



PARISHRAM



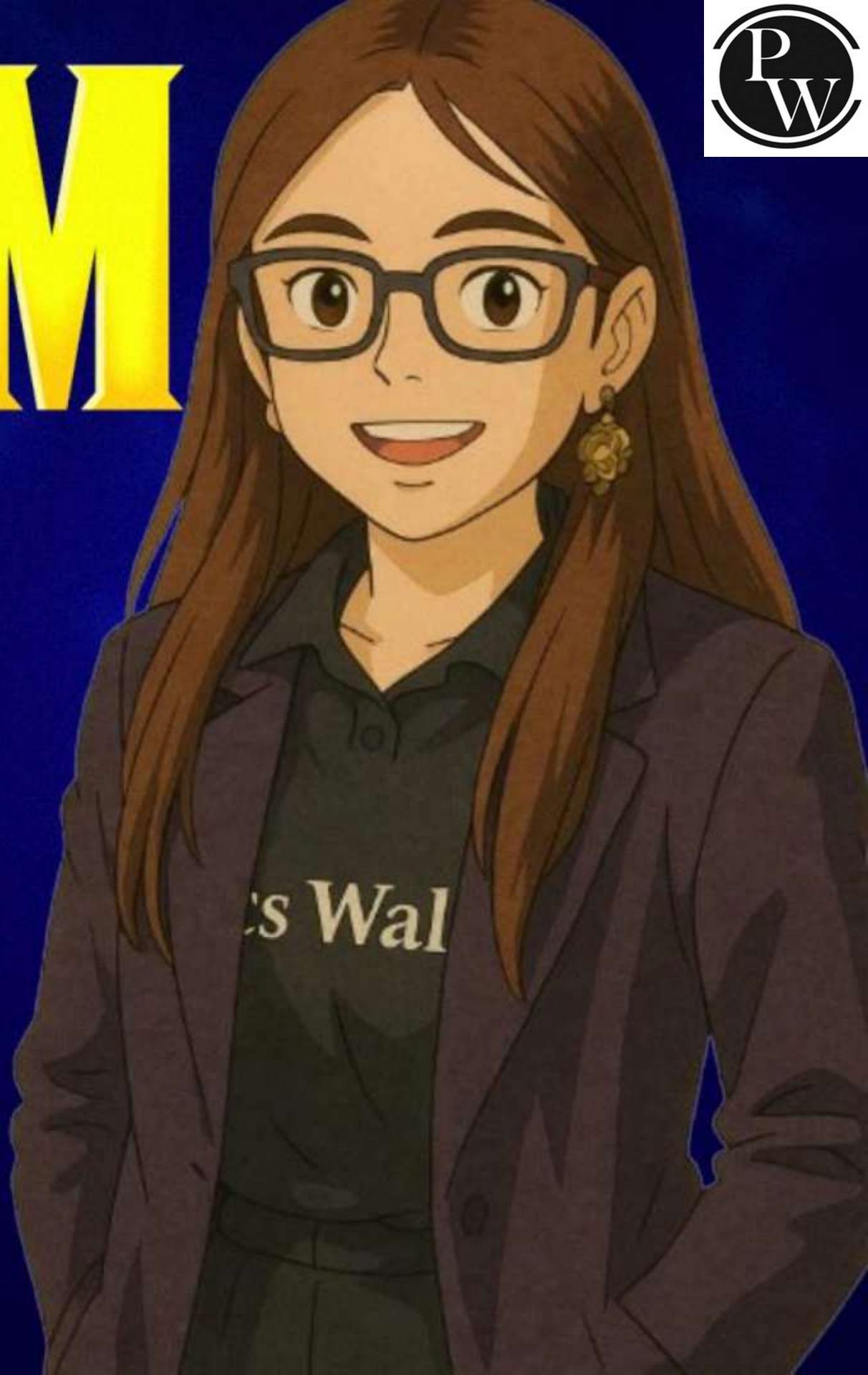
2026

AMINES

CHEMISTRY

LECTURE-1

BY - SHOURYA GROVER (SG) MA'AM





TOPICS TO BE COVERED

1. AMINES -INTRODUCTION ✓
2. NOMENCLATURE ✓
3. METHODS OF PREPARATION OF AMINES ✓
4. QUESTIONS





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Physics Wallah



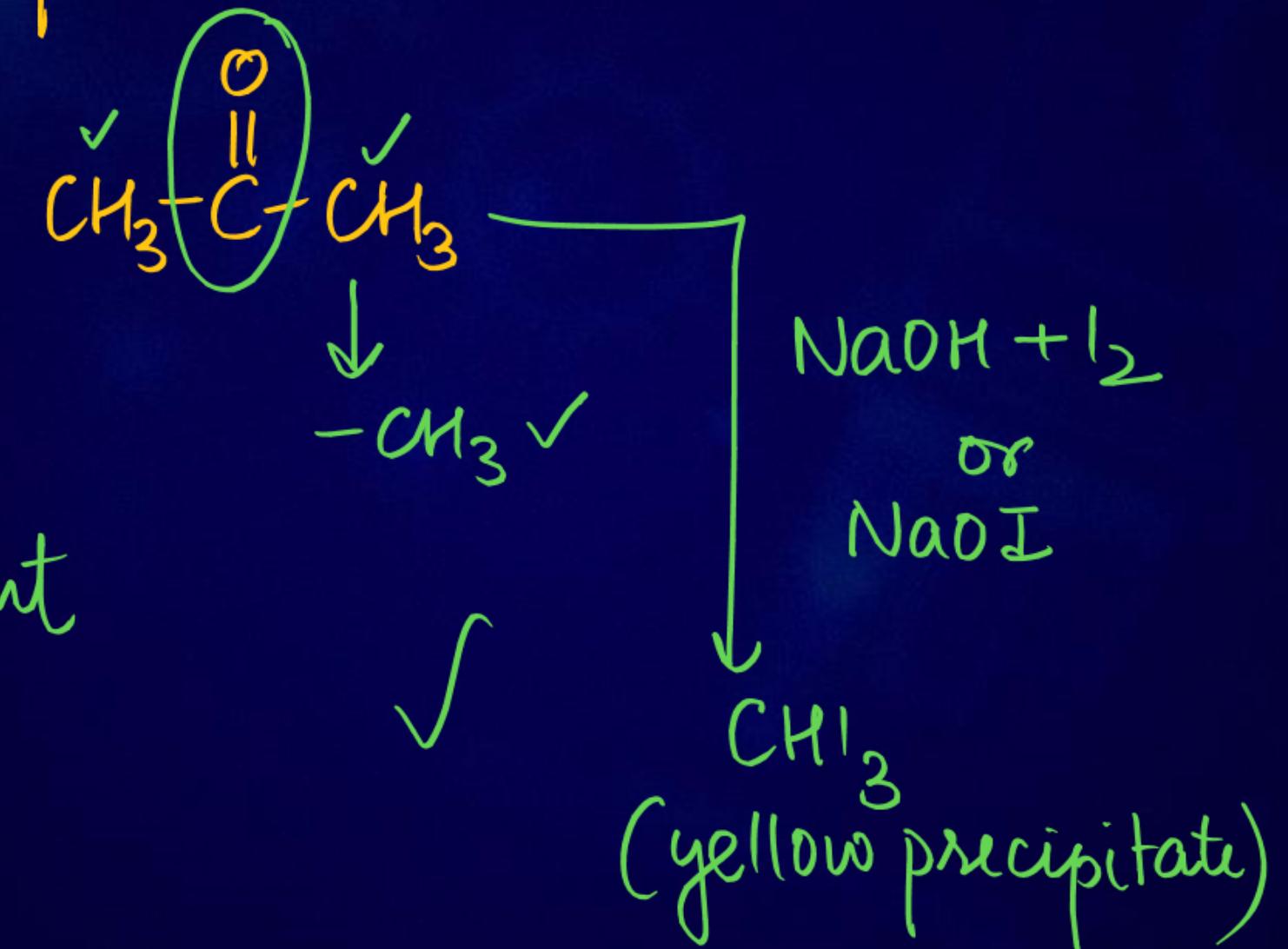
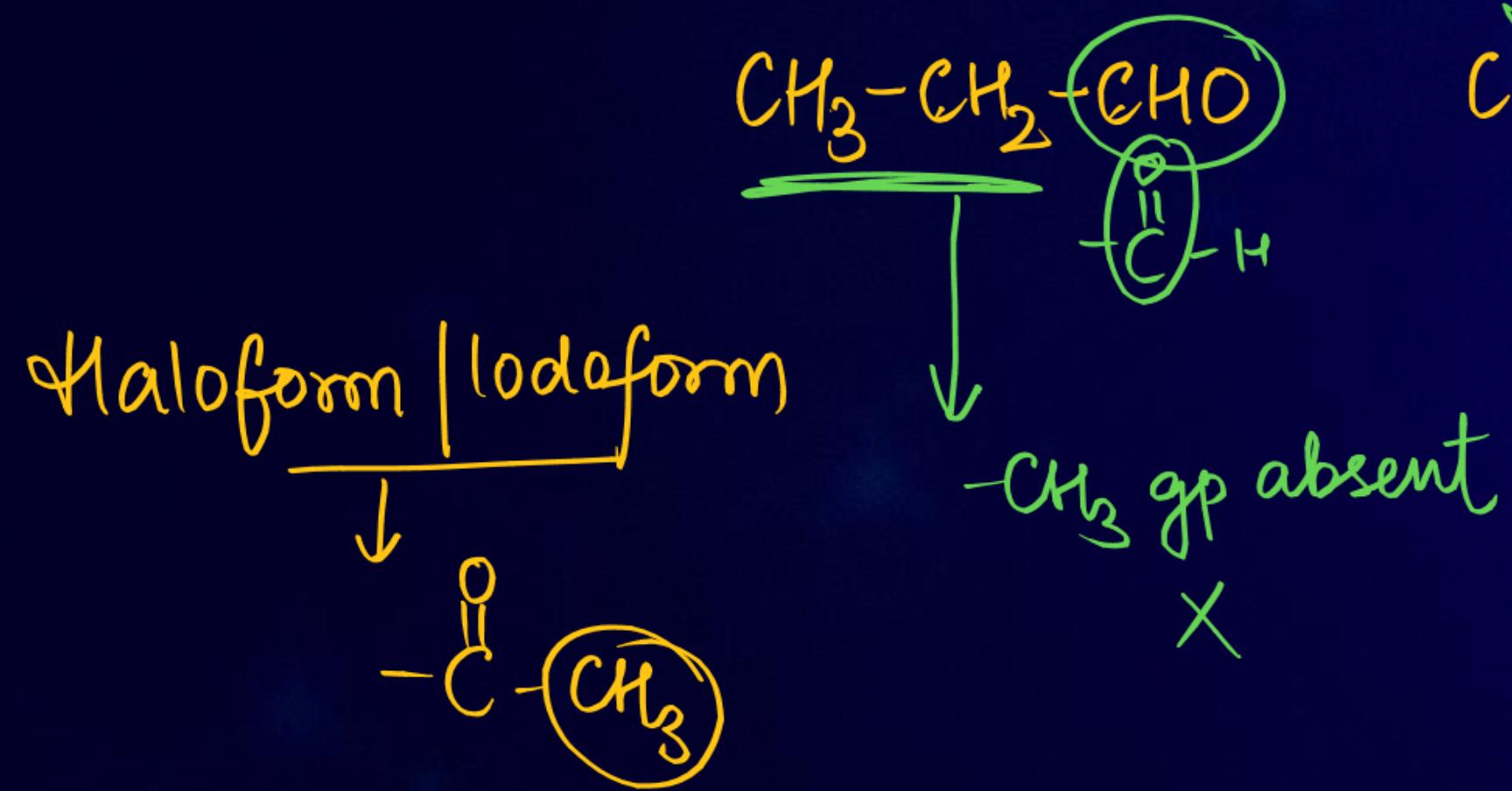
MY SHIMMERING STARS

#SHOURYA'S GALAXY

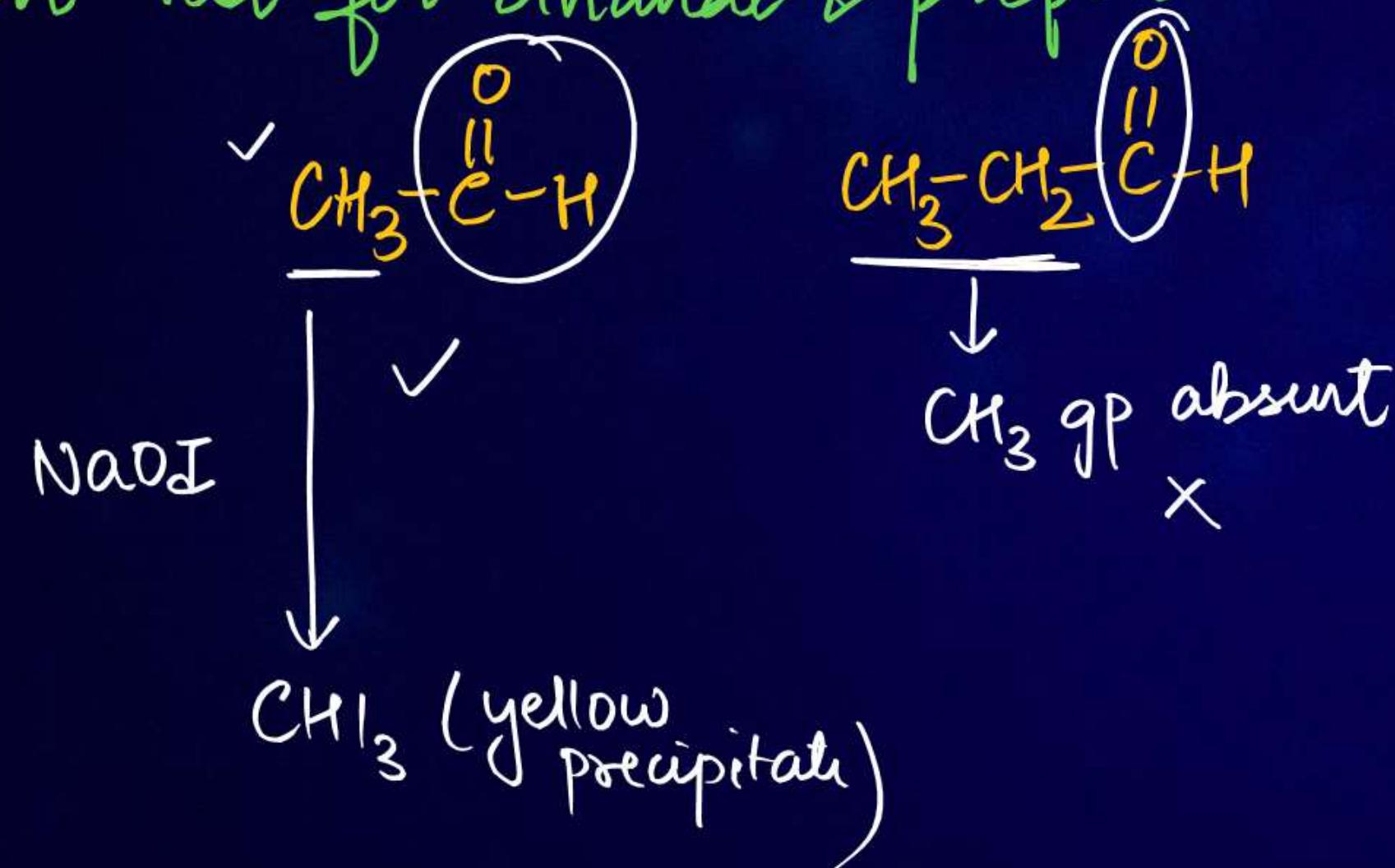
STAPF



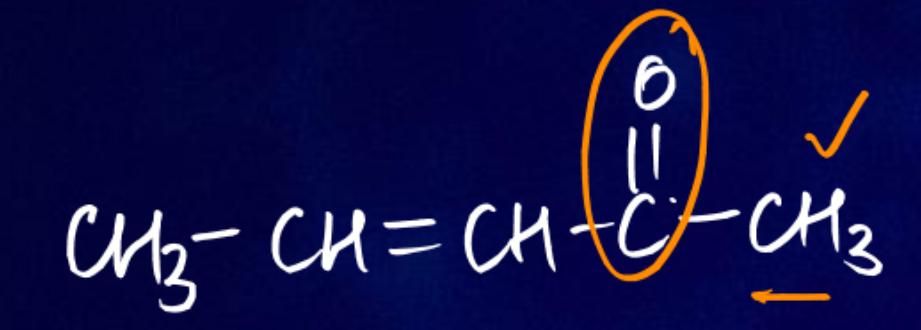
Q. Distinguish b/w Propanal & propanone.



Q. Distinction Test for Ethanal & propanal



Q. Distinction test for



iodoform Test ✓

✗



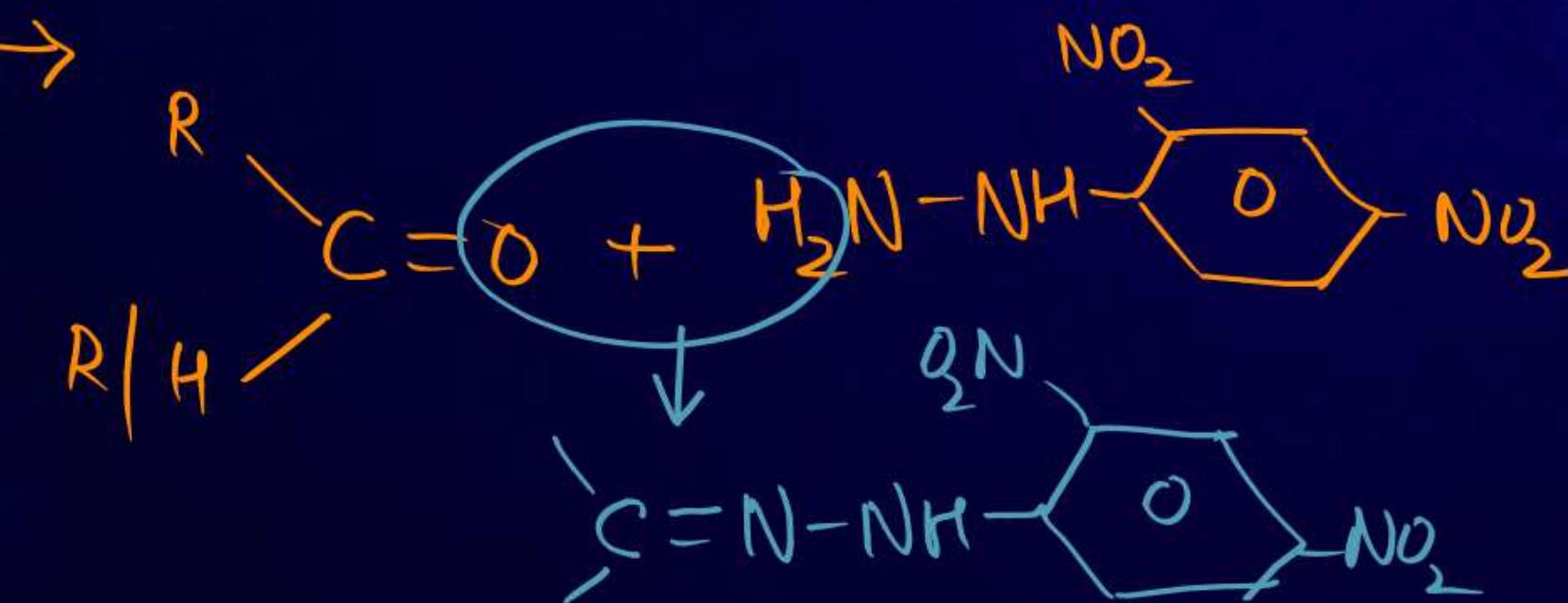
✗

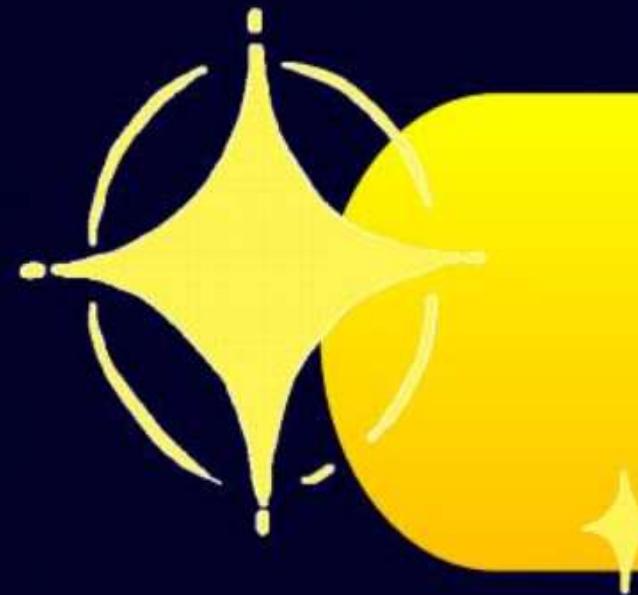
Tollen's test → Aldehydes only

Fehling sol → only aliphatic . aldehyde

2,4-DNP Test → carbonyl comp.

