CHEMISTRY

BOOKS - MODERN PUBLISHERS CHEMISTRY (HINGLISH)

ORGANIC COMPOUNDS CONTAINING NITROGEN

Solved Example

1. Draw the structures, give names according to IUPAC and indicate primary, secondary and tertiary amines :

(a) eight isomeric amines of formula $C_4H_{11}N$.

(b) five isomeric amines of formula C_7H_9N that contain a benzene ring.

View Text Solution

2. Give the IUPAC names of the following compounds

(g) $(CH_3CH_2)_2NCH_3$ (h) $(CH_3)_2NCH_2CH_3$ (i) $CH_3-\overset{CH_2CH_3}{\underset{|}{N}}H$

View Text Solution

3. Draw structures for the following compounds :

(a) p-toluidine (b) N-isopropylaniline (c) t-butylamine

(d) p-fluoroaniline (e) N-Ethyl-4-isopropyl-N-methylaniline (f) p-tert-butylaniline

Watch Video Solution

4. Write chemical equations for the following reactions:

(i) Reaction of ethanolic NH_3 with C_2H_5Cl.

(ii) Ammonolysis of benzyl chloride and reaction of amine so formed with two moles of CH_3Cl.

Watch Video Solution

5. Write chemical equations for the following conversions :

(i) $C_6H_5CH_2NH_2$ into $C_6H_5CH_2OH$ (ii) C_2H_5Cl into $(C_2H_5)_3N$

(iii) Propene into butylamine (iv) n-propyl bromide into ethylamine

(v) Benzene into benzylamine

Watch Video Solution

6. Give the structures of A, B and C in the following reactions :

(i) $CH_3Br \xrightarrow{KCN} A \xrightarrow{LiAlH_4} B \xrightarrow[273K]{HNO_2} C$

(ii) $CH_3COOH \xrightarrow[\Delta]{NH_3} A \xrightarrow{Br_2+KOH} B \xrightarrow{CHCl_3+NaOH} C$

(iii) $CH_3CN \xrightarrow{H_2O/OH^-} A \xrightarrow[\Delta]{NH_3} B \xrightarrow{Br_2+KOH} C$

Watch Video Solution

7. Write structures and IUPAC names of

(i) the amide which gives propanamine by Hoffmann bromamide reaction

(ii) the alkyl halide used in Garbriel phthalimide synthesis to give ethanamine

(iii) amine obtained by reduction of propanamide

(iv) the amine produced by the Hoffmann degradation of benzamide.

Watch Video Solution

8. Complete the following reactions :

View Text Solution

9. (a) How will you convert an alkyl halide into a primary amine having one more carbon atom than the alkyl halide used ?

(b) How can a carboxylic acid be converted into an amine having one less carbon atom than the carboxylic acid used ?

Watch Video Solution

10. Complete the following reactions :

(v) $C_6H_5NH_2 + CHCl_3 + KOH \rightarrow$

View Text Solution

11. How will you convert the following :

(i) Nitrobenzene into aniline,

(ii) Ethanoic acid into methanmine

(iii) Aniline into N-phenylethanamide (write the chemical equations involved).

Watch Video Solution

12. An aromatic compound 'A' of molecular formula C_7H_7ON undergoes a series of reactions as shown below. Write the structures of A, B, C, D and E in the following reactions :

$$(C_7H_7ON)(A) \xrightarrow{Br_2+KOH} \underset{\substack{\downarrow CHCl_3+NaOH \\ (D)}}{C_6H_5NH_2} \xrightarrow[273K]{NaNO+HCl} \underset{\substack{\downarrow KI \\ (E)}}{(B)} \xrightarrow{CH_3CH_2OH} (C)$$

Watch Video Solution

13. Write the main products when benzene diazonium chloride $\left(C_6H_5N_2^+Cl^-\right)$ reacts with the following:

(i) $CuCN/KCN$ (ii) H_2O

(iii) CH_3CH_2OH (iv) Copper powder/HCl

Watch Video Solution

14. How will you convert

(a) propionamide to ethylamine

(b) aniline to phenol

(c) p-toluidine into 2-bromo-4-methylaniline

(d) aniline to acetanilide

(e) aniline to benzene

(f) aniline to bromobenzene

(g) aniline into benzonitrile

(h) methylamine to ethylamine

Watch Video Solution

15. Give the structures of A, B and C in the following reactions :

(a) $CH_3 - COOH \xrightarrow{NH_3/\Delta} A \xrightarrow{Br_2/KOH\,(aq)} B \xrightarrow{CHCl_3+alc.KOH} C$

(b) $C_6H_5N_2^+BF_4^- \xrightarrow[\Delta]{NaNO_2/Cu} A \xrightarrow{Fe/HCl} B \xrightarrow{CH_3COCl/\text{pyridine}} C$

(c) $C_6H_5CONH_2 \xrightarrow{Br_2/aq.KOH} A \xrightarrow[0-5^\circ C]{NaNO_2+HCl} B \xrightarrow{KI} C$

(d) $CH_3 - Cl \xrightarrow{KCN} A \xrightarrow{LiAlH_4} B \xrightarrow[\Delta]{CHCl_3/Alc.KOH} C$

(e) $C_6H_5COO^-NH_4^+ \xrightarrow{\Delta} A \xrightarrow{Br_2/KOH} B \xrightarrow[\text{Pyridine}]{CH_3COCl} C$

(f) $C_6H_5N_2^+BF_4^- \xrightarrow[\Delta]{NaNO_2/Cu} A \xrightarrow{Sn/HCl} B \xrightarrow{CHCl_3+alc.KOH} C$

(g) $ArNH_2 \xrightarrow[0-5^\circ C]{NaNO_2/HCl} A \xrightarrow{CuCN} B$

View Text Solution

16. (a) Write the products of the following reactions :

(b) How will you convert :

(i) benzene to aniline

(ii) benzoic acid to aniline

View Text Solution

17. Write structures of compounds A and B in each of the following reactions:

View Text Solution

Practice Problems

1. Write IUPAC names of the following :

(i) $CH_3CH_2\underset{CH_3}{\underset{|}{C}}HNH_2$ (ii) $(CH_3)_3CNH_2$ (iii) $C_6H_5(CH_2)_3NH_2$

(iv) $NH_2(CH_2)_4\underset{NH_2}{\underset{|}{C}}HCOOH$ (v) $C_6H_5-\overset{CH_3}{\overset{|}{C}}HCH_2NH_2$ (vi)

$H_3C-\underset{H}{\underset{|}{N}}-CH_2-CH_3$

Watch Video Solution

2. Write the structural formula of the following and indicate primary, secondary or tertiary amines:

(i) (N-Methyl) butan-2-amine (ii) 3-(N-ethylamino) butan-1-ol

(iii) N-ethyl-N-methylpropanamine (iv) Dibenzylamine

Watch Video Solution

3. Predict which of the following names are not correct ?

(i) N-Butylethanamine (ii) 1-Amino-2-ethanol (iii) Methylaniline

(iv) Propanediamine (v) 1-Phenylethanamine

Watch Video Solution

Conceptual Questions

1. (a) Arrange the following in the increasing order of boiling points:

$C_2H_5NH_2, C_2H_5OH, (CH_3)_3N$

(b) Arrange the following in increasing order of base strength in gas

phase:

$(C_2H_5)_3N, C_2H_5NH_2, (C_2H_5)_22NH$

(c) Arrange the following in decreasing order of solubility in water:

$(CH_3)_3N, (CH_3)_2NH, CH_3NH_2$

Watch Video Solution

2. Give Reasons: Methylamine is a stronger base than ammonia.

Watch Video Solution

3. Why is aniline soluble in aqueous HCl?

Watch Video Solution

4. Why is it difficult to prepare pure amines by ammonolysis of alkyl halides?

Watch Video Solution

5. Methylamine in water reacts with ferric chloride to precipitate ferric hydroxide. Explain.

Watch Video Solution

6. Electrophilic substitution in case of aromatic amines takes place more readily than benzene. Explain.

Watch Video Solution

7. Although boron trifluoride adds on trimethylamine but it does not add on triphenylamine. Explain.

Watch Video Solution

8. Why does silver chloride dissolve in methylamine solution ?

Watch Video Solution

9. Why does the reactivity of NH_2 get reduced in acetanilide ?

Watch Video Solution

10. Although trimethyl amine and n-propylamine have the same molecular mass, the former boils at a lower temperature (276 K) than the latter (322 K). Why?

Watch Video Solution

11. Sulphanilic acid is soluble in dil. NaOH but not in dil. HCl. Explain.

Watch Video Solution

12. Glycine exists as $NH_3{}^+CH_2COO^-$, zwitter ion but anthranilic acid (p-amino benzoic acid) does not exist as zwitter ion. Why?

Watch Video Solution

13. Tertiary amines do not undergo acylation. Explain.

Watch Video Solution

14. Arrange the following sets in order of their basic strength in aqueous solution :

(i) $NH_3, C_6H_5NH_2, CH_3NH_2, (CH_3)_3N, (CH_3)_2NH$

(ii) Aniline, p-nitroaniline, p-methylaniline.

Watch Video Solution

15. (i) Name the main product when aniline is heated with alcoholic KOH and chloroform.

(ii) Give the IUPAC name of $(CH_3)_2N - C_2H_5$.

Watch Video Solution

16. Why do amines act as nucleophiles?

Watch Video Solution

17. Aniline does not undergo Friedel Crafts alkylation. Explain.

Watch Video Solution

18. Although $-NH_2$ group is an ortho and para directing group, nitration of aniline gives along with ortho and para derivatives, meta derivative also.

Watch Video Solution

19. The presence of a base is needed in the ammonolysis of alkyl halides. Explain.

Watch Video Solution

Watch Video Solution

20. Why cannot be aromatic primary amines prepared by Gabriel pthalimide synthesis ?

Watch Video Solution

21. Suggest a structural formula of a compound having molecular formula $C_8H_{11}N(A)$ which is optically active, dissolves in dil. aqueous HCl and release N_2 with nitrous acid.

Watch Video Solution

22. Why does methylamine has lower boiling point than methanol ?

Watch Video Solution

23. Identify A, B, C and D in the following conversions:

$$A \xrightarrow[0-5^{\circ}C]{NaNO_2/HCl} CH_3OH \xrightarrow{PCl_3} B \xrightarrow{KCN} C \xrightarrow{LiAlH_4} D$$

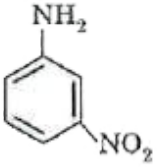
Watch Video Solution

24. Arrange the following compounds in the decreasing order of basicity :

(I)

(II)

(III)



(IV)

Watch Video Solution

25. Name the following reactions:

(i) $C_6H_5N_2{}^+Cl^- \xrightarrow{CuCl/HCl} C_6H_5Cl + N_2$

(ii) $C_6H_5N_2{}^+Cl^- \xrightarrow{Cu/HCl} C_6H_5Cl + N_2 + Cucl$

Watch Video Solution

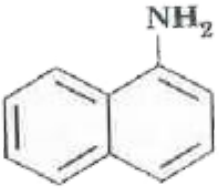
26. Arrange the following in the increasing order of their pK_b values.

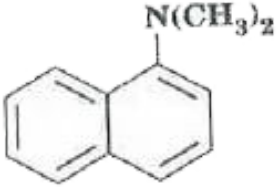
$C_6H_5NH_2, C_2H_5NH_2, C_6H_5NHCH_3$

Watch Video Solution

Ncert File Ncert In Text Questions

1. Classify the following amines as primary, secondary and tertiary :

(i) 

(ii) 

(iii)

$(C_2H_5)_2CHNH_2$ (iv) $(C_2H_5)_2NH$

Watch Video Solution

2. (i) Write structures of different isomeric amines corresponding to the molecular formula, $C_4H_{11}N$.

ii) Write IUPAC names of all the isomers.

(iii) What type of isomerism is exhibited by different pairs of amines?

Watch Video Solution

3. How will you convert

(i) Benzene into aniline (ii) Benzene into N, N-dimethylaniline

$Cl-(CH_2)_4$- Cl into hexane- 1,6- diamine ?

Watch Video Solution

4. Arrange the following in increasing order of their basic strength :

(i) $C_2H_5NH_2, C_6H_5NH_2, NH_3, C_6H_5CH_2NH_2$ and $(C_2H_5)_2NH$ (ii) $C_2H_5NH_2, (C_2H_5)_2NH, (C_2H_5)_3N, C_6H_5NH_2$

(iii) $CH_3NH_2, (CH_3)_2NH, (CH_3)_3N, C_6H_5NH_2, C_6H_5CH_2NH_2$

View Text Solution

5. Complete the following acid-base reactions and name the products :

(a) $CH_3CH_2CH_2NH_2 + HCl \rightarrow$ (b) $(C_2H_5)_3N + HCl \rightarrow$

Watch Video Solution

6. Write reactions of the final alkylation product of aniline with excess of methyl iodide in the presence of sodium carbonate solution.

Watch Video Solution

7. Write chemical reaction of aniline with benzoyl chloride and write the name of the product obtained.

Watch Video Solution

8. Write structures of different isomers corresponding to the molecular formula, C_3H_9N. Write IUPAC names of the isomers which will liberate

nitrogen gas on treatment with nitrous acid.

Watch Video Solution

9. Convert

(i) 3-Methylaniline into 3-nitrotoluene.

(ii) Aniline into 1,3,5 - tribromobenzene.

Watch Video Solution

Ncert File Ncert Textbook Exercises

1. Write IUPAC names of the following compounds and classify them into primary, secondary and tertiary amines.

$(i)(CH_3)_2CHNH_2$ $(ii)CH_3(CH_2)_2NH_2$ $(iii)CH_3NHCH(CH_3)_2$

$(iv)(CH_3)_3CNH_2$ $(v)C_6H_5NHCH_3$ $(vi)(CH_3CH_2)_2NCH_3$

$(vii)m-BrC_6H_4NH_2$

Watch Video Solution

2. Give one chemical test to distinguish between the following pairs of compounds .

i. Methylamine and dimethylamine

ii. Secondary and tertiary amines

iii. Ethylamine and aniline

iv. Aniline and benzylamine

v. Aniline and N-methylaniline

Watch Video Solution

3. Account for the following:

(i) pK_b of aniline is more than that of methylamine.

(ii) Ethylamine is soluble in water whereas aniline is not.

(iii) Methylamine in water reacts with ferric chloride to precipitate hydrated feric oxide.

(iv) Although amino group is o– and p– directing in aromatic electrophilic substitution reactions, aniline on nitration gives a substantial amount of

m-nitroaniline.

(v) Aniline does not undergo Friedel-Crafts reaction.

Diazonium salts of aromatic amines are more stable than those of aliphatic amines.

(vii) Gabriel phthalimide synthesis is preferred for synthesising primary amines.

Watch Video Solution

4. Arrange the following:

(i) In decreasing order of the pK_b values:

$C_2H_5NH_2$, $C_6H_5NHCH_3$, $(C_2H_5)_2NH$ and $C_6H_5NH_2$

(ii) In increasing order of basic strength:

$C_6H_5NH_2$, $C_6H_5N(CH_3)_2$, $(C_2H_5)_2$, NH and CH_3NH_2

(iii) In increasing order of basic strength:

(a) Aniline, p-nitroaniline and p-toluidine

(b) $C_6H_5NH_2$, $C_6H_5NHCH_3$, $C_6H_5CH_2NH_2$

(iv) In decreasing order of basic strength in gas phase:

$C_2H_5NH_2$, $(C_2H_5)_2NH$, $(C_2H_5)_3N$ and NH_3

(v) In increasing order of boiling point:

$C_2H_5OH, (CH_3)_2NH, C_2H_5NH_2$

(vi) In increasing order of solubility in water:

$C_6H_5NH_2, (C_2H_5)_2NH, C_2H_5NH_2$

Watch Video Solution

5. Convert :

i. Ethanoic acid into methylamine

ii. Hexanenitrile into 1-aminopentane

iii. Methanol to ethanoic acid

iv. Ethanoci acid into propanoic acid

v. Ethanoic acid into propanic acid

iv. Methanamine into ethanamine

vii. Nitromethane into dimethulamine

viii. Propanoic acid into ethanoic acid .

Watch Video Solution

6. Describe a method for the identification of primary , secondary and tertiary amines . Also write the chemical equations fo the reactions involed .

Watch Video Solution

7. Write short notes on the following :

i. Carbylamine reaction

ii. Diazotisation

iii . Hofmann bromamide reaction

iv.Coupling reaction

v. Ammonolysis

iv. Acetylation

vii. gabriel phthalimide synthesis

Watch Video Solution

8. Accomplish the following conversions :

i. Nitrobenzene to benzoic acid ii. Benzone to m-bromophenol

iii. Benzoic acid to aniline iv. Aniline to 2,4,6, -tribromofluorobenzene v. Benxyl chloride to 2-phenylethanamine

iv. Chlorobenzen to p-bromoaniline

vii. Aniline to p-bromoaniline viii. Benzamide to toluene xi. Aniline to benzyl alcohol .

Watch Video Solution

9. Give the structures of A, B and C in the following reactions

(i) $CH_3CH_2I \xrightarrow{NaCN} A \xrightarrow[\text{hydrolysis Partial}]{OH^-} B \xrightarrow{NaOH + Br_2} C$

(ii) $C_6H_5N_2Cl \xrightarrow{CuCN} A \xrightarrow{H_2O/H^+} B \xrightarrow[\Delta]{NH_3} C$

(iii) $CH_3CH_2Br \xrightarrow{KCN} A \xrightarrow{LiAlH_4} B \xrightarrow[0^\circ C]{HNO_2} C$

(iv) $C_6H_5NO_2 \xrightarrow{Fe/HCl} A \xrightarrow[273K]{NaNO_2+HCl} B \xrightarrow[\Delta]{H_2O/H^+} C$

(v) $CH_3COOH \xrightarrow[\Delta]{NH_3} A \xrightarrow{NaOBr} B \xrightarrow{NaNO_2/HCl} C$

(vi) $C_6H_5NO_2 \xrightarrow{Fe/HCl} A \xrightarrow[273K]{HNO_2} B \xrightarrow{C_6H_5OH} C$

Watch Video Solution

10. An aromatic compound 'A' on treatment with aqueous ammonia and heating forms compounds 'B' which on heating with Br_2 and KOH forms a compound 'C' of molecular formula C_6H_7N.

