



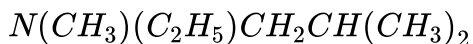
CHEMISTRY

BOOKS - KALYANI CHEMISTRY (ENGLISH)

ORGANIC COMPOUNDS CONTAINING NITROGEN

Intext Questions

1. Give the IUPAC names of the following:



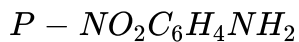
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2. Give the IUPAC names of the following:



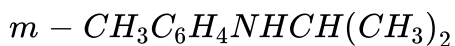
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3. Give the IUPAC names of the following:



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4. Give the IUPAC names of the following:



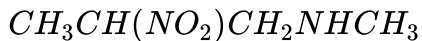
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5. Give the IUPAC names of the following:



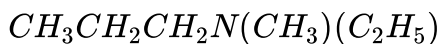
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6. Give the IUPAC names of the following:



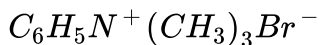
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7. Give the IUPAC names of the following:



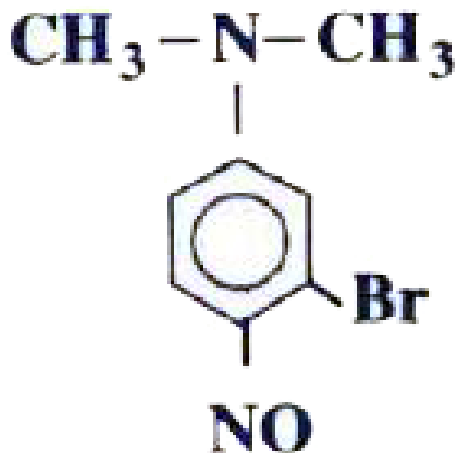
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8. Give the IUPAC names of the following:



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9. Name the following amine according to IUPAC system:



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10. Assign alkanamines names to the following:

N-methylethylamine

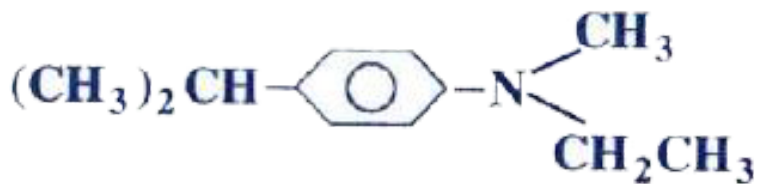
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11. Assign alkanamines names to the following:

N,N-dimethylcycloheptylamine

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12. Classify the following amine as 1° , 2° or 3° and give its IUPAC name.



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13. Draw the structure, give IUPAC names and indicate primary, secondary and tertiary amines in the following:

Eight isomeric amines of formula $\text{C}_4\text{H}_{11}\text{N}$

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14. Draw the structure, give IUPAC names and indicate primary, secondary and tertiary amines in the following:

Five isomeric amines of formula $\text{C}_7\text{H}_9\text{N}$ having one benzene ring



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15. How will you purify amines having non-basic impurities?



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

(i) $(CH_3)_3N$ (ii) CH_3NH_2 (iii) NH_3



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17. Which out of the following does not react with acetyl chloride?

(i) CH_3NH_2 (ii) $(CH_3)_2NH$ (iii) $(CH_3)_3N$

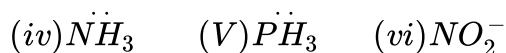


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18. Write the structural formula and IUPAC names of all isomeric amines with molecular formula C_3H_9N . Which out of these will give carbylamine reaction ?

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19. Select the ambident nucleophile from the following:



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20. Arrange the following compounds in the order of increasing boiling points :



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Exercise Part I Objective Questions

1. Methyl amine is.....basic than aniline.

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2. $R_2NH + HNO_2 \rightarrow \dots\dots\dots$

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3. Gabriel phthalimide synthesis is used for the preparation of.....

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4. $CH_3NH_2(aq)$ turns.....litmus.....

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5. Out of aniline and N-nitrosoamine.....is carcinogenic

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6. Carbylamine test is given by.....amines.

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7. Basicity of methylamine is.....than that of ammonia.

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8. Methylamine is more....than ammonia due to....effect.

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9. According to IUPAC system, CH_3CH_2CN is named as while $CH_3CH_2N \rightleftharpoons C$ is named as

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10. All isocyanides on hydrolysis with water in presence of HCl yield.....

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11. Alkyl cyanides are soluble in water than alkyl isocyanides.

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12. Alkyl isocyanides can be converted into cyanides by

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13. Alkyl cyanides generally have boiling points than isocyanides.

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14. Diphenylamine is less than aniline.

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15. Reaction of aniline with yields $C_6H_5N \xrightarrow{\quad} C$ and the reaction is known as reaction.

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16. Benzenediazonium chloride is formed when is treated with and hydrochloric acid at $0 - 5^\circ C$.

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17. Butane nitrile can be prepared by heating

- A. propyl alcohol with KCN
- B. butyl alcohol with KCN
- C. butyl chloride with KCN
- D. propyl chloride with KCN

Answer: D

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18. Phenyl isocyanides are prepared by

- A. Rosenmund's reaction
- B. Carbylamine reaction
- C. Reimer-Tiemann reaction
- D. Wurtz reaction

Answer: B

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19. The compound obtained by reducing CH_3CN with Na / C_2H_5OH is

A. methyl alcohol

B. acetic acid

C. ethylamine

D. methane

Answer: C

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20. An isonitrile on reduction gives

A. 1° amine

B. 2° amine

C. 3° amine

D. quaternary ammonium salt

Answer: B

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21. Hydrolysis of benzonitrile gives

A. benzylamine

B. aniline

C. benzoic acid

D. benzene

Answer: C

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22. Conversion of nitrobenzene to aniline is carried out in

- A. neutral medium
- B. acidic medium
- C. alkaline medium
- D. none

Answer: B

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23. Towards electrophilic substitution, the most reactive will be

- A. nitrobenzene
- B. aniline
- C. aniline hydrochloride
- D. N-acetylaniline

Answer: B

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24. Acetanilide is prepared by the reaction of acetyl chloride on

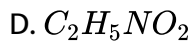
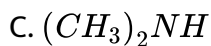
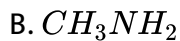
- A. acetamide
- B. aniline
- C. acetaldehyde
- D. benzene

Answer: B

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25. Which of the following gives carbylamine reaction?

