

CHAPTER 1:SOLID STATE

1 MARK QUESTIONS

- Q.1.What type of solids are electrical conductors, malleable and ductile?
- A.1. metallic
- Q.2. Give the significance of lattice point.
- A.2. It signifies position of constituent particles of the unit cell
- Q.3. Name the parameters that characterize the unit cell
- A.3.edge lengths a,b,c and angles (alpha,beta,&gamma)
- Q.4. What is the two dimensional coordination number of a molecule in square close packedstructure.
- A.4.4
- Q.5. Which of the following lattice has the highest packing efficiency ,
(I)simple cubic (II) BCC (III)HCP
- A.5.hcp
- Q.6. What type of stoichiometric defect is shown by (i) ZnS (ii) AgBr
- A.6.(i)frenkel (ii). Both schottky and frenkel
- Q.7. What type of substances makes better permanent magnets? Justify your answer.
- A.7.ferromagnetic, domains aligned in the same direction
- Q.8. Why glass is considered as super cooled liquid?
- A.8.pseudo solid or shows fluidity
- Q.9. Why KCl appears pink when heated in K vapors?
- A.9. F- centres
- Q.10. Give the relationship between density and edge length in an unit cell.
- A.10.density=Z .M/a³.NA

Solid State **1 Marks questions**

Very Short answer questions.

- Q.1:- Why Frenkel defect not found in alkali metal halides ?
- Q.2:- What is effect of presence of schottky defects on the density of solid.
- Q.3:- Fe_3O_4 is ferrimagnetic at room temperature and becomes paramagnetic at 850 K.
Explain.
- Q.4:- What is the effect of temperature on the conductivity of metals and semi metal ?
- Q.5:- Name any one solid in which both Frenkel and Schottky defects occurs.
- Q.6:- Why Frenkel defect found in AgCl ?
- Q.7:- Why does LiCl acquire pink colour when heated in Li vapours ?
- Q.8:- Why does zinc oxide exhibit enhanced electrical conductivity on heating ?
- Q.9:- Why a glass considered a super cooled liquid ?
- Q.10:-What type of substances would make better permanent magnets, ferromagnetic or ferrimagnetic. Justify your answer .

UNIT 1 THE SOLID STATE
VERY SHORT ANSWER TYPE QUESTIONS (1 MARKS)

Q-1. How many spheres are in contact with each other in a single plane of a close packed structure?

A-1. Six(6).

Q-2. Name the two closest packed arrangements of identical spheres.

- A-2.** a) Hexagonal close- packed arrangement
b) Cubic closest packed arrangement.

Q-3. What is the coordination number of a sphere in a

- a) Hexagonal close -packed structure
b) Cubic close packed structure
c) body -centered cubic close -packed structure
d) face – centered cubic close- packed structure.

A-3. a) 12 b) 12 c) 8 d) 12

Q-4. What is the non- stoichiometry defect in the crystals ?

A-4. These defects occur when the ratio of the cations and anions in the resulting compound is different from that as indicated by the laws of the chemical combinations.

Q-5. How many atoms are there in a

- a) simple or primitive unit cell
b) body centered cubic unit cell
c) face centered cubic unit cell

A-5. a) one b) two c) four

Q-6. What other elements may be added to silicon to make electrons available for the conduction of an electric current?

A-6. Phosphorous or Gallium.

Q-7. How many octahedral sites per sphere are there in a cubic closest – packed (face centered cubic) structure.?

A-7. One.

Q-8. How many Tetrahedral sites per sphere are there in a cubic closest – packed (face centered cubic) structure.?

A-8. Two.

Q-9. If the formula of an ionic compound is AB, can the cation A occupy all the

- a) tetrahedral voids b) octahedral voids

A-9. a) No, the cation A can occupy only $\frac{1}{2}$ of the tetrahedral voids.

b) Yes, the cation A can occupy all the octahedral voids.

Q-10. What is the coordination no. of an octahedral void?

A-10. Six(6).

Q-11. What is the coordination no. of a tetrahedral void?

A-11. Four (4).

Q-12. What is the maximum radius of a sphere that can be fitted in a tetrahedral void of cubic close packing of the spheres of radius R without disturbing the arrangement?

A-12. 0.414 R.

Q-13. What is the arrangement of the layers in a hexagonal close – packing of atoms?

A-13. ABABABAB.....

Q-14. What is the arrangement of the layers in a Cubic close – packing of the spheres?

A-14. ABCABCABCABC.....

Q-15. Why is Fe_3O_4 ferrimagnetic at room temperature but becomes paramagnetic at 850 K?

A-15. This is due to the randomization of the spins at 850 K.

Q-16 Which of the two will show the Schottky defect when added to the AgCl crystal

NaCl or CdCl_2 .

A-16. CdCl_2 . This is because divalent Cd^{2+} ions occupy the Ag^+ sites and thus produce cationic vacancies in the crystal.

Q-17 What type of compounds show the Schottky defect?

A-17. Ionic compounds which have cations and anions of nearly the same size.

Q-18. What is an intrinsic semi-conductor?

A-18. An insulator which conducts the electricity at high temperature or on irradiation by electromagnetic radiations.

Q-19. What are 12-16 and 13-15 compounds?

A-19. These are solid substances which are prepared by combining elements of groups 12 and 16 or 13 and 15 respectively.

Q-20. How do electrical resistivity of the following class of the materials vary with temperature : semiconductor, metallic conductor and insulators?

A-20. The electrical resistivity of a semi-conductor decreases with the rise in the temperature but increase in case of metallic conductors and superconductors.

Q-21. What are interstitials in the crystals?

A-21. The ions occupying the vacant sites are called as interstitials.

Q-22. Why is Frenkel defect not found in pure alkali metal halides?

A-22. Because of the small size of the anions.

Q-23. Which point defect lowers the density of the crystals?

A-23. Shottky defect.

Q-24. Why AgCl show the Frenkel defect?

A-24. Frenkel defect is found in the ionic compounds which have lower coordination no. and larger difference in the size of the cations and anions.

Q-25. How is ferromagnetism different from the paramagnetism?

A-25. The ferromagnetism arises due to the spontaneous alignment of the magnetic moment of ions or atoms in the same direction. Paramagnetism is due to the randomization of the spins.

Q-26. What is the difference between ferromagnetic and ferrimagnetic substances?

A-26. Ferromagnetic substances are strongly attracted by the magnetic field while ferrimagnetic substances are attracted weakly.

Q-27. Name the compound in which both Scottky and Frenkel defects are found together?

A-27. AgBr.

Q-28. Why does ZnO appears yellow on heating?

A-28 ZnO when heated, loses oxygen reversibly the excess metal is accommodated in interstitial sites, with electron trapped in the neighbourhood . the yellow colour and the electrical conductivity of non – stoichiometric ZnO is due to these trapped electrons.

Q-29. What is the difference between phosphorous doped and gallium doped semiconductors?

A-29 Doping with phosphorous gives rise to electronic conduction(n-type) whereas doping with gallium gives rise to positive holes conduction(p-type)

Q-30 Arrange simple cubic, body centered cubic , face centered cubic and hexagonal close packing in the increasing order of packing efficiency.

A-30 Simple cubic < body centered cubic <face centered cubic = hexagonal close packing.

Q-31 Name the i) most symmetrical and ii)most unsymmetrical crystal system.

A-31 i) cubic ii) triclinic

Q-32 How are unit cell and space lattice related?

A-32 Space lattice is obtained by repeating the unit cell in three dimensions.

Q-33. Although pure silicon is an insulator, then how does it behave as a semi-conductor on heating?

A-33. As the conductivity of semiconductors increases on heating.

Q-34. For tetrahedral co-ordination, what should be the range of radius ratio r^+/r^- value?

A-34. For a tetrahedral void $r^+/r^- = 0.225-0.414$.

Q-35. When atoms are placed at the corners of all 12 edges of a cube, how many atoms are present per unit cell ?

A-35. Atoms are present at corners . No of atoms = $8 \times \frac{1}{8} = 1$

Solutions

1 Mark questions

1. Why is osmotic pressure most suitable colligative property for determination of molar masses of macromolecules over other properties?

Ans: Because its value is higher in magnitude than others which can be measured easily.

Also it can be observed at room temperature.

2. How does temperature change when a solution shows-

- (a) Positive deviation (b) Negative deviation

Ans: (a) Decreases (b) Increases

3. When dried fruits and vegetables are kept in water, they come in their original shape. Why? Can this process be accelerated by increase in temperature?

Ans: Due to endosmosis. Yes because osmotic pressure is directly proportional to temperature.

4. Equimolar solutions of NaCl and glucose are not isotonic. Why?

Ans: because NaCl gets dissociated in two ions but glucose does not. Hence osmotic pressure of former is double.