The compound 'B' is

Watch Video Solution

11. Complete the following reactions:

(i) $C_6H_5NH_2 + CHCl_3 + alc.\ KOH \rightarrow$

(ii) $C_6H_5N_2Cl + H_3PO_2 + H_2O \rightarrow$

(iii) $C_6H_5NH_2 + H_2SO_4(conc.) \rightarrow$

(iv) $C_6H_5N_2Cl + C_2H_5OH \rightarrow$

(v) $C_6H_5NH_2 + Br_2(aq) \rightarrow$

(vi) $C_6H_5NH_2 + (CH_3CO)_2O \rightarrow$

(vii) $C_6H_5N_2Cl \xrightarrow[(ii)\ NaNO_2/Cu,\ \Delta]{(1)\ HBF_4}$

Watch Video Solution

12. Why cannot be aromatic primary amines prepared by Gabriel pthalimide synthesis ?

Watch Video Solution

13. How do aromatic and aliphatic primary amines react with nitrous acid ?

Watch Video Solution

14. Give explanation for each of the following :

(i) Why are amines less acidic than alcohols of comparable molecular masses ?

(ii). Why do primary amines have higher boiling points han tertiary amines ?

iii. Why are aliphatic amines stroner bases than aromatic amines ?

Watch Video Solution

Ncert File Ncert Exemplar Problems Multiple Choice Question Type I

1. Which of the following is a 3° amine

A. 1-methylcyclohexylamine

B. Triethylamine

C. tert-butylamine

D. N-methylaniline

Answer: B

Watch Video Solution

2. The correct IUPAC name for $CH_2 = CHCH_2NHCH_3$ is

A. Allylmethylamine

B. 2-amino-4-pentene

C. 4-aminopent-1-ene

D. N-methylprop-2-en-1-amine

Answer: D

Watch Video Solution

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

A. CH_3NH_2

B. $NCCH_2NH_2$

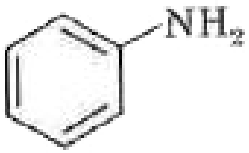
C. $(CH_3)_2NH$

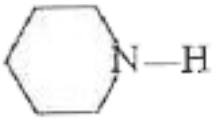
D. $C_6H_5NHCH_3$

Answer: C

Watch Video Solution

4. Which of the following is the weakest Brönsted base?

A. 

B. 

C. 

D. CH_3NH_2

Answer: A

Watch Video Solution

5. Benzylamine may be alkylated as shown in the following equation

$C_6H_5CH_2NH_2 + R - X \rightarrow C_6H_5CH_2NHR$

Which of the following alkyl halides is best suited for this reaction through S_N 1 mechanism?

A. CH_3Br

B. C_6H_5Br

C. $C_6H_5CH_2Br$

D. C_2H_5Br

Answer: C

Watch Video Solution

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

A. $H_2(\text{excess})/\text{Pt}$

B. $LiAlH_4$ in ether

C. Fe and HCl

D. Sn and HCl

Answer: B

Watch Video Solution

7. In order to prepare a 1° amine from an alkyl halide with simultaneous addition of one CH_2 group in the carbon chain, the reagent used as source of nitrogen is.....

A. Sodium amide, $NaNH_2$

B. Sodium azide, NaN_3

C. Potassium cyanide, KCN

D. Potassium phthalimide, $C_6H_4(CO)_2N^-K^+$

Answer: C

Watch Video Solution

8. The source of nitrogen in Gabriel syntheisis of amine is..

A. Sodium azide, NaN_3

B. Sodium nitrite, $NaNO_2$

C. Potassium cyanide, KCN

D. Potassium phthalimide, $C_6H_4(CO)_2N^-K^+$

Answer: D

Watch Video Solution

9. 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

Answer: C

Watch Video Solution

10. The best reagent for converting 2-phenylpropanamide into 2-phenylpropanamine is

A. excess H_2

B. Br_2 in aqueous NaOH

C. iodine in the presence of red phosphorus

D. $LiAlH_4$ in ether

Answer: D

Watch Video Solution

11. The best reagent for converting, 2-phenylpropanamide into 1-phenylethanamine is....

A. excess H_2 / Pt

B. $NaOH / Br_2$

C. $NaBH_4 /$ methanol

D. $LiAlH_4$ /ether

Answer: B

Watch Video Solution

12. Hoffmann bromamide degradation reaction is shown by_____

A. $ArNH_2$

B. $ArCONH_2$

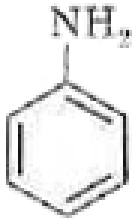
C. $ArNO_2$

D. $ArCH_2NH_2$

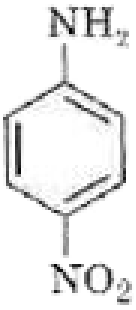
Answer: B

Watch Video Solution

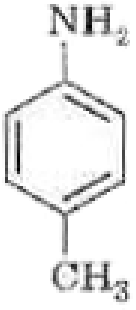
13. The correct increasing order of basic strength for the following compounds is _____.



(I)



(II)



(III)

A. $II < III < I$

B. $III < I < II$

C. $III < II < I$

D. $II < I < III$

Answer: D

Watch Video Solution

14. Methylamine reacts with HNO_2 to form....

A. $CH_3 - O - N = O$

B. $CH_3 - O - CH_3$

C. CH_3CHO

D. CH_3CHO

Answer: C

Watch Video Solution

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

A. NH_3

B. N_2

C. H_2

D. C_2H_6

Answer: B

Watch Video Solution

16. In the nitration of benzene using a mixture of conc. H_2SO_4 and conc. HNO_3, the species which initiates the reaction is _____.

A. NO_2

B. NO^+

C. NO_2^+

D. NO_2^-

Answer: C

Watch Video Solution

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

A. aromatic oxime

B. aromatic hydrocarbon

C. aromatic primary amine

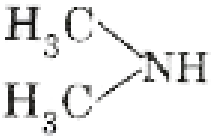
D. aromatic amide

Answer: C

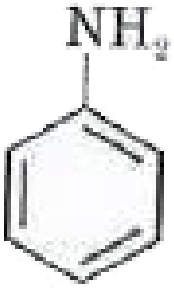
Watch Video Solution

18. The most reactive amine towards dilute hydrochloric acid is...

A. CH_3-NH_2

B. 

C. 

D. 

Answer: B

Watch Video Solution

19. Acid anhydrides on reaction with primary amine gives...

A. amide

B. imide

C. secondary amine

D. imine

Answer: A

Watch Video Solution

20. The reaction $ArN_2^+Cl^- \xrightarrow{Cu/HCl} ArCl + N_2 + CuCl$ is named as _____

A. Sandmeyer reaction

B. Gattermann reaction

C. Claisen reaction

D. Carbylamine reaction

Answer: B

Watch Video Solution

21. 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

Answer: B

Watch Video Solution

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

A. Aniline

B. Phenol

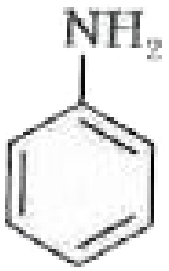
C. Anisole

D. Nitrobenzene

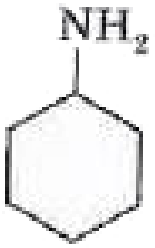
Answer: D

Watch Video Solution

23. Which of the following compounds is the weakest Bronsted base?

A. 

B.



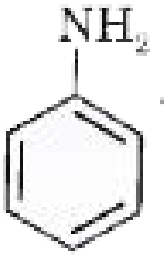
C.

D.

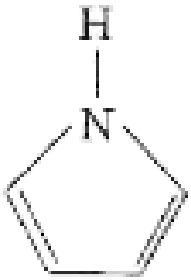
Answer: C

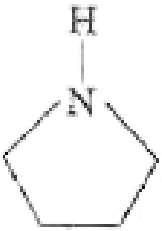
Watch Video Solution

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

A. 

B. NH_3

C. 

D. 

Answer: D

Watch Video Solution

25. The correct decreasing order of basic strength of the following species is ..... H_2O, NH_3, OH^-, NH_2^-

A. $NH_2^- > OH^- > NH_3 > H_2O$

B. $OH^- > NH_2^- > H_2O > NH_3$

C. $NH_3 > H_2O > NH_2^- > OH^-$

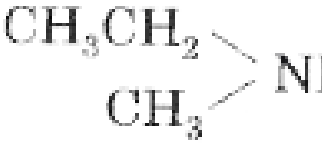
D. $H_2O > NH_3 > OH^- > NH_2^-$

Answer: A

Watch Video Solution

26. Which of the following should be most volatile?

(I) $CH_3CH_2CH_2NH_2 (II) (CH_3)_3N$



(III)

(IV)

CH_3NHCH_3

A. II

B. IV

C. I

D. III

Answer: B

Watch Video Solution

27. Which of the following methods of preparing of amines will give same number of carbon atoms in the chain of amines as in the reactant?

A. Reaction of nitrite with $LiAlH_4$.

B. Reaction of amide with $LiAlH_4$ followed by treatment with water.

C. Heating alkylhalide with potassium salt of phthalimide followed by hydrolysis.

D. Treatment of amide with bromine in aqueous solution of sodium hydroxide.

Answer: C

Watch Video Solution

Ncert File Multiple Choice Question Type Ii

1. Which of the following cannot be prepared by Sandmeyer's reaction?

A. Chlorobenzene

B. Bromobenzene

C. Iodobenzene

D. Fluorobenzene

Answer: C::D

Watch Video Solution

2. Reduction of nitrobenzene by which of the following reagent gives aniline?

A. Sn/HCl

B. Fe/HCl

C. $H_2 - . - Pd$

D. Sn / NH_4OH

Answer: A::B::C

Watch Video Solution

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

A. R-NC

B. $CHCl_3$

C. $COCl_2$

D. $NaNO_2 + HCl$

Answer: A::B

Watch Video Solution

4. The reagents that can be used to convert benzenediazonium chloride to benzene are...

A. $SnCl_2 / HCl$

B. CH_3CH_2OH

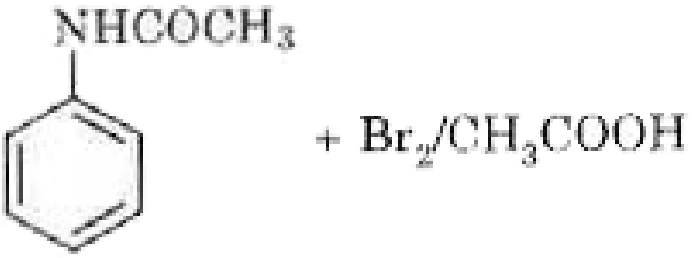
C. H_2PO_2

D. $LiAlH_4$

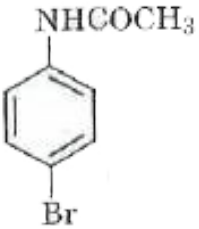
Answer: B::C

Watch Video Solution

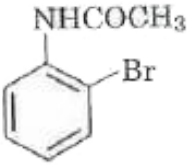
5. The product of the following reaction is _____.



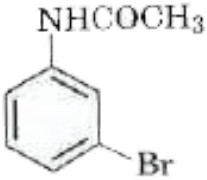
A.



B.



C.

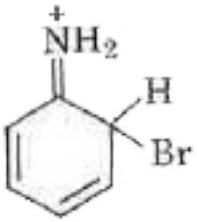


D. 

Answer: A::B

Watch Video Solution

6. Arneium ion involved in the bromination of aniline is....

A. 

B.

C. 

D. 

Answer: A::B::C

Watch Video Solution

7. Which one of the following amines can not be prepared by Gabriel synthesis?

A. Isobutyl amine

B. 2-Phenylethylamine

C. N-methylbenzylamine

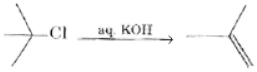
D. Aniline

Answer: A::B

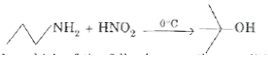
Watch Video Solution

8. Which of the following reactions are correct?

A. 

B. 

C. 

D. 

Answer: A::C

View Text Solution

9. Under which of the following reaction condidiotns, aniline give p-nitro derivative as the major product?

A. Acetyl chloride/pyridine followed by reaction with conc.

H_2SO_4 + conc. HNO_3.

B. Acetic anhydride/pyridine followed by conc. H_2SO_4 + conc. HNO_3.

C. Dil. HCl followed by reaction with conc. H_2SO_4 + conc. HNO_3.

D. Reaction with conc. HNO_3 + conc. H_2SO_4.

Answer: A::B

Watch Video Solution

10. Which of the following reaction belong to electrophilic aromatic substitution

A. Bromination of acetanilide

B. Coupling reaction of aryldiazonium salts

C. Diazotisation of aniline

D. Acylation of aniline

Answer: A::B

Watch Video Solution

Ncert File Short Answer Type Questions

1. What is the role of HNO_3 in the nitrating mixture used for nitration of benzene?

Watch Video Solution

2. Why is NH_2 group of aniline acetylated before carrying nitration ?

Watch Video Solution

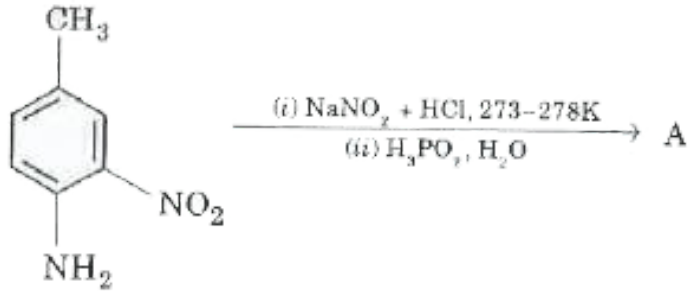
3. What is the product when $C_6H_5CH_2NH_2$ reacts with HNO_3?

Watch Video Solution

4. What is the best reagent to convert nitrile to primary amine

Watch Video Solution

5. Give the structure of 'A' in the following reaction.



Watch Video Solution

6. What is Hinsberg reagent?

Watch Video Solution

7. Why is benzene diazonium chloride not stored and is used immediately after its preparation?

Watch Video Solution

8. Why does acylation of $-NH_2$ of aniline reduces its activating effect?

Watch Video Solution

9. Explain why $MeNH_2$ is stronger base than MeOH ?

Watch Video Solution

10. What is the role of pyridine in the acelation reaction of amines?

Watch Video Solution

11. Under the reaction condition (acidic, basic) the coupling reaction of aryl diazonium chloride with aniline is carried out?

Watch Video Solution

12. Predict the product of reaciton for aniline with bromine in non-polar solvent such as CS_2

Watch Video Solution

13. Arraange the following compounds in increasing order of dipole moment?

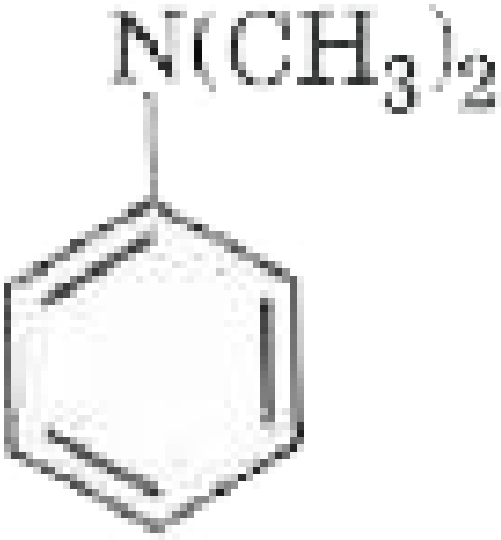
$CH_3CH_2CH_3. CH_3CH_2NH_2, CH_3CH_2OH$

Watch Video Solution

14. What is the structure and IUPAC name of the compound, allyl amine?

Watch Video Solution

15. Write down the IUPAC name of



Watch Video Solution

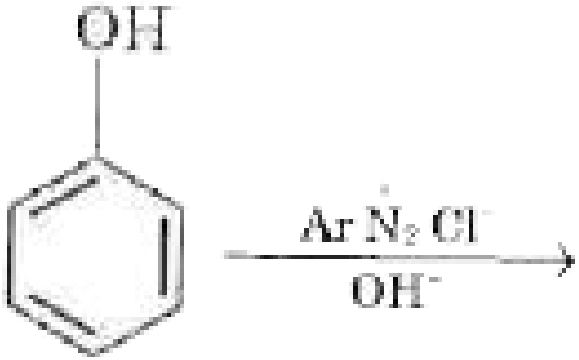
16. A compound Z with molecular formula C_3H_9N reacts with $C_6H_5SO_2Cl$ to give a solid, insoluble in alkali. Identify Z.

Watch Video Solution

17. A primary amine, RNH_2 can be reacted with $CH_3 - X$ to get secondary amine, $R - NHCH(3)$, but the only disadvantage is that 3° amine and quaternary ammonium salts are also obtained as side products. Can your suggest a method where RNH_2 forms only 2° amine?

