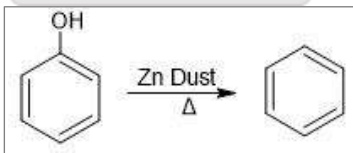
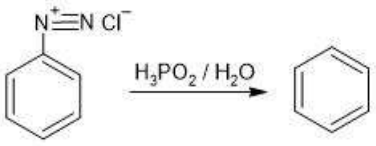
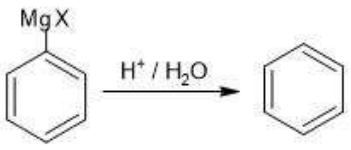
Benzene And Derivatives

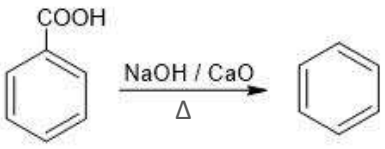
Benzene

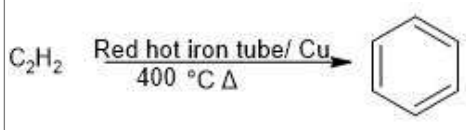
Preparation

- **From phenols** — 

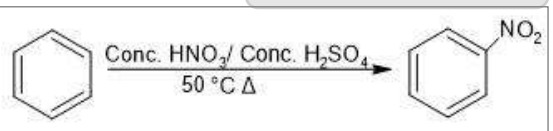
- **From diazonium salts** — 

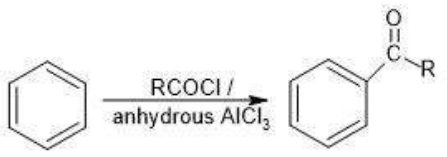
- **From Grignard reagents** — 

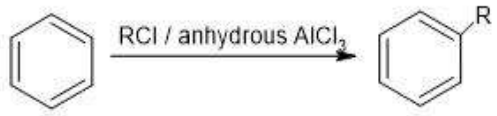
- **From benzonic acid** — 

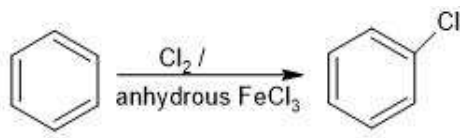
- **From C_2H_2** — 

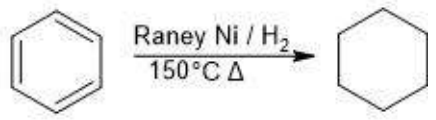
Reactions

- **Nitration** — 

- **Friedel-Crafts acylation** — 

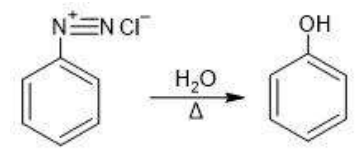
- **Friedel-Crafts alkylation** — 

- **Halogenation** (Cl_2 or Br_2 in the presence of $FeCl_3$, $FeBr_3$, $AlCl_3$ or $AlBr_3$) — 

- **Hydrogenation** — 

Phenol

Preparation



Reactions

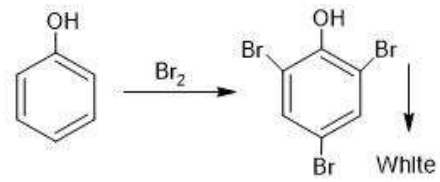
Reaction with Na and NaOH

$$2\ C_6H_5OH + 2Na \longrightarrow 2\ C_6H_5O^-Na^+ + H_2$$

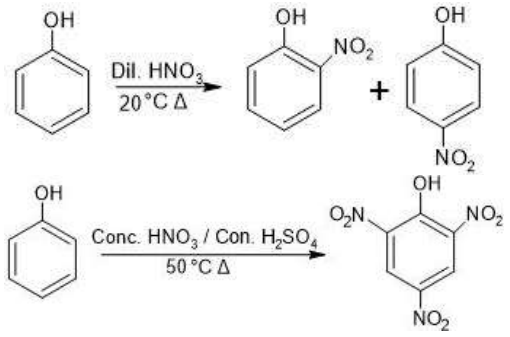
$$C_6H_5OH + NaOH \longrightarrow C_6H_5O^-Na^+ + H_2O$$

Not acidic enough to react with $NaHCO_3$ and evolve CO_2

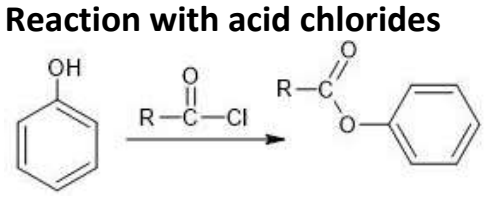
Reaction with Br_2



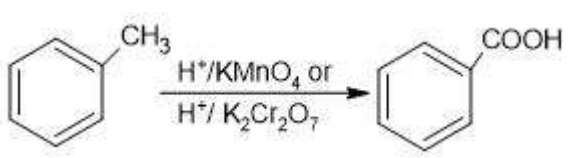
Nitration



Reaction with acid chlorides



Benzene does not oxidize by normal oxidizing agents. Alkyl groups in alkyl substituted benzene can be oxidized.

