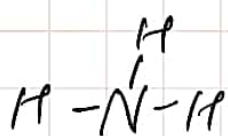


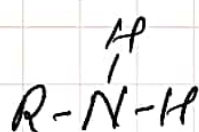
# Amines

By Bharat Panchal Sir..

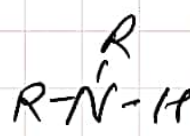
These are alkyl or aryl derivatives of Ammonia



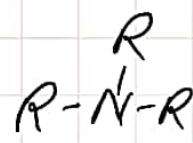
Ammonia



1° amine

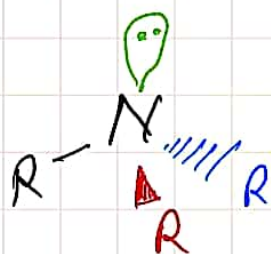


2° amine



3° amine

## Structure of Amines

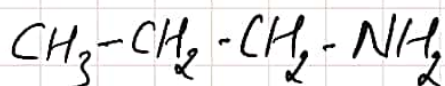


Structure - trigonal pyramidal

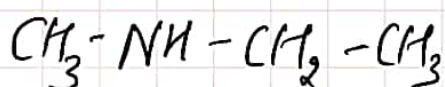
3 Bond Pairs + 1 Lone Pair

Hybrid.  $\rightarrow$   $sp^3$

## • Nomenclature $\Rightarrow$



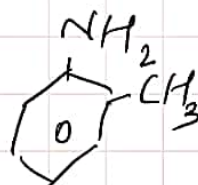
Propan-1-amine



N-Methyl ethanamine



Aniline



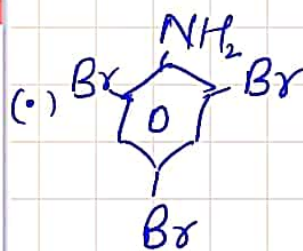
2-Amino toluene

# NCERT Ques.

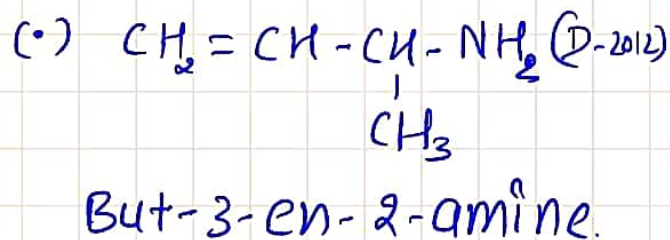
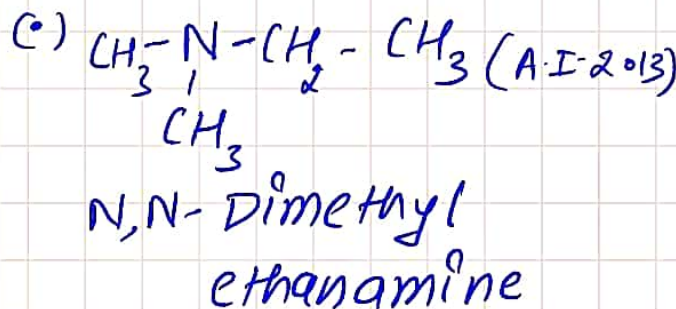
P.Y.Q

(D-2016)

Amine	Common name	IUPAC name
$\text{CH}_3\text{-CH}_2\text{-NH}_2$	Ethylamine	Ethanamine
$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-NH}_2$	n-Propylamine	Propan-1-amine
$\text{CH}_3\text{-CH(NH}_2\text{)-CH}_3$	Isopropylamine	Propan-2-amine
$\text{CH}_3\text{-N(CH}_3\text{)-CH}_2\text{-CH}_3$	Ethylmethylamine	N-Methylethanamine
$\text{CH}_3\text{-N(CH}_3\text{)-CH}_3$	Trimethylamine	N,N-Dimethylmethanamine
$\text{C}_2\text{H}_5\text{-N(CH}_2\text{C}_2\text{H}_5\text{)-CH}_2\text{-CH}_2\text{-C}_2\text{H}_5$	N,N-Diethylbutylamine	N,N-Diethylbutan-1-amine
$\text{NH}_2\text{-CH}_2\text{-CH=CH}_2$	Allylamine	Prop-2-en-1-amine
$\text{NH}_2\text{-(CH}_2\text{)}_6\text{-NH}_2$	Hexamethylenediamine	Hexane-1,6-diamine
	Aniline	Aniline or Benzenamine
	o-Toluidine	2-Methylaniline
	p-Bromoaniline	4-Bromobenzenamine or 4-Bromoaniline
	N,N-Dimethylaniline	N,N-Dimethylbenzenamine



