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CBSE 12th Chemistry Chapter- 13 (Amines) Unsolved Important Questions

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SECTION A

(Each question in this section carry 1 mark)

Q.1. **Arrange the following in increasing order of their basic strength in aqueous solution:** $CH_3.NH_2, (CH_3)_3N, (CH_3)_2NH$

Q.2. **Arrange the following compounds in increasing order of solubility in water:**

$C_6H_5NH_2, (C_2H_5)_2NH, C_2H_5NH_2$

Q.3. **Write the IUPAC name of the given compound:**

Q.4. **Write IUPAC name of the following compound:**

$(CH_3CH_2)_2NCH_3$

Q.5. **Arrange the following compounds in an increasing order of basic strengths in their aqueous solutions:**

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

Q. 6. **Rearrange the following in an increasing order of their basic strengths:** $C_6H_5NH_2, C_6H_5N(CH_3)_2, (C_6H_5)_2$ **and** CH_3NH_2.

Q.7. **Write the structure of the product obtained when glucose is oxidized with nitric acid.**

Q.8. **Write the structure of n-methy-lethanamine.**

Q.9. **The conversion of primary aromatic amines into Diazonium salts is known as_____?**

Q.10. Give the IUPAC name of $H_2N - CH_2 - CH_2 - CH = CH_2$.

Q.11. Write a chemical reaction in which the iodide ion replaces the diazonium group in a diazonium salt.

Q.12. Why is an alkylamine more basic than ammonia?

Q.13. Give the IUPAC name of $H_2N - CH_2 - CH_2 - CH = CH_2$.

Q.14. Arrange the following in the decreasing order of their strength in aqueous solutions:

$CH_3NH_2, (CH_3)_2\ NH, (CH_3)_3\ and\ NH_3$

SECTION B

(Each question in this section carry 2 marks)

Q.15. Write one chemical reaction each to illustrate the following:

(i) Hoffmann's bromamide reaction
(ii) Gabriel phthalimide synthesis

Q.16. (i) Arrange the following in an increasing order of basic strength in water:

$C_6H_5NH_2, (C_2H_5)_2NH, (C_2H_5)_3N$ **and** NH_3

(ii) Arrange the following in increasing order of basic strength in gas phase:

$C_2H_5NH_2, (C_2H_5)_2NH, (C_2H_5)_3N$ **and** $NH_3\ NH_2$.

Q.17. Give the chemical tests to distinguish between the following pairs of compounds:
(i) Ethylamine and Aniline
(ii) Aniline and Benzyl amine

Q.18. Identify A and B in each of the following processes:

(i)

$$CH_3CH_2Cl \xrightarrow{NaCN} A \xrightarrow[Ni/H_2]{reduction} B$$

(ii)

$$C_6H_5NH_2 \xrightarrow{NaNO_2} A \xrightarrow[OH^-]{C_6H_5NH_2} B$$

Q.19. Describe the following giving the relevant chemical equation in each case:
(i) Carbylamines reaction
(ii) Hofmann's bromamide reaction

Q.20. Complete the following reaction equations:
(i) $C_6H_5N_2Cl + H_3PO_2 + H_2O \longrightarrow$
(ii) $C_6H_5NH_2 + Br_2(aq.) \longrightarrow$

Q.21. Give reasons for the following:
(i) Aniline does not undergo Friedal-Crafts reactions.
(ii) $(CH_3)_2NH$ **is more basic than** $(CH_3)_3N$ **in an aqueous solution.**
(iii) Primary amines have higher boiling point than tertiary amines.

Q.22. Write the chemical equations involved in the following reactions:
(i) Hoffmann-bromoimides degradation reaction
(ii) Carbylamines reaction

SECTION C

(Each question in this section carry 3 marks)

Q.23. Give the structures of A, B and C in the following reactions:

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

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

Q.24. How will you convert the followings:

(i) Nitrobenzene into aniline,
(ii) Ethanoic acid into methanamine
(iii) Aniline into N-phenylethanamide (write the chemical equations involved).

Q.25. Give reasons:

(i) Acetylation of aniline reduces its activation effect.

(ii) CH_3NH_2 is more basic than $C_6H_5NH_2$.

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

Q.26. Complete the following reaction equations:

(i)

$$R-\overset{\overset{O}{\|}}{C}-NH_2 \xrightarrow[H_2O]{LiAlH_4}$$

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

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

Q.27. Amino acids may be acidic, alkaline or neutral, how does this happen? What are essential and nonessential amino acids? Name one of each type.

Q.28. Account for the following:

(i) Primary amines $(R-NH_2)$ have higher boiling point than tertiary amines (R_3N).

(ii) Aniline does not undergo Friedel – Crafts reaction.

