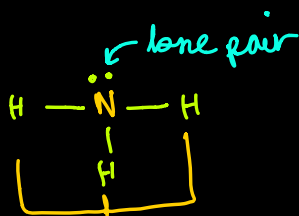
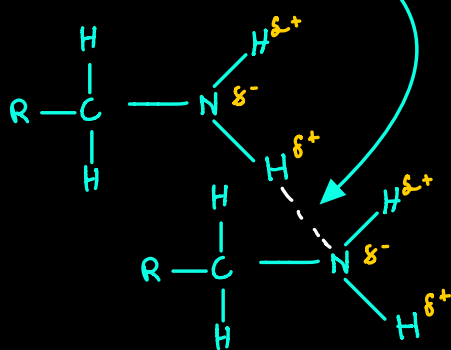
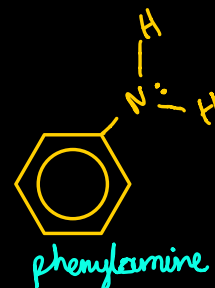
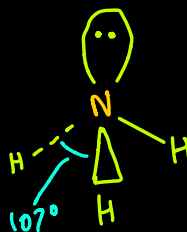


# Amines



these H's can be any R group

> Undergo hydrogen bonding



4 ways of making amines.

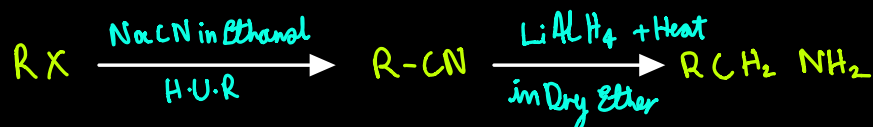
① > from haloalkanes ( $RX \xrightarrow{NH_3 \text{ in ethanol}}$  (Nucleophilic sub))



② > Reducing Nitriles ( $LiAlH_4$  in Dry Ether or  $H_2 + Ni$  catalyst) (Reduction)



③ ① Example: forming amine, increasing C atom by one starting from  $RX$ .

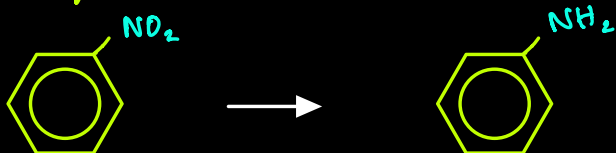


④ > Reducing Amides ( $LiAlH_4$  in Dry Ether + Heat)

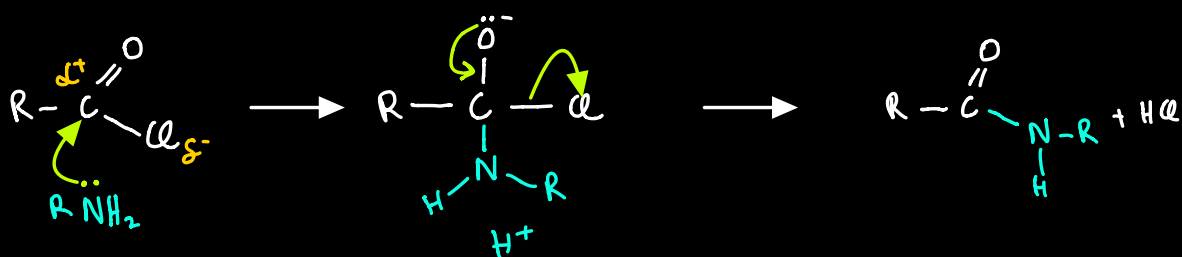


Making Phenylamine.