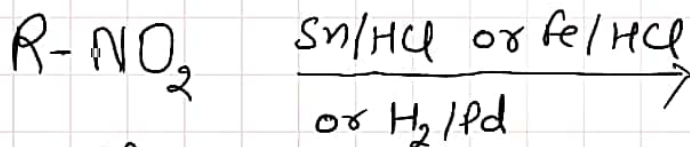
2,4,6-Tribromoaniline



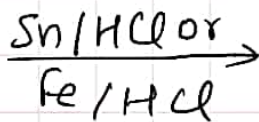
## Preparation of Amines

By Bharat Panchal  
Six

### Reduction of Nitro Compounds

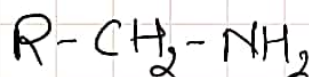
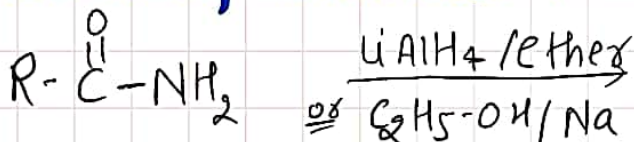


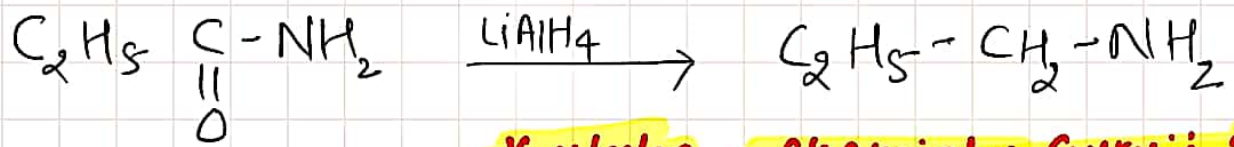
Nitrobenzene



Aniline

### Reduction of Amides

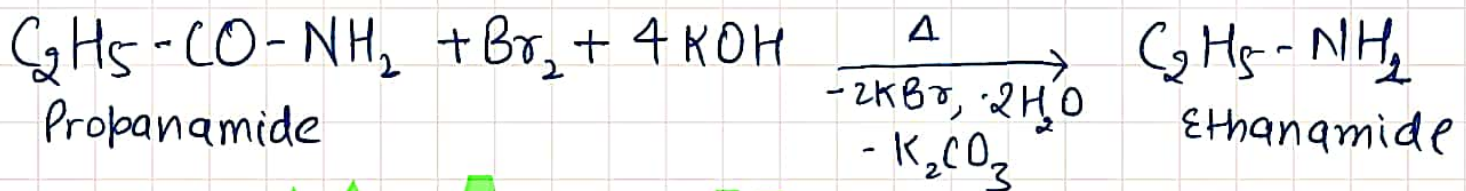
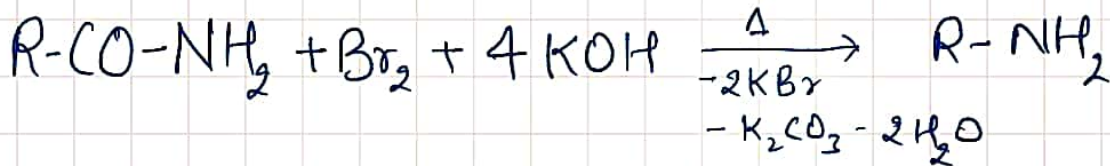




Youtube - Chemistry Guruji 2.0

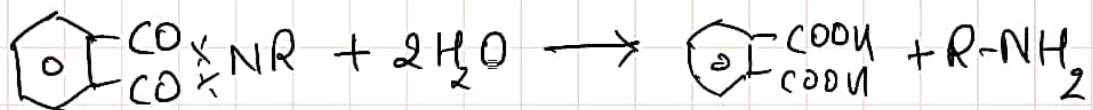
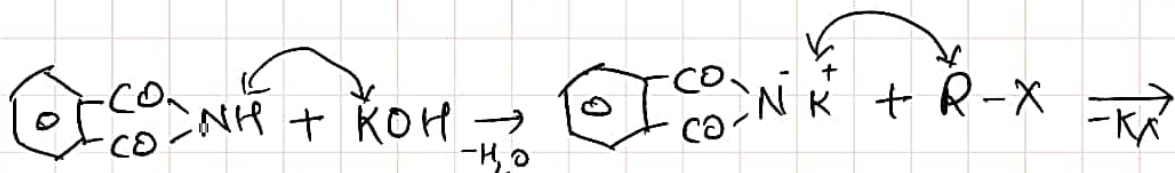
## Hoffmann Bromamide Degradation

