CHEMISTRY

NCERT - NCERT CHEMISTRY(ENGLISH)

AMINES

Solved Examples

1. 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

2. Write chemical equations for the following conversions:

$(i) CH_3 - CH_2 - Cl \text{into} CH_3 - CH_2CH_2 - NH_2$

$(ii) C_6H_5 - CH_2 - Cl \text{into} C_6H_5 - CH_2 - NH_2$

Watch Video Solution

3. Write structures and IUPAC names of

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

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

Watch Video Solution

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

$C_6H_5NH_2, C_2H_5NH_2, (C_2H_5)_2NH_3$

Watch Video Solution

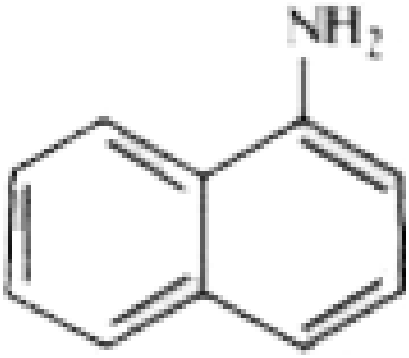
5. How will you convert 4-nitrotoluene to 2-bromobenzoic acid ?

View Text Solution

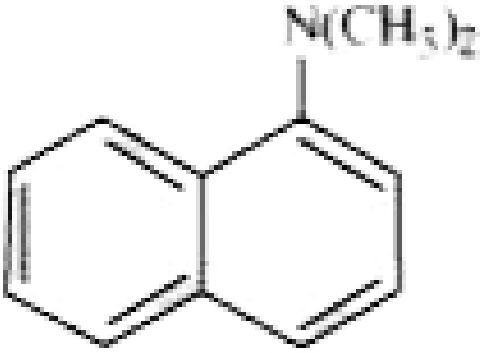
Exercise

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

(i)



(ii)



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

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 $(C_2H_5)_2NH$

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

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

View Text Solution

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

$(i) CH_3CH_2CH_2NH_2 \rightarrow \qquad (ii)(C_2H_5)_3N + HCl \rightarrow$

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.

View Text Solution

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

$(i)(CH_3)_2CHNH_2$ $(II)CH_3(CH_2)_2NH_2$ $CH_3NHCH(CH_3)_2$

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

$(vii)m-Brc_6H_4NH_2$

Watch Video Solution

Watch Video Solution

11. 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

View Text Solution

12. 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.

View Text Solution

13. Arrange the following:

(i) In decreasing order of the pK_b values:

$C_2H_5NG_2, C_6H_5NHCH_3, (C_2H_5)_2NH$ 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) $C_6H_5NH_2, C_6H_5NHCL_3, C_6H_5CH_2NH_2$

(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:

$C_6H_5NH_2 (C_2H_5)_2NH, C_2H_5NH_2$.

View Text Solution

14. Convert :

i. Ethanoic acid into methylamine

ii. Hexanenitrile into 1-aminopentane

iii. Methanol to ethanoic acid

iv. Ethanoic acid into propanoic acid

v. Ethanamine to Methanamine

vi. Methanamine into ethanamine

vii. Nitromethane into dimethylamine

viii. Propanoic acid into ethanoic acid .

View Text Solution

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

Watch Video Solution

16. 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

View Text Solution

17. 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 .

View Text Solution

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

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

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

(iii) $CH_3CH_2Br \xrightarrow{KCN} A \xrightarrow[273K]{NaNO_2 + HCl} B \xrightarrow[\Delta]{H_2O / H^+} C$

(iv) $C_6H_5COOH \xrightarrow[\Delta]{NH_3} A \xrightarrow{NaOBr} B \xrightarrow{C_6H_5OH} C$

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

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

View Text Solution

19. An aromatic compound (A) on treatment with aqueous ammonia and heating forms compound (B) which on heating with Br_2 and KOH froms a compound (C) of the molecular formula C_6H_7N. Write the structures and $IUPAC$ names of compounds (A) . (B) and (C).

Watch Video Solution

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

View Text Solution

21. Aniline can not be prepared by Gabriel phthalimide synthesis due to-

View Text Solution

22. Write the reaction of (i) aromatic and (ii) aliphatic promary amines with nitrous acid .

Watch Video Solution

23. 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