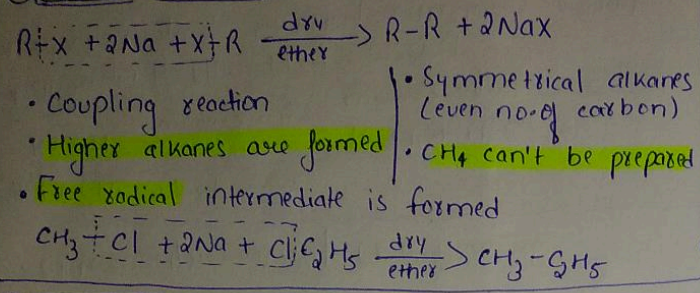
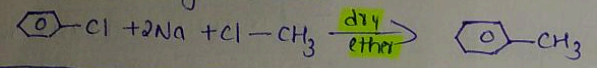


# HYDROCARBONS

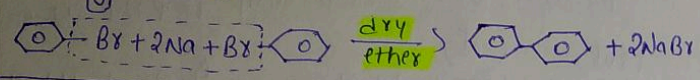
## 1) WURTZ REACTION



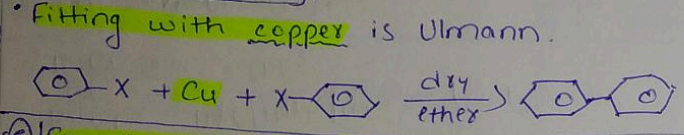
## 2) WURTZ FITTING REACTION :-



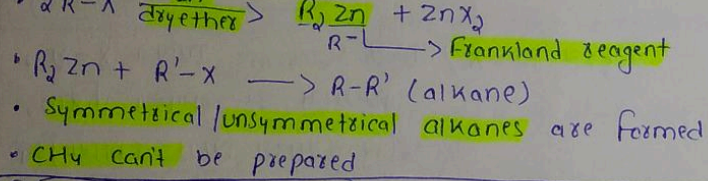
## 3) FITTING REACTION :-



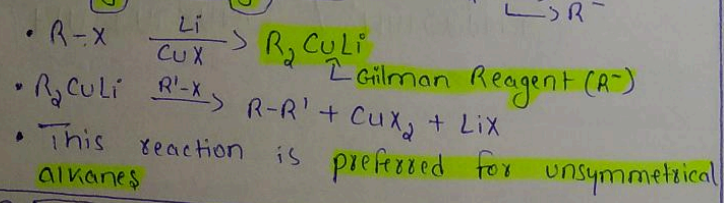
## 4) ULMANN REACTION :-



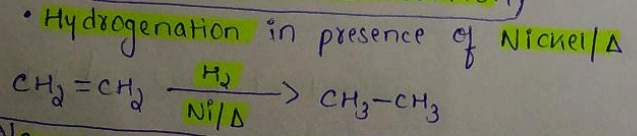
## 5) FRANKLAND REACTION :-



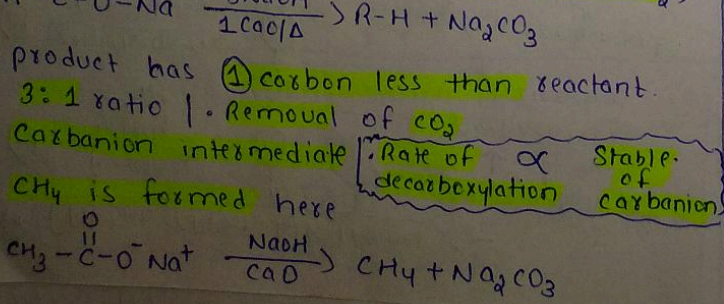
## 6) COREY-HOUSE SYNTHESIS (R<sub>2</sub>CuLi)



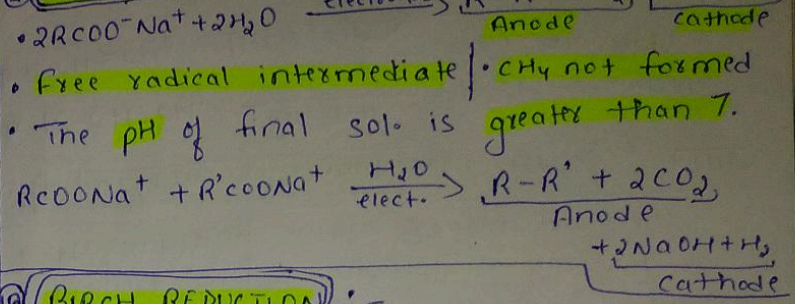
## 7) SABATIER & SANDERSEN'S REACTION



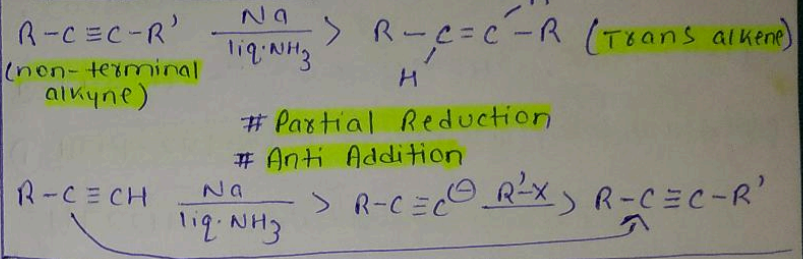
## 8) SODALIME DECARBOXYLATION :- (NaOH (3:1) CaO remove CO<sub>2</sub>)