TRICK - Baby aur Base ke liye hai



## Gabriel phthalimide synthesis:-

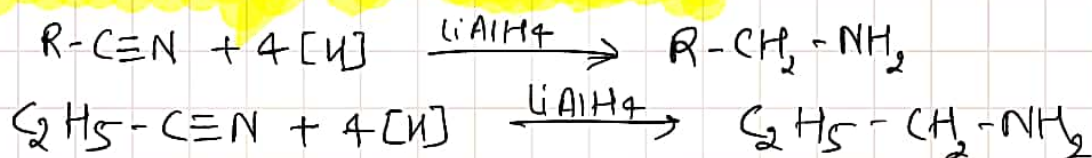
Trick - गेटवर Basement में R-X को H<sub>2</sub>O फाला।



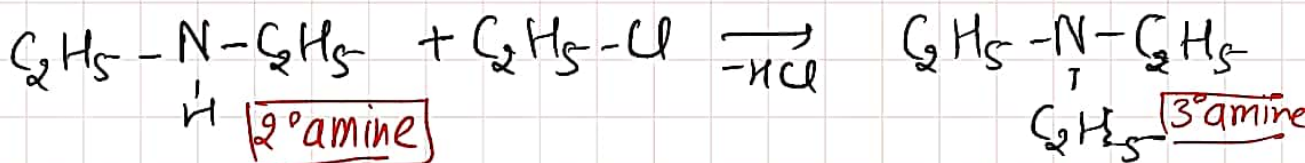
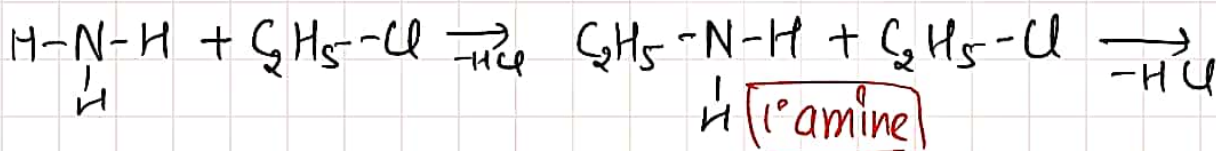
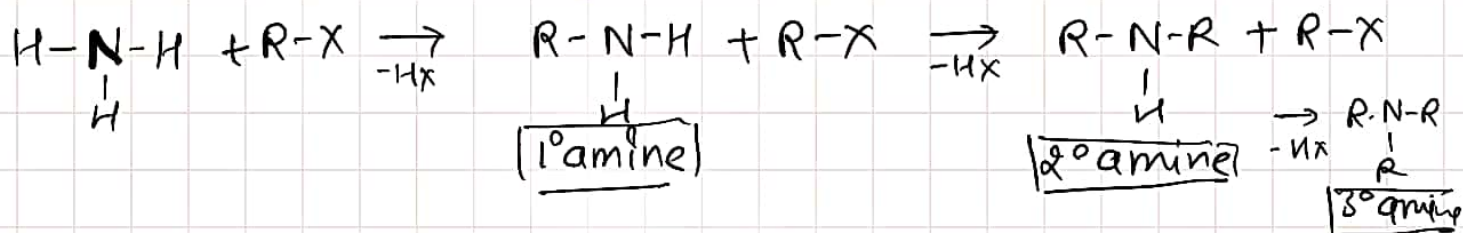
P.T.R

Aromatic 1° amines can't be prepared by this method because aryl halides do not undergo nucleophilic sub. with the anion formed by phthalimide.

## Reduction of Nitriles:-



# Hoffmann Ammonolysis of Alkyl Halide



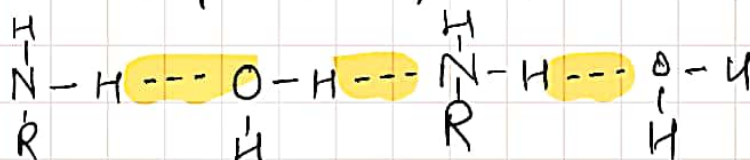
## Physical Properties of Amines:-

### Physical State:-

Lower amines are gases and liquids but higher amines are solids. The lower aliphatic amines are gases with fishy odour. Arylamines are usually colourless but get coloured on storage due to atmospheric oxidation.

### Solubility:-

Lower aliphatic amines are soluble in water because they can form H-Bond with water



Primary and secondary amines are soluble in water due to H-bonding while 3° amines are insoluble in water.

- The solubility decrease with increase in size of hydrophobic alkyl part.

**P.T.R** The solubility of amines is less than that of alcohol of comparable molecular mass because alcohols are more polar than amines and form stronger H-Bond.

By - Bharat Panchal Sir

## Boiling Point $\Rightarrow$

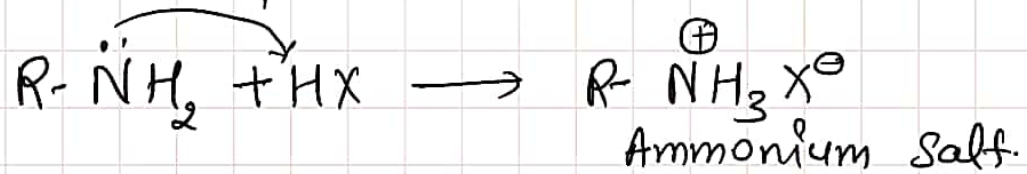
The order of b.pt isomeric amines  
 $1^\circ$  amines  $>$   $2^\circ$  amines  $>$   $3^\circ$  amines

- ①  $3^\circ$  amines do not have intermolecular H-Bonding because no H- is attached to N-atom.
- ②  $1^\circ$  amines have maximum amount of H-Bonding because two H-atoms are attached to N-atom.