5. Two liquids 'A' and 'B' boil at 145°C and 190°C respectively. Which of them will have higher vapour pressure at 80°C?

Ans: Liquid A, because it has lower boiling point hence high vapour pressure at same temperature.

6. Why is camphor preferred as a solvent for determination of depression in freezing point of a solution?

Ans: Because its molar mass ($C_{10}H_{16}O$ - 152) is very high which makes its K_f value higher. It helps making value of ΔT_f higher and easily measurable.

7. Addition of KI in aq. solution of HgI_2 , increases the vapour pressure of solution. Why?

Ans: Because number of particles of solute at surface decreases, as per the following equation- $2KI + HgI_2 \rightarrow K_2[HgI_4]$

8. Which is more concentrated 1M or 1m solution? Justify.

Ans: If density of solution is less than 1 g/mL then, 1m is more concentrated but if density of the same is greater than 1 g/mL then, 1M is more concentrated.

9. During making of ice-creams, mixture of ice and salt is kept aside the churner. Explain why?

Ans: It decreases the temperature than 0°C, which freezes the ice cream effectively.

10. Solution 'A' is obtained by dissolution of 1 g urea (NH_2CONH_2) in 100 g of water and 'B' is obtained by dissolution of 1 g glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) in 100 g of water. Which solution will boil at high temperature and why?

Ans: Boiling points of these solutions will depend on molar masses of solutes ($T_b \propto \Delta T_b \propto 1/M_2$) because all others (K_b , W_2 , W_1) are same. Molar mass of Urea (60) is lesser than that of glucose (180), hence, aq. Solution of urea will boil at high temperature.

SOLUTIONS

Question bank

VSA - 10 Questions

1. What do you mean by 1M HCl solution ?

Ans. 1M HCl means 1 mole of HCl dissolved in 1 litre of solution.

2. Define the term mole fraction?

Ans.Mole fraction is defined as the ratio of no. of moles of a component to the total no. of moles of all the components of the solution.

3. What is the effect of temperature on the solubility of solids in liquids ?

Ans.It increases with increase in temperature.

4. Two liquids A and B on mixing produce a warm solution. Which type of deviation from Raoult's law does it show ?

Ans.It shows negative deviation from Raoult's law.

- 5.Define molal depression constant or cryoscopy constant ?

Ans.It is defined as the depression in freezing point when 1 mole of a solute is dissolved in 1 kg of the solvent.

- 6.Why is freezing point depression of 0.1 M sodium chloride solution is nearly twice that of 0.1 M glucose solution ?

Ans.Freezing point depression is directly proportional to the no. of particles of solute.NaCl is an electrolyte which dissociates to produce 2 particles whereas glucose is a non electrolyte which do not dissociate or associate.Hence depression in freezing point is twice in NaCl as compared to glucose solution.

- 7.Why CaCl_2 is used to clear snow on roads ?

Ans. CaCl_2 clears snow by decreasing the freezing point of water.

- 8.Mention a large scale use of the phenomenon called 'reverse osmosis' .

Ans.Desalination of sea water.

- 9.After removing the outer shell of two eggs in dilute HCl one is placed in distilled water while the other is placed in a saturated solution of sodium chloride. What will you observe and why?

SOLUTIONS

Question bank

Ans.The egg placed in NaCl will shrink due to hypertonic solution outside while the one placed in distilled water will swell due to hypotonic solution outside.

10.Define van't Hoff factor.

Ans.It is defined as the ratio of normal molar mass to the observed molar mass.

CHAPTER 3. SOLUTION

Very short answer type questions (1 mark)

Q 1 .What temperature changes take place when solution shows negative deviation ?

Ans. There will be increase in temperature.

Q2. State the condition resulting in reverse osmosis ?

Ans. When pressure on solution side is increased, reverse osmosis will take place .

Q.3 What is the effect of temperature on solubility of solid solute in liquid ?

Ans. It increases with increase in temperature.

Q.4 How is that alcohol and water are miscible in all proportions ?

Ans. It is because in alcohol solution molecules can form H-bonds with water .

Q.5 Which will have higher boiling point, 0.1M NaCl or 0.1M BaCl₂ solution in water ?

Ans. 0.1M BaCl₂ will have higher boiling point. BaCl₂ → Ba²⁺ + 2Cl⁻ because number of ions are more.

Q.6 State Raoult's law for binary solution containing volatile components ?

Ans. The vapour pressure of each component is directly proportional to mole fraction of each component.

Q.7 Two liquids A&B boil at 145° C and 190°C which of them has higher vapour pressure at 80°C ?

Ans. A has higher vapour pressure at 80°C because it has lower boiling point.

Q.8 What would be the value of Van't Hoff factor for a dilute solution of K₂SO₄ in water ?

Ans. K₂SO₄ → 2K⁺ + SO₄²⁻

i = 3

Q.9 What is meant by boiling point elevation constant ?

Ans. It is equal to elevation in boiling point when molality of solution is equal to one

$$\Delta T_b = K_b \quad \text{when } m=1$$

Q.10 What happens when blood cells are placed in pure water ?

Ans. They will burst because water will enter the cell and cell will swell and ultimately burst.

ELECTROCHEMISTRY

1 Mark

(Q.1) Give the relationship between free energy change and EMF of a cell.

(Ans) $-\Delta rG = n F E_{\text{cell}} \Delta rG$ = Free energy changes

n = moles of electrons F = 96500 Coulomb

E_{cell} = EMF of a cell

(Q.2) How much amount of a substance is deposited by 1 coulomb?

(Ans) 1 Coulomb deposits Eq. Wt. / 96500 gram. This is known as electrochemical equivalent of the substance.

(Q.3) Write the relationship between molar conductivity & specific Conductivity.

(Ans)

$\Lambda_m = \kappa \times \frac{1000}{C}$ (κ = Specific conductivity & Λ_m is the molar conductivity

C = molar concentration

(Q.4) What is the reference electrode in determining the standard electrode potential?

(Ans) Normal hydrogen electrode (NHE)

(Q.5) Which electrolyte is used in a dry cell?

(Ans) A paste of NH_4Cl , MnO_2 and carbon.

(Q.6) Name the metal that can be used in cathodic protection of iron against rusting.

(Ans) A metal which is more electropositive than iron e.g Al, Zn, Mg etc.

(Q7) Why a dry cell becomes dead after some time even it has not been used?

(Ans) The acidic NH_4Cl corrodes the zinc container. So a dry cell becomes dead after a long time.

(Q.8) Which cells were used in the Apollo space program?

(Ans) $\text{H}_2 - \text{O}_2$ fuel cell

(Q.9) How can you increase the reduction potential of an electrode?

(Ans) By increasing the concentration of the ions.

(Q.10) Which electrolyte is used in mercury cell and fuel cell?

(Ans) In mercury cell, moist mercuric oxide mixed with KOH and in fuel cell concentrated aqueous KOH or NaOH solution are used.

TOPIC -ELECTROCHEMISTRY
ONE MARK QUESTION

Q.1. In electrolytic cell, electrical energy is

Sol. Consumed

Q.2. In electrochemical cell, electrical energy is for a cell.

Sol. Generated

Q.3. If for a cell ΔG is less than zero, the cell reaction is

Sol. Spontaneous

Q.4. With dilution, the conductance of strong electrolyte

Sol. Increases

Q.5. Conductance of a weak electrolyte is than the conductance of strong electrolyte of same concentration.

Sol. less

Q.6 What is cell constant? What are its units?

Ans: Cell constant = l/a , where l is the distance of separation of two electrodes (in cm) of the area of cross section ' a ' cm^2 . Its units are cm^{-1} or m^{-1} .

Q.7 Can we use direct current for experimental determination of resistance of a solution?

Sol. No, it will cause electrolysis of solution. The concentration and resistance of solution will change with time.

Q.8. Although aluminium is above hydrogen in the electrochemical series, it is stable in air and water. Explain.

Ans- This is because of the formation of a thin protective layer of aluminium oxide on the aluminium surface.

Q.9. What is the role of ZnCl_2 in a dry cell?

Sol. ZnCl_2 combines with NH_3 produced to form the complex salt $[\text{Zn}(\text{NH}_3)_2 \text{Cl}_2]$, otherwise the pressure developed due to NH_3 would crack the seal of the cell.

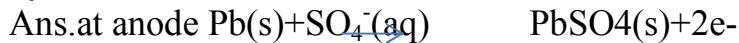
Q.10. Why do acetate ions have lower ionic conductance than Cl^- ions?

Ans- Acetate ions being larger in size are less mobile than chloride ions and because of this the ionic conductance of acetate ions have lesser value.

ELECTROCHEMISTRY

1 MARKS QUESTION

Q.1. Write anode and cathode reaction occur in lead storage battery?



Q.2. Why it is necessary to use a salt bridge in a galvanic cell?

(Ans) To complete the inner circuit and to maintain electrical neutrality of the electrolytic solutions of the half-cells.

