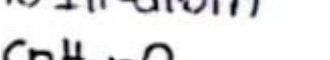
Carbonyl compound

Aldehyde

carbonyl carbon directly attach to 1H-atom

$C_nH_{2n}O$

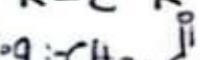


E.g: H-CHO
Methanal

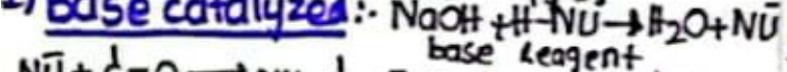
Ketone

carbonyl carbon bonded with 2 alkyl group.

- $C_nH_{2n}O$
- 

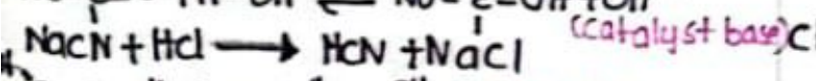

Propanone

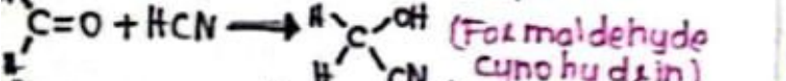
Reactions of Aldehyde & Ketones
Nucleophilic Addition

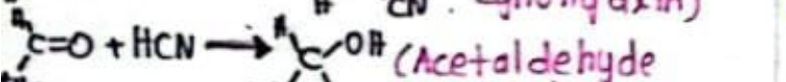
2) Base catalyzed:- 
base reagent

(intermediate)

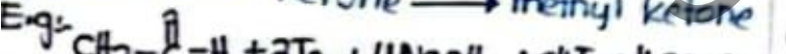
(catalyst base)

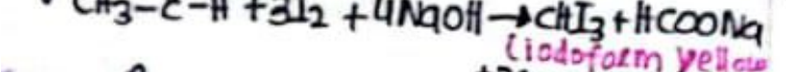

(Formaldehyde cyno hydrin)

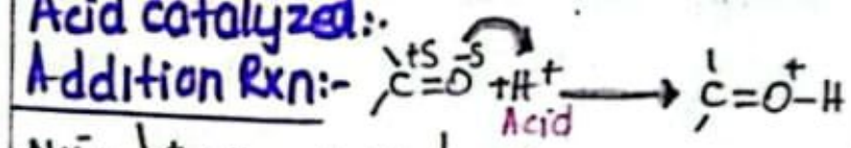

(Acetaldehyde cyno hydrin)

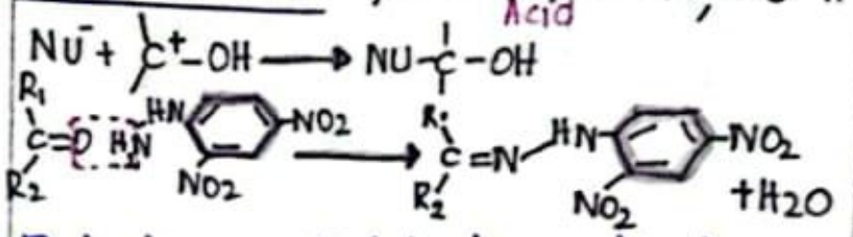
Mechanism:- 
(catalyst base)

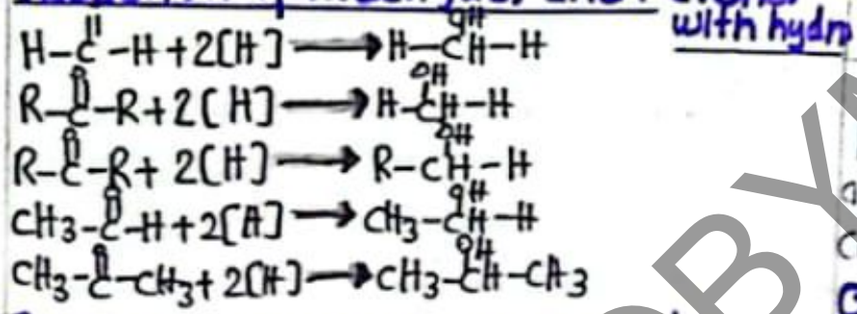
Haloform Rxn:- Aldehyde ⟶ only Ethanal
Ketone ⟶ methyl ketone