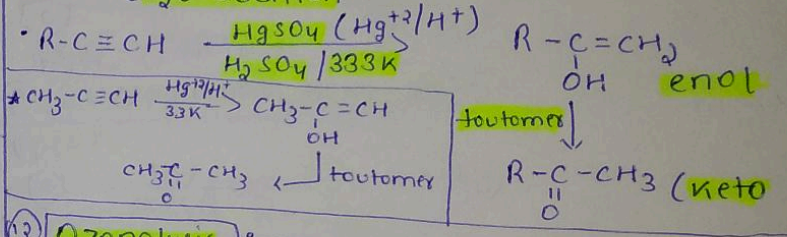
## 9) KOLBE'S ELECTROLYSIS



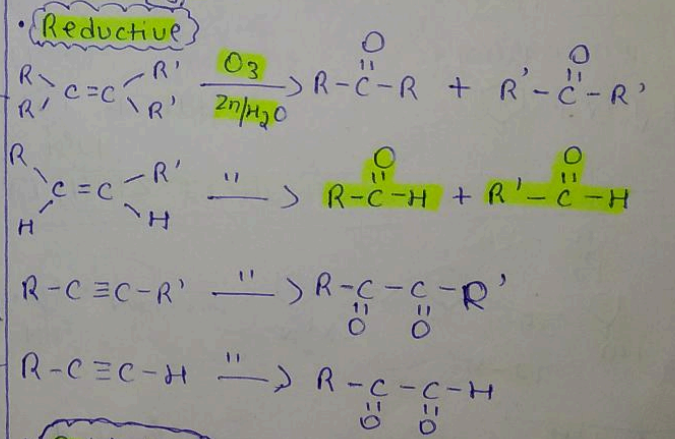
## 10) BIRCH REDUCTION :-



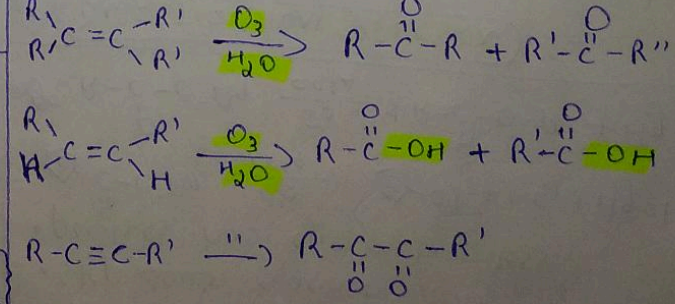
## 11) KUCHEROV'S REACTION (MORZHONIKOV RULE)



## 12) OZONOLYSIS :-



## • Oxidative

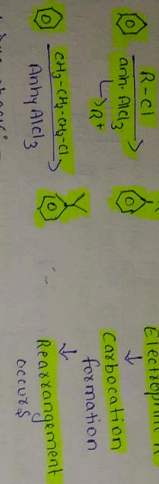


(yellow)

formed. carbonyl compound is



**(3) FRIEDRICH CRAFT ALKYLATION :-**



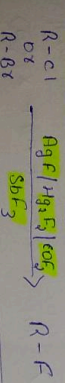
\* Drawback: -  
 can't be formed

**HALOALKANES & HALOARENE**

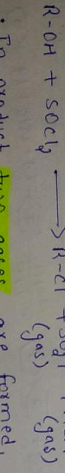
**(1) FRANKELSTERN REACTION :-**

alkyl iodide is formed  
 $R-X + NaI \xrightarrow{acetone} R-I$  ( $X = Cl, Br$ )

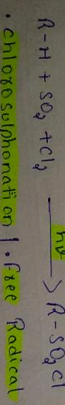
**(2) SWARTZ REACTION :-**



**(3) DARZEN PROCESS :-**



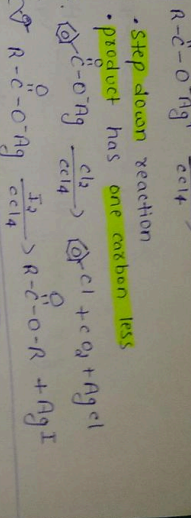
**(4) REED REACTION :-**



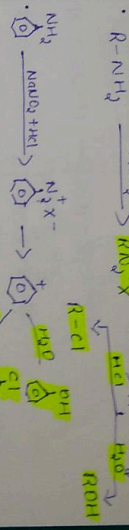
**# LUCAS TEST**

$R-OH \xrightarrow{conc. HCl} R-Cl + H_2O$   
 distinguish b/w 1°/2°/3° alcohol  
 \* alcohol gives turbidity with Lucas reagent  
 3° alcohol  $\rightarrow$  immediately turbidity  
 2° alcohol  $\rightarrow$  5 min turbidity  
 1° alcohol  $\rightarrow$  30 min turbidity (eventually)