Q.3. What is unit of molar conductivity?

Ans. $\text{ohm}^{-1}\text{cm}^{-1}\text{mol}^{-1}$

Q.4. What is meant by limiting molar conductivity?

Ans. The molar conductivity of a solution at infinity dilution is called limiting molar conductivity.

Q.5. Write the use of platinum foil in the hydrogen electrode.

(Ans) Platinum foil is used for the inflow and out flow of electrons.

Q.6. How can you increase the reduction potential of an electrode?

Ans. By 2 method

i) increase in concentration of Mn^+ ion in solution ii) by increasing the temperature

Q.7. Why does a dry cell becomes dead after a long time.

Ans. Because acidic NH_4Cl corrode the zinc container

Q.8.) What is the reference electrode in determining the standard electrode potential?

(Ans) Normal hydrogen electrode (NHE)

Q.9. Give the relationship between molar conductivity and specific conductivity?

Ans. $\lambda_m = k \times 1000/M$

Q.10. Write the name of chemical substance which is used to prevent corrosion.

Ans. Bisphenol

Chapter 4 chemical kinetics

1 marks questions

Q1:-For a reaction, $A + B \rightarrow \text{Product}$; the rate law is given by, $r = k[A]^{1/2}[B]^2$. What is the order of the reaction

Ans:- The order of the reaction is 5/2

Q2:- What will be the effect of temperature on rate constant?

Ans:- The rate constant of a reaction is nearly doubled with a 10° rise in temperature. However, the exact dependence of the rate of a chemical reaction on temperature is given by Arrhenius equation,

$k = Ae^{-E_a/RT}$ Where, A is the Arrhenius factor or the frequency factor, T is the temperature, R is the gas constant, E_a is the activation energy

Q3:- Mention the factors that affect the rate of a chemical reaction.

Ans:- The factors that affect the rate of a reaction are as follows.

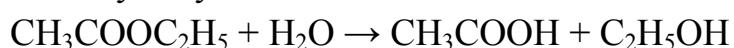
(i) Concentration of reactants (pressure in case of gases)

(ii) Temperature

(iii) Presence of a catalyst

Q4. Give one example of pseudo first order reaction.

Ans. Hydrolysis of an ester



4. The conversion of molecules X to Y follows the second order of kinetics. If concentration of X is increased 3 times, how will it affect the rate of formation of Y.

$$\text{Ans. Rate} = k [A]^2$$

$$= k [3A]^2$$

$$= k [9a]^2$$

The rate of formation will become nine times.

Q5. The rate law for a reaction is $\text{Rate} = K [A][B]^{3/2}$

Can the reaction be an elementary process? Explain.

Ans. No, an elementary process would have a rate law with orders equal to its molecularities and therefore must be in integral form.

Q6.What do you understand by ‘rate of reaction’?

Ans:- The change in concentration of any reactant or product per unit time is called rate of reaction

Q7. Why is a finely divided substance more efficient catalyst?

Ans:-Because of large surface area.

Q8.What are the units for rate constant for zero order reaction?

Ans:- $\text{mol L}^{-1}\text{s}^{-1}$

Q9.What are the units for rate constant for first order reaction?

Ans:- s^{-1}

Q10.What are the units for rate constant for second order reaction?

Ans:- $\text{mol}^{-1}\text{Ls}^{-1}$

Q11.Entropy of activation is usually negative. Why?

Ans:-with the formation of transition state there is loss in the randomness of the reacting molecule.

Q12.Write order of a reaction which proceeds at a uniform rate.

Ans:--Zero.

Q13.If half life period of a reaction is directly proportion to initial conc. Of the reactant, what is the order of the reaction?

Ans:- Zero order.

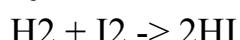
Q14.Liquid bromine react stowly as compared to bromine vapours. Why?

Ans:-Because of more surface area.

Q15.What is the unit of rate of the reaction.

Ans. Mol/lit

Q16.Write the differential rate equation for the following:



Ans. $-\frac{d}{dt}[\text{H}_2] = -\frac{d}{dt}[\text{I}_2] = \frac{d}{dt}[\text{HI}]$

Q17What are the factors on which rate of reaction depends.

Ans.1) Temperature 2) Concentration of reactant 3)Pressure 4) Surface area

Q18. Identify the order of the reaction

$$K = 1.6 \times 10^{-3} \text{ sec}^{-1}$$

Ans. Ist order

Chapter 4 chemical kinetics

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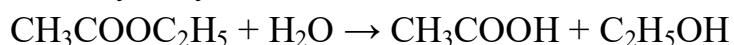
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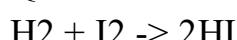
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Q18. Identify the order of the reaction

$$K = 1.6 \times 10^{-3} \text{ sec}^{-1}$$

Ans. Ist order

CHEMICAL KINETICS

(1 MARK QUESTIONS)

1. What do you understand by the rate determining step of a reaction?
2. Find the molecularity of following reaction. $\text{RCOOR}' + \text{H}_2\text{O} \xrightarrow{\text{H}^+} \text{RCOOH} + \text{R}'\text{OH}$
3. The rate constant of a reaction is $5.0 \times 10^{-5} \text{ L mol}^{-1} \text{ min}^{-1}$. What is the order of the reaction?
4. Why rate of the reaction does not remain constant throughout?
5. What is the order of reaction whose rate constant has the same units as the rate of reaction?
6. Write Arrhenius equation.
7. Define rate constant or specific reaction rate.
8. The reaction $\text{A} + 3\text{B} \rightarrow 2\text{C}$ obeys the rate equation. Rate = $k [\text{A}]^{1/2} [\text{B}]^{3/2}$. What is the order of this reaction?
9. What are the units of rate constant for a first order reaction?
10. Give one example of a reaction where order and molecularity are equal.

ANSWERS TO 1 MARK QUESTION

1. The slowest step in a reaction is known as rate determining step.
2. Molecularity of reaction = 2 (there are two reactant molecules in balanced equation)
3. The order of reaction is 2.
4. Rate of reaction depends upon concentration of reactants which keep on decreasing with time. Hence, rate of reaction does not remain constant throughout.
5. Zero order.
6. $Ae - Ea/RT$ Where, k = Rate constant Ea = Activation energy A = Arrhenius factor
7. When the molar concentration of each reactant is unity, the rate of reaction is called specific reaction rate.
8. Order $= (1/2) + (3/2) = 2$
9. s^{-1}
10. For elementary reaction, order and molecularity are same. These reactions are carried out only in one step.
 $2\text{HI} \rightarrow \text{H}_2 + \text{I}_2$

SURFAC CHEMISTRY		
1 MARK QUESTIONS		
1	What is a solid sol ?	1
AN S	Colloids which have both dispersed and dispersion medium in solid phase.	
2	Define adsorption?	1
AN S	The accumulation of molecules of a species at the surface rather in the bulk of a solid or liquid is termed adsorption.	
3	What is the sign of free energy change during heat of adsorption?	1
AN S	Negative	
4	What are dispersed phase and dispersion medium in cheese?	1
AN S	Dispersed phase- liquid ; Dispersion medium solid.	
5	What do you understand by reversible and irreversible colloids and why are these called so?	1
AN S	In reversible colloids constituents can be separated easily and colloid is formed on mixing again while it can not be done in irreversible colloids.	
6	A little quantity of egg albumin was shaken with water , Name the type of colloid formed .	1
AN S	Macromolecular lyophilic colloid there is attraction between disperse phase and dispersion medium.Egg albumin is protein polymer having size of colloidal dimension.	
7	What is a multimolecular colloid? Give two examples?	1
AN S	Colloidal particle are formed by aggregation of large number of atoms or molecules. Gold sol and Sulphur sol.	
8	What is hydrophilic colloid? How these colloids are prepared?	1
AN S	Colloids have dispersion medium is water and the particles of disperse phase have attraction towards water , These are prepared by mixing dispersed phase with water.	
9	Why Gold sol can not be prepared by shaking gold with water ?	1
AN S	Lyophobic colloid do not form colloid by mixing two phases.	
10	What is the role of enzyme?	1
AN S	These catalyse the biochemical reactions.	

SURFACE CHEMISTRY

1 MARK QUESTIONS

Q1. What type of forces are responsible for the occurrence of physisorption ?

Ans. Vander Waals forces.

Q2. What is the sign of free energy change during heat of adsorption?

Ans. Negative

Q3. What are dispersed phase and dispersion medium in cheese?

Ans. Dispersed phase- liquid; Dispersion medium solid.

Q4. Why does sky look blue?

Ans. Dust particles along with water particles scatter blue light maximum.

Q5. Give two examples of positively charged colloids

Ans. Haemoglobin (blood) (2) Fe(OH)_3 sol.

Q6. Why is FeCl_3 preferred over KCl in case of a cut leading to bleeding?