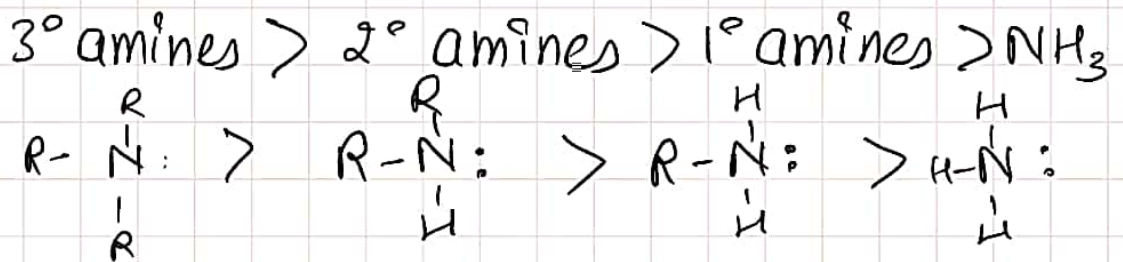
## Basic Character of Amines

- $\rightarrow$  Amines are basic in nature due to the presence of lone pair of  $e^-$  on nitrogen atom.
- $\rightarrow$  Aliphatic amines are stronger bases than ammonia due to +I effect of Alkyl group.
- $\rightarrow$  Aromatic amines are weaker bases than ammonia due to -I effect of Aryl group.
- $\rightarrow$  Besides inductive effect, effects like steric effect, solvation effect, resonance effect also affect the basic strength of amines.

Amines are basic in nature and reacts with acids to form salts.

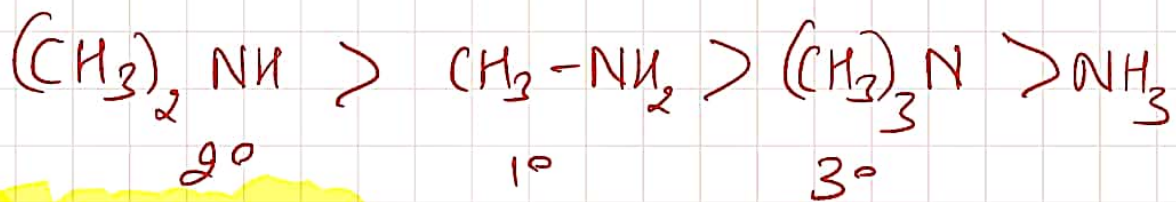
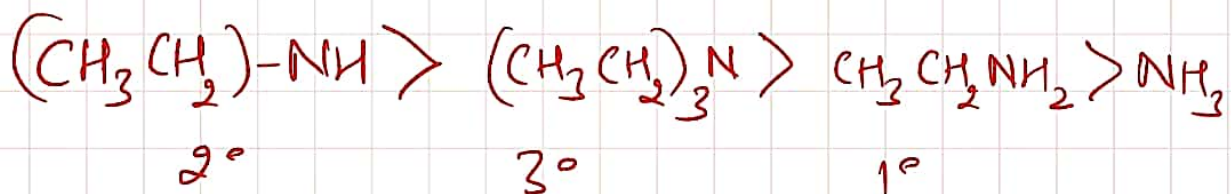


→ Order of basic character of amines in gaseous phase  
(Acc. to +I effect)