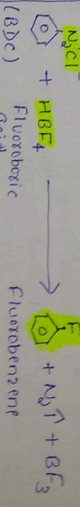
**(5) HUNDSBICHER REACTION :-**



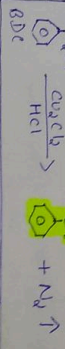
**(6) PIRAZOTIZATION REACTION :-**



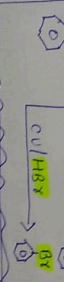
**(7) BALZ-SCHIEFFERMAN REACTION :-**



**(8) SANDMEYER REACTION :-**

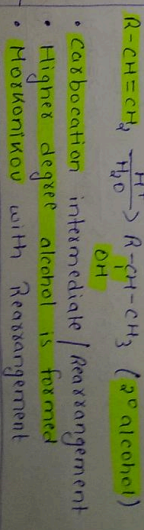


**(9) GATTERMANN REACTION :-**

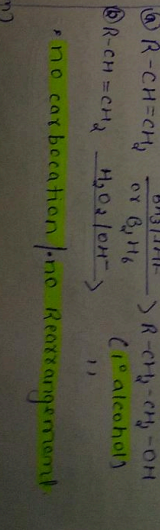


**ALCOHOL - PHENOL - ETHER**

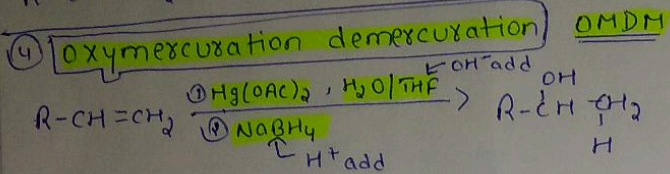
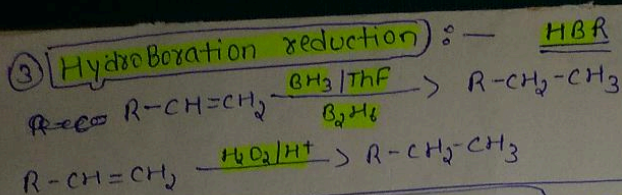
**(1) Acid-catalyzed Hydration (maximilium)**



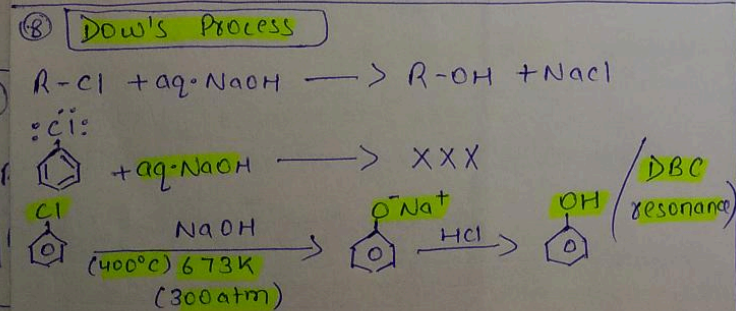
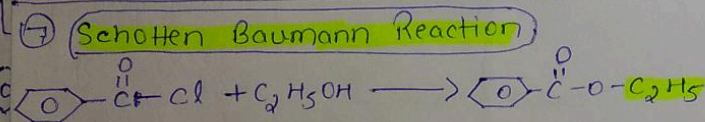
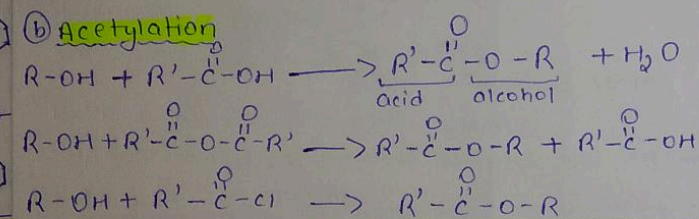
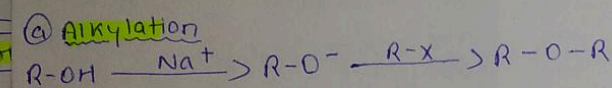
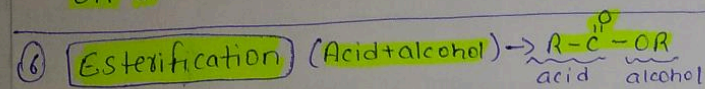
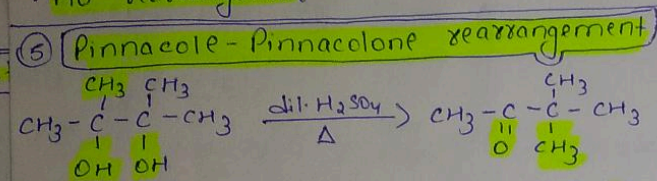
**(2) Hydroboration oxidation (Anti-Mark), HBR**



