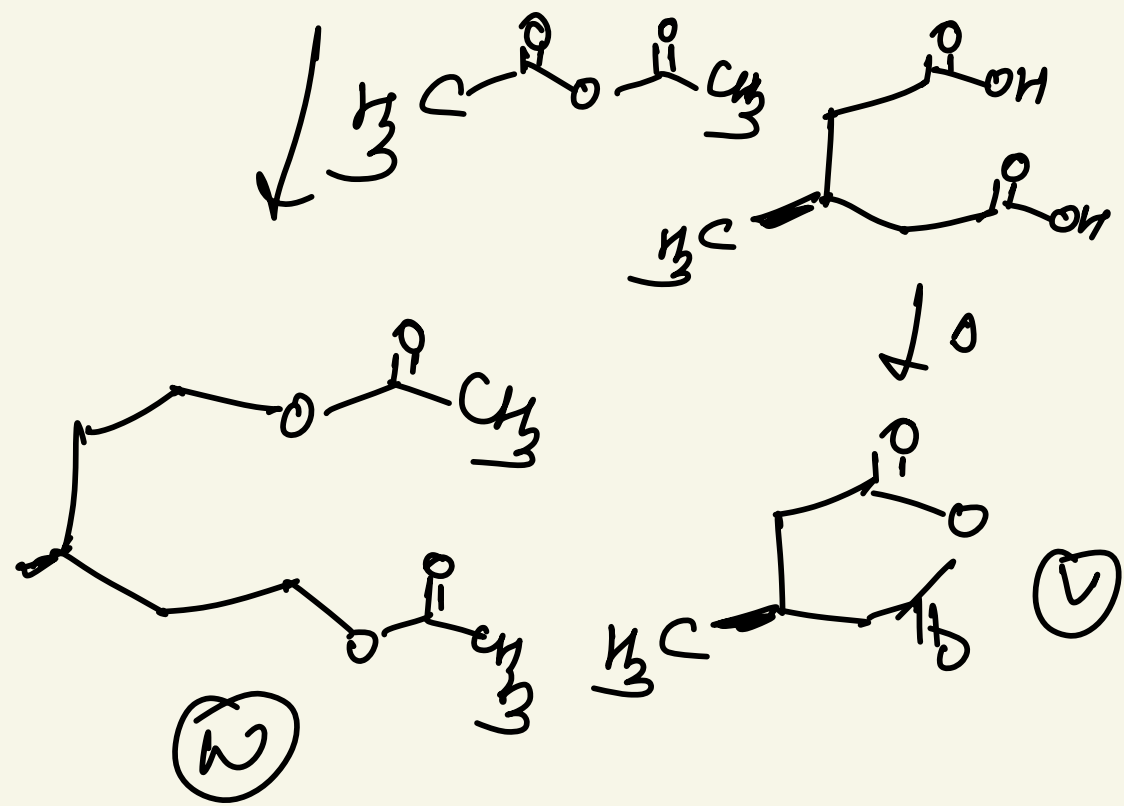
4 7 37 172

Q. $H_2C=C=O \xrightarrow{I_2} A \xrightarrow[H_2O]{H^{\oplus}} B$



Q.

