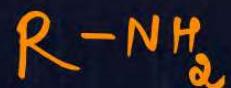




General Introduction



1°amine



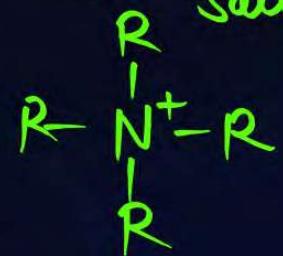
2°amine



3°amine



4°ammonium
salt





Classification of Amines

Aliphatic



1°

2°

3°

Aromatic



1°

2°

3°

IUPAC

Suffix-2 amine

prefix-2 amino



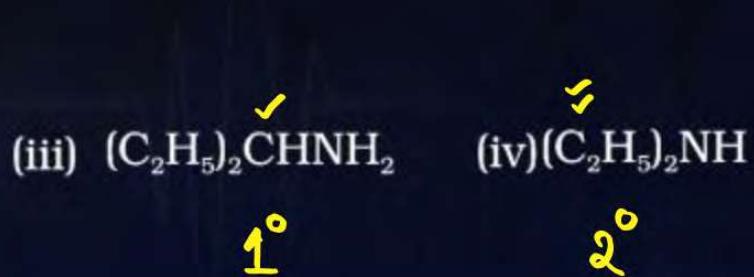
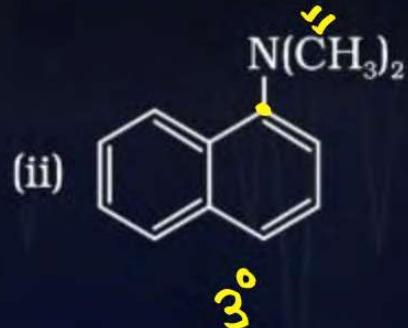
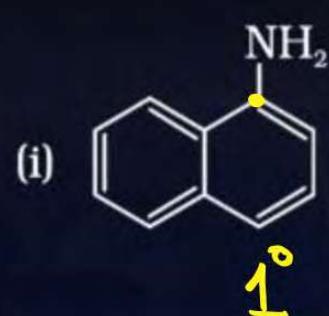
Butan-2-amine



3-Amino
pentanoic acid

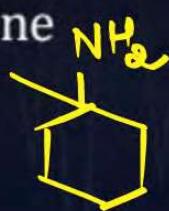
C.Q. 01 (NCERT Exemplar)

Classify the following amines as primary, secondary or tertiary:



Which of the following is a 3° amine?

A 1-methylcyclohexylamine

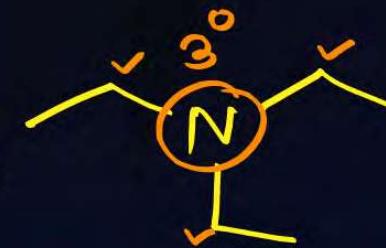


C tert-butylamine



B Triethylamine

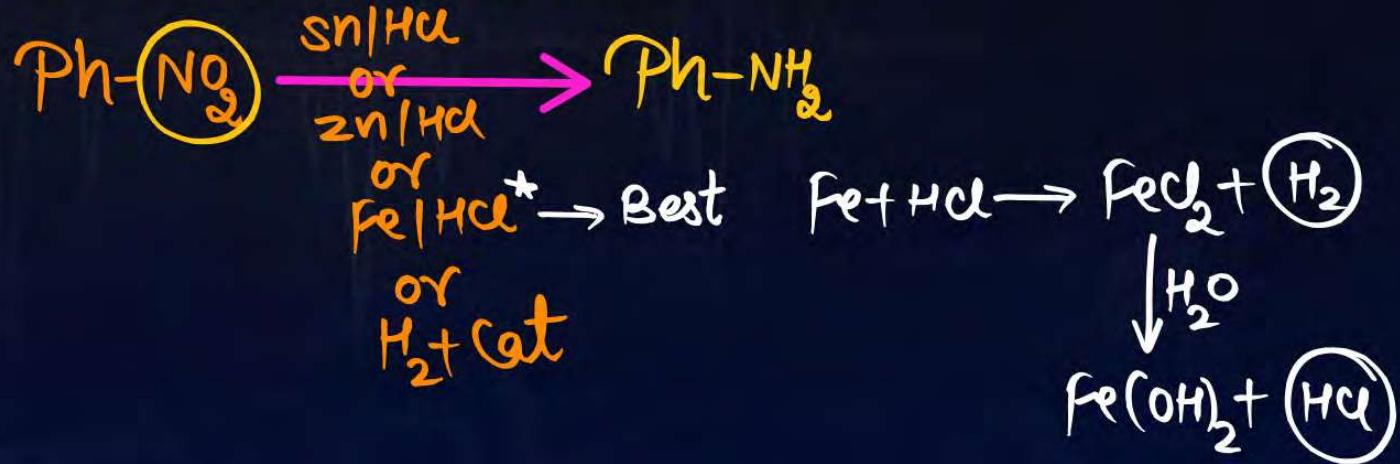
D N-methylaniline





Methods of Preparation of Amines

1. By reduction of nitro compounds:



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



- A** H₂ (excess)/Pt
- C** Fe and HCl

- B** LiAlH₄ in ether
- D** Sn and HCl

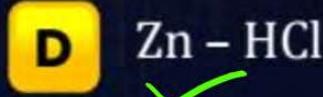
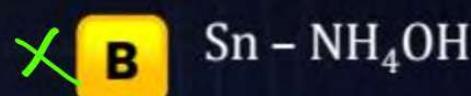
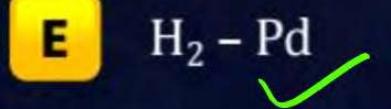
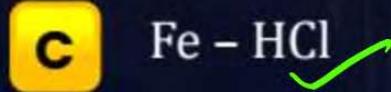
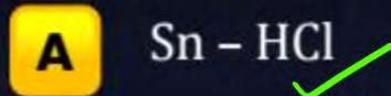
Reduction of aromatic nitro compounds using Fe and HCl gives _____.



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

C.Q. 05 [31 Aug, JEE Mains 2021 (Shift-I)]

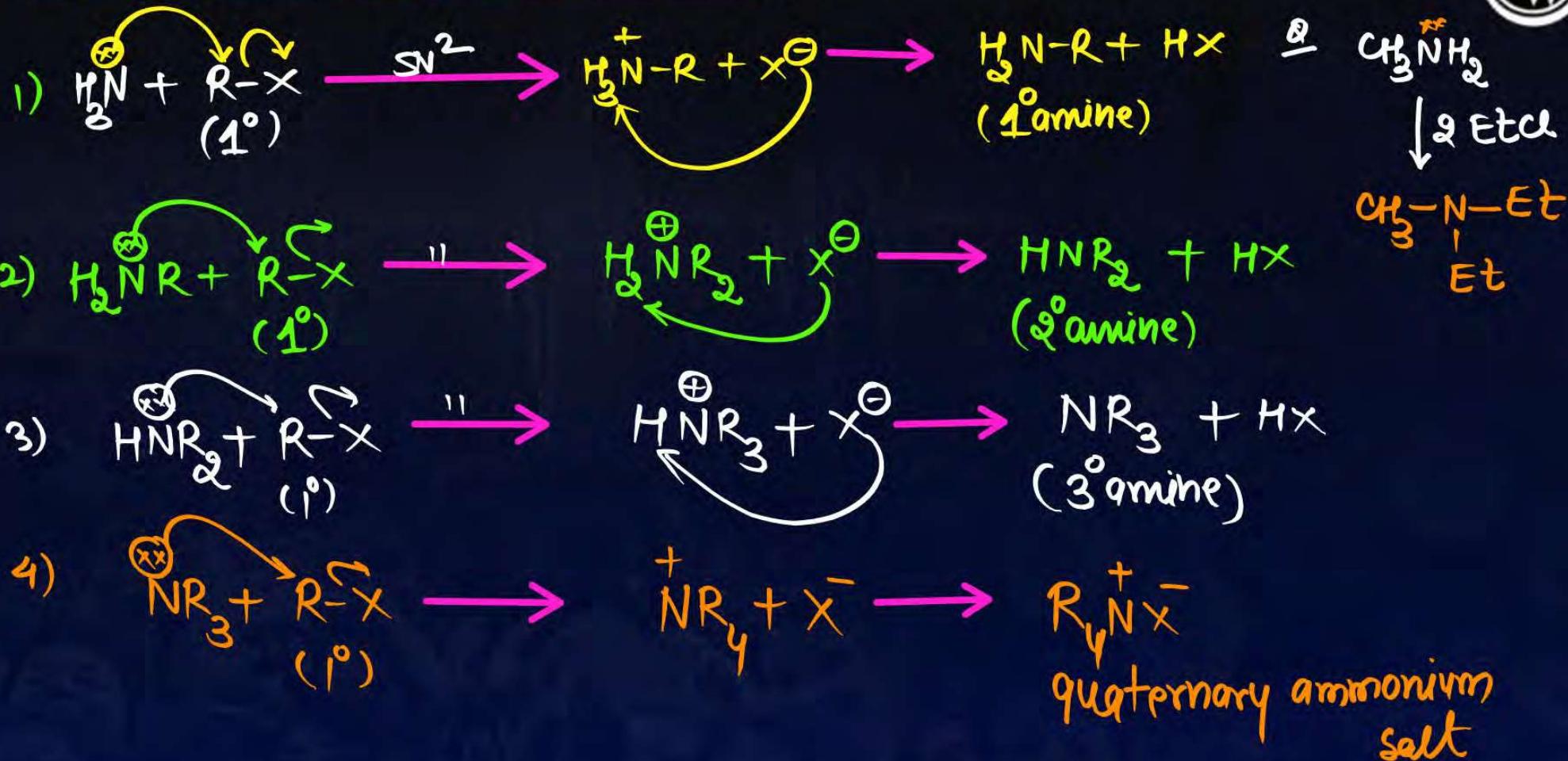
The total number of reagents from those given below, that can convert nitrobenzene into aniline is _____.(integer answer)



Ans 5

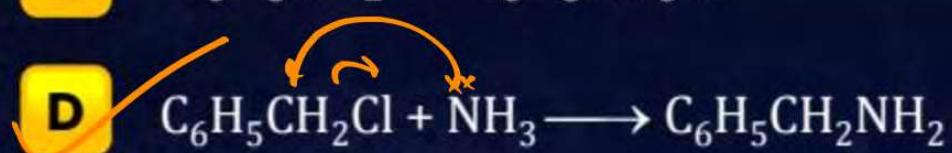
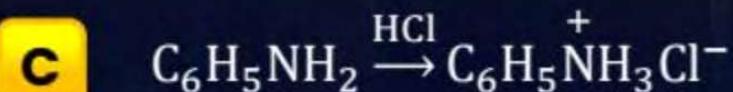
2. By ammonolysis of alkyl halides: (S_N^2)

P
W

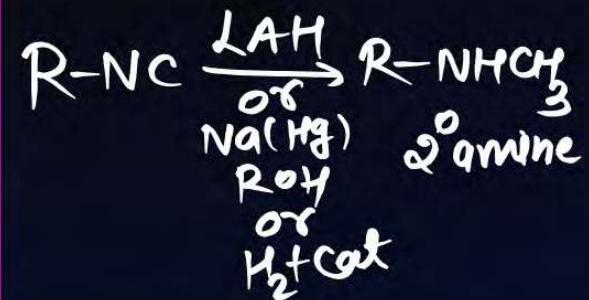
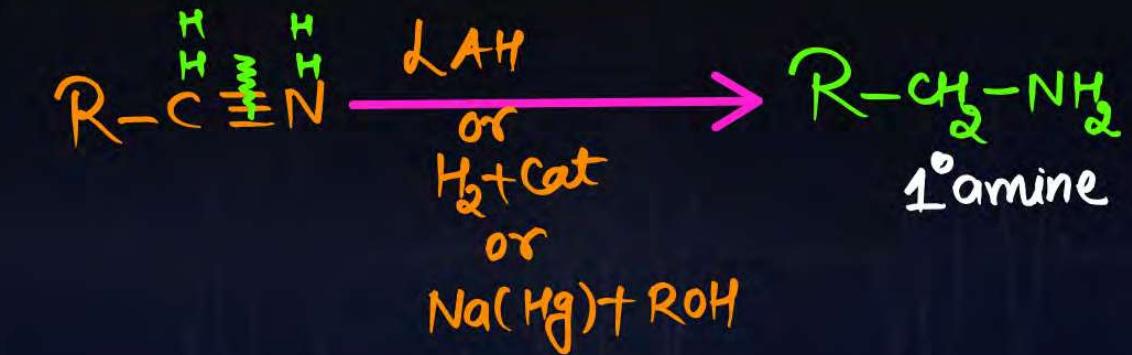


C.Q. 06 [17 March, JEE Mains 2021 (Shift-I)]

Which of the following reactions is an example of ammonolysis?



3. By reduction of nitriles:



C.Q. 07 [5 Sep, JEE Mains 2020 (Shift-I)]

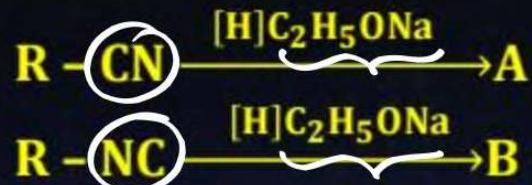
The most appropriate reagent for conversion of $\text{C}_2\text{H}_5\text{CN}$ into $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$ is:

A NaBH_4 X

B CaH_2 X

C $\text{Na}(\text{CN})\text{BH}_3$ X

D LiAlH_4

C.Q. 08

Product A and B will be respectively:

- A** RNHCH₃ & RCH₂NH₂
- B** RCH₂NH₂ & RNHCH₃
- C** RCH₂NH₂ & RN(CH₃)₂
- D** RNHCH₃ & RCH₂NH₂

4. By reduction of amides:

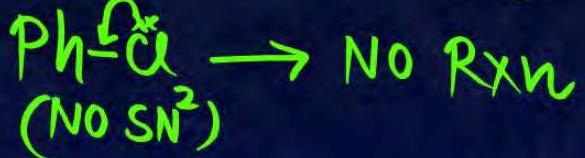
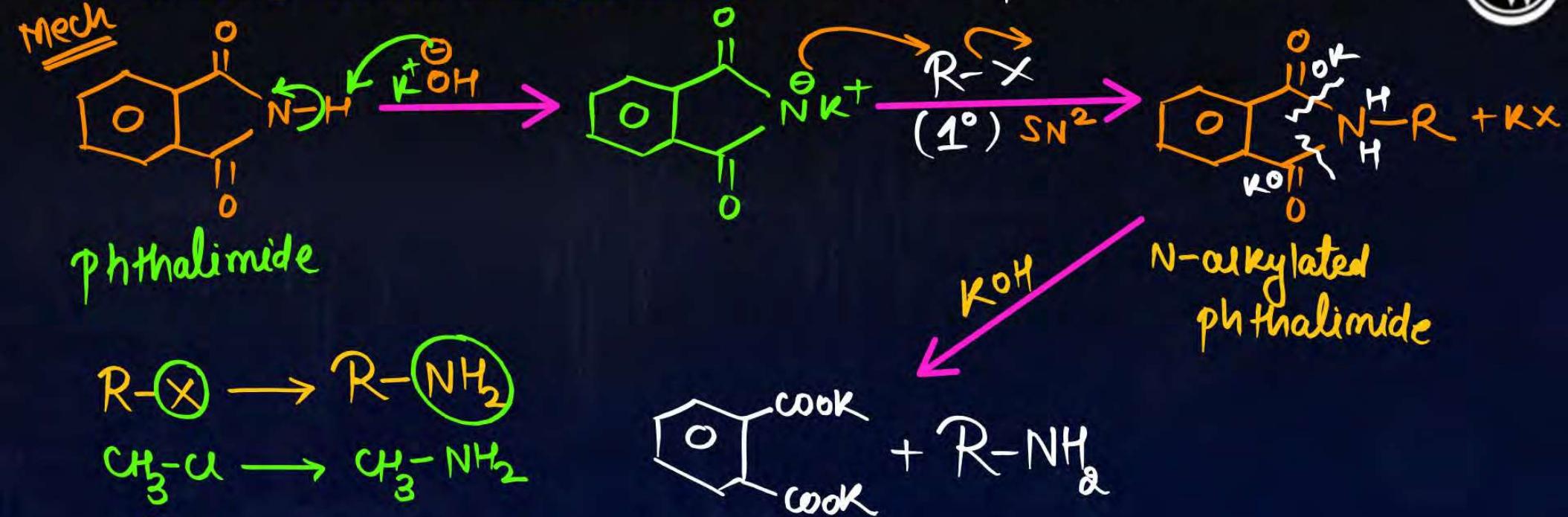


C.Q. 09

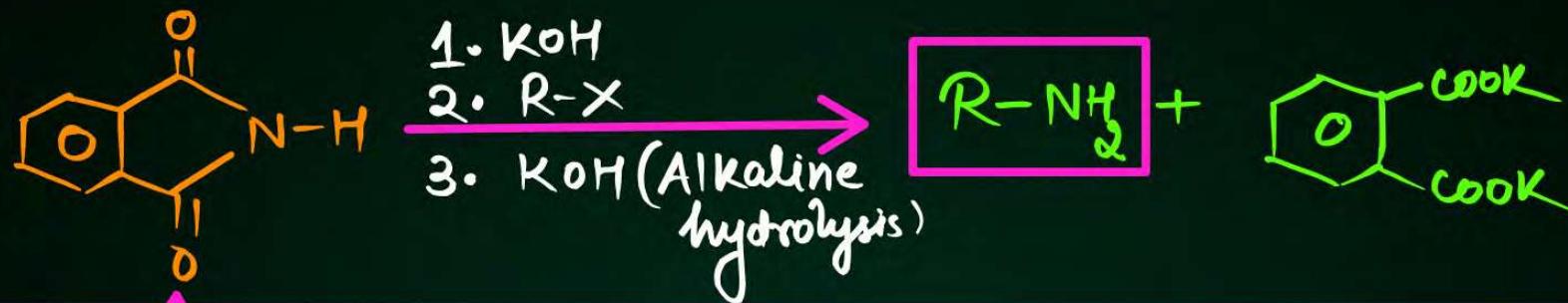
Which on reduction does not give primary amine?

