

HALF YEARLY EXAM 2018-19
ASSIGNMENT FOR CHEMISTRY
LEVEL-1

1. SOLID STATE

1. Write the definition of followings:-

- i. Crystalline Solid ii. Amorphous Solid
- iii. Unit Cell iv. Extrinsic & Intrinsic Semiconductor
- v. Ferromagnetic, Antiferromagnetic & Ferrimagnetic
- vi. 13-15 compounds & 12-16 compounds

2.i. Write difference between n-type & p-type semiconductor

ii. Write difference between Schottky & Frenkel defects

iii. Aluminium crystallises in C.C.P. Its metallic radius is 125 pm.

- a. What is the length of the side of unit cell.
- b. How many unit cells are there in 1 cm of Aluminium?

2. SOLUTION

1. Define the following :-

- i. Henry's law and its application
- ii. Raoult's law (All three laws)
- iii. Ideal & Non-ideal Solution.
- iv. Azeotropes
- v. Molar elevation & Molar depression constant.
- vi. Osmosis & Reverse osmosis.

2.i) Calculate a) Molality b. Molarity c. Mole Fraction of KI if the density of 20% (Mass by mass) aq. KI is 1.202 g ml⁻¹

ii. A solution containing 30 g of non-volatile solute exactly in 90 g of water has the vapour pressure of 2.8 kPa at 298 K. Further 18 g of water is added to the solution and the vapour pressure becomes 2.9 kPa. At 298 K. Calculate a) Molar mass of solute b) Vapour pressure of water at 298 K.

3. ELECTROCHEMISTRY

1. Define followings:-

i. Molar Conductivity ii. Kohlrausch's law

iii. Faraday's law of electrolysis

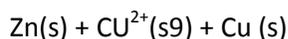
iv. Primary & Secondary battery

v. Fuel Cell with overall cell reaction.

2.i. Numerical based on Nernst equation (From NCERT)

ii. The conductivity of 0.2M. Solution of KCl at 298K is 0.248 Scm^{-1} . Calculate its Λ_m°

iii. The Standard electrode potential for Daniell cell is 1.1V. Calculate the standard Gibbs energy for the reaction.



iv. The molar conductivity of 0.025 mol⁻¹ methanoic acid is $46.1 \text{ Scm}^2 \text{ mol}^{-1}$. Methanoic acid is $46.1 \text{ Scm}^2 \text{ mol}^{-1}$. Calculate its degree of dissociation and dissociation constant. Given

$$\Lambda_m^\circ(\text{H}^+) = 3.19.6 \text{ Scm}^2 \text{ mol}^{-1} \text{ and } \Lambda_m^\circ(\text{HCO}_2^-) = 54.6 \text{ Scm}^2 \text{ mol}^{-1}$$

4. CHEMICAL KINETICS

1. Define followings.

i. Rate law expression. ii. Order & Molecularity of reaction.

iii. Pseudo first order reaction. iv. Activation energy.

v. Collision Frequency.

2.i. The initial concentration of $\text{N}_2\text{O}_5(\text{g}) \longrightarrow 2\text{NO}_2(\text{g}) + \frac{1}{2} \text{O}_2(\text{g})$ was $1.24 \times 10^{-2} \text{ mol L}^{-1}$ at 318K. The concentration of N_2O_5 after 60 Minut was $0.20 \times 10^{-2} \text{ mol L}^{-1}$ calculate the rate constant of reaction at 318K.

ii. For a First order reaction show that time required for the completion of 90% completion.

iii. The decomposition of A into product has value of K as 4.5×10^3 at 10°C and energy of activation 60 kJ mol^{-1} . At what temperature would K be $1.5 \times 10^4 \text{ s}^{-1}$.

5. SURFACE CHEMISTRY

1. Define followings:-

i. Absorption & Adsorption

- ii. Physisorption & Chemisorption
 - iii. Adsorption isotherm
 - iv. Activity & Selectivity of Catalyst.
 - v. Tyndall effect & Brownian Movement.
 - vi. Associated colloid. & Kraft temperature.
 - vii. Zeta potential & Electrophoresis.
- 2.i. Preparation and Properties of colloidal solution.
- ii. Explain Dialysis, Electrodialysis and Peptization.

6. GENERAL PRINCIPLES AND PROCESS OF ISOLATION OF ELEMENTS

1. Define followings:-
- i. Ore's & Minerals
 - ii. Froth floatation Process
 - iii. Leaching
 - iv. Zone refining basic principle
 - v. Various process of refining of ores.
- 2.i. Out of C & CO which is a better reducing agent at 673K
- ii. State the role of Silica in Metallurgy of copper.
- iii. What is the role of cryolite in Metallurgy of Aluminium.
- iv. Differentiate between cast Iron & Pig Iron.

