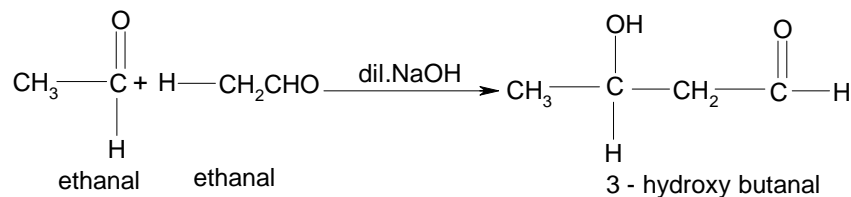


CLASS - XII CHEMISTRY

Important Name Reactions

1. Aldol condensation :-

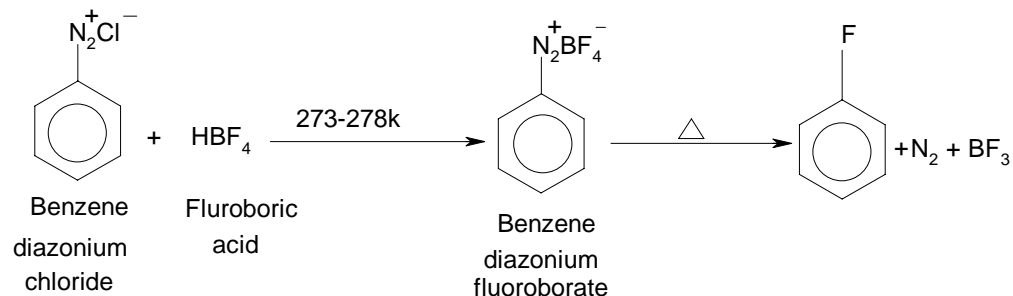
Two molecules of aldehydes or ketones containing α - hydrogen atom, in the presence of dilute alkali (dil. NaOH) undergo condensation to form β - hydroxyl aldehydes or β -hydroxy ketones.



Formaldehyde and benzaldehyde which do not have α - hydrogen atom do not undergo aldol condensation.

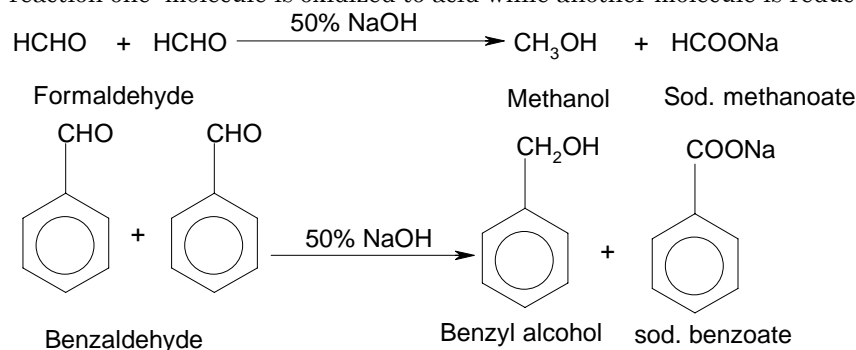
2. Balz – Schiemann reaction :-

This reaction involves the decomposition of diazonium fluoroborate to fluoro benzene.



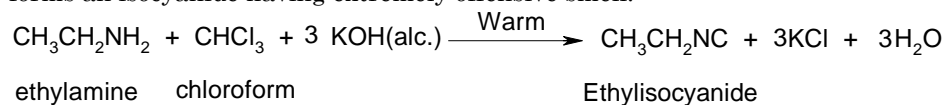
3. Cannizzaro reaction :-

Aldehydes which do not contain any α - hydrogen atom (e.g. formaldehyde, benzaldehyde) undergo self oxidation and reduction reaction on treatment with conc. NaOH (50%). In this reaction one molecule is oxidized to acid while another molecule is reduced to alcohol.