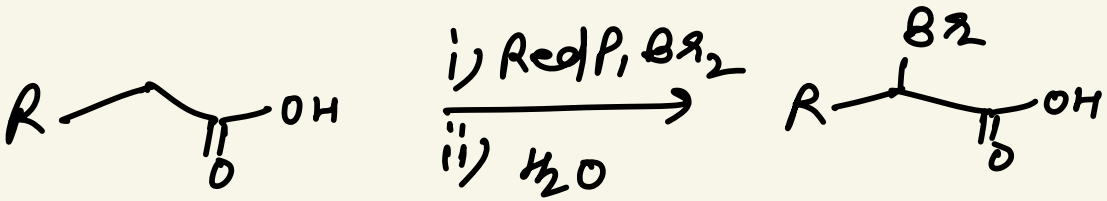




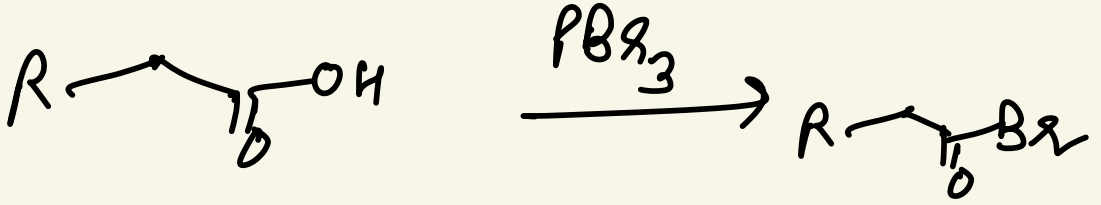
$C_{10}H_{18}O_4$

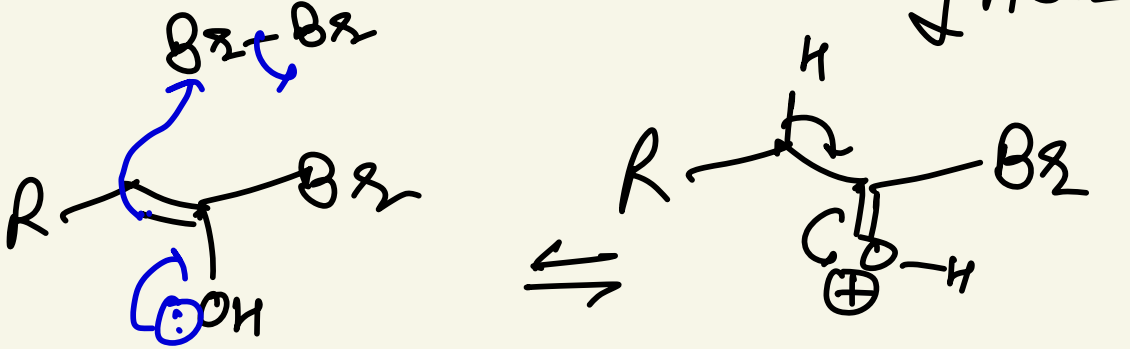
① HVZ Rxn :-

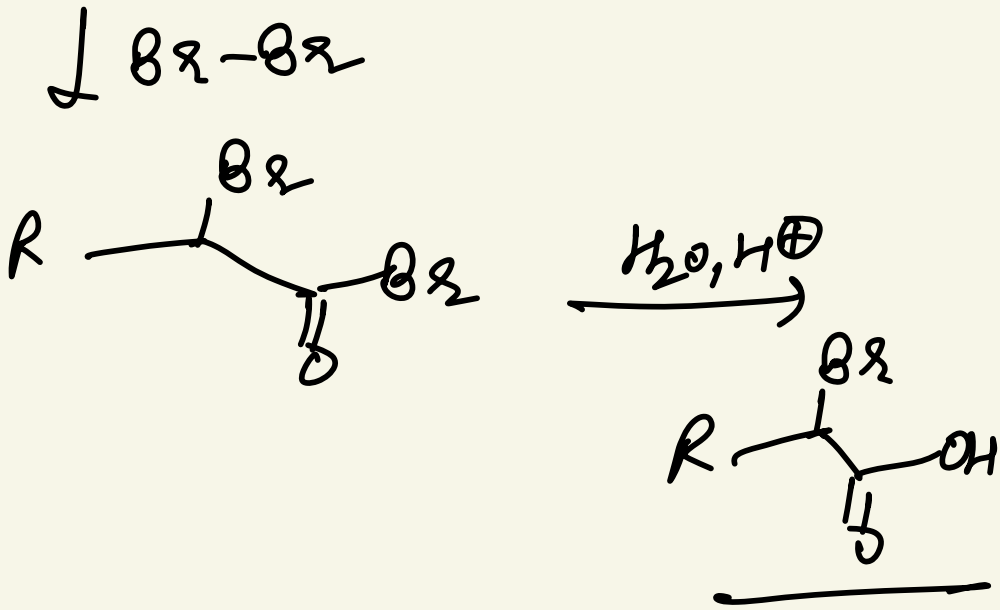
Hell-volhard-Zielnsky Rxn :-



