

2016 IMPORTANT QUESTIONS OF CHEMISTRY XI YEAR

CHAPTER#1:

1) Differentiate between:

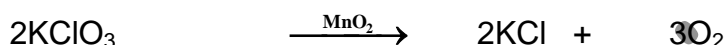
- i. Atom and Gram atom
- ii. Mole and molecule
- iii. Formula weight and molecular weight
- iv. Empirical formula and molecular formula

2) The empirical formula of a compound is CH_2O . If the molecular weight of the compound is 180, calculate the molecular formula.

3) How many molecules of water are present in 5.4 grams of H_2O ?

4) A given compound contains C = 60%, H = 13.0% and O = 27%. Calculate its empirical formula.

5) Calculate the volume of oxygen at S.T.P. that may be obtained by complete decomposition of 51.3 gm of KClO_3 on heating in presence of MnO_2 as a catalyst (At. Mass of K = 39; Cl = 35.5; O = 16; Mn = 55)



6) Define the following:

- i. Limiting Reactants
- ii. Significant Figure
- iii. Bond Energy

7) Compare the rates of diffusion of the following pairs of gases:

- i. H_2 and D_2
- ii. CH_4 and He
- iii. SF_6 and SO_2

8) 54 gm of dinitrogen pent oxide (N_2O_5) is decomposed on heating as under:



9)) simplify the following by using exponential notation

$$34100+3900+2100$$

10. In a collection of 24×10^{25} molecules of $\text{C}_2\text{H}_5\text{OH}$ what is the number of moles?

Chapter#2

1) Derive General Gas Equation.

2) What is Viscosity? Give two factors which affect viscosity?

3) Define and explain Boyle's Law and Charles' Law

4) What are the basic postulates of the Kinetic Molecular Theory? Why do gases deviate from the Ideal Behavior?

5) Calculate the value of R (gas constant) in two different units.

6) State and explain Dalton's Law of Partial Pressures.

7) What are the main postulates of the Kinetic Molecular Theory? How does it explain the following properties of gases?

- i. Diffusibility
- ii. Compressibility
- iii. Expansion

8) What is surface tension? Discuss any two factors which affect surface tension.

9) 400 cm^3 of helium gas effuses from a porous container in 20 seconds. How long will SO_2 gas take to effuse from the same container? (At Wt : S = 32, He =4)

10) Give reasons for the following:

- i. Evaporation is a cooling process.
- ii. A falling drop of a liquid is always spherical.
- iii. Pressure cooker is used for rapid cooking.

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- iv. The reactions with powdered marble are more vigorous than those with the pieces of marble.
- v. Milk sours more rapidly in summer than in winter.
- 11) Explain why the process of diffusion occurs most rapidly in gases slow in liquids and very slow in solids
- 12) A 500 cm³ vessel contains 2gm of He and 8gm of CH₄. What is the total pressure of the mixture of these gases at -3°C? (Atomic masses H3 = 4, C = 12, H = 1)
- 13) A 100 cm³ gas cylinder filled with chlorine under 160 torr pressure is connected by stop-cock with another cylinder of 400 cm³ filled with nitrogen under pressure of 200 torr. What will be the total pressure when stop cock is opened?
- 14) at 30C 500cm³ of H₂ at 400 torr pressure and one dm³ of N₂ at 600 torr pressure are transferred into a 1500 cm³ flask. Calculate the total pressure of mixture of gases
- 15) 380.0 cm³ of hydrogen gas was collected over water at 23°C and 613 torr; find the volume of dry hydrogen at S.T.P (vapour pressure of water at 23°C = 21 torr)

CHAPTER #3

2) Explain the terms:

- (i) Ionization Potential (ii) Electron Affinity (iii) Electro negativity

3) What are the weaknesses of Rutherford's Atomic Theory?

(b) How have these defects been removed by Bohr in his Atomic Theory?

4) Write short notes on any TWO of the following:

- i. Electro negativity ii. Ionic Radius iii. Pauli's Exclusion Principle
iv. Common-ion Effect v. Activation Energy

5) Define Radioactivity. Describe the characteristics of Alpha OR Gamma Rays.

6) Write down the postulates of Bohr's Atomic Theory and derive the expression of the radius of hydrogen atom.

7) What rules and principles are violated in the following electronic configurations:

- (i) 1s² 2s³ (ii) 1s² 2p² (iii) 1s² 2s² 2p⁶ 3s² 3p⁶ 3d⁴ 4s
(iv) 1s² 2s² sp⁶ 3s² 3px 3py⁰ 3pz⁰

7) Write a short note on Radioactivity OR Spectroscopy.

8) Starting from K.E. = $\frac{1}{2} mv^2$ and P.E = $\frac{-Ze^2}{r}$ derive an expression for energy of an electron in nth orbit.

9)) what are cathode rays? Describe the experiment for their discovery write their properties what conclusion are drawn from these properties

10) How were positive rays generated from cathode experiment

CHAPTER#4

1) Explain the geometry of BeCl₂ and H₂O molecules on the basis of hybridization and electron Pair Repulsion Theory.