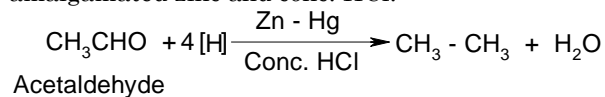
4. Carbylamine reaction :-

When a primary amine (aliphatic or aromatic) is warmed with chloroform and alcoholic KOH, it forms an isocyanide having extremely offensive smell.



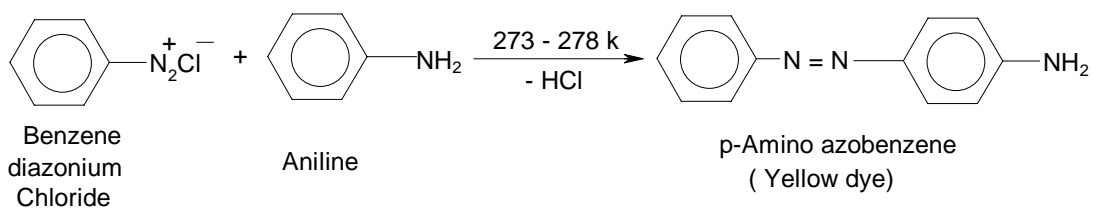
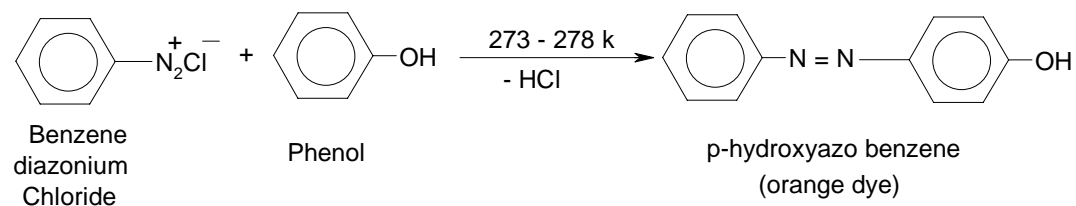
5. **Clemmensen reduction :-**

It involves the reduction of aldehydes and ketones to the corresponding hydrocarbons & with amalgamated zinc and conc. HCl.



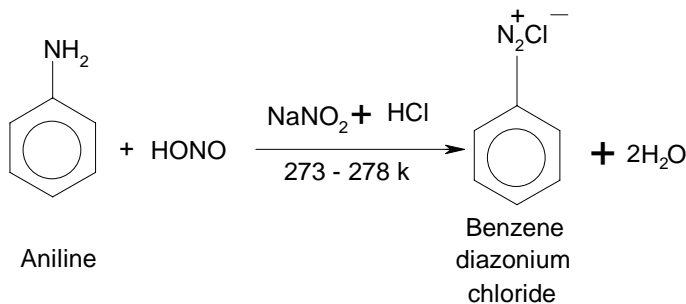
6. **Coupling reaction :-**

The reaction of diazonium salts with phenol and aromatic amines to form azo-compounds. The reaction is carried out in ice cold solution.



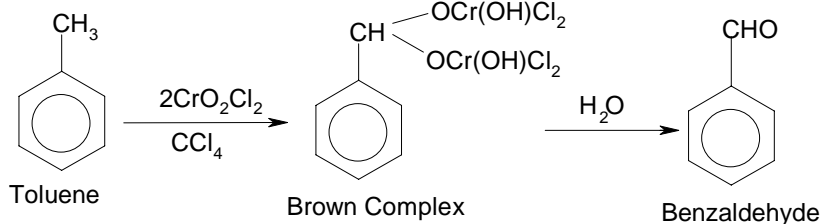
7. **Diazotization :-**

The formation of diazonium salt from primary amine in a dilute mineral acid (HCl) and treatment with cold solution of Nitrous acid ($\text{NaNO}_2 + \text{dil HCl}$) at 273 – 278 K.