Ans. FeCl_3 helps in coagulation of blood more effectively than KCl . Greater the valency of coagulating ion, more will be coagulating power.

Q7. What is the role of enzyme?

Ans. These catalyse the biochemical reactions.

Q8. Name the catalyst in the manufacture of sulphuric acid and give its function?

Ans. V_2O_5 accelerates the rate of reaction by the formation of an activated complex with reactants

Q9. The enthalpy of adsorption of chemisorption is high. Why?

Ans. Chemisorption involves chemical bond formation.

Q10. Why is it necessary to remove CO when ammonia is obtained by Haber's process?

Ans. CO acts as poison catalyst for Haber's process and lowers the activity of solution therefore it is necessary to remove when NH_3 obtained by Haber's process.

SURFACE CHEMISTRY

1 marks:

1. What type of forces is responsible for the occurrence Physical adsorption?

Ans. Vander Waals forces

2. Which has a higher enthalpy of adsorption: physisorption or chemisorptions?

Ans. Chemisorptions

3. How is adsorption of gases related to its critical temperature?

Ans. Higher is the critical temperature of a gas, greater is the ease of liquefaction or greater are the Vanderwaal's forces of adsorption & hence greater is the adsorption.

4. Give an expression of Freundlich isotherms.

Ans. $x/m = kp^{1/n}$ or $\log x/m = \log k + 1/n \log p$

5. Write the dispersed phase & dispersion medium of butter.

Ans Dispersed phase: Liquid

Dispersion medium: Solid

6. Name the temperature above which the formation of micelles takes place.

Ans. Kraft temperature

7. Why is ferric chloride preferred over potassium chloride in case of a cut leading to bleeding?

Ans Fe^{3+} has a greater coagulating power than K^+ ion as ferric ion has higher charge. Higher the charge more is the coagulation power.

8. Why finely divided substances are more effective as an adsorbent?

Ans. Powdered substances have the greater surface area as compared to their crystalline forms. Greater the surface area greater is the adsorption.

9. What is Peptization?

Ans. The process of converting a precipitate into colloidal sol by shaking it with dispersion medium in the presence of small amount of electrolyte.

10. How can lyophilic sol be coagulated?

Ans. By adding an electrolyte & by adding a suitable solvent.

METALLURGY

VERY SHORT ANSWER TYPE QUESTION

(1 marks)

Q.1- What is slag?

A.1- It is easily fusible material, which is formed when gangue still present in roasted ore combines with the flux.

e.g. CaO (flux) + SiO_2 (gangue) $\rightarrow \text{CaSiO}_3$ (slag)

Q.2- Which is better reducing agent at 983K, carbon or CO?

A.2- CO, (above 983K CO being more stable & does not act as a good reducing agent but carbon does.)

Q.3- At which temperature carbon can be used as a reducing agent for FeO ?

A.3- Above 1123K, carbon can reduce FeO to Fe.

Q.4- What is the role of graphite rods in electrometallurgy of aluminium?

A.4- Graphite rods act as anode, are attacked by oxygen to form CO_2 and so to be replace time to time.

Q.5- What is the role of cryolite in electrometallurgy of aluminium?

A.5- alumina cannot be fused easily because of high melting point. Dissolving of alumina in cryolite furnishes Al^{3+} ions, which can be electrolyzed easily.

Q.6- What are depressants?

A.6- It is possible to separate two sulphide ore by adjusting proportion of oil to water in froth flotation process by using a substance known as depressant.

e.g. NaCN is used to separate ZnS and PbS .

Q.7- Copper can be extracted by hydrometallurgy but not Zn. Why?

A.7- The E° of Zn is lower than that of Cu thus Zn can displace Cu^{2+} ion from its solution. On other hand side to displace Zn from Zn^{2+} ion, we need a more reactive metal than it.

Q.8- Give name and formula of important ore of iron .

A.8- Haematite – Fe_2O_3 , Magnetite – Fe_3O_4 , Iron pyrites FeS_2 .

Q.9- Give name and formula of important ore of Copper .

A.9- Copper pyrites CuFeS_2 , Malachite $\text{CuCO}_3 \cdot \text{Cu(OH)}_2$, Cuprite Cu_2O .

Q.10- Give name and formula of important ore of Zinc .

A.10- Zinc blende - ZnS , Calamine- ZnCO_3 , Zincite – ZnO .

METALLURGY

1 Mark Questions

1. Name the chief ores of aluminium and zinc.
Ans. Aluminium – Bauxite, Zinc – Zinc blende.
2. Differentiate between a mineral and an ore.
Ans. Ore is a mineral from which a metal can be extracted profitably and comfortably.
3. Name the principle ore of Iron.
Ans. Haematite.
4. Name the depressant which is used to separate ZnS and PbS ores by froth floatation process.
Ans. NaCN.
5. What role is played by CO₂ in getting pure alumina (Al₂O₃)in the extraction of aluminium?
Ans. CO₂ helps to precipitate Al₂O₃ from Na[Al(OH)₄].
6. What are the collectors used in froth floatation process? Name a substance that can be used as such.
Ans. Collectors increases the non wettability of the mineral particles. Pine oils, fatty acids, xanthates etc.
7. Why does copper obtained in the extraction from copper pyrites have a blistered appearance?
Ans. Due to evolution of SO₂.
8. What is levigation?
Ans. It is the process of separation of impurities by washing with stream of water to separate higher impurities away where ores are left behind .
9. what is sintering?
Ans. The crushing ore of reasonable size and heating below melting point to change into single mass.
10. Which metal is most abundant in the earth crust?
Ans. Aluminum is the most abundant metal in the earth crust.

HALOGEN FAMILY

One Mark Questions

1. Why is ICl more reactive than I₂?

Ans. I-Cl bond is polar whereas I-I bond is non-polar. In general, interhalogen compounds are more reactive than halogens due to weaker X-X¹ bonding than X-X bond. Thus, ICl is more reactive than I₂.

2. Name two poisonous gases which can be prepared from chlorine gas?

Ans Phosgene (COCl₂) , tear gas (CCl₃NO₂)

3. Name the halogen which does not exhibit positive oxidation state .

Ans. Fluorine being the most electronegative element does not show positive oxidation state .

4. With what neutral molecule is ClO⁻ isoelectronic? Is that molecule a Lewis base?

Ans. ClF . Yes, it is Lewis base due to presence of lone pair .

5. HF is much less volatile than HCl.

Ans. HF is associated with intermolecular H- bonding.

6. Explain why fluorine always exhibit an oxidation state of - 1 only.

Ans. Because it is the most electronegative element in the periodic table.

7. Why are halogens strong oxidizing agents?

Ans: Since halogens are having high electron gain enthalpy they act as strong oxidizing agents.

Nitrogen Family

One Mark Questions

1. What is laughing gas ?

Ans. N₂O(nitrous oxide) is known as laughing gas .

2.What is the covalence of Nitrogen in N₂O₅ ?

Ans.4

3.What happen when sodium nitrate reacts with conc.HNO₃ ?

Ans. NaNO₃ + H₂SO₄ ----> NaH₂SO₄ + HNO₃

4.Why; metals such as Cr,Al do not dissolve in con. HNO₃?

Ans.-Due to the formation of a passive film of oxide on the surface.

5.What happens whenPCl₅ is heated ?



6. PH₃ has lower boiling point than NH₃;why?

Ans. There is Inter molecular hydrogen bonding in NH₃.

7.What happens when H₃PO₃ is heated?

Ans. 4H₃PO₃ → 3H₃PO₄ + PH₃ (disproportionation)

8.Why does R₃P = O exist but R₃N = O does not?

Ans. Nitrogen cannot form *dπ–pπ* bond.

9.Why Nitrogen as diatomic molecule and phosphorus as P₄?

Ans.Due to small size N form *pπ–pπ* bond resulting into N≡N.

10. Are all the five bonds in PCl₅ molecule equivalent?

Ans.Two axial bonds are longer than equatorial bonds due to repulsion

NOBLE GASES

One mark questions

Q1 Why group 18 elements are termed as noble gases?

Ans. Little reactivity

Q2 Write general electronic configuration of noble gas elements.

Ans $ns^2 np^6$ except He ns^2

Q3 Noble gases have very high ionization enthalpy. Why?

Ans Completely filled valence shell.

Q4 Noble gases have very large positive electron gain enthalpy. Why?

Ans. Completely filled valence shell.

Q5 Noble gases have very low boiling points. Why?

Ans. Weak dispersion forces.

Q6 All noble gases are

Ans. Mono-atomic.

Q7 has the lowest boiling point of any known substance.

Ans. He

Q8 Noble gases are reactive.

Ans Least

Q9 First noble gas compound is prepared by mixing And

.....

Ans. Xe , PtF_6

Q10 No true compounds of , And

.....Are yet known.

Ans.He,Ne,Ar

Oxygen family

1 MARKS QUESTIONS (OXYGEN FAMILY)

1) Why is sulphuric acid highly viscous?