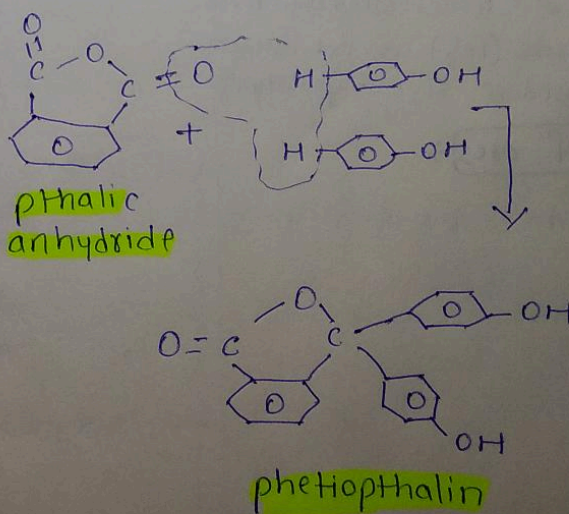
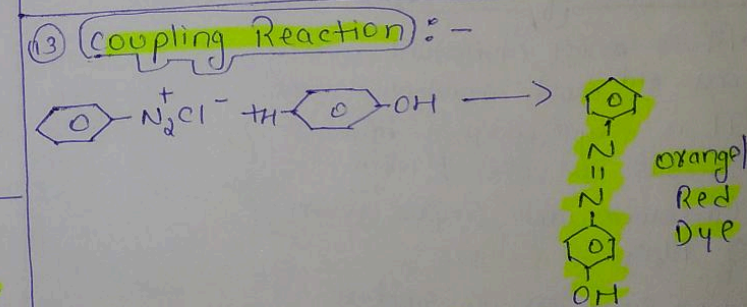
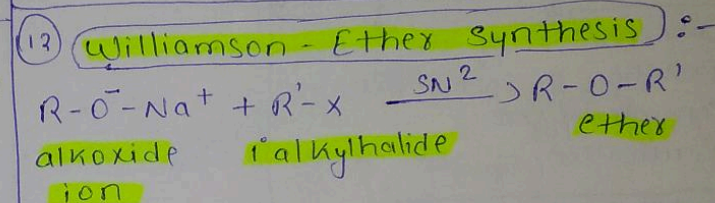
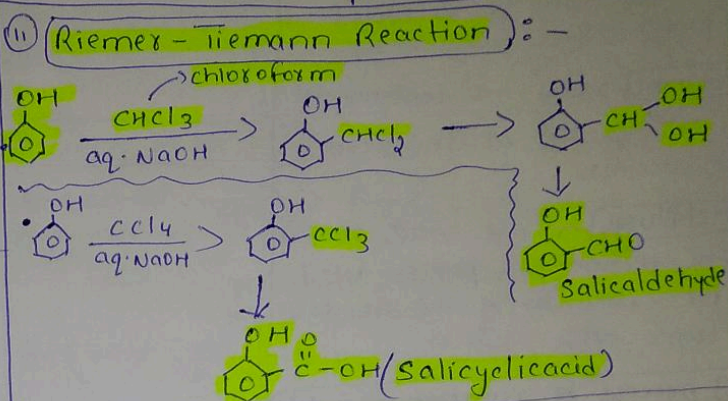
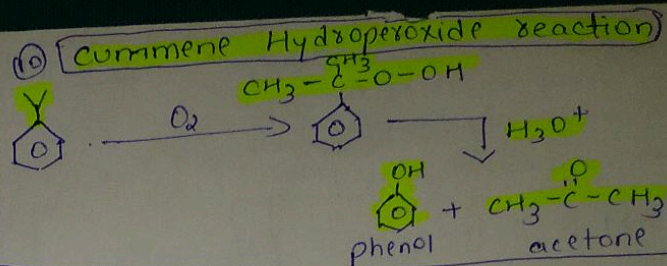
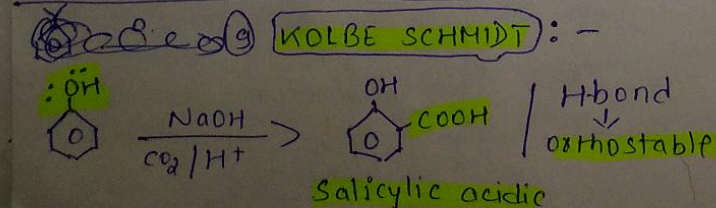




- Markovnikov without rearrangement
- anti addition
- no rearrangement



• Industrial preparation of phenol

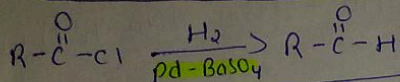


formed.