- A. CH_3CONH_2



Answer: B

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26. The compound obtained by heating a mixture of a primary amine and chloroform with ethanolic potassium hydroxide (KOH) is

A. an alkyl isocyanide

B. an alkyl halide

C. an amide

D. an amide and nitro compound.

Answer: A

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27. which of the following reactions will not give a primary amine ?



Answer: C



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28. Gabriel synthesis is used for the preparation of

A. 1° aromatic amine

B. 1° aliphatic amine

C. 2° amine

D. 3° amine

Answer: B

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29. Nitrosoamines ($R_2N - N = O$) are insoluble in water. On heating them with conc. H_2SO_4 , they give sec. amines. The reaction is called

- A. Liberman's nitroso reaction
- B. Etard's reaction
- C. Fries reaction
- D. Perkin's reaction.

Answer: A

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30. Which of the following is a 3° amine?

A. 1-methylcyclohexylamine

B. Triethylamine

C. tert-butylamine

D. N-methylaniline

Answer: B

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

A. Allylmethylamine

B. 2-amino-4-pentene

C. 4-aminopent-1-ene

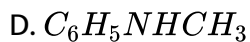
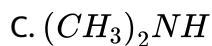
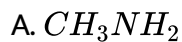
D. N-methylprop-2-en-1-amine

Answer: D

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

_____ .

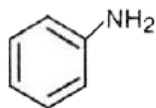


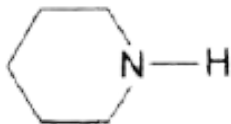
Answer: C

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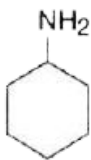
33. Which of the following is the weakest Bronsted base?

A.





B.



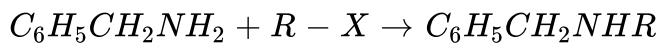
C.

D. CH_3NH_2

Answer: A

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34. Benzyl amine may be alkylated as shown in the following equation :



Which of the following alkyl halides is best suited for this reaction through $\text{S}_{\text{N}}1$ mechanism ?

A. CH_3Br

B. $\text{C}_6\text{H}_5\text{Br}$

C. $\text{C}_6\text{H}_5\text{CH}_2\text{Br}$

D. C_2H_5Br

Answer: C

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

A. H_2 (excess)/Pt

B. $LiAlH_4$ in ether

C. Fe and HCl

D. Sn and HCl.

Answer: B

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36. 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 [$C_6H(CO)_2N^- K^+$].

Answer: C



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

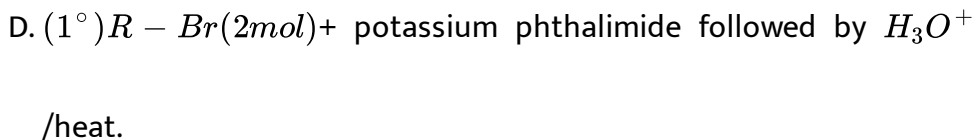
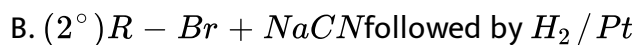
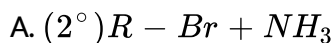
- A. Sodium azide (NaN_3)
- B. Sodium nitrite ($NaNO_2$)
- C. Potassium cyanide (KCN)

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

Answer: D

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38. Amongst the given set of reactants the most appropriate for preparing 2° amine is _____ .



Answer: C

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39. 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



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40. 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

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41. Hofmann bromide degradation reaction is shown by

A. $ArNH_2$

B. $ArCONH_2$

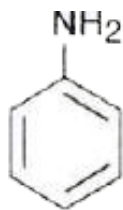
C. $ArNO_2$

D. $ArCH_2NH_2$

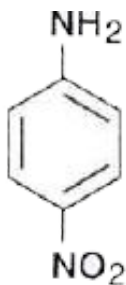
Answer: B

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42. The correct increasing order of basic strength for the following compound is



(I)



(II)



(III)

A. II lt IIIlt I

B. III lt IIlt II

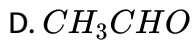
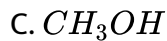
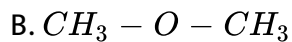
C. III lt IIIlt I

D. II lt I lt III.

Answer: D

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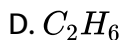
43. Methylamine reacts with HNO_2 to form



Answer: C

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



Answer: B

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



Answer: C



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

A. aromatic oxime

B. aromatic hydrocarbon

C. aromatic primary amine

D. aromatic amide.

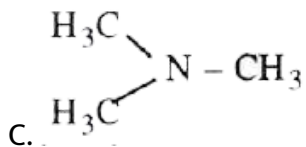
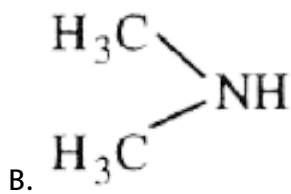
Answer: C

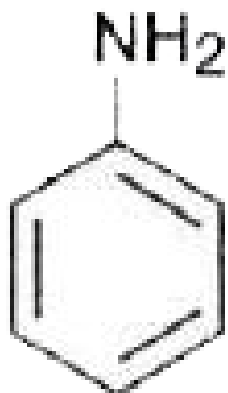
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47. The most reactive amine towards dilute hydrochloric acid is

_____.

A. $CH_3 - NH_2$





D.