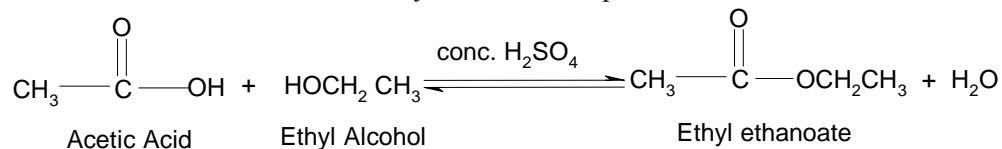
8. **Etard's reaction :-**

The oxidation of toluene to benzaldehyde with chromyl chloride (CrO_2Cl_2) dissolved in CCl_4 .

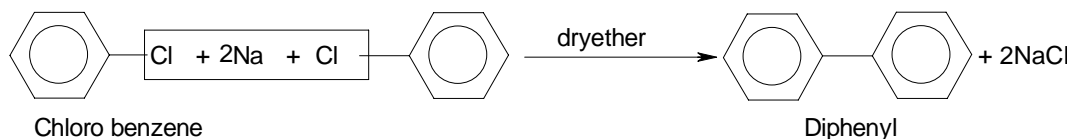


9. Esterification reaction :-

The reaction of alcohol with carboxylic acids in the presence of conc. H_2SO_4 to form esters.



10. Fittig's reaction:-



In this reaction two molecules of haloarenes combine with metallic sodium in the presence of dry ether to give diphenyl.

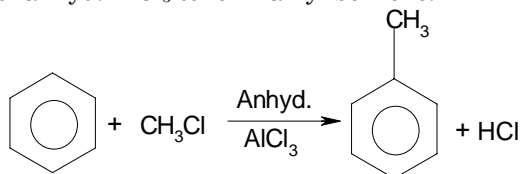
11. Finkelstein reaction :-

Chloroalkanes or bromoalkanes are converted into corresponding iodoalkanes by treating with sodium iodide dissolved in acetone.

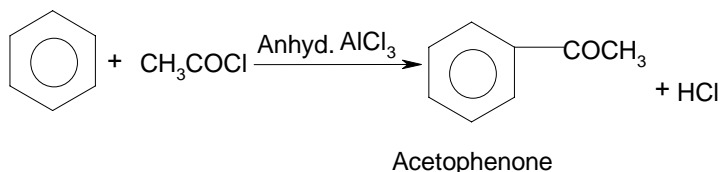


12. Friedel craft's alkylation or acylation :-

(Alkylation) Benzene and other aromatic hydrocarbon reacts with alkyl halide in the presence of anhyd. $AlCl_3$ to form alkyl benzene.

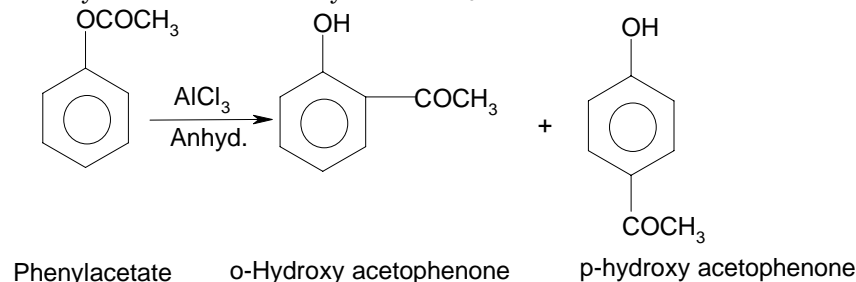


(Acylation) :- Benzene and other aromatic hydrocarbon reacts with acid chlorides or acid anhydrides in the presence of anhydrous $AlCl_3$ to form ketones.