iodoform Test



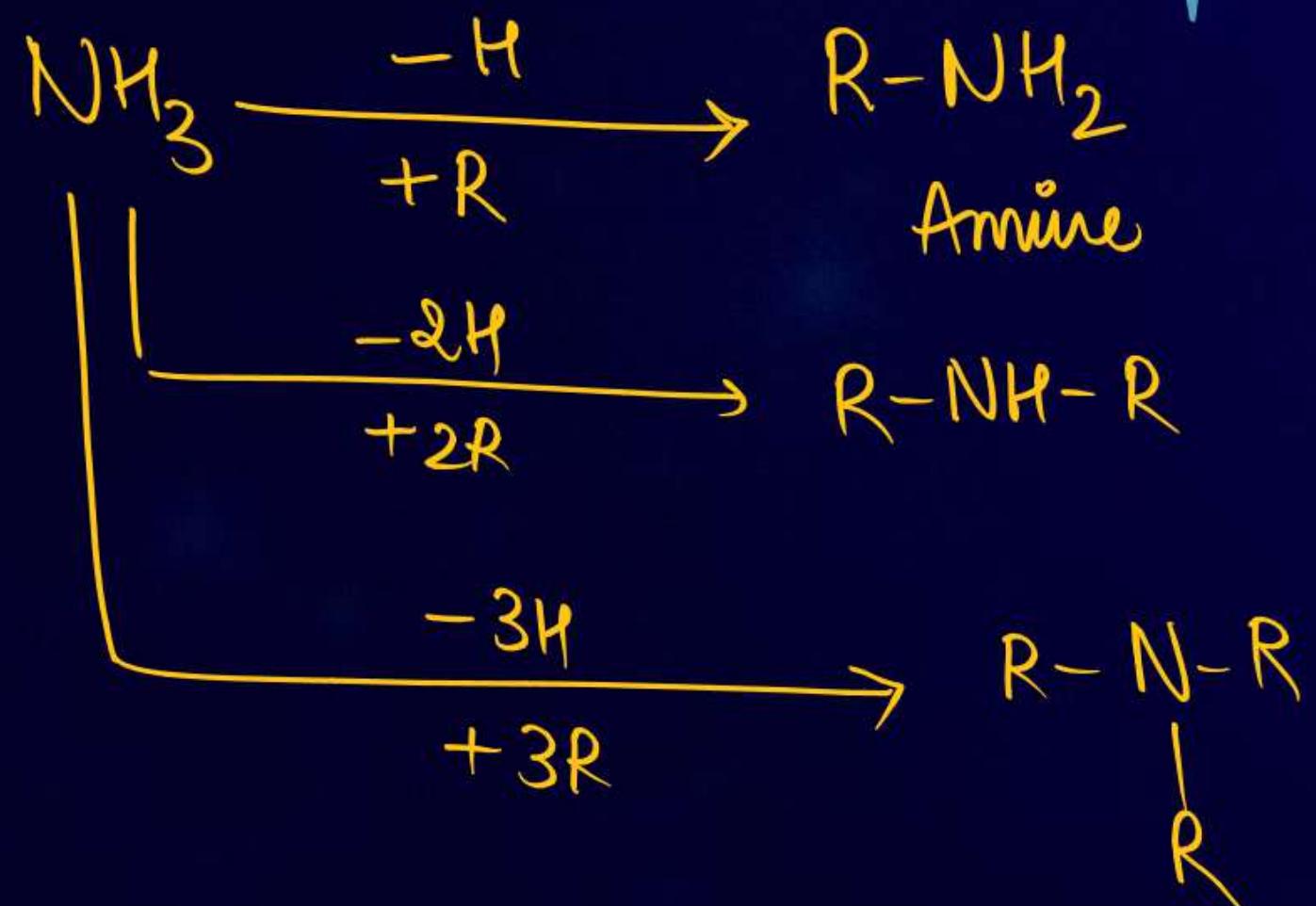


AMINES -INTRODUCTION

INTRODUCTION



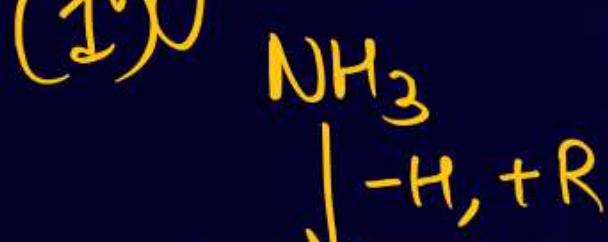
Amines are derivatives of Ammonia



CLASSIFICATION OF AMINES



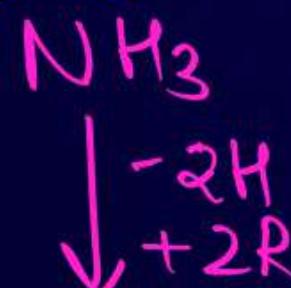
Primary Amine
(1°)



When one hydrogen atom is replaced by R group, 1° amine is formed. EX- $CH_3CH_2NH_2$, CH_3NH_2 ,



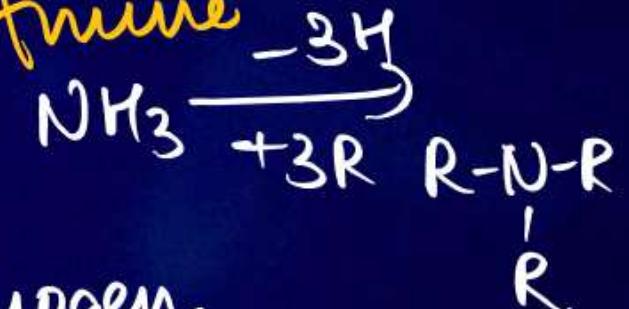
Secondary amine
(2°)



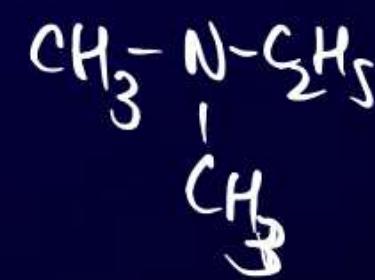
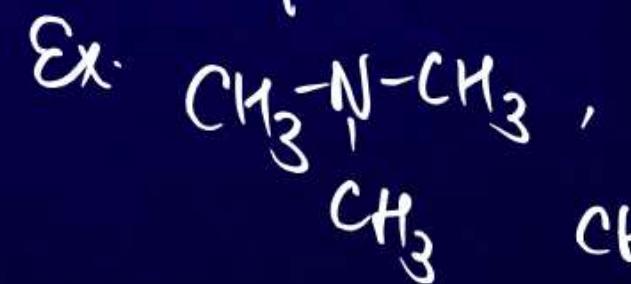
When two hydrogen atoms are replaced by 2 R gps 2° amine is formed.



Tertiary Amine
(3°)



When three hydrogen atom are replaced by 3 R gps. 3° amine is formed.



NOMENCLATURE OF AMINES



1° amine



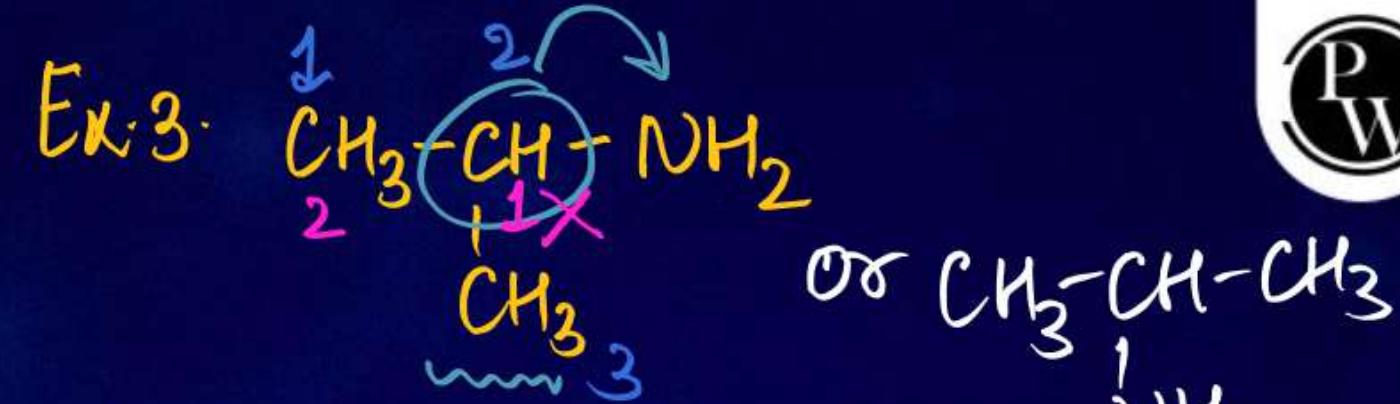
C/N \rightarrow alkylamine

IUPAC \Rightarrow alk + ane + amine
 $\quad \quad \quad$ alk -
alkanamine



C/N \rightarrow ethylamine

IUPAC \rightarrow ethanamine



C/N \rightarrow isopropylamine

IUPAC \rightarrow prop + ane / + 2-amine

propan-2-amine

\rightarrow methylamine

\rightarrow methanamine

$\begin{array}{ccc} 3 & 2 & 1 \\ \text{CH}_3 & \text{CH}_2 & \text{CH}_2 \end{array}$

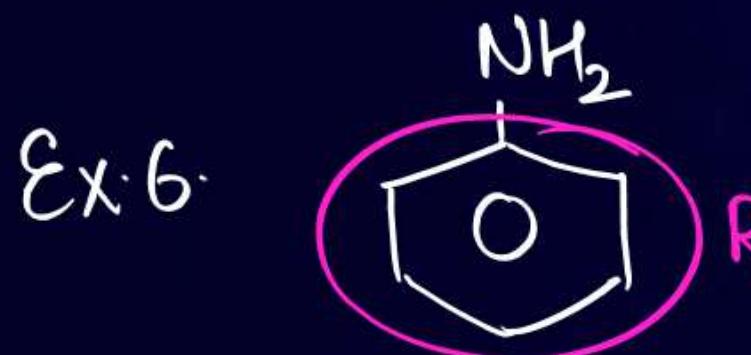
C/N \rightarrow n-propylamine

IUPAC \rightarrow propan-1-amine



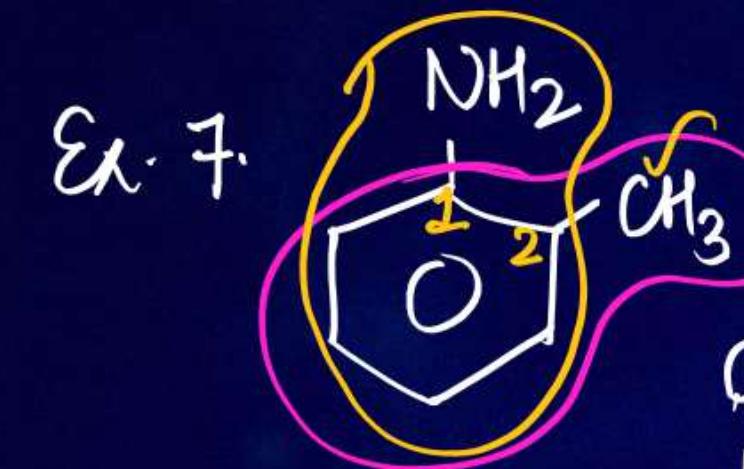
C|N → vinylamine

IUPAC → eth-1-ene/1-amine
eth-1-en-1-amine



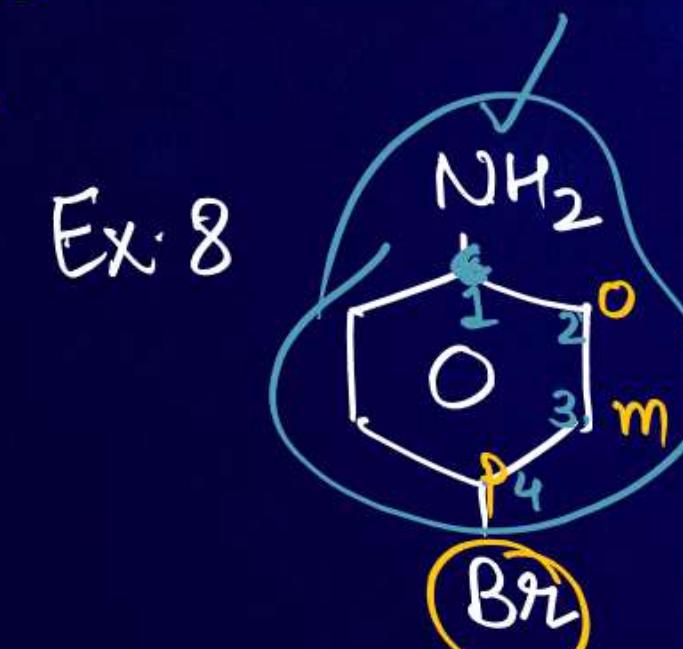
C|N → aniline

IUPAC → aniline or benzylamine
benzenamine



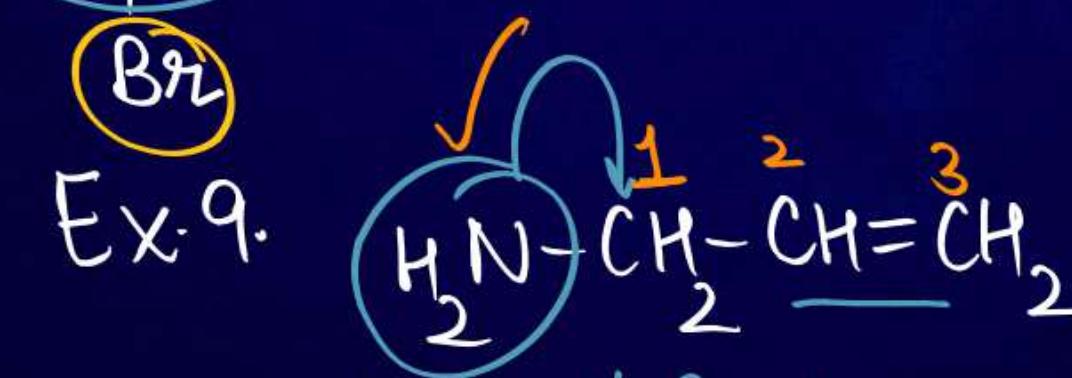
C|N → o-toluidine

IUPAC → 2-methylaniline



C|N → p-bromoaniline

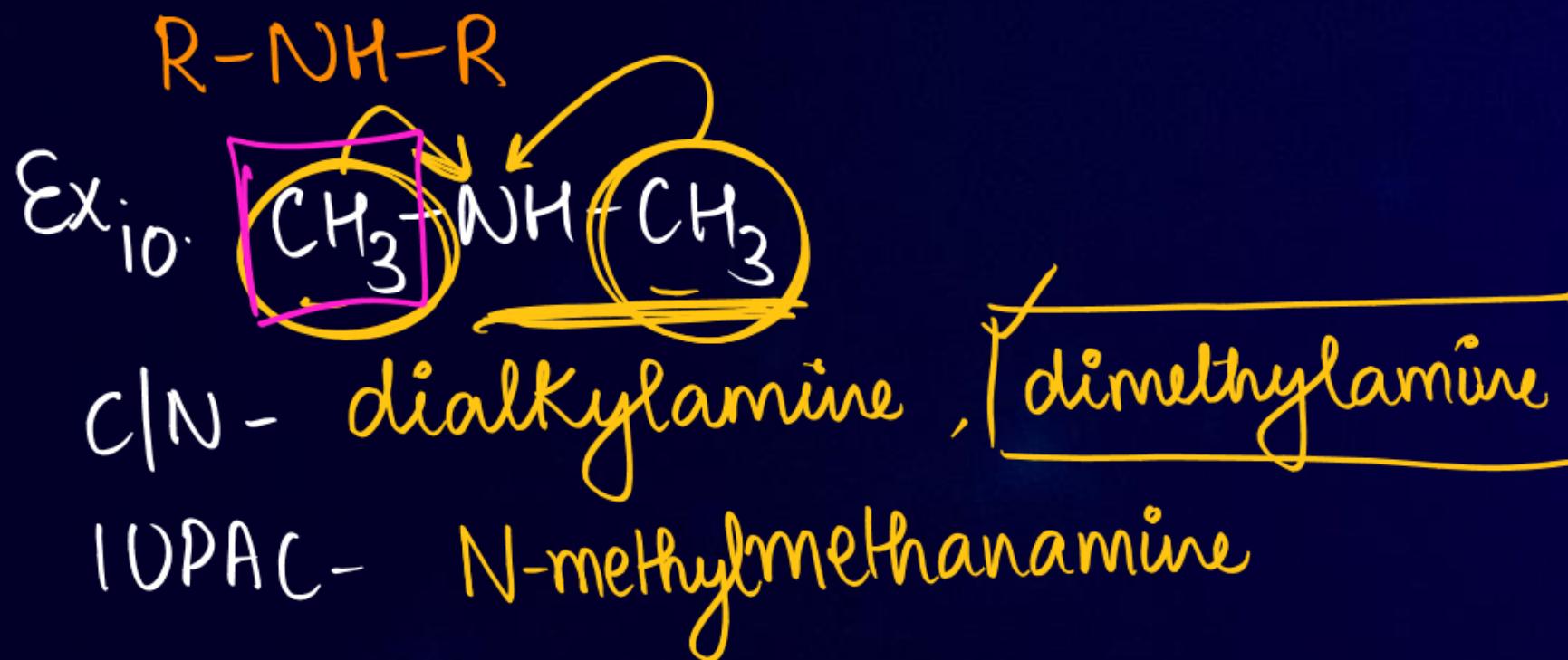
IUPAC → 4-bromoaniline



C|N - allylamine

IUPAC - prop-2-en-1-amine

$R-NH-R$
 \rightarrow diamine (Secondary)

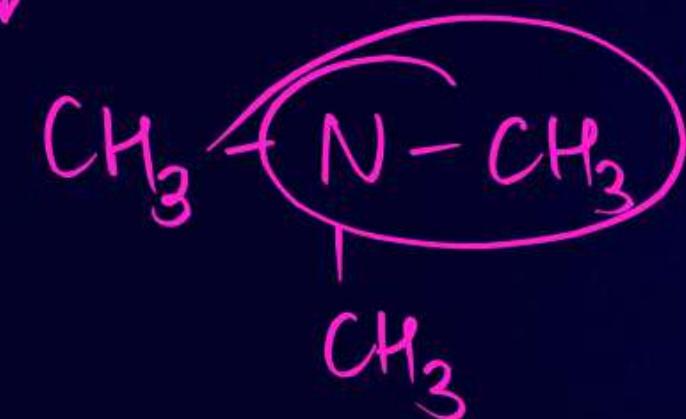


$R-NH-R'$

C/N - alphabetical
 IUPAC \rightarrow prefix (Class C) word Root
 More C

Ex. II. $\overset{m}{CH_3}-NH-\overset{e}{C_2H_5}$
 C/N \rightarrow ethylmethylamine
 IUPAC \rightarrow N-methylethanamine

3° amine



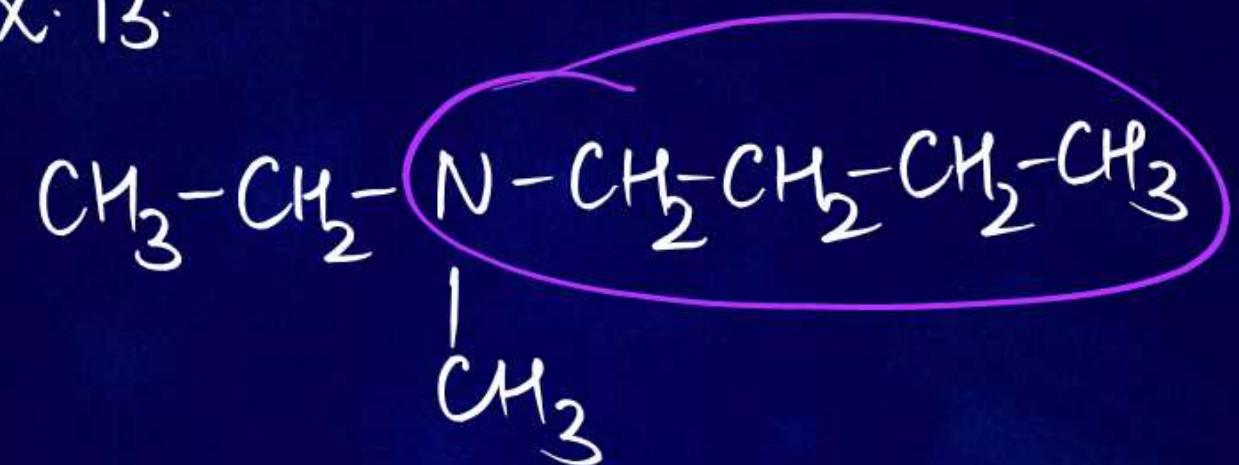
Ex 12:

C|N → trialkylamine

trimethylamine

IUPAC → N,N-dimethylmethanamine

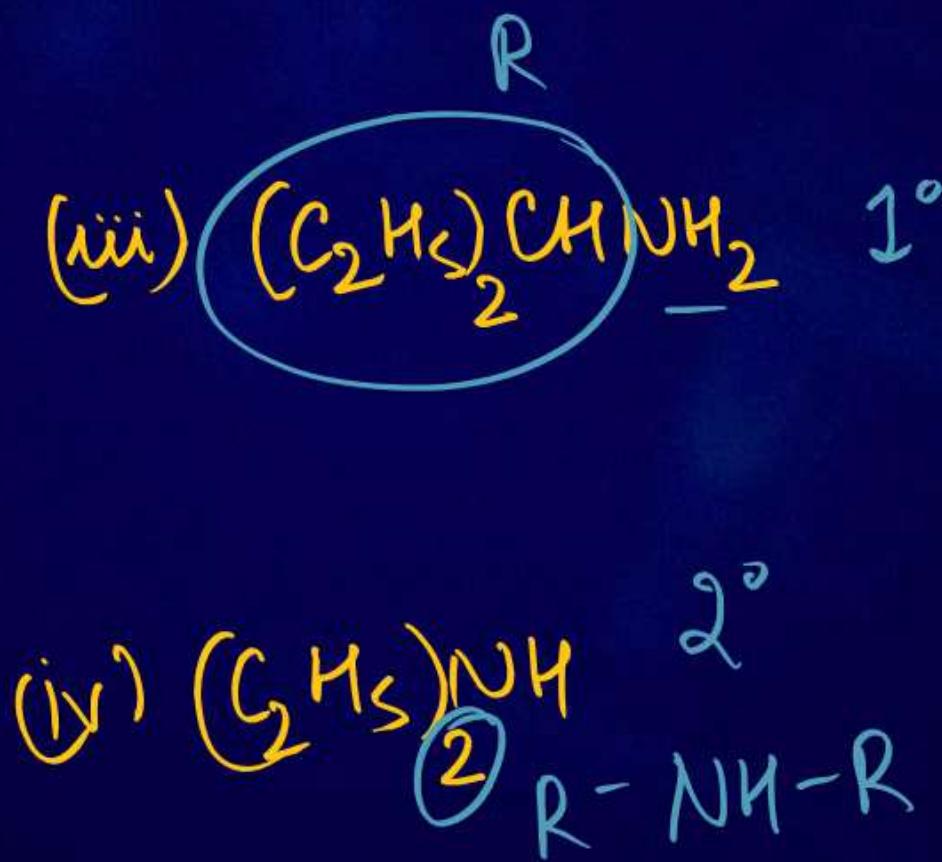
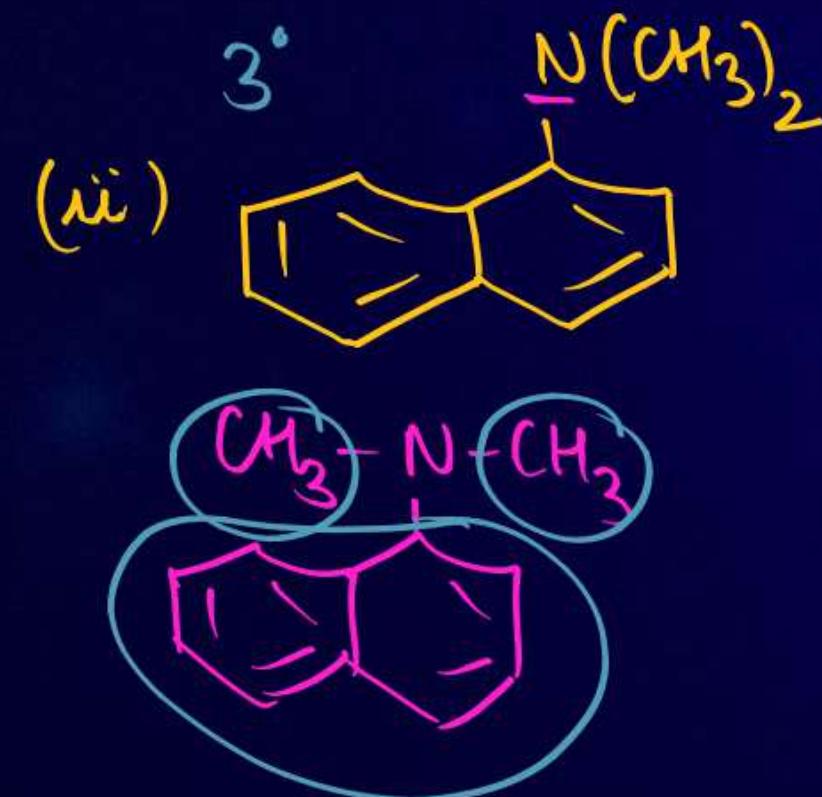
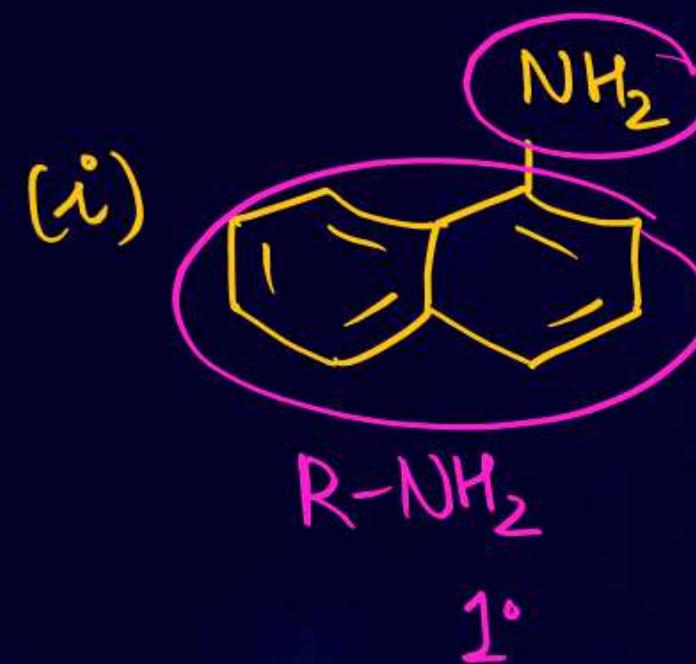
Ex. 13.



HW ✓

Intext
Que.

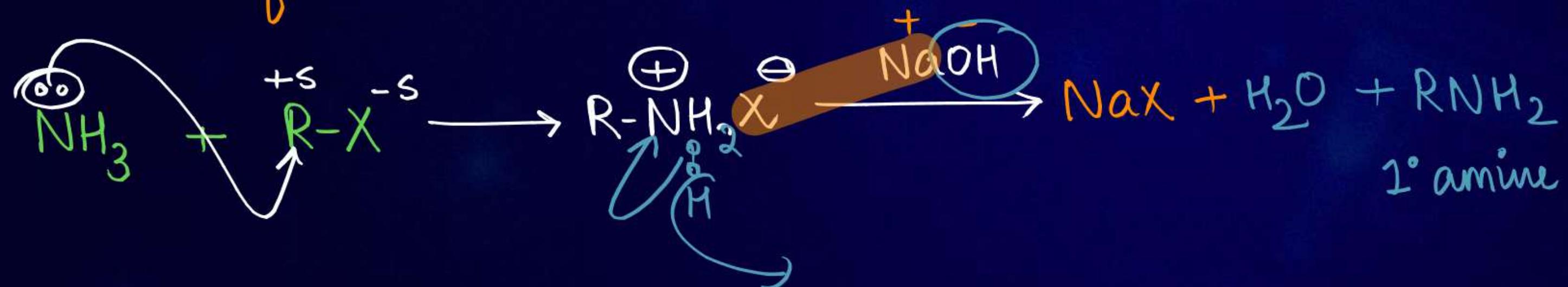
Q. 1° , 2° , 3° Identify

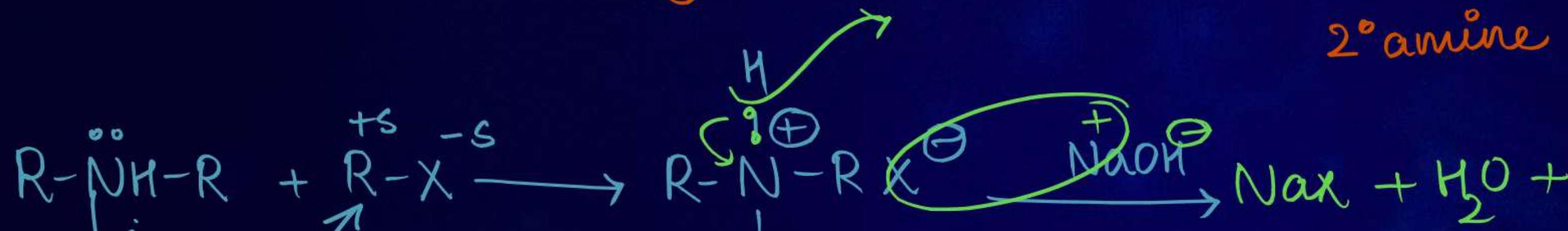
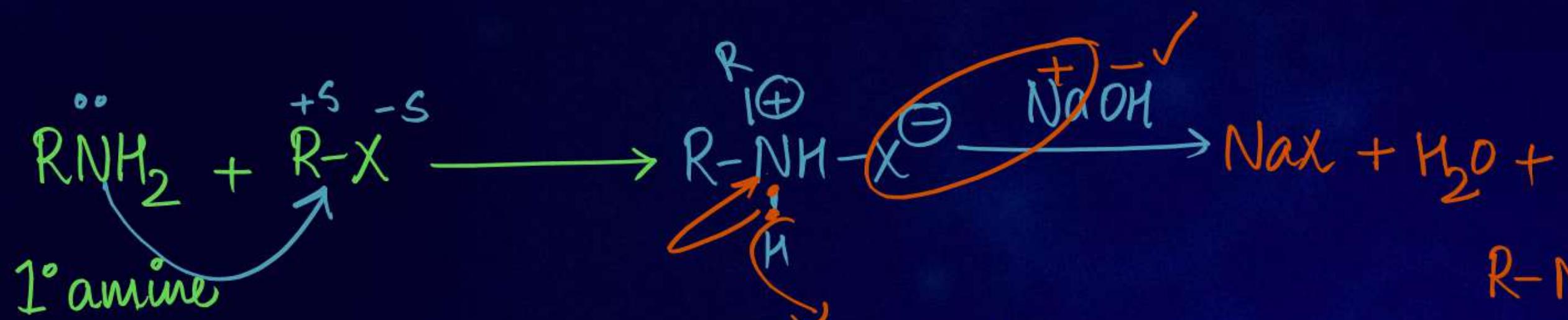


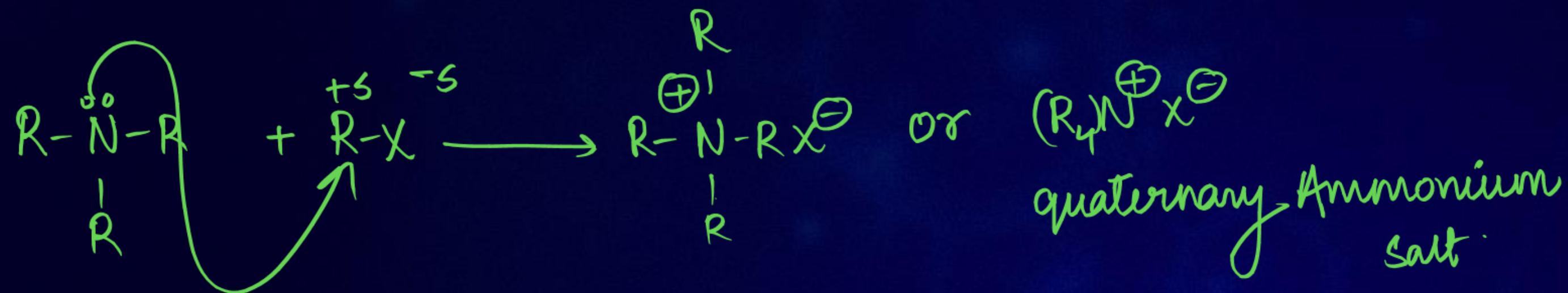
MOP OF AMINES

1) Ammonolysis of alkyl halide (Rx)

addition of ammonia or its derivatives

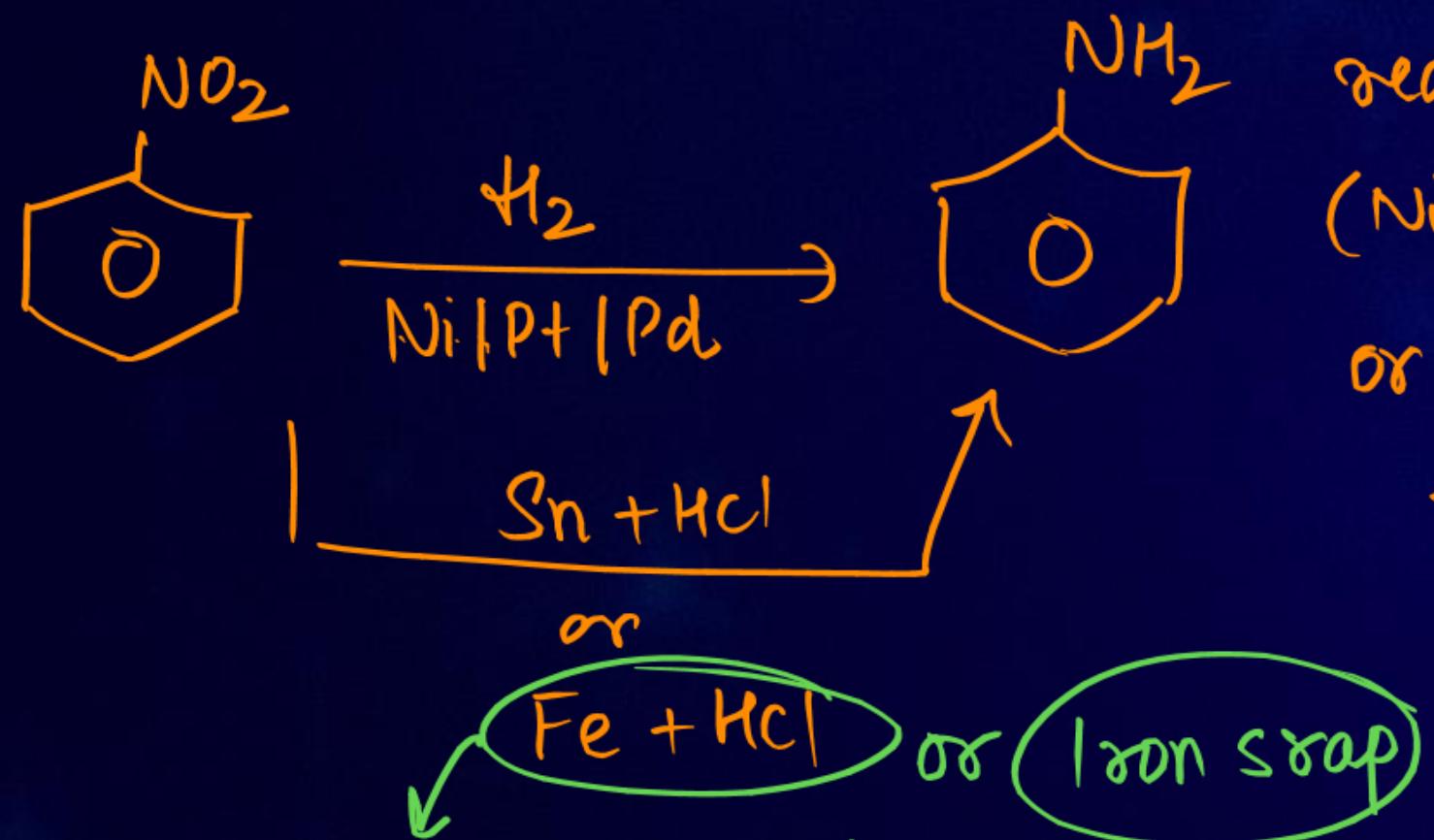






The Disadvantage of Ammonolysis Rx is that a Mixture of amines is produced ie. primary, secondary, tertiary, quaternary ammonium salt. It is an example of Nucleophilic substitution Rx.

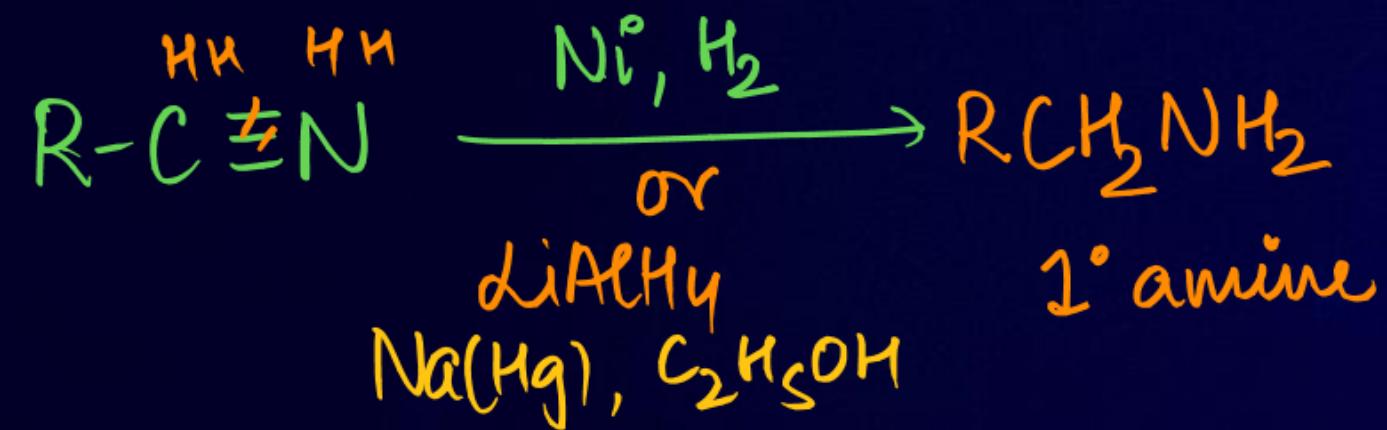
2) Reduction of Nitro Compounds



Preferable Method
because FeCl_3 gets hydrolysed to give HCl

This is done when nitro compounds reacts in the presence of catalyst ($\text{Ni}, \text{Pt}, \text{Pd}$) and hydrogenation occurs or it can take place in the presence of metal with Acid, Amines are produced.

3) Reduction of Nitriles



Nitriles on Rx with catalyst (catalytic hydrogenation) or LiAlH_4 lithium aluminumhydride yield 1° amine.

4) Reduction of Amides



Anide

Same no of Carbon atoms are produced in product.



Boards ke Tricky Sawaal, Ab Simple with Sample Papers!

Cheat Sheets & One-Shot
Revision Videos

28 Sample Papers
with Explanations

Step-wise Marking
Scheme



CBSE PYQs 2025 & SQP 2025-26
with Marking Scheme

12 Handwritten Papers
via QR Code

Level-wise Difficulty
(Easy, Medium, Hard)



HOMEWORK

1. COMPLETE NOTES
2. CREATE FLOWCHART WITHOUT SEEING NOTEBOOK
3. REVISE NOTES
4. FINISH DHA 5



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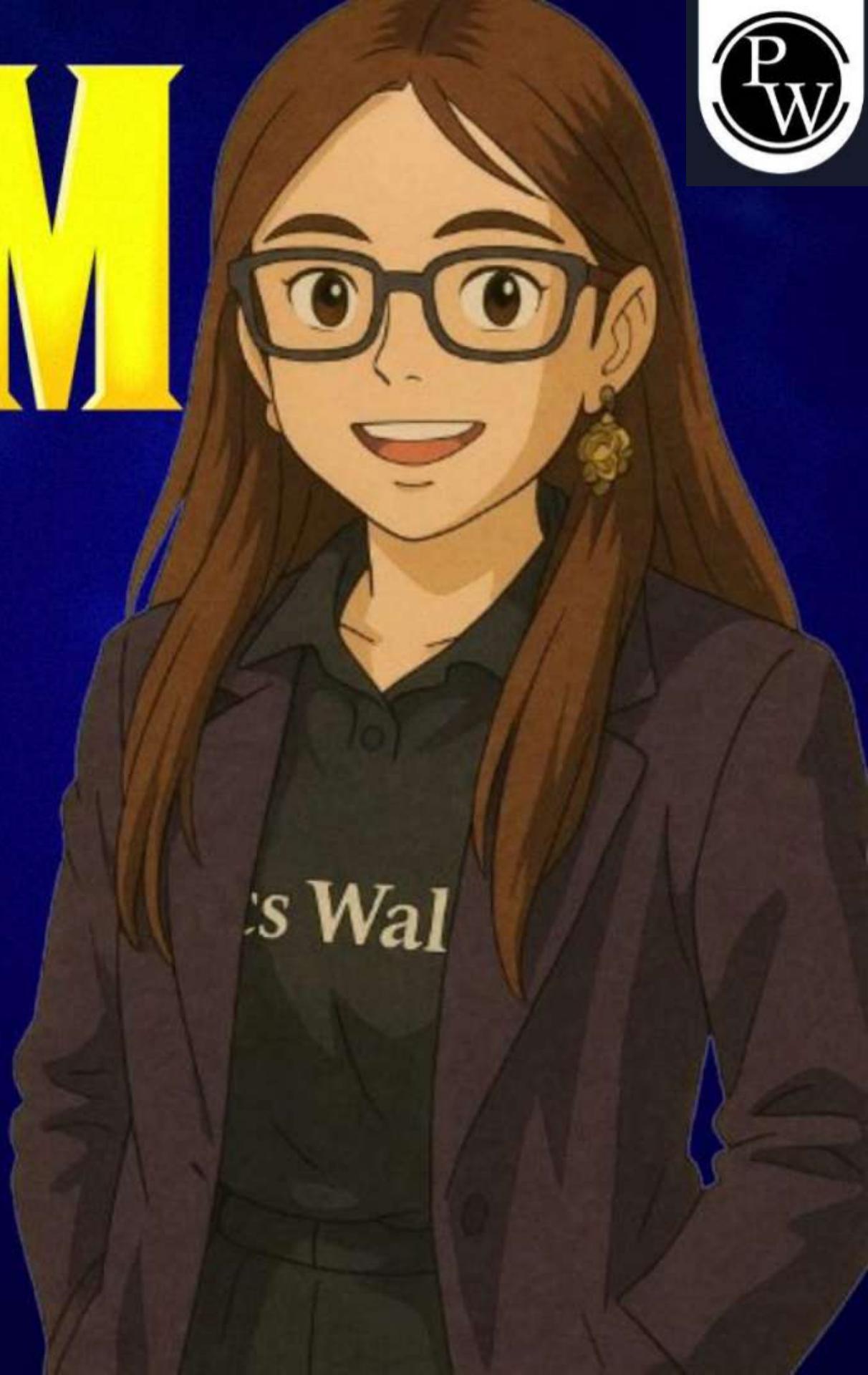
2026