Answer: B

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

- A. amide
- B. imide
- C. secondary amine
- D. imine

Answer: A





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49. The reaction $Ar\overset{+}{N}_2Cl^- \xrightarrow{Cu/HCl} ArCl + N_2 + CuCl$ is named as

- A. Sandmeyer reaction
- B. Gatterman reaction
- C. Claisen reaction
- D. Carbylamine reaction

Answer: B



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

- A. Hofman Bromamide reaction

B. Gabriel phthalimide synthesis

C. Sandmeyer reaction

D. Reaction with NH_3 .

Answer: B

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

A. Aniline

B. Phenol

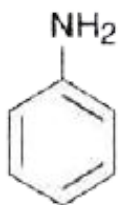
C. Anisole

D. Nitrobenzene

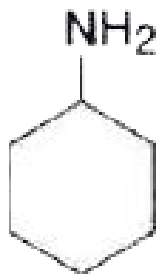
Answer: D

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



A.



B.



C.



D.

Answer: C

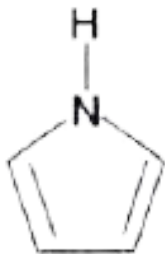
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53. Among the following amines, the strongest Bronsted base is....

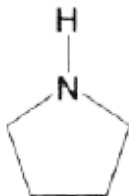


A.

B. NH_3



C.

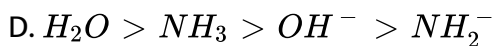
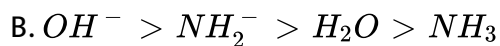
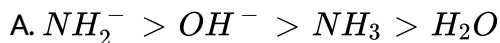


D.

Answer: D

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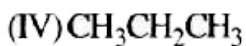
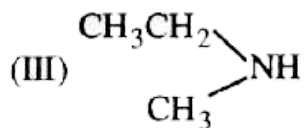
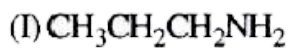
54. The correct decreasing order of basic strength of the following species is H_2O , NH_3 , OH^- , NH_2^-



Answer: A

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55. Which of the following should be most volatile ?



A. II

B. IV

C. I

D. III

Answer: B

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56. Which of the following methods of preparation of amines will not give same number of carbon atoms in the chain of amines as the 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: D

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57. Gabriel synthesis is used for the preparation of

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58. Nitrosoamines are formed by primary amines.

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59. Pure primary amines can be prepared by the action of ammonia on alkyl halides.

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60. Amides on treatment with Br_2 and KOH form the amines having the same number of carbon atoms.

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61. There are three position isomers of the amine having molecular formula $C_3H_7NH_2$

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62. Trimethylamine is less basic than dimethylamine.

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63. Ethanamine reacts with benzenesulfonyl chloride to form N-ethylbenzenesulfonamide which is insoluble in KOH.

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64. The treatment of an alkyl halide with silver cyanide forms an alkyl cyanide.

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65. The hydrolysis of an alkyl cyanide always yields formic acid.

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66. Carbylamine reaction is given by secondary amines.

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67. Alkyl cyanides are as poisonous as KCN.

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68. Alkyl cyanides have lower boiling points than the isomeric isocyanides.

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69. Catalytic reduction of isocyanides gives primary amines.

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70. Reduction of nitrobenzene with H_2 in presence of platinum gives nitrosobenzene.

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71. Aniline is a weaker base than benzyl amine.

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72. Match the following Columns

- | | |
|--|------------------------|
| (i) Primary amine + HNO_2 | (a) Soluble complex |
| (ii) Nitroethane + LiAlH_4 | (b) Insoluble compound |
| (iii) Dimethylamine
+Hinsberg's reagent+KOH | (c) Amines |
| (iv) Silver chloride
+ Methylamine | (d) Methanamine |
| (v) Ethanamide + Br_2 + KOH | (e) Ethanamine |
| (vi) Hinsberg's reagent | (f) Primary alcohol |
| (vii) Alkyl cyanides and
isocyanides | (g) Isocyanides |
| (viii) Soluble in water | (h) Functional isomers |
| (ix) Insoluble in water | (i) Benzene |
| (x) Benzenediazonium salt
+ H_3PO_2 | (j) Coupling |
| (xi) Phenol + benzene-
diazonium salt | (k) Cyanides |



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Exercise Part II Descriptive Questions Very Short Answer Questions

1. What is the state of hybridization of carbon and nitrogen atoms in alkyl amines?



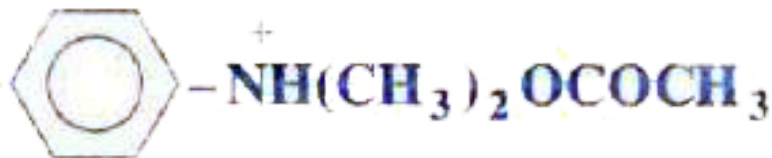
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2. Write IUPAC names of the following:



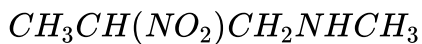
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3. Write IUPAC names of the following:



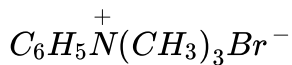
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4. Give the IUPAC names of the following:



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5. Write IUPAC names of the following:



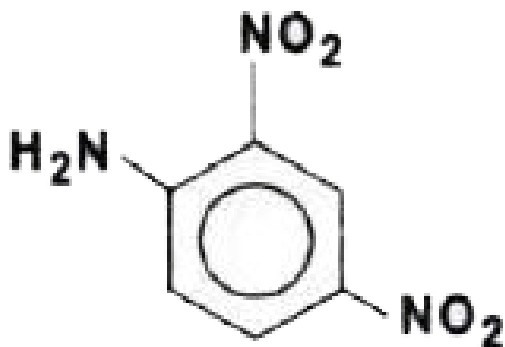
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6. Write the IUPAC name of the following compound :



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7. Write IUPAC names of the following compounds:



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8. Write IUPAC names of the following compounds:



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9. How would you convert propanenitrile to propanamine?

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10. What reagent is used for converting a amide into an amine with the same number of carbon atoms?

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11. What reaction is used for converting a primary amide into a primary amine containing one carbon atom less than the parent amide ?

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12. Write the chemical reaction for the reduction of nitroethane by $LiAlH_4$

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13. What is ammonolysis?

 [Watch Video Solution](#)

14. Why do amines act as nucleophiles ?

 [Watch Video Solution](#)

15. Which out of isomeric amines has highest boiling point and why?

 [Watch Video Solution](#)

16. Why lower amines are soluble in water?

 [Watch Video Solution](#)

17. Why amines are less soluble in water as compared to alcohols?

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18. Which type of amines are prepared by Gabriel phthalimide reaction?