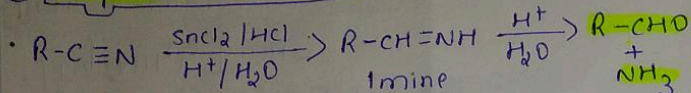


**ALDEHYDE KETONE CARBOXYLIC ACID**

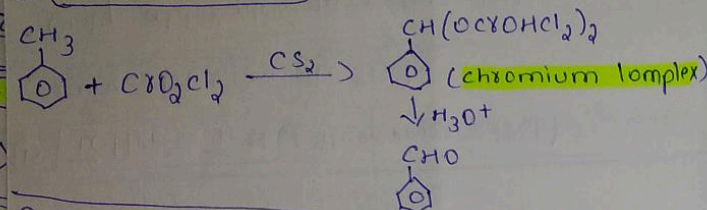
**1) Rosenmund Reduction :-**



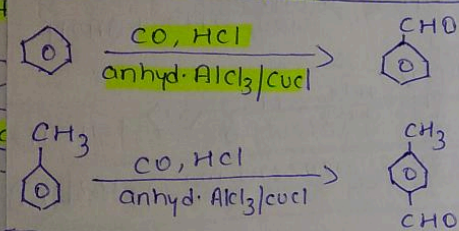
**2) Stephen Reduction :-**



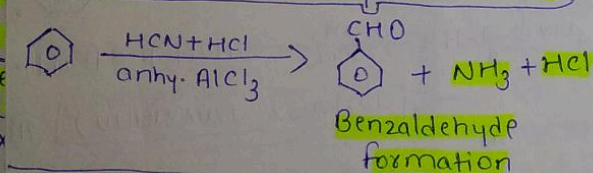
**3) Etard Reaction :-**



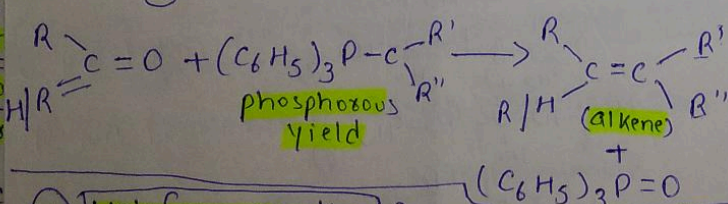
**4) Gattermann Koch Reaction :-**



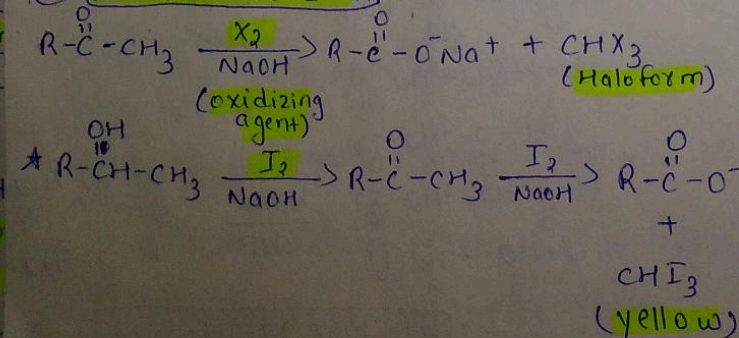
**5) Gattermann Aldehyde Reaction :-**



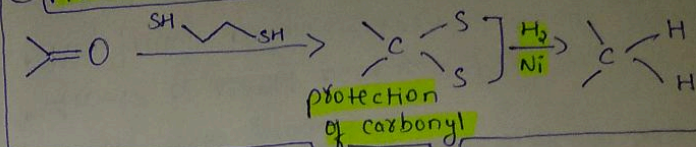
**6) Wittig Reaction :-**



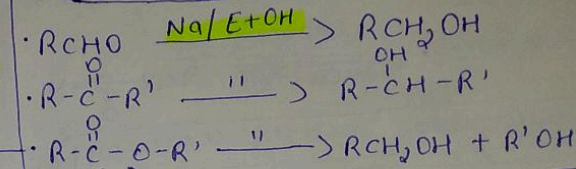
**7) Haloform reaction :-**



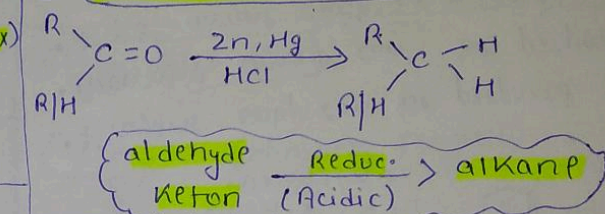
**8) Mozingo Reaction :-**



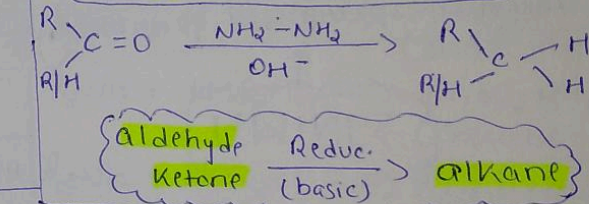