Watch Video Solution

18. Complete the following reaction.

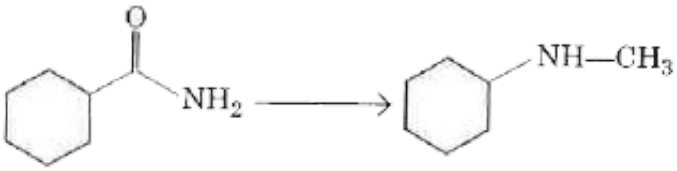


Watch Video Solution

19. Why is aniline soluble in aqueous HCl?

Watch Video Solution

20. Suggest a route by which the following conversion can be accomplished.



Watch Video Solution

21. Identify A and B in the following reaction.

Watch Video Solution

22. How will you carry out the following conversion?

(i) Toluene to p-toluidine

(ii) p-toluidine diazonium chloride to p-toluic acid

Watch Video Solution

23. Write following conversions

(i) Nitrobenzene-Acetanilide

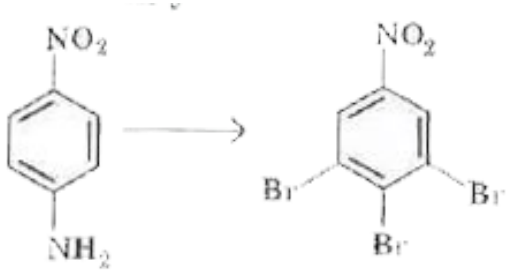
(ii) Acetanilide-p-nitroaniline

Watch Video Solution

24. A solution contains 1g mol. Each of p-toluene diazonium chloride and p-nitrophenyl diazonium cholride. To this 1g mol.of alkaline solution of phenol is added. Predict the major product. Explain your answer.

Watch Video Solution

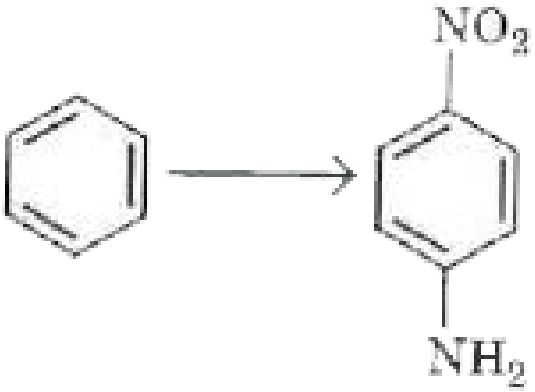
25. How will you bring out the following conversion?



p-Nitroaniline 3, 4, 5-Tribromonitrobenzene

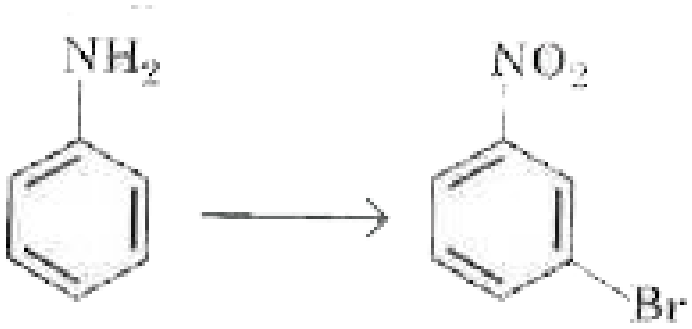
Watch Video Solution

26. How will you carry out the following conversion?



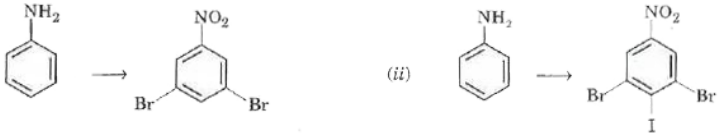
Watch Video Solution

27. How will you carry out the following conversion?



Watch Video Solution

28. How will you carry out the following conversion?



Watch Video Solution

Ncert File Matching Type Questions

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

Column I	Column II
(*a*) Ammonolysis number of carbon atoms.	(*i*) Amine with lesser number of C atoms
(*b*) Gabriel phthalimide synthesis	(*ii*) Detection test for primary amines.
(*c*) Hoffmann Bromamide reaction	(*iii*) Reaction of phthalimide with KOH and R—X.
(*d*) Carbylamine reaction with NH_3.	(*iv*) Reaction of alkylhalides

Watch Video Solution

2. Match the compounds given in Column I with the items given in Column II.

Column I	Column II
(*a*) Benzene sulphonyl chloride	(*i*) Zwitter ion
(*b*) Sulphanilic acid	(*ii*) Hinsberg reagent
(*c*) Alkyl diazonium salts	(*iii*) Dyes
(*d*) Aryl diazonium salts	(*iv*) Conversion to alcohols

Watch Video Solution

Ncert File Assertion And Reason Type Questions

1. Assertion(A) Acylation of amines gives a monsubstituted product whereas alkulation of amines gives polysubstitues product.

Reason(R) Acyl group sterically hinders the apprach of further acyl group

Watch Video Solution

2. Assertion (A): Hofmann's bromamide reaction is given by primary amines.

Reason: Primary amines on more basic than secondary amines.

Watch Video Solution

3. Assertion (A): N-ethylbenzene sulphonamide is solube in alkali.

Reason (R): Hydrogen attached to nitrogen In sulphonamide is strongly

acidic.

Watch Video Solution

4. Assertion(A): N,N-diethylbenzene sulphonamide is insoluble in alkali.

Reason(R): Sulphonyl group attached to nitrogen atoms is strong electron withdrawing group.

Watch Video Solution

5. Assertion(A): Only a small amount of HCl is required in the reduction of nitro compound with iron scrap and HCl in the presence of steam.

Reson(R): $FeCl_2$ formed get hydrolysed to release HCl during the reaction.

Watch Video Solution

6. Assertion(A): Aromatic 1° amines can be prepared by Gabriel phtalmide synthesis.

Reason (R): Aryl halides undergo nucleophilic substitution with anion formed by pthalimide.

Watch Video Solution

7. Assertion(A): Acetanilide is less basic aniline.

Reson(R): Acetylation of aniline results in decrease of electron density on nitrogen.

Watch Video Solution

Quick Memory Test A Say True Or False

1. Amines act as Lewis bases.

Watch Video Solution

2. In aqueous solution, trimethylamine is more basic than methylamine.

Watch Video Solution

3. p-Bromoaniline is formed when aniline is treated with bromine water.

Watch Video Solution

4. Azo dye test can be used to distinguish aromatic primary amines from aliphatic primary amines.

Watch Video Solution

5. Catalytic reduction of carbylamines always gives primary amines. True or False.

Watch Video Solution

6. N-Methylbenzamide on heating with aqueous solution of NaOH and Br_2 gives N-methylaniline.

Watch Video Solution

7. Secondary amines evolve N_2 with nitrous acid. False or True?

Watch Video Solution

8. Acetanilide is less basic than aniline.

Watch Video Solution

9. Gabriel phthalimide synthesis is used in the preparation of

Watch Video Solution

10. Tertiary amines dissolve in nitrous acid to form corresponding salts.

Watch Video Solution

Quick Memory Test B Complete The Missing Links

1. Aniline on heating with fuming H_2SO_4 gives .....

Watch Video Solution

2. The IUPAC name of lowest molecular mass tertiary amine is .....

Watch Video Solution

3. In Schotten-Baumann reaction, aniline is heated with .....

Watch Video Solution

4. Carbylamine test is used to test ..... amines.

Watch Video Solution

5. Libermann nitroso reaction is used for the detection of ..... amines.

Watch Video Solution

6. Hinsberg's reagent is

Watch Video Solution

7. Phenyl isocyanide on reduction with hydrogen and Raney nickel gives .....

Watch Video Solution

8. Secondary amines react with aldehydes and ketones containing α - hydrogen to form .....

Watch Video Solution

9. Reaction of acetamide with NaOH and Br_2 gives .....

Watch Video Solution

10. In Hoffmann bromamide reaction, the carbonyl group is lost as .....

Watch Video Solution

Quick Memory Test C Choose The Correct Alternative

1. Isocyanide test is used for the detection of primary/ secondary amines.

Watch Video Solution

2. Amino group is ortho-para / meta director.

Watch Video Solution

3. Primary/ tertiary amines donot react with Hinsberg's reagent.

Watch Video Solution

4. Out of aniline and benzylamine, anilinel gives azo dye test.

Watch Video Solution

5. Benzene diazonium chloride when reacted with hypophosphorus acid, produces :

Watch Video Solution

6. PK_b of aniline is less / more than $p - C_6H_4(NH_2)NH_2$

Watch Video Solution

7. K_b of p-methylaniline is more / less than aniline.

Watch Video Solution

8. Aniline is less/more basic than ethylamine.

Watch Video Solution

9. Electron withdrawing group on aniline makes it less/more basic.

Watch Video Solution

10. Gabriel phthalimide synthesis is used for the preparation of primary aromatic/primary aliphatic amines.

Watch Video Solution

Revision Exercises Objective Type Questions Multiple Choice Questions

1. Out of the following compounds, which is the most basic in aqueous medium?

A. CH_3NH_2

B. $(CH_3)_2NH$

C. $(CH_3)_3N$

D. $C_6H_5NHZ_2$.

Answer: B

Watch Video Solution

2. Which of the following amines gives carbylamine reaction?

A. $C_2H_2NH_2$

B. $(C_2H_5)_2NH$

C. $(C_2H_5)_3N$

D. $CH_3NHC_2H_5$.

Answer: A

Watch Video Solution

3. Ethylamine reacts with nitrous acid to form:

A. C_2H_5OH

B. C_2H_5OH, N_2, H_2O

C. $C_2H_5N_2^+Cl^-$

D. C_2H_5NHOH, NH_3.

Answer: B

Watch Video Solution

4. Hinsberg's reagent is:

A. benzene sulphonyl chloride

B. benzene sulphonic acid

C. phenyl isocyanide

D. benzene sulphonamide.

Answer: A

Watch Video Solution

5. Reaction of ethylamine with chloroform in alcoholic KOH gives

A. C_2H_5NC

B. CH_3NC

C. CH_3CN

D. $CH_3NC.$

Answer: B

Watch Video Solution

6. Which of the following statement is incorrect?

A. Diazonium salts are crystalline solids

B. They are unstable and explode in dry state

C. Aromatic diazonium salts are less stable than aliphatic diazonium salts

D. These are readily soluble in water

Answer: C

Watch Video Solution

7. When primary amine reacts with choloroform in ethanolic KOH then the product is:

A. isocyanide

B. aldehyde

C. cyanide

D. alcohol

Answer: A

Watch Video Solution

8. Which of the following does not react with Hinsberg reagent?

A. $C_2H_5NH_2$

B. $(C_2H_5)_2NH$

C. $(C_2H_5)_3N$

D. CH_3NH_2

Answer: C

Watch Video Solution

9. $C_6H_5N_2Cl + CuCN \rightarrow C_6H_5CN + N_2 + CuCl$ is

A. Balz-Schiemann

B. Gattermann reaction

C. Simonini reaction

D. Sandmeyer reaction

Answer: D

Watch Video Solution

10. Which of the following is most basic?

A. Benzylamine

B. Aniline

C. Acetanilide

D. p-nitroaniline

Answer: A

Watch Video Solution

11. Among the following which one is strongest base?

A. Ammonia

B. Methylamine

C. Ethylamine

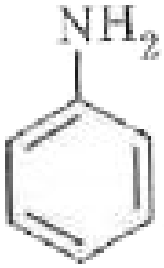
D. None of these

Answer: C

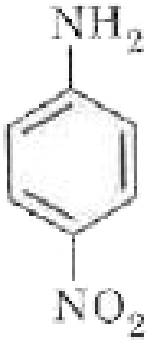
View Text Solution

12. Which of the following compound is the most basic?

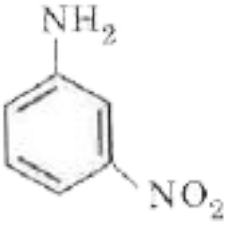
A.

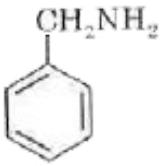


B.



C.

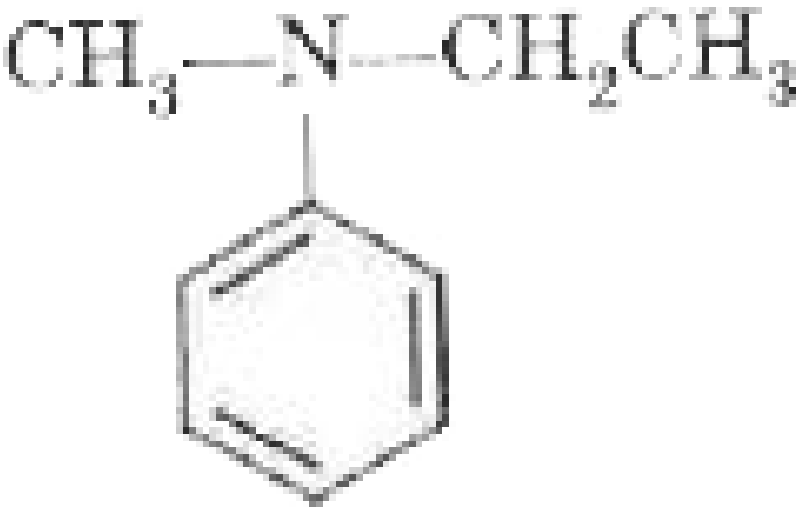


D. 

Answer: D

Watch Video Solution

13. The IUPAC name of



is

A. N-Ethyl-N-methylbenzenamine

B. N-Methyl-N-ethylbenzenamine

C. N, N-Ethyl methylbenzenamine

D. N, N-Methyl ethylbenzenamine

Answer: A

Watch Video Solution

14. Gabriel phthalimide synthesis is used in the preparation of

A. 1° amine

B. 2° amine

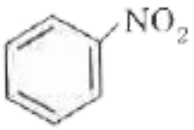
C. 3° amine

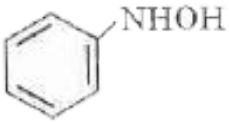
D. all of these

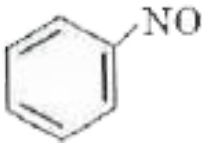
Answer: A

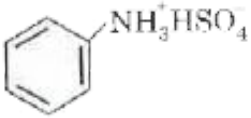
Watch Video Solution

15. Which of the following compound will be formed when aniline reacts with H_2SO_4 ?

A. 

B. 

C. 

D. 

Answer: D

Watch Video Solution

16. $C_2H_5NH_2 + HNO_2 \rightarrow$ A, A is :

A. C_2H_5OH

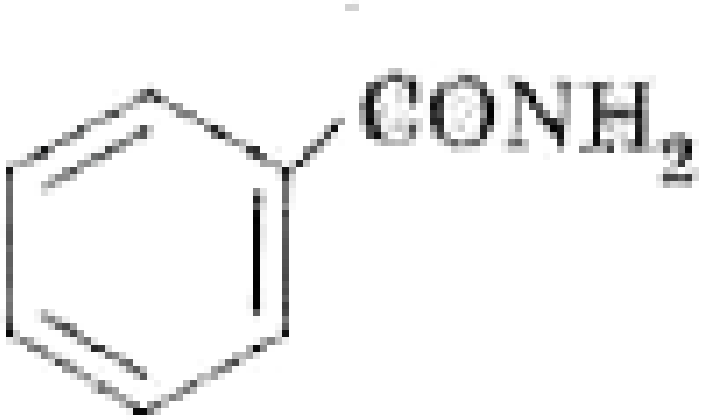
B. C_2H_5NHOH

C. C_2H_6

D. $C_2H_5NO_2$

Answer: A

Watch Video Solution



17. $\xrightarrow[\Delta]{H_3O^+}$

P, P is :

A. Benzoic acid

B. Aniline

C. Benzonitrile

D. Benzylamine

Answer: A

Watch Video Solution

18. $CH_3C \equiv N \xrightarrow{H_2 / Ni}$ P, P will be?

A. CH_3CH_2NC

B. $CH_3CH_2NH_2$

C. CH_3NHCH_3

D. CH_3NH_2

Answer: B

Watch Video Solution

19. Which of the following compound gives dye test ?

A. Aniline

B. Methylamine

C. Diphenylamine

D. Ethylamine

Answer: A

Watch Video Solution

20. The IUPAC name of the compound

$$H_3C - CH_2 - \underset{\underset{CH_2}{||}}{C} - CH_2 - \overset{\overset{OH}{|}}{\underset{\underset{NH_2}{|}}{C}} - CH_3$$ is

A. 2-Amino- 4- ethyl -2 - hydroxypent - 4 - ene

B. 2-Amino - 4 - ethylpent - 4 - en - 2 - ol

C. 4-Ethyl - 2 - hydroxypent - 4 -en - 2 - amine

D. 2-Amino - 4 - methylhexan - 2 -ol

Answer: B

Watch Video Solution

21. Complete the following reaction

Reaction	Amine formed
(i) $CH_3CONH_2 \xrightarrow{Br_2, KOH}$	(A) Propylamine
(ii) $CH_3CONH_2 \xrightarrow[Ether]{LiAlH_4}$	(B) Ethylamine
	(C) Methylamine

A. (i) – (C), (ii) - (B)

B. (i) - (A), (ii) - (B)

C. (i) - (C), (ii) - (A)

D. (i) - (B), (ii) - (A)

Answer: A

Watch Video Solution

22. Match the following columns

Amine	IUPAC name
(*i*) $CH_2 = CHCH_2NH_2$	(*A*) Prop-2-en-1-amine
(*ii*) $C_2H_5N(CH_3)C_2H_5$	(*B*) Prop-1-ene-3-amine
	(*C*) N-Methyl-N-ethylethanamine
	(*D*) N-Ethyl-N-methylethanamine

A. (i) – (D), (ii) - (A)

B. (i) - (B), (ii) - (C)

C. (i) - (A), (ii) - (D)

D. (i) - (C), (ii) - (A)

Answer: C

Watch Video Solution

23. Match the following columns

Reaction	Name of reaction
(i) $C_6H_5N_2^+ Cl^- \xrightarrow[HCl]{Cu_2Cl_2} C_6H_5Cl + N_2$	(A) Gattermann reaction
(ii) $C_6H_5N_2^+ Cl^- \xrightarrow[HBr]{Cu,} C_6H_5Br + N_2$	(B) Sandmeyer reaction
	(C) Schiemann reaction

A. (i) – (A), (ii) - (B)

B. (i) - (B), (ii) - (A)

C. (i) - (C), (ii) - (B)

D. (i) - (A), (ii) - (C)

Answer: B

Watch Video Solution

24. Match the following columns

Reaction	Main product
(i) $C_6H_5N_2^+Cl^- \xrightarrow{H_3PO_2, H_2O}$	(A) $C_6H_5NH_2$
(ii) $C_6H_5N_2^+Cl^- \xrightarrow[\text{Boil}]{H_2O}$	(B) C_6H_6
	(C) C_6H_5OH
	(D) C_6H_5COOH

A. (i) – (C), (ii) - (B)

B. (i) - (A), (ii) - (B)

C. (i) - (D), (ii) - (B)

D. (i) - (B), (ii) - (C)

Answer: D

Watch Video Solution

25. Match the following columns

Reaction	Main product
(i) $CH_3CONH_2 \xrightarrow[(ii)\ CHCl_3, KOH]{(i)\ Br_2, KOH}$	(A) CH_3NC
(ii) $CH_3CH_2CN \xrightarrow[(ii)\ HNO_2, 273\ K]{(i)\ LiAlH_4}$	(B) CH_3CH_2OH
	(C) CH_3CH_2NC
	(D) $CH_3CH_2CH_2OH$

A. (i) – (A), (ii) - (D)

B. (i) - (C), (ii) - (D)

C. (i) - (B), (ii) - (A)

D. (i) - (C), (ii) - (D)

Answer: A

Watch Video Solution

Revision Exercises Passage Based Questions

1. Benzamide (A) is prepared by heating benzoic acid with ammonia. It undergoes the following reactions:

$$A \xrightarrow[\text{reaction 1}]{Br_2, KOH, \Delta} B \xrightarrow[273-278K \text{reaction 2}]{NaNO_2, HCl} C \xrightarrow[\Delta \text{reaction 3}]{H_3PO_2, H_2O} D \xrightarrow[anhyd AlCl_3 \text{reaction 4}]{CH_3Cl}$$

E on heating with acidic $KMnO_4$ gives back benzoic acid.