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19. Why aniline appears red in colour on standing in air for a long time?

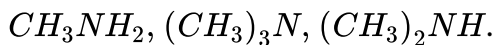
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20. Why is an alkylamine more basic than ammonia ?

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21. Do as directed :

(i) Arrange the following compounds in the increasing order of their basic strength in aqueous solution:



(ii) Identify 'A' and 'B'

(iii) Write equation of carbonylamine reaction.

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22. Of methylamine and aniline, which is a stronger base and why?

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23. Cyclohexylamine is stronger base than aniline because

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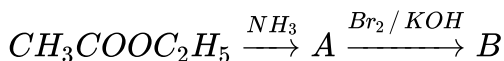
24. CH_3CONH_2 is a weaker base than $CH_3CH_2NH_2$.

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25. How is the basic strength of aromatic amines affected by the presence of an electron releasing group on the benzene ring?

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26. Identify A and B in the following sequence :



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27. Why is carbon-nitrogen bond length in aromatic amines shorter than in aliphatic amines?

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28. How is phenylaminomethane obtained from phenylnitrile ?

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29. How is aminoethane obtained from ethanal ?

 [Watch Video Solution](#)

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

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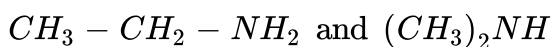
31. How is aniline obtained from benzoic acid ?

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32. Illustrate the following with an example : Acetylation reaction.

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33. Give chemical tests to distinguish between the following| pair of compounds:



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34. State the reaction taking place when : Bromine water is added to the aqueous solution of aniline.

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35. Give a chemical test to distinguish between aniline and N-methylaniline.

 [Watch Video Solution](#)

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36. How is m-nitroaniline obtained from nitrobenzene?

 Watch Video Solution

37. Direct nitration of aniline is not carried out. Explain why?

 Watch Video Solution

38. Name one reagent used for separation of primary, secondary and tertiary amines.

 Watch Video Solution

39. Give one example of a zwitterion.

 Watch Video Solution

40. Mention the chief use of quaternary ammonium salts derived from long chain amines.

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41. Mention two important uses of sulfanilic acid.

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42. What is diazotization ?

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43. Why are benzenediazonium salts soluble in water?

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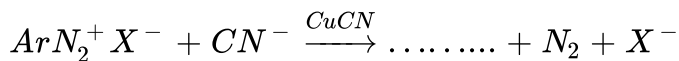
44. Name one chemical test which can be used to distinguish an aromatic primary amine from an aliphatic primary amine.

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45. Name the compound formed by coupling reaction of 4-aminobenzenesulfonic acid and N, N-dimethylbenzenamine and give its one use.

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46. Complete the following equation:



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47. An organic compound A having molecular formula C_2H_7N on treatment with HNO_2 gave the oily yellow substance. Identify A.

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48. Write IUPAC name of the following compound:



 [Watch Video Solution](#)

49. Why does sulfanilic acid has high melting point?

 [Watch Video Solution](#)

50. Give one application of aromatic amines.

 [Watch Video Solution](#)

51. How is aniline purified ?

 [Watch Video Solution](#)

52. What is Hinsberg's reagent? What is its use?

 [Watch Video Solution](#)

53. Write a balanced chemical equation for the reaction of methylamine and silver chloride

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54. A compound A having molecular formula (C_3H_9N) on treatment with benzenesulfonyl chloride gives an insoluble solid. Identify A

 [Watch Video Solution](#)

55. Write the chemical equation for the reaction between ethylamine and nitrous acid and name the organic compound formed.

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56. What do you mean by exhaustive methylation of amines?

 [Watch Video Solution](#)

57. Complete and balance the following equations:



 [Watch Video Solution](#)

58. Complete and balance the following equations:



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59. What are the reagents used in Hofmann reaction? What is the organic product ?

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60. What is carbylamine reaction?

 [Watch Video Solution](#)

61. Write the chemical reaction occurring in the preparation of fluorobenzene from aniline.

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62. Write a chemical reaction for carbylamine test.

 [Watch Video Solution](#)

63. How is orange-I prepared ?

 [Watch Video Solution](#)

64. How will you convert

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

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

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65. What are nitriles ?

 [Watch Video Solution](#)

66. What are carbylamines ?

 [Watch Video Solution](#)

67. Give the IUPAC name of n-propyl cyanide.

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68. Give the IUPAC and common name of vinyl cyanide ($CH_2 = CHCN$).

 [Watch Video Solution](#)

69. What happens when an isocyanide is heated for a long time?

 [Watch Video Solution](#)

70. What is meant by unidentate, didentate and ambidentate ligands?

Give two examples for each.

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71. Why alkyl cyanides are soluble in water?

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72. Write the structural formula of isobutyronitrile.

 [Watch Video Solution](#)

73. Why the alkyl cyanides possess higher boiling points than the corresponding alkyl halides?

 [Watch Video Solution](#)

74. It is not possible to prepare aryl cyanides from aryl halides. Why?

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75. Name the major product obtained when an alkyl halide is treated with silver cyanide.

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76. What is the industrial use of acrylonitrile?

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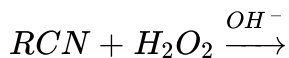
77. Write the first hydrolysis product of alkanenitrile.

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78. Which major product is formed in the reaction $RCONH_2 \xrightarrow[\text{Heat}]{P_2O_5}$

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79. Which major product is formed in the reaction,



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80. Why isocyanides are less soluble in water than the corresponding cyanides?

 [Watch Video Solution](#)

81. Why boiling points of alkyl cyanides are higher than those of the corresponding isocyanides?

 [Watch Video Solution](#)

82. Write the reducing agents which reduce alkyl cyanides to primary amines.



[Watch Video Solution](#)

83. Give one use of acetonitrile.



[Watch Video Solution](#)

84. Give the industrial importance of phenyl isocyanide.



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85. What happens when phenyl cyanide is treated with a dilute mineral acid ?