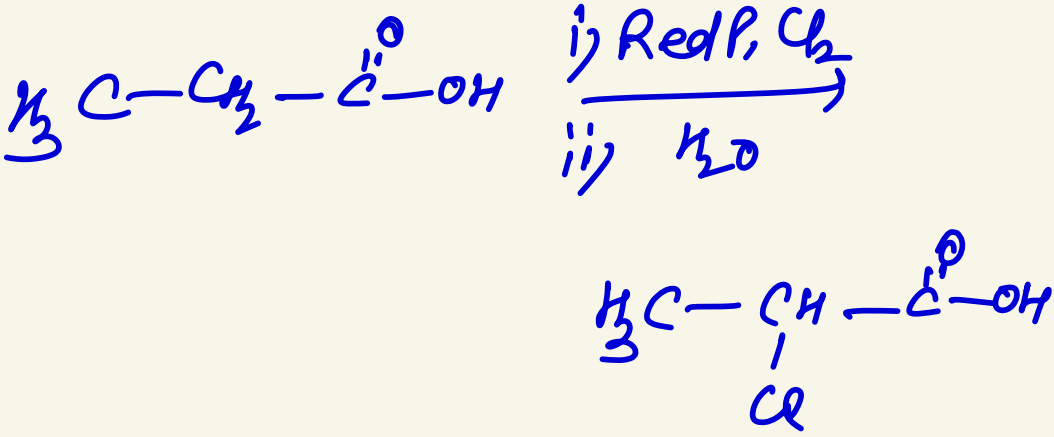
* α-position of Carboxylic acid gets Halogenated



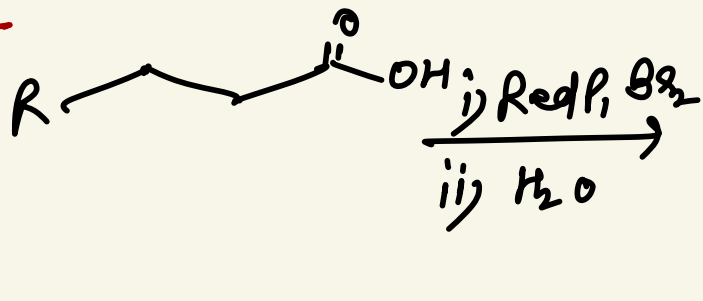


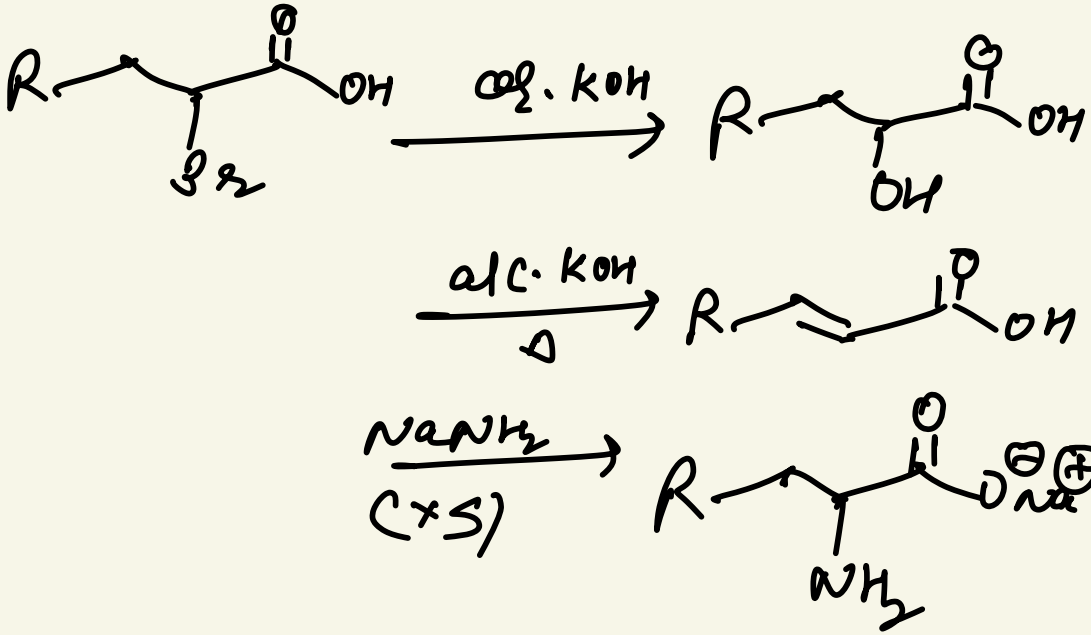

Br–Br
R
Br
Br
O
H2O, H⊕
R
Br
OH
O

Q.