1. Write the name of reaction 1.

Watch Video Solution

2. Benzamide (A) is prepared by heating benzoic acid with ammonia. It undergoes the following reactions:

$$A \xrightarrow[\text{reaction 1}]{Br_2, KOH, \Delta} B \xrightarrow[273-278K \text{reaction 2}]{NaNO_2, HCl} C \xrightarrow[\Delta \text{reaction 3}]{H_3PO_2, H_2O} D \xrightarrow[anhyd AlCl_3 \text{reaction 4}]{CH_3Cl}$$

E on heating with acidic $KMnO_4$ gives back benzoic acid.

2. Write the chemical reaction for reaction 3

Watch Video Solution

3. Benzamide (A) is prepared by heating benzoic acid with ammonia. It undergoes the following reactions:

$$A \xrightarrow[\text{reaction 1}]{Br_2, KOH, \Delta} B \xrightarrow[273-278K \text{reaction 2}]{NaNO_2, HCl} C \xrightarrow[\Delta \text{reaction 3}]{H_3PO_2, H_2O} D \xrightarrow[anhyd AlCl_3 \text{reaction 4}]{CH_3Cl}$$

E on heating with acidic $KMnO_4$ gives back benzoic acid.

3. Write the chemical reaction for reaction 2 if temperature is 298K.

View Text Solution

4. Benzamide (A) is prepared by heating benzoic acid with ammonia. It undergoes the following reactions:

$$A \xrightarrow[\text{reaction 1}]{Br_2, KOH, \Delta} B \xrightarrow[273-278K \text{reaction 2}]{NaNO_2, HCl} C \xrightarrow[\Delta \text{reaction 3}]{H_3PO_2, H_2O} D \xrightarrow[anhyd AlCl_3 \text{reaction 4}]{CH_3Cl}$$

E on heating with acidic $KMnO_4$ gives back benzoic acid.

4. What is the product B? Is it more or less basic than $C_2H_5NH_2$?

Watch Video Solution

5. Benzamide (A) is prepared by heating benzoic acid with ammonia. It undergoes the following reactions:

$$A \xrightarrow[\text{reaction 1}]{Br_2, KOH, \Delta} B \xrightarrow[273-278K \text{reaction 2}]{NaNO_2, HCl} C \xrightarrow[\Delta \text{reaction 3}]{H_3PO_2, H_2O} D \xrightarrow[anhyd AlCl_3 \text{reaction 4}]{CH_3Cl}$$

E on heating with acidic $KMnO_4$ gives back benzoic acid.

5. Give reaction for the conversion of E into benzyl alcohol.

Watch Video Solution

6. Four structural isomers are possible corresponding to the molecular formula C_3H_9N. Out of these, two are primary amines which are position isomers. All are more basic than aniline.

6. Write the structural formula and IUPAC name of tertiary amine having the above molecular formula.

Watch Video Solution

7. Four structural isomers are possible corresponding to the molecular formula C_3H_9N. Out of these, two are primary amines which are position isomers. All are more basic than aniline.

7. Which of these liberate N_2 gas on treatment with nitrous acid?

Watch Video Solution

8. Four structural isomers are possible corresponding to the molecular formula C_3H_9N. Out of these, two are primary amines which are position isomers. All are more basic than aniline.

8. Will these amines be more basic or less basic than ammonia?

Watch Video Solution

9. Four structural isomers are possible corresponding to the molecular formula C_3H_9N. Out of these, two are primary amines which are position isomers. All are more basic than aniline.

9. How will you prepare one of these primary amines by Hoffmann bromamide reaction?

Watch Video Solution

10. Four structural isomers are possible corresponding to the molecular formula C_3H_9N. Out of these, two are primary amines which are position

isomers. All are more basic than aniline.

10. Which of these will not react with benzene sulphonyl chloride?

Watch Video Solution

Revision Exercises Assertion Reason Questions

1. Assertion: n-Propylamine has higher boiling point than trimethylamine.

Reason : Among n-propylamine molecules, there is hydrogen bonding but there is no hydrogen bonding in trimethylamine.

Watch Video Solution

2. Assertion: Aniline does not undergo Friedel Crafts reaction.

Reason : Friedel Crafts reaction is an electrophilic substitution reaction.

Watch Video Solution

3. Assertion: Aniline is a weaker base than ammonia.

Reason : Aniline is resonance stabilized.

Watch Video Solution

4. Assertion: Carbylamine reaction involves the reaction between 1° amine and chloroform in the presence of alkali.

Reason : 1° -amines are more basic than 2° -amines.

Watch Video Solution

5. Assertion: Tertiary amines undergo acylation reaction.

Reason : Tertiary amines do not have replaceable H atom.

Watch Video Solution

6. Assertion(A) : Aniline hydrogen sulphate on heating froms a mixture of o- and p-amineo- sulphonic acid .

Reason (R) : The suphonic acid is `overline e withdrawing .

Watch Video Solution

7. Assertion: Ammonolysis of alkyl halides involves reaction between alkyl halides and alcoholic ammonia.

Reason: Ammonolysis of alkyl halides mainly produces 2° amines.

View Text Solution

8. Assertion: Sulphanilic acid has high melting point and is practically insoluble in water.

Reason : Sulphanilic acid exists as zwitter ion salt.

View Text Solution

9. Assertion: Alkyl cyanides and alkyl isocyanides have much higher boiling points than corres- ponding alkyl halides.

Reason : Cyanides and isocyanides are much more polar than alkyl halides.

View Text Solution

10. Assertion : p-nitroaniline is a weaker base than p-toluidine.

Reason: The electron donating $-NO_2$ group in p-nitroaniline makes it a weaker base.

Watch Video Solution

Revision Exercises Very Short Answer Questions

1. Write the IUPAC name of the following:

$$H_3C-\underset{CH_3}{\overset{|}{N}}-\underset{C_2H_5}{\overset{CH_3}{\overset{|}{\underset{|}{C}}}}-CH_2CH_3$$

Watch Video Solution

2. Write the structural formulae of all the amines with molecular formula C_2H_7N.

Watch Video Solution

3. What is the name of the reaction when benzene diazonium chloride is treated with cuprous chloride?

Watch Video Solution

4. How is iodobenzene obtained from benzene diazonium chloride?

Watch Video Solution

5. Write a chemical reaction to prepare an azo dye from benzene diazonium chloride.

Watch Video Solution

6. The product formed in the reaction is

$C_6H_5 - N_2Cl + H_3PO_2 + H_2O \xrightarrow{Cu^+}$ H_(3)PO_(3)+HCl+N_(2)`

Watch Video Solution

7. What happens when aniline is treated with Br_2 water?

Watch Video Solution

8. Give one reaction that can be used as a test for primary amines.

Watch Video Solution

9. pK_b of aniline is more than that of methylamine. Why?

Watch Video Solution

10. Convert aniline the phenylisocyanide

Watch Video Solution

11. Arrange the following in the increasing order of basicity:

aniline, p-nitroaniline, p-toluidine.

Watch Video Solution

12. What is carbylamine test for 1° amines?

Watch Video Solution

13. Arrange the following in the increasing order of their basic strength in aqueous solutions:

$CH_3NH_2, (CH_3)_3N, (CH_3)_2NH$

Watch Video Solution

14. The strongest. hasc among the following compounds is

$NH_3, H_3CNH_2, (H_3C)_2, NH, H_5C_6NH_2$

Watch Video Solution

15. Complete the reaction:

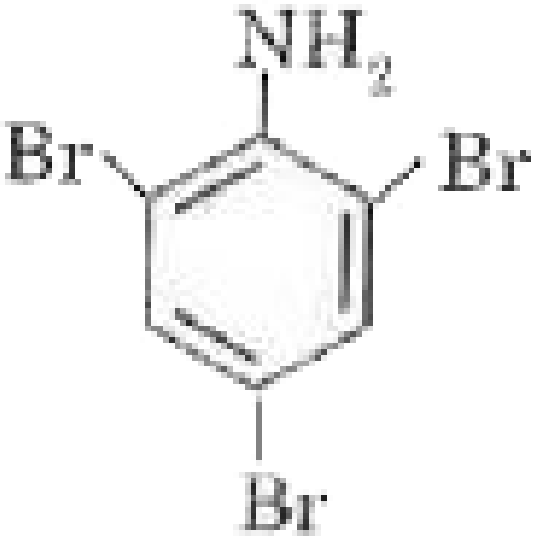
$CH_3 - CH_2C \equiv N \xrightarrow{Na(Hg)/C_2H_5OH} ?$

Watch Video Solution

16. What happens when benzene diazonium chloride solution is added slowly to boiling dil, mineral acid?

Watch Video Solution

17. Write the IUPAC name of



Watch Video Solution

18. How is benzamide converted into benzylamine?

Watch Video Solution

19. Write down diazotisation reaction.

Watch Video Solution

20. Complete the following reaction:

$$Ar - NH_2 \xrightarrow[0-5^\circ C]{NaNO_2, HCl} A \xrightarrow{CuCN} B$$

Watch Video Solution

21. Write down Hinsberg's test for primary amines.

Watch Video Solution

22. Write IUPAC name of the following compound : $CH_3NHCH(CH_3)_2$

Watch Video Solution

23. Write IUPAC name of the following compound

$(CH_3CH_2)_2NCH_3$

Watch Video Solution

24. Arrange the following in increasing order of base strength in gas phase:

$(C_2H_5)_3N, C_2H_5NH_2, (C_2H_5)_2NH$

Watch Video Solution

25. Arrange the following in decreasing order of solubility in water:

$(CH_3)_3N, (CH_3)_2NH, CH_3NH_2$

Watch Video Solution

26. Arrange the following compounds is increasing order of solubility in water :

$C_6H_5NH_2, (C_2H_5)_2NH, C_2H_5NH_2$

Watch Video Solution

27. Give a chemical test to distinguish between ethylamine and aniline.

Watch Video Solution

28. Rerrange the following in an increasing order of their basic strengths:

$C_6H_5NH_2, C_6H_5N(CH_3)_2, (C_6H_5)_2$ NH and CH_3NH_2.

Watch Video Solution

29. Write the structure of n-methy-lethanamine.

Watch Video Solution

30. The conversion of primary aromtatic amines in to diazonium salts is known as

Watch Video Solution

31. Write the IUPAC name of the compound:

$$CH_3— NH–CH_2– \underset{\underset{CH_3}{|}}{C} H–CH_3$$

Watch Video Solution

Revision Exercises Short Answer Questions

1. Explain the following:

(i) Tertiary amines do not undergo acylation.

(ii) CH_3NH_2 is stronger base than ammonia.

(iii) It is difficult to prepare pure amines by ammonolysis of alkyl halides.

Watch Video Solution

2. An amine (A) C_3H_9N reacts with nitrous acid at 0 to $5^\circ C$ to give an oily layer separated from reaction mixture. Write the structure of A and its reaction with

(i) acetyl chloride

(ii) methyl magnesium bromide.

Watch Video Solution

3. (a) Why have primary amines higher boiling point than tertiary amines?

(b) How can you find out whether a given amine is a primary amine? Write the chemical reaction involved in the test you perform.

Watch Video Solution

4. In the following cases rearrange the compounds as directed:

(i) In an increasing order of basic strength:

$C_6H_5NH_2$, $C_6H_5N(CH_3)_2$, $(C_2H_5)_2NH$ and CH_3NH_2

(ii) In a decreasing order of basic strength:

Aniline, p-nitroaniline and p-toluidine

(iii) In an increasing order of pK_b values:

$C_2H_5NH_2$, $C_6H_5NHCH_3$, $(C_2H_5)_2NH$ and $C_6H_5NH_2$

Watch Video Solution

5. Complete the following chemical equations

(i)$C_6H_5N_2Cl + C_6H_5NH_2 \rightarrow$

(ii)$C_6H_5N_2 + CH_3CH_2OH \rightarrow$

(iii) $RNH_2 + CHCl_3KOH \rightarrow$

Watch Video Solution

6. (a) Explain why an alkylamine is more basic than ammonia?

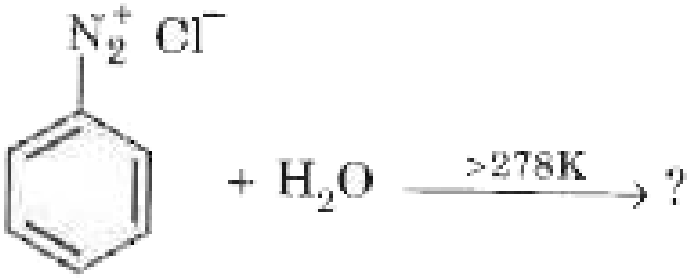
(b) How would you convert:

(i) Aniline to nitrobenzene

(ii) Aniline to iodobenzene

Watch Video Solution

7. (a) Complete the following reaction:



(b) Explain ethylamine is more basic than ammonia.

(c) What is carbylamine reaction?

Watch Video Solution

8. (a) Write chemical test, to distinguish between CH_3NH_2 and $(CH_3)_2$ NH.

(b) Fill in the blanks :

(i) $CH_3CH_2I \xrightarrow{NaCN} ? \xrightarrow[\text{hydrolysis}]{OH^-, \text{partial}} ?$

(ii) $C_6H_5N_2Cl \xrightarrow{CuCN} ? \xrightarrow[H^+]{H_2O} ?$

Watch Video Solution

Watch Video Solution

9. Write chemical equations for the following conversions:

(i) Nitrobenzene to benzoic acid

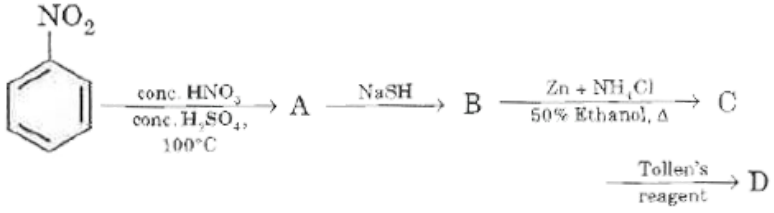
(ii) Benzyl chloride to 2-phenyl ethanamine

(iii) Aniline to benzoic acid.

Watch Video Solution

10. (a) (i) Convert aniline to fluorobenzene.

(ii) Write structural formula of the compounds A to D:



(b) Write structural formulae of the compound A and B:

$C_6H_5CONH_2 \xrightarrow{Br_2/KOH} A \xrightarrow{Br_2/H_2O} B.$

Watch Video Solution

11. (a) Complete the following reactions:

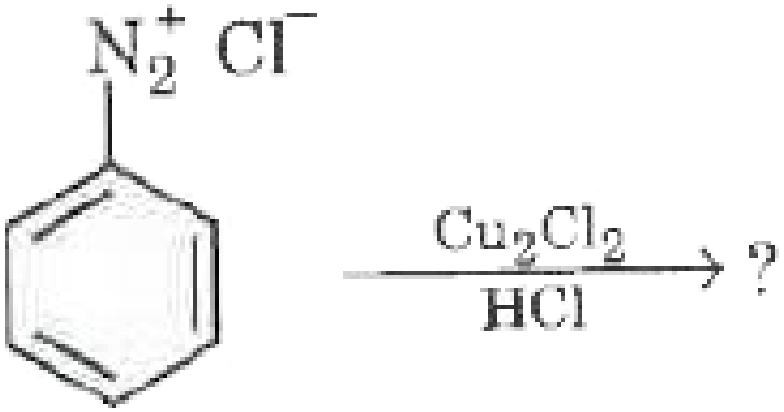
(i) $C_6H_5NH_2 + CHCl_3 + KOH(alc.) \xrightarrow{warm}$

(ii) $C_6H_5N_2^-Cl^- \xrightarrow{Cu_2Cl_2, HCl}$

(b) Write coupling reaction.

Watch Video Solution

12. (a) Complete the following reaction:



(b) Convert aniline into benzoic acid.

(c) What is Balz-Schiemann reaction?