Ans1) It is due to intermolecular hydrogen bonding.

2) What is the formula of marshall's acid.

Ans 2) $\text{H}_2\text{S}_2\text{O}_8$

3) Why 16 group elements are known as chalcogens?

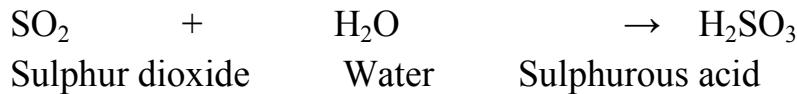
Ans 3) because many metals metal rods occurred as oxides and sulfides.

4) Name the radioactive element present in 16 group elements.

Ans 4) Polonium

5) What happens when SO_2 reacts with water?

Ans 5) It gives sulphurous acid



6) Which aerosols deplete ozone?

Ans 6) Aerosol such as chlorofluorocarbons CFCs i.e, freon CCl_2F_2 depletes the Ozone Layer by supplying chlorine free radical and convert Ozone to oxygen

7) Which allotrope of sulphur is thermally stable at room temperature?

Ans) Rhombic sulphur

8) The two O-O Bond length is in the Ozone molecule are equal. Give reason

Ans) it is due to resonance hybrid.

9) Sulphur has a greater tendency for catenation than oxygen. Give reason

Ans) Sulphur has a greater tendency for catenation than oxygen because S-S bond is stronger than oxygen oxygen Bond due to its less inter inter electronic repulsion.

10) Why H₂S is more acidic than H₂O.

Ans) This is because bond dissociation enthalpy of H-S bond is lower than that of a H-O bond.

INNER TRANSITION ELEMENTS

(ONE MARK QUESTIONS)

1.Name a member of lanthanoid series which is well known to exhibit +4 oxidation state ?

Ans :- cerium (z=58).

2.Actinoid contraction is greater from element to element than LanthanoidContraction. Why?

Ans.Due to poor shielding by 5f electrons in the Actinoids than that of the 4f electron in the Lanthanoids

3.La³⁺(Z =57) and Lu³⁺ (Z = 71) do not show any colouring solutions.

Ans.Since they do not have any unpaired electrons in their configuration.

4. What is lanthanide contraction?

Ans. Decrease in atomic / ionic radii across lanthanoid series with increase in atomic number.

5. . What are inner transition elements ?

Ans. lanthanoids and actinoids are called inner transition elements because inner f orbitals are progressively filled

Transition Element (d BLOCK Elements)

(One Marks Questions)

Q. 1 Out of Ag_2SO_4 , CuF_2 , MgF_2 , CuCl which compound will be coloured & why?

Ans- CuF_2 . In CuF_2 , Cu^{2+} ($3d^9$) has an unpaired electron and d-d transition.

Q. 2 Zr and Hf have identical size. Why?

Ans- due to lanthanoid contraction.

Q. 3 Mn (II) shows maximum paramagnetic character amongst the divalent ions of the first transition series. Why?

Ans- Mn(II) has maximum no of unpaired electrons i.e $3d^5$.

Q. 4 Among transition metals, the highest oxidation state is exhibited in oxoanions of a metal. Assign the reason.

Ans- multiple bonding nature of oxygen.

Q.5 Transition metal forms a numbers of interstitial compounds.

Ans- Due to presence of voids of appropriate size in their crystal lattice, the small size atoms like H,C,N,B etc. entrapped their interstices.

Q.6 Zn^{2+} salts are White while Cu^{2+} salts are blue?

Ans- Zn^{2+} ion has complete filled 3d orbitals ($3d^{10}$) and Cu^{2+} ion ($3d^9$) there is a one half filled 3d orbital which absorbed red colour from visible region and reflect blue colour(complementary to red)

Q.7 Why Zn, Cd, Hg do not regarded as Transition elements.

Ans- Because d-orbitals of Zn,Cd,Hg are completely filled.

Q. 8 Ti^{3+} salts are coloured whereas Ti^{4+} salts are colourless.

Ans- Ti^{3+} has one electron in 3d subshell whereas Ti^{4+} has no electron in 3d subshell. Therefore in Ti^{3+} -d-d transition are possible whereas Ti^{4+} ($3d^0$) d-d transition are not possible. Hence Ti^{3+} salts are coloured whereas Ti^{4+} salts are colourless.

Q. 9 Sc form no coloured compound. yet it is regarded as transition elements.

Ans- Sc has in completely filled d-orbitals($3d^14s^2$).It does not form any coloured ion due to absence of any unpaired electrons in Sc^{3+} .

Q.10 Cu^{+1} is unstable in aq. Solution. Give reason.

Ans- due to high hydration enthalpy.

Transition elements

1 mark questions

Q.1 On what ground can you say that scandium ($Z=21$) is a transition element but zinc ($Z=30$) is not?

A1.Sc has 1 unpaired electron in d orbital ,while Zn has all paired electrons.

Q.2 Why do the transition elements exhibit higher enthalpies of atomization?

A2. Due to strong bonding.

Q.3 Name a transition element which does not exhibit variable oxidation states.

A3. Sc

Q.4 Write down the electronic configuration of:

1) Cu^+ 2) Mn^{2+}

A 4. 1) Cu^+ ; [Ar]3d10 2) Mn^{2+} [Ar]3d5

Q.5 Why is the highest oxidation state of a metals exhibited in its oxide of fluoride only?

A5. Due to higher electronegativity.

Q.6 Which is stronger reducing agent Cr^{2+} or Fe^{2+}

A6. Cr^{2+}

Q.7 Which of the 3d series of the transition metals exhibits the largest number of oxidation state?

A8. Mn

Q.8 Which metal in the first series of transition metal exhibits +1 oxidation state most frequency?

A8.Cu

Q.9 Which elements are known as coinage metals?

A9. Cu, Ag ,Au.

Q.10 Which element has higher melting point:

Fe, Cu

A10. Fe

COORDINATION CHEMISTRY

1-mark questions

1-Write the formula of tetraaminediaquacobalt(III) chloride .

Ans-[Co(H₂O)₂(NH₃)₄]Cl₃

2-Write the IUPAC name of [PtCl₂(en)₂](NO₃)₂

Ans- dichloridobis(ethane-1,2-diamine)platinum(IV) nitrate

3-What is the oxidation state of mercury in Na[Hg(CN)₂] ?

Ans - +1

4-What is the denticity of edta ?

Ans- 6

5-Find out the number of geometrical isomers of [CoCl₂(en)₂]⁺ .

Ans-2

6-State the kind of isomerism possible for [Cr(en)₃]³⁺ .

Ans-Optical isomerism

7-Is [NiCl₄]²⁻ diamagnetic or paramagnetic ?

Ans-Paramagnetic

8-What is the hybridization of Zn in [Zn(NH₃)₄]²⁺ ?

Ans-sp³

9-What is the spin magnetic moment of [Fe(CN)₆]³⁻ ?

Ans-1.73 B.M

10-Is [Mn(CN)₆]³⁻ an inner orbital complex or outer orbital complex ?

Ans—outer orbital complex

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Ans-outer orbital complex

HALOALKANES AND HALOARENES

1 MARK QUESTION-

Q.1. How is Grignard reagent prepared? Write equation.

Ans. $\text{RX} + \text{Mg} \rightarrow \text{RMgX}$ in presence of dry ether

Q2. Write the IUPAC name of DDT ?

Ans. 2,2-Bis-(p-chlorophenyl)-1,1,1-trichloroethane

Q.3. Why p-dichlorobenzene has high melting point than o- and m- isomers ?

Ans. As it is symmetrical

Q.4. Why is ammonolysis of haloalkane not a good method to prepare pure amines

Ans. Because it produce mixture of primary, secondary and tertiary amines which are difficult to separate

Q.5. Arrange the compounds CH_3F , CH_3Cl , CH_3Br , CH_3I in increasing order of reactivity showing $\text{S}_{\text{N}}1$ reaction

Ans. $\text{CH}_3\text{F} < \text{CH}_3\text{Cl} < \text{CH}_3\text{Br} < \text{CH}_3\text{I}$

Q.6. Predict the product of the following reaction-

Na / ether



Ans. $(\text{CH}_3)_2\text{CHCH}(\text{CH}_3)_2 + 2\text{NaI}$

Q.7. Which of the following compound shows optical isomerism-

1-Bromobutane , 2-Bromobutane , 1-Bromo-2-methylpropane

Ans. 1-Bromo-2-methylpropane

Q.8. Draw the structure of 2-Chloro-3-methylpentane .

Ans. $\text{CH}_3\text{CH}(\text{Cl})\text{CH}(\text{CH}_3)\text{C}_2\text{H}_5$

Q.9. What is the use of Iodoform ?

Ans. As antiseptic

Q.10. Why haloalkane are insoluble in water ?