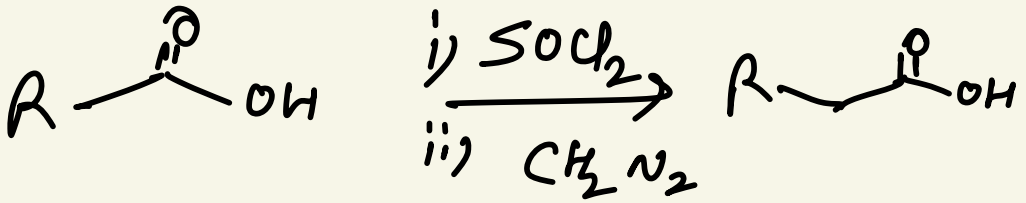

H3C–CH2–C(=O)–OH
i) Red P, Cl2
ii) H2O
H3C–CH(Cl)–C(=O)–OH

Q.





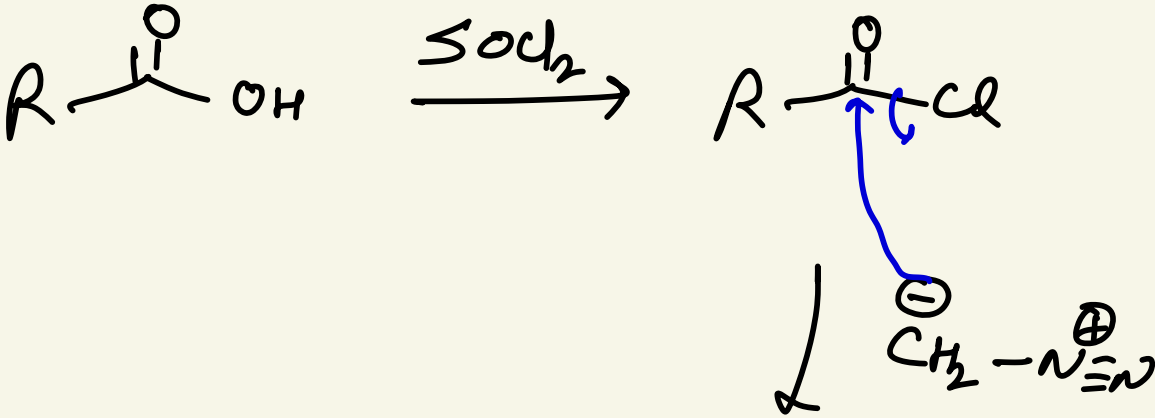
② Arndt - Eistert Rxn:

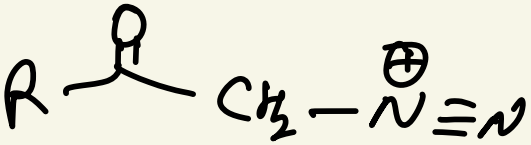


*Step-up Rxn

iii) NEt_3 / As_2O (base)