- A $\text{CH}_3\text{CN} \longrightarrow \text{CH}_3\text{CH}_2\text{NH}_2$
- B $\text{C}_2\text{H}_5\text{NC} \longrightarrow \text{CH}_3-\text{NHCH}_3$
- C $\text{CH}_3\text{CONH}_2 \longrightarrow \text{CH}_3\text{CH}_2\text{NH}_2$
- D All of these

5. Gabriel phthalimide synthesis: used for the prep of ali 1° amine



Gab Phth. Rxn

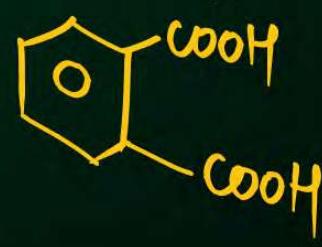
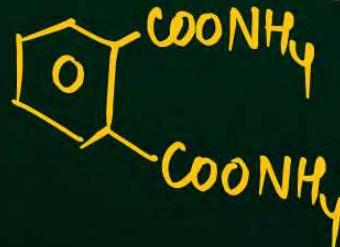
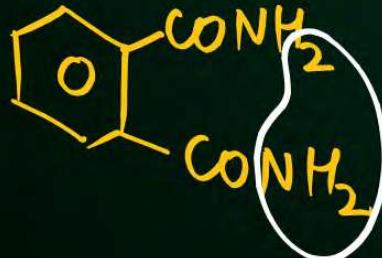


strong heat

Heat

Excess
 NH_3

Alk Kmg/Δ
 H^+



The source of nitrogen in Gabriel synthesis of amines is _____.

- A Sodium azide, NaN_3 ×
- B Sodium nitrite, NaNO_2 ×
- C Potassium cyanide, KCN ×
- D Potassium phthalimide, $\text{C}_6\text{H}_4(\text{CO})_2\text{N}^-\text{K}^+$

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

- A** Hoffmann Bromamide reaction
- B** Gabriel phthalimide synthesis
- C** Sandmeyer reaction
- D** Reaction with NH_3

C.Q. 12 (NCERT Exemplar)

~~Assertion:~~ Aromatic 1° amines can be prepared by Gabriel Phthalimide Synthesis.

~~Reason:~~ Aryl halides undergo nucleophilic substitution with anion formed by phthalimide.

A

Both assertion and reason are wrong.

B

Both assertion and reason are correct statements but reason is not correct explanation of assertion.

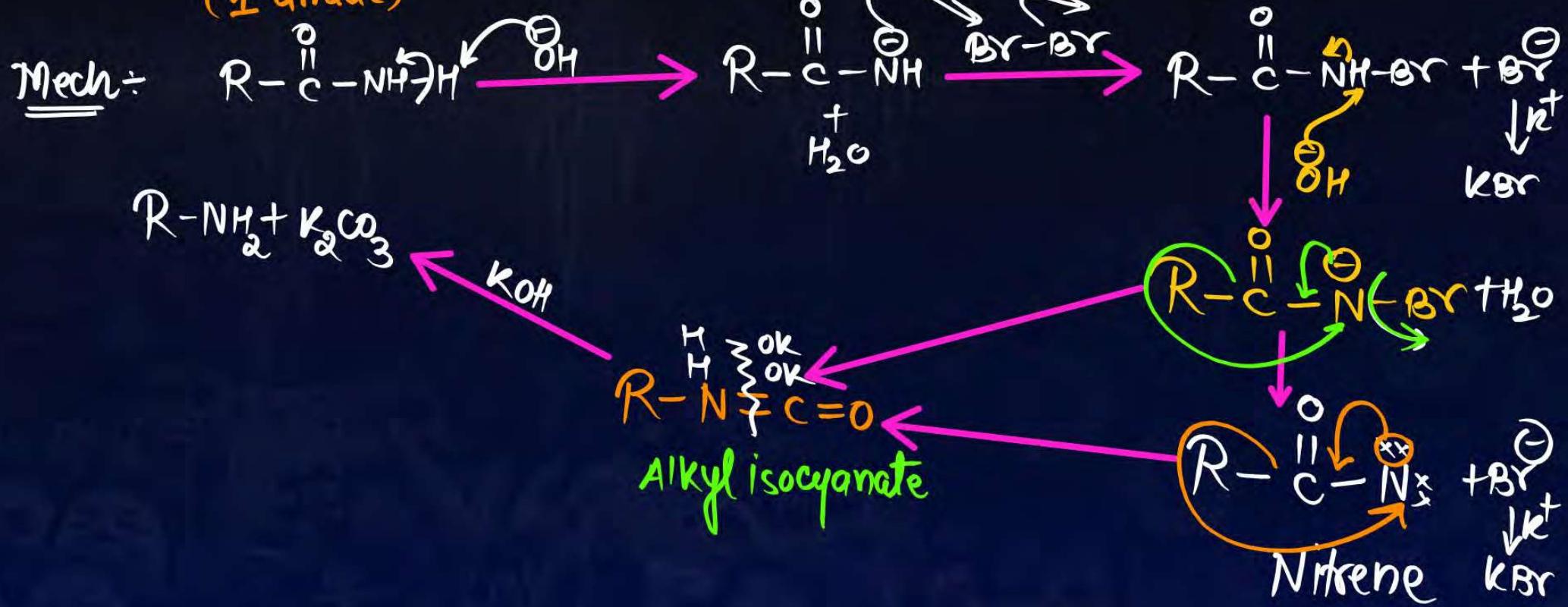
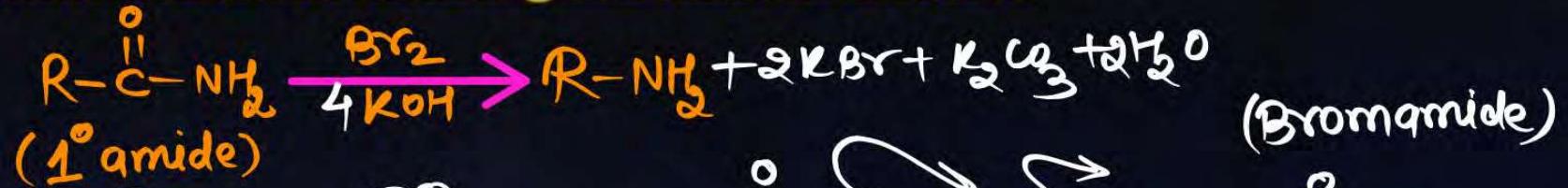
C

Assertion is correct statement but reason is wrong statement.

D

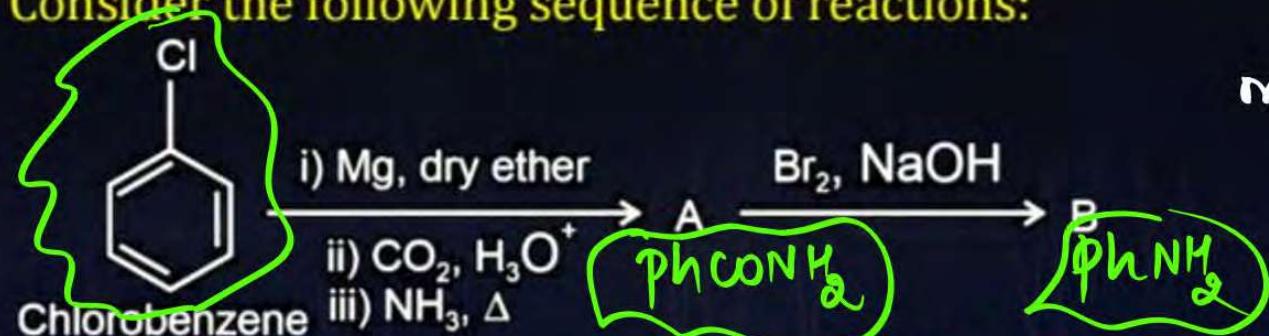
Both assertion and reason are correct statements and reason is correct explanation of assertion.

6. Hoffmann bromamide degradation reaction:



C.Q. 13 (JEE Mains 2025, 28 January Shift-1)

Consider the following sequence of reactions:



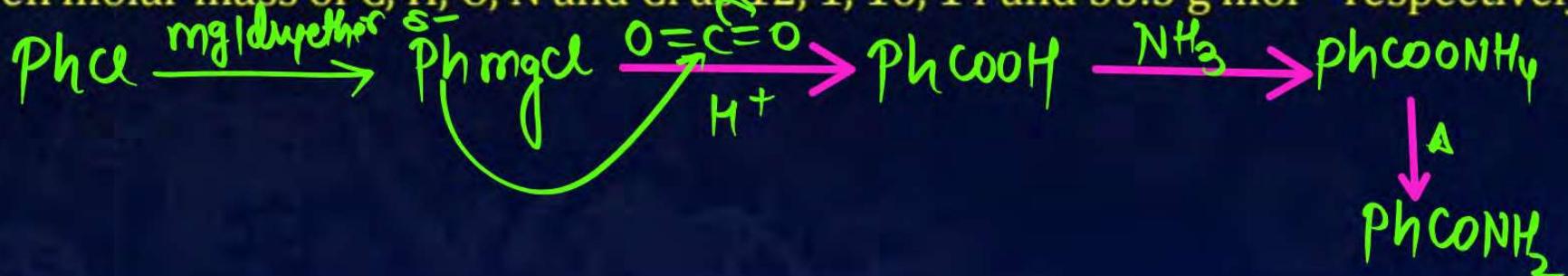
$$\text{mmol of PhCl} = \frac{11.25}{112.5} = 0.1 \quad \text{P.W.}$$

$$\text{mmol of aniline} = 0.1$$

$$\begin{aligned} \text{w(mg) of aniline} &= 0.1 \times 93 \\ &= 10 \times 93 \text{ mg} \end{aligned}$$

11.25 mg of chlorobenzene will produce 93×10^{-1} mg of product B.
 (Consider the reactions result in complete conversion.)

[Given molar mass of C, H, O, N and Cl as 12, 1, 16, 14 and 35.5 g mol⁻¹ respectively]



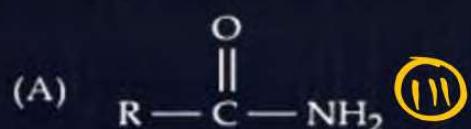
C.Q. 14 (JEE Mains 2025, 22 January Shift-2)

P
W

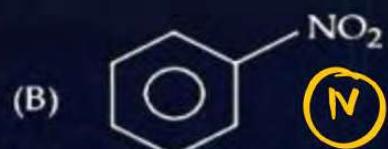
Match the Compounds (List - I) with the appropriate Catalyst/Reagents (List - II) for their reduction into corresponding amines.

List - I
(Compounds)

List - II
(Catalyst/Reagents)



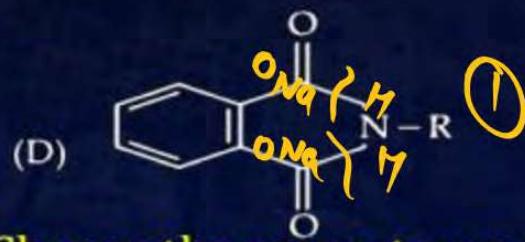
(I) NaOH (aqueous)



(II) H_2/Ni



(III) $LiAlH_4, H_2O$



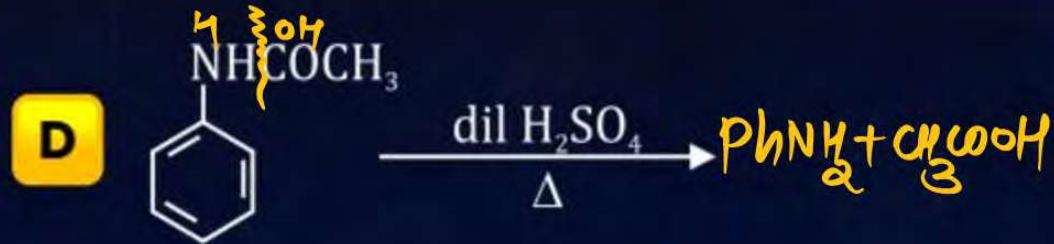
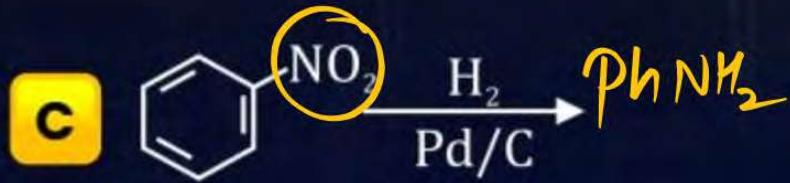
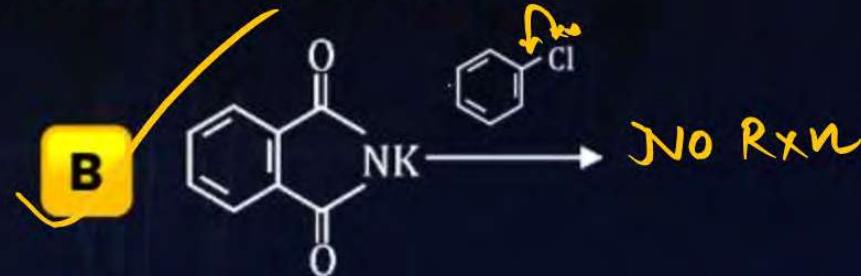
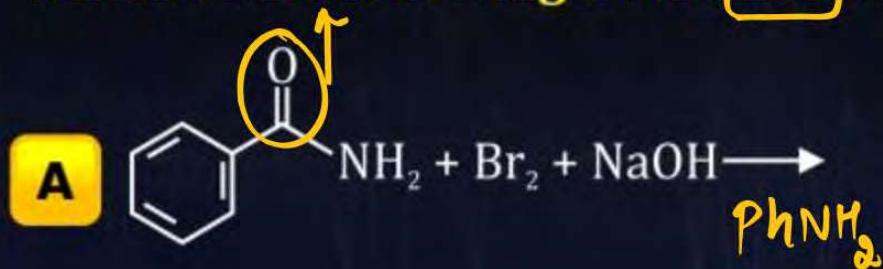
(IV) Sn, HCl

Choose the correct answer from the options given below:

- A** (A)-(II), (B)-(I), (C)-(III), (D)-(IV)
- B** (A)-(II), (B)-(IV), (C)-(III), (D)-(I)
- C** (A)-(III), (B)-(II), (C)-(IV), (D)-(I)
- D** (A)-(III), (B)-(IV), (C)-(II), (D)-(I) 

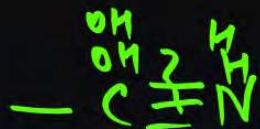
C.Q. 15 [31 Jan, JEE Mains 2023]

Which of the following would **not** result an aromatic amines?