Watch Video Solution

13. How will you achieve the synthesis of only 4-bromoaniline from aniline without the production of the trisubstituted aniline.

Watch Video Solution

14. (a) Why have primary amines higher boiling points than tertiary amines?

(b) Write the products obtained in the nitration of aniline.

(c) What is carbylamine reaction?

Watch Video Solution

15. Give one chemical test to distinguish between the following pairs of compounds:

(i) Methylamine and dimethylamine

(ii) Aniline and benzylamine

Watch Video Solution

16. Account for the following:

(i) pK_b of aniline is more than that of methylamine.

(ii) Ethylamine is soluble in water whereas aniline is not.

(iii) Methylamine in water reacts with ferric chloride to precipitate hydrated feric oxide.

(iv) Although amino group is o– and p– directing in aromatic electrophilic substitution reactions, aniline on nitration gives a substantial amount of m-nitroaniline.

(v) Aniline does not undergo Friedel-Crafts reaction.

Diazonium salts of aromatic amines are more stable than those of aliphatic amines.

(vii) Gabriel phthalimide synthesis is preferred for synthesising primary amines.

Watch Video Solution

17. Give the structures of A, B and C in the following reactions:

(i) $C_6H_5N_2{}^+Cl^- \xrightarrow{CuCN} A \xrightarrow{H_2O/H^+} B \xrightarrow[\Delta]{NH_3} C$

(ii) $C_6H_5NO_2 \xrightarrow{Sn, HCl} A \xrightarrow{NaNO_2, HCl} B \xrightarrow[\Delta]{H_2O / H^+} C$

Watch Video Solution

18. Write Hinsberg's test to distinguish primary, secondary and tertiary amines.

Watch Video Solution

19. Write short notes on the following:

(i) Carbylamine reaction

(ii) Gabriel phthalimide reaction.

(iii) Hoffmann bromamide reaction.

(iv) Gattermann reaction.

(v) Balz Schiemann reaction.

(vi) Coupling reaction.

Watch Video Solution

20. How will you canvert the following :

(i) Nitrobenzene into aniline,

(ii) Ethanoic acid into methanmine

(iii) Aniline into N-phenylethanaminde (write the chemical equations involved).

Watch Video Solution

21. Give the structures of A, B and C in the following reactions:

(i) $CH_3Br \xrightarrow{KCN} A \overset{LiAlH_4(\rightarrow)}{} B \xrightarrow[273K]{HNO_2} C$

(ii) $CH_3COOH \xrightarrow[\Delta]{NH_3} A \xrightarrow{Br_2+KOH} B \xrightarrow{CHCl_3+NaOH} C$

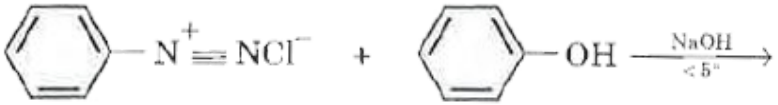
Watch Video Solution

22. (a) What is Hoffmann's bromamide reaction? Write the reaction involved in it.

(b) Secondary amine is stronger base than tertiary amine.

Give reason.

(c) Complete the following reactions:



(ii) $C_2H_5NH_2 + CH_3COCI \rightarrow$

Watch Video Solution

23. (a) Give one reaction that can be used as a test for primary amines.

(b) Arrange the following substances in increasing order of their basic strength in water:

$C_6H_5NH_2, (C_2H_5)_2NH, (C_2H_5)_3N, C_2H_5NH_2$

(c) Out of ethylamine and ethyl alcohol, which has higher boiling point and why?

Watch Video Solution

24. (a) Why is the secondary amine more basic than primary amine?

(b) Explain Hoffman mustard oil reaction.

(c) How is a primary amine distinguished from a secondary amine using a chemical test?

Watch Video Solution

25. (a) Account for the correct order of decreasing basicity of ethylamine, 2-aminoethanol and 3-aminopropan-1-ol

(b) How will you convert aniline into chlorobenzene?

(c) Write a short note on carbylamine test.

Watch Video Solution

26. (a) Write coupling reaction.

(b) Give a chemical test to distinguish between aniline and N-methylaniline.

(c) How will you convert benzoic acid to aniline?

Watch Video Solution

27. (a) What is Garbriel phthalimide reaction? Give the reaction.

(b) Complete the following reactions:

(i) $CH_3CONH_2 + Br_2 + 4KOH \rightarrow$? + ? + ? + ?

(ii) $CH_3CH_2NH_2 + HNO_2 \xrightarrow{<5^\circ C}$? + ? + ?

Watch Video Solution

28. CARBYLAMINE REACTION

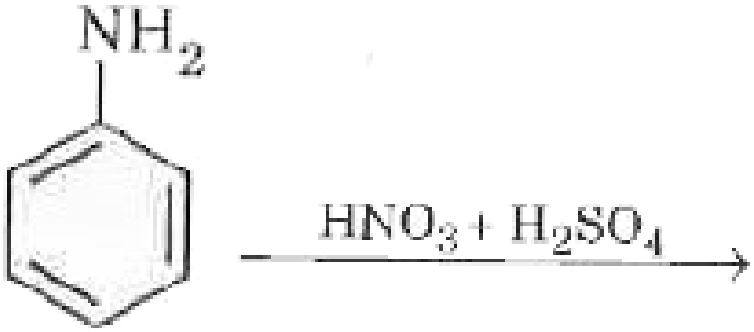
Watch Video Solution

29. (a) Why is secondary amine more basic than the tertiary amine?

(b) How can $1^\circ, 2^\circ$ and 3° amine be distinguished by Hinsberg test?

(c) Complete the reaction:

(i) $CH_3CONH_2 + 4[H] \xrightarrow{LiAlH_4 / ether}$?



Watch Video Solution

30. (a) Write the chemical equations of:

(i) Coupling reaction

(ii) Mendius reaction

(b) Why amines have higher boiling points than corresponding hydrocarbons.

Watch Video Solution

31. Identify A, B, C and D in the following conversions:

$$A \xrightarrow[273-278K]{NaNO_2/HCl} CH_3OH \xrightarrow{PCl_3} B \xrightarrow{KCN} C \xrightarrow{LiAlH_4} D$$

Watch Video Solution

32. Write the structures of A, B and C in the following:

(i) $C_6H_5CONH_2 \xrightarrow{Br_2/aq.KOH} A \xrightarrow[0-5^\circ C]{NaNO_2/HCl} B \xrightarrow{KI} C$

(ii) $CH_3Cl \xrightarrow{KCN} A \xrightarrow{LiAlH_4} B \xrightarrow[\Delta]{CHCl_3+alcKOH} C$

Watch Video Solution

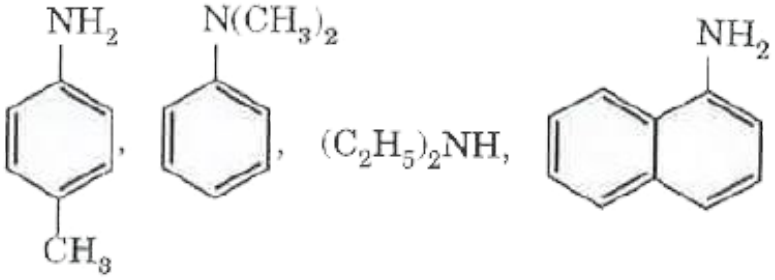
33. (a) What happens when aniline reacts with bromine water at room temperature?

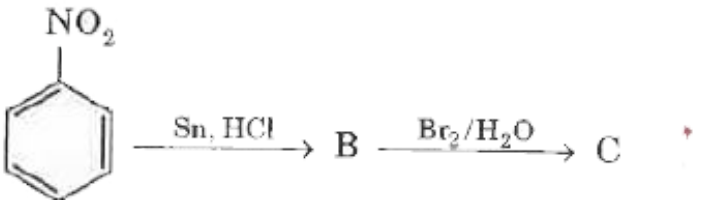
(b) Give a chemical test for primary amines.

(c) Write the diazotisation reaction of aniline.

Watch Video Solution

34. (a) Classify the following amines as primary, secondary and tertiary.

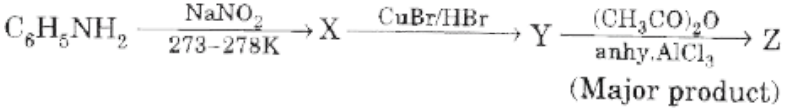




Identify the products B and C and write their formulae.

Watch Video Solution

35. Identify the compounds X, Y and Z in the following reactions:



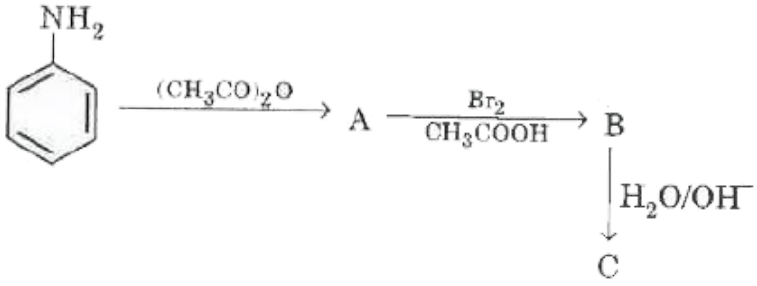
Watch Video Solution

36. (a) Explain, with the help of chemical equations, how the following compounds would be obtained from benzene diazonium chloride:

(i) Iodobenzene

(ii) 4-Aminoazobenzene

(b) Complete the following reaction:



(c) What will happen if aniline is treated with aqueous bromine?

Watch Video Solution

37. (a) Name the test used to identify primary amines using $CHCl_2$ and ethanolic KOH.

(b) How can you convert methyl iodide to ethanamine?

Watch Video Solution

38. Write the structures of main products when benzene diazonium chloride reacts with the following reagents:

(i) CuCN

(ii) CH_3CH_2OH

(iii) KI

Watch Video Solution

39. Write equations of the following reactions:

(i) Acetylation of aniline

(ii) Coupling reaction

(iii) Carbylamine reaction

Watch Video Solution

40. (a) Arrange the following compounds in an increasing order of basic strengths in their aqueous solutions:

$NH_3, CH_3NH_2, (CH_3)_2NH, (CH_3)_3N.$

(b) Complete the following reaction equations:

(i) $RCONH_2 \xrightarrow[H_2O]{LAH}$

(ii) $C_6H_5N_2Cl + H_3PO_2 + H_2O \rightarrow$

(iii) $C_6H_5NH_2 + Br_2(aq) \rightarrow$

Watch Video Solution

41. Give the chemical tests to distinguish between the following pairs of compounds :

(i) Ethylamine and Aniline

(ii) Aniline and Benzlamine

Watch Video Solution

42. Given the chemical tests to distinguish between the following pairs of compounds :

(i) Methylamine and Dimethylamine

(ii) Aniline and N - Methylamine

Watch Video Solution

43. Give the structures of the products A, B and C in the following reactions:

(i) $CH_3CH_2Br \xrightarrow{KCN} A \xrightarrow{LiAlH_4} B \xrightarrow[0^\circ C]{HNO_2} C$

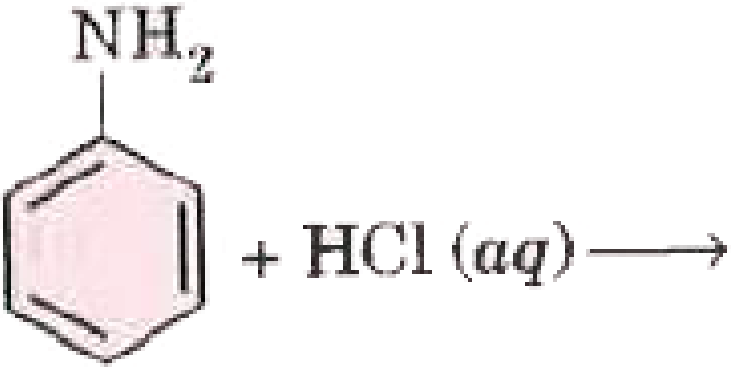
(ii) $CH_3COOH \xrightarrow[\Delta]{NH_3} A \xrightarrow{NaOH + Br_2} B \xrightarrow{CHCl_3 + alcKOH} C$

Watch Video Solution

44. Complete the following reactions :

(i) $CH_3CH_2NH_2 + CHCl_2 + alc.\ KOH \rightarrow$

(ii) $C_6H_5N_2{}^+Cl^- \xrightarrow[\text{(Room Temp.)}]{H_2O}$



Watch Video Solution

45. Write the main products of the following reactions :

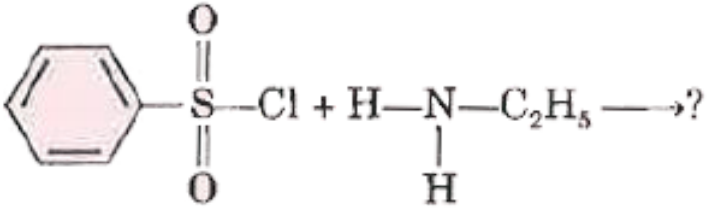
(i) $C_6H_5N_2^+Cl^- \xrightarrow{H_3PO_2+H_2O}$?

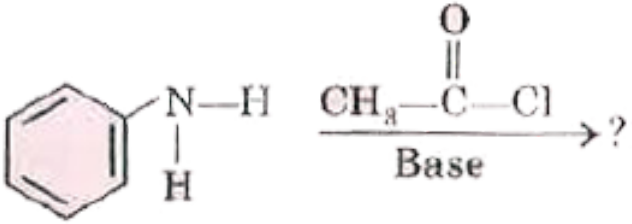
(iii) $CH_3-\underset{\underset{O}{||}}{C}-NH_2 \xrightarrow{Br_2+NaOH}$?

Watch Video Solution

46. Write the main products of the following reactions:

(i) $CH_3CH_2NH_2 \xrightarrow[0^\circ C]{HNO_2}$?

(ii) 

(iii) 

Watch Video Solution

47. Write the structures of A, B and C in the following:

(i) $C_6H_5COO^-NH_4^+ \xrightarrow{\Delta} A \xrightarrow{Br_2/KOH} B \xrightarrow[\text{pyridine}]{CH_3COCl} C$

(ii) $C_6H_5N^+BF_4^- \xrightarrow[453-473K]{\text{Heat}} A \xrightarrow{Sn/HCl} B \xrightarrow[\Delta]{CHCl_3+alc.KOH} C$

Watch Video Solution

48. Give reasons for the following

(a) Acetylation of aniline reduces its activation effect.

(b) CH_3NH_2 is more basiic than $C_6H_5NH_2$.

(c) Although $-NH_2$ is o/p directing group, yet aniline on nitration gives a significant amount of m-nitroaniline.

Watch Video Solution

49. Write the structures of compounds A, B and Cin the following reactions:

(a) $CH_3 - COOH \xrightarrow{NH_3 / \Delta} A \xrightarrow{Br_2 / KOH\,(aq)} B \xrightarrow{CHCl_3 + alc.KOH} C$

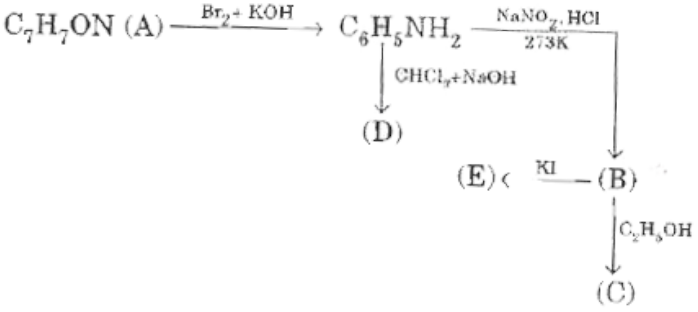
(b) $C_6H_5N_2^+BF_4^- \xrightarrow[\Delta]{NaNO_2 / Cu} A \xrightarrow{Fe / HCl} B \xrightarrow{CH_3COCl\,/\,\text{pyridine}} C$

Watch Video Solution

Revision Exercises Long Answer Questions

1. An aromatic compound 'A' of molecular formula C_7H_7ON undergoes a series of reactions as shown below. Write the structures of A, B, C, D and E

in the following reactions:



Watch Video Solution

2. (a) Write the structures of main products formed when aniline reacts with the following reagents:

(i) Br_2 water

(ii) HCl

(iii) $(CH_3CO)_2$ O/pyridine

(b) Arrange the following in the increasing order of their boiling point:

$C_2H_5NH_2, C_2H_5OH, (CH_3)_3N$

(c) Give a simple chemical test to distinguish between the following pair of compounds:

$(CH_3)_2NH$ and $(CH_3)_3N$

Watch Video Solution

3. (a) Write the structures of main products formed when benzene diazonium chloride $\left(C_6H_5N_2{}^+Cl^-\right)$ reacts with following reagents:

(i) CuCN/KCN

(ii) H_2O

(iii) CH_3CH_2 OH

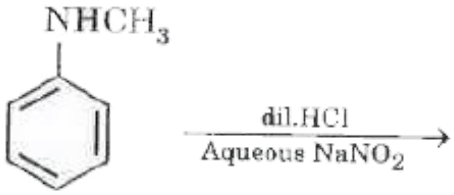
(b) Arrange the following:

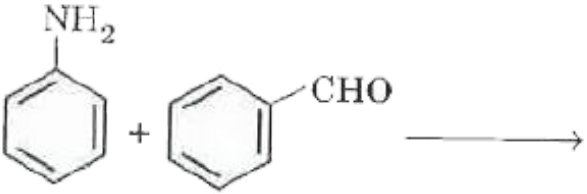
(i) $C_2H_5NH_2, C_2H_5OH, (CH_3)_3N$: in increasing order of their boiling point.

(ii) Aniline, p-nitroaniline, p-methylaniline in the increasing order of their basic strength.