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

Q.29. Give the structure of A, B and C in the Following reactions:

(i) $C_6H_5NO_2 \xrightarrow{Sn+HCl}$

$$A \xrightarrow[273k]{NaNO_2+HCl} B \xrightarrow{H_2O} C$$

(ii) $CH_3CN \xrightarrow{H_2O/H^+} A \xrightarrow[\Delta]{NH_3}$

$$B \xrightarrow{Br_2+KOH} C.$$

Q.30. Give reasons for the following:

(a) Acetylation of aniline reduces its activation effect.

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

(c) Although –NH2 is o/p directing group, yet aniline on nitration gives a significant amount of m-nitroaniline.

Q.31. Account for the following observations:

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

(ii) Methylamine solution in water reacts with ferric chloride solution to give a precipitate of ferric hydroxide.

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

Q.32. Write chemical equations for the following conversion:

(i) Nitrobenzene to benzoic acid.

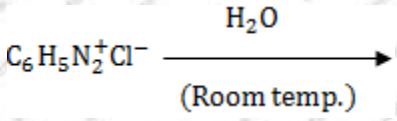
(ii) Benzyl chloride to 20phenylethanamine.

(iii) Aniline to benzyl alcohol.

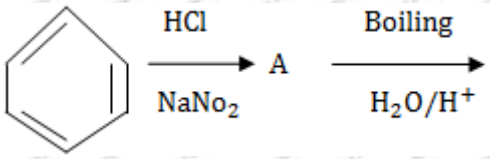
Q.33. Complete the following reactions:

(i) $CH_3\ CH_2\ NH_2 + CHCl_3$+alc. KOH⟶

(ii)



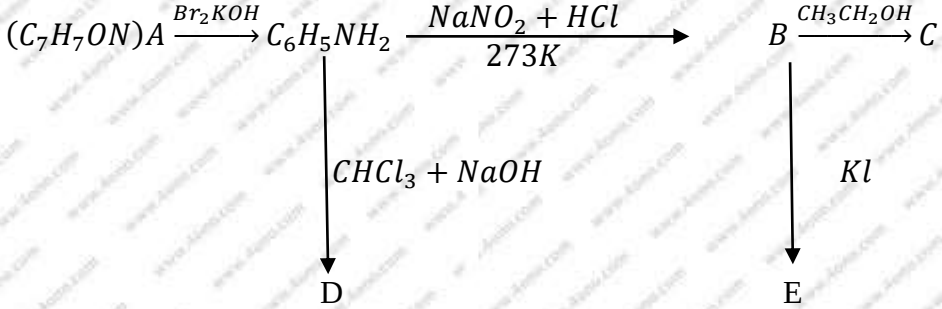
(iii)



SECTION D

(Each question in this section carry 5 marks)

Q.34. An aromatic compound 'A' of molecular formula C_7H_7ON undergoes a series of reactions as shown below. Write the structures of A, B, C, D and E in the following reactions:



Q.35. (a) Write the structure of main products when aniline reacts with the following reagents:

(i) Br_2 **water,**

(ii) HCl,

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

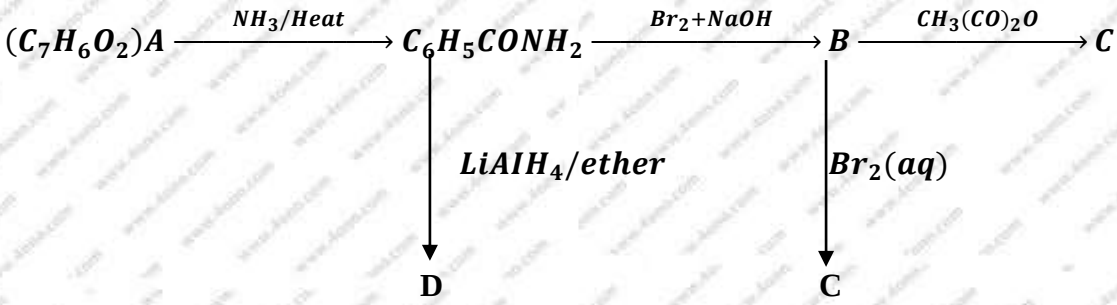
(b) Arrange the following in the increasing order of their boiling point:

$C_2H_5NH_2, C_2H_5OH, (CH_3)_3N$

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

$(CH_3)_2\ NH\ and\ (CH_3)_3N$

Q.36. An aromatic compound 'A' of molecular formula $C_7H_6O_2$ **undergoes a series of reaction:**



As shown below. Write the structures of A, B, C, D and E in the following reactions:

Q.37. (a) Write the structures of main products when benzene diazonium chloride reacts with the following reagents:

(i) $H_3PO_2 + H_2O$

(ii) CuCN/KCN

(iii) H_2O

(b) Arrange the following in the increasing order of their basic character in an aqueous solution:

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

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

$C_6H_5 - NH_2\ and\ C_6H_5 - NH - CH_3$

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