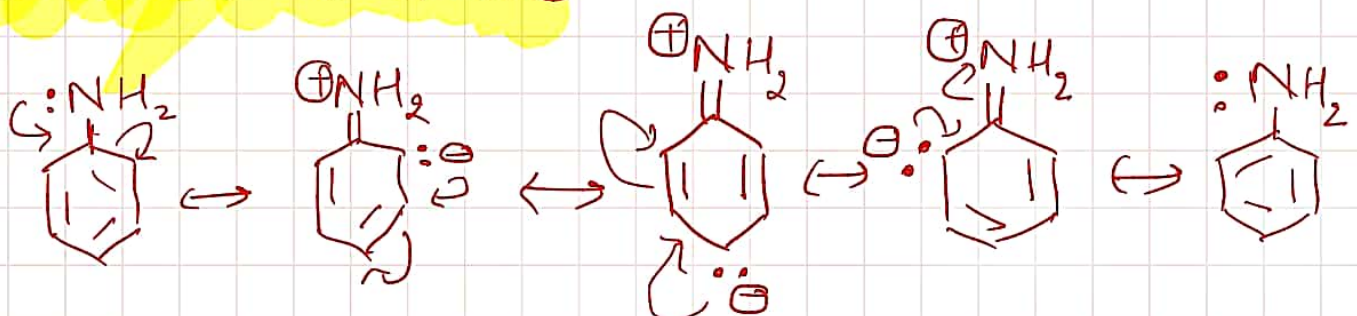


However in aqueous phase :-

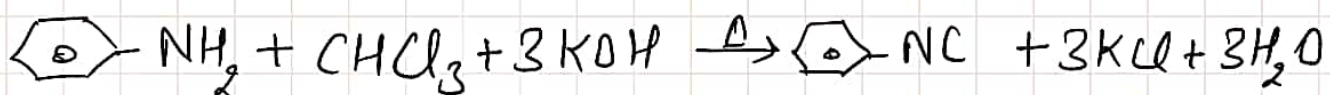
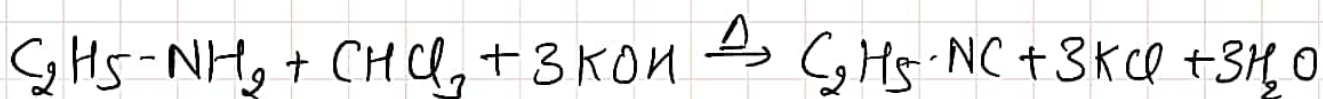
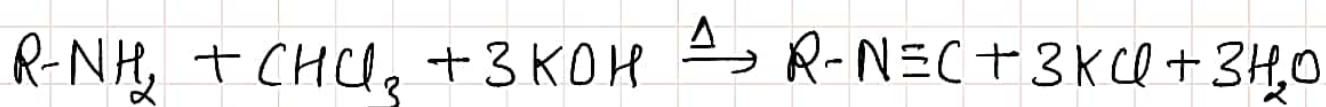
There is subtle interplay of Inductive effect, steric effect and solvation effect



## Resonance in Aniline

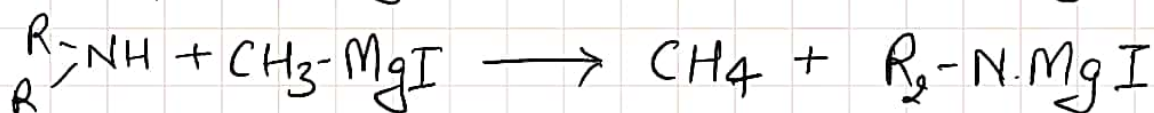
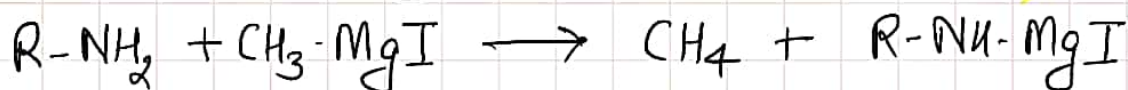


## Carbylamine Reaction



## Reaction with Grignard Reagent $\Rightarrow$

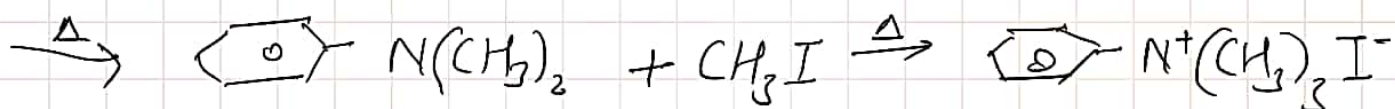
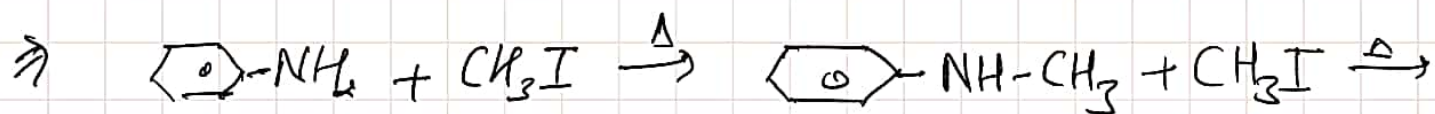
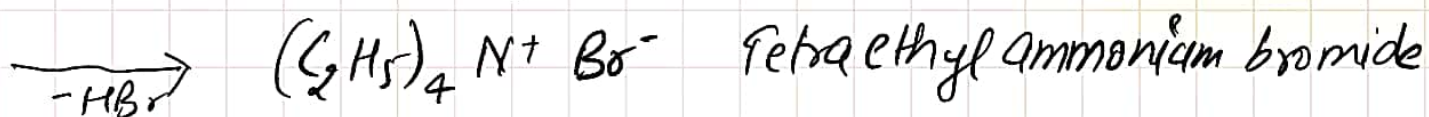
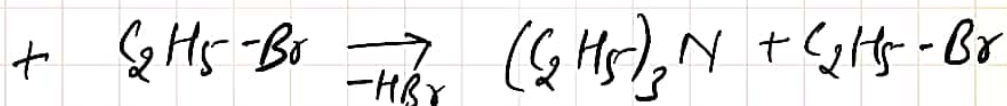
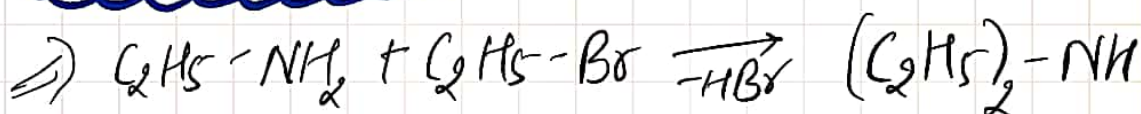
By  
Bhasat  
Panchal



