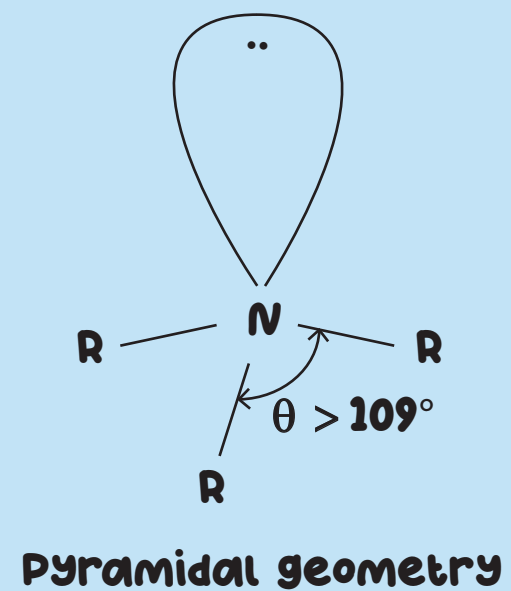


AMINES

STRUCTURE

NH_3 Ammonia
 R-NH_2 1° Amine
 $\text{R}_2\text{-NH}$ 2° Amine
 R_3N 3° Amine



PHYSICAL PROPERTIES

PHYSICAL STATE

Lower aliphatic amines are gases, intermediate members are liquid (fishy odour), while higher members are solid.

SOLUBILITY

Lower aliphatic amines are soluble in water due to H-bonding, while higher amines ($> \text{C}_6$) are insoluble in water.

$$\text{Solubility} \propto \frac{1}{\text{Molecular weight}}$$

BOILING POINT

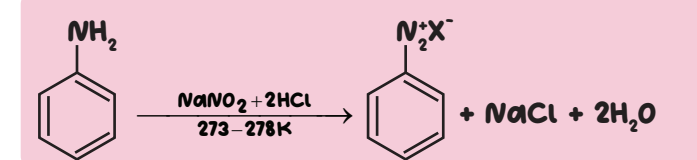
Primary and secondary amines form intermolecular H-bonding while tertiary does not.

Primary > Secondary > Tertiary

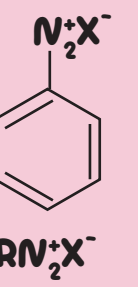
PHYSICAL PROPERTIES

Colourless, soluble in water, decompose in dry state
 $\text{C}_6\text{H}_5\text{N}_2^+\text{Cl}^-$ is readily soluble in water

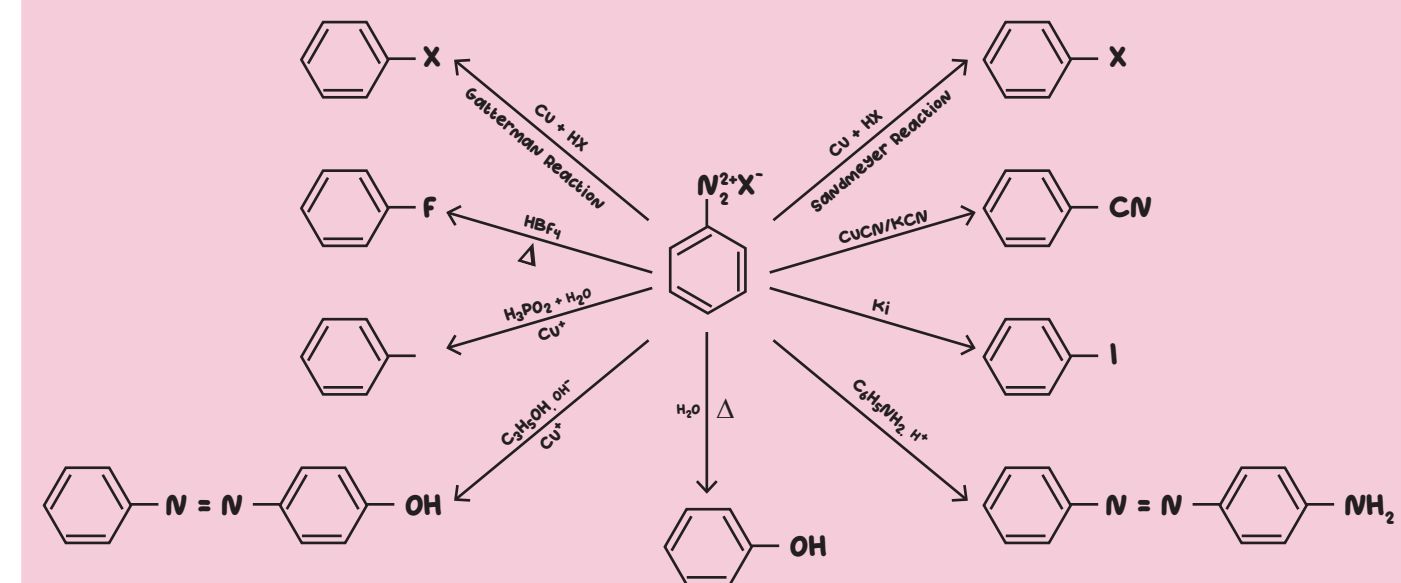
PREPARATION



DIAZONIUM SALTS

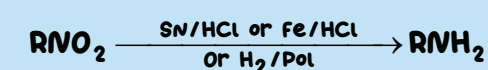


CHEMICAL PROPERTIES



PREPARATION

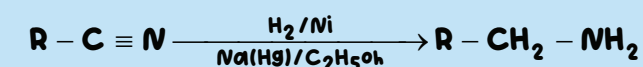
Reduction of Nitro Compounds.