AMINES

CHEMISTRY

LECTURE-2

BY - SHOURYA GROVER (SG) MA'AM





TOPICS TO BE COVERED

1. AMINES -MOP PART 2 ✓
2. PHYSICAL PROPERTIES ✓
3. CHEMICAL PROPERTIES ✓
4. NCERT READING





MY SHIMMERING STARS

#SHOURYA'S GALAXY

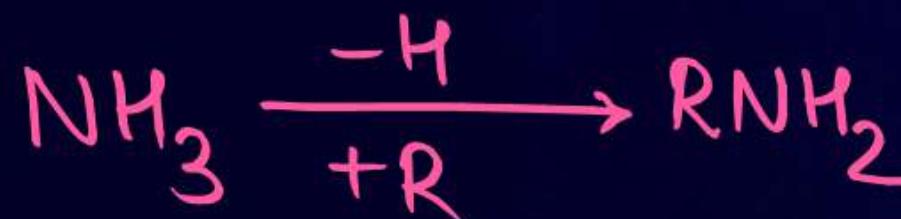
STAPFT



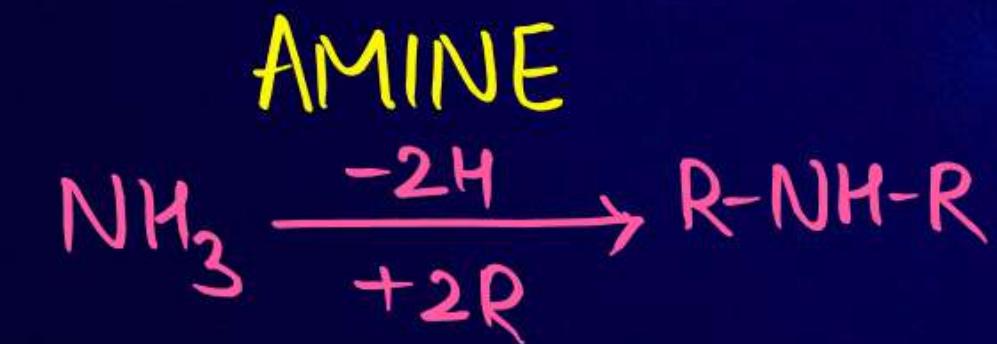
Classification



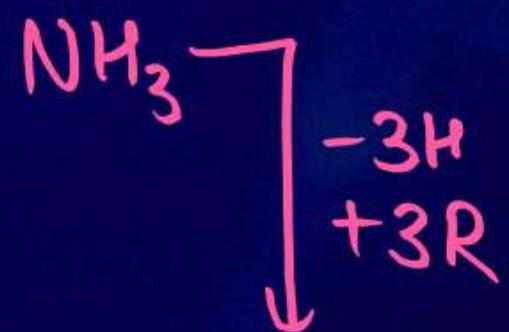
PRIMARY AMINE



SECONDARY AMINE



TERTIARY AMINE





MOP OF AMINES PART 2

METHOD OF PREPARATION



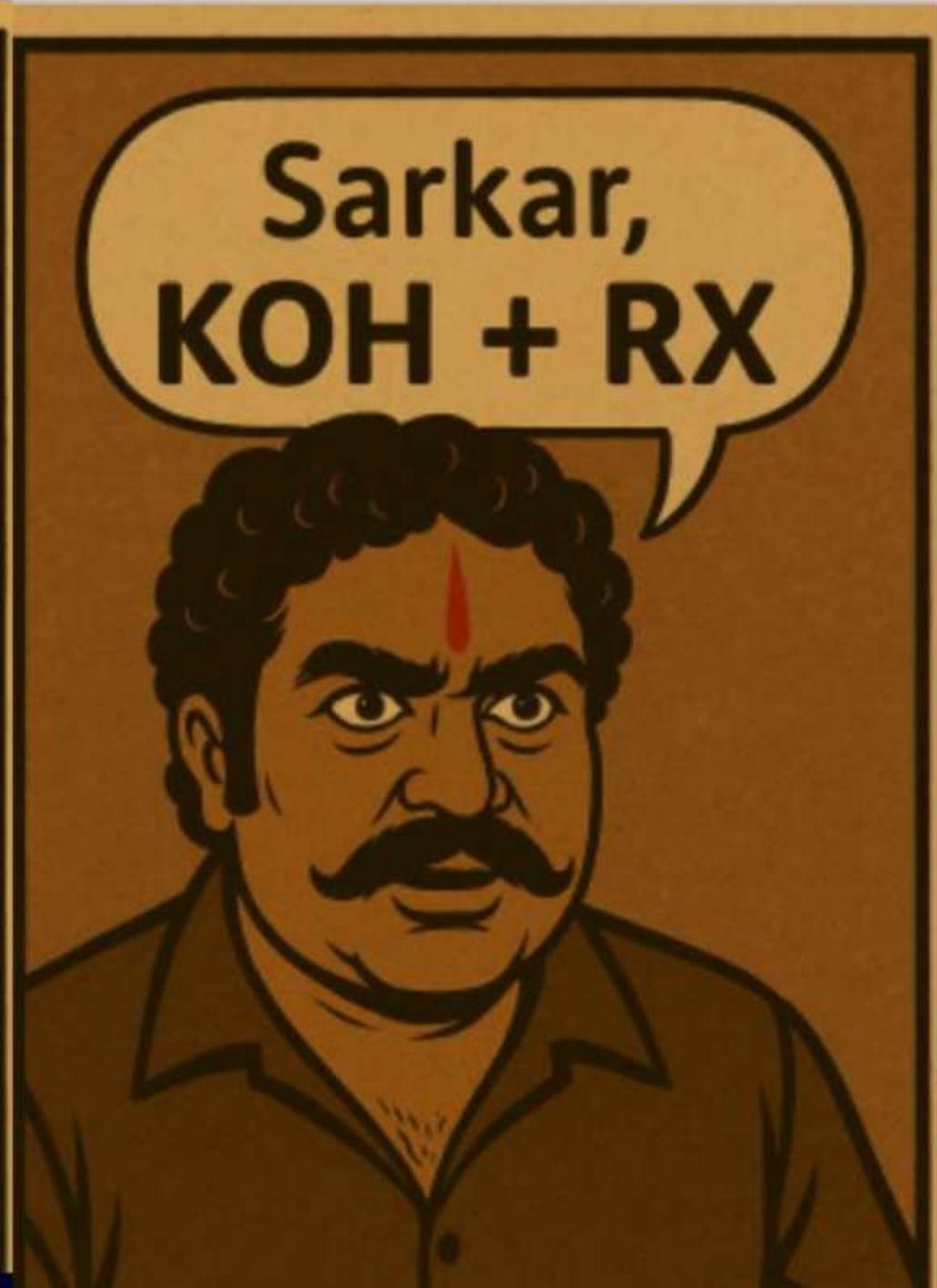
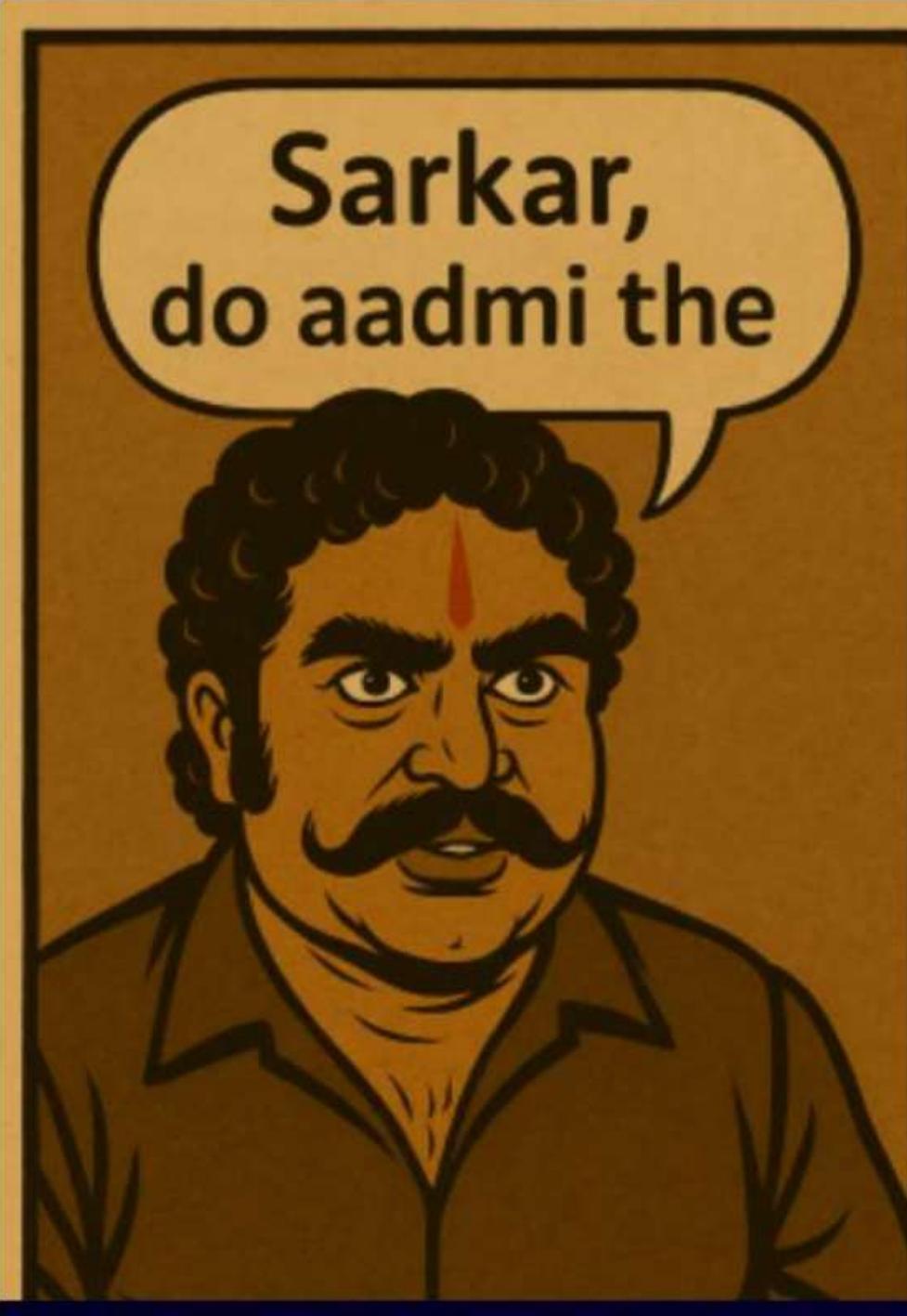
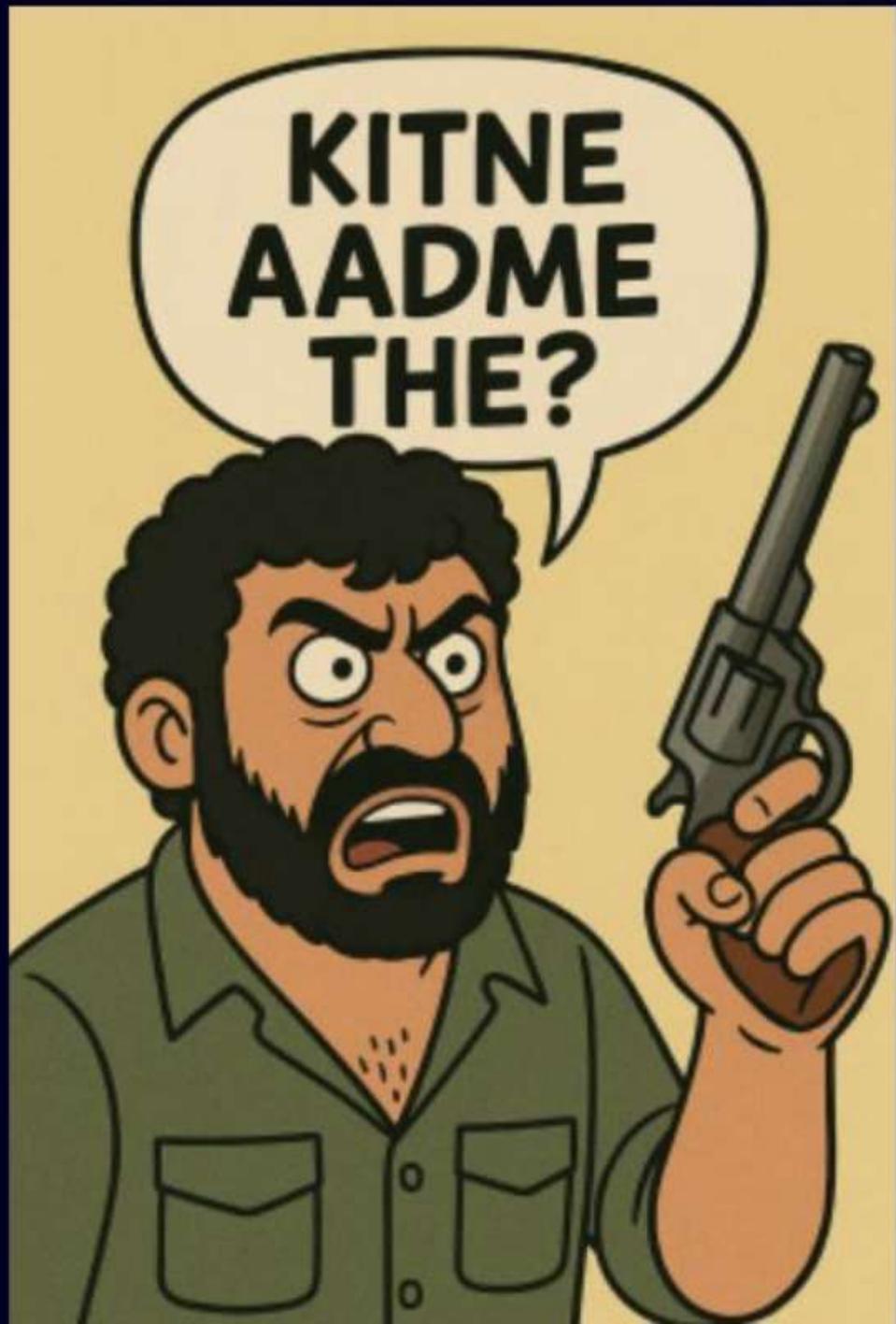
GABRIEL PHTHALIMIDE SYNTHESIS



METHOD OF PREPARATION



GABRIEL PHTHALIMIDE SYNTHESIS

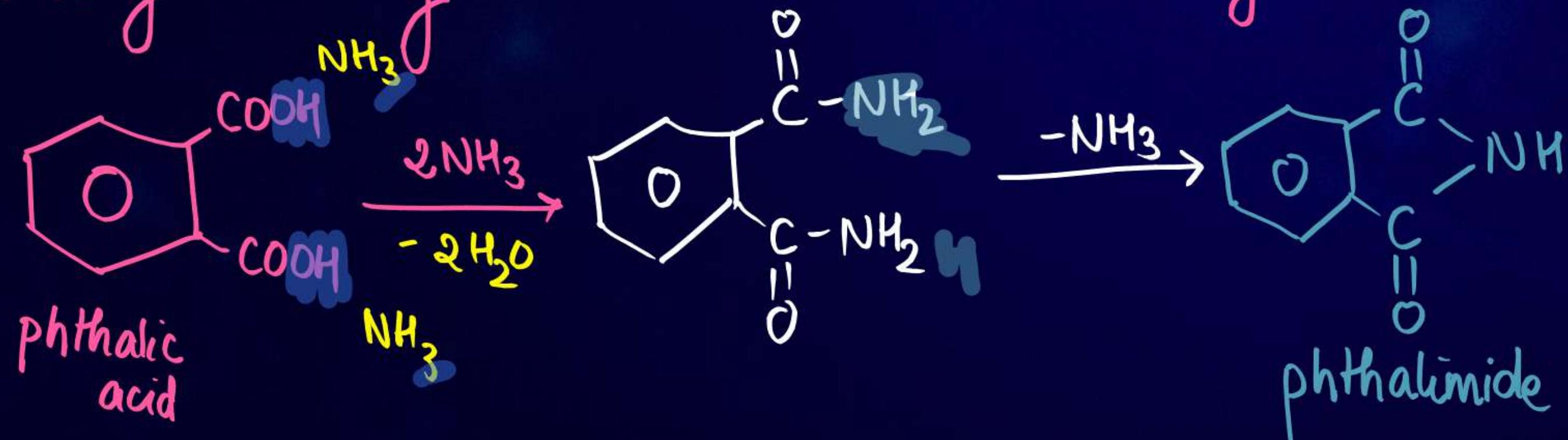


METHOD OF PREPARATION



GABRIEL PHTHALIMIDE SYNTHESIS

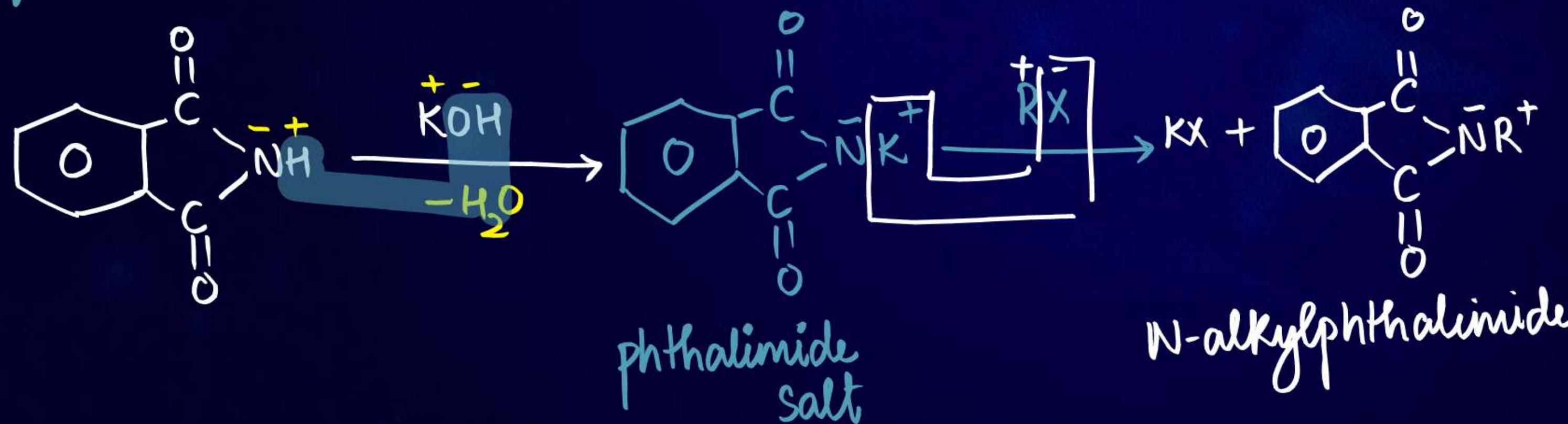
- It is used for the preparation of **1° aliphatic amine**.
- Aromatic 1° amines cannot be prepared by this Rx.
- Secondary & tertiary amines are also not obtained by this Rx.



Phthalimide on reaction with ethanolic potassium hydroxide

(KOH)

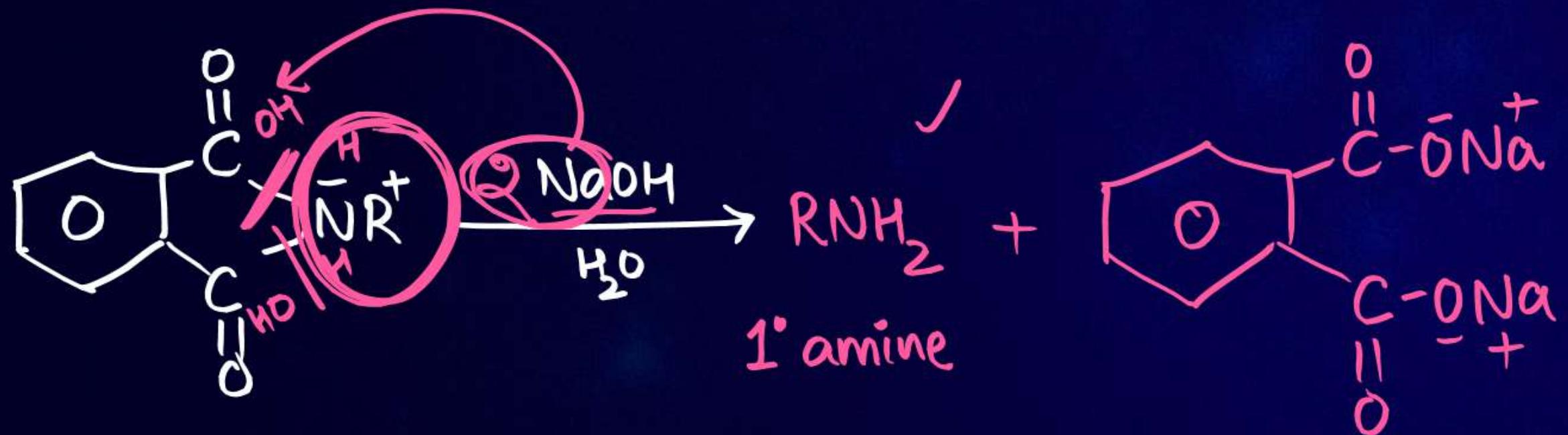
producing salt which on further Rx with RX will lead to formation
of RNH_2 (1° amine).



METHOD OF PREPARATION



GABRIEL PHTHALIMIDE SYNTHESIS



METHOD OF PREPARATION



HOFFMANN BROMAMIDE DEGRADATION REACTION



Amide



1° amine +
 NaBr
 $+ \text{H}_2\text{O}$

→ 1 carbon less product is obtained.



PHYSICAL PROPERTIES



Lower aliphatic amines are gases.