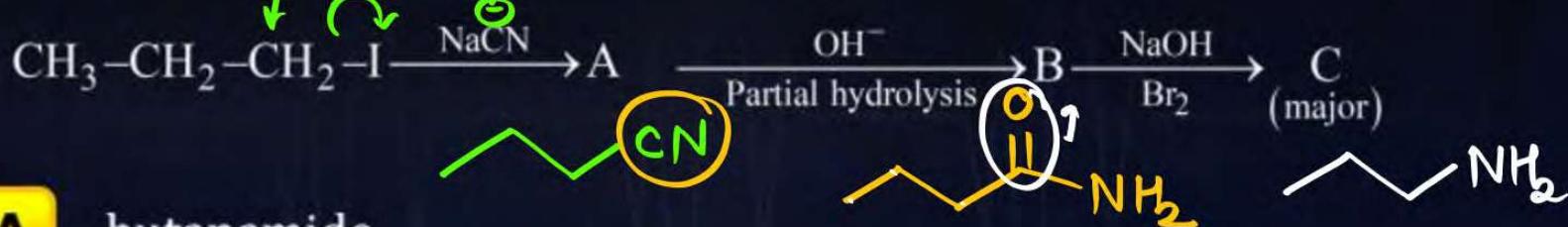


C.Q. 16 (NEET 2024)

PW



Identify the major product **C** formed in the following reaction sequence:



A butanamide

B α -bromobutanoic acid

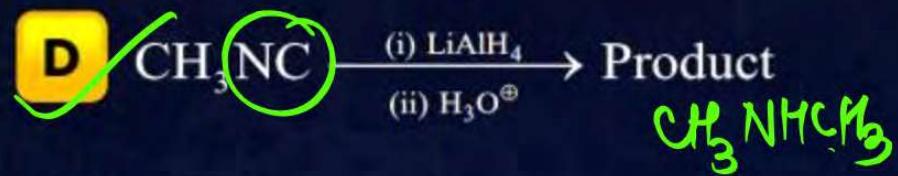
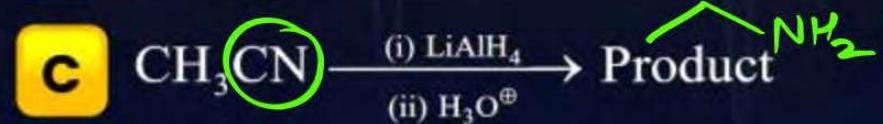
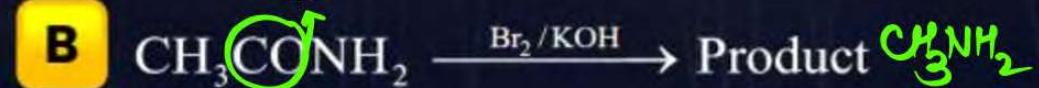
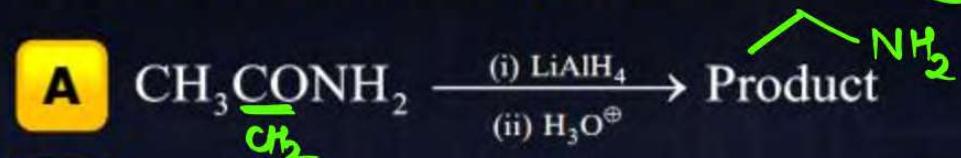
C propylamine

D butylamine

C.Q. 17 (NEET 2023)

PW

Which of the following reactions will NOT give primary amines as the product?



C.Q. 18 (NCERT Exemplar)

~~X~~ **Assertion:** Hoffmann's bromamide reaction is given by primary amines.

~~X~~ **Reason:** Primary amines are more basic than secondary amines.

$\text{1}^\circ < \text{2}^\circ$

- A** Both assertion and reason are wrong. ✓
- B** Both assertion and reason are correct statements but reason is not correct explanation of assertion.
- C** Assertion is correct statement but reason is wrong statement.
- D** Both assertion and reason are correct statements and reason is correct explanation of assertion.

Match the reactions given in Column I with the statements given in Column II.

Column I

(i) Ammonolysis d

(ii) Gabriel phthalimide synthesis c

(iii) Hoffmann Bromamide reaction a

(iv) Carbylamine reaction b

Column II

(a) Amine with lesser number of carbon atoms.

(b) Detection test for primary amines.

(c) Reaction of phthalimide with KOH and R—X

(d) Reaction of alkyl halides with NH₃



Chemical Properties of Amines



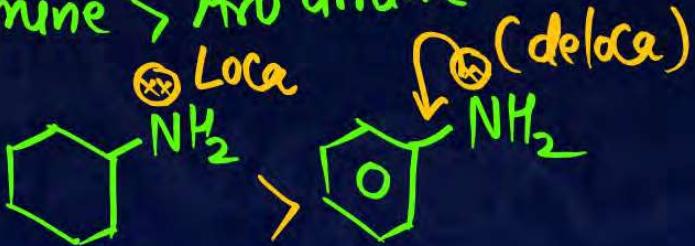
1. Basic character of amines:



$$[B_s \uparrow K_b \uparrow \rho K_b \downarrow] \\ [\bar{\Omega}_H \uparrow \rho^{\Omega_H} \downarrow, \rho^H \uparrow]$$

1) Availability of L-P on N \uparrow $B_s \uparrow$

2) Ali amine $>$ Aro amine



3) In gas phase $3^\circ > 2^\circ > 1^\circ$

4) In aq media (solvation hydration)

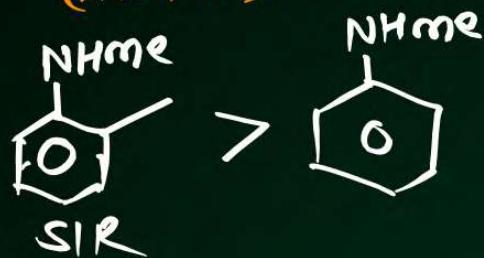
$R = Me \quad 2 > 1 > 3$

$R = Et \quad 2 > 3 > 1$

$R = Pr \quad 3 > 2 > 1$

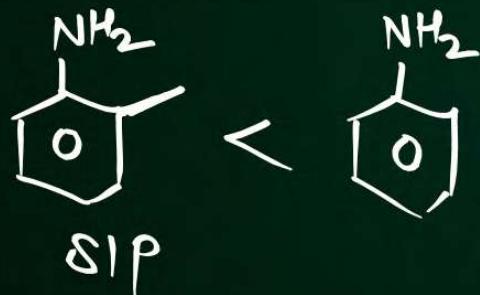
: :

⑤ SIR (in $3^\circ > 2^\circ$) BS ↑
 (ortho amine)



Non bulky
 H, D, T, F, OH, NH₂, CN
 etc

⑥ SIP (in 1° Aro amine) BS ↓



C.Q. 20 (JEE Mains 9th April 2024, Morning Shift)

Correct order of basic strength of Pyrrole



deloca



Loca
 δP^2

, Pyridine and Piperidine

A Piperidine > Pyridine > Pyrrole

C Pyridine > Piperidine > Pyrrole

B Pyrrole > Pyridine > Piperidine

D Pyrrole > Piperidine > Pyridine

C.Q. 21 (NCERT Exemplar)

Amongst the following, the strongest base in aqueous medium is _____.

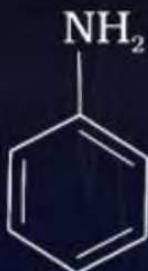


C.Q. 22 (NCERT Exemplar)

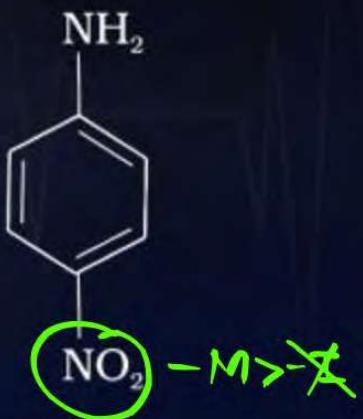


$$\text{BS} \propto +M, +H, +I \propto \frac{1}{-M, -H, -I}$$

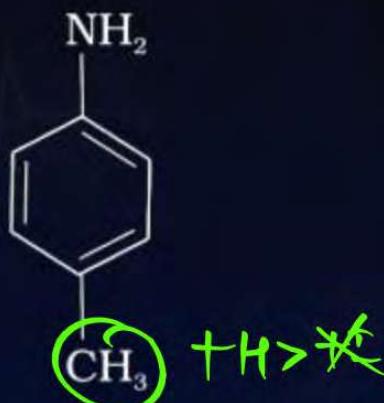
The correct increasing order of basic strength for the following compounds is



(I)



(II)



(III)

- A II < III < I
- C III < II < I

- B III < I < II
- D ✓ II < I < III

2. Alkylation: (Aromonolysis)



C.Q. 23

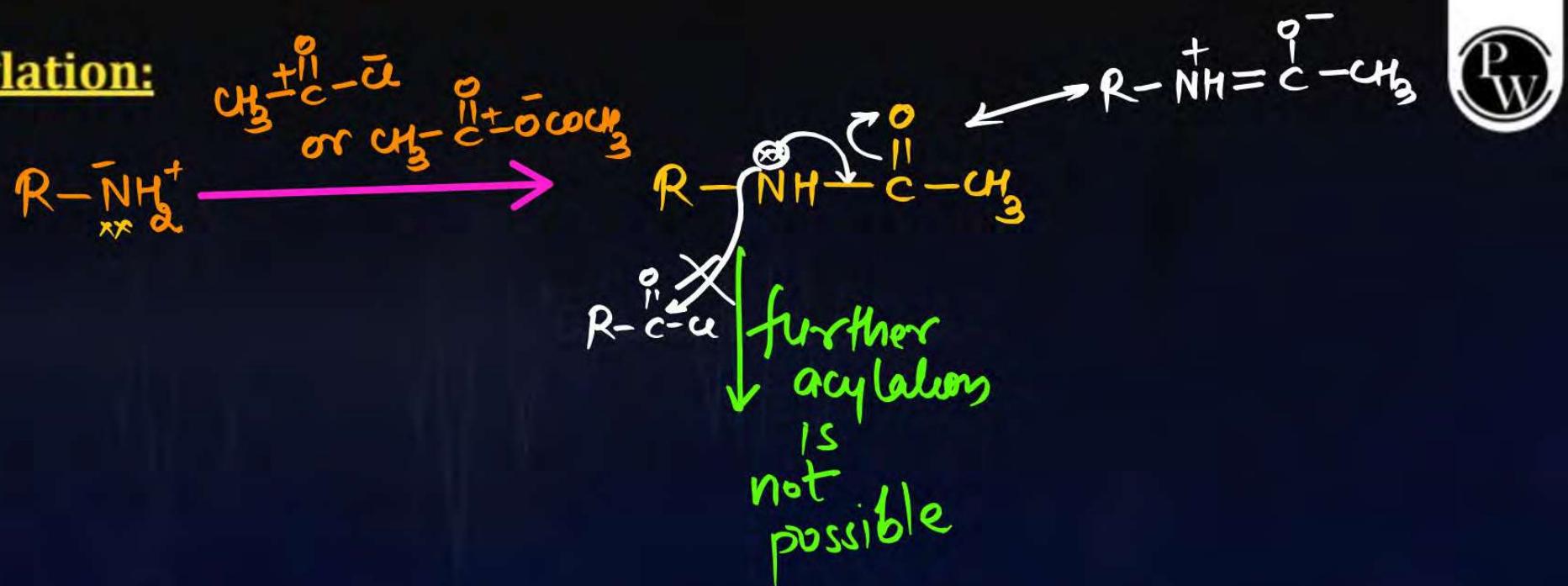


Alkylation is possible in:

- A** primary amines only
- B** secondary amines only
- C** tertiary amines only
- D** primary and secondary amines both



3. Acylation:



C.Q. 24 (NCERT Exemplar)

Assertion: Acylation of amines gives a monosubstituted product whereas alkylation of amines gives polysubstituted product.

Reason: Acyl group sterically hinders the approach of further acyl groups.

- A** Both assertion and reason are wrong.
- B** Both assertion and reason are correct statements but reason is not correct explanation of assertion.
- C** Assertion is correct statement but reason is wrong statement.
- D** Both assertion and reason are correct statements and reason is correct explanation of assertion.

4. Carbylamine Test: (Isocyanide Test) given by 1° amine (ali ✓ aro ✓)



Which of the following species are involved in the carbylamine test?

- A RNC
- B CHCl_3
- C COCl_2
- D Both (A) & (B)

C.Q. 26 [20 July, JEE Mains 2021 (Shift-I)]



Compound A is converted to B reaction with CHCl_3 and KOH. The compound B is toxic and can be composed by C. A, B and C respectively are:

- A Primary amine, nitrile compound, conc. HCl
- B Secondary amine, isonitrile compound, conc. NaOH
- C Primary amine, isonitrile compound, conc. HCl
- D Secondary amine, nitrile compound, conc. NaOH

5. Reaction with nitrous acid: (HNO_2) or ($\text{NaNO}_2 + \text{HCl}$)

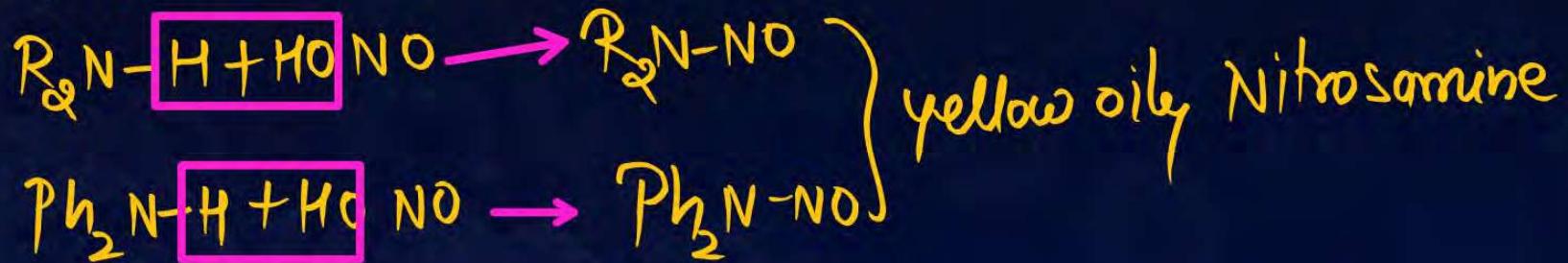
Ali 1° amine



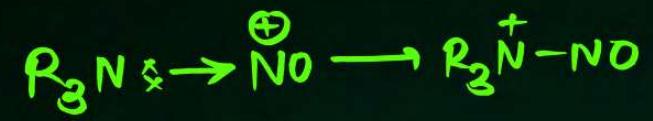
Aro 1° amine



Ali & Aro 2° amine

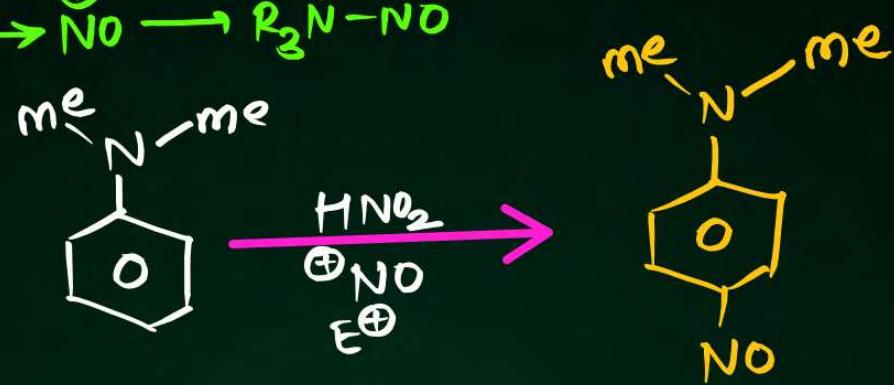


Ali 3° amine

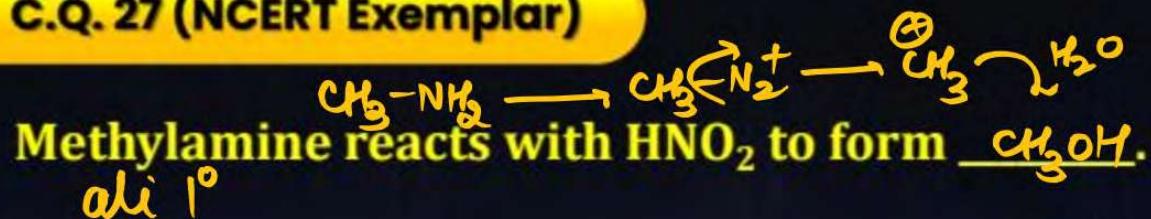


Aro 3° amine

ESR



C.Q. 27 (NCERT Exemplar)



- A $\text{CH}_3\text{ON}=0$
- C CH_3OH

- B CH_3OCH_3
- D CH_3CHO

C.Q. 28 (NCERT Exemplar)

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

- A NH₃
- C H₂

- B N₂
- D C₂H₆

C.Q. 29 (NEET 2022)



Given below are two statements:

~~Statements-I:~~ Primary aliphatic amines react with HNO_2 to give unstable diazonium salts.

~~Statements-II:~~ Primary aromatic amines react with HNO_2 to form diazonium salts which are stable even above 300 K.