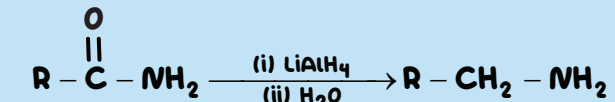
Ammonolysis



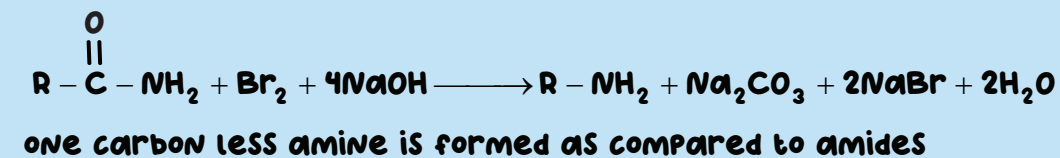
Reduction of Nitriles



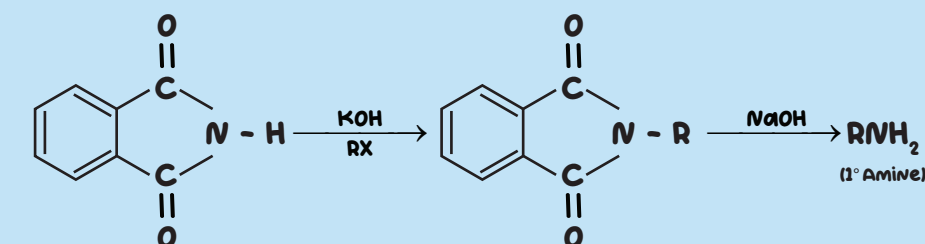
Reduction of Amides



Hoffmann Bromamide Degradation reaction



Gabriel Phthalimide Synthesis



Aromatic primary amines cannot be prepared by this method.

IN GASEOUS PHASE

3° Amine > 2° Amine > 1° Amine > NH_3

IN AQUEOUS PHASE

$(\text{CH}_3)_3\text{NH} > \text{CH}_3\text{NH}_2 > (\text{CH}_3)_2\text{N} > \text{NH}_3$
 $(\text{C}_2\text{H}_5)_2 > (\text{C}_2\text{H}_5)_3\text{N} > (\text{C}_2\text{H}_5)\text{NH}_2 > \text{NH}_3$

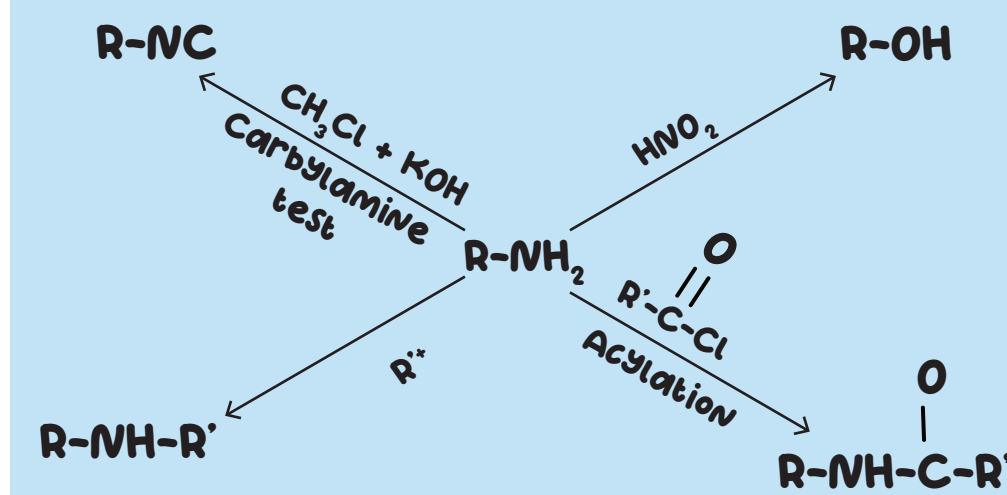
OVERALL BASICITY ORDER

Aliphatic Amine > Amines
 > Aromatic Amines

BASIC NATURE

Due to the presence of lone pair on nitrogen amines are basic.
 Factors affecting basicity
 (i) Inductive effect
 (ii) Solvation effect
 (iii) Steric hindrance

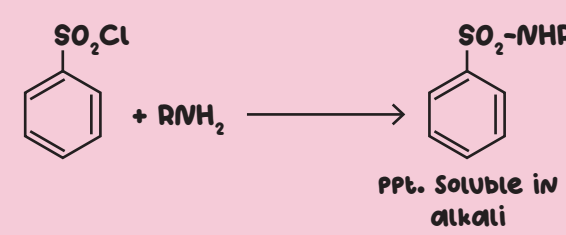
CHEMICAL REACTION



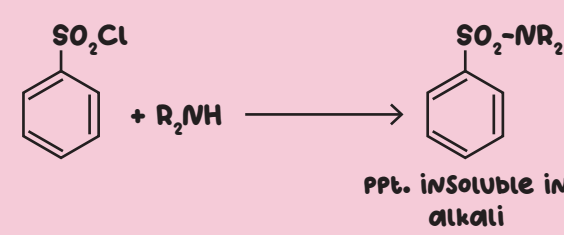
TEST FOR AMINES

HINSBERG'S TEST

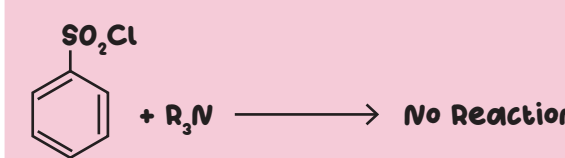
PRIMARY AMINE



SECONDARY AMINE



TERTIARY AMINE



ELECTROPHILIC SUBSTITUTION