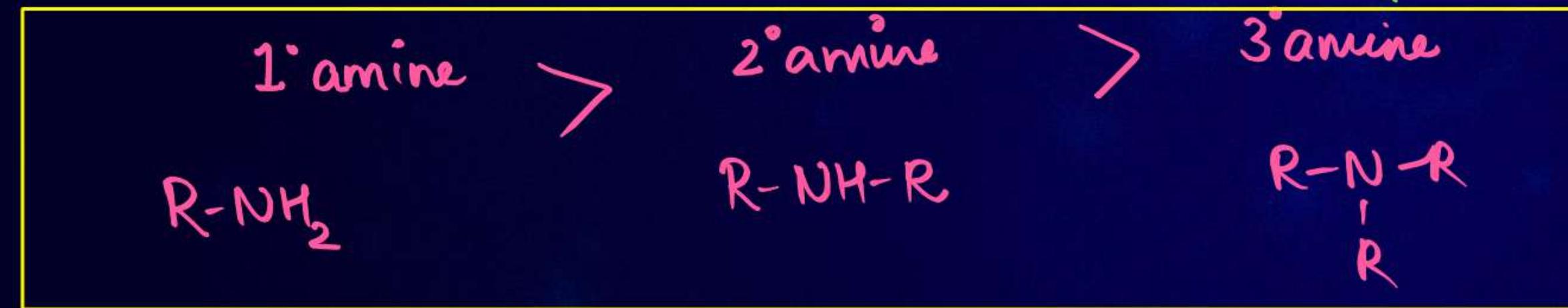
Compounds (amines) with three or more than 3 are liquid.

More Carbon containing compounds (Higher) are solid.

- * Aromatic amines are colourless but on storage they develop colour due to atmospheric oxidation



BOILING POINT



ORDER BASED

They form H-bond.

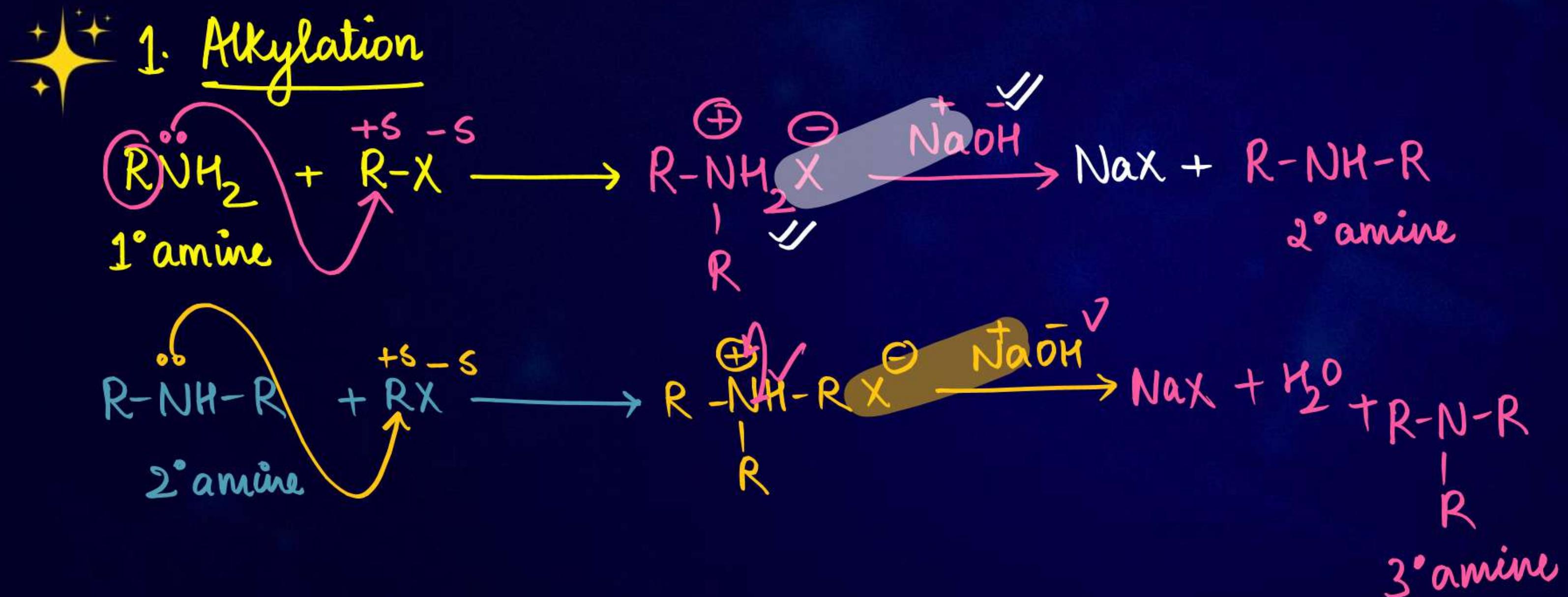


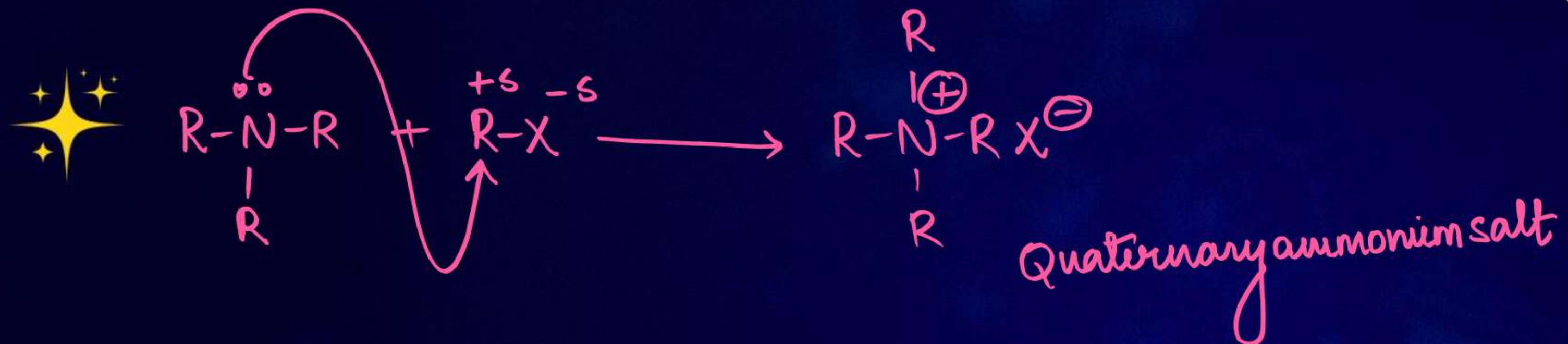
Solubility

lower Molecules (amines) are soluble in water forming H-bond.
But on increasing the number of carbon atoms, solubility will decrease because, more the no of carbon atom, more is the hydrophobic part. Hence solubility decreases.

H₂O H₂O

CHEMICAL PROPERTIES

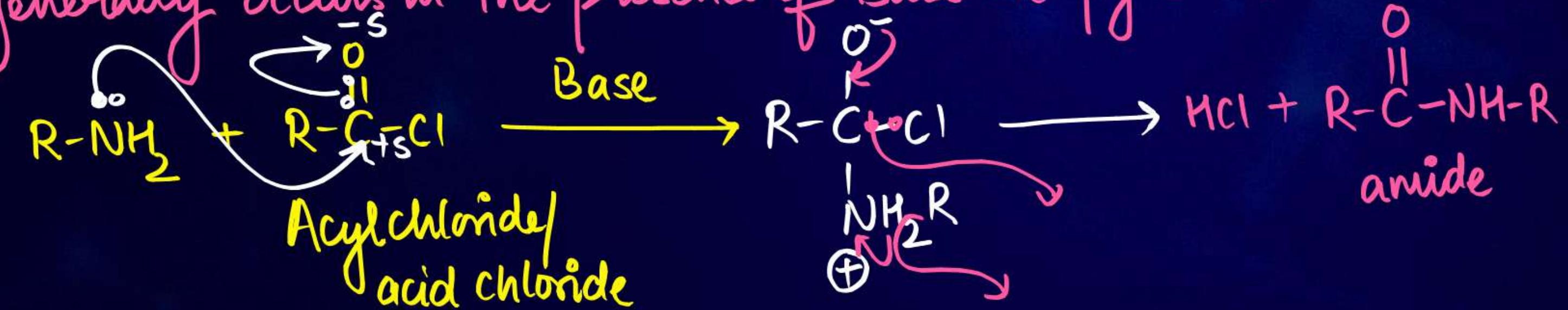


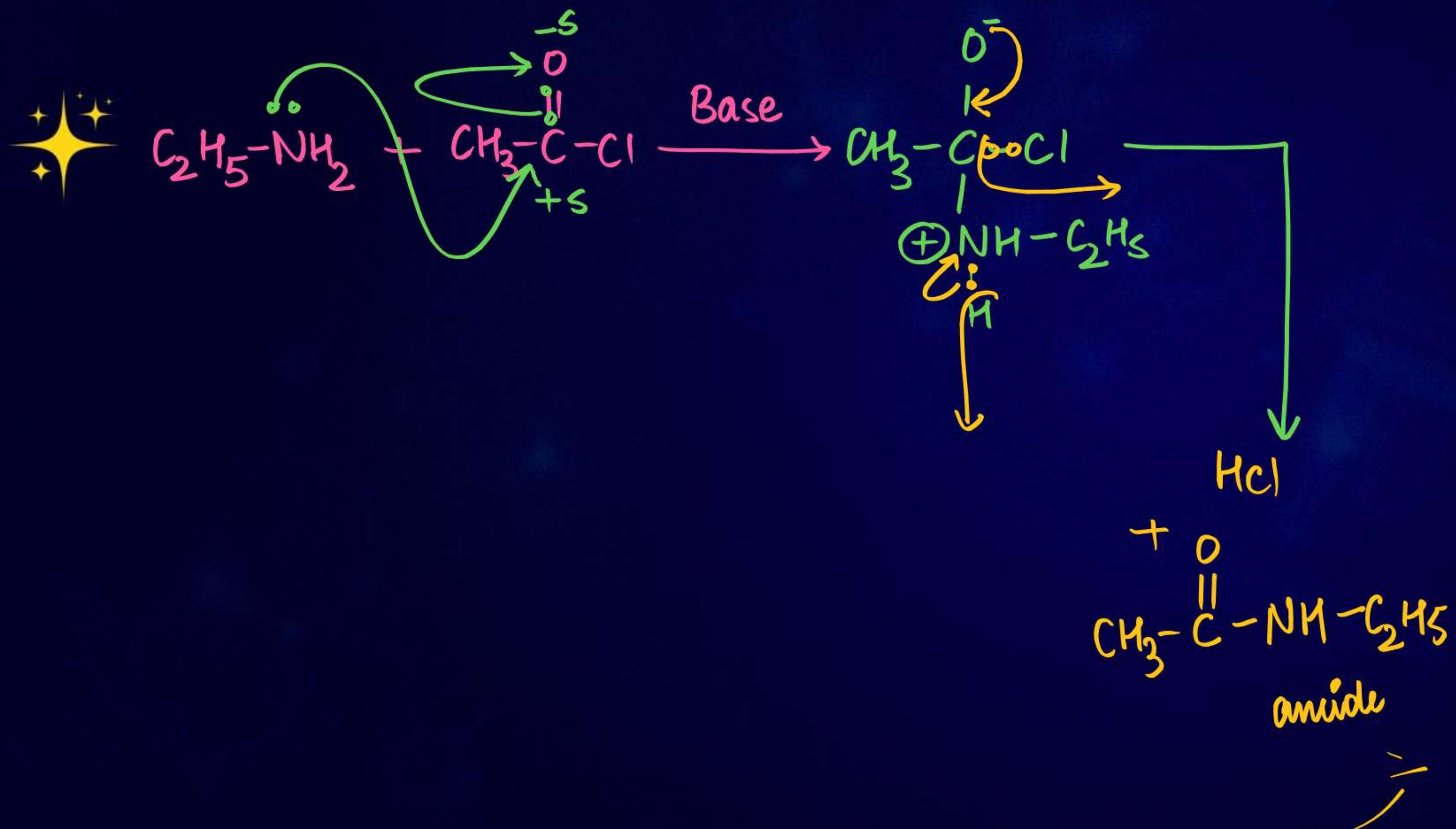




2. Acylation

Amines React with Acyl chloride | Ester | anhydride to yield amides.
It generally occurs in the presence of Base ex. pyridine.







Homework



2) Flowchart of MOP



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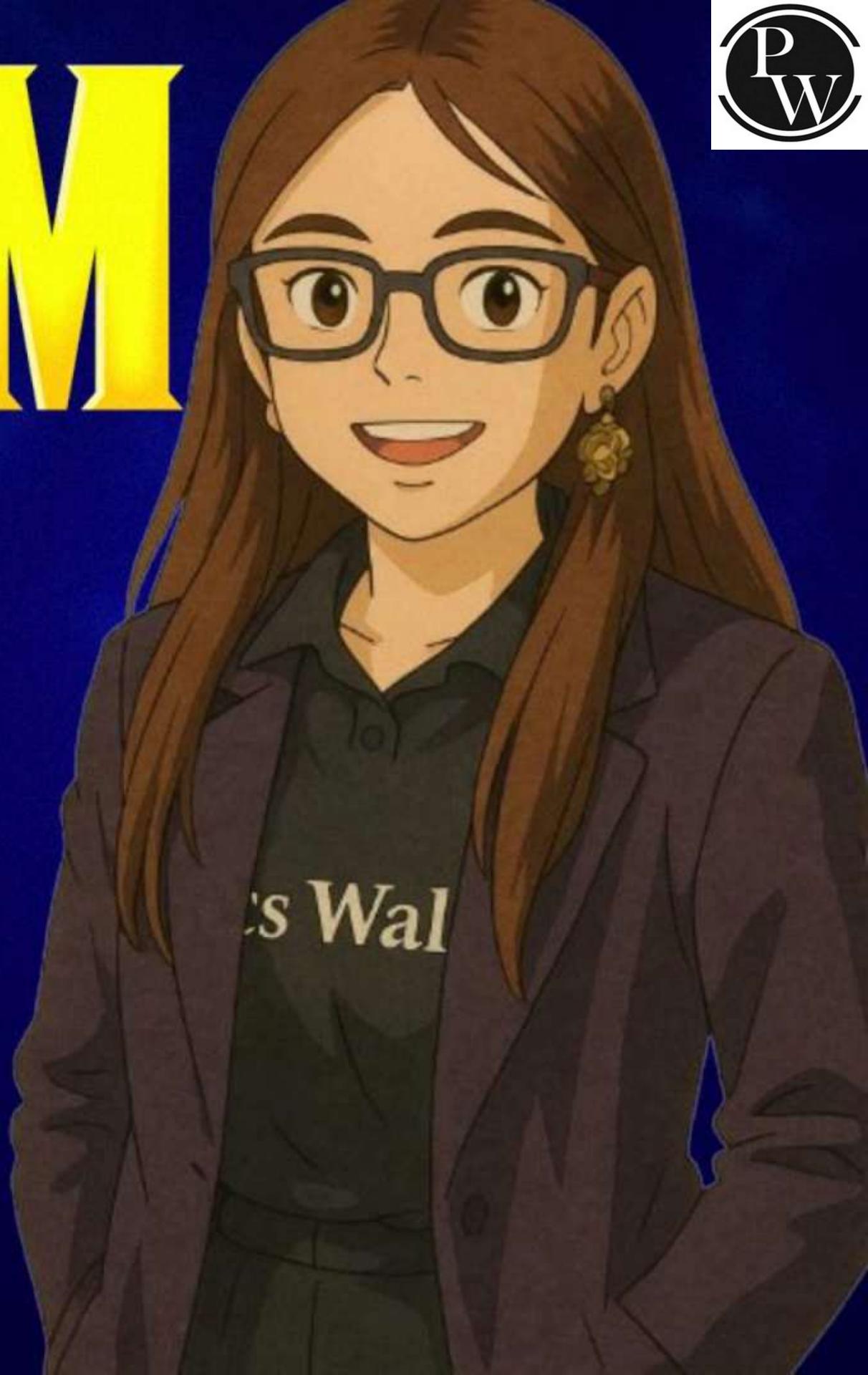
2026

AMINES

CHEMISTRY

LECTURE-3

BY - SHOURYA GROVER (SG) MA'AM





TOPICS TO BE COVERED

1. AMINES -CHEMICAL PROPERTIES ✓
2. DIAZONIUM SALT
3. NCERT READING
4. QUESTIONS





MY SHIMMERING STARS

#SHOURYA'S GALAXY

STAPF

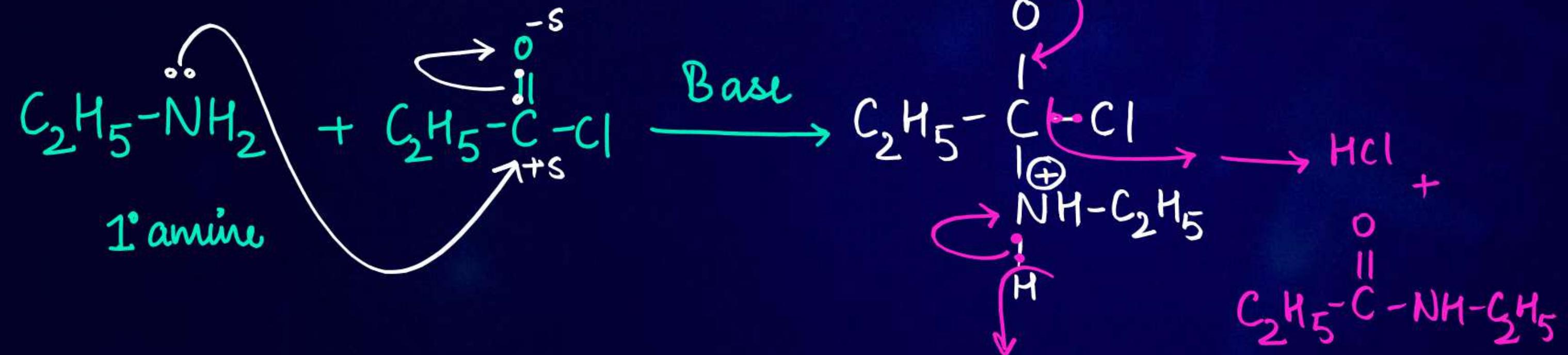




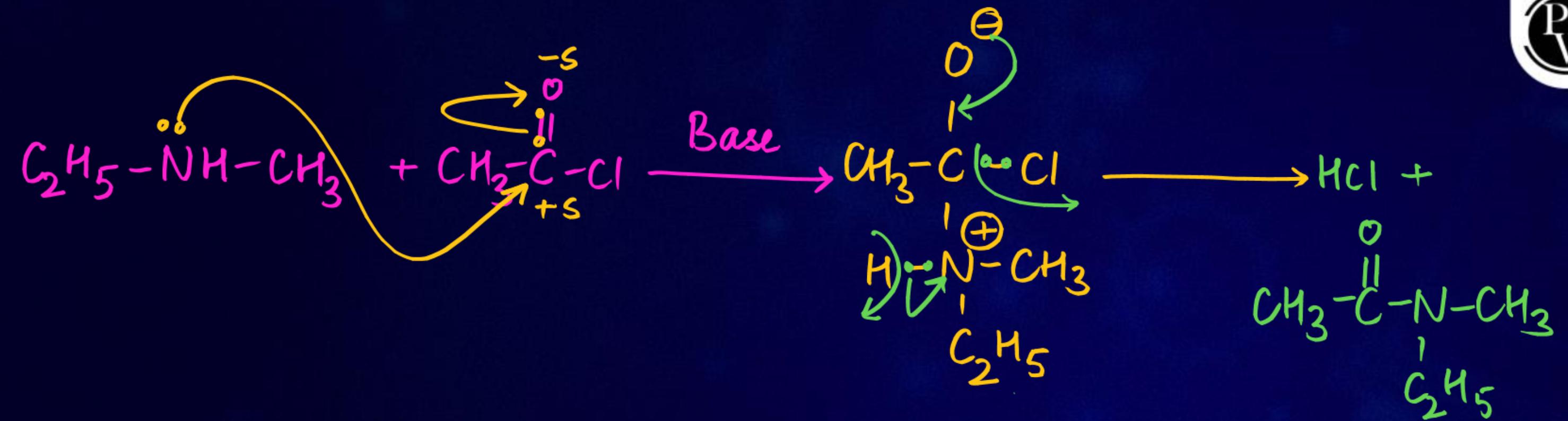
AMINES - CHEMICAL PROPERTIES

CHEMICAL PROPERTIES

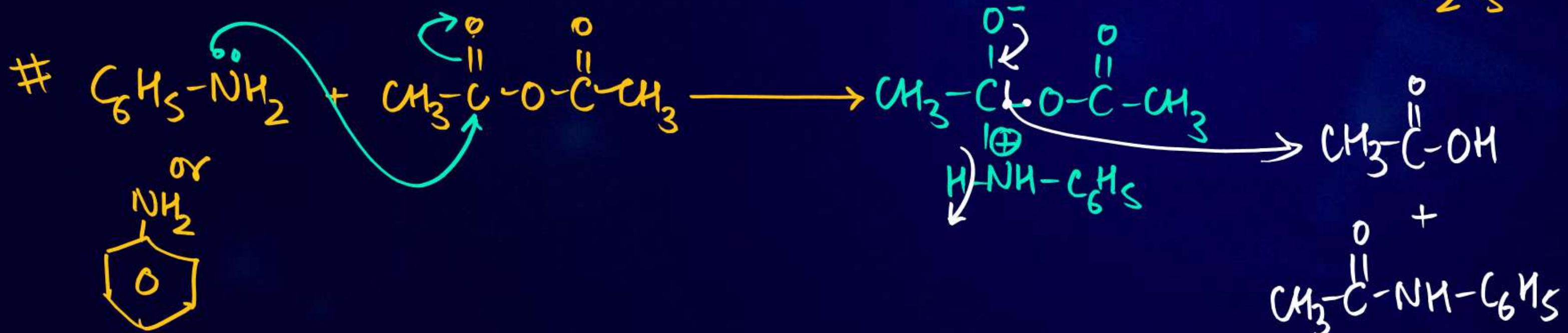
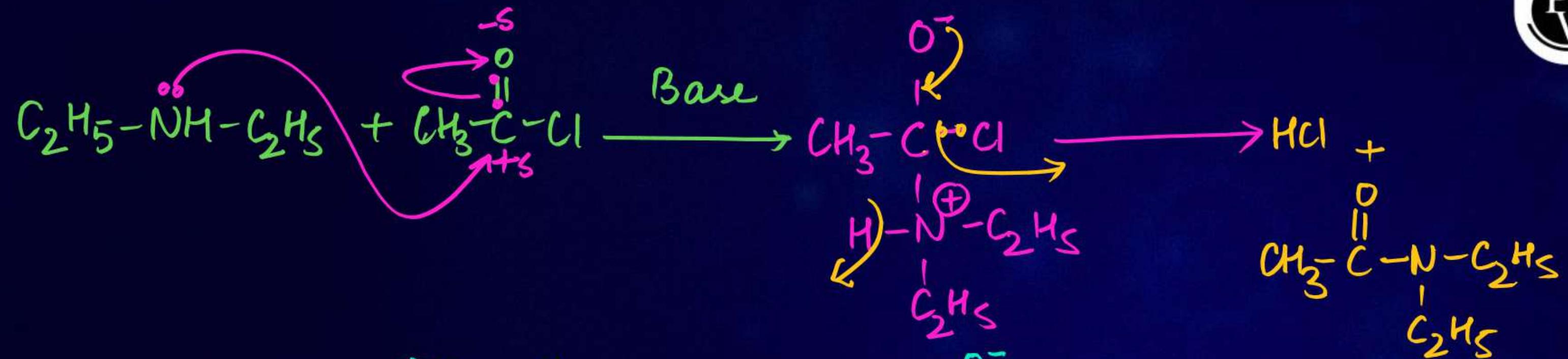
ACYLATION