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86. Write the chemical equation for the conversion of ethaneisonitrile to ethylamine.



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 [Watch Video Solution](#)

87. Why is methylamine more basic than aniline?

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88. Ethylamine is soluble in water whereas aniline is almost insoluble.
Why?

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89. Why are diazonium salts of aromatic amines more stable than those of aliphatic amines?

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Exercise Part II Descriptive Questions Short Answer Questions

1. How are aliphatic amines classified ? Give the structural formula and an example of each group.

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

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3. Explain the following reactions :

(a) Gabriel Phthalimide reaction

(b) Coupling reaction

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4. How will you obtain primary amine from phthalimide ?

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5. What happens when :

methyl cyanide is reduced with Na / C_2H_5OH

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6. What happens when :

methyl cyanide is reduced with Na / C_2H_5OH

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7. When acetamide is treated with Br_2 and an alkali, a primary amine containing one carbon atom less than the starting amide is formed.

Name the reaction and write the balanced equation.

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8. How will you purify amines having non-basic impurities?

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9. Why amines have higher boiling points than corresponding alkanes ?

 [Watch Video Solution](#)

10. Why amines have lower boiling points than alcohols and carboxylic acids of comparable molecular mass?

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11. Explain the following order of basic strength of compounds. Secondary amines > Tertiary amines > Primary amines > NH_3 > aromatic amines.

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12. Of methylamine and aniline, which is a stronger base and why?

 [Watch Video Solution](#)

13. Aniline is a weaker base than cyclohexylamine. Explain.

 [Watch Video Solution](#)

14. Aniline is a stronger base than p-nitroaniline but weaker base than p-methoxyaniline.

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15. $C_6H_5N^+(CH_3)_3OH$ is a stronger base than NH_4OH . Explain.

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16. What do you mean by exhaustive methylation of amines?

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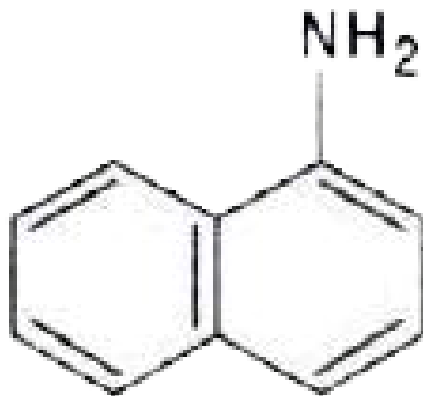
17. Describe Schotten Baumann reaction.

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18. Why tertiary amines do not react with acid chlorides and acid anhydrides?

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



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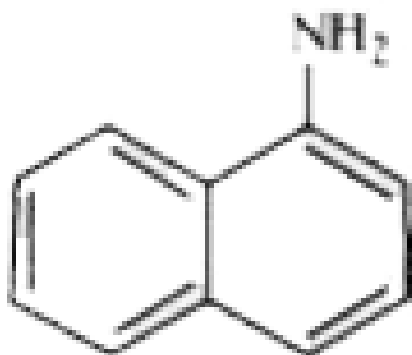
20. Classify the following amines as primary, secondary and tertiary:



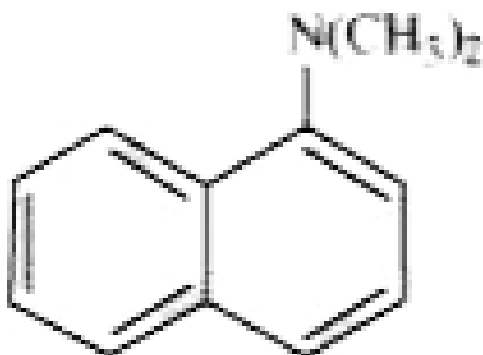
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21. Classify the following amines as primary, secondary or tertiary:

(i)



(ii)



(iii) $(\text{C}_2\text{H}_5)_2\text{CHNH}_2$

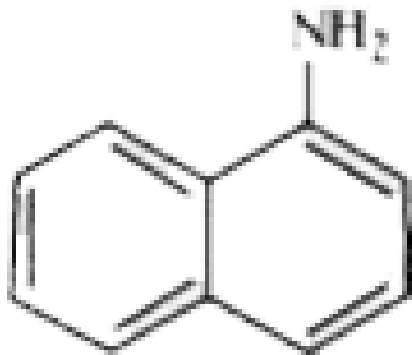
(iv) $(\text{C}_2\text{H}_5)_2\text{NH}$



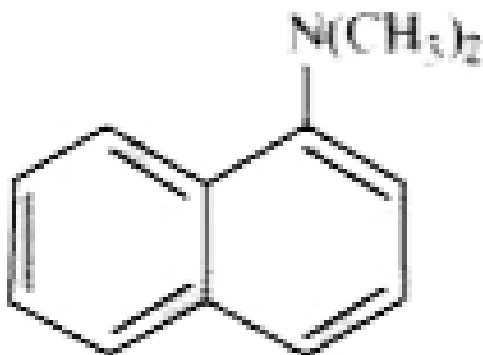
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22. Classify the following amines as primary, secondary or tertiary:

(i)



(ii)



(iii) $(\text{C}_2\text{H}_5)_2\text{CHNH}_2$

(iv) $(\text{C}_2\text{H}_5)_2\text{NH}$



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23. (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?

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24. How will you convert

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

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

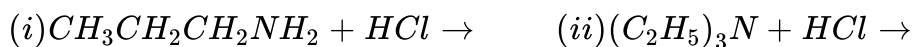
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25. How will you convert:

Benzene into N,N-dimethylaniline

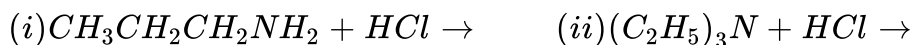
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26. Complete the following acid-base reactions and name the products:



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



 [Watch Video Solution](#)

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

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29. 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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30. 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.

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31. Convert:

3-Methylaniline into 3-nitrotoluene

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32. Convert:

Aniline into 1, 3,5-tribromobenzene.