Ans. Cannot form H-bonds with water molecules & cannot break H-bonds between water molecules

ALKYL HALIDES AND HALOARENES

ONE MARK QUESTIONS

Q1. Why are halo alkanes more reactive than haloarenes?

Ans. In haloarenes, there is double bond character between carbon and halogen due to resonance effect which makes it less reactive.

(ii) In benzene, carbon atom is sp^2 hybridised which is more electronegative than sp^3 C present in halo alkanes. Hence C-Cl bond in aryl halides is shorter and stronger.

Q2. Why do halo alkanes undergo nucleophilic substitution where as haloarenes undergo electrophilic substitution?

Ans. Due to more electro negative nature of halogen atom in halo alkanes carbon atom becomes slightly positive and is easily attacked by nucleophilic reagents. While in halo arenes due to resonance, carbon atom becomes slightly negative and attacked by electrophilic reagents.

Q3. Aryl halides cannot be prepared by the action of sodium halide on phenol in the presence H_2SO_4 . Why?

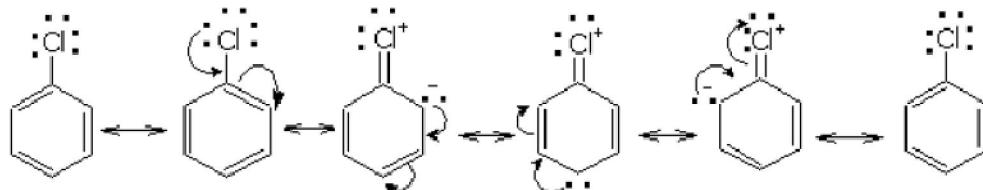
Ans. Due to resonance the carbon-oxygen bond in phenol has partial double bond character and it is stronger than carbon oxygen single bond.

Q4. p-dichloro benzene has higher m.p. than those of ortho and m-isomers.?

Ans. p-dichloro benzene is symmetrical, fits into crystal lattice more readily. So it has higher melting point.

Q5. Although chlorine is an electron-withdrawing group, it is ortho and para directing in electrophilic aromatic substitution reactions. Why?

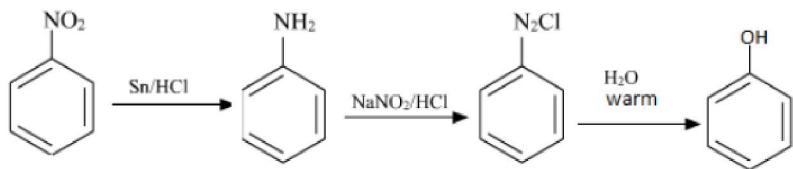
Ans. Chlorobenzene is resonance hybrid. There is -ve charge at ortho and para positions due to +R effect so electrophilic substitution reaction will take place at ortho and para positions. However ring is deactivated due to dominating -I effect.



Q6. How can we produce nitro benzene from phenol?

Ans. (i) First convert phenol to benzene by heating with Zn dust.

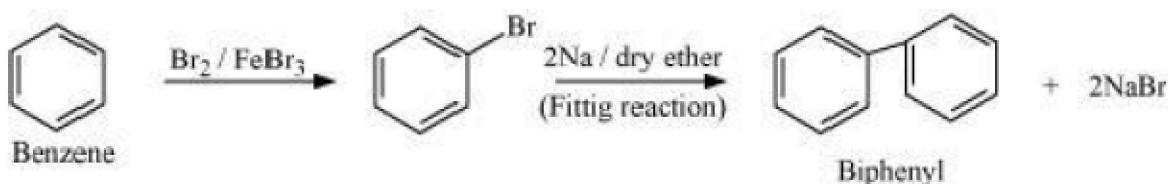
(ii) Nitration of benzene with conc. nitric acid in presence of conc. sulphuric acid.



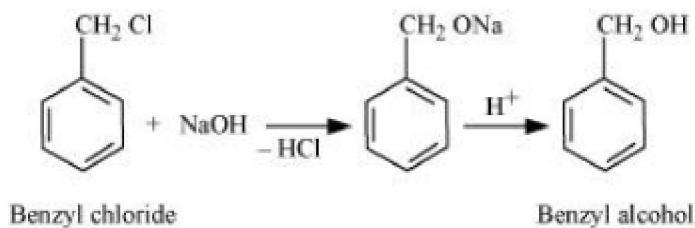
Q7. Alcohols react with halogen acids to form haloalkanes but phenol does not form halo benzene. Explain.

Ans. The C-O bond in phenol acquires partial double bond character due to resonance. Hence it is not cleaved by X^- ions to form halobenzenes. But in alcohols a pure single bond(C-O bond)is maintained and can be cleaved by X^- ions.

Q8.How will you convert Benzene to diphenyl?



Q 9.How will you convert Benzyl chloride to benzyl alcohol?



Q10Why does preparation of aryl iodides requires presence of an oxidising agent?

Sol. Iodination reaction is reversible in nature To carry out the reaction in the forward direction, HI formed during iodination is removed by oxidation. HIO_4 is used as an oxidising agent.

ALCOHOLS

1-Mark

Q.1- Name the primary alcohol which gives iodoform test.

Ans: Ethanol.

Q.2- Name one reagent which is used for the distinction between primary, secondary and tertiary alcohols.

Ans: Lucas reagent (anhyd. $ZnCl_2$ + Conc. HCl) or any other suitable test

Q.3- Arrange the following compounds in the decreasing order of acid strength.

Propan-1-ol, 2, 4, 6-trinitrophenol, 3-nitrophenol, 3,5-dinitrophenol

Ans. 2, 4, 6-trinitrophenol > 3,5-dinitrophenol > 3-nitrophenol > propan-1-ol

Q.4- How will you know whether a given -OH group is alcoholic or phenolic in nature?

Ans: Phenolic -OH group gives blue or violet colorations with neutral $FeCl_3$ while alcoholic -OH group does not.

Q.5- Write the structure of the molecule of a compound whose IUPAC name is 1-phenylpropan-2-ol.

Ans. $C_6H_5CH_2CH(OH)CH_3$

Q.6- Arrange the following in order of increasing boiling points.

(i) $CH_3CH_2CH_2CH_2OH$, (ii) $CH_3CH_2CH_2CH_3$, (iii) $CH_3CH_2OCH_2CH_3$, (iv) $CH_3CH_2CH_2CHO$

Ans. (ii) < (iii) < (iv) < (i)

Q.7- What is the IUPAC name of the alcohol: $HC \equiv C-CH_2OH$?

Ans : Prop-2-yn-1-ol

Q.8-Alcohols are highly soluble in water. Why?

Ans. Due to the formation of H-Bonding between alcohols and water.

Q.9- 1. What is the main product obtained when vapors of t-butyl alcohol are passed over Copper at 573 K ?

Ans. 2- Methylpropene.

Q.10- Arrange the following alcohols in the order of increasing reactivity towards Lucas reagent

2-butanol, 1-butanol, 2-methyl-2-propanol

Ans . 1-butanol < 2-butanol < 2-methyl-2-propanol.

ETHERS

1-Mark

1-Give examples of symmetrical and unsymmetrical ethers.

Ans. symmetrical –Dialkyl/Diaryl ether unsymmetrical-Arylalkyl ether or R-O-R'

2-Name an inorganic substance structurally similar to ether.

Ans-H₂O

3-How diethyl ether is obtained from ethanol?

Ans.Acid catalysed dehydration at 413 K with Conc.H₂SO₄

4- Name one reaction used to prepare ethers.

Ans.Williamson's Synthesis

5-Give the structure of anisole.

Ans.  OCH₃

6-What is the directive influence of ethereal group on benzene ring?

Ans.Ortho and Para

7-Ethers are highly volatile in nature.Why?

Ans.Due to the absence of H-Bonding.

8-Give one reaction in which dry ether is used.

Ans.Wurtz Reaction.

9-What is the bond angle in ethers?

Ans.Morethan normal tetrahedral angle.

10-What is the role of dry ether in the synthesis of Grignard Reagent?

Ans.As a solvent.

TOPIC: PHENOL

One Mark Ques:

1. Name the simplest hydroxyl derivative of benzene.

Ans: Phenol

2. Name the compound which is also known as carbolic acid.

Ans: Phenol

3.. Name the method by which O-nitrophenol and p-nitrophenol are separated.

Ans: By steam distillation the two isomers are separated.

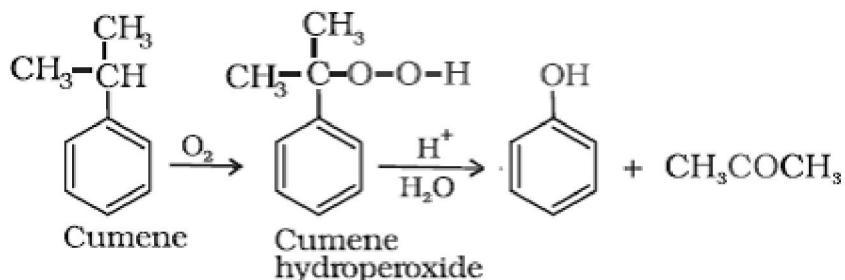
4. . Give reason: Lower alcohols are soluble in water.