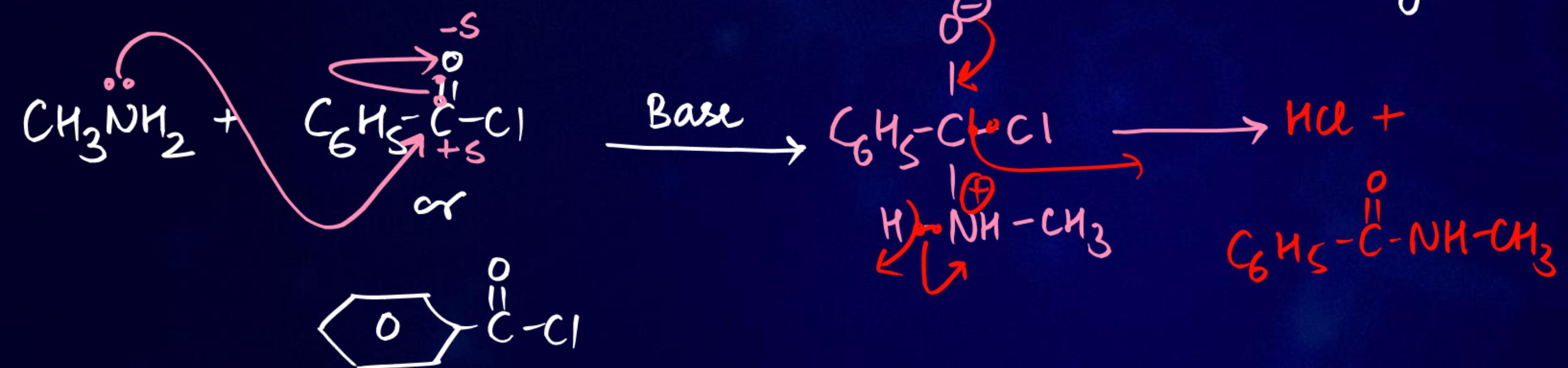
HW:



xx



Amines also React with C_6H_5COCl , this process is called Benzoylation



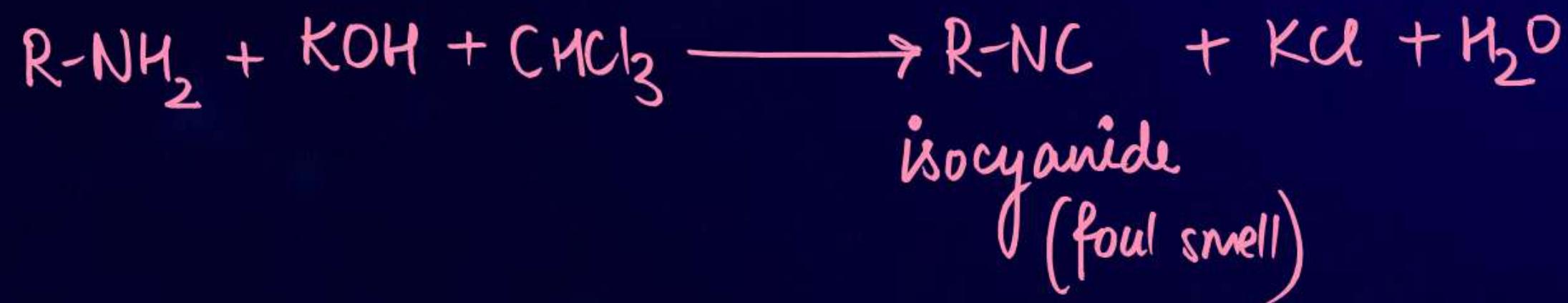
Benzoyl chloride

CARBYLAMINE RX | ISOCYANIDE TEST

1° amines undergoes this Rx.

It is a distinction test for 1° amines.

In this test foul smell producing product is obtained ie. isocyanide.



RX WITH NITROUS ACID



diazonium
salt
(unstable)

1° aliphatic amine Reacts with nitrous acid ($\text{NaNO}_2 + \text{HCl}$) forming an unstable product called diazonium salt which on further hydrolysis produces nitrogen gas, ROH & HCl resp

Aromatic Amine



Benzene
diazonium
salt

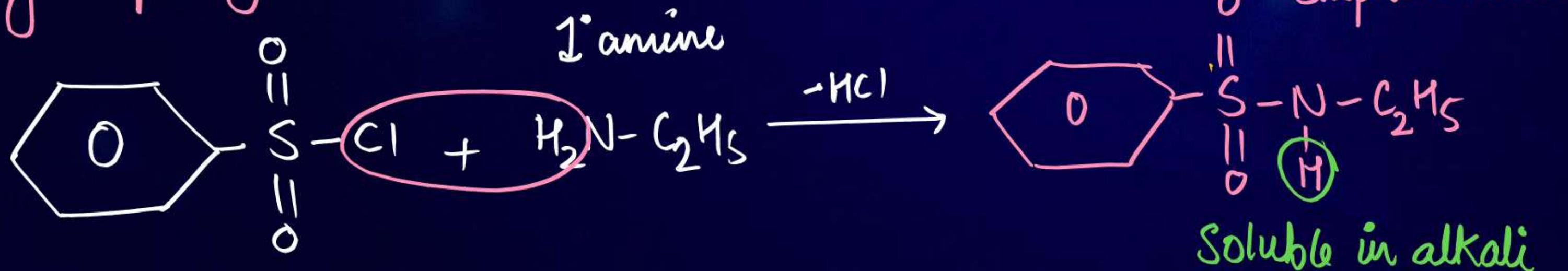
RX WITH ARYLSULPHONYL CHLORIDE

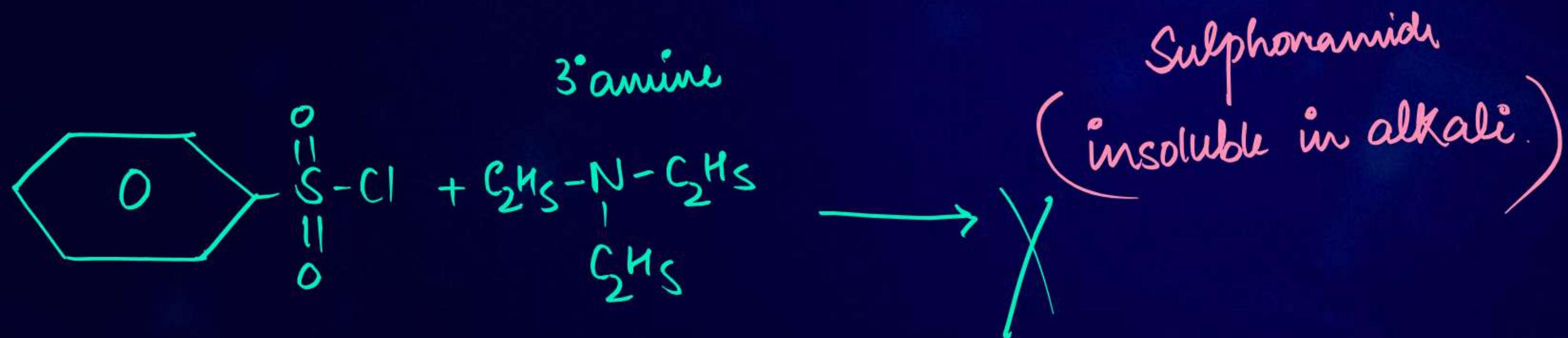
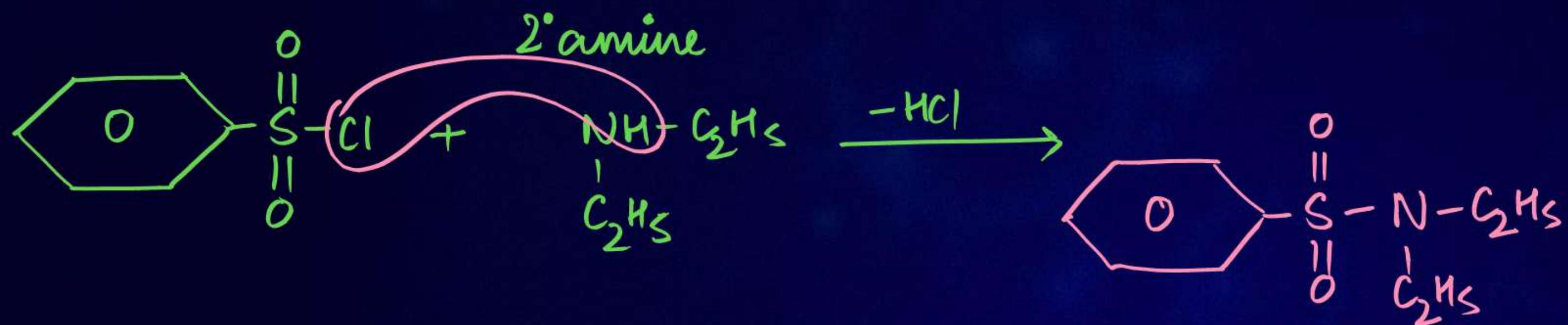
~~Repeted out~~

This Rx is used as distinction test for 1°, 2° & 3° amines.

It is also called 'Hinsberg Test'.

In this Rx, Hinsberg Reagent is used ($C_6H_5SO_2Cl$) also called arylsulphonylchloride.

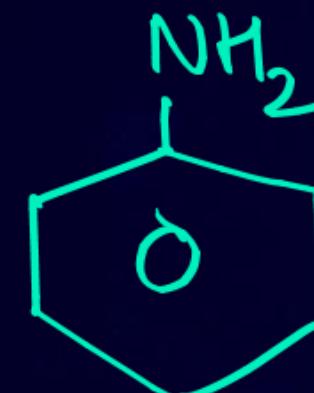




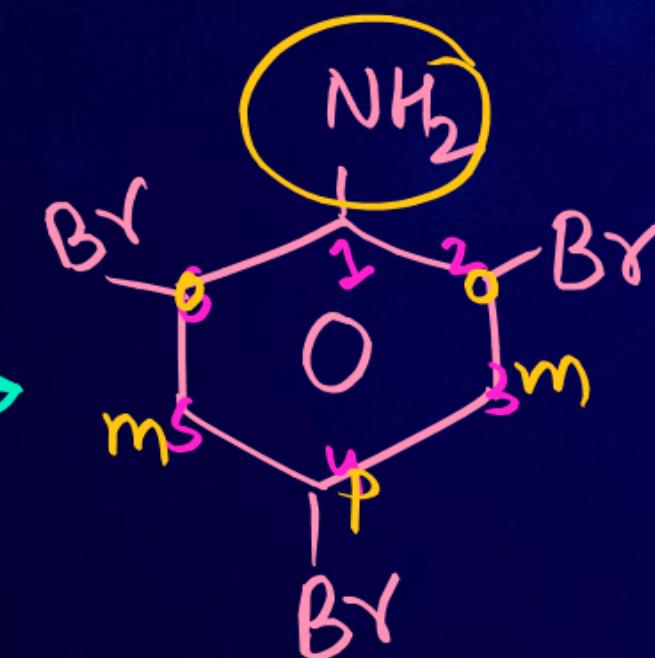
ELECTROPHILIC SUBSTITUTION RX

(a) BROMINATION

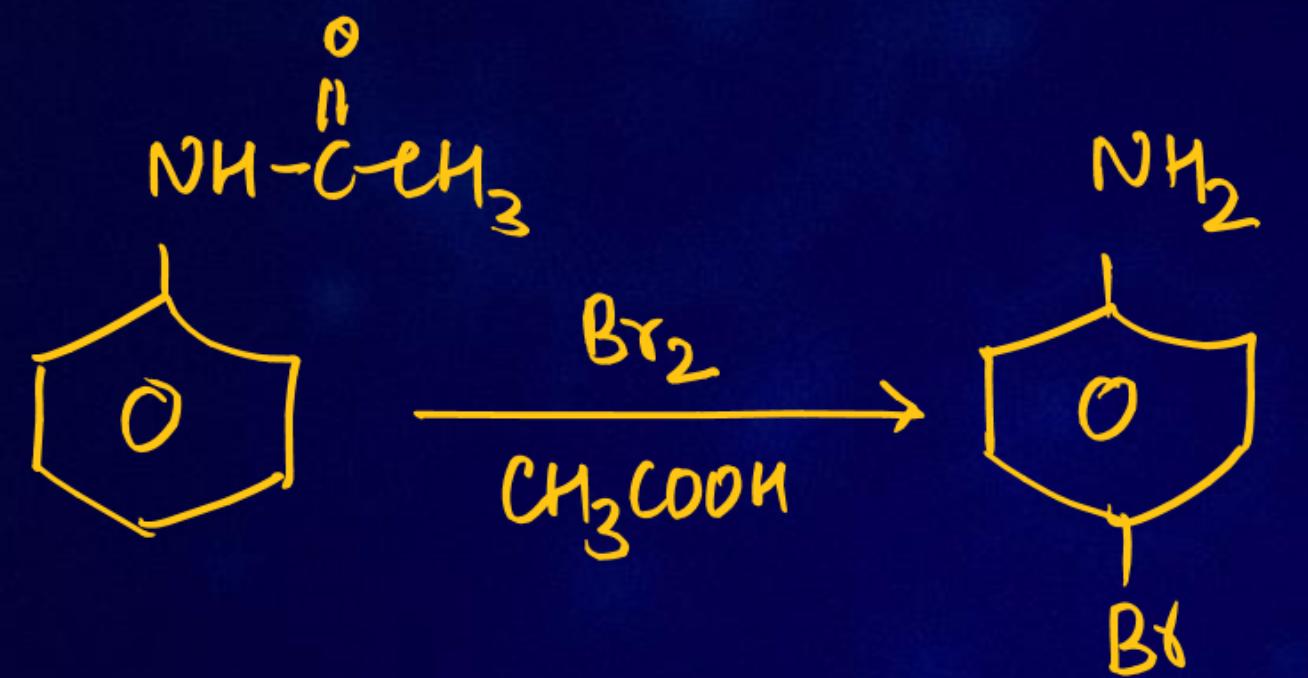
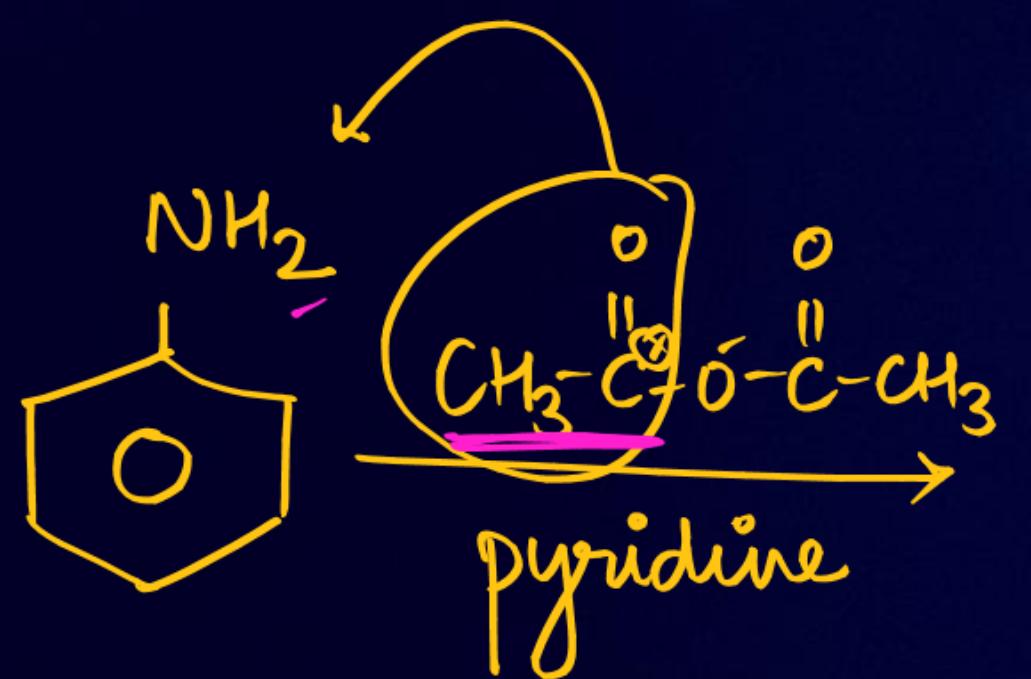
Repeated
Qu.



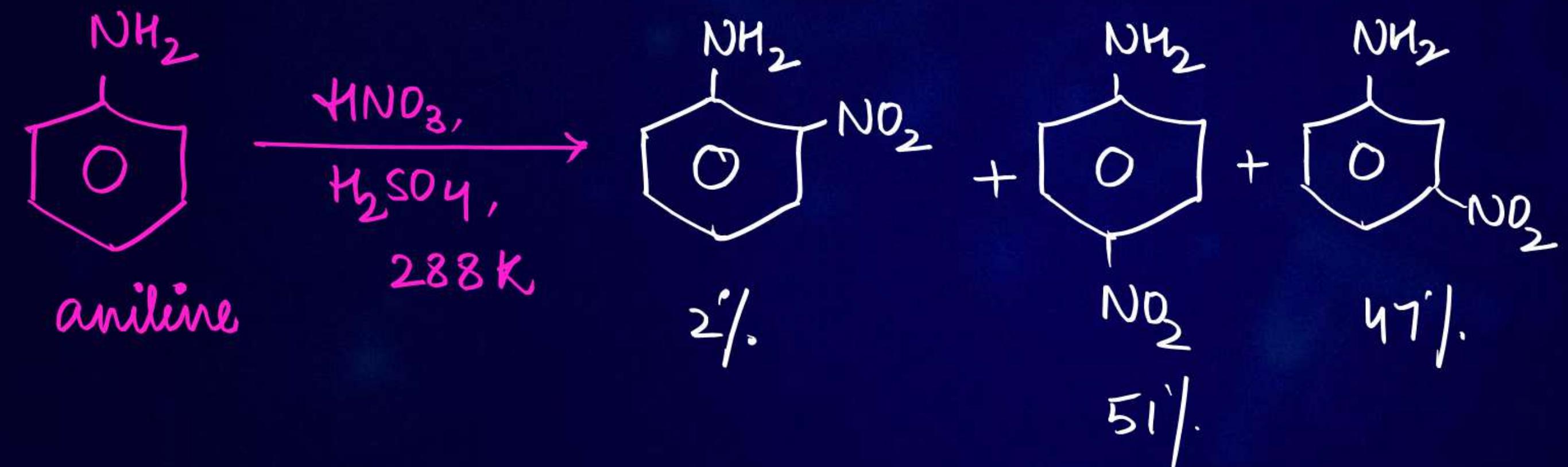
3Br_2
water
Room temp

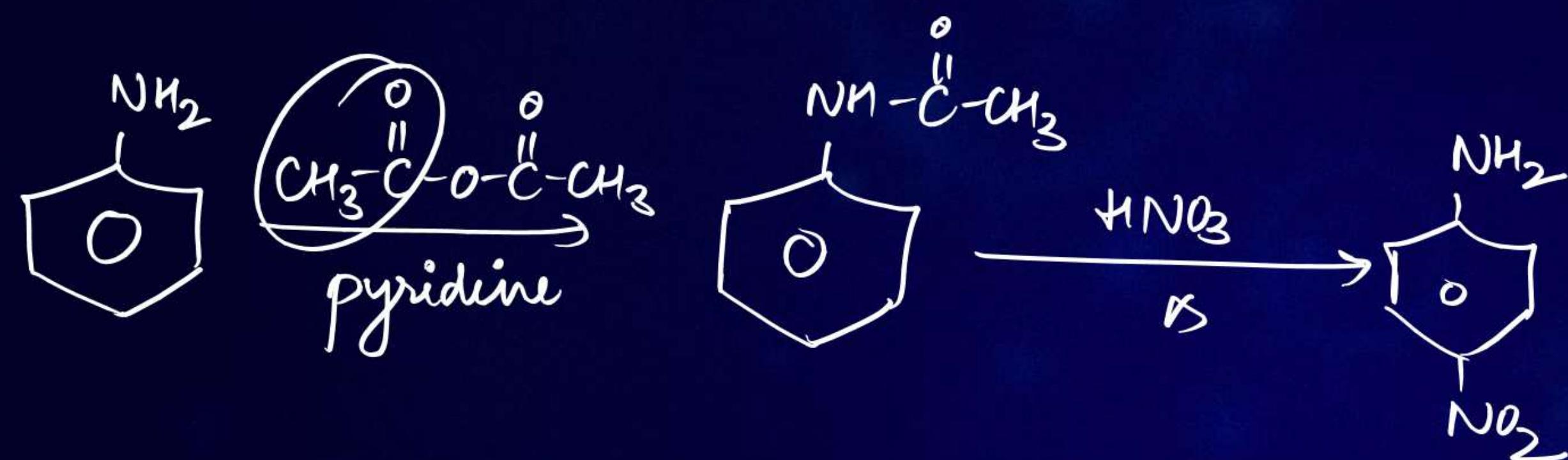


2,4,6-tribromoaniline

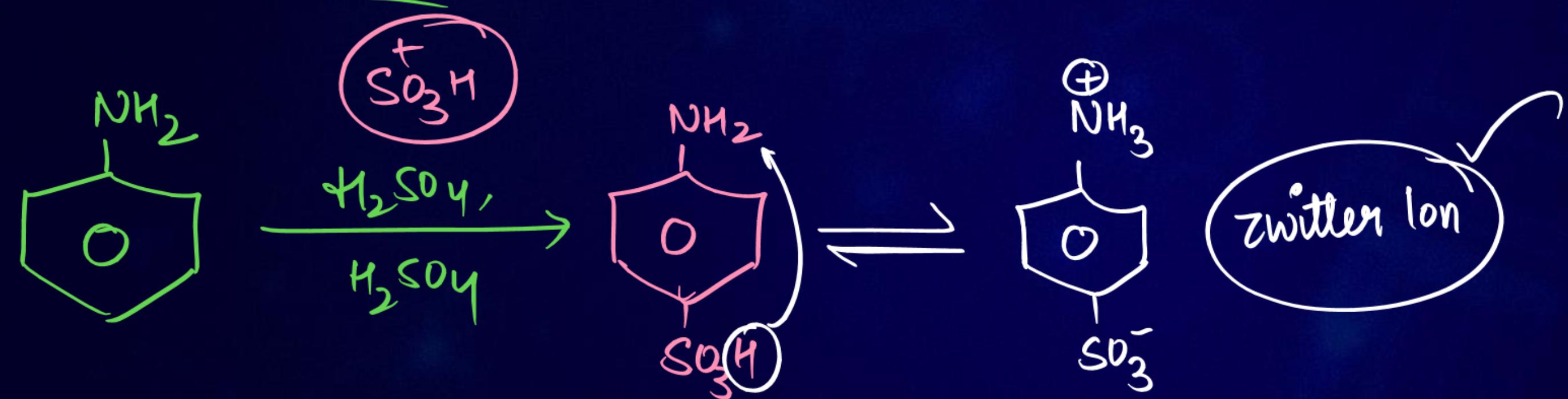


p-bromoaniline

NITRATION



SULPHONATION





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HOMEWORK

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3. REVISE NOTES
4. FINISH DHA/DPP

