CHEMISTRY

BOOKS - R G PUBLICATION

AMINES

Exercise

1. Write one chemical test to distinguish between methylamine and dimethylamine.

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2. Give reasons why the aromatic amines are weaker bases than aliphatic amines.

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

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4. Write one chemical test to distinguish between ethylamine and aniline.

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5. Arrange in increasing order of basic strength: $CH_3NH_2, (CH_3)_2NH, (CH_3)_3N$

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6. K_b value of aniline is less than that of methyl amine. Why?

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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. Arrange the following compounds in the increasing order of their basic strength in aqueous soluiton:

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

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9. Give a chemical test for primary amines.

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10. What happens when aniline reacts with bromine water at room temperature?

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11. Write the diazotisation reaction of aniline.

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12. Complete and name the following reactions: $RNH_2 + CHCl_3 + KOH_{alc} \rightarrow$

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13. Complete and name the following reactions: $RCONH_2 + Br_2 + NaOH \rightarrow$

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14. Identify A and B : $CH_3CH_2Br \xrightarrow{KCN} A \xrightarrow{LiAlH_4} B$

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15. Identify C and D :

$$C_6H_5NO_2 \xrightarrow{Fe+HCl} C \xrightarrow[HCl]{NaNO_2} D$$

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16. How will you convert the following? Give chemical equations only. Aniline to phenylisocynaide.

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17. An organic compound contains $A(C_7H_5N)$ on hydrolysis with strong aqueous acid gives another compound B which is a monobasic aromatic carboxylic acid. The compound B on treatment with ammonia gives a salt which on heating gives C. The compound C undergoes Hofmann's bromamide reaction to yield aniline. Name A, B and C and write the chemical reactions involved.

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

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19. Methanamine can be prepared using Gabriel phthalimide synthesis. Write chemical equation only for the synthesis.

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20. How can you convert aniline to p-nitroaniline? Give the chemical equations only.

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21. Identify A, B, C and D in the following conver-sions:

$$A \xrightarrow[273-278]{NaNO_2/HCI} CH3OH \xrightarrow{PCl} B \xrightarrow{KCN}$$

$$\underset{D}{\overset{C}{\downarrow LiAIH_4}}$$

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22. How will you convert aniline into phenol? Give necessary chemcial equations.

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23. Name the following reactions:

$$C_6H_5N_2^+CI^- \xrightarrow{CuCI\,/\,HCI} C_6H_5 - CI + N_2$$

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24. Name the following reactions:

$$C_6H_5N_2^+CI^- \xrightarrow{Cu\,/\,HCI} C_6H_5 - CI + N_2 + CuCl$$

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25. What is ammonolysis reaction?

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26. Why aromatic amine cannot be prepared by Gabrial Pthalimide reaction?

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27. Explain why the solubility of amines in water decrease on increasing molar mass.

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28. In the vapour phase what is the order of basicity of 1°, 2° & 3° amine.

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29. Why acylation of amine is carried out inpresence of pyridine?

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30. What is carbylamine test?

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31. Name the reagent with formula which is used to distinguish $1^{\circ}, 2^{\circ}$ & 3° amines.

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

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

$C_6H_5NH_2, C_6H_5NHCH_3, C_6H_5CH_2NH_2$

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34. Write one importance of aryl diazonium salt.

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35. Why is the presence of a base needed in the ammonolysis of alkyl halide?

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36. Give reasons for each of the following oberva-tions: Even under mild conditions aniline on bromi-natoin gives 2,4,6, tribromo aniline.

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37. Give reasons for each of the following obervations: Diazonium ion acts as electrphile.

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38. Write the chemical reaction stating the reaction conditions require for each of the following conversions: Methyl bromide to ethylamine.

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39. Write the chemical reaction stating the reaction conditions require for each of the following conversions: Aniline to Phenol

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40. Write the chemical reaction stating the reaction conditions require for each of the following conversions: p-toluidine to 2-bromo-4-methyl aniline.

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41. Between alcohol and amine having same number of C-atom, which one is more soluble in water & why?

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42. Writing various resonating structures show that arylamine is less basic than alkylamine.

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43. How $1^{\circ}, 2^{\circ}$ and 3° amine react with Hinsberg's reagent ? Show the reactions.

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44. Why aniline gives 2,4,6 tribromo aniline when reacts with bromine in aqueous medium? If we want to obtain monobromo derivative what should we do?

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45. In order to obtain p-nitro aniline from nitration of aniline, why $-NH_2$ group should be pro-tected?

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46. Why aryl diazonium chloride is more stable than alkyl diazonium chloride?

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47. Write short notes on the following: Gabriel Pthalimide reaction.

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48. Write short notes on the following: Coupling reactions.

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49. Write short notes on the following: Hoffmann's degradation reaction.

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50. 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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51. What happens when: Nitro benzene reacts with scrap iron in press-ence of little HCI.

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52. What happens when: Ethyl cyanide reacts with ethanolic sodium.

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53. What happens when: Ethyl bromide reacts with phthalimide in pres-ence of KOH & then aq NaOH.

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54. What happens when: Benzamide is treated with sodium hypobromite solution.

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55. What happens when: Ethylamine reacts with ethanoic anhydride.

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56. What happens when: Sodium salt of benzene sulphonic acid is fused with caustic soda.

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57. What happens when: Aniline reacts with sodium nitrite/HCI at $5^{\circ} C$.

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58. Benzene diazonium chloride reacts with HBF_4 & that heated.

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59. Benzene diazonium chloride reacts with phenol in presence of sodium hydroxide.

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60. Accomplish the following conversions:

Nitrobenzene to benzoic acid.