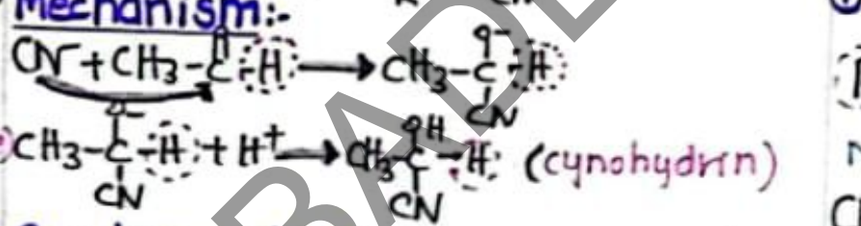
E.g: 
(iodoform yellow ppt)

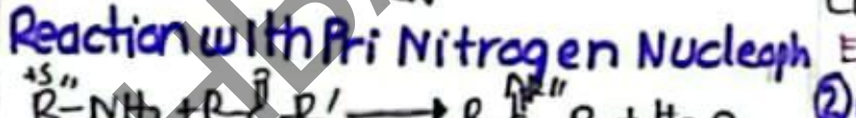


Acid catalyzed:- Addition Rxn:-

Acid



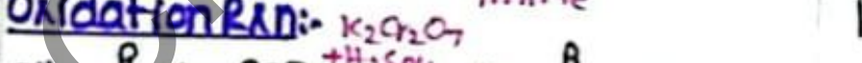
Reduction of Aldehydes and Ketones with hydr


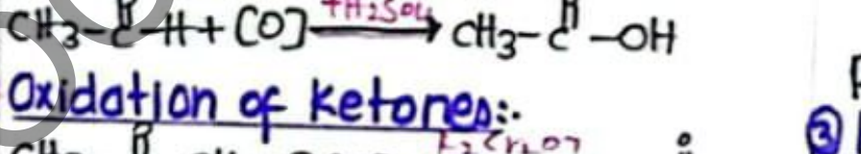
Reaction with Hydrogen cynide:-


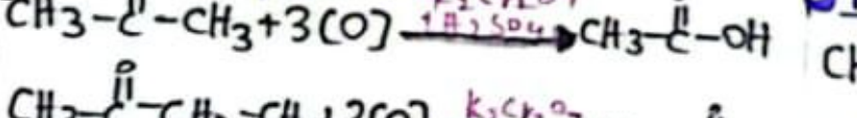
Mechanism:-

(cynohydrin)

Reaction with Pri Nitrogen Nucleoph

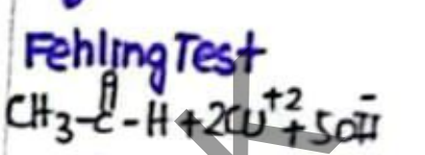
imine

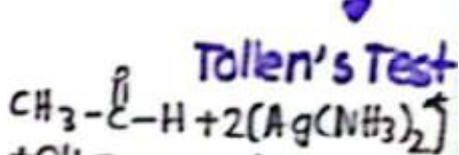
Oxidation Rxn:- 

Oxidation of Ketones:-




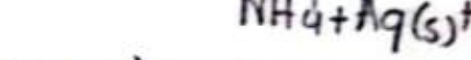
Test used to distinguish Aldehydes and Ketones.

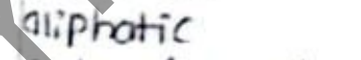
Fehling Test

Red ppt (cuprous oxide)

Tollen's Test


Carboxylic acid

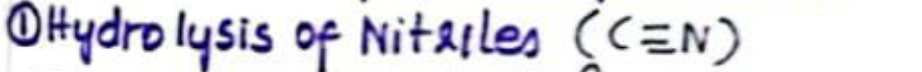
aliphatic carboxylic acid


aromatic carboxylic acid

General formula:- 

Preparation of carboxylic acid:-

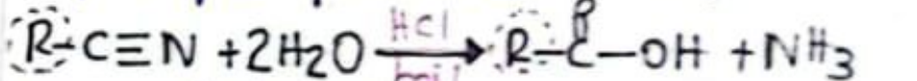
① Hydrolysis of Nitriles (C≡N)