PARISHRAM



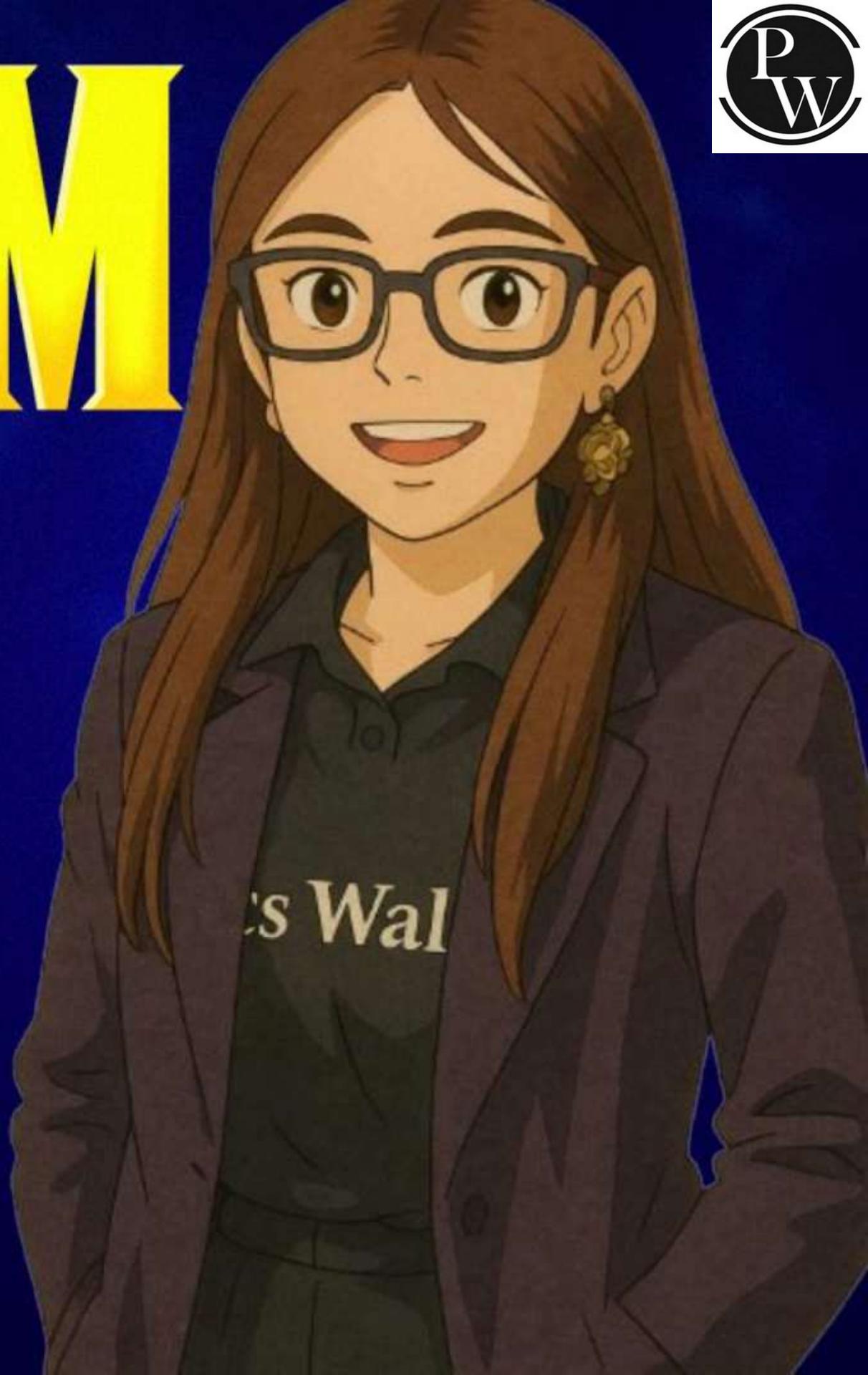
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AMINES

CHEMISTRY

LECTURE-4

BY - SHOURYA GROVER (SG) MA'AM





TOPICS TO BE COVERED

1. BASICITY ✓
2. DIAZONIUM SALT ✓
3. NCERT READING ✓
4. QUESTIONS ✓





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Physics Wallah



MY SHIMMERING STARS

#SHOURYA'S GALAXY

STAPF





AMINES - BASICITY

CHEMICAL PROPERTIES

NCERT



CH_3COCl

Aniline does not undergo Friedel-Crafts reaction (alkylation and acetylation) due to salt formation with aluminium chloride, the Lewis acid, which is used as a catalyst. Due to this, nitrogen of aniline acquires positive charge and hence acts as a strong deactivating group for further reaction.

$\text{CH}_3\text{-Cl}$

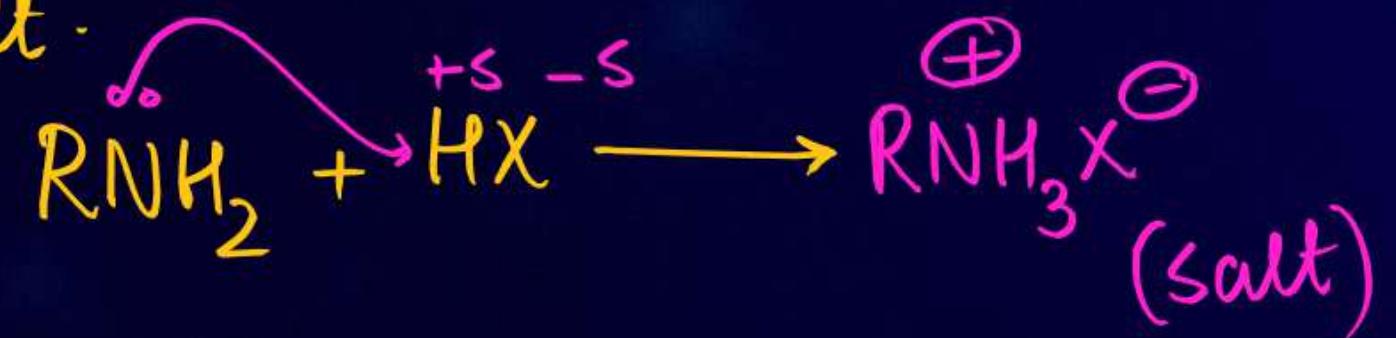
CHEMICAL PROPERTIES



BASICITY →

Base → donate e⁻ pair

Amines act as Base and reacts with Acid to form salt.



Acid-Base

Arrhenius Theory

Acid → donate H⁺

Base → donate OH⁻

Bronsted Lowry Concept

Acid → donate H⁺

Base → accept H⁺

Lewis Theory

Acid → accept e⁻ pair

Base → donate e⁻ pair

$$\text{Acidity} \propto -I \propto -M$$

$$+I \propto M$$

$$\text{Basicity} \propto +I \propto +M$$

$$-I \propto -M$$

(Inductive effect) (Mesomeric effect)

Q. What is the order of Basic strength or which is more Basic



$$\text{Basicity} \propto +I$$

+I ↑ Basicity ↑

Q2. Which is More Basic?

Aliphatic Amine

(c)



Aromatic amine

(d)



-I

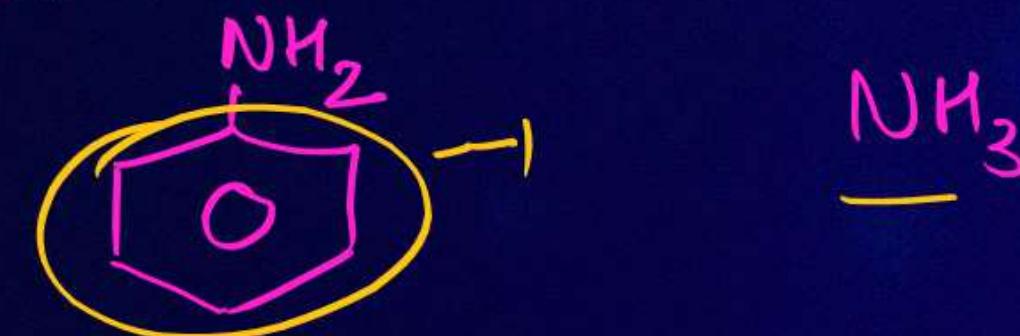
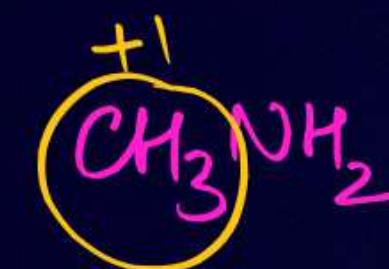
(c)



-I

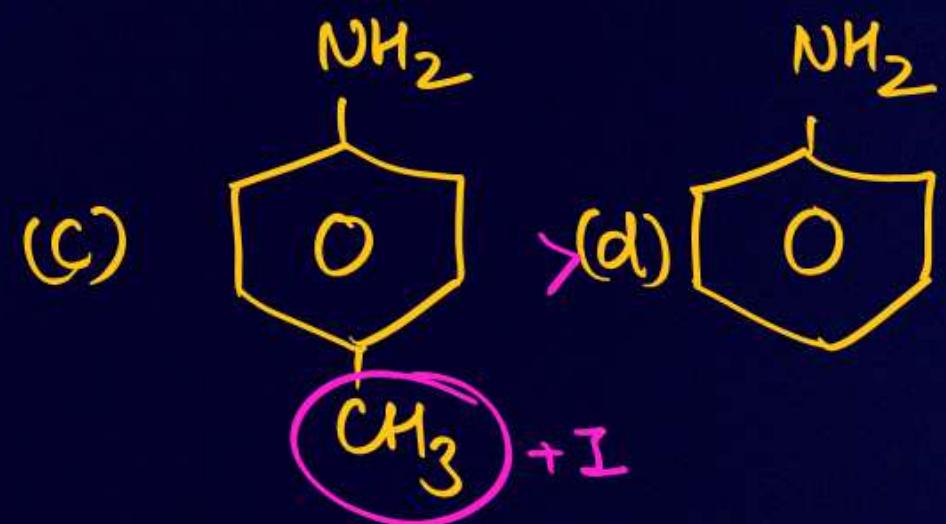
Q. Which is More Basic

- (a) Aliphatic amine (b) Aromatic Amine (c) Ammonia

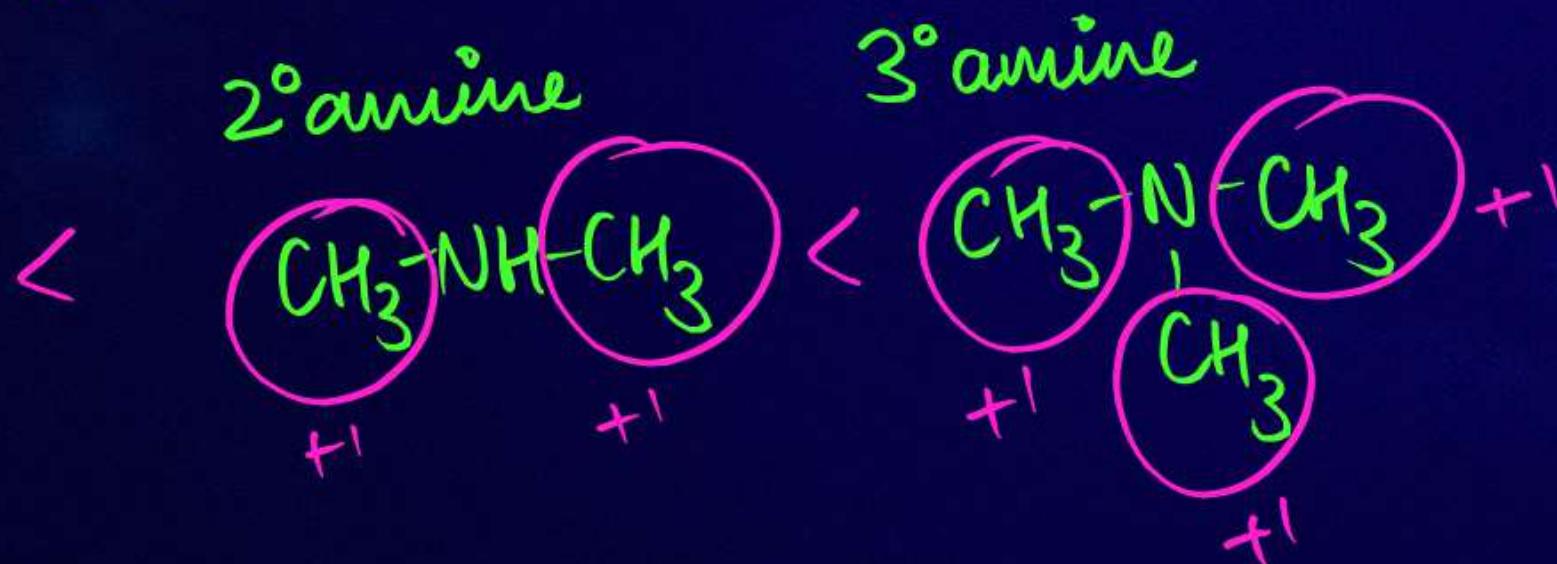
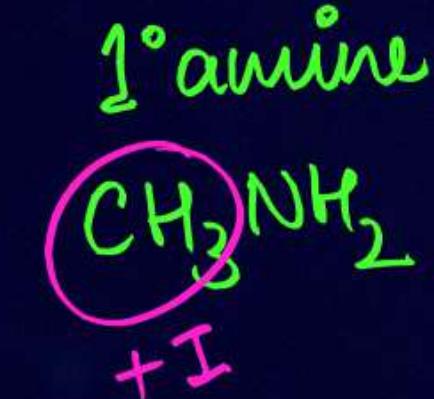


$$a > c > b$$

Q. which is More Basic



Q. which is More Basic



$3^\circ > 2^\circ > 1^\circ$

* # Normal

$$3^\circ > 2^\circ > 1^\circ$$

what is the order of Basicity in aqueous sol?

1: 2: 3:

$$2^\circ > 1^\circ > 3^\circ$$

$$\text{Basic strength} = \text{Basicity} = K_b \propto + \frac{I \propto + M}{-1 \propto -M}$$

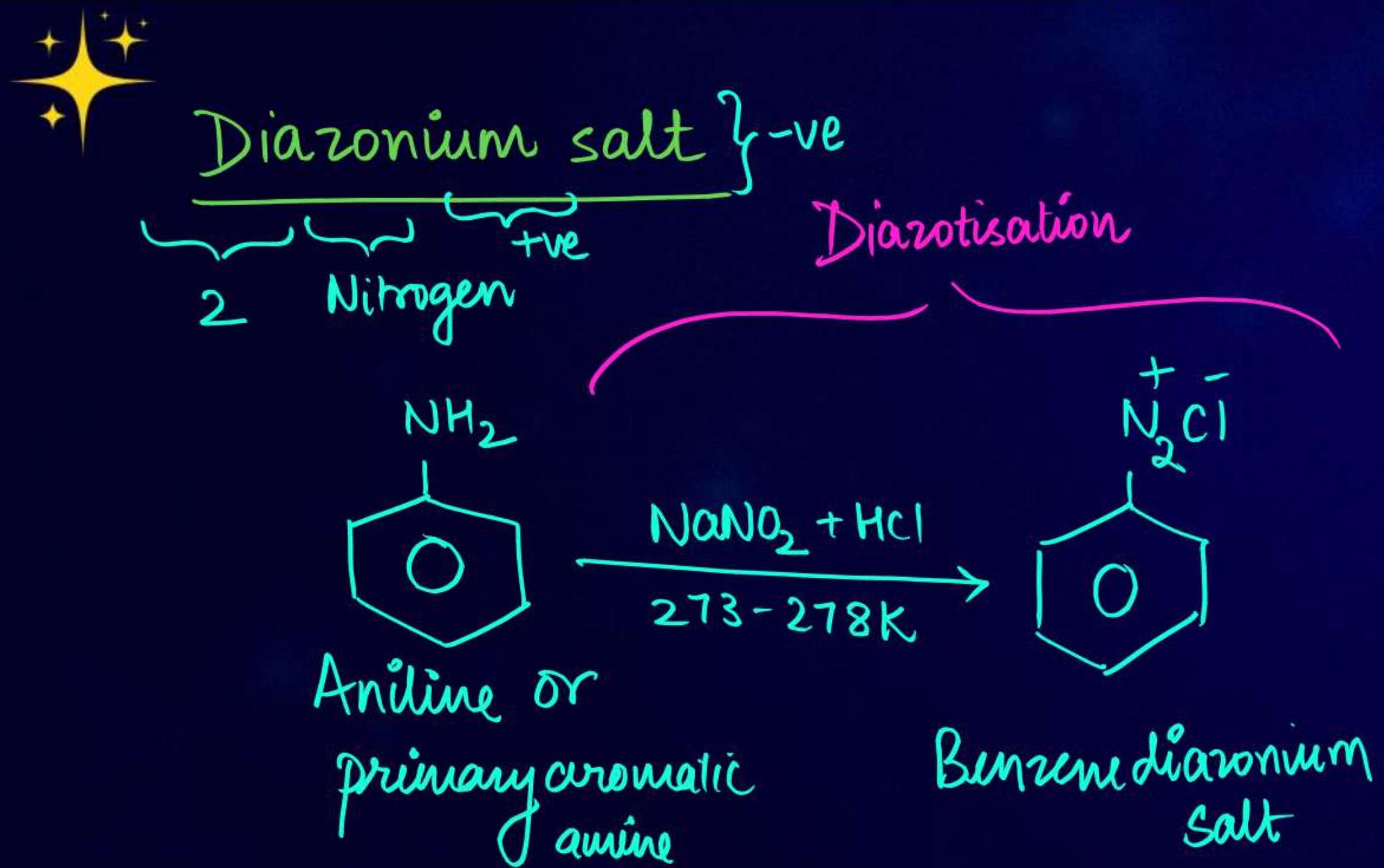
$$pK_b ?$$

$$pK_b = -\log K_b$$

$$K_b \uparrow pK_b \downarrow$$

$$\begin{aligned} H^+ &\uparrow \\ pH &= -\log H^+ \\ pH &\downarrow \end{aligned}$$

DIAZONIUM SALT - INTRODUCTION



When Aniline or primary aromatic amine Reacts with ($\text{NNO}_2 + \text{HCl}$) at 273-278 K, it yields diazonium salt. This process is called diazotisation.