**P.T.R**

Tertiary amines do not react with Grignard reagents as they do not contain active H-atoms.

## ALKYLATION

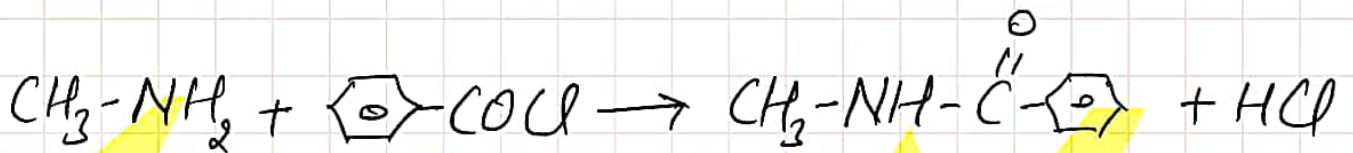
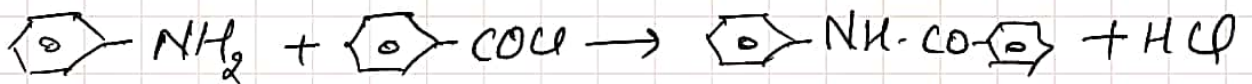


WHEN YOUR TEACHER SAYS



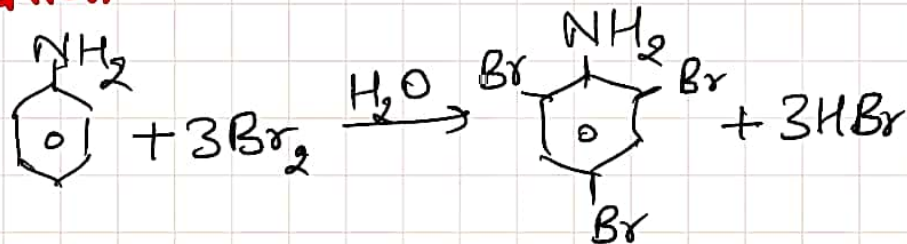
"HIGHLIGHT ONLY THE IMPORTANT PARTS."