7. P-BLOCK ELEMENTS

- 1.i. Nitrogen exists as diatomic molecules but phosphorus does not why?
- ii. Why are pentahalides more covalent than trihalides.
- iii. Why is BiH_3 the strongest reducing agent amongst all the hydrides of Group 15 elements?
- iv. Mention the conditions required to maximise the yield of ammonia.
- v. How does ammonia react with a solution of W_2O_2
- vi. What is the covalency of Nitrogen in N_2O_5 ?

vii. Bond angle in PH_4^+ is higher than that in PH_3 . Why?

viii. What happens when PCl_5 is heated?

ix. What happens when H_3PO_4 is heated?

x. Why is H_2O liquid and H_2S gas?

2.i. Order of stability of halogens and order of acidic strength of hydrogen halide and oxyacid of halogen

ii. Preparation of Cl_2 gas from Deacon's process.

iii. Interhalogen compounds are more reactive than halogens?

iv. Give reason for bleaching action of Cl_2 .

v. Name two poisonous gases which can be prepared by chlorine gas.

vi. Why do halogens act as strong oxidizing agents?

vii. Halogens are coloured. Why?

viii. Write the electron dot structure of

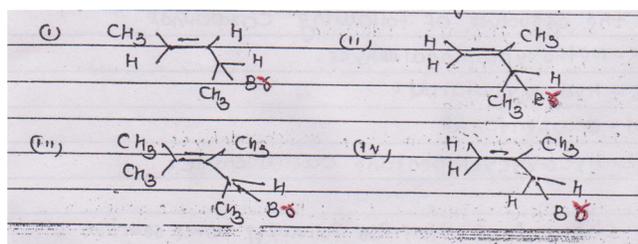
a. XeF_2 b. XeF_4 c. XeOF_4 d. ICl_4 e. H_2S f. H_2SO_5 g. H_3PO_3 h. H_3PO_2

ix. Atomic radii of group 18 elements are exceptionally large. Why?

x. Why is it difficult to study the chemistry of radon?

8. HALOALKANES & HALOARENES

1. Write IUPAC names of the following



2. i. Reasoning based question on physical properties of haloalkanes & haloarenes.

ii. Problem based on $\text{S}_\text{N}1$ & $\text{S}_\text{N}2$ reaction?

iii. Write equation for the following name reaction.

a. Groove's process b. Sandmeyer reaction.

c. Finkelstein reaction d. Sandmeyer reaction

- e. Boaroding Hunsdicker's process.
- f. Dow's Process
- g. Baiz schiemen reaction.
- h. Wurtz reaction, WURT2 Fitting reaction.
- i. Write the structure & IUPAC name of D.D.T.

9. ALCOHOL, PHENOLS & ETHER

1. Write the chemical equation for following name reaction.

- a. KOLBe's reaction
- b. Reimer Tienann reaction.
- c. Willianson Synthesis of ether

2. i. Reaction Mechanism of

- a. Acid catalyzed dehydration of alcohols
- b. Acid catalyzed hydration of Alkene
- c. Cleavage of ether using HI
- ii. Distinguish between alcohol & Phenols.

10. ALDEHYDE'S KETONE'S & CARBOXYWC ACID

1. Write the structure of following compounds

- i. α -Methoxy propional dehyde.
- ii. 3- Hydroxy butanal.
- iii. 4-Oxopentanal
- iv. 2-Hydroxycyclopentance carbaldehde.

2. Write chemical equation for following name reaction.

- i. Stephen reaction
- ii. Etard reaction
- iii. aattermann Koch reaction.
- iv. WOLFF – KI5hner reaction.
- v. Clemnensen reduction.

vi. Aldol & cross aldol condensation reaction.

vii. Cannizzaro reaction

3. Distinguish between followings.

i. Propanal & Propanone

ii. Phenol & Benzoic Acid

iii. Ethanal & Propanal.

4. i. Aldehydes are more reactive towards nucleophilic addition reaction than ketone why?

ii. Although phenoxide ion has more number of resonance structures than carboxylate ion, carboxylic acid is stronger acid than phenol why?

11. POLYMER

1. Distinguish between

i. Thermoplastic & Thermosetting Polymer

ii. H.D.P. & L.D.P

iii. Addition & Condensation Polymerisation.

2. i. What is vulcanization of rubber.

ii. Write the structural formula of monomers of following Polymers – Teflon, PAN, Nylon 6.6 Nylon-6, Melamine, Neoprene, PHBV, Nylon-2-Nylon-6.