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33. How will you bring about the following conversions ?

Ethyl bromide to ethanamine

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34. How will you bring about the following conversions ?

Methylamine to ethylamine.

 [Watch Video Solution](#)

35. Explain Libermann's nitrosoamine reaction.

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36. What is meant by :

Acylation

 [Watch Video Solution](#)

37. What is meant by :

benzoylation ?

 [Watch Video Solution](#)

38. Like ammonia, amines combine with metal ions to form coordination compounds. Discuss.

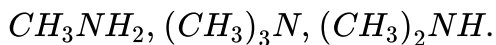
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39. How do primary secondary and tertiary amines react with nitrous acid ?

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40. Do as directed :

(i) Arrange the following compounds in the increasing order of their basic strength in aqueous solution:



(ii) Identify 'A' and 'B'

(iii) Write equation of carbonylamine reaction.

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41. Explain how does the presence or absence of hydrogen on nitrogen of amines affect the modes of their reactions with nitrous acid.

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42. Describe the following processes with an example in each case :

Protonation

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43. Describe the following processes with an example in each case :

Acetylation

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44. Write one chemical equation each to exemplify the following reactions :

Carbylamine reaction

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45. Write the chemical equations involved in the following reactions:

(i) Hoffmann-bromamide degradation reaction

(ii) Carbylamine reaction

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46. Explain the following:

Aniline is less basic than ammonia.

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47. Explain the following:

Aniline is a weaker base than ethylamine.

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48. Arrange the following sets in order of their basic strength:

Ethylamine, ammonia and triethylamine.

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49. Arrange the following in increasing order of basic strength:

Aniline, p-Nitroaniline and p-toluidine



 [Watch Video Solution](#)

50. Aniline is a weaker base than benzyl amine.

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51. Why is aniline soluble in aqueous HCl?

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52. Explain the following:

Aniline readily reacts with bromine to give 2,4,6-tribromoaniline

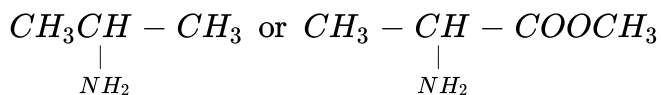
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53. How will you convert aniline into: (i) benzonitrile (ii) acetanilide (iii) benzoic acid ?

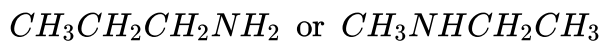
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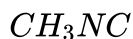
54. Which amine in each of the following pairs is a stronger base? Give reasons.

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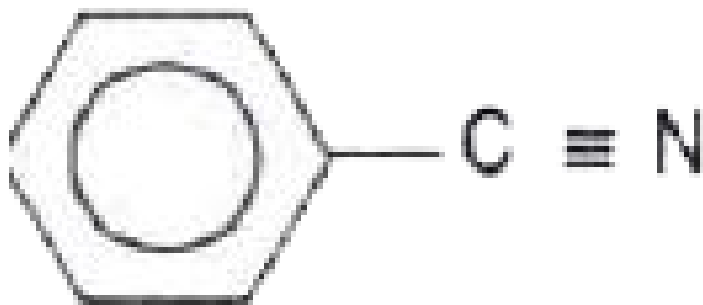
55. Which amine in each of the following pairs is a stronger base? Give reasons.

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56. Give the IUPAC names of the following:

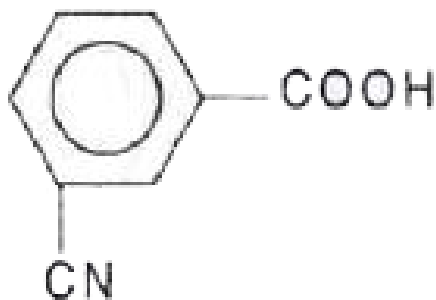
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57. Give the IUPAC names of the following:



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58. Give the IUPAC names of the following:



[▶ Watch Video Solution](#)

59. Give the IUPAC names of the following:



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60. How would you prepare alkyl cyanides from:

Primary amines

 [Watch Video Solution](#)

61. How would you prepare alkyl cyanides from:

Alkyl halides

 [Watch Video Solution](#)

62. How would you prepare alkyl cyanides from:

acid amides?

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63. What are ambident nucleophiles ? Example with an example.

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64. Haloalkanes react with KCN to form alkyl cyanides as main product while AgCN forms isocyanides as the chief product. Explain.

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65. How will you prepare alkyl isocyanides from:

Primary amines

 [Watch Video Solution](#)

66. How will you prepare alkyl isocyanides from:

Alkyl halides?



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67. Bring out the following conversions :

acetic acid to methyl cyanide



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68. Bring out the following conversions :

acetamide to ethanenitrile



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69. Bring out the following conversions :

Aniline to phenyl isocyanide.



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70. Complete the following equations :



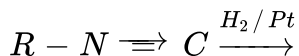
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71. Complete the following equations :



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72. Complete the following equations :



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73. How will you carry out the following conversions :

Methyl carbonylamine to dimethylamine

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74. How will you carry out the following conversions :

An amine to ethyl isocyanide ?

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75. How is methanamine prepared from methyl isocyanide ?

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76. What is vapour phase nitration ? Give one of its applications.

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77. How will you convert the following :

(i) Nitrobenzene into aniline,

(ii) Ethanoic acid into methanamine

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

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78. How will you obtain the following from nitrobenzene?

Phenylhydroxylamine

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79. How will you obtain the following from nitrobenzene?

p-Aminophenol

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80. How will you obtain the following from nitrobenzene?

m-Bromonitrobenzene.

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81. How is nitromethane prepared from methyl bromide ? Give the reaction of nitromethane with

Sn/HCl

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82. How is nitromethane prepared from methyl bromide ? Give the reaction of nitromethane with

Zn/NH_4Cl

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83. What happens when :

ethyl iodide reacts with $AgNO_2$ and product is reduced?

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84. What happens when :

ethyl bromide is treated with AgCN and product is hydrolysed ?