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61. Accomplish the following conversions:

Methamine into ethanamine

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62. Accomplish the following conversions:

Methanol into ethanoic acid

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63. Accomplish the following conversions:

Chloro benzene to p-chloroaniline

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64. Accomplish the following conversions:

Benzene to m-bromo phenol.

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65. Accomplish the following conversions:

Benzyl chloride to 2-phenyl ethanamine.

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66. Accomplish the following conversions:

Nitromethane into dimethylamine

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67. Accomplish the following conversions:

Hexanenitrile into 1-aminopentane

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68. Accomplish the following conversions:

Aniline to benzyl alcohol.

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69. Accomplish the following conversions:

Ethanoic acid into methanol.

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70. Explain the following: $P(K)b$ value for aniline is more than that for methylamine

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71. Explain the following: Ethylamine is soluble in water where as aniline is not soluble in water

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72. Explain the following: Primary amines have higher b.p. than ter-tiary amines

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73. Explain the following: Amines are less acidic than alcohols of comparable molecular mass

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74. Explain the following: Methylamine in water reacts with $FeCI_3$ to give hydrated Fe_2O_3.

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75. Distinguish the following pairs: Ethylamine & aniline

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76. Distinguish the following pairs: Aniline and Benzylamine

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77. Distinguish the following pairs: Methylamine and Dimethylamine

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78. Why do amines react as nucleophiles?

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79. Explain the following: Ethylamine is soluble in water where as aniline is not soluble in water

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80. Why direct nitration of aniline is not carried out?

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81. What is carbylamine test?

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82. Identify C and D :

$$C_6H_5NO_2 \xrightarrow{Fe+HCl} C \xrightarrow[HCl]{NaNO_2} D$$

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83. Write the structres of A and B:

$$CH_3COOH \xrightarrow{NH_3} A \xrightarrow{NaOBr} B$$

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84. Write the structres of A and B:

$$C_6H_5NO_2 \xrightarrow{Fe/HCI} A \xrightarrow{HNO_2} B.$$

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85. Write the structres of A and B:

$$C_6H_5\overset{\oplus}{N}_2C\overset{\Theta}{I} \xrightarrow{CuCN} A \xrightarrow[OH^-]{Partial Hydrolysis} B$$

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86. How will you convert: Nitro benzene to benzoic acid.

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87. How will you convert: Aniline to chloro Benzene.

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88. How will you convert: Acetaldehyde to ethylamine

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89. How will you convert: Aniline to Benzyl chloride

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90. How will you convert: Propanoic acid to ethanoic acid

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91. How will you convert: Hexanenitrile to -1 aminopentane.

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92. Why amines are basic substances while amides are neutral?

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93. Give the structures of A and B in the following reactions:

$$C_2H_5I \xrightarrow{NaCN} A \xrightarrow[OH^-]{Partial\,Hydrolysis} B$$

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94. Give the structures of A and B in the following reactions:

$$C_6H_5NO_2 \xrightarrow{Fe\,/\,HCI} A \xrightarrow{NaNO_2\,/\,HCI} B$$

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95. Give the structures of A and B in the following reactions:

$$CH_3COOH \xrightarrow{NH_3} A \xrightarrow{NaOBr} B$$

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96. Give the structures of A and B in the following reactions:

$$C_2H_5Br \xrightarrow{KCN} A \xrightarrow{LiAlH_4} B$$

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97. Give the structures of A and B in the following reactions:

$$C_6H_5\overset{\oplus}{N}_2C\overset{\ominus}{I} \xrightarrow{CuCN} A \xrightarrow{Hydrolysis} B$$

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98. Why is the presence of a base needed in the ammonolysis of alkyl halide?

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99. Account for the following observations: Methylamine solution in water reacts with ferric chloride solution to give a precipitate of ferric hydroxide.

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

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101. Give a chemical test to distinguish between each of the following pairs of compounds: Ethylamine and Aniline.

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102. Give a chemical test to distinguish between each of the following pairs of compounds: Aniline and Benzylamine.

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103. Bring out the following Conversionsn: Nitrobenzene to benzoic acid.

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104. Bring out the following Conversionsn: Benzyl chloride to 2-phenyl ethanamine.

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105. Bring out the following Conversionsn: Aniline to benzyl alcohol.

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106. Write the chemical reaction to illustrate the following: Coupling reaction

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107. Write the chemical neaction each to illustrate the following: Ammonolysis.

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108. Give a chemical test to distinguish between the following pairs of compounds: Aniline and N-ethyl aniline

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109. Give a chemical test to distinguish between the following pairs of compounds: N-Methyl propane-2 amine and N-ethyl-N-methyl ethanamine.

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110. Although BF_3 adds on triethyl amine but it does not add on triphenyl amine, explain.

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111. An organic compound contains $A(C_7H_5N)$ on hydrolysis with strong aqueous acid gives another compound B which is a monobasic aromatic carboxylic acid. The compound B on treatment with ammonia gives a salt which on heating gives C. The

compound C undergoes Hofmann's bromamide reaction to yield aniline. Name A, B and C and write the chemical reactions involved.

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112. An optically active amide $(A)C_5H_{11}NO$ on acid hydrolysis gives an acid and NH_3. When (A) is treated with bromide and alkali a compound is obtained which one treatment with nitrous acid gives an optically active

alcohol and nitrogen. The alcohol gives positive iodoform test. What is the structure of A and show the reactions involved.

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113. How can you convert an amide into an amine having one carbon less that the starting compound: Name the reaction.

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114. How can you convert an amide into an amine having one carbon less that the starting compound: Give the IUPAC name and structure of the amine obtained by the above method if the amide is 3-chloro butanamide.

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