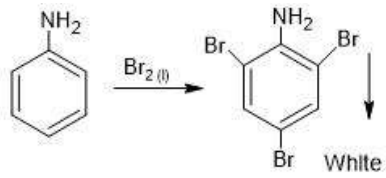


Aniline

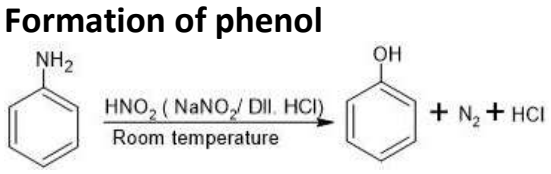
Preparation

Reactions

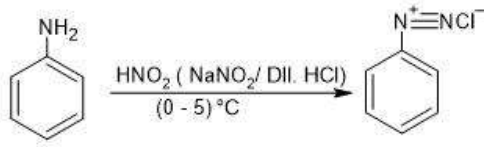
Reaction with Bromine water



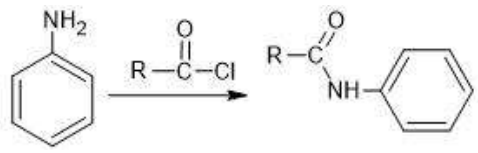
Formation of phenol



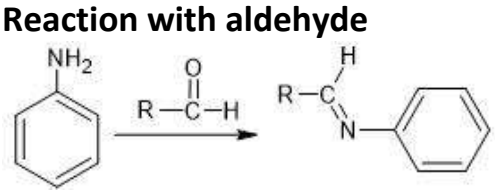
Formation of diazonium salts



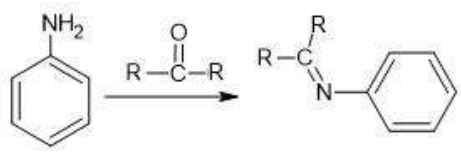
Reaction with acid chlordes



Reaction with aldehyde



Reaction with ketones



Ortho para directing groups:

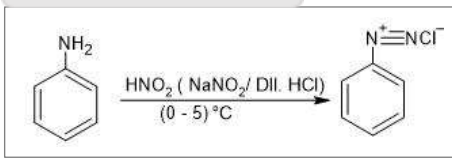
E.g.: -OH, -R, $-NH_2$, $-OCH_3$, halogens

Meta directing groups;

E.g.: $-NO_2$, -CHO, -COR, -COOH, -COOR

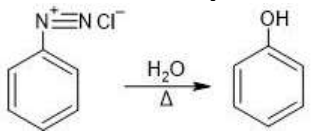
Diazonium salts

Preparation

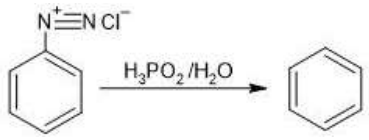


Reactions

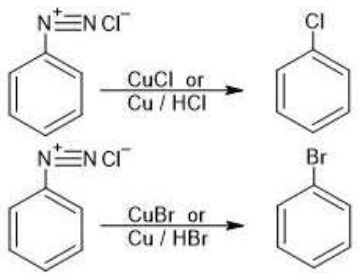
Formation of phenol



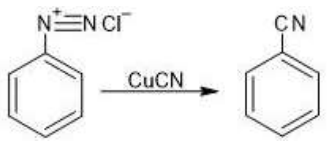
Reaction with H_3PO_2



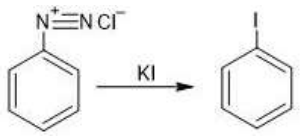
Reaction with CuCl and CuBr



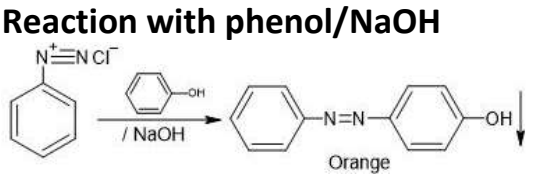
Reaction with CuCN



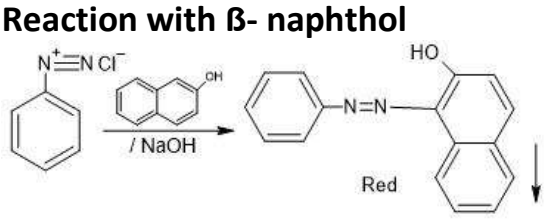
Reaction with KI



Reaction with phenol/NaOH



Reaction with ß- naphthol



X = Cl, Br, I

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