



CHEMISTRY

BOOKS - VIKRAM PUBLICATION (ANDHRA PUBLICATION)

ORGANIC COMPOUNDS CONTAINING NITROGEN

Textual Examples

1. Write chemical equations for the following reactions :

Reaction of ethanoic NH_3 with C_2H_5Cl .

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2. Write chemical equations for the following reactions :

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

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3. Write chemical equations for the following conversions :

$CH_3 - CH_2 - Cl$ into $CH_3 - CH_2 - CH_2 - NH_2$

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4. Write chemical equations for the following conversions :

$C_6H_5 - CH_2 - Cl$ into $C_6H_5 - CH_2 - CH_2 - NH_2$

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5. Write structures and IUPAC names of

the amide which gives propanamine by Hoffmann bromamide reaction.

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6. Write structures and IUPAC names of

the amine produced by the Hoffmann degradation of benzamide.

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7. Arrange the following in decreasing order of their basic strength :

$C_6H_5NH_2$, $C_2H_5NH_2$, $(C_2H_5)_2NH$, NH_3

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8. How will you convert 4 nitrotoluene to 2 - bromobenzoic acid ?

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Very Short Answer Questions

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

i) $(CH_3)_3CHNH_2$ ii) $CH_3(CH_2)_2NH_2$ iii) $(CH_3CH_2)_2NCH_3$

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2. Explain why ethylamine is more soluble in water, whereas aniline is not soluble.

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3. Why aniline does not undergo Friedel - Crafts reaction ?

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4. Gabriel Phthalimide synthesis exclusively forms primary amines only. Explain.

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5. Arrange the following bases in decreasing order of pK_b values.

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

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6. Arrange the following bases in increasing order their basic strength. Aniline. P - nitroaniline and P - toluidine.



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7. Write equations for carbylamine reaction of any one aliphatic amine.

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



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9. Accomplish the following conversions.

i) Benzoic acid to benzamide ii) Aniline to P - bromoaniline.

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10. Why cannot aromatic primary amines be prepared by Gabriel phthalimide synthesis ?

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Short Answer Questions

1. Write the IUPAC names of the following compounds.



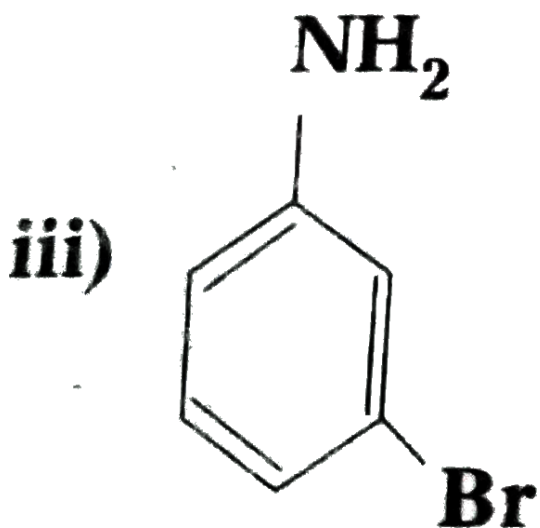
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2. Write the IUPAC names of the following compounds.



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3. Write the IUPAC names of the following compounds.

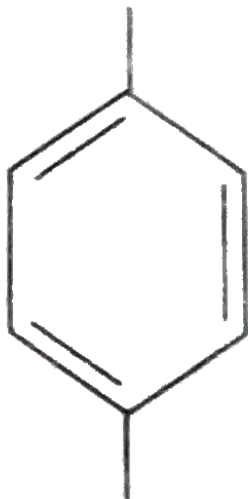


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4. Write the IUPAC names of the following compounds.



iv)



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

Methylamine and dimethylamine

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

Aniline and N.Methylaniline

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

Ethylamine and aniline

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8. Account for the following :

pK_b of aniline is more than of methylamine.

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9. Account for the following :

Reduction of alkylcyanide forms primary amine whereas alkyl isocyanide forms secondary amine.

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10. How do you prepare the following ?

N, N-Dimethyl propanamine from ammonia

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11. How do you prepare the following ?