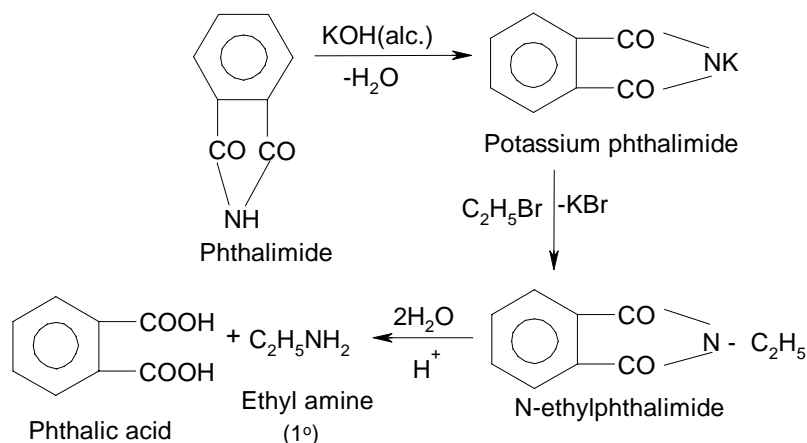
13. Fries rearrangement :-

The conversion or rearrangement of an aryl ester into o- and p-hydroxy ketone or a mixture of both by treatment with anhydrous $AlCl_3$



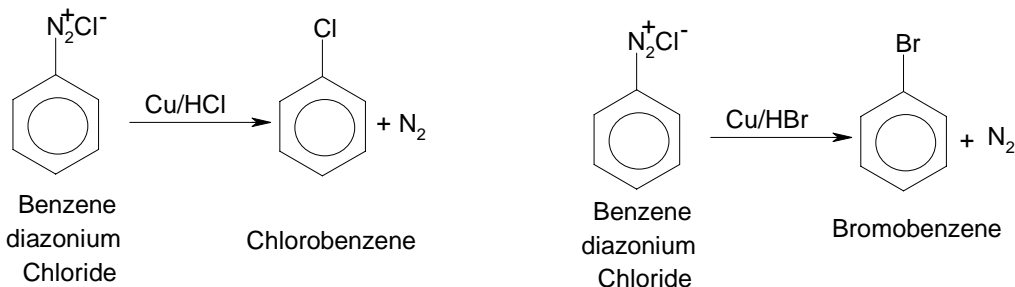
14. Gabriel phthalimide synthesis: -

This reaction is used to prepare primary amines. In this reaction, phthalimide is converted into its potassium salt by treating with alcoholic solution of KOH. The salt is then treated with alkyl halide to give N-alkyl phthalimide, which on hydrolysis with dil. HCl gives a primary amine as the product



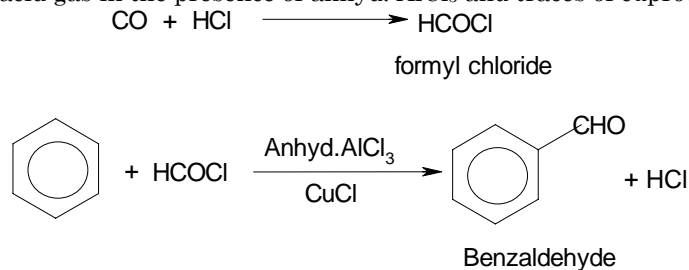
15. Gattermann reaction:-

This involves the reaction of benzene diazonium chloride with Cu/HCl and Cu/HBr to prepare Chlorobenzene and bromobenzene respectively.