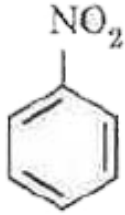
Watch Video Solution

4. Write the organic products in the following reactions:

(i) 

(ii) 

(iii)  + $CHCl_3$ $\xrightarrow[\text{Heat}]{\text{Ethanolic KOH}}$

(iv)  $\xrightarrow[\text{(b) Aqueous NaOH}]{\text{(a) Sn/HCl(conc.)}}$

(v)  $\xrightarrow[\text{Cu powder, Heat}]{\text{Aqueous } NaNO_2}$

(vi) RCN $\xrightarrow[\text{Dry ether, Heat}]{LiAlH_4}$

Watch Video Solution

5. (a) Write the reactions involved in the following :

(i) Hoffmann bromamide degradation reaction.

(ii) Diazotisation .

(iii) Gabriel phthalimide synthesis

(b) Give reasons :

(i) $(CH_3)_2NH$ is more basic than $(CH_3)_3N$ in an aqueous solution.

(ii) Aromatic diazonium salts are more stable than aliphatic diazonium salts .

Watch Video Solution

Higher Order Thinking Skills Advanced Level

1. tert-Butylamine cannot be prepared by action of ammonia on tert-butyl bromide. Why? Explain.

Watch Video Solution

2. Explain : 2-aminoethanoic acid exists as a dipolar ion as does p-amino sulphonic acid but p-amino benzoic acid does not.

Watch Video Solution

3. Why are aryldiazonium ion more stable than alkyldiazonium ion?

Watch Video Solution

4. p-methoxyaniline is a stronger base than aniline but p-nitroaniline is a weaker base than aniline. Explain.

Watch Video Solution

5. Can we prepare aniline by Gabriel phthalimide reaction?

View Text Solution

6. Sulphanilic acid is insoluble in water and organic solvents. Explain.

Watch Video Solution

7. Why is an amide more acidic than amine?

Watch Video Solution

8. Which is more basic $PhNH_2$ or Ph_2NH ?

Watch Video Solution

9. An optically inactive compound (A) having molecular formula $C_4H_{11}N$ on treatment with HNO_2 gave an alcohol (B) which on heating with conc. H_2SO_4 at 440 K gave an alkene (C) . (C) on treatment with HBr gave an optically active compound (D) having molecular formula C_4H_9Br Identify (A) ,(B) ,(C) and (D).

Watch Video Solution

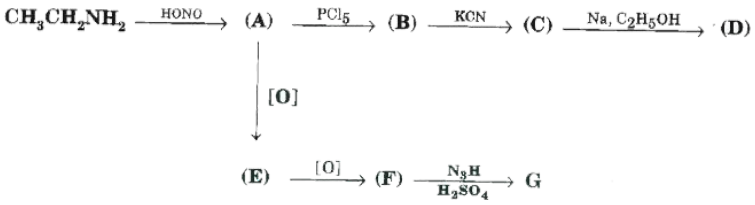
10. A colourless substance (A) is sparingly soluble in water and gives (B) on heating with mineral acids. Compound (B) on reaction with $CHCl_3$ and alcoholic potash produces an obnoxious smell of carbylamine due to the formation of (C). Compound (A) on reaction with chlorosulphonic acid gives (D) which on treatment with ammonia gives (E). Compound (E) on hydrolysis gives sulphanilamide, a well known drug. Give structures of (A) to (E) with proper reasoning.

View Text Solution

11. An organic compound A (C_3H_5N) on boiling with alkali gives ammonia and sodium salt of an acid B $(C_3H_6O_2)$. A on reduction gives $C(C_3H_9N)$ which with nitrous acid gives D (C_3H_8O). Give the structural formulae of A, B, C and D.

Watch Video Solution

12. Identify (A) to (G) in the following reaction scheme:



Watch Video Solution

13. $\underset{\text{Optically active}}{\underset{(X)}{C_5CH_{13}N}} \xrightarrow[N_2]{NaNO_2/HCl} (Y)\text{Tertiary alcohol} + \text{Other product}$

Find (X) and (Y) . Is (Y) optically active ? Write the intermediate steps .

Watch Video Solution

Competition File Objective Type Questions Multiple Choice Questions M C Q A

1. Aniline undergoes condensation to form Schiff base on reacting with

A. acetyl chloride

B. ammonia

C. acetone

D. benzaldehyde.

Answer: D

Watch Video Solution

2. An isocyanide on reduction with hydrogen in the presence of Pt gives

A. amide

B. primary amine

C. secondary amine

D. alcohol.

Answer: C

Watch Video Solution

3. Aniline on oxidation with $Na_2Cr_2O_7$ and H_2SO_4 gives

A. benzoic acid

B. m-amino benzoic acid

C. Schiff's base

D. p-benzoquinone.

Answer: D

Watch Video Solution

4. Which of the following reactions is given by only primary amines ?

A. Reaction with HONO

B. Reaction with chloroform and alcoholic KOH

C. Reaction with acetyl chloride

D. Reaction with Grignard reagent.

Answer: B

Watch Video Solution

5. Amino $(-NH_2)$ group is susceptible to oxidation by HNO_3, therefore, nitration is done in the presence of :

A. dil H_2SO_4

B. CS_2 at $0^\circ C$

C. $CH_3, COCl$

D. Water.

Answer: C

Watch Video Solution

6. Aniline reacts with $NaNO_2$ and HCl at room temperature to give

A. nitroaniline

B. phenol

C. diazonium chloride

D. chloroaniline.

Answer: C

Watch Video Solution

7. Silver chloride is soluble in methylamine due to the formation of:

A. $Ag(CH_3NH_2)Cl$

B. $Ag + CH_3Cl + NH_4Cl$

C. $\left[Ag(CH_3NH_2)_2\right]Cl$

D. $AgOH$.

Answer: C

Watch Video Solution

8. Diethylamine reacts with nitrous acid to give

A. $(C_2H_5)_2NH^+NO_2^-$

B. $(C_2H_5)_2NNO$

C. C_2H_5OH

D. N_2 and alcohol.

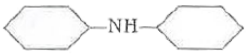
Answer: B

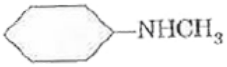
Watch Video Solution

9. Maximum pK_b value is of

A. $(CH_3)_2NH$

B. $(CH_3CH_2)_2NH$

C. 

D. 

Answer: C

Watch Video Solution

10. Reaction of acetamide with bromine and KOH gives

A. CH_3COOH

B. $CH_3CH_2NH_2$

C. CH_3COONH_4

D. CH_3NH_2.

Answer: D

Watch Video Solution

11. Hoffmann degradation of m-bromobenzamide gives

A. Aniline

B. m-bromoaniline

C. bromobenzene

D. m-bromoethyl benzene.

Answer: B

Watch Video Solution

12. Which of the following is Hofmann mustard oil reaction?

A. Reaction of aromatic amine with iodoform

B. Reaction of primary amine with $CHCl_3$

C. Reaction of primary amine with CS_2 and $HgCl_2$

D. Reaction of secondary amine with nitrous acid.

Answer: C

Watch Video Solution

13. On heating aniline with CS_2 in the presence of $HgCl_2$ the product is :

A. Phenyl cyanide

B. Phenyl isocyanide

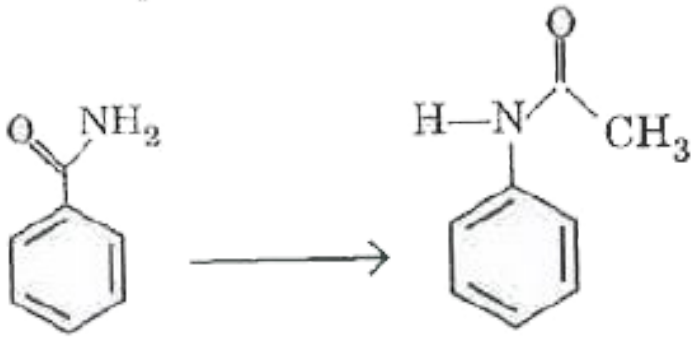
C. Phenyl isothiocyanate

D. p-Aminobenzene sulphonic acid

Answer: C

Watch Video Solution

14. The reagents needed to convert is/are



A. $KOH, Br_2, LiAlH_4$

B. KOH, Br_2, CH_3COCl

C. $HONO, Cu_2Cl_2, (CH_3CO)_2O$

D. $KOH, Br_2, Ni, H_2, CH_2COCl$

Answer: B

Watch Video Solution

15. A positive carbylamine test is given by:

A. N, N-dimethylaniline

B. 2, 4-dimethylaniline

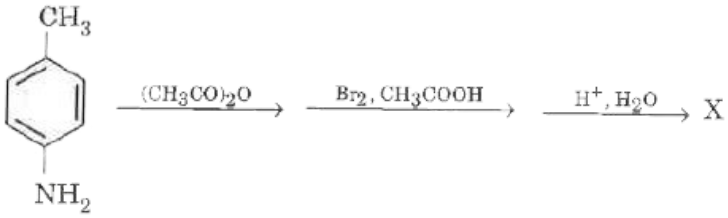
C. N-methyl-o-methylaniline

D. p-methyl benzylamine

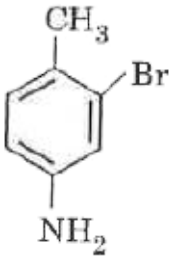
Answer: D

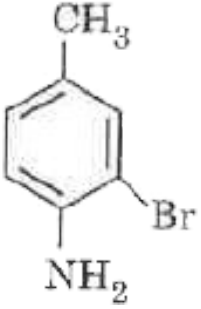
Watch Video Solution

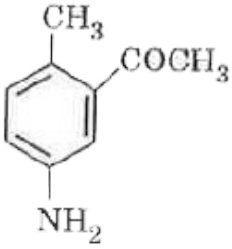
16. In the reaction

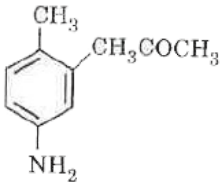


A.



B. 

C. 

D. 

Answer: B

Watch Video Solution

17. The compound $C_5H_{13}N$ is optically active and reacts with HONO to give $C_5H_{11}OH$. The compound is

A. N-methylbutanamine

B. 2-Aminopentane

C. 1-Aminopentane

D. N,N-Dimethylpropanamine

Answer: B

Watch Video Solution

18. In the reaction of p-chlorotoluene with KNH_2 is liguid NH_3 the major product is .

A. o-toluidine

B. m-toluidine

C. p-toluidine

D. p-chloroaniline

Answer: B

Watch Video Solution

19. p-chloroaniline and anilinium hydrochloride cannot be distinguished by

A. Sandmeyer's reaction

B. $NaHCO_3$

C. $AgNO_3$

D. Carbylamine test.

Answer: D

Watch Video Solution

20. $CH_3CH_2Cl \xrightarrow{NaCN} X \xrightarrow{Ni/H_2} Y \xrightarrow[\text{anhydride}]{Acetic} Z$

Z in the above reaction sequence is .

A. $CH_3CH_2CH_2NHCOCH_3$

B. $CH_3CH_2CH_2NH_2$

C. $CH_3CH_2CH_2CONHCH_3$

D. $CH_3CH_2CH_2CONHCOCH_3$

Answer: A

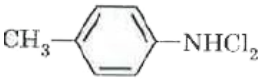
Watch Video Solution

21. The reaction of chloroform with alcoholic KOH and p-toluidine forms:

A. 

B. 

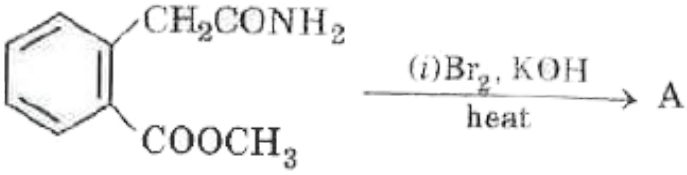
C. 

D. 

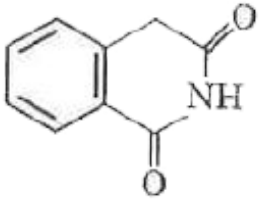
Answer: A

Watch Video Solution

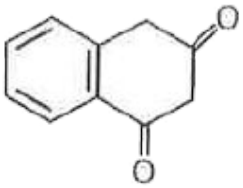
22. In the following reaction, the product A is



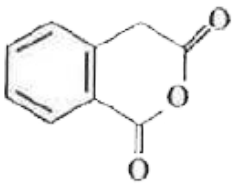
A.



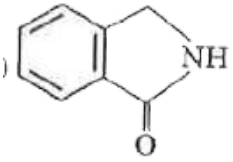
B.



C.



D.



Answer: D

Watch Video Solution

23. Which of the following compounds will dissolve in an alkali solution after it has undergone reaction with Hinsberg reagent?

A. CH_3NH_2

B. $(CH_3)_2NH$

C. $C_6H_5NHC_6H_5$

D. $(CH_3)_3N$

Answer: A

Watch Video Solution

24. Secondary amines could be prepared by

A. reduction of nitriles

B. Hoffmann bromamide reaction

C. reduction of amides

D. reduction of isonitriles

Answer: D

Watch Video Solution

25. In Balz-Schiemann reaction, benzene diazonium chloride reacts with

A. KI

B. CuCN/KCN

C. HBF_4

D. HBF_4 and $NaNO_2, Cu$

Answer: C

Watch Video Solution

26. The indicator methyl orange is prepared by coupling dia- zonium salt of sulphanilic acid with

A. Aniline

B. N, N-dimethylaniline

C. p-methylaniline

D. naphthol.

Answer: B

View Text Solution

27. Benzene diazonium chloride on reaction with phenol in weakly basic medium gives

A. diphenyl ether

B. p-hydroxyazobenzene

C. chlorobenzene

D. benzene

Answer: B

View Text Solution

28. Which of the following reaction represents Sandmeyer's reaction?

A. $C_6H_5N_2^+Cl^- \xrightarrow{CuCN\,/\,KCN} C_6H_5CN + N_2$

B. $C_6H_5N_2^+Cl^- \xrightarrow{Cu\,,HCl} C_6H_5Cl + N_2$

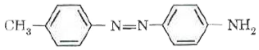
C. $C_6H_5N_2^+Cl^- \xrightarrow[HCl]{Cu_2Cl_2} C_6H_5Cl + N_2$

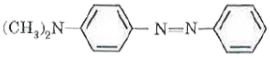
D. $C_6H_5N_2^+Cl^- \xrightarrow{HBF_4} C_6H_5F + N_2$

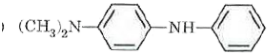
Answer: C

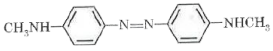
Watch Video Solution

29. Aniline when diazotized in cold and then treated with dimethyl aniline gives a coloured product. Its structure would be

A. 

B. 

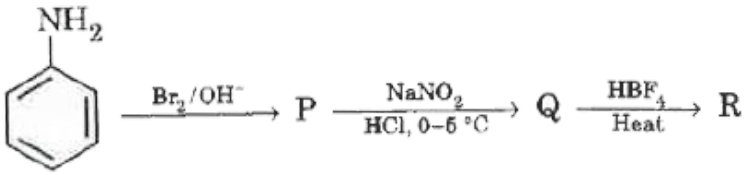
C. 

D. 

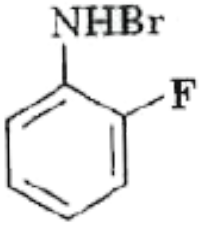
Answer: B

Watch Video Solution

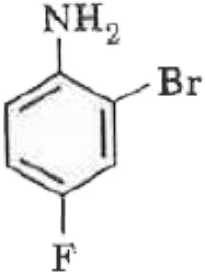
30. The product R in the following reaction is



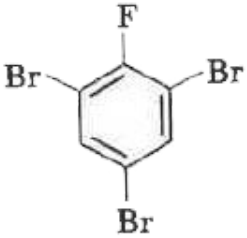
A.



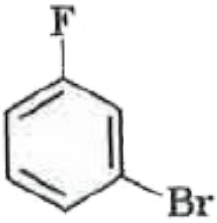
B.



C.



D.

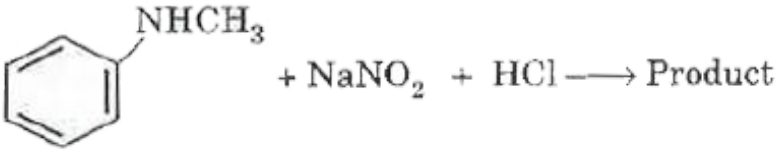


Answer: C

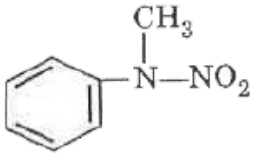
Watch Video Solution

Competition File B Multiple Choice Questions

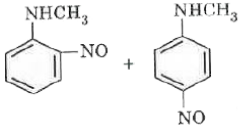
1. Predict the product



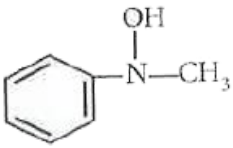
A.



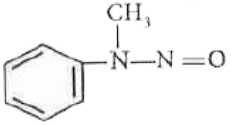
B.



C.



D.



Answer: D

Watch Video Solution

2. Nitrobenzene can be prepared from benzene by using a mixture of cone. HNO_3 and cone. H_2SO_4 In the mixture, nitric acid acts as a/an

A. acid

B. base

C. catalyst

D. reducing agent

Answer: B

Watch Video Solution

3. Acetamide is treated with the following reagents seprately.Which one of these would yield methyl amine?

A. Hot conc. H_2SO_4

B. PCl_5

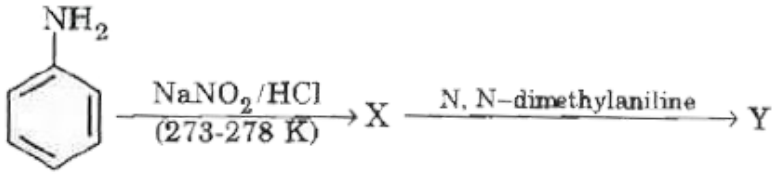
C. $NaOH-Br_2$

D. Sodalime

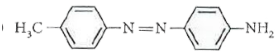
Answer: C

Watch Video Solution

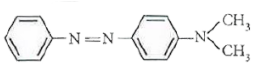
4. Aniline in a set of the following reactions yielded a coloured product Y.