Propanamine from chloroethane

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12. Compare the basicity of the following in gaseous and in a aqueous state and arrange them in increasing order of basicity.

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13. How do you carryout the following conversions ?

N - Ethylamine to N, N - Diethyl propanamine

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14. How do you carry out the following conversions ?

Aniline to Benzene sulphonamide

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15. Explain with a suitable example how benzene sulphonylchloride can distinguish primary, secondary and tertiary amines.

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16. Write the reactions of aromatic amines with nitrous acid

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17. Write the reactions of

aliphatic primary amines with nitrous acid.

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18. Explain why amines are less acidic than alcohols of comparable molecular masses.

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19. How do you prepare Ethyl cyanide and Ethyl isocyanide from a common alkylhalide ?

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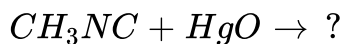
Long Answer Questions

1. An aromatic compound 'A' on treatment with aqueous ammonia and heating forms compound B which on heating with Br_2 and KOH

forms compound 'C' of molecular formula C_6H_7N . Write the structures and IUPAC names of compounds A, B and C.

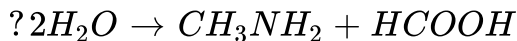
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2. Complete the following conversions.



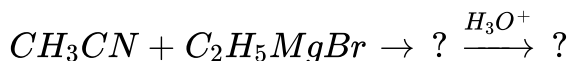
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3. Complete the following conversions.



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4. Complete the following conversions.



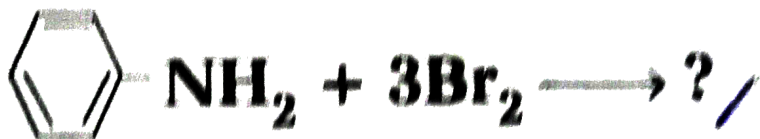
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5. Complete the following conversions.



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6. Complete the following conversions.



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7. Write the structures of different isomeric amines corresponding to the molecular formula $C_9H_{13}N$.

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8. What reducing agents can bring out reduction of nitrobenzene ?

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9. Write the product formed when benzyl chloride is reacted with ammonia followed by treatment with methyl and ethyl chlorides.

Write the product

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10. Identify the amide and cyanide which on reduction with appropriate reducing agent gives n - butylamine.

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11. Write the mechanism of Hoffmann bromamide reaction.

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12. How do you make the following conversions ?

Chlorophenylmethane to phenylacetic acid

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13. How do you make the following conversions ?

Chlorophenylmethane to 2 - phenylethanamine.

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14. Identify the starting amide which gives p - methyl aniline on reaction with bromine and sodium hydroxide and write all the steps involved in the reaction.

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15. Explain why the order of basicity for methyl amine, N, N - dimethyl amine and N, N, N - trimethyl amine changes in gaseous and a aqueous medium.

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16. Write the equations involved in the reaction of Nitrous acid with Ethylamine and aniline.

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17. Explain with equations how methylamine, N, N - dimethylamine and N, N, N - trimethylamine react with benzenesulphonyl chloride and how this reaction is useful to separate these amines.



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18. Explain why aniline in strong acidic medium gives a mixture of Nitro anilines and what steps need to be taken to prepare selectively P - nitro aniline.

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19. Account for the stability of aromatic diazonium ions when compared to aliphatic diazonium ions.

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20. Write the equations showing the conversion of aniline diazoniumchloride to

a) chlorobenzene, b) Iodobenzene and c) Bromobenzene

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21. Complete the following conversions : Aniline to Fluorobenzene

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22. Complete the following conversions : Aniline to Cyanobenzene

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23. Complete the following conversions : Aniline to Benzene

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24. Complete the following conversions : Aniline to Phenol

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25. Explain the following name reactions :

Sandmeyer reaction

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26. Explain the following name reactions :

Gatterman reaction

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27. Write the steps involved in the coupling of Benzene diazoniumchloride with aniline and phenol.