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85. Write the names of the products formed when propanenitrile is subjected to:

hydrolysis under mild acidic conditions

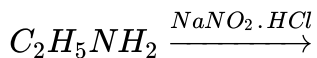
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86. Write the names of the products formed when propanenitrile is subjected to:

reduction using H_2 / Ni .

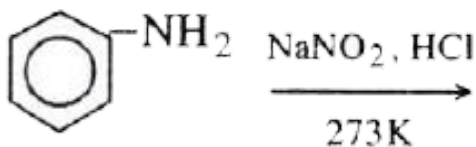
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87. Complete the following reactions and name the products:



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88. Complete the following reactions and name the products:



 [Watch Video Solution](#)

89. Write down the formula of benzenediazonium chloride. Indicate how can it be prepared from aniline.

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90. Before reacting aniline with HNO_3 for nitration, it is converted to acetanilide. Why is this done and how is nitroaniline obtained subsequently ?

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91. Write one chemical equation each to exemplify the following reactions :

Carbylamine reaction

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92. Write the chemical equations involved in the following reactions:

(i) Hoffmann-bromamide degradation reaction

(ii) Carbylamine reaction

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Exercise Part II Descriptive Questions Long Answer Questions

1. How will you prepare :

a pure sample of a primary amine from a primary alkyl halide

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2. How will you prepare :

a primary amine from a cyanide

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3. How will you prepare :

a primary amine from an amide ?

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4. How will you convert:

an alkyl halide into a primary amine having one more carbon than the alkyl halide used ?

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5. How will you convert:

a carboxylic acid to a primary amine having one carbon atom less than the carboxylic acid itself?

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6. Account for the following:

Amines are basic while amides are neutral

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7. Account for the following:

Tertiary amines do not undergo acylation reaction

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8. Trimethylamine is less basic than dimethylamine.

 [Watch Video Solution](#)

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

 [Watch Video Solution](#)

10. Account for the following:

Alkylamines are stronger bases than arylamines.

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11. Account for the following:

Aniline is acylated first to prepare its monobromo derivative.

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12. How is aniline prepared on a large scale ?

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13. What happens when aniline

is heated with a mixture of conc. nitric acid and sulfuric acid ?

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14. Electrophilic substitution of aniline with bromine water at room temperature gives

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15. When aniline is heated with conc. H_2SO_4 at 455-475 K, it forms

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16. How will you distinguish between primary, secondary and tertiary amines ?

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17. Give three points of distinction between ethylamine and aniline.

 [Watch Video Solution](#)

18. How is aniline diazotised ? Write chemical reactions.

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19. How will you convert the following :

(i) Nitrobenzene into aniline,

(ii) Ethanoic acid into methanamine

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

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20. How is m-nitroaniline obtained from nitrobenzene?

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21. Bring out the following conversions :

Aniline to phenyl isocyanide.

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22. How will you bring about the following conversions ?

Ethylamine to diethylamine

 [Watch Video Solution](#)

23. How will you bring about the following conversions ?

Aniline to bromobenzene

 [Watch Video Solution](#)

24. How will you bring about the following conversions ?

Aniline to sulfanilic acid

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25. How will you bring about the following conversions ?

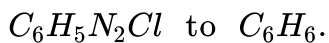
Aniline to o-nitroaniline





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26. How will you bring about the following conversions ?



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27. Describe the industrial preparation of

ethylamine



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28. Describe the industrial preparation of

Aniline



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29. What is diazotisation? Give its one industrial application with the help of suitable example.

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30. Write the names of products and reactions when aniline reacts with excess methyl iodide

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31. Give balanced equations for the following reactions :

Aniline with acetyl chloride.

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32. How is aniline distinguished from N-methylaniline by carbylamine test ? Give the reaction also.



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33. Convert aniline to methyl orange.



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34. What is ammonolysis ? Give its one application. Why do amines dissolve in mineral acids ?



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35. How is ethylamine prepared from (i) nitroethane (ii) propanamide ?



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36. What is Hinsberg reagent ? Give the action of this reagent with primary and secondary amines.



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37. Prepare sulfanilic acid from aniline. Why this acid has high melting point ?



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

$C_2H_5NH_2$, $C_6H_5NH_2$, CH_2 and $(C_2H_5)NH$



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

$C_2H_5NH_2$, $(C_2H_5)_2NH$, $(C_2H_5)_3N$, $C_5H_5NH_2$



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40. 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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41. Describe a method for the identification of primary, secondary and tertiary amines. Also write chemical equations of the reactions involved.

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42. Write short notes on the following:

Carbylamine reaction

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43. Write short notes on the following:

Diazotisation





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44. Write short notes on the following:

Coupling reaction



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45. Write short notes on the following:

Ammonolysis



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46. Write short notes on the following:

Acetylation



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47. Write short notes on the following:

Hofmann-broamide reaction

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48. Write short notes on the following:

Gabriel phthalimide synthesis.

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49. Account for the fact that cyanide ion is an ambident nucleophile

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50. Give the structures of the main organic substitution products expected from the reaction of 1-bromobutane with $LiAlH_4$

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51. Write the reactions and names of products when propanenitrile is subjected to hydrolysis under mild conditions.

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52. How will you prepare propanenitrile from: (i) an appropriate alkyl amide (ii) an appropriate alkyl halide ?

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53. How are cyanides and isocyanides prepared ? Give their important properties.

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54. How will you distinguish between ethyl cyanide and ethyl isocyanide ?

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55. Explain :

Treatment of alkyl halides with alcoholic KCN produces alkyl cyanides whereas with alc. AgCN produces alkyl isocyanides.

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56. Explain :

Alkyl cyanides are more soluble in water than corresponding alkyl isocyanides.

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57. Discuss the partial reduction of alkyl cyanides.





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Isc Examination Questions Part I Objective Questions

1. is more basic than NH_3 because of effect.