Ans: Due to the formation of hydrogen bonds with water molecules.

5. While separating a mixture of ortho and para nitrophenols by steam distillation, name the isomer which will be steam volatile. Give reason

Ans: ortho – nitrophenols due to intra-hydrogen bonding.

6. Give the equations of reactions for the preparation of phenol from Cumene.



7. Why are reactions of alcohol/phenol and with acid chloride in the presence of pyridine?

Ans. Because esterification reaction is reversible and presence of base (pyridine) neutralizes HCl produced during reaction thus promoting forward reaction.

8. Explain why phenols do not undergo substitution of the $-\text{OH}$ group like alcohols?

Ans: C—O bond in phenols has partial double bond-character due to resonance and hence is difficult to break.

9. Name the reagents used in the following reaction:

Bromination of phenol to 2,4,6-tribromophenol.

Ans: Bromine-water.

10. Why alcohols and phenols are soluble in water?

Ans: Due to their ability to form hydrogen bonds with water molecules.

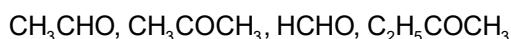
Aldehyde and Ketone

1 mark Questions :-

1. Suggest a reason for large difference in the boiling points of butanol and butanal, although they have same solubility in water.

Ans Butanol undergoes hydrogen bonding but butanal does not

2. Arrange the following in order of their increasing reactivity towards HCN?

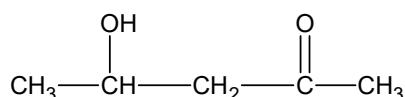


Ans $\text{C}_2\text{H}_5\text{COCH}_3 < \text{CH}_3\text{COCH}_3 < \text{CH}_3\text{CHO} < \text{HCHO}$

3. To what oxidation state does ethanal reduce Cu (II).

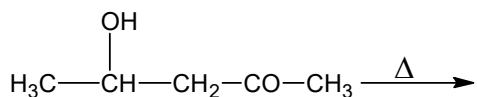
Ans +1 oxidation state.

4. Write the I.U.P.A.C. name of



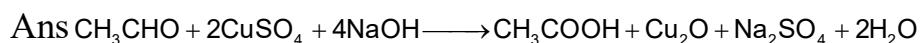
Ans 4 – Hydroxypentan – 2 – one

5. Find the product:



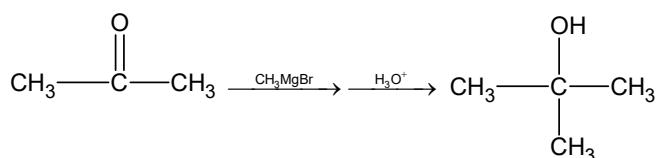
Ans $\text{H}_3\text{C} \text{---} \overset{\text{CH}=\text{CH}}{\underset{|}{\text{CH}}} \text{---} \text{CO} \text{---} \text{CH}_3$

6. Give the equation associated with Fehling's Test given by CH_3CHO .



7. How will you convert acetone into 2 – methyl – 2 – propanol?

Ans



8. Mention an industrial product manufactured from methanal.

Ans Bakelite.

9. Give one chemical test to distinguish :

Acetaldehyde and benzaldehyde

Ans These two compounds can be distinguished by Fehling's test. Acetaldehyde gives red

coloured ppt. with Fehling's solution but benzaldehyde does not

10. Which of the following compound gives a positive iodoform test?

2 pentanone & 3 – hexanol

Ans 2 – pentanone

AMINES- Question Bank Amines

1 Mark Questions

- 1) Write the structure of N-Methylethanamine.
- 2)
- 3) Write the structure of Prop-2-en-1-amine
- 4) Why do amines behave as nucleophiles?
- 5) Why is an alkylamine more basic than ammonia?
- 6) Arrange the following compounds in increasing order of basic strength in their aqueous solutions: NH_3 , CH_3NH_2 , $(\text{CH}_3)_3\text{NH}$, $(\text{CH}_3)_2\text{NH}$.
- 7) Why is aniline soluble in aqueous HCl?
- 8) What is the role of pyridine in the acylation reaction of amines?
- 9) Why is benzene diazoniumchloridenot stored and is used immediately after its preparation?
- 10) Arrange the following in the increasing order of their solubility in water:
 $\text{C}_6\text{H}_5\text{NH}_2$, $(\text{C}_2\text{H}_5)_2\text{NH}$, $\text{C}_2\text{H}_5\text{NH}_2$.
- 11) Arrange the following compounds in increasing order of basic strength:
 $\text{C}_6\text{H}_5\text{NH}_2$, $\text{C}_6\text{H}_5\text{N}(\text{CH}_3)_2$, $(\text{C}_6\text{H}_5)_2\text{NH}$, CH_3NH_2
- 12) Give the IUPAC name of $\text{H}_2\text{N}-\text{CH}_2-\text{CH}_2-\text{CH}=\text{CH}_2$
- 13) Name one reagent used for the separation of primary, secondary & tertiary amine .

Answers of 1 Mark Questions

- 1) $\text{CH}_3\text{NHCH}_2\text{CH}_3$
- 2) $\text{H}_2\text{NCH}_2\text{CH}=\text{CH}_2$
- 3) Due to the presence of lone pair of electrons on N atom
- 4) Due to +I effect of alkyl group which increases the electron density on N atom.
- 5) $\text{NH}_3 < (\text{CH}_3)_3\text{NH} < \text{CH}_3\text{NH}_2 < (\text{CH}_3)_2\text{NH}$
- 6) Because of the formation of anilinium ion which is soluble in water.
- 7) To remove the side product,i.e., HCl from the reaction mixture.
- 8) Because it is unstable in nature.
- 9) $\text{C}_6\text{H}_5\text{NH}_2 < (\text{C}_2\text{H}_5)_2\text{NH} < \text{C}_2\text{H}_5\text{NH}_2$ (Hydrogen bonding)
- 10) $(\text{C}_6\text{H}_5)_2\text{NH} < \text{C}_6\text{H}_5\text{NH}_2 < \text{C}_6\text{H}_5\text{N}(\text{CH}_3)_2 < \text{CH}_3\text{NH}_2$ (+I effect of alkyl group and -I effect of Phenyl)
- 11) But-3-en-1-amine
- 12) Hinsberg reagent (benzene sulphonylchloride)

ALDEHYDE

VERY SHORT ANSWER QUESTIONS

(1 marks)

1. Name an aldehyde having no alpha hydrogen .

Ans. Formaldehyde or benzaldehyde etc.

2. Give a chemical test to distinguish between acetaldehyde and Benzaldehyde.

Ans. Acetaldehyde gives Fehling's test and Iodoform test while Benzaldehyde doesn't.

3. $(CH_3)_3C-CHO$ does not undergo aldol condensation. Comment.

Ans. No α H is present.

4. Why do aldehydes behave like polar compounds?

Ans. Due to presence of C=O group, which is polar.

5.Why formaldehyde cannot be prepared by Rosenmund's reduction?

Ans. Because the formyl chloride thus formed is unstable at room temperature,cannot be prepared by Rosenmund reduction.

6.Cyclohexanone forms cyanohydrin in good yield but 2,2,6-trimethylcyclohexanone does not. Why?

Ans. In 2,2,6- trimethyl cyclohexanone there is steric hindrance of 3 –methyl groups so it does not form cyanohydrin in good yield.

7. What is Tollen's reagent?

Ans. Ammonical silver nitrate solution $[Ag(NH_3)_2]OH$.

8. Why PCC cannot oxidize methanol to methanoic acid while KMnO₄ can?

Ans. This is because PCC is a mild oxidizing agent and can oxidize methanol to methanal only.

While KMnO₄ is strong oxidizing agent which oxidizes it to methanoic acid.

9. Give IUPAC name of the following compound;

$C_6H_5-CH(OH)-CH=CH-CHO$

Ans. 4- Hydroxy-4-phenylbut-2-enal

10. Write the use of NaHSO₃ for the carbonyl compounds.

Ans. For the separation and purification of the carbonyl compounds.

AMINES(PREPARATION & PHYSICAL PROPERTIES)

1 MARK QUESTION (10)

1. Why aromatic amines are insoluble in water?

Ans: Due to lack of formation of H-bonding.

2. Why aliphatic amines partially soluble in water?

Ans: Due to formation of H-bonding.

3. Why aromatic amine have low boiling point than aliphatic amine?

Ans: Due to absence of H-bonding.