**9) Bouveault Blanc Reduction :-**



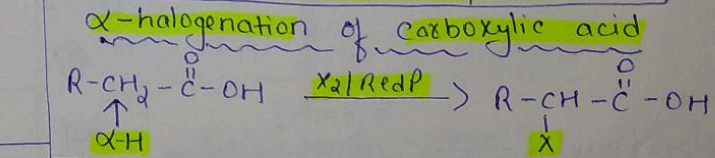
**10) Clemmenson Reduction :-**



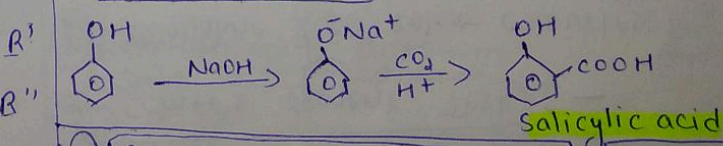
**11) Wolf Kishner reduction :-**



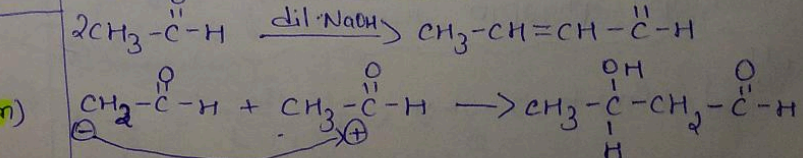
**12) Hell Volhard Zelinisky Reaction :-**



**13) Kolbe's Reaction :-**



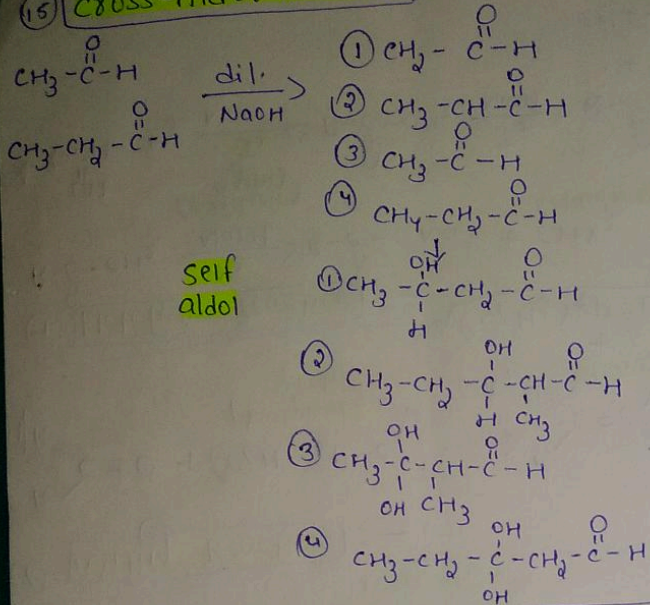
**14) Aldol condensation :-**



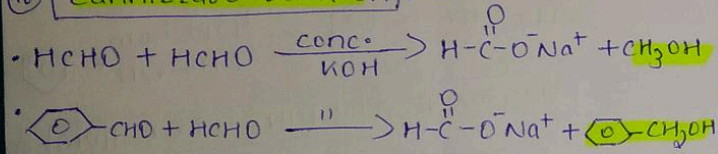
- a) enolate ion form
- b) enolate will attack on carbonyl carbon
- c) α-β unsaturated carbonyl compound is formed.



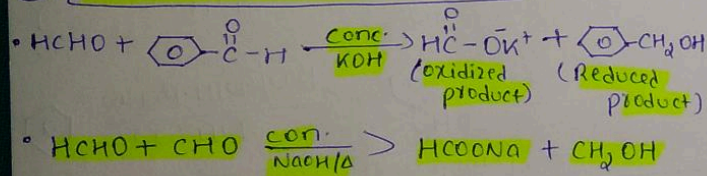
**15 Cross-Aldol reaction:** -



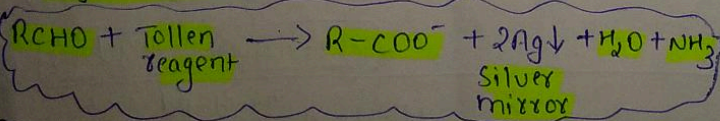
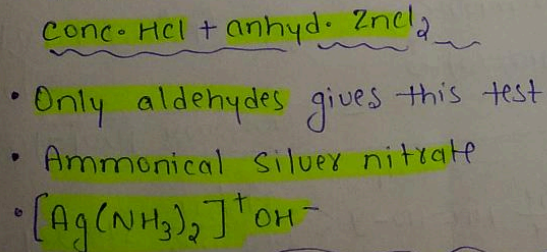
**16 Cannizzaro reaction:** -