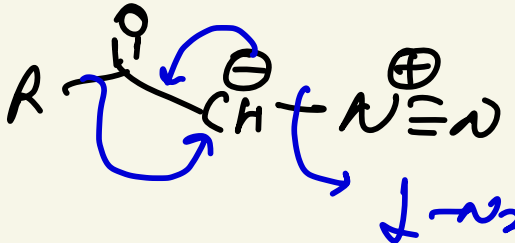
iv) H_2O

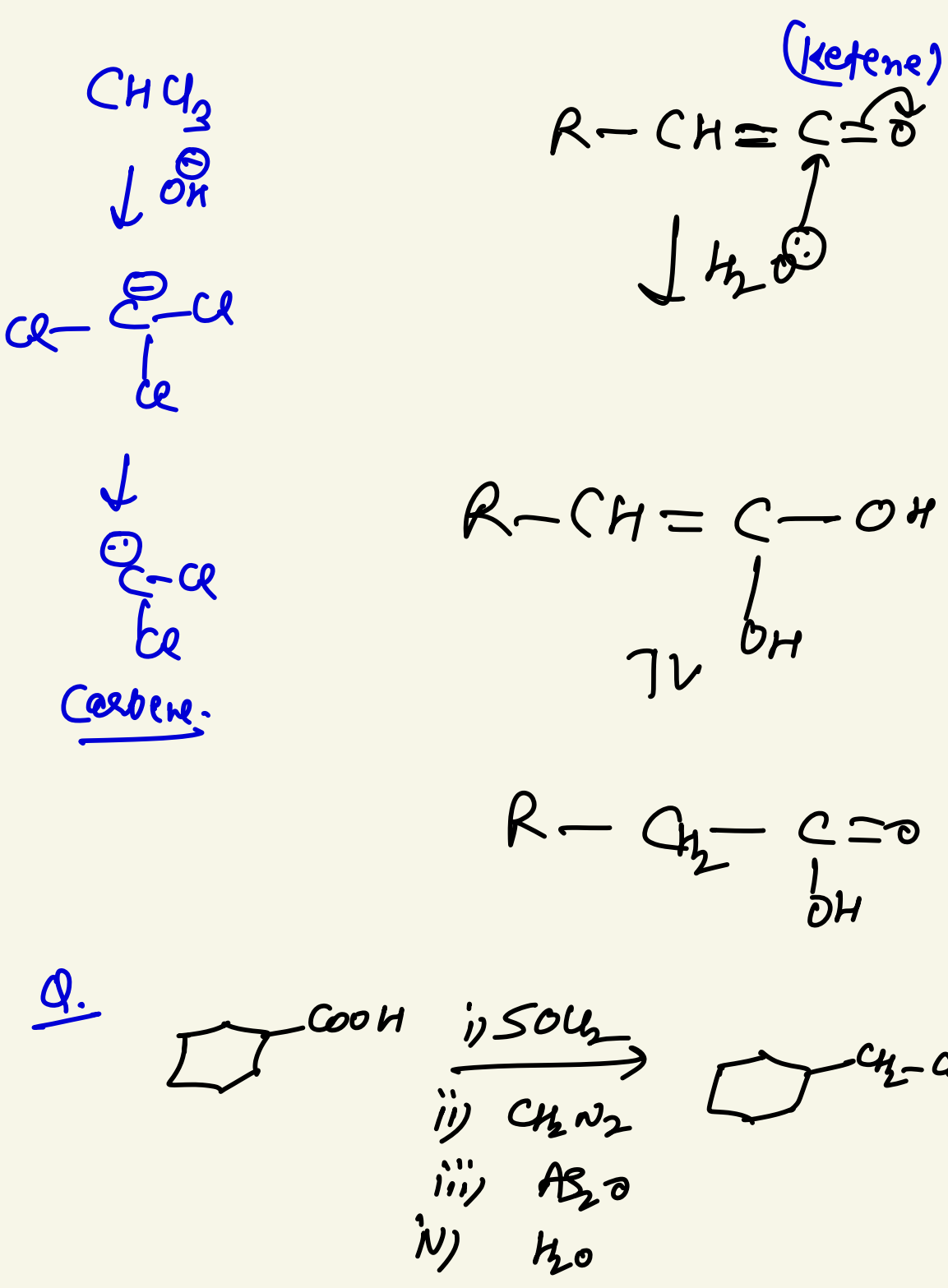




$As_2O + H_2O \rightarrow \underline{AsOH}$ $\xrightarrow{-H^{\oplus}}$ NEt_3 / As_2O (Base)

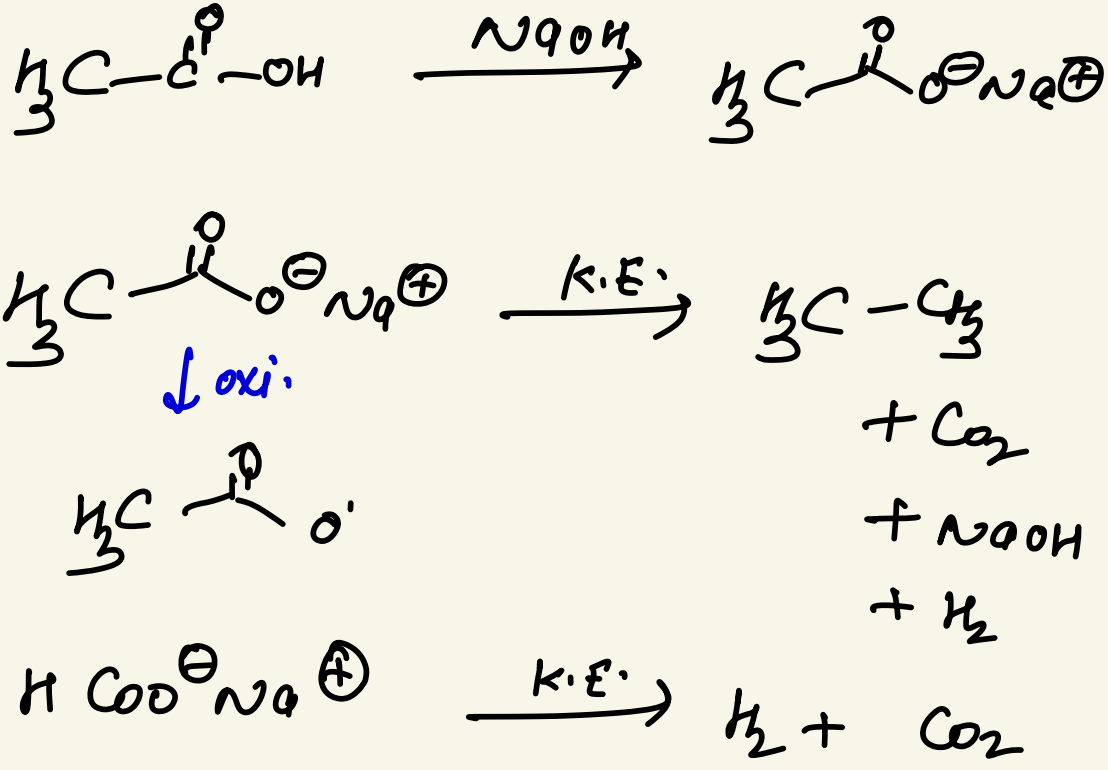
(Wolf Rearrangement)



