

Tilottama College
Assignment - 2077

Class: 12
Time: 3 hrs
Subject: Chemistry

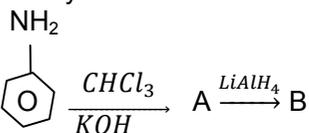
F.M. :- 75
P.M. :- 27

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Group - A (15x2=30)

Attempt any fifteen questions:

1. What type of hybridization is present in acetylene? Give two features of the hybridisation.
2. All normal solutions are standard solution but all standard solution may not be normal solution. Justify the statement.
3. Water is Lewis base as well as Bronsted - lowery acid. Explain.
4. The solubility product of chalk is 9.3×10^{-8} . Calculate its solubility in gm/litre.
5. Differentiate between the order of reaction and molecularity of reaction.
6. How many amperes of current is required to liberate 2.24 litre of chlorine gas at NTP in an hour by the electrolysis of NaCl solution?
7. Draw the energy profile diagram for the exothermic and endothermic reaction.
8. Derive an expression to relate Gibb's Free Energy Change and net work or useful work.
9. Explain, why benzene undergo electrophilic substitution reaction readily than addition reaction.
10. Identify A & B



11. Why ethanol has high boiling point than its functional isomer dimethyl ether?
12. Convert chlorobenzene into methoxybenzene.
13. Compound A (C₄H₈O) undergoes reaction with hydrazine to give compound B but do not give Fehlings test. Identify compound A and B with reaction involved.
14. What happens when:
 - a. formaldehyde reacts phenol
 - b. Acetone reacts with hydroxylamine

15. Write any two isomeric amines of C₂H₇N and give the chemical test to distinguish them.
16. Define the terms ; a.zwitter ion b.isoelectronic point.
17. Why direct nitration of aniline is not done?
18. Write down the structural formula of monosaccharides obtained from hydrolysis of sucrose.
19. Define auxochrome and chromophore with suitable example of each.
20. Give an important use of:
 - a. Pesticides
 - b. BHC
 - c. Antipyretic drugs
 - d. Nitrogen Fertilizer
21. Show with chemical reaction, philosopher's wool is an amphoteric.
22. What is Nessler's reagent? How is it prepared?

Group - B (5x5=25)

Attempt any five questions:

23. Define the terms: a) degree of ionization b) buffer action.
Equal volume of two solutions having p^H 2 and p^H11 are mixed together. What will be the p^H of resulting solution? [1+1+3]
24. What is a galvanic cell? Give the symbolic representation of the Daniell cell.
Can a solution of 1 M CuSO₄ be stored safely in a vessel made of nickel metal? Given $E_{\text{Cu}^{2+}/\text{Cu}}^{\circ} = +0.34V$ and $E_{\text{Ni}^{2+}/\text{Ni}}^{\circ} = -0.25V$. [1+1+3]
25. What is meant by enthalpy of formation? Calculate the enthalpy of formation of ethane at 298k, if the anthalpies of combustion of C,H and C₂H₆ are 94.14, -68.47 and -373.3 kcal, respectively.[1+4]
26. Give the laboratory prearation of diethyl ether. [5]
27. Show your familiarity with the following reactions [5]
 - a. Rosenmunds reduction.
 - b. Perkin's condensation
 - c. Diazotization reaction
 - d. Carbylamines reaction
 - e. Cannizzaro reaction
28. Compound A having molecular formula C₃H₆O₂ which upon ammonolysis gives B. on heating B with Br₂ in presence of KOH, gives

- C. When heated C with nitrous acid gives compound D. The compound D gives positive iodoform test. Oxidation of D gives E, which when reacts with ethanoic acid produces pleasant smell. Identify A, B, C, D and E respectively and write reactions involved.
29. Compare and contrast the properties of calomel and corrosive sublimate.

Best of Hard Labour

Group - C (2x10=20)

Attempt any two questions :

30. **a.** How does temperature and catalyst affect the rate of reaction? Explain. Show that the half life period of first order reaction is independent of initial concentration.
- b.** 2L of ammonia gas at 30°C and 0.9 atm pressure neutralizes 134 ml of sulphuric acid solution. Find the concentration of sulphuric acid in gram per litre?
31. **a.** How primary, secondary and tertiary amines are separated? Explain.
- b.** An organic compound contains 69.77% carbon, 11.63% hydrogen and rest oxygen. The molecular mass of the compound is 86. It does not reduce Tollen's reagent but forms addition compound with sodium bisulphite & give iodoform test. On vigorous oxidation it gives ethanoic & propanoic acid. Write the possible structure of compounds.
32. What are the alcoholic isomers of C_3H_8O ? How they are distinguished by Victor-Meyer method?
- The compound A obtained by heating B and paste of bleaching powder is allowed to react with aminoethane and alcoholic potassium hydroxide which gives C with obnoxious smell. The compound C on reduction with $LiAlH_4$ gives D. If compound B is primary alcohol that responds positive iodoform test, identify A, B, C and D with concerned reaction.
33. Write short note on any two:
- Selection of indicator in acid-base titration
 - Laboratory preparation of nitrobenzene.
 - Faraday's first and second law of electrolysis.
 - Manufacture of steel by Bessemerization process.