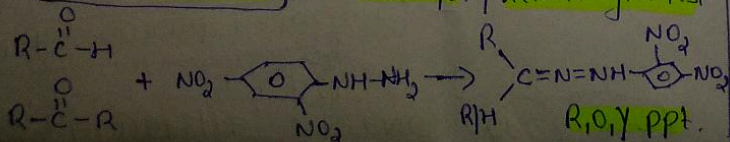
**17 cross cannizzaro reaction:** -



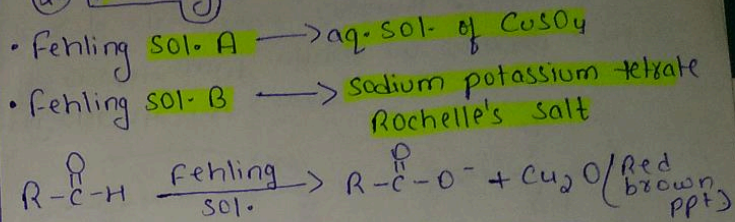
**18 Tollen's Test (silver mirror test)**



**19 2,4-DNP Test:** - Aldehyde / ketone give test

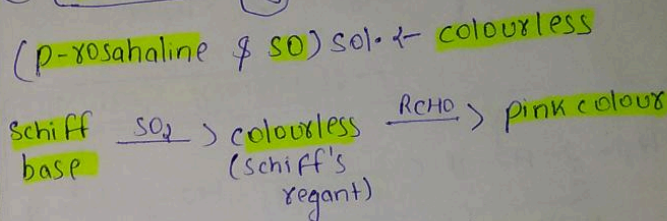


**20 Fehling solution:** -



\* Ketone & aromatic aldehyde do not give this test.

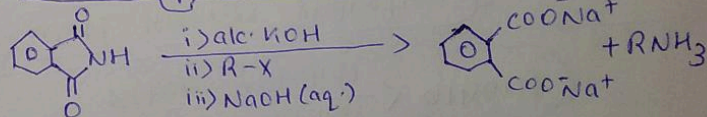
**21 Schiff's reagent Test:** -



- Ketone don't give this test
- Both aliphatic & aromatic aldehyde give this test.

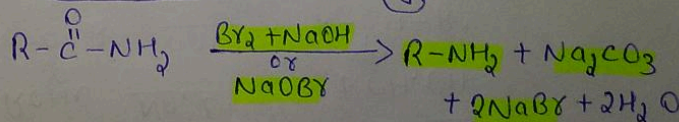
**AMINES**

**1 Gabriel phthalimide reaction:** -

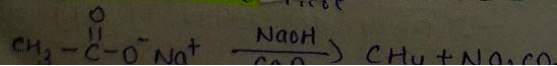


- 1° amine only can be prepared
- Aromatic amine can't be prepared
- 2° & 3° amine can't be prepared
- pure aliphatic 1° amine obtained

**2 Hoffmann Bromide Degradation reaction**

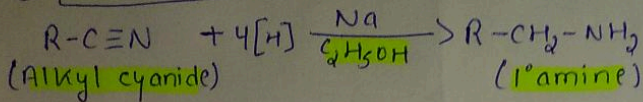


- 1° amine formed with one carbon less than the product
- 4mole of NaOH used per  $\text{Br}_2$
- Acyl / Alkyl isocyanate formed as an intermediate
- Migration of alkyl / aryl group from carbonyl carbon amide to nitrogen.

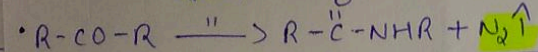
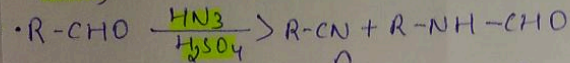
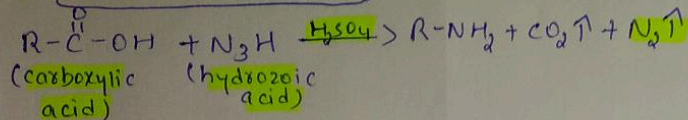




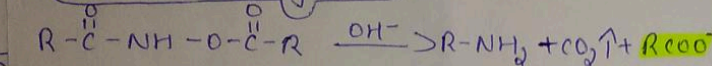
③ **Mendius reaction** :-



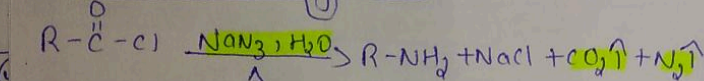
④ **Schmidt reaction** :-



⑤ **Lossen rearrangement** :-

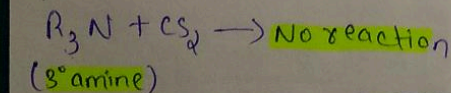
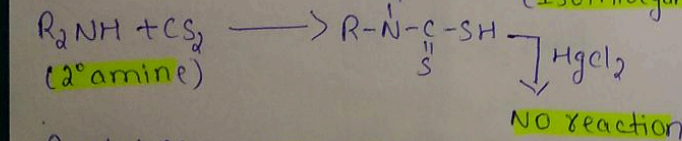
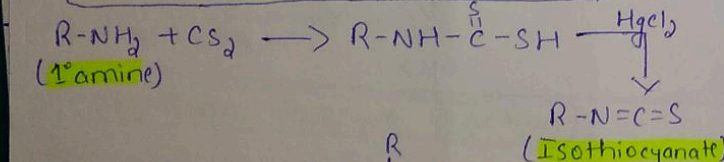


