

CLASS 12TH

PAPER CHEMISTRY

Time : 3 hrs.

M. M. – 70 Marks

NOTE : Q. No. 1 has 28 parts carrying 1 mark each.

Q. No. 2 to 11 carry 2 marks each.

Q. No. 12 to 15 carry 3 marks each.

Q. No. 16 to 17 carry 5 marks each.

Q1. Comprehension

Lyophilic sols are more stable than lyophobic sols. This is due to the fact that lyophilic colloids are extensively solvated, i.e., colloidal particles are covered by a sheath of the liquid in which they are dispersed.

Lyophilic colloids have a unique property of protecting lyophobic colloids. When a lyophilic sol is added to the lyophobic sol, the lyophilic particles form a layer around lyophobic particles and thus protect the latter from electrolytes. Lyophilic colloids used for this purpose are called protective colloids

Answer the followings

- Which type of colloids are stable in nature?
- Define lyophilic colloids.
- Which type of colloids undergo solvation?
- What are protective colloids?
- How protection of colloids can be done?

True/False

- The C-X bond length in halobenzene is smaller than C-X bond length in $\text{CH}_3\text{-X}$ (T/F)
- Alcohols are weaker acids than water (T/F)
- Carboxylic acids are more acidic than phenols. (T/F)
- Keratin is fibrous protein (T/F)
- Aliphatic Amines are more basic than NH_3 (T/F)
- which of the following aqueous solutions have should have the highest boiling point :
(a) 1.0 M NaOH (b) 1.0 M Na_2SO_4 (c) 1.0 M NH_4NO_3
(d) 1.0 M KNO_3

- xii. Colligative properties depends upon :
- (a) Nature of solute particles present in the solution
 - (b) Nature of solute particles present in the solution
 - (c) Physical properties of the solute particles
 - (d) Nature of the solvent particles
- xiii. The value of Henry's constant :
- (a) Increases with increase in temp
 - (b) decreases with increase in temp
 - (c) remains constant
 - (d) first increases then decreases
- xiv. 18 g of glucose is dissolved in 1kg of water at what temp will the water boil ,
 k_b for water is $0.52 \text{ K kg mol}^{-1}$
- (a) 373.2 K
 - (b) 378.2 K
 - (c) 381.5 K
 - (d)
- xv. Which of the followings oxidation state of oxygen is +2
- (a) Cl_2O
 - (b) O_2F_2
 - (c) OF_2
 - (d) N_2O
- xvi. Ethanol upon heating with conc. H_2SO_4 at 443 k gives:
- (a) Diethyl ether
 - (b) Ethylene
 - (c) Ethyl hydrogen sulphate
 - (d) none of these

- xvii. Oxidation state of Fe in $[\text{Fe}(\text{CN})_6]^{3-}$
 (a) +3 (b) +2 (c) +4 (d) -3
- xviii. IUPAC name of the complex $\text{K}_3[\text{Fe}(\text{CN})_6]$ is
 (a) potassium hexacyanoferrate (II) (b) potassium hexacyanoferrate (III) (c) potassium hexacyanoiron (II) (d) tripotassium hexacyanoiron (II)
- xix. Which among the followings is disaccharides
 (a) Glucose (b) cellulose (c) Sucrose (d) starch
- xx. Which among the followings is globular protein?
 (a) Albumin (b) Keratin (c) collagen (d) None of the above
- xxi. Which among the following is secondary amine:
 (a) CH_3NH_2 (b) $(\text{CH}_3)_3\text{N}$
 (c) CH_3NHCH_3 (d) $\text{CH}_3\text{CH}_2\text{NH}_2$
- xxii. Alkyl cyanide upon reduction with Na/ethanol gives
 (a) Carboxylic acids (b) primary amines
 (c) sec- amine (d) tert-amine
- xxiii. Which among the followings is most acidic?
 (a) Acetic acid (b) Formic acid
 (c) Chloroacetic acid (d) Ethanol
- xxiv. Which among the followings undergoes cannizzaro's reaction?
 (a) Ethanal (b) Benzaldehyde
 (c) Propanal (d) None of above
- xxv. When aliphatic aldehydes are treated with Fehling solution, following observation is obtained
 (a) White ppt (b) red coloration (c) Orange coloration (d) Brown coloration
- xxvi. In Clemmensen reduction the reducing agent used is
 (a) Na / ethanol (b) Zn-Hg /HCl (c) Mg-Hg/H₂O (d) LiAlH_4
- xxvii. One Faraday contains the charge
 (a) 95000C (b) 96500 C (c) 94500 C (d) 95600 C
- xxviii. XeF_2 has linear structure because
 (a) Xe is sp^3d^2 hybridized having 6 bp and 1lp (b) Xe is sp^3d^2 hybridized having 4 bp and 2 lp
 (c) Xe is sp^3d hybridized having 2 bp and 3 lp
 (d) Xe is sp^3 hybridized having 3 bp and 1lp



Section-B Two Mark

Questions

Q2 The vapour pressure of 2.1% of an aqueous solution of a non electrolyte at 373 K is 755 mm calculate the molar mass of solute

OR

When 1.80 gm of non volatile compound is dissolved in 25 g of acetone, the solution boils at 56.86 C while pure acetone boils at 56.38 C under the same atmospheric pressure calculate the molar mass of the compound . K_b for acetone is $1.72 \text{ K kg mol}^{-1}$

Q3. What is specific conductance of a solution ? How it varies with dilution ?

Q4. A first order reaction is found to have a rate constant $k = 5.5 \times 10^{-14} \text{ sec}^{-1}$ Find the half life period

OR

A first order reaction is 75% completed in 40 minutes , calculate its half life period

Q5. Why does NCl_5 not exist ?

OR

Oxygen is a gas while sulphur is solid . explain

Q6. Why nitrous acid is oxidant as well as reductant ?

OR

What is the basicity of H_3PO_4 and why ?

Q7. Why transition metals act as good catalysts?

Q8. Why are Mn^{2+} compounds more stable than Fe^{2+} towards oxidation to their +3 state?

Q10. What is meant by unidentate and ambidentate ligands? Give two examples for each.

OR

$[\text{Fe}(\text{CN})_6]^{4-}$ and $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ are of different colours in dilute solutions. Why?

Q11. Explain the factors affecting rate of a reaction.

Section-C Three Mark Questions

Q12. Calculate the potential of hydrogen electrode in contact with a solution whose

Q13. Compare and explain the reactivity of different alcohols towards sodium.



Q14. For a first order reaction, show that time required for 99% completion is twice the time required for the completion of 90% of reaction.

OR

A first order reaction takes 40 min for 30% decomposition.
Calculate half life period.

Q15. Why is dioxygen a gas but sulphur a solid?

Section-D Five Mark Questions

Q16. Explain giving reasons-

- (i) Transition metals and many of their compounds show paramagnetic behaviour. (1)
- (ii) The enthalpies of atomisation of the transition metals are high. (2)
- (iii) The transition metals generally form coloured compounds. (2)
- (i) n-butyl chloride is treated with alcoholic KOH
- (ii) bromobenzene is treated with Mg in the presence of dry ether
- (iii) ethyl chloride is treated with aqueous KOH, act as good catalyst. (2)
- (iv) methyl bromide is treated with sodium in the presence of dry ether, undergoes oxidative coupling
- (v) methyl chloride is treated with KCN ?
- (iii) The d^1 configuration is very unstable in ions. (1)

Q17. What happens when-

OR

- (i) Sandmeyer's reaction
- (ii) Finkelstein reaction
- (iii) Hundsdiecker reaction
- (iv) Fittig reaction
- (v) Ullmann reaction