2) Differentiate between:

- i. Orbit and Orbital ii. Covalent & Coordinate Covalent Bond

3)) What is an Ionic Bond? Explain the formation of NaCl.

(b) Distinguish between Sigma and Pi bonds.

(c) Predict the shape of the following molecules on the basis of electron pair repulsion theory:

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4) Define Orbital Hybridization. Describe sp^3 Hybridization.

5) (a) explain the shape of ethene (C_2H_4) on the basis of hybridization

Or

Explain the structure of NH_3 on the basis of electron pair repulsion theory

6) what do you mean by term of dative bond explain with example

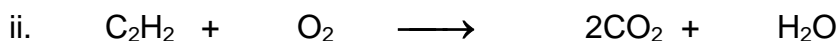
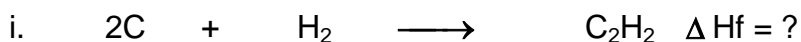
differentiate b/w sigma and pi bonds

CHAPTER # 5

1) a) State and explain the First Law of Thermodynamics and prove that work is equal to $p \Delta V$.

(b) Define the heat of formation.

Calculate the heat of formation of C_2H_2 from carbon and hydrogen with the help of the following data.



2) (a) State and explain Hess's Law of Constant heat summation and give its application.

(b) Define the following terms:

i. Macroscopic properties

ii. Extensive properties

iii. Energy of Activation

3) Define the following terms:

i. System

ii. State

iii. Surrounding

4) When 54000 Joule of heat is added to a system of a gas at a constant pressure $2 \times 10^5/\text{m}^2$, its internal energy increases by 1000 joule. Calculate change in volume of system.

5) 3600 KJ heat is entered in a gas cylinder, calculate the value of ΔE :

i. If the volume is kept constant.

ii. If the volume is not constant, work of -800 KJ was performed by gas.

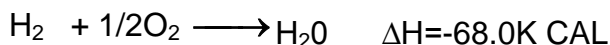
iii. If the gas is allowed to expand, the value of work is +5200 KJ.

6) differentiate:

Exothermic and endothermic reaction

7)) a system absorbs 200J of heat from the surroundings and does 120J of work on the surroundings by expansion find the internal energy change of the system

8) Calculate the heat of formation from the following data



CHAPTER#6

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V. N in NCl_3 vi. O in OF_2

7) Define Electrode Potential. How is the electrode potential Zn determined?

8) Find the molarity of 0.5 gm of NaOH in 250 cm^3 of aqueous solution.

9)) how is buffer solution is prepared

Find the oxidation number of:

Cr in K_2CrO_7 *S in $\text{Na}_2\text{S}_2\text{O}_3$ *P in H_3PO_4

10) Ph of a solution is 8.4 calculate the H^+ Ion and OH^- Ion concentration

) 3.86g of NaOH is dissolved in 2.5 dm^3 of solution find its molarity

CHAPTER# 8

1) Determine the initial rate of the following reaction at 303°C in which is Rate constant is $8.5 \times 10^{-5} \text{ lit mol}^{-1} \text{ sec}^{-1}$ Initial concentration of the reactions is $9.8 \times 10^{-2} \text{ mole/lit}$.

2) Discuss the effects of change in (i) concentration and (ii) surface area, and (iii) the catalyst on the rate of a chemical reaction.

3) What is the Rate of chemical reaction?

(b) Derive an expression for the determination of the rate constant of reaction.

(c) What is Energy of Activation?

4) The rate constant for the decomposition of nitrogen dioxide.



What is the initial rate when the initial concentration of NO_2 is 0.50 M ?

5) Define the following terms:

i. Rate of reaction ii. Order of reaction iii. Catalyst iv. Activation energy v. Specific rate constant

6)) Distinguish between the following:

i. Rate and velocity of a reaction ii. Rate constant and rate expression
iii. Positive catalyst and Inhibitor

7) For a chemical reaction $\text{A} \longrightarrow \text{B}$ the threshold energy of reaction is 31 KJ/mol . The average internal energy of A is 12 KJ/mol ; calculate the activation energy of A.

8) Write the rate expression. Find the value of rate constant and determine the order of reaction using the following data.

	[NO]	[O ₂]	Rate
i.	0.1M	0.1M	$2 \times 10^{-3} \text{ M sec}^{-1}$
ii.	0.2M	0.1M	$8 \times 10^{-3} \text{ M sec}^{-1}$
iii.	0.1M	0.2M	$2 \times 10^{-3} \text{ M sec}^{-1}$

9) write notes on any two of the following:

Fast reactions

Slow reactions

Moderate reactions

Positive catalyst

a) define and explain activation ENERGY

10)) find order of reaction

Sr. No.	[A]	[B]	Rate
1.	0.1	0.1	8×10^{-4}

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2.	0.2	0.1	16×10^{-4}
3.	0.1	0.2	16×10^{-4}

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