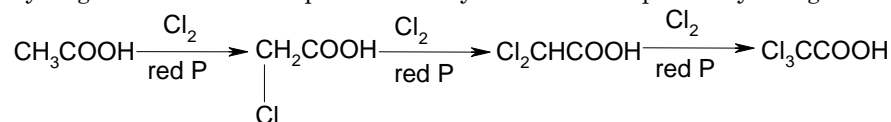
16. Gattermann-Koch reaction :-

Benzene is converted to benzaldehyde by passing a mixture of carbon monoxide and hydrochloric acid gas in the presence of anhyd. AlCl_3 and traces of cuprous chloride (CuCl)



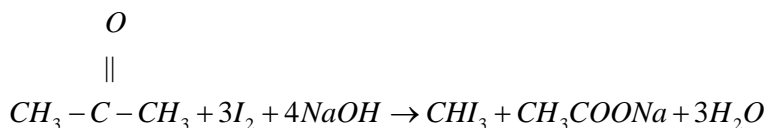
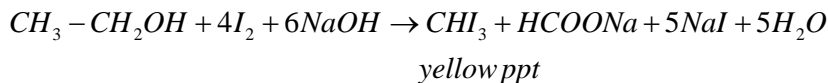
17. Hell vohlard zelinsky Reaction (HVZ) :-

The aliphatic carboxylic acids containing α -hydrogen reacts with Cl_2 or Br_2 in the presence of a small amount of red phosphorous to give α -haloacids. With excess of halogen, all the α -hydrogen atoms of the aliphatic carboxylic acids are replaced by halogen atoms

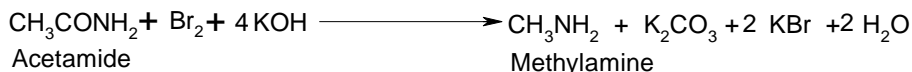


18. Iodoform reaction :-

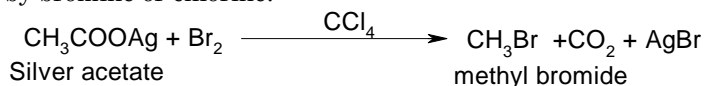
The compounds containing group $\text{CH}_3-\overset{\text{O}}{\parallel}{\text{C}}-$ or $\text{CH}_3-\overset{\text{O}}{\text{C}}\text{H}-$ reacts with aq. NaOH and iodine solution give yellow ppt of iodoform (CHI_3).

**19. Hoffmann bromamide reaction :-**

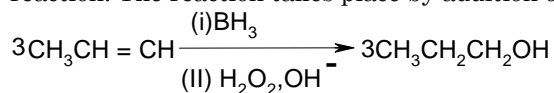
The amides can be converted into primary amines containing one carbon atom less than the original amide by heating with a mixture of Br_2 in the presence of NaOH or KOH. This reaction is also called Hoffmann's degradation reaction.

**20. Hunsdiecker reaction :-**

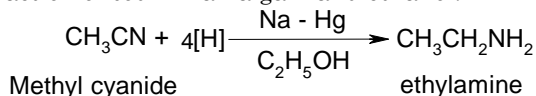
Alkyl halides are prepared by decomposition the silver salt of carboxylic acids dissolved in CCl_4 by bromine or chlorine.

**21. Hydroboration reaction :-**

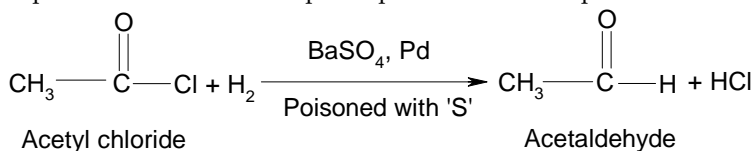
This reaction involves addition of water to a double bond opposite to that of markovnikov reaction. The reaction takes place by addition of borane (BH_3) followed by hydrolysis to alcohol.

**22. Mendius reaction;-**

The alkyl or aryl cyanide is reduced to a primary amine with nascent hydrogen produced by the action of sodium amalgam and ethanol.