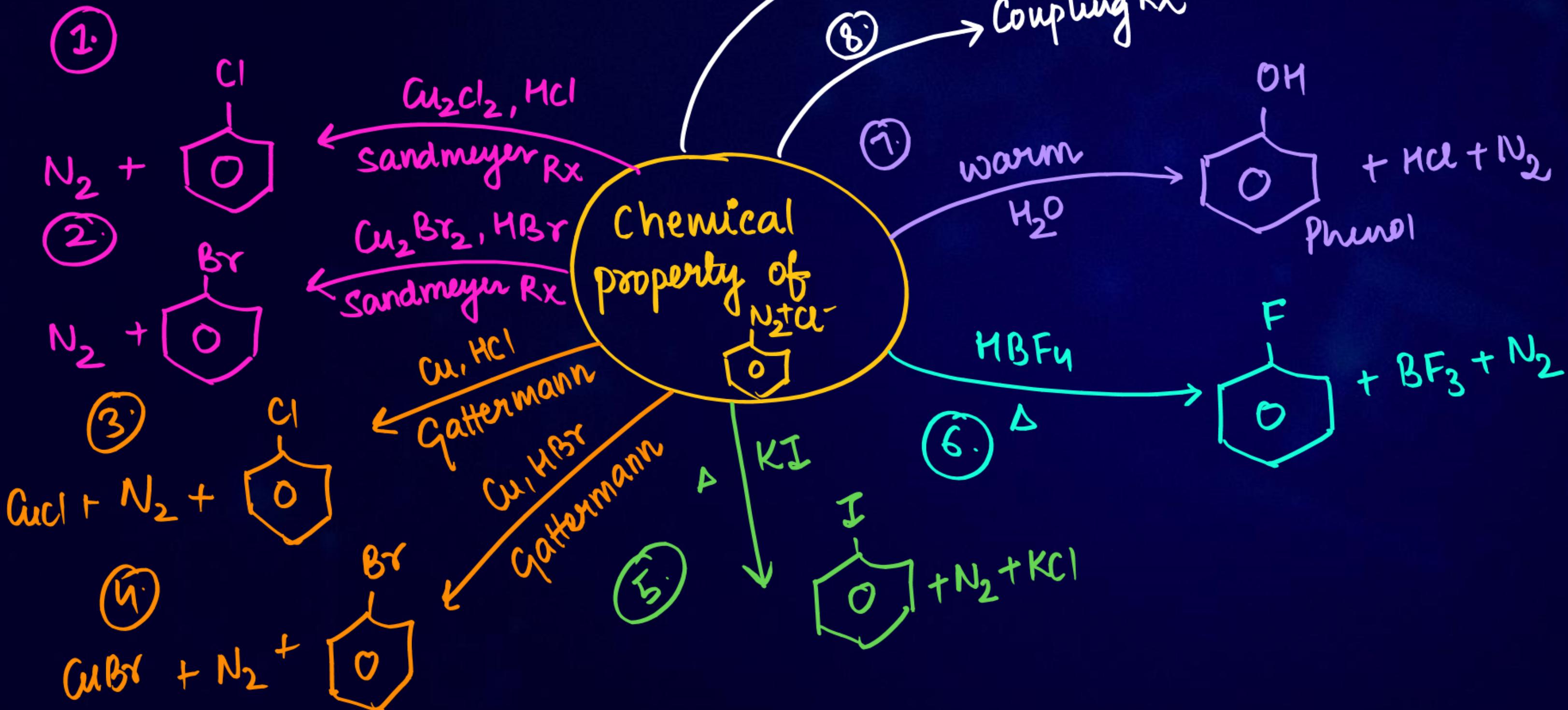
DIAZONIUM SALT

Physical Properties

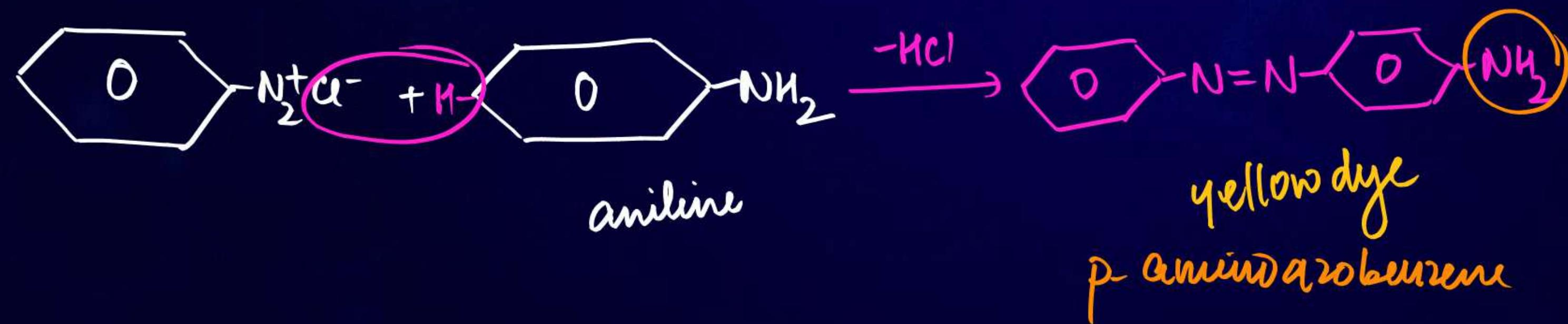
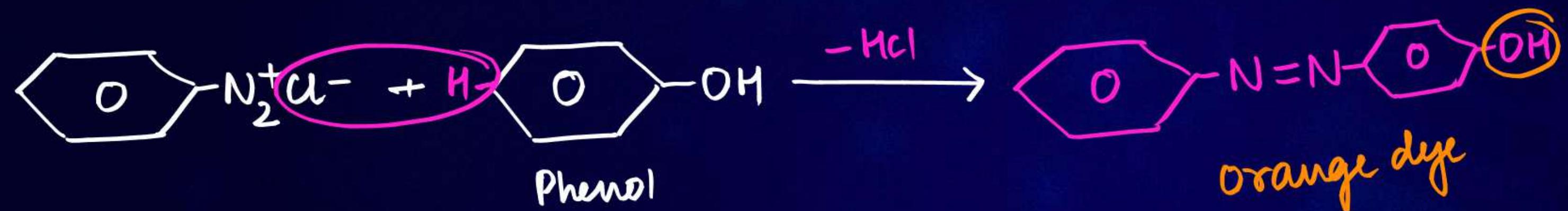
Benzene diazonium chloride is a colourless crystalline solid. It is readily soluble in water and is stable in cold but reacts with water when warmed. It decomposes easily in the dry state. Benzene diazonium fluoroborate is water insoluble and stable at room temperature.

(fixed arrangement)

CHEMICAL PROPERTIES



Coupling Rx (Azo test)



QUESTION

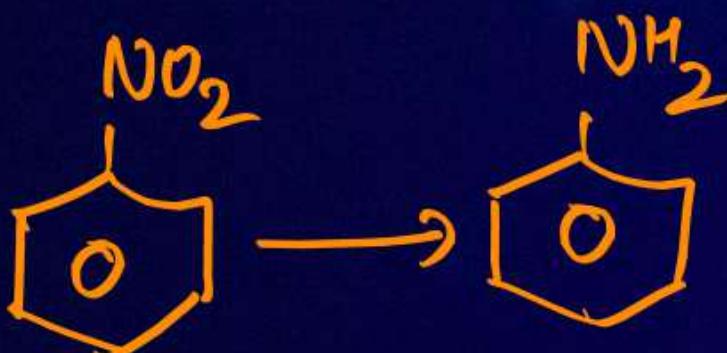
Which of the following is a 3° amine?

- A 1-Methylcyclohexylamine
- B Triethylamine ✓ $\text{C}_2\text{H}_5-\underset{\text{C}_2\text{H}_5}{\text{N}}-\text{C}_2\text{H}_5$
- C tert-Butylamine
- D N-Methylaniline

QUESTION

Which of the following reagents would not be a good choice for reducing an aryl nitro compound to an amine?

- A $\text{H}_2(\text{excess})/\text{Pt}$ ✓
- B LiAlH_4 in ether
- C Fe and HCl ✓
- D Sn and HCl ✓



QUESTION

Amongst the given set of reactants, the most appropriate for preparing 2° amine is

_____.



- A $2^\circ R - Br + NH_3$
- B $2^\circ R - Br + NaCN$ followed by H_2/Pt
- C $1^\circ R - NH_2 + RCHO$ followed by H_2/Pt
- D $1^\circ R - Br$ (2mol) + potassium phthalimide followed by $H_3O^+/heat$

QUESTION

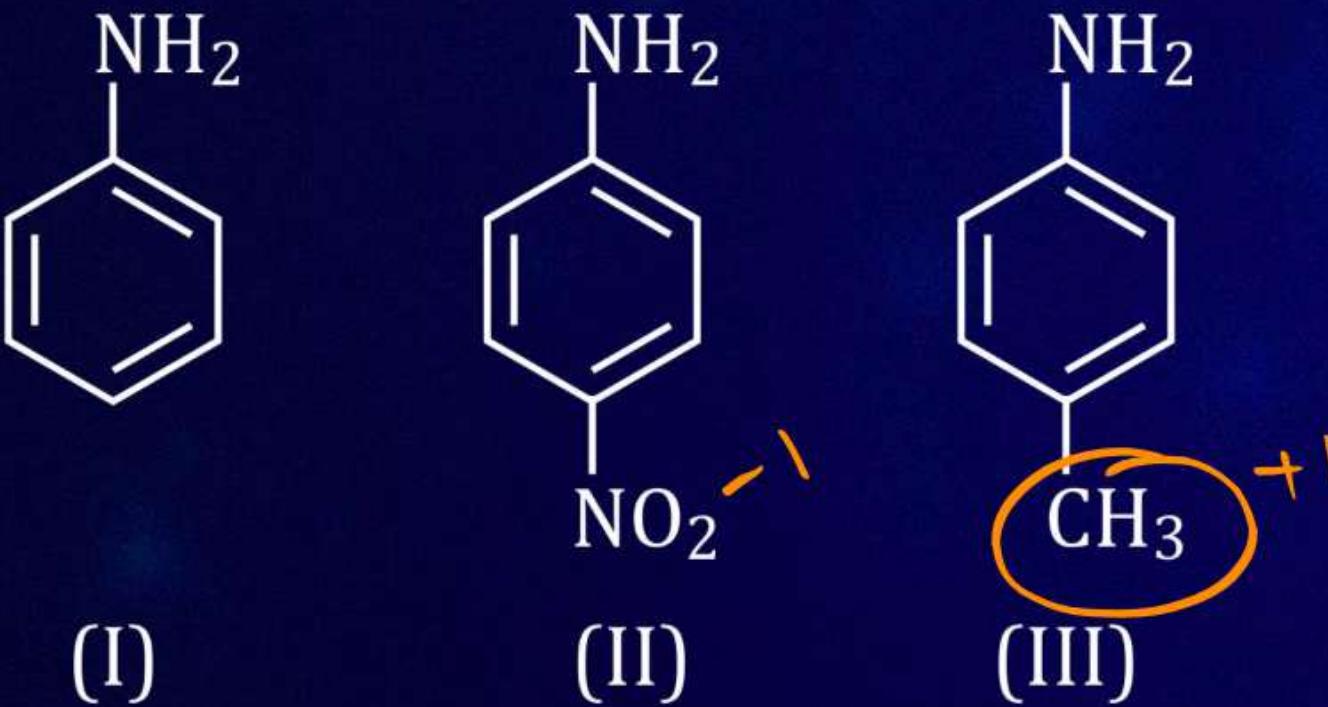
Hoffmann bromamide degradation reaction is shown by _____.



- A** $\text{ArNH}_2 +$
- B** ArCONH_2 ✓
- C** $\text{ArNO}_2 +$
- D** $\text{ArCH}_2\text{NH}_2 +$

QUESTION

The correct increasing order of basic strength for the following compounds is _____.



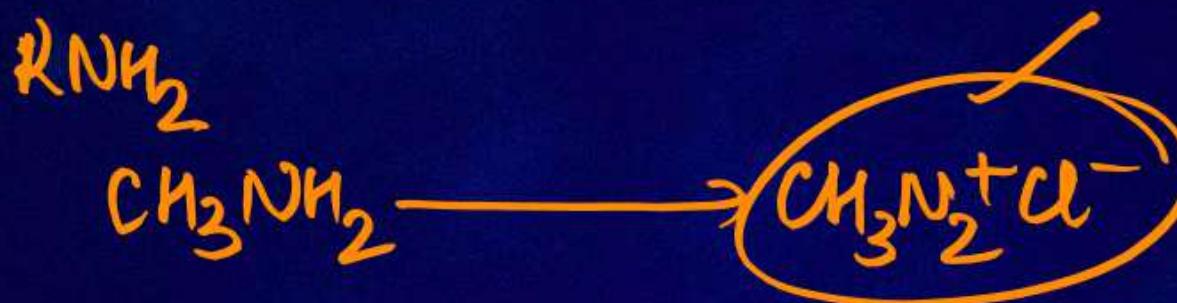
- A** II < III < I
- B** III < I < II
- C** III < II < I
- D** II < I < III

III > I > II

QUESTION

The gas evolved when methylamine reacts with nitrous acid is _____.

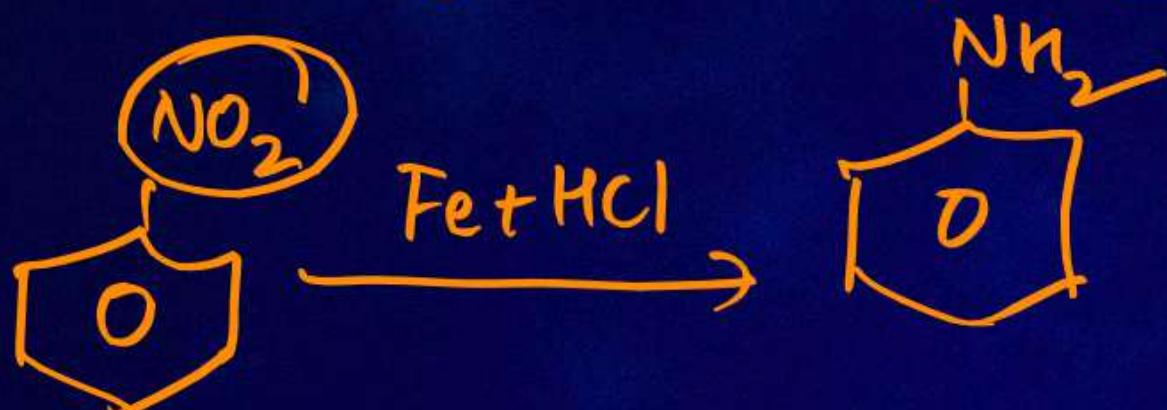
- A** NH₃
- B** N₂
- C** H₂
- D** C₂H₆



QUESTION

Reduction of aromatic nitro compounds using Fe and HCl gives _____.

- A** aromatic oxime
- B** aromatic hydrocarbon
- C** aromatic primary amine
- D** aromatic amide



QUESTION

Is named as _____.

- A** Sandmeyer reaction
- B** Gattermann reaction *✓*
- C** Claisen reaction
- D** Carbylamine reaction

QUESTION

Best method for preparing primary amines from alkyl halides without changing the number of carbon atoms in the chain is

①

- A Hoffmann bromamide reaction
- B Gabriel phthalimide synthesis
- C Sandmeyer reaction
- D reaction with NH_3

QUESTION

Which of the following compounds will not undergo azo coupling reaction with benzene diazonium chloride?

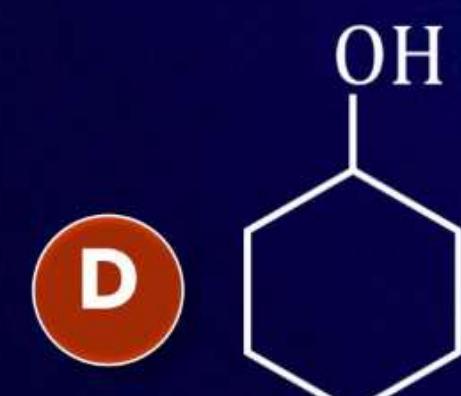
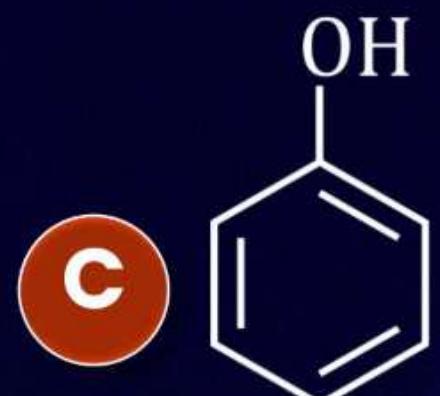
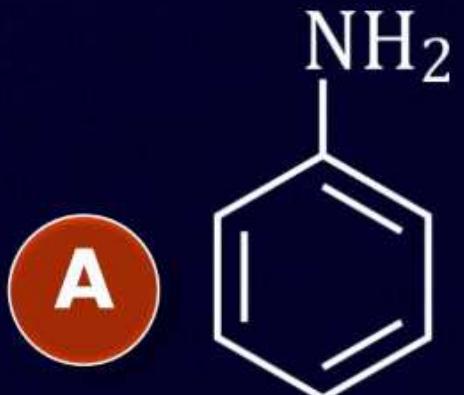
②

- A Aniline
- B Phenol
- C Anisole
- D Nitrobenzene

QUESTION

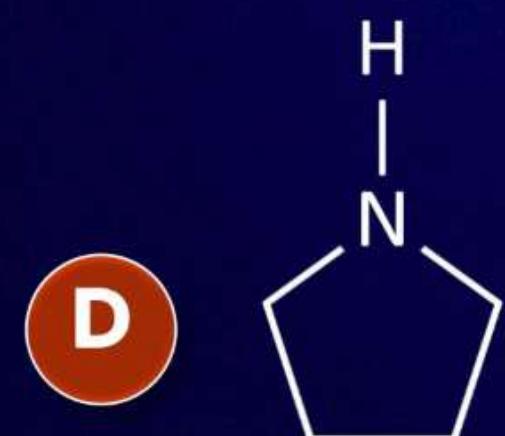
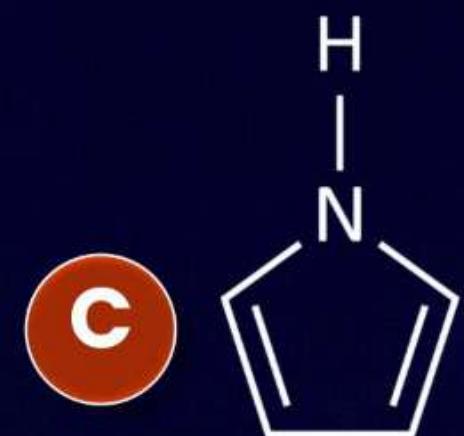
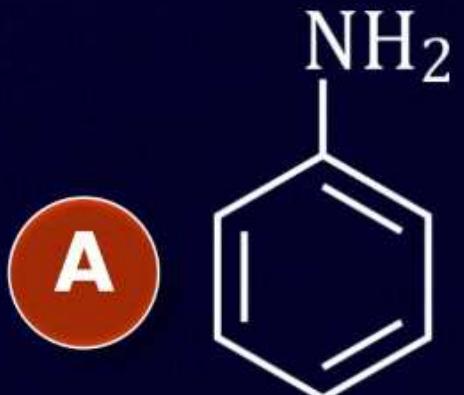
Which of the following compounds is the weakest Bronsted base?

③



QUESTION

Among the following amines, the strongest Bronsted base is _____.



④

QUESTION

The correct decreasing order of basic strength of the following species is _____.



⑤

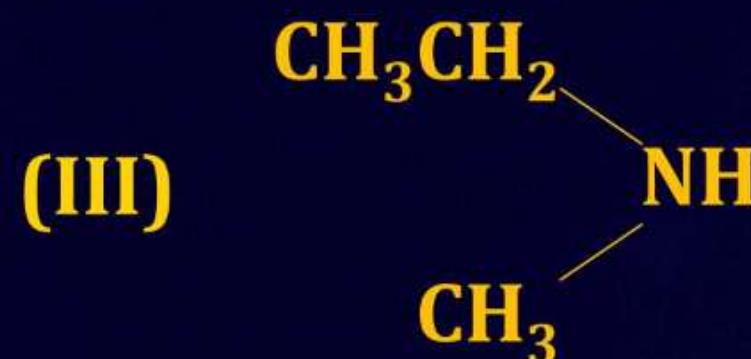
- A** $\text{NH}_2^- > \text{OH}^- > \text{NH}_3 > \text{H}_2\text{O}$
- B** $\text{OH}^- > \text{NH}_2^- > \text{H}_2\text{O} > \text{NH}_3$
- C** $\text{NH}_3 > \text{H}_2\text{O} > \text{NH}_2^- > \text{OH}^-$
- D** $\text{H}_2\text{O} > \text{NH}_3 > \text{OH}^- > \text{NH}_2^-$

QUESTION

Which of the following should be most volatile?



⑥



A II

B IV

C I

D III

QUESTION

Which of the following methods of preparation of amines will not give same number of carbon atoms in the chain of amines as in the reactant?

7

- A** Reaction of nitrite with LiAlH_4
- B** Reaction of amide with LiAlH_4 followed by treatment with water
- C** Heating alkyl halide with potassium salt of phtalimide followed by hydrolysis
- D** Treatment of amide with bromine in aqueous solution of sodium hydroxide

QUESTION

Nitrogen atom of amino group is _____ hybridised.

⑧

- A** sp
- B** sp^2
- C** sp^3
- D** sp^3d

QUESTION

The shape of $(\text{CH}_3)_3\text{N}$ is pyramidal because

⑨

- A** nitrogen forms three sp^3 hybridised sigma bonds with carbon atoms of methyl groups and there is one non-bonding electro pair
- B** nitrogen forms three sp^2 hybridised sigma bonds with carbon atoms of methyl groups and fourth orbital forms pi bond
- C** nitrogen has five valencies which are arranged in pyramidal shape
- D** the unpaired electron present on nitrogen is delocalised.

QUESTION

C_3H_9N cannot represent

- A 1° amine
- B 2° amine
- C 3° amine
- D quaternary ammonium salt

10



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Level-wise Difficulty
(Easy, Medium, Hard)

Thank
You