# Acylation



## Electrophilic Substitution Reaction

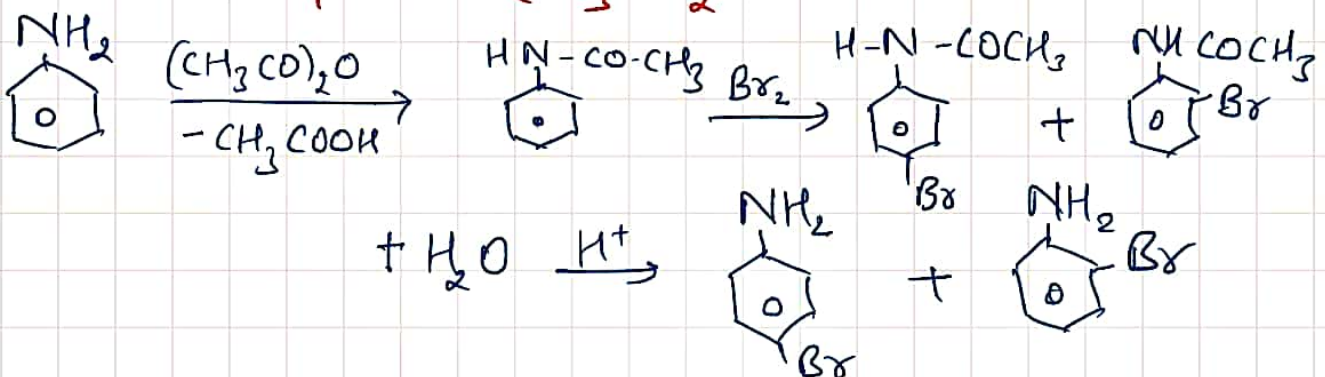
### (i) Bromination -



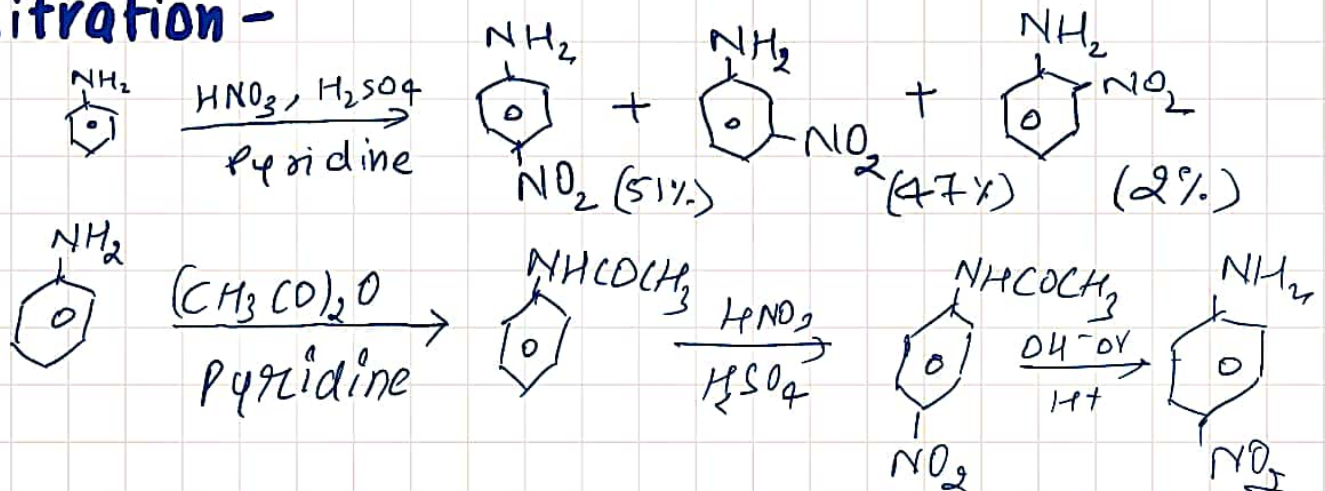
Chemistry  
Guruji  
2.0

### P.T.R

For monobromination, treat aniline with acetic anhydride  $(\text{CH}_3\text{CO})_2\text{O}$