**23. Rosenmund's reduction reaction: -**

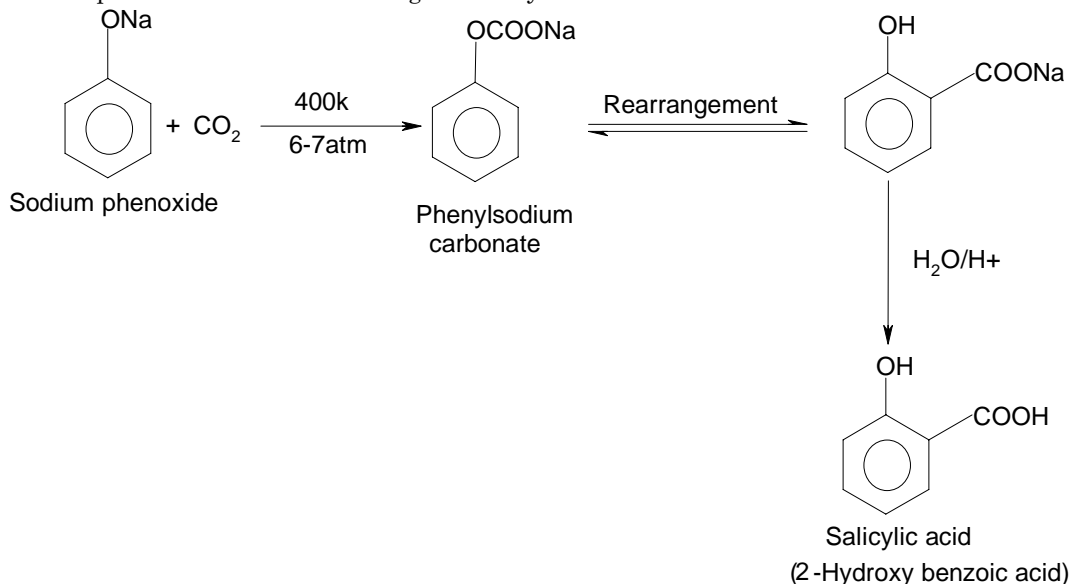
Acid chloride are converted to corresponding aldehydes by catalytic reduction. The reaction is carried out by passing through a hot solution of the acid chloride in the presence of palladium deposited over barium sulphate poisoned with sulphur.



The poisoning of palladium catalyst decreases its activity and it does not allow the further reduction of aldehyde into alcohol.

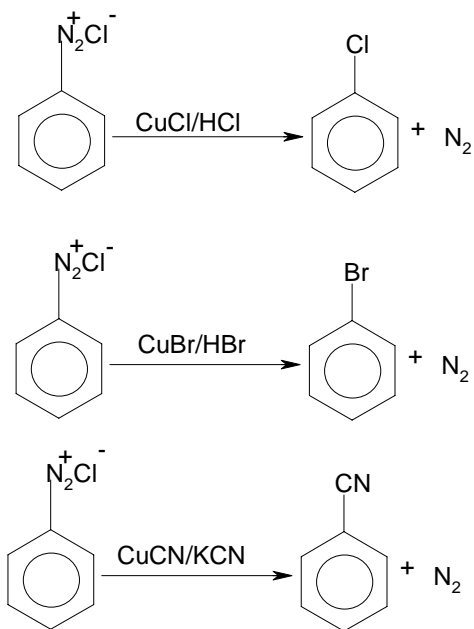
24. Kolbe's Schmidt reaction :-

Sodium phenoxide reacts with CO_2 under pressure (6-7atm) at 400K to form sodium salicylate which upon acidification with HCl gives salicylic acid.



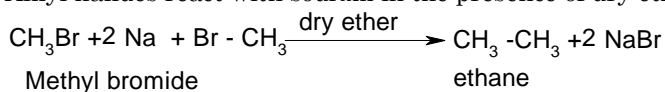
25. Sandmeyer's reaction:-

Benzene diazonium chloride is converted to chlorobenzene, bromobenzene, cyanobenzene on treatment with CuCl/HCl , CuBr/HBr , CuCN/KCN respectively