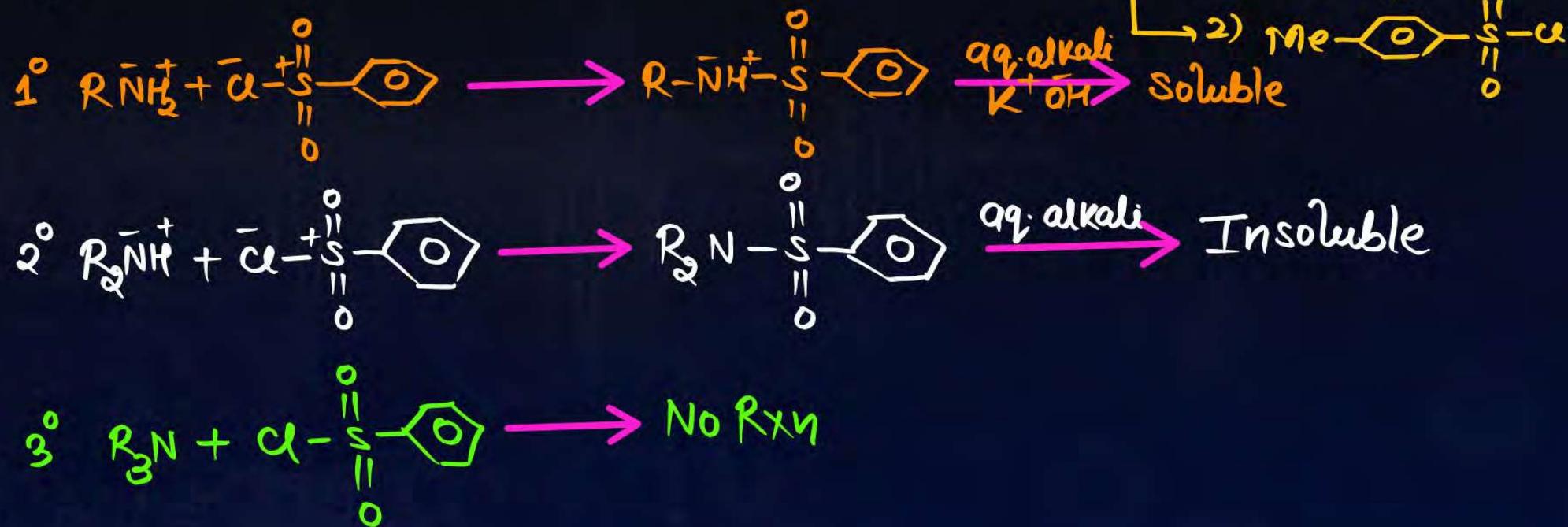


In the light of the above Statements, choose the most appropriate answer from the options given below:

- A Statements I is incorrect but Statements II is correct.
- B Both Statements I and Statements II are correct.
- C Both Statements I and Statements II are incorrect.
- D ~~Statements I is correct but Statement II is incorrect.~~

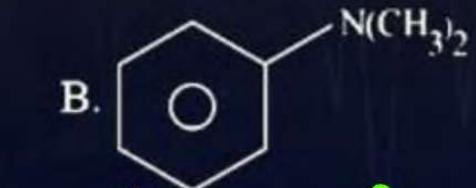
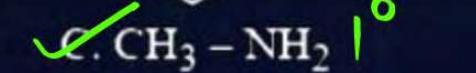
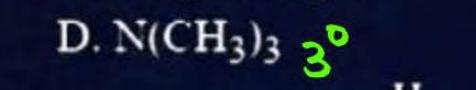
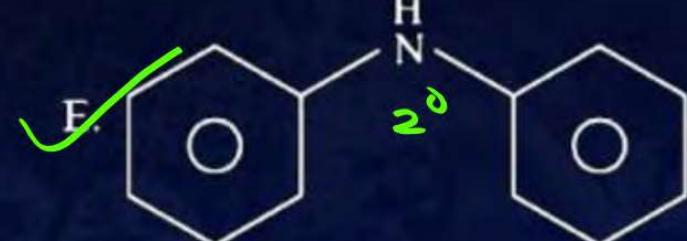
6. Reaction with Aryl sulphonyl chlorides (Hinsberg's Reagent):

Hinsberg's test used to distin. b/w 1°, 2° & 3° amines



C.Q. 30 (JEE Mains 2025, 23 January Shift-1)

Which among the following react with Hinsberg's reagent?

- A.  1°
- B.  3°
- C.  1°
- D.  3°
- E.  2°

Choose the correct answer from the options given below:

- A** C and D only
- B** A, B and E Only
- C** B and D Only
- D** A, C and E Only



C.Q. 31 (JEE Mains 2025, 28 January Shift-2)



Identify correct statements:

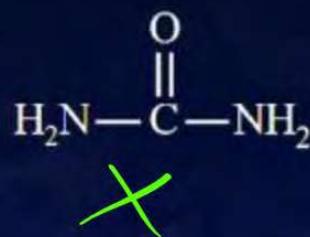
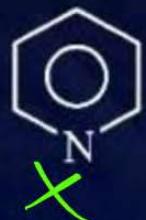
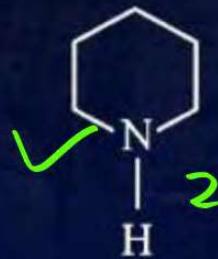
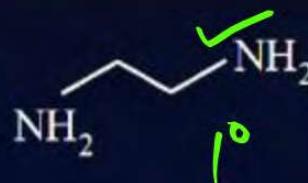
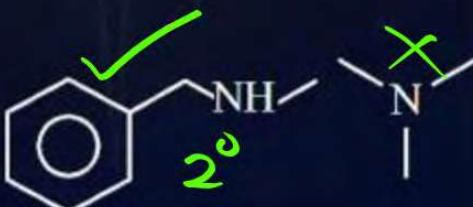
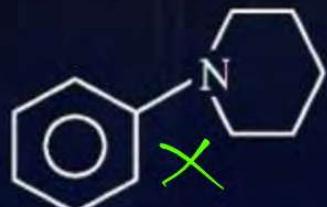
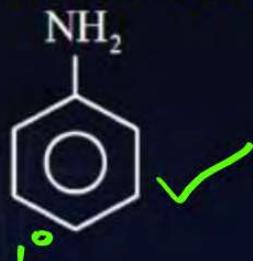
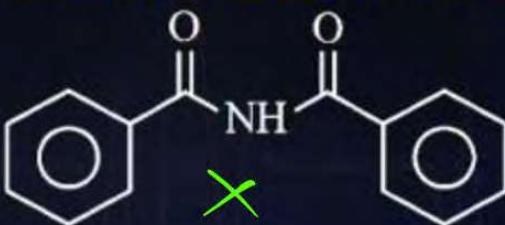
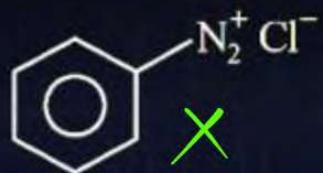
- (A) Primary amines do not give diazonium salts when treated with NaNO_2 in acidic condition.
- (B) Aliphatic and aromatic primary amines on heating with CHCl_3 and ethanolic KOH form carbylamines.
- (C) Secondary and tertiary amines also give carbylamines test.
- (D) Benzene sulfonyl chloride is known as Hinsberg's reagent.
- (E) Tertiary amines reacts with benzene sulfonyl chloride very easily.

Choose the correct answer from the options given below:

- A** (B) and (C) only
- B** (D) and (E) only
- C** (B) and (D) only
- D** (A) and (B) only

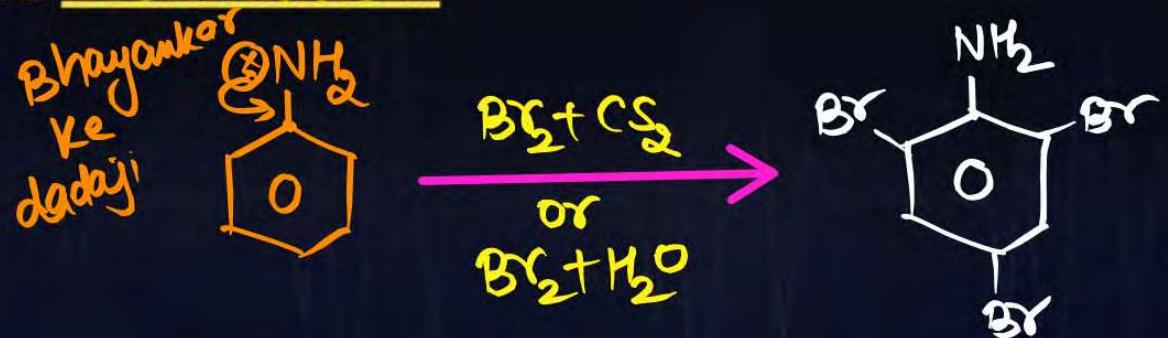
C.Q. 32 (JEE Mains 1st Feb 2024, Evening Shift)

Number of compound which give reaction with Hinsberg's reagent is 5.

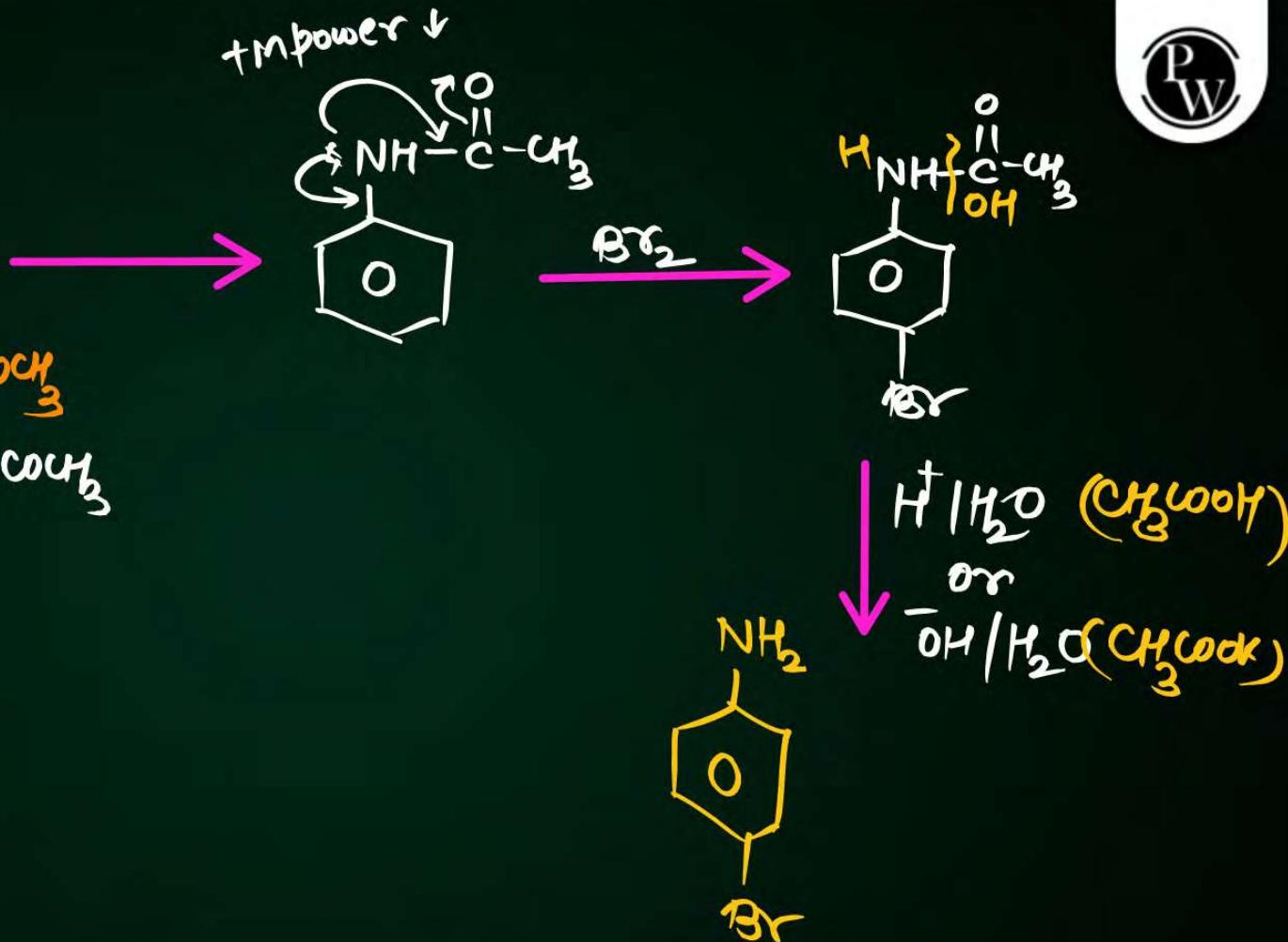
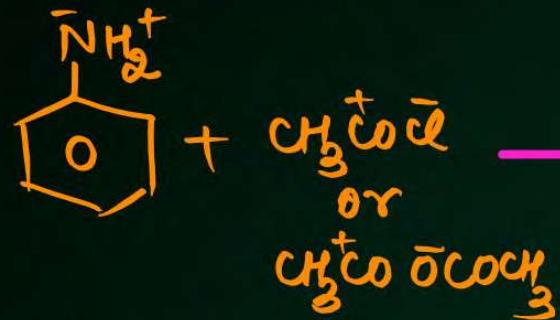


7. Electrophilic aromatic substitution reaction:

A. Bromination:

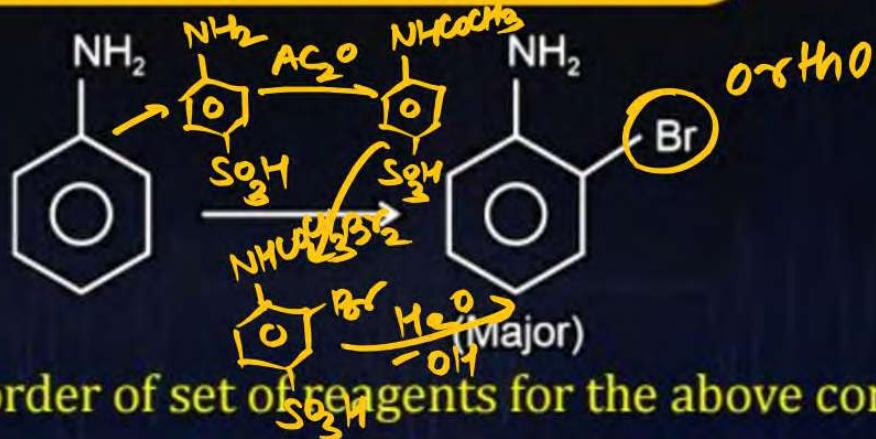


For mono bromination



C.Q. 33 (JEE Mains 2025, 24 January Shift-2)

For reaction



The correct order of set of reagents for the above conversion is:

A $\underline{\text{H}_2\text{SO}_4}$, $\underline{\text{Ac}_2\text{O}}$, $\underline{\text{Br}_2}$, $\underline{\text{H}_2\text{O}(\Delta)}$, $\underline{\text{NaOH}}$

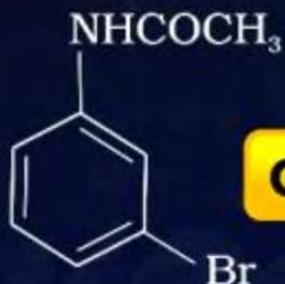
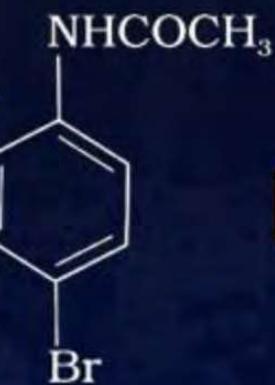
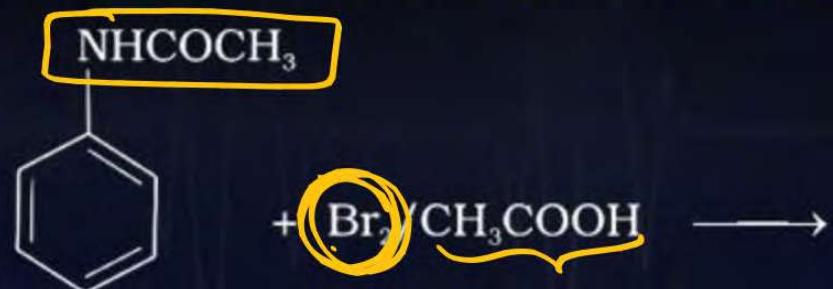
B $\cancel{\text{X}} \underline{\text{Ac}_2\text{O}}$, $\underline{\text{H}_2\text{SO}_4}$, $\underline{\text{Br}_2}$, $\underline{\text{NaOH}}$

C $\cancel{\text{X}} \underline{\text{Ac}_2\text{O}}$, $\underline{\text{Br}_2}$, $\underline{\text{H}_2\text{O}(\Delta)}$, $\underline{\text{NaOH}}$

D $\cancel{\text{X}} \underline{\text{Br}_2/\text{FeBr}_3}$, $\underline{\text{H}_2\text{O}(\Delta)}$, $\underline{\text{NaOH}}$

C.Q. 34 (NCERT Exemplar)

The product of the following reaction is _____.