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2. When acetamide is treated with bromine and caustic soda, it gives and the reaction is called



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3. Ethyl isocyanide, on hydrolysis with dilute sulfuric acid gives and



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4. Dehydration of an amide with phosphorus pentoxide yield:

- A. Ammonia
- B. Alkyl cyanide
- C. Alkyl isocyanide
- D. Alkyl amine

Answer:



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5. The product formed when aniline is warmed with chloroform and caustic potash is :

- A. phenyl chloride
- B. methyl isocyanide
- C. phenyl isocyanide
- D. nitrophenol

Answer:

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6. Hydrolysis of an isocyanide in the presence of an acid yields primary amine and methyl amine

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7. Match the following columns

- (i) Hinsberg's reagent
- (ii) Carbylamine

- (a) Obnoxious smell
- (b) Amines

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1. Explain carbylamine reaction with atleast one example.

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2. Give balanced equation for the reaction gives below: Methyl isocyanide is warmed with dilute hydrochloric acid.

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3. Give one reason for the following: Direct nitration of aniline is not possible.

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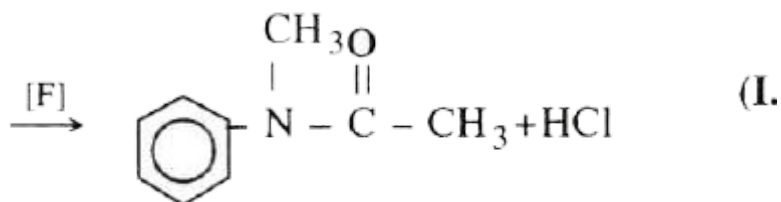
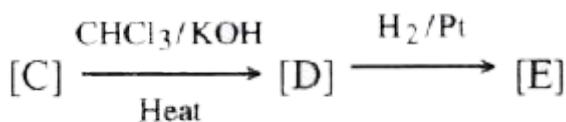
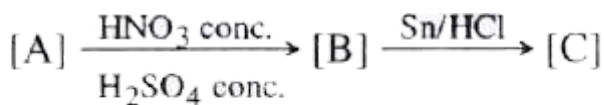
4. Aniline is treated with a mixture of NaNO_2 and excess of HCl at low temperature.

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5. How would you convert methylamine to ethylamine?

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6. Give the name and formula of each A, B, C, D, E and F in the following conversion reactions :



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7. Write balanced equations of the following reactions:

Aniline and Bromine Water

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8. Write balanced equations of the following reactions:

Ethylamine and nitrous acid

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9. Give one example of Hofmann's Degradation.

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10. State the reagents for the following conversions : Benzene $\xrightarrow{(A)}$

Nitrobenzene $\xrightarrow{(B)}$ Aniline $\xrightarrow{(C)}$ Aniline Hydrochloride $\xrightarrow{(D)}$

Benzenediazonium chloride.



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11. An organic compound A with molecular formula C_2H_7N on reaction with nitrous acid gives a compound B. B on controlled oxidation gives a compound C. C reduces Tollens' reagent to give silver mirror and D. B reacts with D in the presence of concentrated sulfuric acid to give a sweet smelling compound E. Identify A, B, C, D and E. Give the reaction of C with ammonia and name the product.



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12. Give a balanced equation for the following reaction : Aniline treated with benzoyl chloride.



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13. How can the following conversions be brought about:

Ethylamine to methylamine

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14. How can the following conversions be brought about:

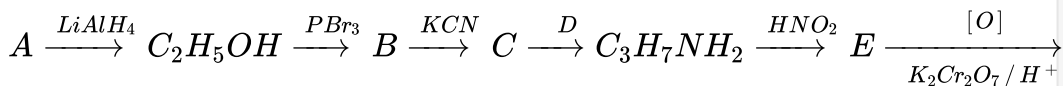
Benzene to acetanilide

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15. Give one good chemical test to distinguish between methylamine and dimethylamine.

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16. Identify A to F :



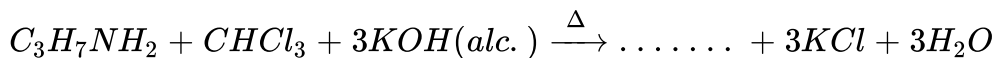
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17. Identify the reagents X, Y and Z.



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18. Complete the following reaction and name the reaction:



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19. Name the type of isomerism exhibited by the following pairs of compounds :



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20. An organic compound [A] having molecular formula C_2H_7N on treatment with nitrous acid gives a compound [B] having molecular formula C_2H_6O . [B] on treatment with an organic compound (C) gives a carboxylic acid [D] and a sweet smelling compound (E). Oxidation of [B] with acidified potassium dichromate also gives [D].

Identify [A], [B], [C], [D] and [E].

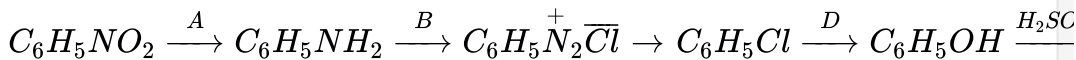
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21. An organic compound [A] having molecular formula C_2H_7N on treatment with nitrous acid gives a compound [B] having molecular formula C_2H_6O . [B] on treatment with an organic compound (C) gives a carboxylic acid [D] and a sweet smelling compound (E). Oxidation of [B] with acidified potassium dichromate also gives [D].

Write balanced chemical equation of [D] with chlorine in the presence of red phosphorus and name the reaction.

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22. Identify the reagents A, B, C, D, E and F required for the following conversion :



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23. Give one chemical test to distinguish between aniline and ethylamine.

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24. Give balanced equation for Balz-Schiemann's reaction.

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25. How can the following conversion be brought about: Phenol to aniline

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26. Give balanced equation for Hofmann's degradation reaction.

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27. Give one good chemical test to distinguish between methylamine and dimethylamine.

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28. Give balanced equations for the following reactions :

Aniline is treated with nitrous acid and HCl at low temperature.

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29. Give balanced equations for the following reactions :

Ethylamine with nitrous acid.

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30. Give balanced equations for the following reactions :

Aniline with acetyl chloride.

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31. How can the following conversions be brought about:

Benzoic acid to aniline

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32. How can the following conversions be brought about:

Benzene to benzenediazonium chloride ?

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33. Give balanced chemical equation for carbylamine reaction.

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