> Reducing nitrobenzene (Sn + conc HCl + Heat)



Amines as nucleophiles



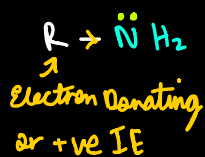
Amines as bases



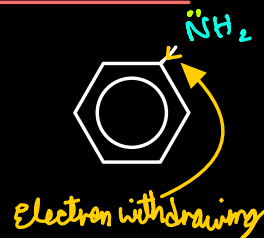
Basicity of Amines

Most Basic

Least Basic



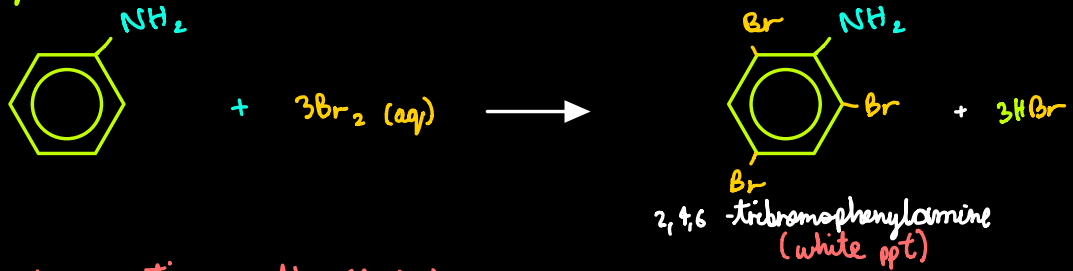
lone pair on ammonid is easily lost as R is electron Donating



lone pair on ammonid is not easily lost as Benzene is electron withdrawing as the lone pair on N is delocalised into the ring

S, P, Cl,

Phenylamine with bromine water



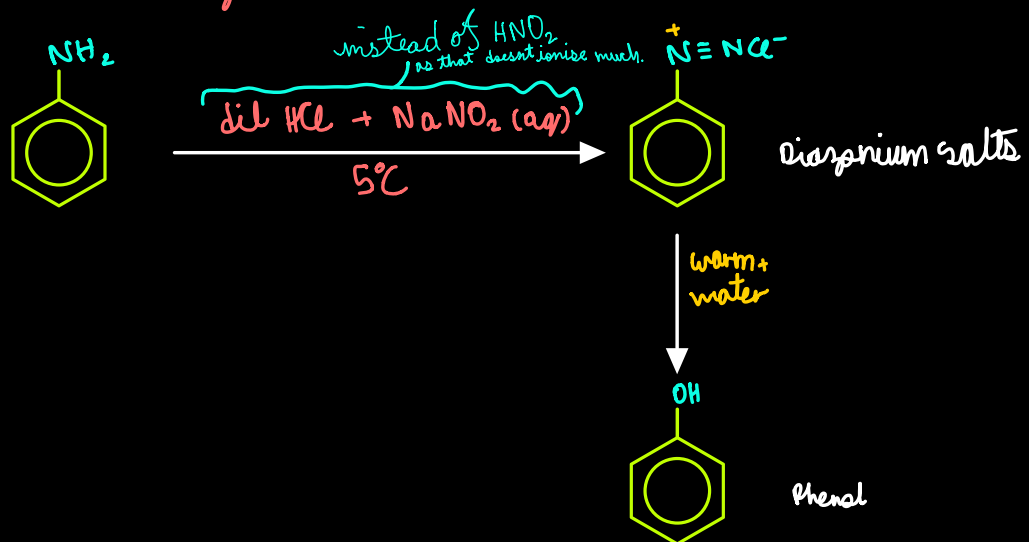
> similar reaction with  $\text{Cl}_2(\text{aq})$

Diazonium salt.

> Overall:

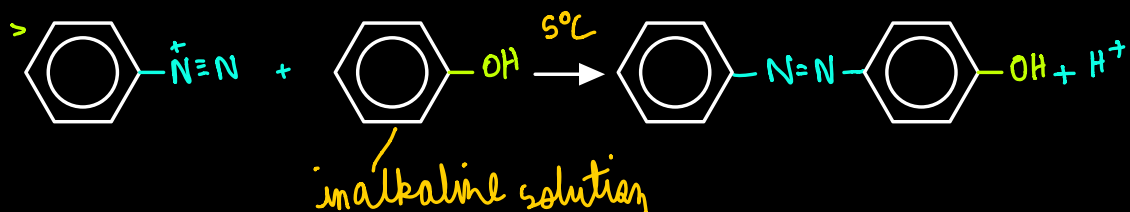


① phenylamine to diazonium

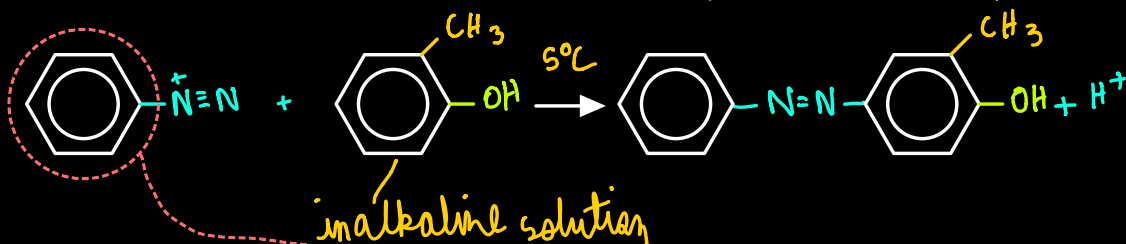


② coupling reaction

Diazonium salts reaction with phenol ( $5^{\circ}\text{C}$  + phenol in alkaline sol.)

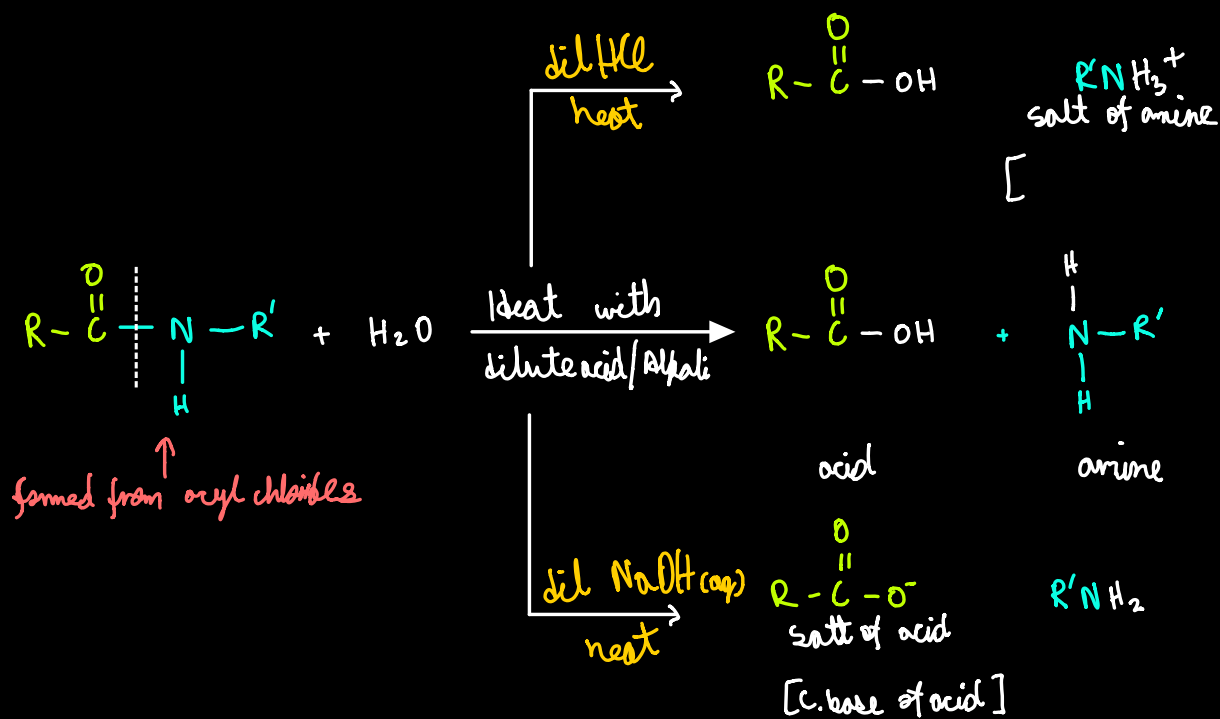


> similar reaction takes place with, for eg, the following



> yes, there can be a substituent on the nitrogen ring.

## Hydrolysis of Amides



## Reduction of Amides