D

None of these

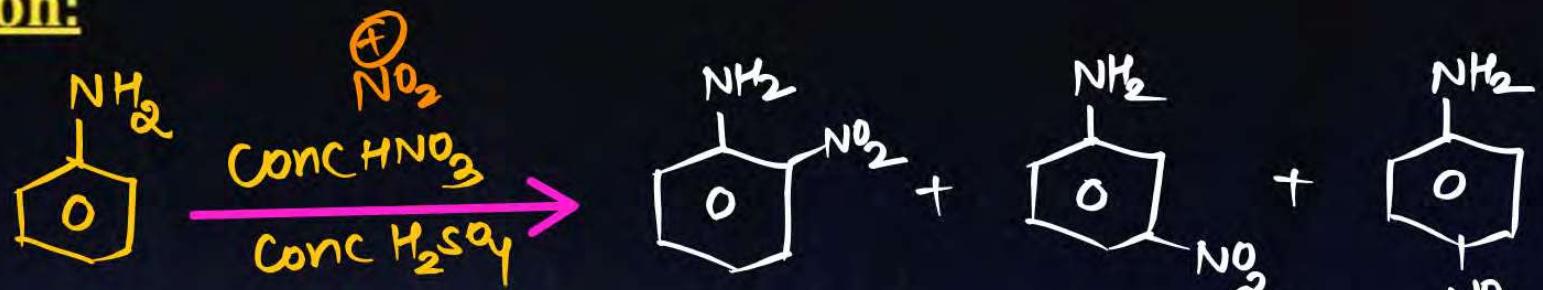
C.Q. 35



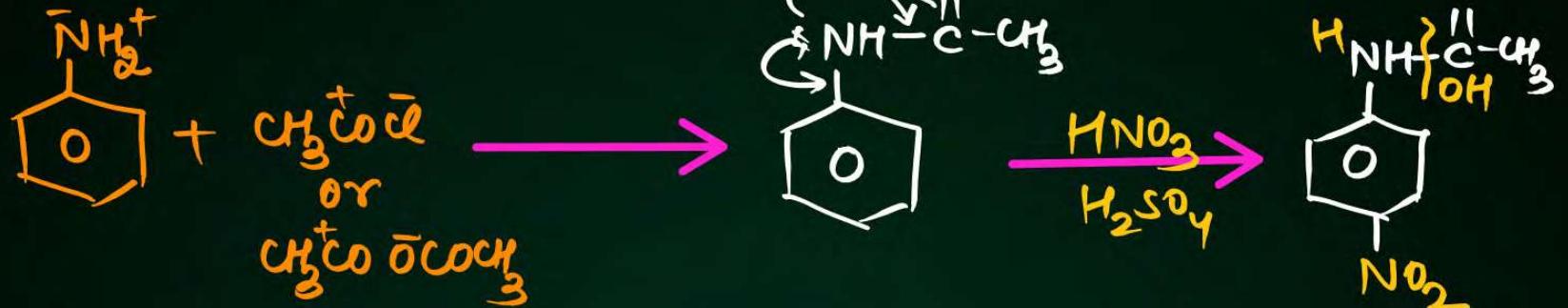
Aniline on treatment with aqueous bromine gives:

- A 2,4,6-tribromoaniline
- B *o*-bromoaniline
- C 2,4-dibromoaniline
- D *p*-bromoaniline

B. Nitration:



For mono nitration



+M power $\text{NH}_2 >> \text{NHCOCH}_3$



$\text{H}^+/\text{H}_2\text{O} (\text{CH}_3\text{COOH})$
or
 $-\text{OH}/\text{H}_2\text{O} (\text{CH}_3\text{COOK})$

C.Q. 36 (AIIMS 2010)

Assertion: Nitration of aniline can be conveniently done by protecting the amino group by acetylation.

Reason: Acetylation increases the electron-density on the benzene ring.

- A** If both Assertion and Reason are correct and the Reason is the correct explanation of Assertion.
- B** If both Assertion and Reason are correct but Reason is not the correct explanation of Assertion.
- C** If Assertion is correct but Reason is incorrect.
- D** If both the Assertion and Reason are incorrect.

C.Q. 37 [28 July, JEE Mains 2022 (Shift-II)]

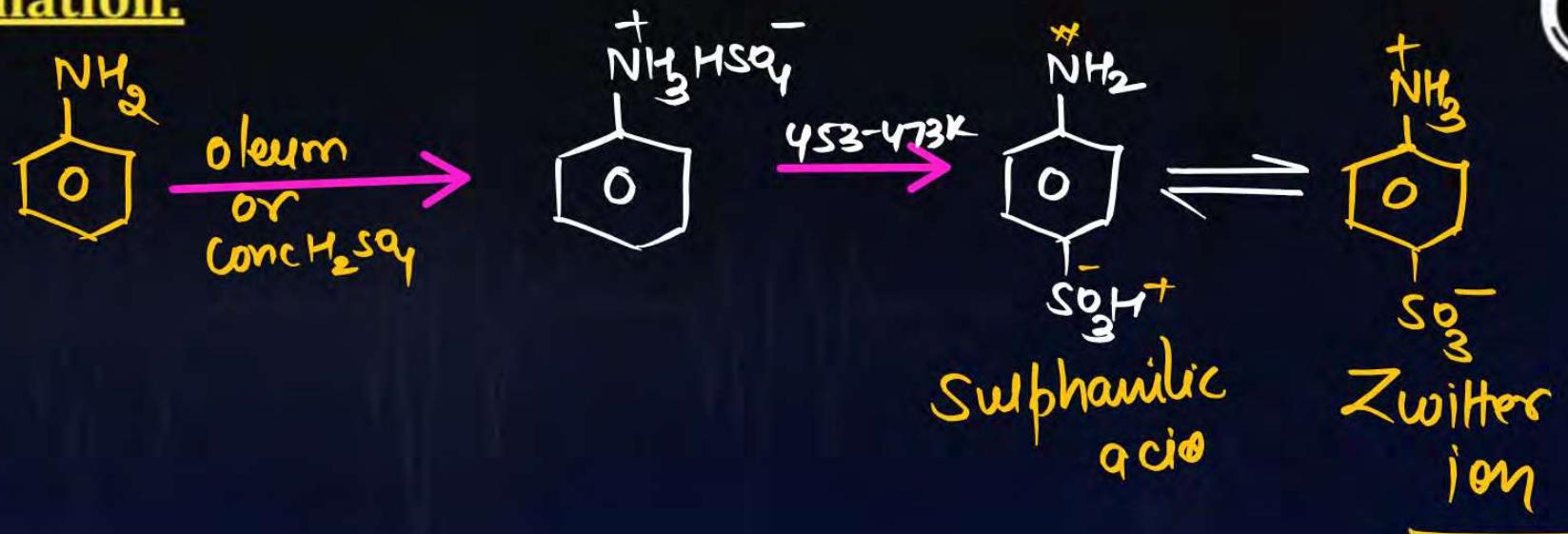
Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A): Aniline on nitration yields ortho, meta and para nitro derivatives of aniline.

Reason (R): Nitrating mixture is a strong acidic mixture.

- A** Both (A) and (R) are true and (R) is the correct explanation of (A).
- B** Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
- C** (A) is true but (R) is false.
- D** (A) is false but (R) is true.

C. Sulphonation:



C.Q. 38

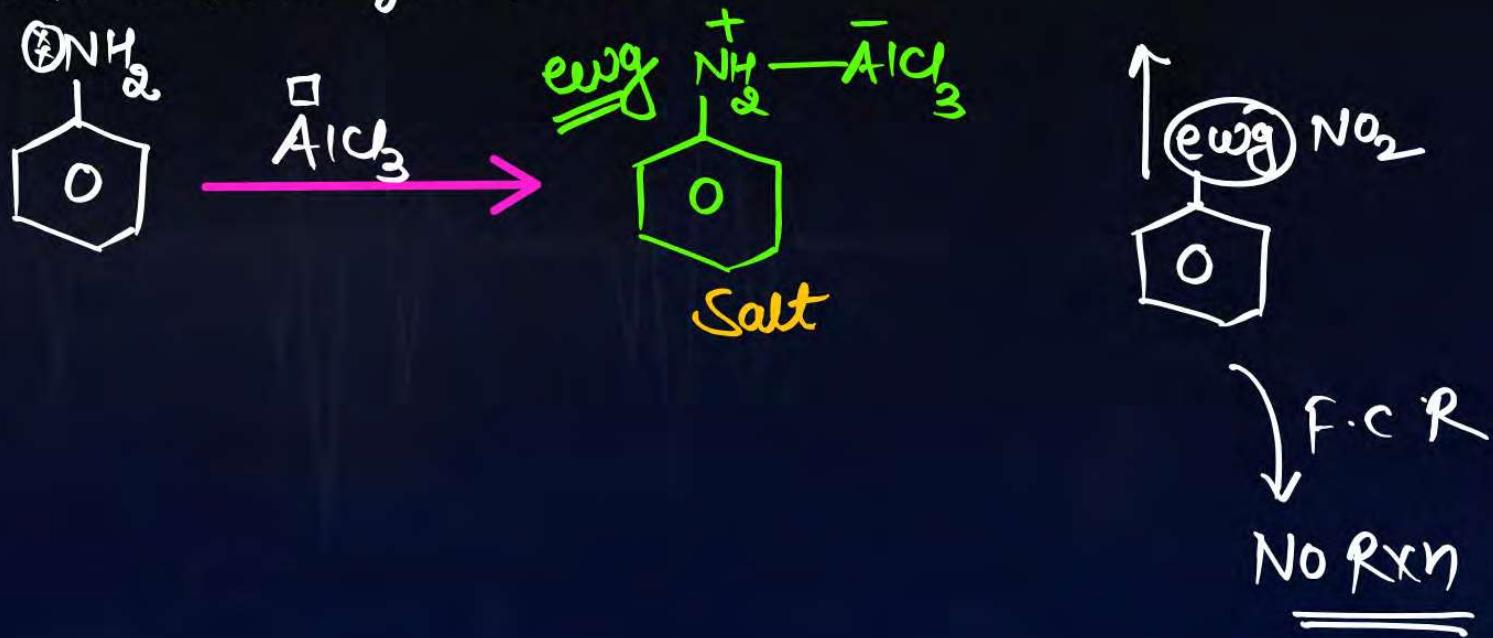


Aniline on heating with fuming sulphuric acid gives:

- A aniline sulphate
- B sulphanilic acid
- C aniline 2, 4-disulphonic acid
- D nitrobenzene

D. Friedel-Crafts Reaction (Alkylation & Acetylation):

Aniline does not give F.C.R



C.Q. 39 (NEET 2024)

Given below are two statements:

Statement I: Aniline does not undergo Friedel-Crafts alkylation reaction.

Statement II: Aniline cannot be prepared through Gabriel synthesis.

In the light of the above statement, choose the correct answer from the option given below.

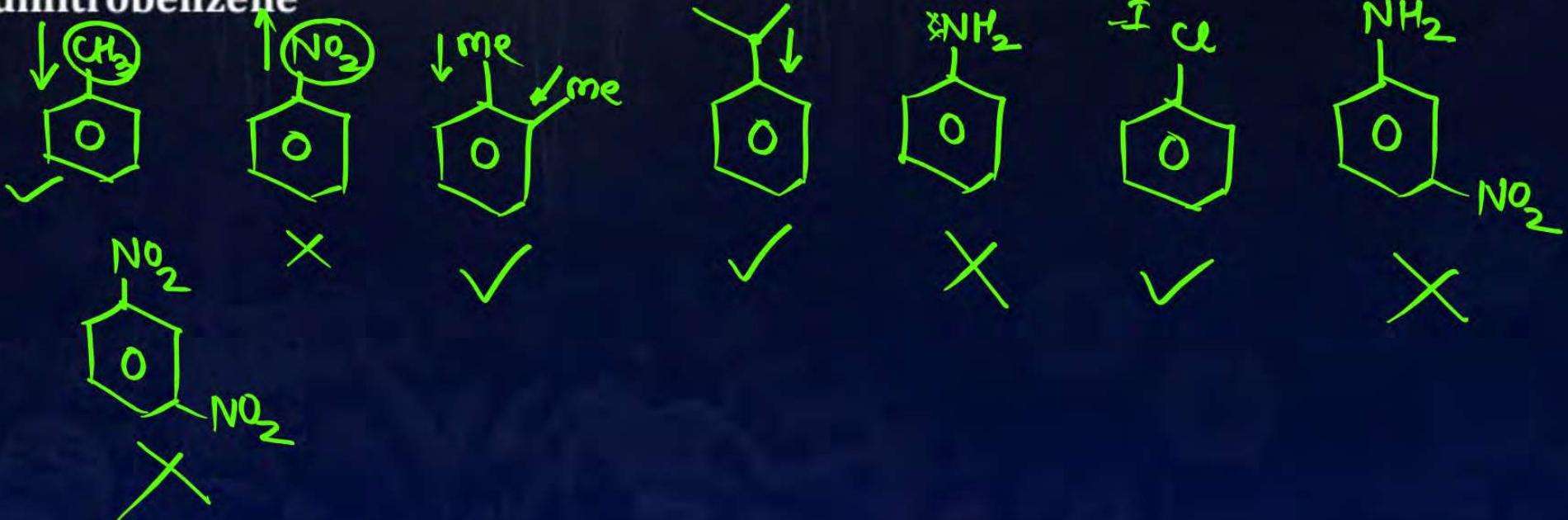
- A** Statement I is correct but Statement II is false.
- B** Statement I is incorrect but Statement II is true.
- C** Both Statement I and Statement II are true.
- D** Both Statement I and Statement II are false.

C.Q. 40 (JEE Mains 9th April 2024, Evening Shift)

aniline & Nitrobenzene
P W

Number of compounds from the following which cannot undergo Friedel-Crafts reactions is: 4

toluene, nitrobenzene, xylene, cumene, aniline, chlorobenzene, m-nitroaniline, m-dinitrobenzene





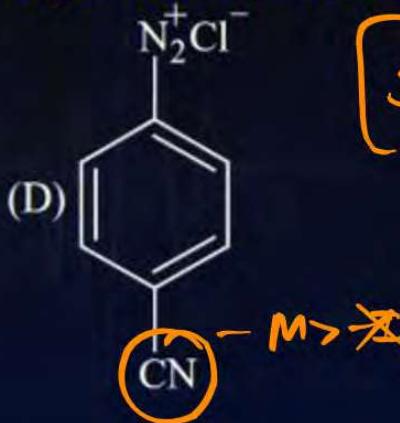
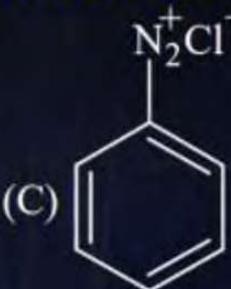
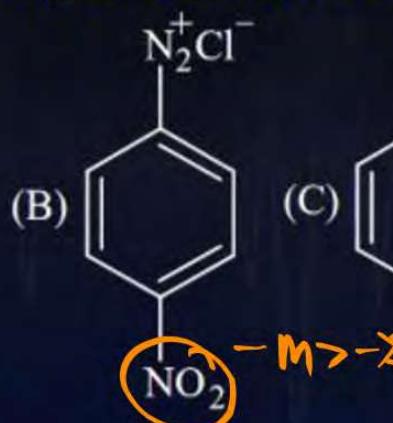
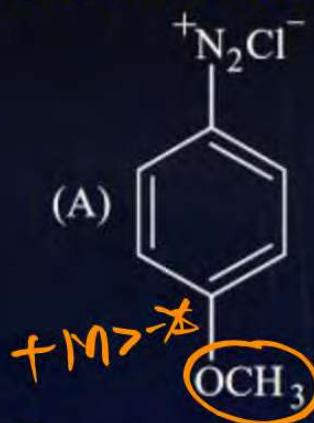
Methods of Preparation of Diazonium Salt



C.Q. 41 [26 July, JEE Mains 2022 (Shift-I)]



The correct stability order of the following diazonium salt is:



[Stability \propto edge $\propto \frac{1}{\text{ewg}}$]

-M power

$-\text{NO}_2 > -\text{CN}$

- A (A) > (B) > (C) > (D)
- B ~~(A) > (C) > (D) > (B)~~
- C ~~(C) > (A) > (D) > (B)~~
- D ~~(C) > (D) > (B) > (A)~~



Chemical Properties of Diazonium Salt

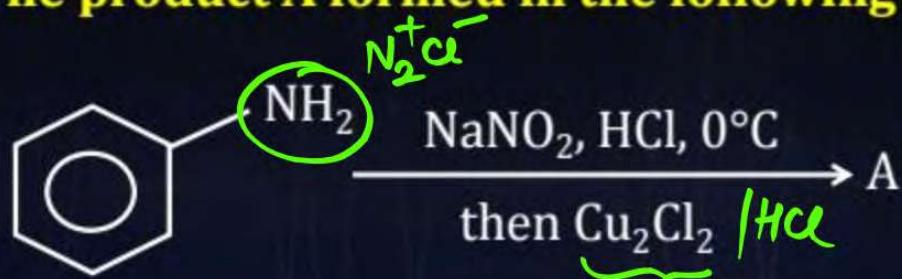
1. Reactions involving displacement of nitrogen:

A. Replacement of halide & cyanide ion:

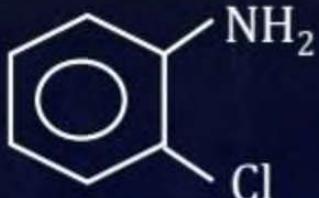


C.Q. 42 (JEE Mains 29th January 2024, Evening Shift)

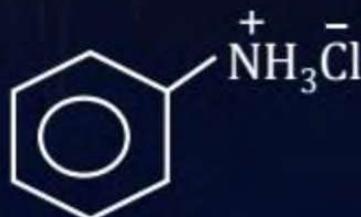
The product A formed in the following reaction is:



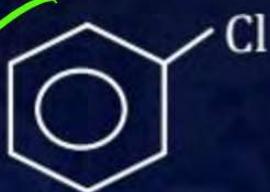
A



B



C



D



C.Q. 43 (NCERT Exemplar)

The reaction $\text{Ar N}_2^+ \text{Cl}^- \xrightarrow{\text{Cu}/\text{HCl}} \text{ArCl} + \text{N}_2 + \text{CuCl}$ is named as _____.