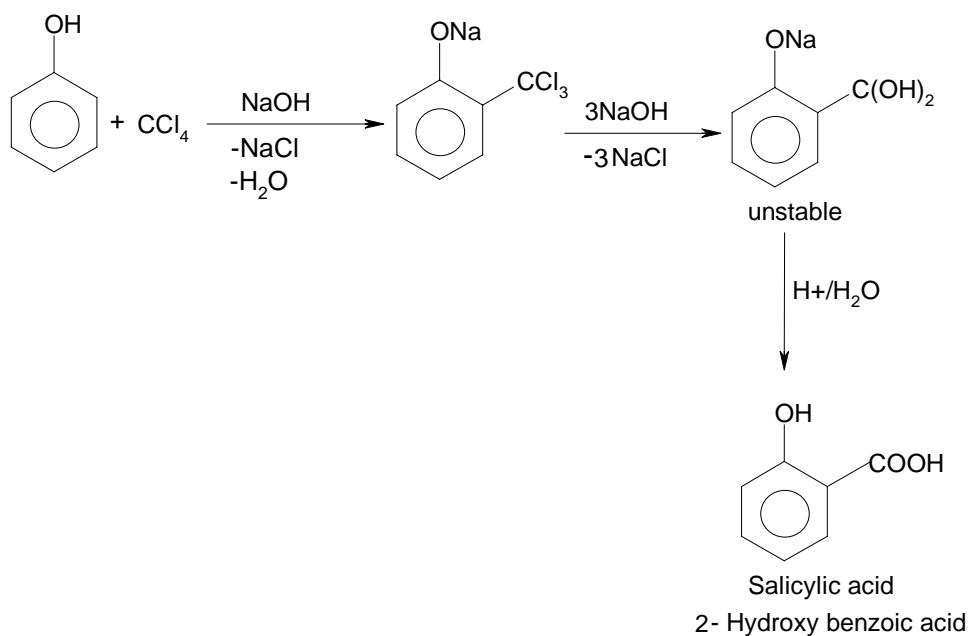
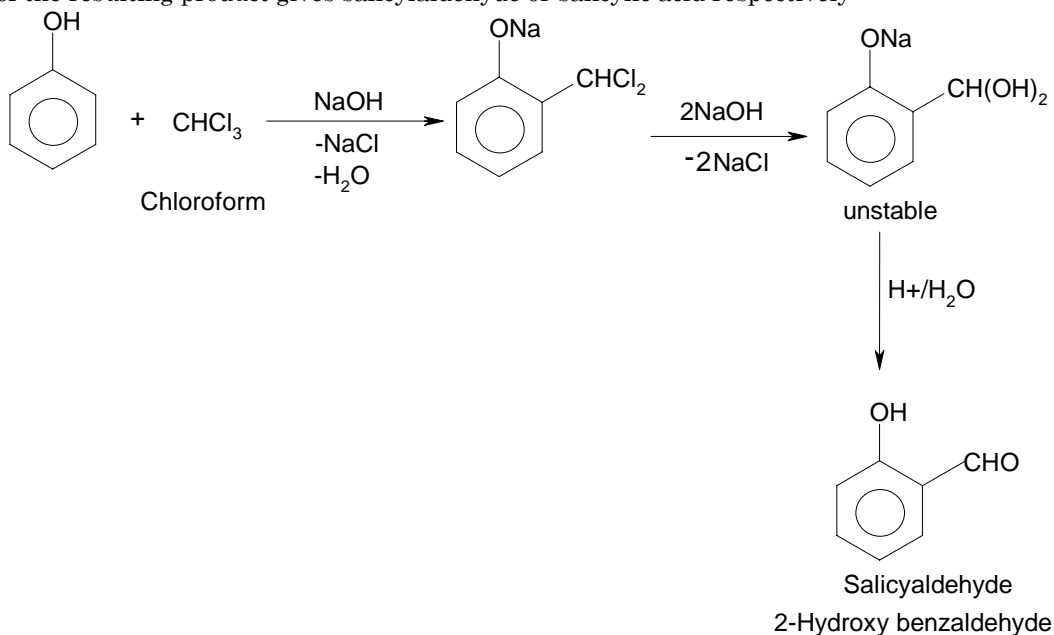
26. Wurtz reaction: -

Alkyl halides react with sodium in the presence of dry ether to form alkane.