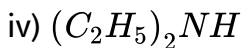
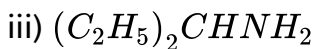
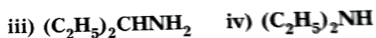
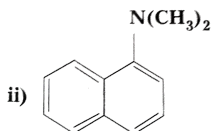
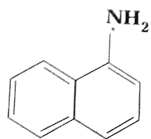
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28. Write the equations involved in the conversion of acetamide and propanaldehydeoxime to methyl cyanide and ethyl cyanide respectively.

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Intext Questions

1. Classify the following amines as primary, secondary or tertiary.



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2. i) Write the 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 ?

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3. How will you convert

benzene into aniline ?

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4. How will you convert

benzene into N,N-dimethylaniline ?

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5. How will you convert

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

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6. Arrange the following in increasing order of their basic strength.

$C_2H_5NH_2$, $C_6H_5NH_2$, NH_3 , $C_6H_5CH_2NH_2$ and $(C_2H_5)_2NH$

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7. Arrange the following in increasing order of their basic strength.

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

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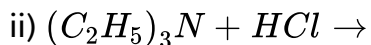
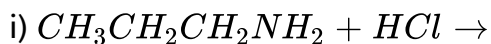
8. Arrange the following in increasing order of their basic strength.

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



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9. Complete the following acid-base reactions and name the products.



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



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

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12. Write the 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.

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13. Convert :

3-methyl aniline into 3-nitrotoluene.

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14. Convert :

aniline into 1, 3, 5-tribromobenzene.

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Dam Sure Vsaq 2 Marks

1. Gabriel Phthalimide synthesis exclusively forms primary amines only. Explain.

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2. Write equations for carbylamine reaction of any one aliphatic amine.

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3. Why aniline does not undergo Friedel - Crafts reaction ?

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



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5. Why cannot aromatic primary amines be prepared by Gabriel phthalimide synthesis ?

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6. Accomplish the following conversions.

i) Benzoic acid to benzamide ii) Aniline to P - bromoaniline.

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7. How are Amines prepared by Hoffmann bromamide degradation method.

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8. What is Diazotisation reaction ? Give equation.

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9. What is sulphonation ? Give equation.

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10. Arrange the following bases in increasing order their basic strength. Aniline. P - nitroaniline and P - toluidine.

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11. How is benzene diazonium chloride prepared ? Give equation.

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12. Arrange the following bases in decreasing order of pK_b values.

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

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13. What is a coupling reaction ? Give equation.

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14. How do you convert aniline to parabromo aniline.

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15. How is Aniline prepared.

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16. Explain why ethylamine is more soluble in water, whereas aniline is not soluble.

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Dam Sure Saq 4 Marks

1. Explain with a suitable example how benzene sulphonylchloride can distinguish primary, secondary and tertiary amines.

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2. How do you prepare Ethyl cyanide and Ethyl isocyanide from a common alkylhalide ?

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3. How do you distinguish cyanides and isocyanides by hydrolysis and reduction.

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4. How do you carryout the following conversions ?

N - Ethylamine to N, N - Diethyl propanamine

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5. How do you carryout the following conversions ?

Aniline to Benzene sulphonamide

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6. Explain the basic character of different Amines.

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7. Write two methods each for the preparation of alkyl cyanide and alkyl isocyanide.

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

Methylamine and dimethylamine

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Dam Sure Saq 8 Marks

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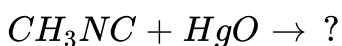
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Gatterman reaction

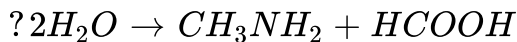
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3. Complete the following conversions.



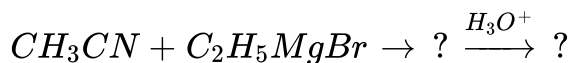
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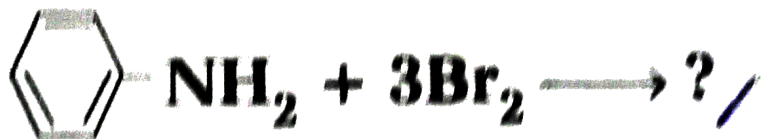
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