- A** Sandmeyer reaction
- C** Aldol condensation

- B** Gatterman reaction
- D** Carbylamine reaction

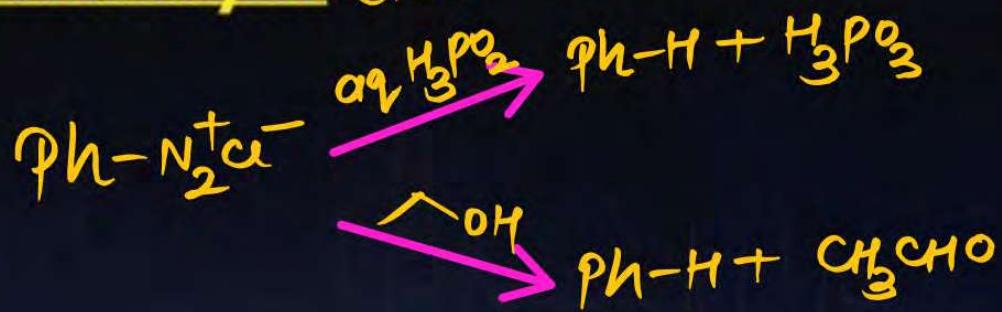
B. Replacement by iodide ion: Sizzis Rxn



C. Replacement by fluoride ion: Balz-Schiemann Rxn



D. Replacement by H: (Redⁿ rxn)



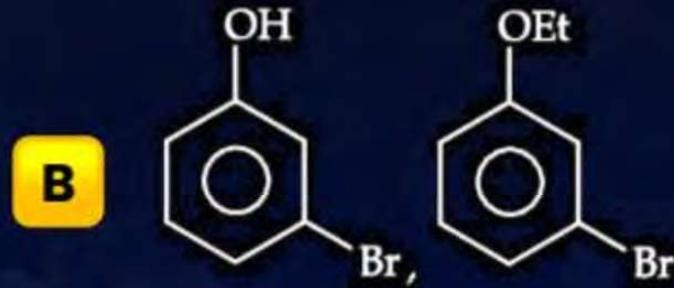
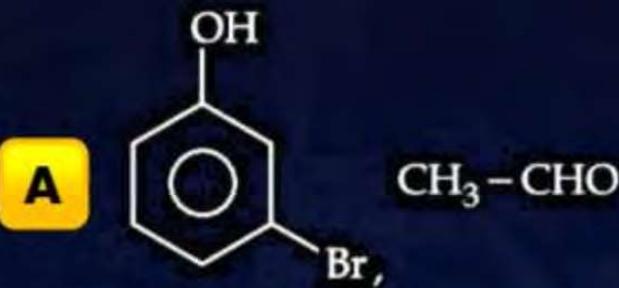
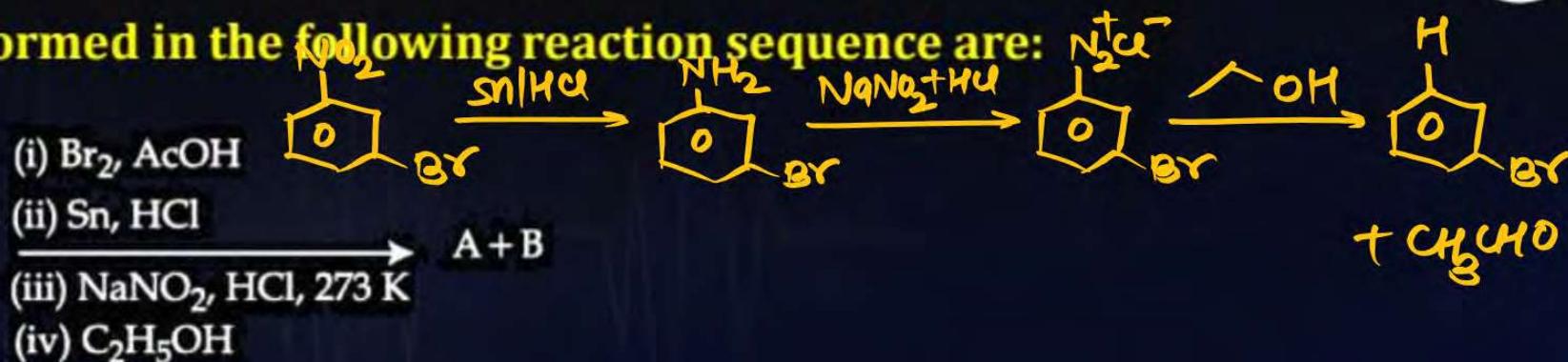
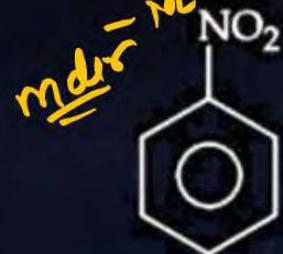
E. Replacement by hydroxyl group:

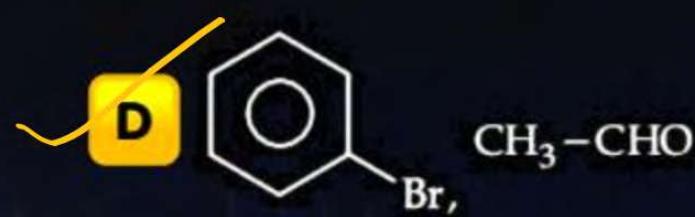
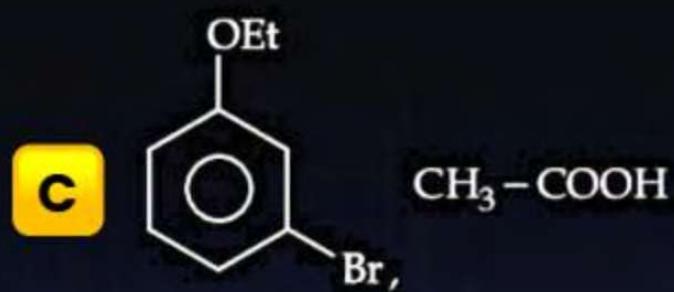


C.Q. 44 (JEE Mains 2025, 22 January Shift-1)

P
W

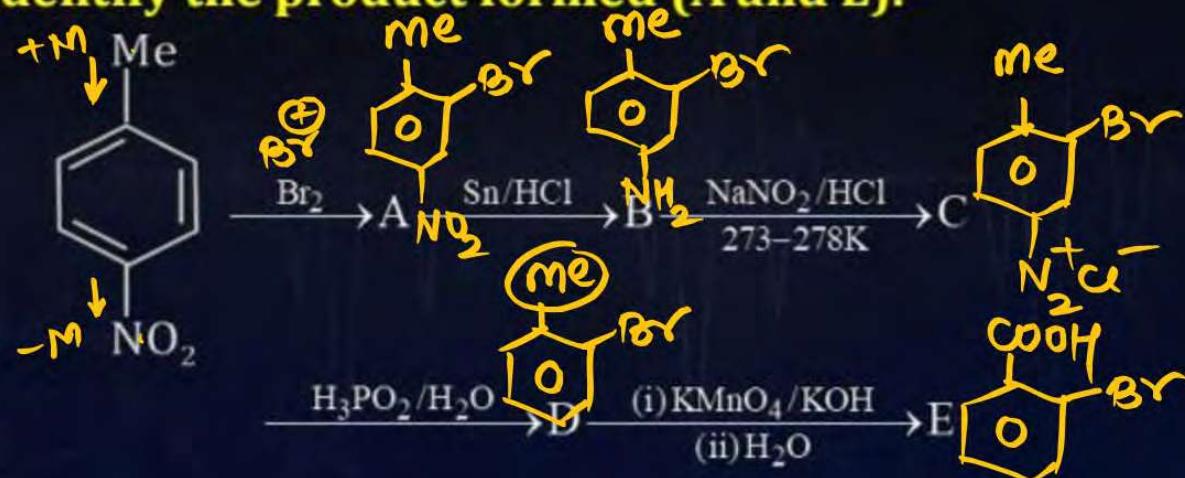
The products formed in the following reaction sequence are:



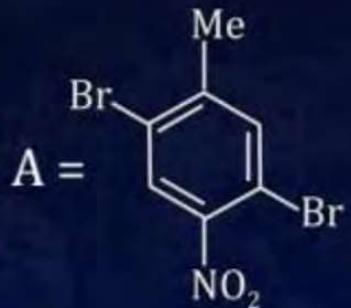


C.Q. 45 [25 Jan, JEE Mains 2023]

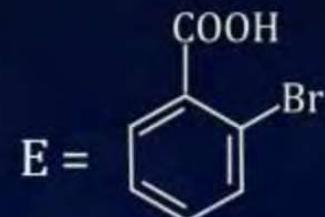
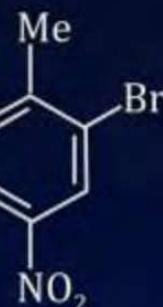
Identify the product formed (A and E).

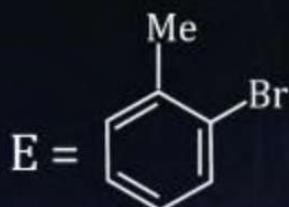
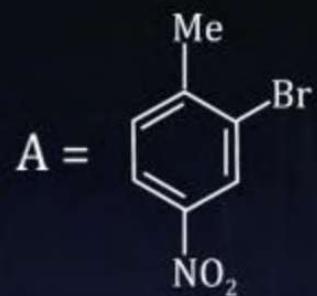
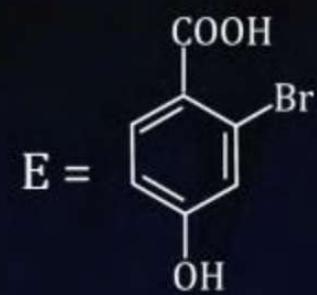
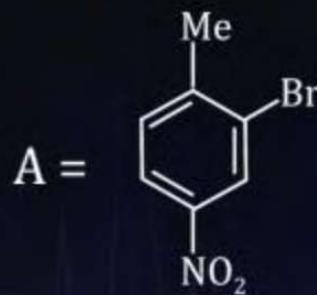


A



B

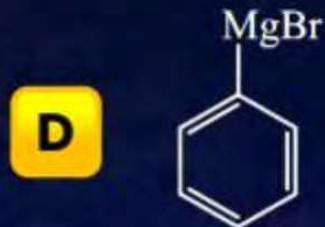
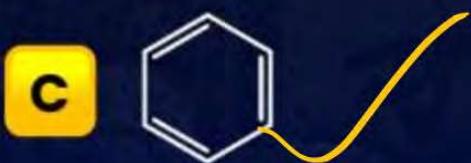
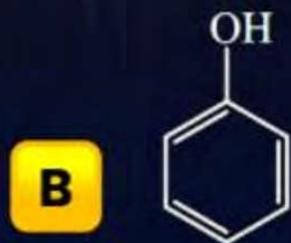
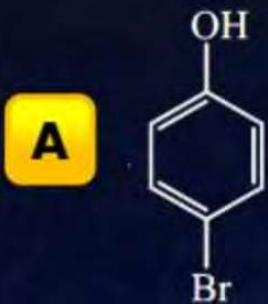
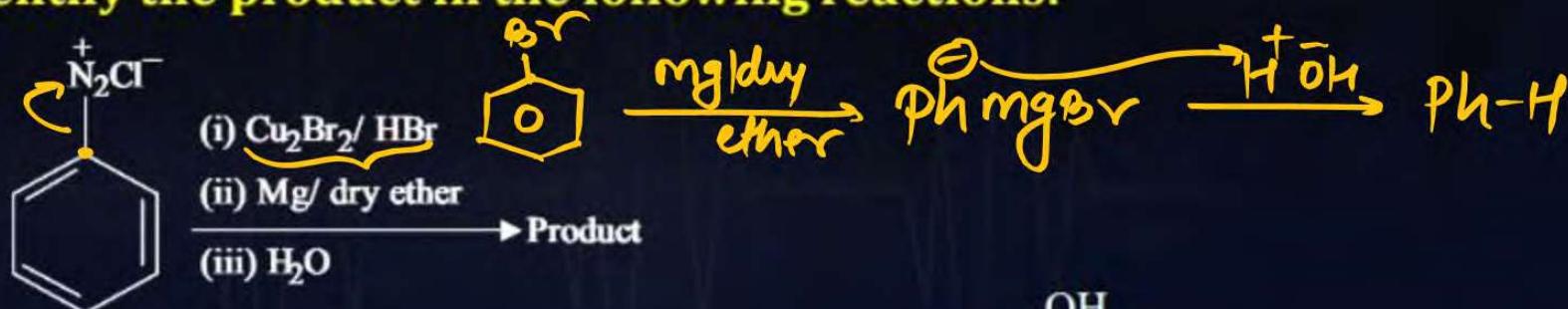


C**D**

C.Q. 46 (NEET 2023)

PW

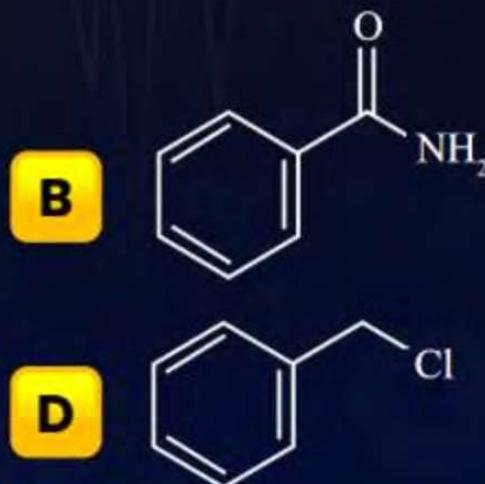
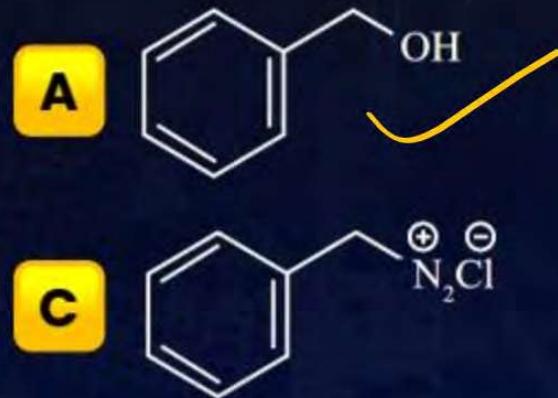
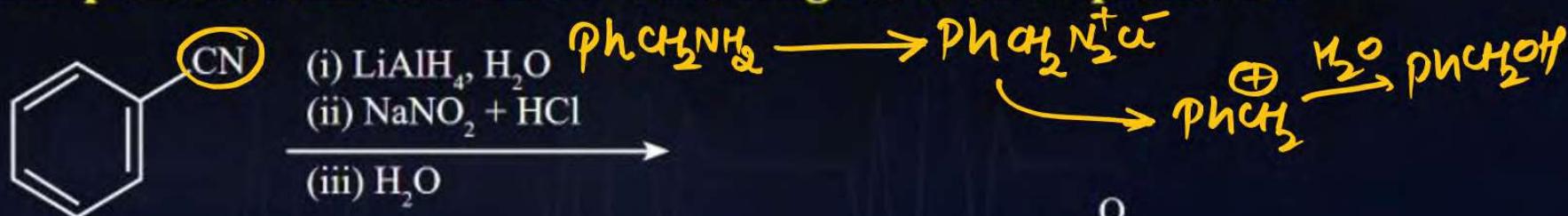
Identify the product in the following reactions:



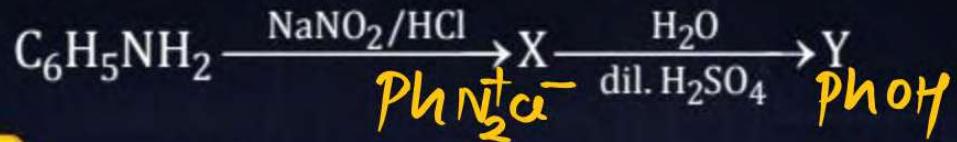
C.Q. 47 (NEET 2022)

PW

The product formed from the following reaction sequence is:



C.Q. 48 (AIIMS 1998)

Identify Y in the reaction:

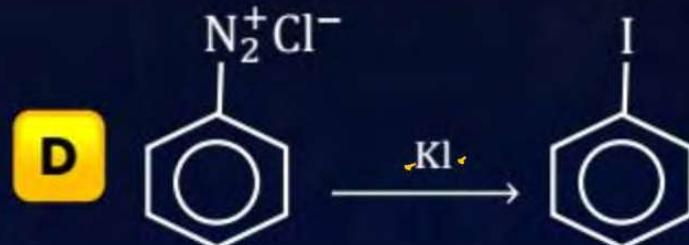
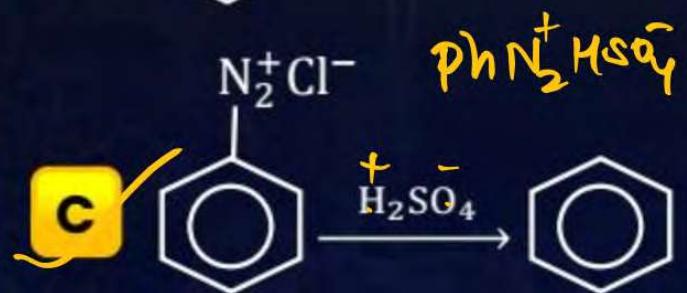
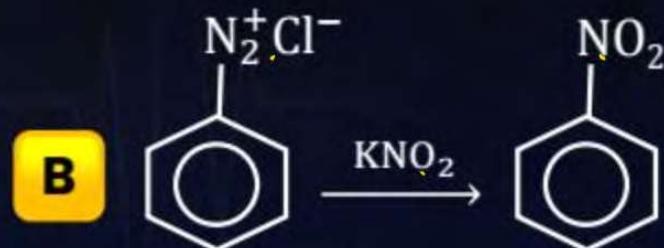
- A** $\text{C}_6\text{H}_5\text{N}_2\text{Cl}$
- B** $\text{C}_6\text{H}_5\text{OH}$
- C** $\text{C}_6\text{H}_5\text{NHOH}$
- D** C_6H_6