⑥ **Curtius rearrangement** :-

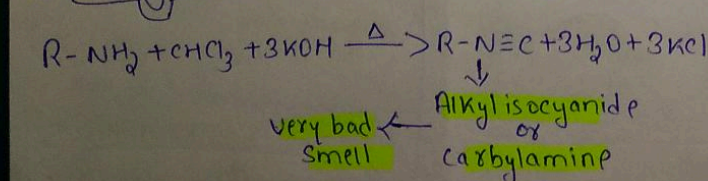


\* Intermediate  $\rightarrow$  isocyanate

⑦ **Hoffmann Mustard Oil reaction / test**



⑧ **Carbylamine reaction (Iso-cyanide test)**

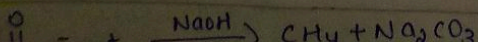


• Both aliphatic & aromatic primary amine give this test.

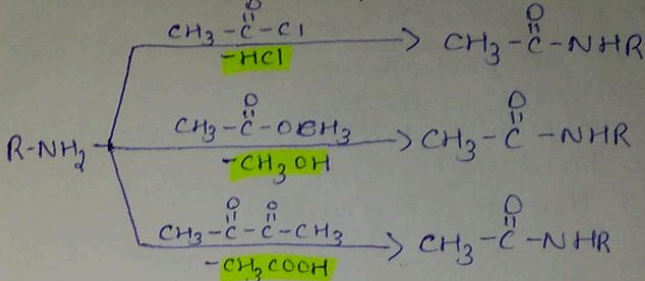
• Used to distinguish 1° amine from 2° & 3° amine

• 2° & 3° amine don't respond to this test

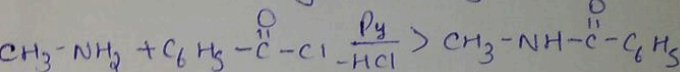
• Intermediate is dichloro carbon



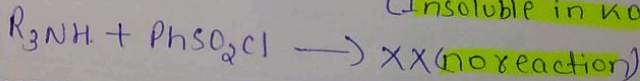
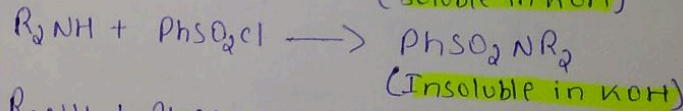
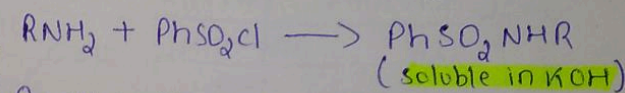
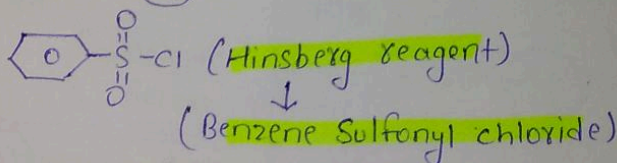
⑨ **Schotten Baumann Reaction** :-  
(Acylation of amine)



• 3° amine don't give acetylation reaction

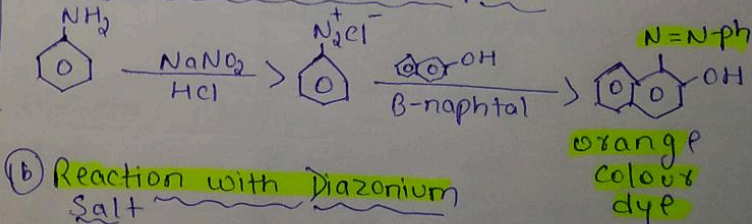


⑩ **Heisbergs test** :-

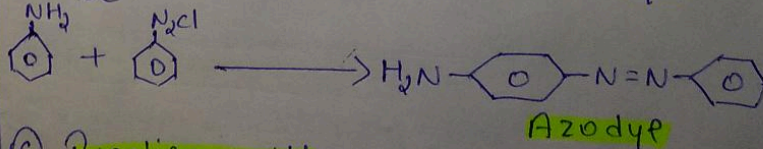


⑪ **Coupling reaction** :-

(a) **Reaction with  $\beta$ -Naphthol**



(b) **Reaction with Diazonium Salt**



(c) **Reaction with Benzaldehyde**