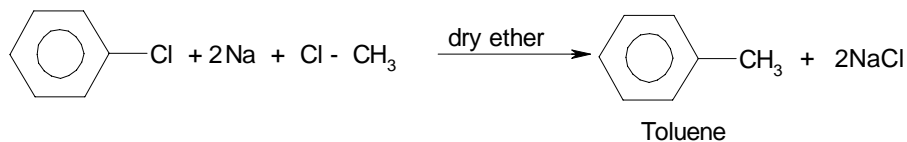
27. Reimer-Tiemann reaction:-

Phenol react with chloro form or CCl_4 in the presence of aqueous alkali at 340 K. The hydrolysis of the resulting product gives salicylaldehyde or salicylic acid respectively



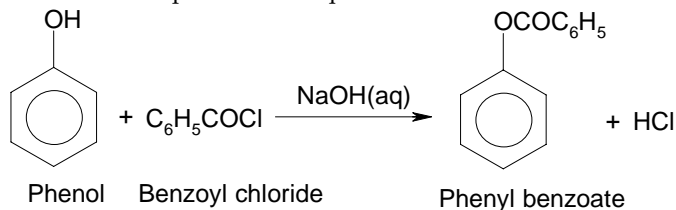
28. Wurtz-fittig reaction: -

Haloalkanes react with haloarenes in the presence of sodium and dry ether to form alkyl benzene.

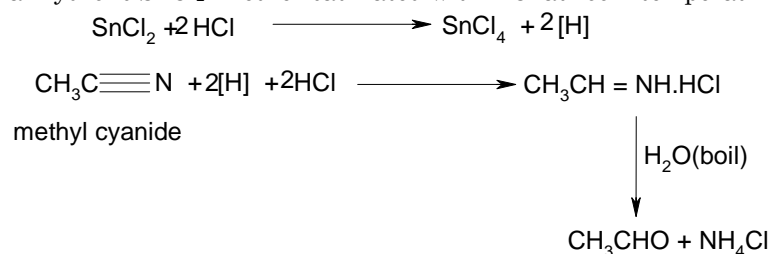


29. Schotten Baumann reaction:-

The reaction involves the benzylation of phenol, primary or secondary amine with benzoyl chloride in the presence of aqueous NaOH

**30. Stephen's reduction reaction:-**

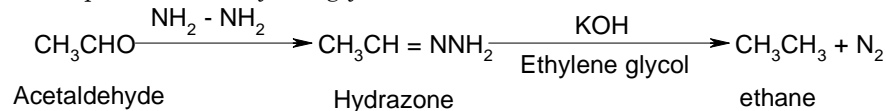
The partial reduction of alkyl or aryl cyanides to the corresponding aldehyde with a suspension of anhydrous SnCl₂ in ether saturated with HCl at room temperature followed by hydrolysis

**31. Williamson's synthesis:-**

This reaction is used to prepare both symmetrical and unsymmetrical ethers by treating alkyl halide with either sodium alkoxide or sodium phenoxide

**32. Wolff-Kishner reduction reaction: -**

The reduction is done by heating the carbonyl compound with a mixture of hydrazine and KOH in the presence of ethylene glycol.

**33. Ullmann Reaction: -**

When alkyl iodide or aryl iodide is treated with Cu higher alkane or diphenyl is formed respectively.

**34. Swarts reaction:-**

When alkyl chloride or alkyl bromide is treated with AgF or Hg₂F₂ or CoF₃ alkyl fluoride is formed. This is the only method for the preparation for the alkyl fluoride.