F. Replacement by -NO₂ group:



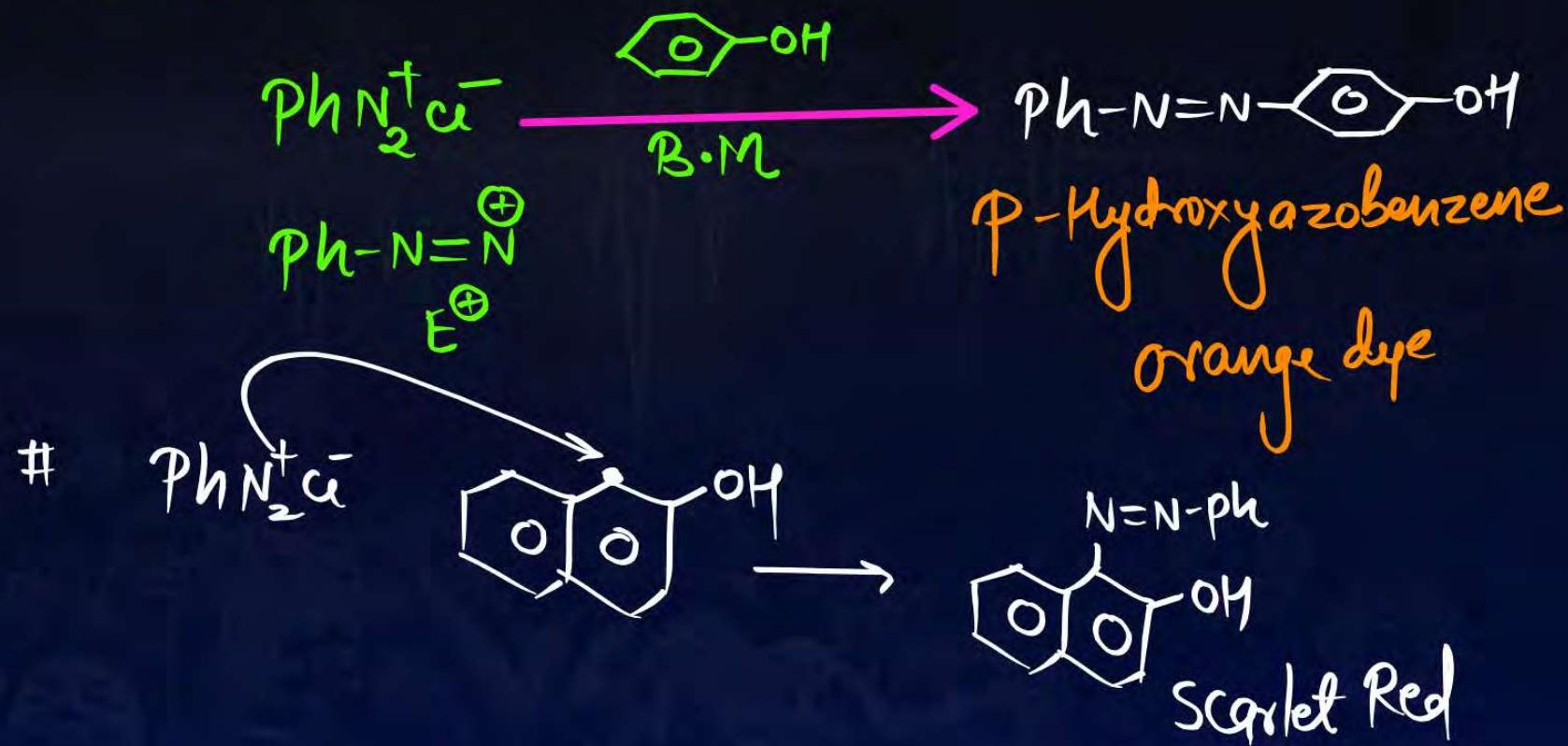
C.Q. 49 (AIIMS 27 May, 2018 (M))

Which reaction gives wrong product?



2. Reactions involving retention of diazo group:

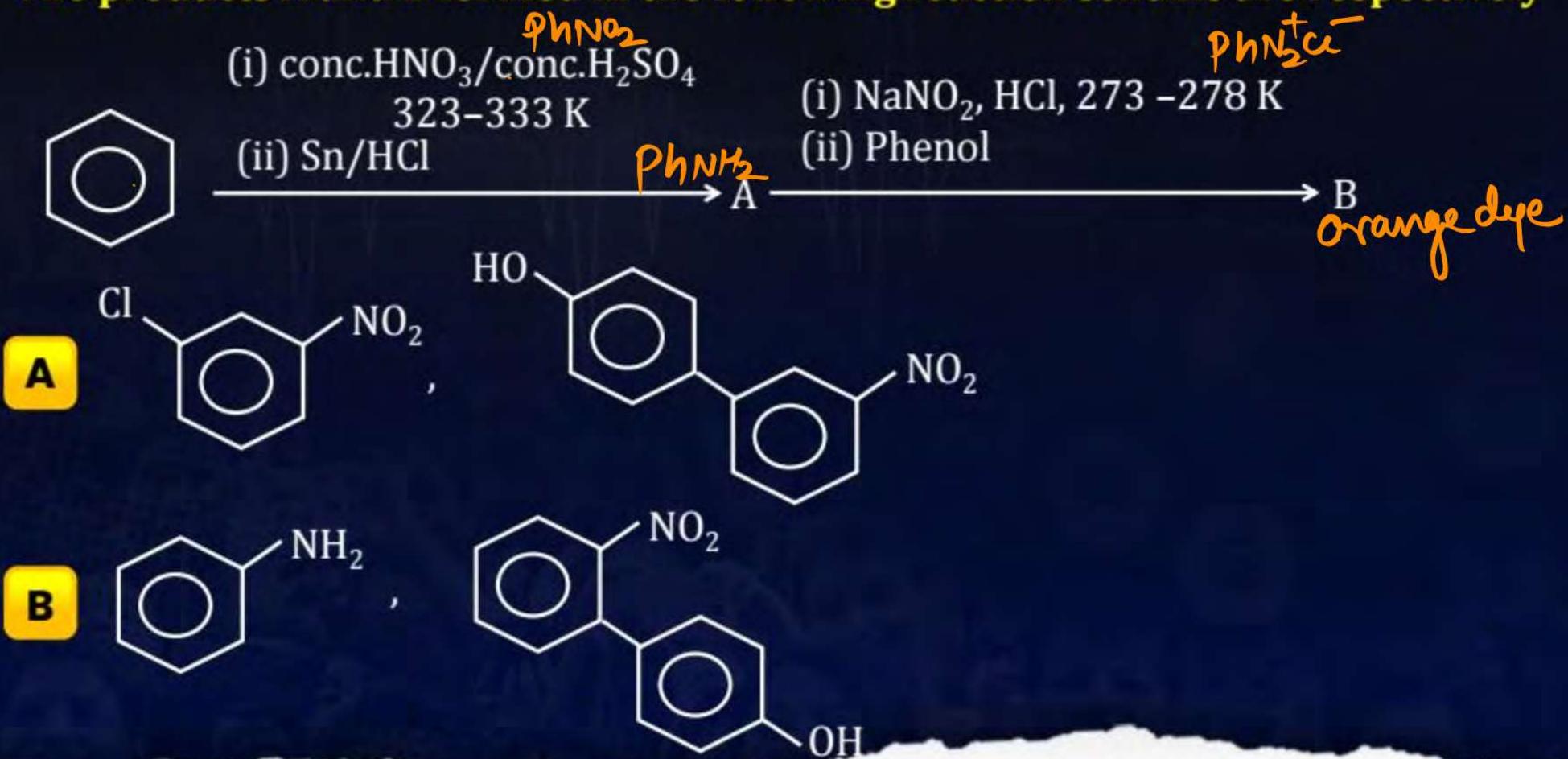
Coupling reactions: A. With phenol

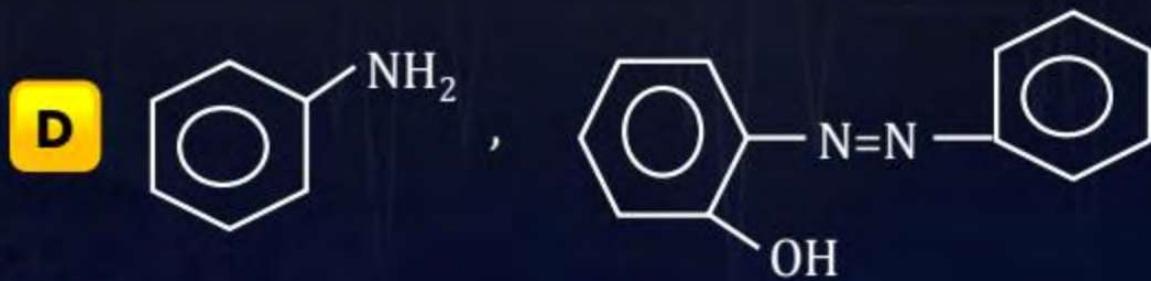
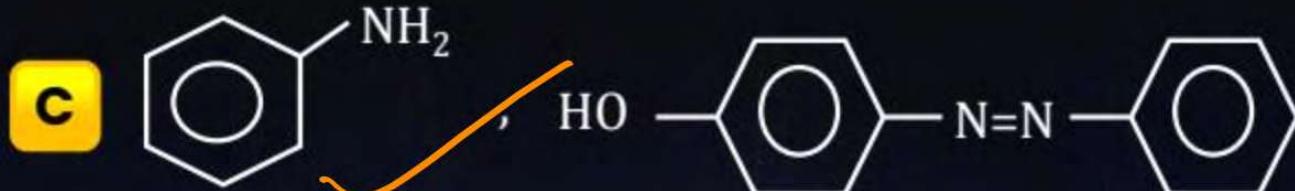


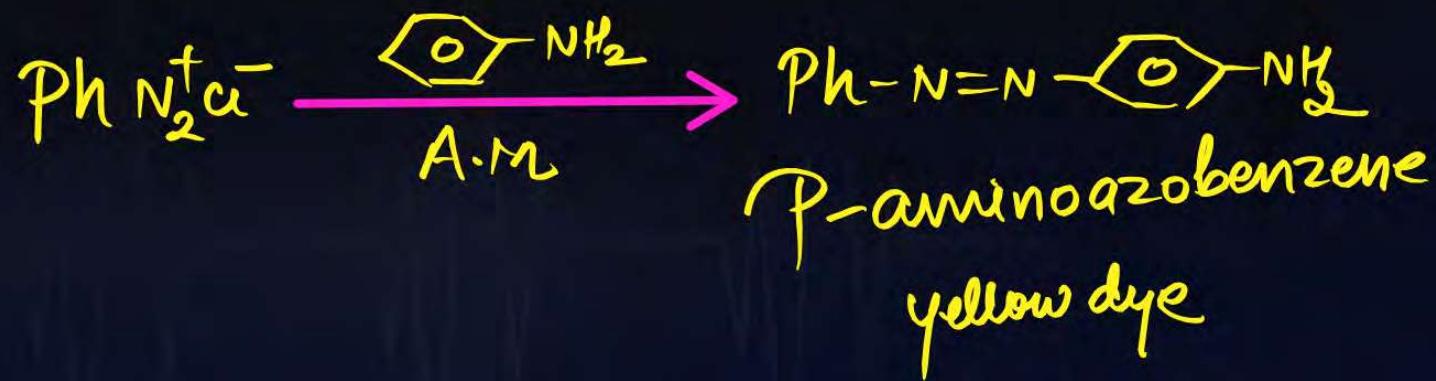
C.Q. 50 (JEE Mains 30th January 2024, Evening Shift)

PW

The products A and B formed in the following reaction scheme are respectively

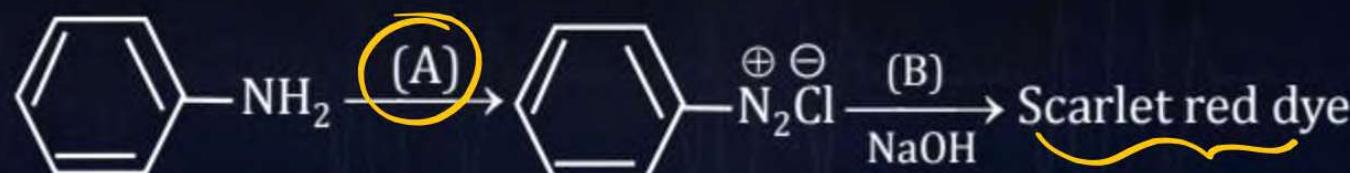




B. With aniline:

C.Q. 51 (JEE Mains 30th January 2024, Morning Shift)

Following is a confirmatory test for aromatic primary amines. Identify reagent (A) and (B).

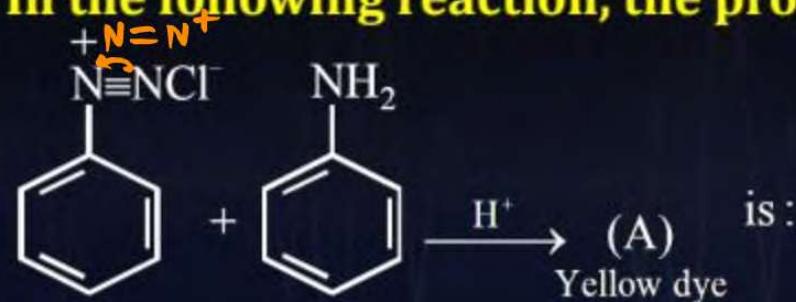
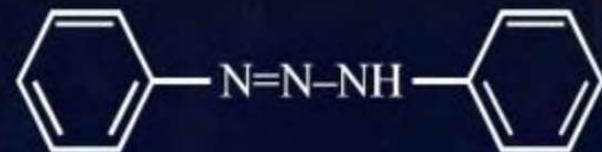
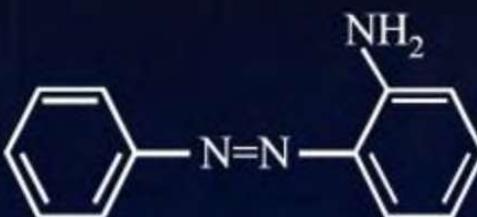
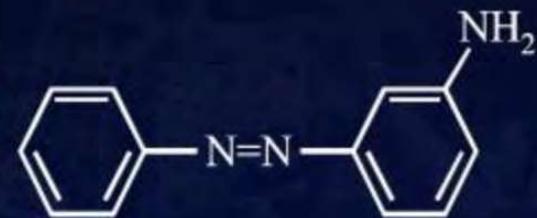
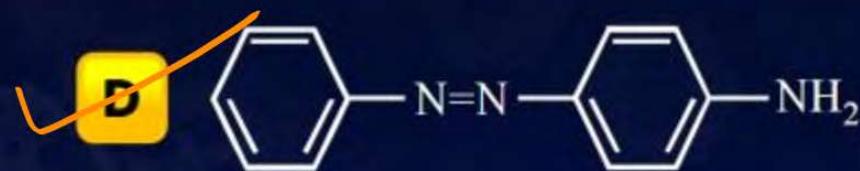


A = ~~HNO₃/H₂SO₄~~; B =

B = NaNO₂+HCl, 0-5°C; B =

C = NaNO₂+HCl, 0-5°C; B =

D = NaNO₂+HCl, 0-5°C; B =

C.Q. 52 (NEET 2014)**In the following reaction, the product (A).****A****B****C****D**

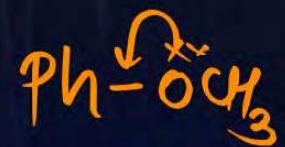
C.Q. 53 (AIIMS 2016)

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

A Aniline



C Anisole

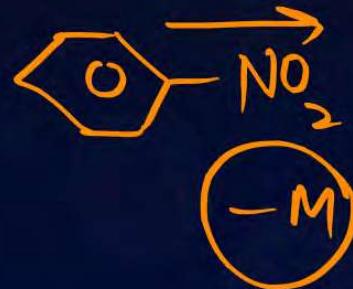


B Phenol



D

Nitrobenzene





Physical Properties of Amines

1. Boiling Point

BPD & MW

due to hydrogen bonding BPT↑

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

2. Melting Point

MP \propto C.L.E

Amines > Amides

3. Solubility

No. of C ↑ Hydrophobic part ↑ soln ↓

C.Q. 54 (AIIMS 2004)

Melting points are normally highest for

- A tertiary amides
- B secondary amides
- C primary amides
- D amines



Practice Problems

QUESTION-1



Which one of the following is not a primary amine?