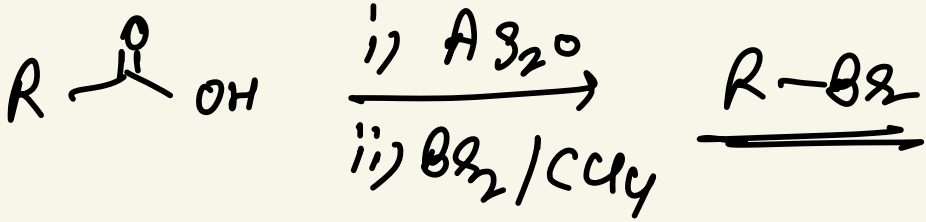

$CHCl_3$
$OH^{\ominus}$
Carbene.
(Ketene)
$R-CH=C=O$
H_2O
$R-CH=C(OH)-OH$
$R-CH_2-C(=O)-OH$
Q.
COOH
i) $SOCl_2$
ii) CH_2N_2
iii) Ag_2O
iv) H_2O
CH_2-COOH

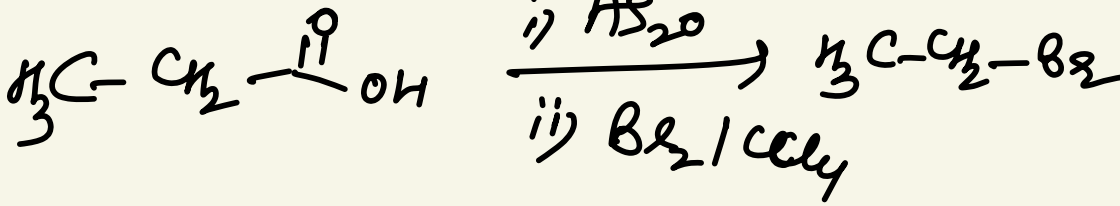
Q. 

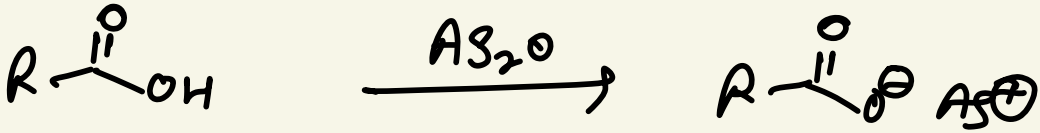
(3) Kolbe's Electrolysis :-

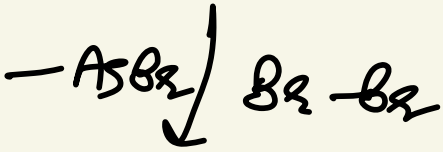


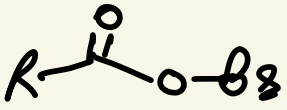
(9) Hunsdicker Rxn :-

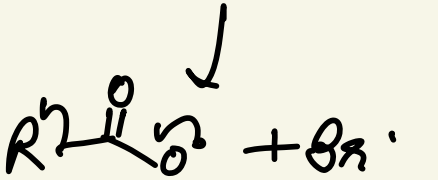












$$R\text{-}Br + CO_2 \leftarrow R^{\cdot} + CO_2 + Br^{\cdot}$$

H.W.

Page-38.