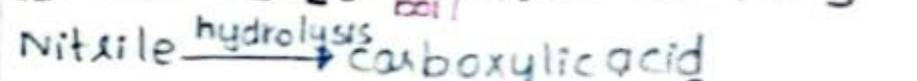


Nitrile ⟶(hydrolysis) carboxylic acid

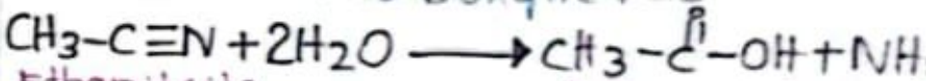
Ethanitrile — Ethanoic Acid

② Oxidation of Primary Alcohol:-


oxidation

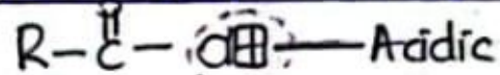


③ Hydrolysis of Esters:-




Soap

Reactivity of carboxylic acid



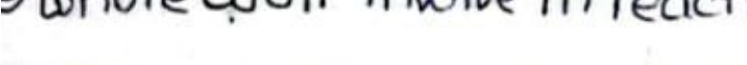
① 

② OH group replace by other atom

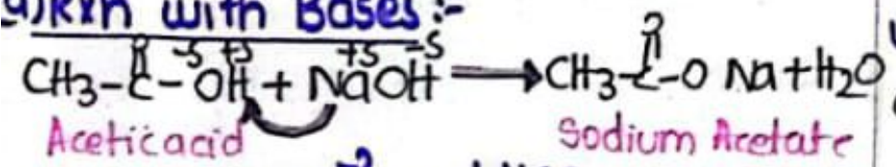
③ whole COOH involve in reaction.

Reactions of carboxylic acid:-

① Rxn involving H-atom of COOH:-

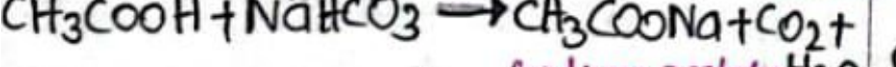


a) Rxn with Bases:-

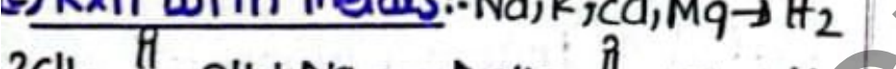


b) Rxn with CO_3^{-2} and HCO_3^-:-

c) Rxn with Metals:- Na, K, Ca, Mg → H_2

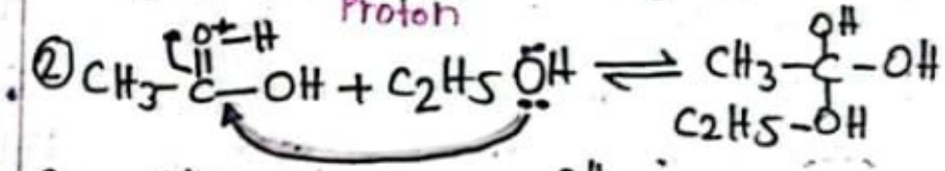


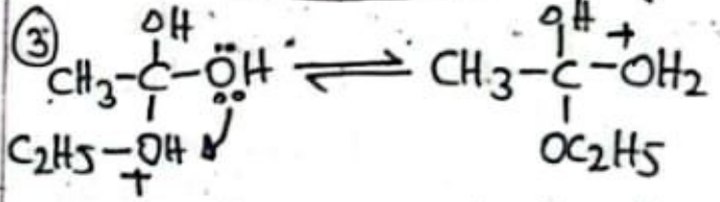
② Rxn involving OH gp COOH acid:-

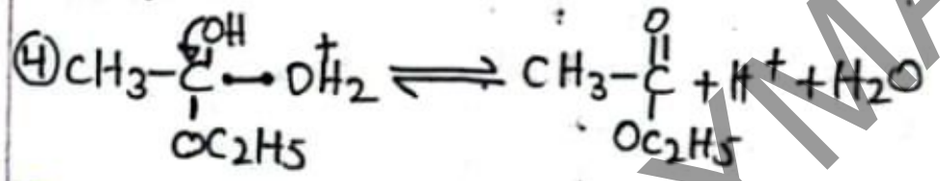


Mechanism:-

① 

② 

③ 

④ 

③ Rxn involving (COOH)

(i) Reduction of Alcohols:-

(ii) Hydrolysis of Ester:-

Name :- Nafeesa
Teacher :- Miss Ayesha