A

tert-Butylamine



B

Ethylamine



C

sec-Butylamine



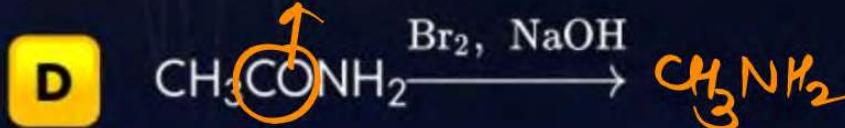
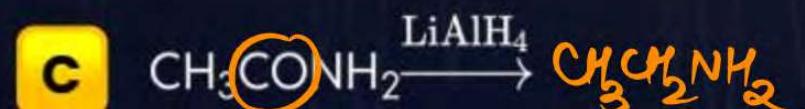
D

Dimethylamine



QUESTION-2

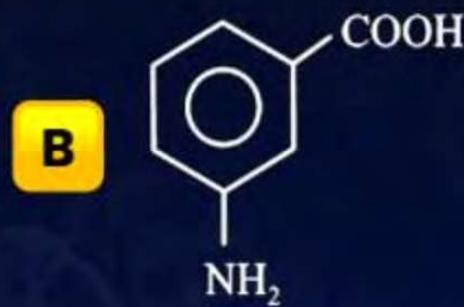
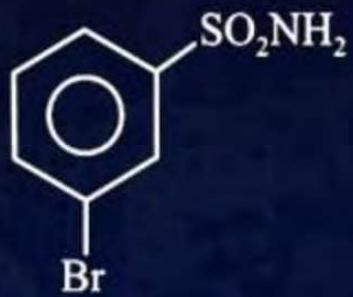
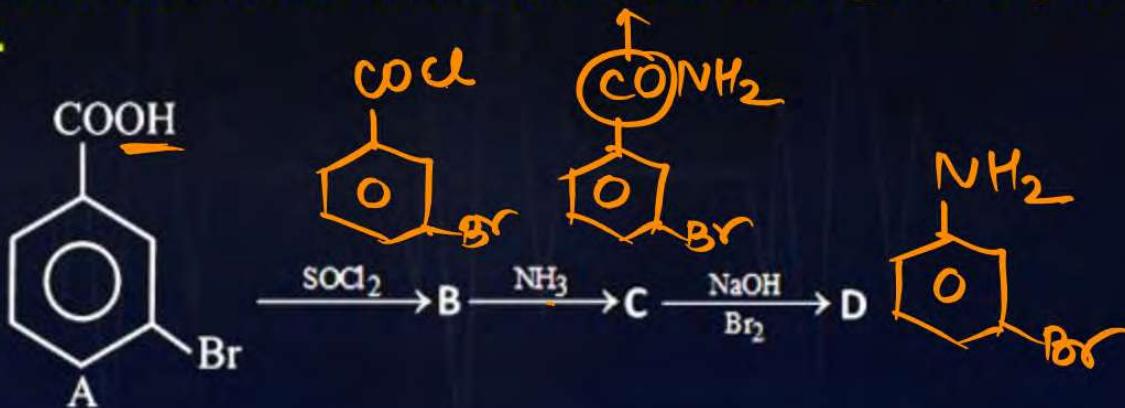
Which of the following will not give a primary amine?

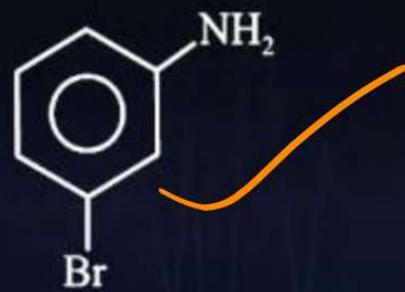


QUESTION-3



In a set of reactions m-bromobenzoic acid gave a product D. Identify the product D.



C**D**

QUESTION-4

Which of the following statement is incorrect in case of Hoffmann bromamide degradation?

- A** Reaction is useful for decreasing length of carbon chain by one carbon atom.
- B** It gives tertiary amine.
- C** It gives primary amine;
- D** Aqueous KOH is used with bromine.

QUESTION-5

n-Butylamine (I), diethylamine (II) and N, N dimethylethyl amine (III) have the same molar mass. The increasing order of their boiling point is:

A $\text{III} < \text{II} < \text{I}$

B $\text{I} < \text{II} < \text{III}$

C $\text{II} < \text{III} < \text{I}$

D $\text{II} < \text{I} < \text{III}$

QUESTION-6



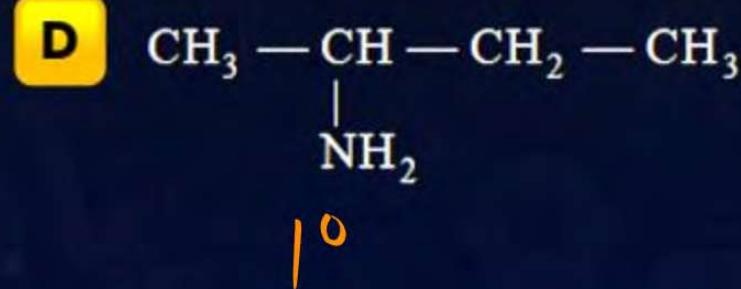
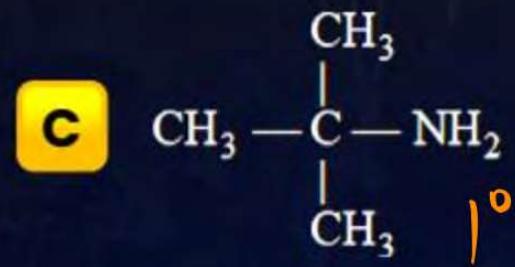
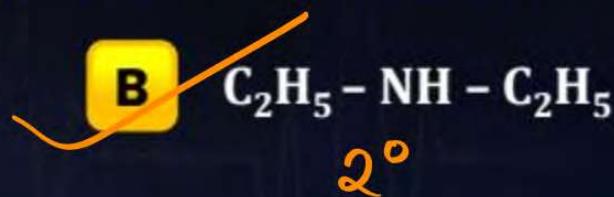
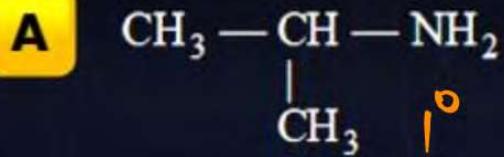
The distinction between primary, secondary and tertiary amines can be done experimentally by using

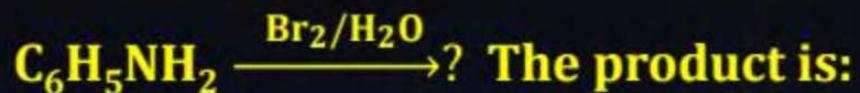
- A Hinsberg's reagent
- B Lucas's reagent
- C Benedict's reagent
- D Tollen's reagent



QUESTION-7

Which compound does not respond to carbylaminies reaction?



QUESTION-8

- A** Only o-bromoaniline
- B** 2, 4, 6-tribromoaniline
- C** o- and p-bromoaniline
- D** Only p-bromoaniline

QUESTION-9

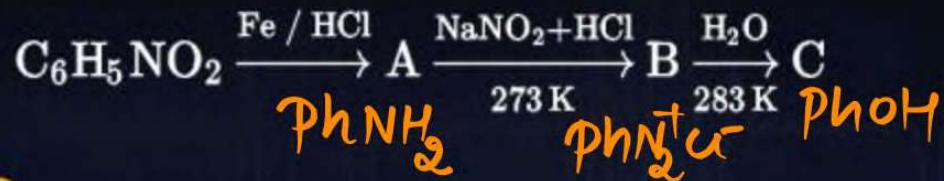


Aniline on direct nitration produces

- A o-Nitroaniline 2%
- B m-Nitroaniline 47%
- C p-Nitroaniline 51%
- D All of these

QUESTION-10

Identify the product C in the series.



- A** $\text{C}_6\text{H}_5\text{OH}$
- B** $\text{C}_6\text{H}_5\text{CH}_2\text{OH}$
- C** $\text{C}_6\text{H}_5\text{CHO}$
- D** $\text{C}_6\text{H}_5\text{NH}_2$

QUESTION-11



In the preparation of chlorobenzene from aniline, the most suitable reagent is:

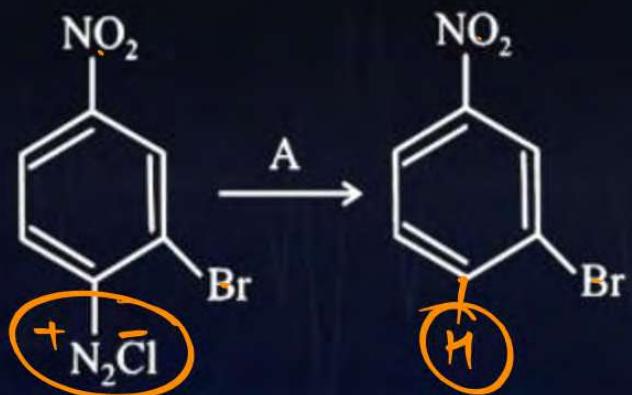
A chlorine in the presence of ultraviolet light X

B chlorine in the presence of AlCl_3 X

C nitrous acid followed by heating with $\text{Cu}_2\text{Cl}_2/\text{HCl}$ ✓

D HCl and Cu_2Cl_2



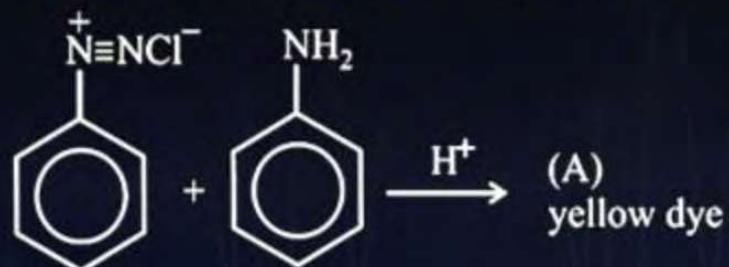
QUESTION-12**In the reaction****A is:**

- A** $\text{H}^+/\text{H}_2\text{O}$
- C** Cu_2Cl_2

B $\text{HgSO}_4/\text{H}_2\text{SO}_4$ **D** H_3PO_2 and H_2O

QUESTION-13

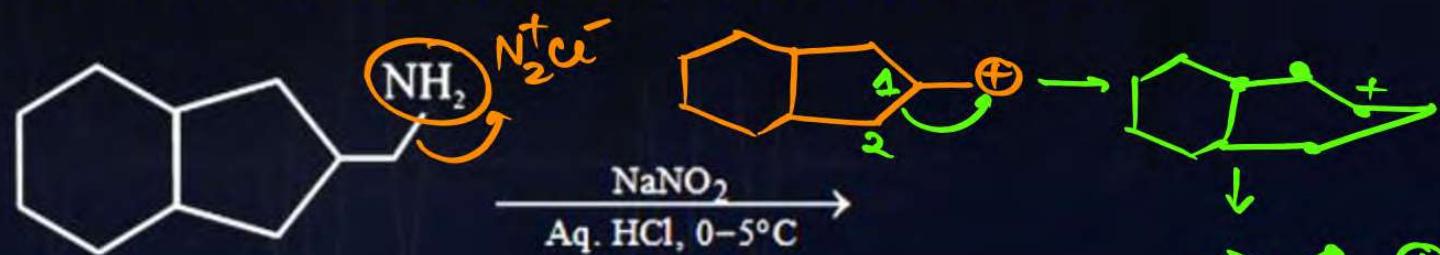
In the following reaction, the product (A) is:



- A**
B
C
D
A red checkmark is placed over structure D.

QUESTION-14

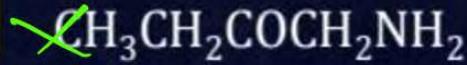
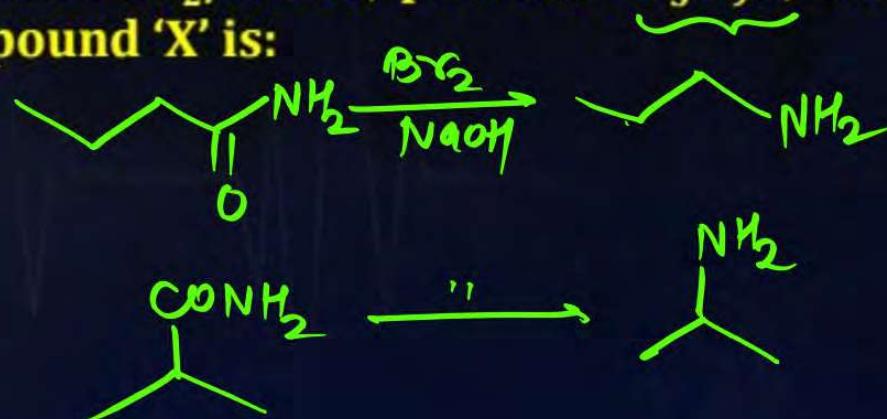
The major product formed in the reaction given below will be:



- A
B
C
D

QUESTION-15

A compound 'X' on treatment with Br_2/NaOH , provided $\text{C}_3\text{H}_9\text{N}$, which gives positive carbylamine test. Compound 'X' is:

A**B****C****D**

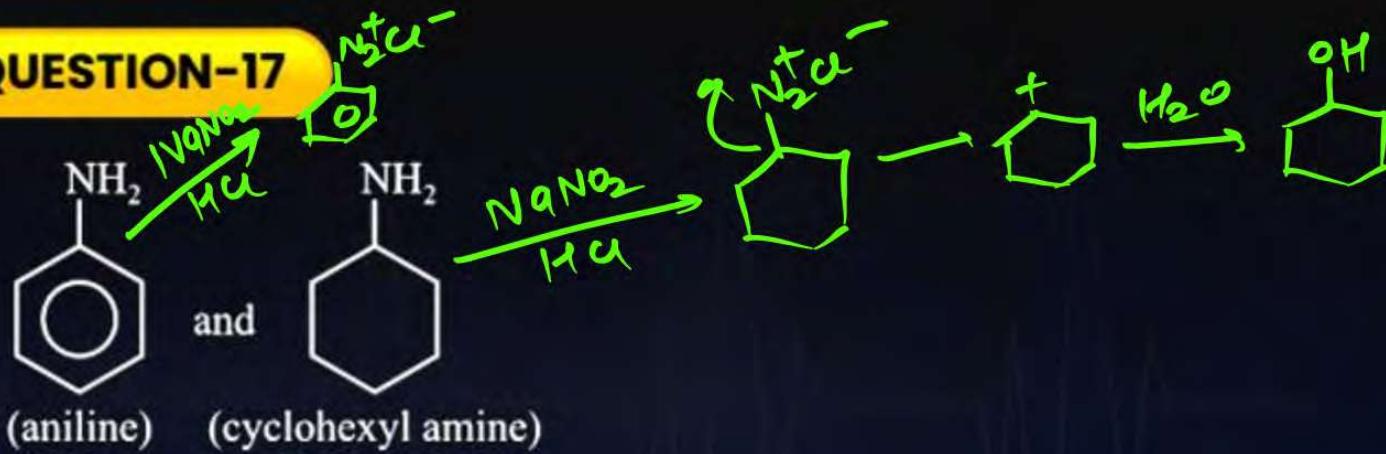
QUESTION-16



Considering the basic strength of amines in aqueous solution, which one has smallest pK_b value?

K_b highest $B_s \uparrow$

- A $(CH_3)_2NH$ 2°
- B CH_3NH_2 1°
- C $(CH_3)_3N$ 3°
- D $C_6H_5NH_2$

QUESTION-17

can be differentiated by:

A Hinsberg test X

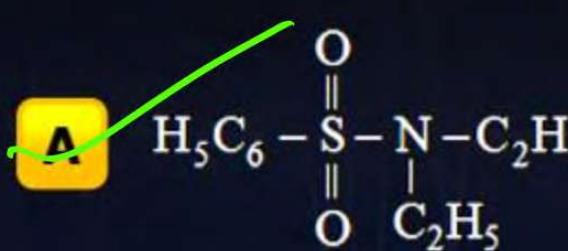
C \checkmark NaNO₂, HCl, then β -Naphthol

B Iso-cyanide test

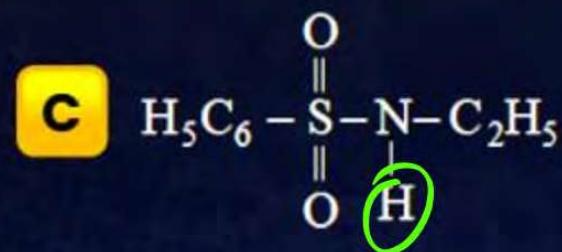
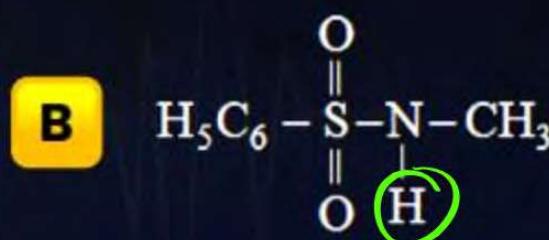
D NaOH

QUESTION-18

Which of the following is **insoluble** in alkali?



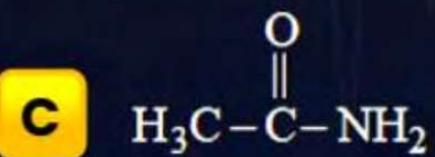
2°



D All of these

QUESTION-19

Which of the following compound gives a product with foul smell when reacted with chloroform in presence of an alkali?



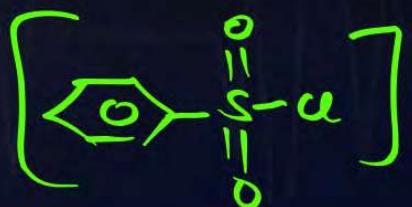
QUESTION-20



Hinsberg's reagent is:

A phenylisocyanide

B benzenesulphonyl chloride



C toluene

D o-dichlorobenzene