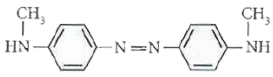


The structure of Y would be :

A. 

B. 

C. 

D. 

Answer: C

Watch Video Solution

5. Which of the following statements about primary amines is false ? .

A. Arylamines react with nitrous acid to produce phenols

B. Alkyl amines are stronger bases than ammonia

C. Alkyl amines are stronger bases than aryl amines

D. Alkyl amines react with nitrous acid to produce alcohols.

Answer: A

Watch Video Solution

6. Aniline is treated with $NaNO_2 / HCl$ at $0^\circ C$ to give compound X which on treatment with cuprous cyanide gives another compound Y. When compound Y is treated with H_2 / Ni compound Z is obtained. The compound Z is

A. Benzyl alcohol

B. Benzylamine

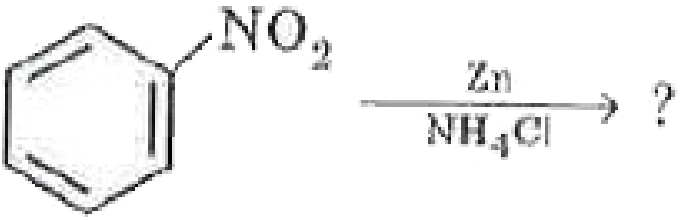
C. N-ethylaniline

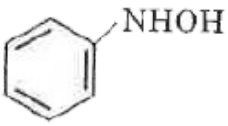
D. Phenol

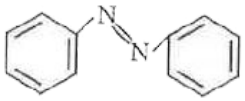
Answer: B

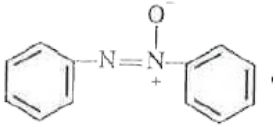
Watch Video Solution

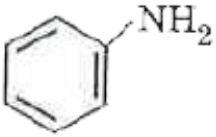
7. What is the product obtained in the following reaction ?



A. 

B. 

C. 

D. 

Answer: A

Watch Video Solution

8. Aniline is treated wi.th bromine water to give an organic compound X which when treated with $NaNO_2$ and HCI at $0^\circ C$ gives a water soluble compound Y. Compound Yon treatment with Cu_2Cl_2 and HCI gives compound Z . Compound Z is

A. o-bromochlorobenzene

B. p-bromochlorobenzene

C. 2, 4, 6-tribromophenol

D. 2, 4, 6-tribromochlorobenzene

Answer: D

Watch Video Solution

9. Secondary amines could be prepared by

A. reduction of nitriles

B. Hoffmann bromamide reaction

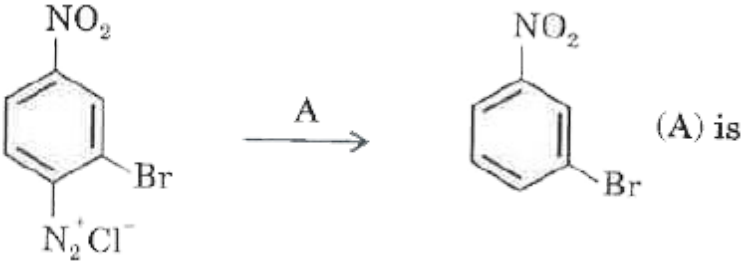
C. reduction of amides

D. reduction of isonitriles

Answer: D

Watch Video Solution

10. In the reaction:



(A) is

A. H_3PO_2 and H_2O

B. H^+ / H_2O

C. $HgSO_4 / H_2SO_4$

D. Cu_2Cl_2

Answer: A

Watch Video Solution

11. Nitrobenzene on reaction with conc HNO_3 / H_2SO_4 at $80 - 100^\circ C$ forms which one of the following products .

A. 1, 4-Dinitrobenzene

B. 1, 2, 4-Trinitrobenzene

C. 1, 2-Dinitrobenzene

D. 1,3-Dinitrobenzene

Answer: D

Watch Video Solution

12. Which of the following will be most stable diazonium salt $RN_2^+X^-$? .

A. $CH_3N_2^+X^-$

B. $C_6H_5N_2^+X^-$

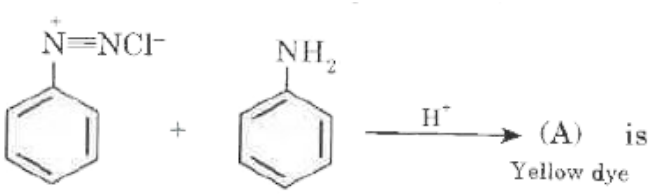
C. $CH_3CH_2N_2^+X^-$

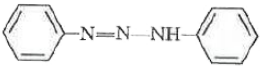
D. $C_6H_5CH_2N_2^+X^-$

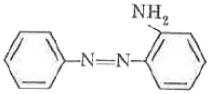
Answer: B

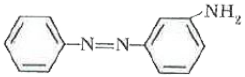
Watch Video Solution

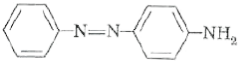
13. In the following reaction, the product (A)



A. 

B. 

C. 

D. 

Answer: D

Watch Video Solution

14. The number of structure isomers possible from the molecular formula C_3H_9N is:

A. 2

B. 3

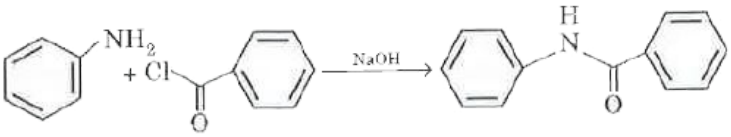
C. 4

D. 5

Answer: C

Watch Video Solution

15. The following reaction :



is known by the name:

A. Acetylation reaction

B. Schotten-Baumann reaction

C. Friedel-Craft's reaction

D. Perkin's reaction

Answer: B

Watch Video Solution

16. Method by which aniline cannot be prepared is:

A. reduction of nitrobenzene with H_2 / Pd in ethanol.

B. potassium salt of phthalimide treated with chlorobenzene followed by hydrolysis with aqueous NaOH solution.

C. hydrolysis of phenylisocyanide with acidic solution.

D. degradation of benzamide with bromine in alkaline solution.

Answer: B

Watch Video Solution

17. The electrolytic reduction of nitrobenzene in strongly acidic medium produces .

A. azobenzene

B. aniline

C. p-aminophenol

D. azoxybenzene.

Answer: C

Watch Video Solution

18. Which one of the following amines cannot be prepared by Gabriel phtahlimide synthesis?

A. Ethylamine

B. Isopropylamine

C. n-Propylamine

D. Ethylmethylamine

Answer: D

Watch Video Solution

19. Which one of the following amines forms a non-acidcic and alkali insoluble product with p-toluenece sulphonyl chloride?

A. Tertiary butylamine

B. n-Butylamine

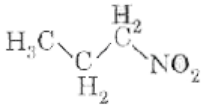
C. Isobutylamine

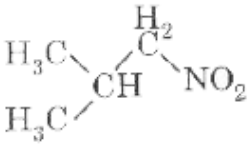
D. Diethylamine

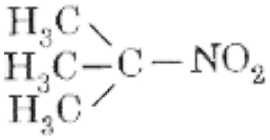
Answer: D

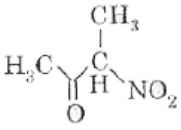
Watch Video Solution

20. Which one of the following -compounds does not react with nitrous acid ? .

A. 

B. 

C. 

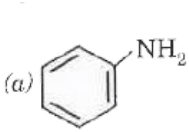
D. 

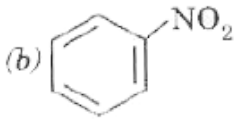
Answer: C

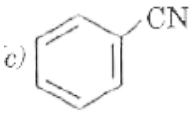
Watch Video Solution

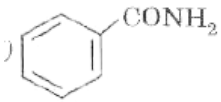
21. A given nitrogen-containing compound A reacts with Sn/HCI followed by HNO_2 to give an unstable compund B. B on treatment with

pheno1 forms a beautiful coloured compound C with the molecular formula $C_{12}H_{10}N_2O$ The structure of compound A is .

A. 

B. 

C. 

D. 

Answer: B

Watch Video Solution

22. Which of the following reactions is appropriate for converting acetamide to methamine?

A. Hoffmann bromamide reaction

B. Stephen's reaction

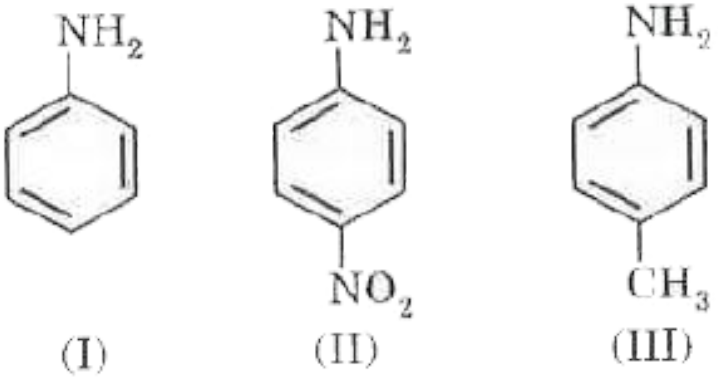
C. Gabriel phthalimide synthesis

D. Carbylamine reaction

Answer: A

Watch Video Solution

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



(I) (II) (III)

A. III $<$ I $<$ II

B. III $<$ II $<$ I

C. II $<$ I $<$ III

D. II $<$ III $<$ I

Answer: C

Watch Video Solution

24. Nitration of aniline in strong acidic medium also gives m-nitroaniline because

A. inspite of substituents, nitro group always goes to only m-position

B. in electrophilic substitution reactions, amino group is meta directive

C. in absence of substituents, nitro group always goes to m-position

D. in acidic (strong) medium, aniline is present as anilinium ion.

Answer: D

Watch Video Solution

25. The correct order of the basic strength of methyl substituted amines in aqueous solution is

A. $CH_3NH_2 > (CH_3)_2NH > (CH_3)_3N$

B. $(CH_3)_2NH > CH_3NH_2 > (CH_3)_3N$

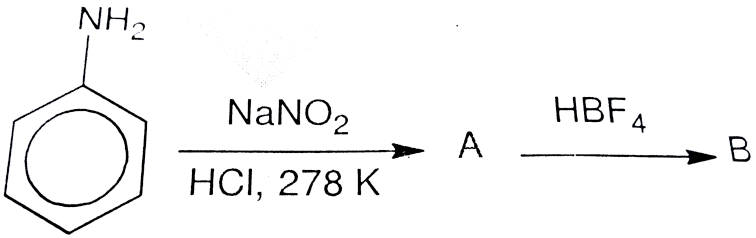
C. $(CH_3)_3N > CH_3NH_2 > (CH_3)_2NH$

D. $(CH_3)_3N > (CH_3)_2NH > CH_3NH_2$

Answer: B

Watch Video Solution

26. In the chemical reactions,



the compounds 'A' and 'B' respectively are

A. benzene diazonium chloride and fluorobenzene

B. nitrobenzene and chlorobenzene

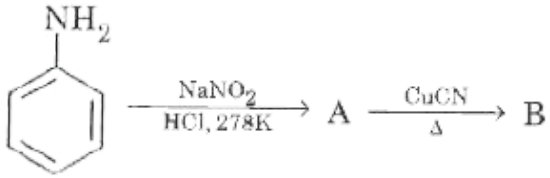
C. nitrobenzene and fluorobenzene

D. phenol and benzene

Answer: A

Watch Video Solution

27. In the chemical reactions :



the compounds A and B respectively are :

A. benzenediazonium chloride and benzonitrile

B. Nitrobenzene and chlorobenzene

C. Phenol and bromobenzene

D. Fluorobenzene and phenol

Answer: A

Watch Video Solution

28. Benzylamine is a stronger base than aniline because

A. The lone pair of electrons on the nitrogen atom in benzylamine is delocalised.

B. The lone pair of electrons on the nitrogen atom in aniline is delocalised.

C. The lone pair of electrons on the nitrogen atom in aniline is not involved in resonance.

D. Benzylamine has a higher molecular mass than aniline

Answer: B

Watch Video Solution

29. An organic compound (P) having molecular mass 180 is acylated with CH_3COCl to get a new compound with molecular mass 348. The number of amino groups present per molecule of compound (P) is

A. 6

B. 2

C. 5

D. 4

Answer: C

Watch Video Solution

30. The positive carbylamine test is given by

A. N, N-dimethylaniline

B. triethylamine

C. N-methylaniline

D. p-methylbenzylamine

Answer: D

Watch Video Solution

31. The best reagent for converting 2-phenylpropanamide into 2-phenylpropanamine is

A. Br_2 in aqueous NaOH

B. excess of H_2

C. iodine in the presence of red phosphorus

D. $LiAlH_2$ in ether

Answer: D

Watch Video Solution

32. An aromatic compound A (C_7H_9N) on reacting with $NaNO_2$ / HCI at $0^\circ C$ forms benzyl alcohol and nitrogen gas. The number of isomers possible for the compound A is

A. 5

B. 7

C. 3

D. 6

Answer: A

Watch Video Solution

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

A. $C_6H_5NH_2$

B. $(CH_3)_2NH$

C. CH_3NH_2

D. $(CH_3)_3N$

Answer: B

Watch Video Solution

34. On heating an aliphatic primary amine with chloroform and enthanolic potassium hydrozide, the organic compound formed is

A. an alkyl isocyanide

B. an alkanol

C. an alkanediol

D. an alkyl cyanide.

Answer: A

Watch Video Solution

35. In the given set of reactions :

$$2-\text{Bromopropane} \xrightarrow[\Delta]{\text{alc.AgCN}} 'X' \xrightarrow{LiAlH_4} 'Y'$$

The IUPAC name of product 'Y' is :

A. N-isopropylmethanamine

B. N-methylpropan-2-amine

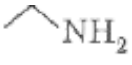
C. N-methylpropanamine

D. Butan-2-amine,

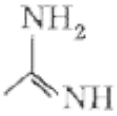
Answer: B

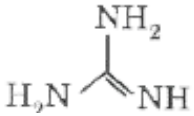
Watch Video Solution

36. The correct order of basicity of the following compounds is

1. 

2. 

3. 

4. 

A. $1 < 2 < 3 < 4$

B. $1 < 2 < 4 < 3$

C. $2 < 1 < 3 < 4$

D. $4 < 3 < 2 < 1$

Answer: C

Watch Video Solution

Watch Video Solution

37. Consider the following sequence of reactions

Compounds $[A] \xrightarrow{\text{reduction}} [B] \xrightarrow{HNO_2} CH_3CH_2OH$ The compound $[A]$ is .

A. propane nitrile

B. ethane nitrile

C. nitromethane

D. methyl isocyanate.

Answer: B

Watch Video Solution

38. An organic compound 'A' on reduction give compound 'B' which on reaction with trichloromethane and caustic potash foms 'C'. The compound 'C' on catalytic reduction give N-methyl benzenamine, the compound 'A' is:

A. nitrobenzene

B. nitromethane

C. methanamine

D. benzenamine.

Answer: A

Watch Video Solution

39. In the hofmann-bromamide degradation reaction, the number of moles of NaOH and Br_2 used per mole of amine produced are

A. one mole of NaOH and one mole of Br_2

B. four moles of NaOH and two moles of Br_2

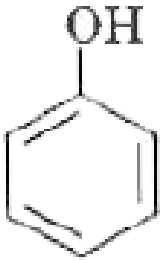
C. two moles of NaOH and two moles of Br_2

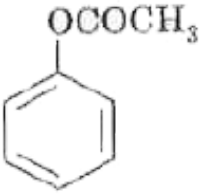
D. four moles of NaOH and one mole of Br_2

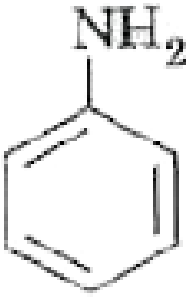
Answer: D

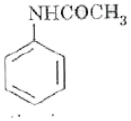
Watch Video Solution

40. Which of the following compounds will give significant amount of meta- product during mononitration reaction?

A. 

B. 

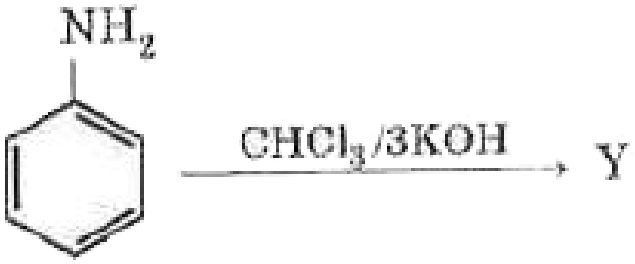
C. 

D. 

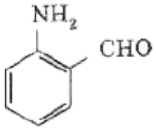
Answer: C

Watch Video Solution

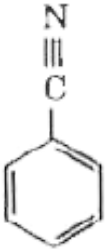
41. The product Y for the below reaction is



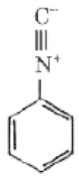
A.



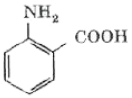
B.



C.



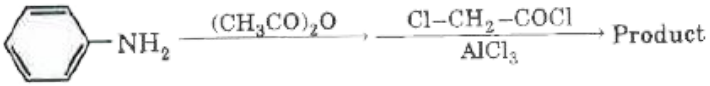
D.



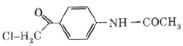
Answer: C

Watch Video Solution

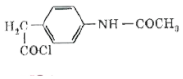
42. The product formed in the following reaction is



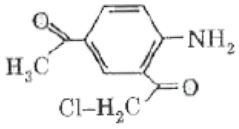
A.