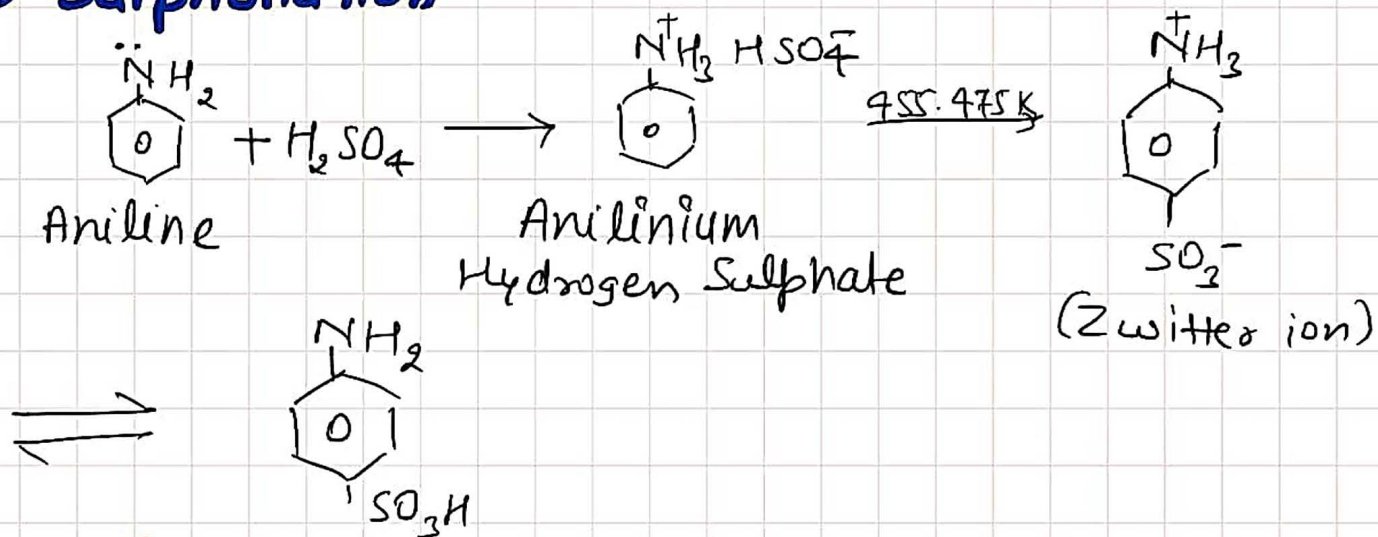


### (ii) Nitration -





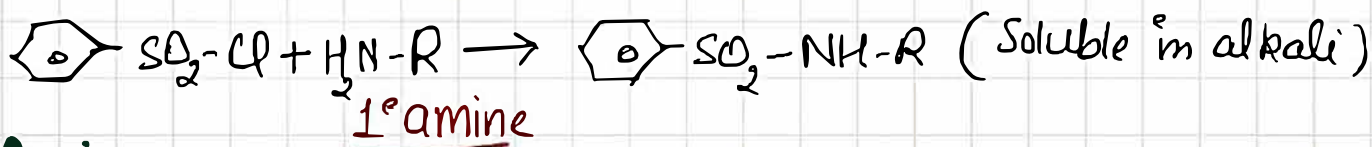
# ⇒ Sulphonation



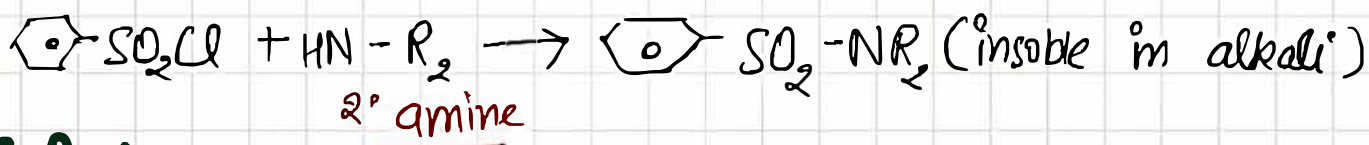
## ⇒ Hinsberg Test (benzene sulphonyl chloride)



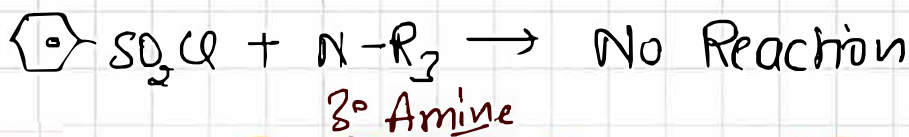
### 1° Amines



### 2° Amines



### 3° Amines

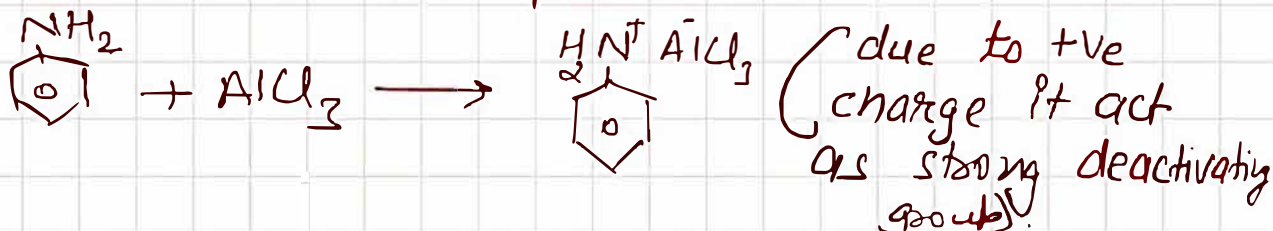


**P.T.R**

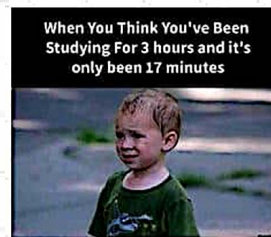
**Friedel craft Rxn are not possible for**



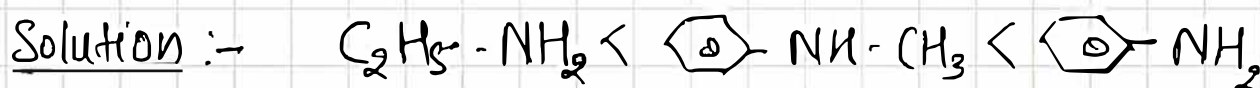
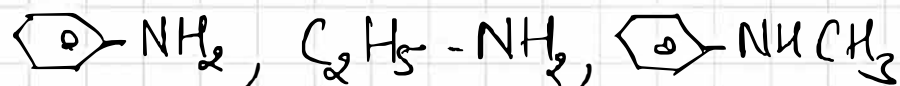
because it form salt with anhy.  $\text{AlCl}_3$  that is used as catalyst in the reaction.



Basic Character  $\propto K_b$   
Basic Character  $\propto \frac{1}{pK_b}$



- Arrange the following in the increasing order of  $pK_b$  values: (C.B.S.E - 2018)



(\*) Give reasons: (CH3)2NH is more basic than (CH3)3N in an aqueous solution (C.B.S.E - 2018)

Ans: (CH3)2NH is more basic than (CH3)3N in an aqueous solution due to less steric hindrance.