4. Why primary amines form stronger H-Bonding than secondary and tertiary amines?

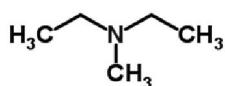
Ans: Due to availability of more hydrogen for H-Bonding.

5. Write the IUPAC name of the following compound: $\text{CH}_3\text{CH}_2\text{CH}_2\text{NHCH}_3$.

Ans: N-Methylpropan-1-amine

6. Draw the structure of N-Ethyl-N-Methylethanamine.

Ans:



7. Give the IUPAC name of secondary amine having lowest molecular mass.

Ans: N- Methylmethanamine.

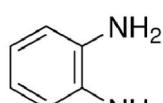
8. Why Amines have higher boiling points than hydrocarbons of similar molecular mass ?

Ans: Due to hydrogen bonding.

9. What is the hybridization of N atom in amines and shape of amino group?

Ans: It is sp^3 and shape is tetrahedral.

10. Write one amino compound which has intramolecular hydrogen bonding.



Ans: NH_2 NH_2 1,2-diaminobenzene

TOPIC CARBOHYDRATE QUESTION BANK

1 MARKS QUESTIONS AND THEIR ANSWERS

1. What is meant by reducing sugar ?

Answer- Carbohydrates which reduce Fehling solution to red precipitate of Cu₂O or Tollen's reagent to metallic Ag is called a reducing sugar.

2. What are the products of hydrolysis of lactose ?

Answer- The products of hydrolysis of lactose are glucose and galactose

3. What are the components of starch ?

Answer- The components of starch are – Amylose and amylopectin .

4. Why is cellulose not a source of nourishment to the human body ?

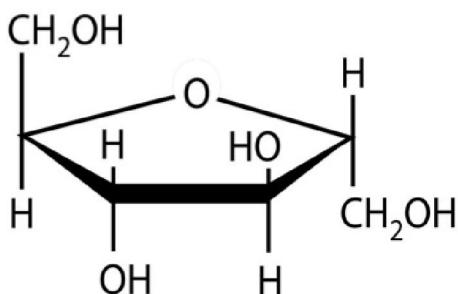
Answer- Cellulose is not digest in the body of human due to absence of cellulose digesting bacteria , thus is not be use as nutrients.

5. Write one structural difference between amylose and amylopactine ?

Answer- Amylose is a long unbranched chain polymer with 200-1000 glucose units while amylopactine is a branched chain polymer of D glucose.

6. Write pyranose structure of glucose .

Answer-



7. What are mono saccharides ?

Answer- A carbohydrate that can not be hydrolysed further to give simpler unit of polyhydroxy aldehydes or ketones is called a monosaccharide.

8. Write the constituents of sucrose .

Answer- The constituents of sucrose are glucose and fructose .

9. What do you understand by the glycosidic linkage ?

Answer- It is a linkage between two monosaccharide units through oxygen atom is called glycosidic linkage.

- 10.What is meant by inversion of sugar ?

Answer- Sucrose is dextrorotatory but after hydrolysis it gives levor and dextrorotatory monosaccharide in which levorotation is more than dextrorotatory thus it is known as inversion of sugar.

NUCLEIC ACIDS (1 Marks Questions)

1.Of RNA and DNA, Which has Replicating property?

Ans.DNA

2.Replication of D.N.A is semi-conservative

Ans: One strand is retained in daughter strand of DNA.

3.When RNA is hydrolysed ,there is no relationship among the quantities of different

bases obtained what does this fact suggest about the structure of RNA?

Ans:RNA is single stranded no complimentary base pairing ,has any ratio of purines to pyrimidines.

4.D.N.A is called master molecule.

Ans:It is responsible for transfer of hereditary information from one generation to other and controls all important functions of the cell.

5.Explain the term codon w.r.t. RNA

Ans : Sequence of triplets of nitrogen bases copied from DNA.

6.What product would be formed when a nucleotide from DNA containing thymine is hydrolysed ?

Ans: deoxy ribose sugar,thymine&phosphoric acid.

7 .write the full forms of RNA and DNA

Ans : DNA-Deoxyribose nucleic acid & RNA- Ribose nucleic acid

8. Name two classes of nitrogen containing bases found in nucleotides

Ans: Purines & Pyrimidines.

9. Define Mutation

Ans: Sudden transferable change in DNA

10.Name the linkage which joins two nucleotides?

Ans: Phosphodiesterlinkage

TOPIC- PROTEIN AND VITAMINS

ONE MARKS QUESTIONS

Q1 Why vitamin C cannot be stored in our body?

Ans-Vitamin C is a water soluble vitamin and it is excreted daily from our body and hence cannot be stored in our body.

Q2 Which diseases is caused by the deficiency of vitamin B₁ ?

Ans-Beri-beri is caused by the deficiency of vitamin B₁

Q3 Which vitamin is synthesised naturally in our body?

Ans-Vitamin-D is synthesised naturally in our body.

Q4 Why amino acids are soluble in water?

Ans-Amino acids are soluble in water because of formation of H-Bond with –COOH group, present in amino acid.

Q5 What is zwitter ion?

Ans-Amino acid –NH₂ group and –COOH group ,–NH₂ group take proton from –COOH group and form –NH₃⁺ and –COO⁻ and exist as dipolar ion called as zwitter ion.

Q6 Define dipeptide?

Ans-When two amino acid react together they form peptide linkage called as dipeptide.

Q7 Write the name of two amino acids?

Ans-Valine and Leucine.

Q8 What is Xerophthalima?

Ans-The hardening of the cornea of the eye due to the deficiency of vitamin –A is called Xerophthalima.

Q9 Which vitamin helps in the coagulation of the blood?

Ans-Vitamin K helps in the coagulation of Blood.

Q10 Write the configuration present in alpha-aminoacid?

Ans- Alpha amino acid have L-configuration.

POLYMER - QUESTION BANK ---(1 MK QUESTIONS)

Q.1.What is the primary structural feature necessary for a molecule to make it useful in a condensation polymerisation reaction?

Ans- Monomer unit(s) contain two or more functional group.

Q 2.Novolac and Bakelite on the basis of structure.

Ans: A linear product of *Phenol - formaldehyde polymer* whereas branched form is bakelite.

Q.3.Why should one always use purest monomer in free radical polymerisation?

Ans: Impurities of other substances if present, may inhibit or hinder the chain propagation.

Q.4.Describe the role of chain transfer agent in polymerisation?

Ans- It react with the growing chain in addition polymerization to interrupt the further growth of original chain and in which product of such a reaction will initiate its own chain growth to form a new polymer with lower molecular mass.

Q..Thermosetting polymers are infusible. Why?

Ans- Due to presence of intensive cross linking.

Q.6 Why is Bakelite a thermosetting polymer?

Ans: It is a cross-linked polymer. On heating it sets permanently into a solid. It can not be remoulded by heating again.

Q.7 (a) Identify the type of polymer. —A—A—A—A—A—A—

Ans- Homopolymer

Q .8.Identify the type of polymer. —A—B—B—A—A—A—
B—A—

Ans- Heteropolymer

Q.9.Can enzyme be called a polymer? Comment.

Ans. Enzymes are biocatalysts which are proteins and are thus polymers.

Q.10.Give the name of the polymer which is used for making non-stick utensils?

Ans. Teflon

Topic- Addition Polymers]

1 mark question-

Q1-Identify the polymer. -A-A-A-A-A-A-

Q2-Identify the type of polymer. -A-B-B-A-A-A-B-A-

Q3-Why are rubbers called elastomers?

Q4-Can enzyme be called a polymer?

Q5-What are copolymers?

Q6-Define addition polymers.

Q7-Give the name of the polymer which is used for making non stick utensils.

Q8-What is the name and structure of the monomer of natural rubber?

Q9-Name the polymer used for making contact lenses?

Q10-Write the name of the polymer which is also known as orlon?

CHAPTER 16 Chemistry in everyday life

1 MARK QUESTIONS

1. Name the medicine used for the treatment of the .

Ans- Morphine

2. Define Antipyretics.

Ans. The medicine which use to reduce the body temperature. Example – Aspirine

3. Name a food preservative which is most commonly used by food producer.

Ans. Sodium benzoate

4. What are the main constituents of Dettol?

Ans -Choloroxylenol& Terpineol

5. Why is the use of aspartame limited to cold food and drinks?

Ans It is unstable at cooking temperature and decomposes

6. What are the main constituents of Tincture of Iodine?

Ans Tincture iodine: 2-3% iodine solution in alcohol water mixture.

7. what are pathogens?

Ans- Any organism that causes disease. Ex. Bacteria, viruses

8. What do you know by allosteric site of an enzyme?

Ans : The site of an enzyme other than active site to which a drug binds.

- . 9. Define antagonists.

Ans Drugs that inhibit natural function of receptors by binding to their active sites.

10. What is a hypnotic? Give an example.

Ans Sleep producing chemical substances. Ex. Luminal