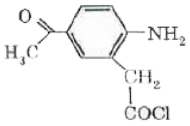


B.



C.

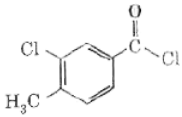


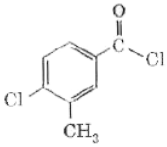
D. 

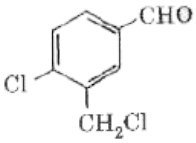
Answer: A

Watch Video Solution

43. Identify 'M' in the following sequence of reactions:

A. 

B. 

C. 

D. 

Answer: B

View Text Solution

44. If aniline is treated with conc. H_2SO_4 and heated at $200^\circ C$ the product is

A. anilinium sulphate

B. benzenesulphonic acid

C. m-aminobenzenesulphonic acid

D. sulphanilic acid

Answer: D

Watch Video Solution

45. Which of the following is more basic than aniline? .

A. Diphenylamine

B. Triphenylamine

C. p-Nitroaniline

D. Benzylamine

Answer: D

Watch Video Solution

46. The increasing order of basicity of the following compounds is:

A. $(A) < (B) < (C) < (D)$

B. $(B) < (A) < (C) < (D)$

C. $(B) < (A) < (D) < (C)$

D. $(D) < (B) < (A) < (C)$

Answer: C

View Text Solution

47. Which of the following is least soluble in water at 298 K?

A. CH_3NH_2

B. $(CH_3)_3N$

C. $(CH_3)_2NH$

D. $C_6H_5NH_2$

Answer: D

Watch Video Solution

48. If aniline is treated with 1:1 mixture of conc. HNO_3 and conc. H_2SO_4, p-nitroaniline and m-nitroaniline are formed nearly in equal amounts. This is due to

A. m-directing property of $-NH_2$ group

B. protonation of $-NH_2$ which causes deactivation of benzene ring

C. m- and p-directing property of $-NH_2$ group

D. isomerization of some p-nitroaniline into m-nitroaniline.

Answer: B

Watch Video Solution

49. Cyclohexylamine and aniline can be distinguished by

A. Hinsberg's test

B. Carbylamine test

C. Bromine test

D. Beilstein's test

Answer: C

Watch Video Solution

50. In the Hoffmann rearrangement of primary amides having optically active group with S-configuration, the product amine has

A. R-configuration

B. S-configuration

C. racemic mixture

D. meso-form

Answer: B

Watch Video Solution

51. The product formed in the below reaction is

A. 

B. 

C. 

D. 

Answer: B

View Text Solution

52. Coupling of benzene diazonium chloride with $1-$ naphthol in alkaline medium will give:

A. 

B. 

C. 

D. 

Answer: C

Watch Video Solution

53. Aniline dissolved in dilute HCL is reacted with sodium nitrate at $0^{\circ}C$. This solution was added dropwise to a solution containing equimolar mixture of aniline and phenol in dil. HCl. The structure of the major product is :

A. 

B. 

C. 

D. 

Answer: A

Watch Video Solution

54. The major product of the following reaction is :

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

55. The major product obtained in the following reaction is:

A. 

B. 

C. 

D. 

Answer: A

View Text Solution

56. The major products A and B for the following reaction are :

A. 

B. 

C. 

D. 

Answer: B

View Text Solution

57. The increasing order of reactivity of the following compounds towards reaction with alkyl halides directly is:

A. $(A) < (B) < (C) < (D)$

B. $(B) < (A) < (C) < (D)$

C. $(B) < (A) < (D) < (C)$

D. $(A) < (C) < (D) < (B)$.

Answer: B

View Text Solution

58. Arrange the following amines in the decreasing order of basicity:

A. $I > II > III$

B. $III > II > I$

C. $I > III > II$

D. $III > I > II$

Answer: D

View Text Solution

59. The increasing basicity order of the following compounds is :

(A) $CH_3CH_2NH_2$

(B) $CH_3CH_2\underset{\displaystyle CH_2CH_3}{\overset{|}{N}}H$

(C) $H_3C-\underset{\displaystyle CH_3}{\overset{|}{N}}-CH_3$

(D) $Ph-\underset{\displaystyle CH_3}{\overset{|}{N}}-H$

A. $(D)<(C)<(A)<(B)$

B. $(A)<(B)<(D)<(C)$

C. $(A)<(B)<(C)<(D)$

D. $(D)<(C)<(B)<(A)$

Answer: D

Watch Video Solution

60. Ethylamine $(C_2H_5NH_2)$ can be obtained from N-ethylphtahlimide on treatment with:

A. $NaBH_4$

B. CaH_2

C. H_2O

D. NH_2NH_2

Answer: D

Watch Video Solution

61. Which of the following is NOT a Correct method of the preparation of benzylamine from cyanobenzene?

A. (i) HCl/H_2O (ii) $NaBH_4$

B. (i) $LiAlH_4$ (ii) H_3O^+

C. (i) $SnCl_2$ + HCl(gas) (ii) $NaBH_4$

D. H_2 / Ni

Answer: A

Watch Video Solution

62. In the reaction

the structure of the product T is :

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

63. The major product of the following reaction is

A. 

B. 

C. 

D. 

Answer: A

View Text Solution

64. Amongst the compounds gives, the one that would form a brilliant colored dye on treatment with $NaNO_2$ in dil. HCl followed by addition to an alkaline solution of $\beta -$ naphthol is

A. 

B. 

C. 

D. 

Answer: C

Watch Video Solution

65. The major product of the reaction is

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

66. In the following reactions, the major product W is

A. 

B. 

C. 

D. 

Answer: A

View Text Solution

67. The product(s) of the following reaction sequence is(are)

A. 

B. 

C. 

D. 

Answer: B

View Text Solution

68. The order of basicity among the following compounds is

A. $IV > II > III > I$

B. $II > I > IV > III$

C. $I > IV > III > II$

D. $IV > I > II > III$

Answer: D

View Text Solution

69. The major product of the following reaction is

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

70. Aniline reacts with mixed acid(conc. HNO_3 and conc. H_2SO_4) at 288 K to give P $(51\,\%)$, Q $(47\,\%)$ and R $(2\,\%)$. The major product(s) of the following reaction sequence is (are)

A. 

B. 

C. 

D. 

Answer: D

View Text Solution

Competition File C Multiple Choice Questions

1. A positive carbylamine test is given by:

A. N, N- Dimethyl aniline

B. 2, 4-Dimethyl aniline

C. N-Methyl-o-methyl aniline

D. p-Methyl benzylamine

Answer: B::D

Watch Video Solution

2. Which of the following reactions form benzylamine?

A. 

B. 

C. 

D. 

Answer: A::D

View Text Solution

3. Reaction of $RCONH_2$ with a mixture of Br_2 and KOH gives RNH_2 as the main product. The intermediates involved in the reaction are:

A. $RCONHBr$

B. $R - NHBr$

C. $R - N = C = O$

D. $RCONBr_2$

Answer: A::C

Watch Video Solution

4. Which reagents among the following can affect the conversion ?

$CH_3C \equiv N \rightarrow CH_3CH_2NH_2$

A. H_2, Pt

B. Ammoniacal $AgNO_3$

C. $LiAlH_4$

D. $NaBH_4$

Answer: A::C

Watch Video Solution

5. Which of the following amines undergo acylation reaction ?

A. $CH_3CH_2NH_2$

B. $C_6H_5NH_2$

C. $(CH_3CH_2)_2NH$

D. $(CH_3)_3N$

Answer: A::B::C

Watch Video Solution

6. In which of the following amines, the first has lower pK_b value than the second ?

A. Aniline, m-nitro aniline

B. m-Toluidine, p-toluidine

C. Aniline, p-chloroaniline

D. Aniline, p-aminophenol

Answer: A::C

Watch Video Solution

7. In the following reaction.

$2X + B_2H_6 \rightarrow \left[BH_2(X)_2\right]^{\oplus}[BH_4]^{\ominus}$

The amine $(s)x$ is /are.

A. NH_3

B. CH_3NH_2

C. $(CH_3)_2NH$

D. $(CH_3)_3N$

Answer: A::B::C

Watch Video Solution

8. The reduction of benzenediazonium chloride to phenyl hydrazine can be accomplished by:

A. $SnCl_2, HCl$

B. Na_2SO_3

C. CH_3CH_2OH

D. H_3PO_2

Answer: A::B

Watch Video Solution

9. The possible product(s) to be obtained from the reaction of cyclobutyl amine with HNO_2 is/are

A. 

B. 

C. 

D. $H_2C = CH_2$

Answer: A::C

View Text Solution

Competition File D Multiple Choice Questions Based On The Given Passage Comprehension

1. Amines are basic in nature due to the presence of lone pair of electrons on N atom of $-NH_2$ group. The basic strength of amines can be expressed by their dissociation constant, K_b or pK_b.

$RNH_2 + H_2 \rightarrow RNH_3^+ + OH^-$

$K_b = \frac{[RHH_3^+][OH^-]}{[RNH_2]}$ and $pK_b = -\log K_b$

Greater the K_b value or smaller the pK_b value, more is the basic strength of amine. Aliphatic amines are stronger bases than ammonia due to the electron releasing effect of alkyl groups. The basic strength among amines decreases as :

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

Aryl amines such as aniline are less basic than aliphatic amines due to the involvement of lone pair of electrons on N atom with the resonance in benzene. In derivatives of aniline, the electron releasing groups increase the basic strength while electron withdrawing groups decrease the basic strength. The base weakening effect of electron withdrawing group and base strengthening effect of electron releasing group is more marked at p-position than at m-position. Every o- substituted aniline is less basic than aniline due to ortho effect.

Which of the following has lowest pK_b value ?

A. 

B. 

C. 

D. 

Answer: C

View Text Solution

2. Amines are basic in nature due to the presence of lone pair of electrons on N atom of $-NH_2$ group. The basic strength of amines can be expressed by their dissociation constant, K_b or pK_b.

$$RNH_2 + H_2 \rightarrow RNH_3^+ + OH^-$$

$$K_b = \frac{[RHH_3^+][OH^-]}{[RNH_2]} \text{ and } pK_b = -\log K_b$$

Greater the K_b value or smaller the pK_b value, more is the basic strength of amine. Aliphatic amines are stronger bases than ammonia due to the electron releasing effect of alkyl groups. The basic strength among amines decreases as :

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

Aryl amines such as aniline are less basic than aliphatic amines due to the involvement of lone pair of electrons on N atom with the resonance in benzene. In derivatives of aniline, the electron releasing groups increase the basic strength while electron withdrawing groups decrease the basic strength. The base weakening effect of electron withdrawing group and base strengthening effect of electron releasing group is more marked at p-position than at m-position. Every o- substituted aniline is less basic

than aniline due to ortho effect.

Which of the following statement is not correct?

A. Ethylamine is more basic than aniline

B. o-methylaniline has lower pK_b value than aniline

C. p-methylaniline is less basic than m-methylaniline

D. Aniline has lower pK_b value than o-nitroaniline

Answer: C

Watch Video Solution

3. Amines are basic in nature due to the presence of lone pair of electrons on N atom of $-NH_2$ group. The basic strength of amines can be expressed by their dissociation constant, K_b or pK_b.

$$RNH_2 + H_2 \rightarrow RNH_3^+ + OH^-$$

$$K_b = \frac{[RHH_3^+][OH^-]}{[RNH_2]} \text{ and } pK_b = -\log K_b$$

Greater the K_b value or smaller the pK_b value, more is the basic strength of amine. Aliphatic amines are stronger bases than ammonia due to the

electron releasing effect of alkyl groups. The basic strength among amines decreases as :

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

Aryl amines such as aniline are less basic than aliphatic amines due to the involvement of lone pair of electrons on N atom with the resonance in benzene. In derivatives of aniline, the electron releasing groups increase the basic strength while electron withdrawing groups decrease the basic strength. The base weakening effect of electron withdrawing group and base strengthening effect of electron releasing group is more marked at p-position than at m-position. Every o- substituted aniline is less basic than aniline due to ortho effect.

Maximum pK_b value is of

A. $(CH_3CH_2)_2NH$

B. 

C. $(CH_3)_2NH$

D. 

Answer: B

View Text Solution

4. Amines are basic in nature due to the presence of lone pair of electrons on N atom of $-NH_2$ group. The basic strength of amines can be expressed by their dissociation constant, K_b or pK_b.

$RNH_2 + H_2 \rightarrow RNH_3^+ + OH^-$

$K_b = \frac{[RHH_3^+][OH^-]}{[RNH_2]}$ and $pK_b = -\log K_b$

Greater the K_b value or smaller the pK_b value, more is the basic strength of amine. Aliphatic amines are stronger bases than ammonia due to the electron releasing effect of alkyl groups. The basic strength among amines decreases as :

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

Aryl amines such as aniline are less basic than aliphatic amines due to the involvement of lone pair of electrons on N atom with the resonance in benzene. In derivatives of aniline, the electron releasing groups increase the basic strength while electron withdrawing groups decrease the basic strength. The base weakening effect of electron withdrawing group and base strengthening effect of electron releasing group is more marked at

p-position than at m-position. Every o- substituted aniline is less basic than aniline due to ortho effect.

The strongest base among the following is

A. $C_6H_5NH_2$

B. $p-NO_2C_6H_4NH_2$

C. $m-NO_2-C_6H_4NH_2$

D. $C_6H_5CH_2NH_2$

Answer: D

Watch Video Solution

5. Amines are basic in nature due to the presence of lone pair of electrons on N atom of $-NH_2$ group. The basic strength of amines can be expressed by their dissociation constant, K_b or pK_b.

$RNH_2 + H_2 \rightarrow RNH_3^+ + OH^-$

$K_b = \frac{[RHH_3^+][OH^-]}{[RNH_2]}$ and $pK_b = -\log K_b$

Greater the K_b value or smaller the pK_b value, more is the basic strength

of amine. Aliphatic amines are stronger bases than ammonia due to the electron releasing effect of alkyl groups. The basic strength among amines decreases as :

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

Aryl amines such as aniline are less basic than aliphatic amines due to the involvement of lone pair of electrons on N atom with the resonance in benzene. In derivatives of aniline, the electron releasing groups increase the basic strength while electron withdrawing groups decrease the basic strength. The base weakening effect of electron withdrawing group and base strengthening effect of electron releasing group is more marked at p-position than at m-position. Every o- substituted aniline is less basic than aniline due to ortho effect.

Which of the following group does not decrease the basic strength of aniline ?

A. $-OCH_3$

B. $-NO_2$

C. $-CN$

D. $-\text{halogen}$

Answer: A

Watch Video Solution

6. Treatment of compound O with $KMnO_4/H^+$ gave P, which on heating with ammonia gave Q. The compound Q on treat ment with $Br_2/NaOH$ produced R. On strong heating, Q gave S, which on further treatment with ethyl 2-bromopropano ate in the presence of KOH followed by acidification, gave a compound T.

The compound R is

A. 

B. 

C. 

D. 

Answer: A

View Text Solution

7. Treatment of compound O with $KMnO_4/H^+$ gave P, which on heating with ammonia gave Q. The compound Q on treat ment with $Br_2/NaOH$ produced R. On strong heating, Q gave S, which on further treatment with ethyl 2-bromopropano ate in the presence of KOH followed by acidification, gave a compound T.

The compound T is

A. glycine

B. alanine

C. valine

D. serine

Answer: B

View Text Solution

Competition File Matrix Match Type Questions

1. Match the compounds in Column I with their properties / reactions in Column II.

View Text Solution

Competition File Integer Type Or Numerical Value Type Questions

1. The number of isomeric amines corresponding to molecular formula C_3H_9N, which liberate N_2 gas on treatment with nitrous acid is

Watch Video Solution

2. The number of amines having pK_b less than $C_6H_5NH_2$ among the following is

$P-CH_3C_6H_5NH_2, o-CH_3C_6H_4NH_2, m-CH_3C_6H_4NH_2, C_6H_5N(CI$

Watch Video Solution

3. How many isomeric amines with formula C_7H_9N contain a benzene ring ?

Watch Video Solution

4. The number of isomeric amines of molecular formula $C_4H_{11}N$ which give carbylamine reaction is

Watch Video Solution

5. Total number of nitrogen atoms presentin reduced product obtained by reducing nitrobenzene with $LiAlH_4$ followed by aqueous work up is

Watch Video Solution

6. In the following reaction sequence, the amount of D (in g) formed from 10 moles of acetophenone is _____ (Atomic weights in g mol^{-1} : H = 1, C = 12, N = 14, O = 16, Br = 80. (The yield (%) corresponding to the product in each step is given in the parenthesis.)

View Text Solution

7. Schemes 1 and 2 describe the conversion of P to Q and R to S, respectively. Scheme 3 describes the synthesis of T from Q and S. The total number of Br atoms in a molecule of T is _____.

View Text Solution

Unit Practice Test

1. Convert

(i) 3-Methylaniline into 3-nitrotoluene.

(ii) Aniline into 1,3,5 - tribromobenzene.

Watch Video Solution

2. (i) What is Gabriel phthalimide synthesis? Why aromatic primary amines cannot be prepared by this method?

(ii) Why are aromatic amines weaker bases than aliphatic amines?

Watch Video Solution

3. Explain the following reactions by giving one example :

(i) Carbylamine reaction (ii) Sandmeyer's reaction

(iii) Balz-Schiemann reaction

Watch Video Solution

4. Explain the following:

(a) Ethylamine is soluble in water, whereas aniline is not.

(b) Although amino group is o- and p-directing in aromatic electrophilic substitution reactions, aniline on nitration gives a substantial amount of m-nitroaniline.

(c) Aniline does not undergo Friedel Crafts reaction.

View Text Solution

5. (a) How does benzene diazonium chloride react with

(i) phenol (ii) aniline

(b) Describe the method for the identification of primary, secondary and tertiary amines. Also write chemical equations for the reactions involved.

Watch Video Solution