

SREE SARAVANA NIKETAN MATRIC HIGHER SECONDARY SCHOOL.**NERINJIPETTAI, ERODE.****11TH CHEMISTRY VOL -1 (5 MARKS)****Random important Questions****UNIT – 1 Basic Concepts of Chemistry and Chemical Calculations**

- How much volume of chlorine is required to form 11.2L of HCl at 273K and 1 atm pressure?
- Any two types of redox reactions i) Decomposition reactions (2m) ii) Displacement reactions (3m)
- Calculate the empirical and molecular formula of a compound containing 76.6% carbon, 6.38 % hydrogen and rest oxygen its vapour density is 47.
- Balance the following equations by ion electron method.
 $\text{C}_2\text{O}_4^{2-} + \text{Cr}_2\text{O}_7^{2-} \rightarrow \text{Cr}^{3+} + \text{CO}_2$ (in acid medium)
- A Compound on analysis gave Na = 14.31% S = 9.97% H= 6.22% and O= 69.5% calculate the molecular formula of the compound if all the hydrogen in the compound is present in combination with oxygen as water of crystallization. (molecular mass of the compound is 322).
- Balance the following equations by oxidation number method
 $\text{KMnO}_4 + \text{H}_2\text{C}_2\text{O}_4 + \text{H}_2\text{SO}_4 \rightarrow \text{K}_2\text{SO}_4 + \text{MnSO}_4 + \text{CO}_2 + \text{H}_2\text{O}$
- How many moles of ethane is required to produce 44 g of CO_2 (g) after combustion.
- The density of carbon dioxide is equal to 1.965 kgm^{-3} at 273 K and 1 atm pressure. Calculate the molar mass of CO_2 .
- Calculate the empirical and molecular formula of a compound containing 76.6% carbon, 6.38 % hydrogen and rest oxygen its vapour density is 47.

UNIT – 2 Quantum Mechanical Model of Atom

- Describe Bohr's atom model.
- Explain angular momentum and de Broglie concept.
- Derive Shortly about Schrodinger wave equation.
- Give the main features of the quantum mechanical model of atom.
- Short notes on four quantum numbers.
- Sketch the orbital for s,p,d.
- Describe the Aufbau principle.
- In a reaction $x + y + z_2 \rightarrow xyz_2$ identify the Limiting reagent if any, in the following reaction mixtures.
 - 200 atoms of x + 200 atoms of y + 50 molecules of z_2
 - 1mol of x + 1 mol of y + 3 mol of z_2
 - 50 atoms of x + 25 atoms of y + 50 molecules of z_2
 - 2.5 mol of x + 5 mol of y + 5 mol of z_2
- State and explain Pauli's exclusion principle.
- Calculate the energy required for the process.
 $\text{He}^+ (\text{g}) \rightarrow \text{He}^{2+} (\text{g}) + \text{e}^-$
 The ionisation energy for the H atom in its ground state is - 13.6 eV atom^{-1} .
- What is the de Broglie wavelength (in cm) of a 160g cricket ball travelling at 140 Km hr^{-1} .

UNIT – 3 Periodic Classification Of Elements

- What is the basic difference in approach between Mendeleev's periodic table and modern periodic table?
- Explain the Pauling method for the determination of ionic radius.

3. Explain the periodic trend of ionisation potential.
4. What is screening effect? Briefly give the basis for Pauling's scale of electronegativity.
5. State the trends in the variation of electronegativity in group and periods.
6. i.) Why halogens act as oxidizing agent? (3M)
ii) What is screening effect? (2M)
7. Briefly outline the characteristics of modern periodic table.
8. i.) write the general electronic configuration of s, p, d and f block elements (2m)
ii) name the first and the last elements in the following periods (n)
[i) n=4 ii) n= 5 iii) n=6 iv) n=7] (3m)
9. Bring out the difference between electron gain enthalpy and electronegativity.

UNIT – 4**Hydrogen**

1. Write about Hydrogen in the position of periodic table
2. Give detailed account of ortho and para hydrogen.
3. Give the uses of hydrogen
4. Note on Temporary hardness and Permanent hardness. Give reaction in each?
5. i.) uses of heavy water (2m)
ii) How H_2O_2 prepared by industrial method. (3m)
6. i) Explain exchange reactions of deuterium (3m)
ii) compare the structure of H_2O and H_2O_2 . (2m)
7. Explain preparation of hydrogen using electrolysis.
8. How do you expect the metallic hydrides to be useful for hydrogen storage ?
9. Give detailed account for the Temporary hardness and Permanent hardness.

UNIT – 5**Alkali and Alkaline Earth Metals**

1. i.) How is plaster of paris prepared? (3m)
ii) uses of plaster of paris. (2m)
2. Describe briefly the biological importance of Calcium and magnesium.
3. i.) Which would you expect to have a higher melting point, magnesium oxide or magnesium fluoride? Explain your reasoning.
ii) Give any two uses of baking soda.
4. i.) Discuss the similarities between beryllium and aluminium. (3m) \
ii) give any two uses of alkaline earth metals. (2m)
5. i.) Substantiate Lithium fluoride has the lowest solubility among group one metal fluorides. (3m)
ii) Short note on Quick lime (2m)
6. Explain Why? i.) the stability of hydrides decreases down the group.
ii) lithium iodide is covalent.
7. i.) Explain why lithium carbonate is the least stable among alkali metal carbonates. (3m)
ii) Mention the uses of sodium carbonate (2m)

UNIT – 6**Gaseous State**

1. Derive the critical constants from van der Waals constant.
2. i.) What is liquefaction of gases (2m)
ii) Write about different methods used for liquefaction of gases?
3. Give detailed account of Andrews isotherm of CO_2 .
4. i.) What are the gas laws studied? (2m)

- ii) calculate the pressure exerted by 2 moles of sulphur hexafluoride in a steel vessel of volume 6 dm³ at 70 °C assuming it is an ideal gas. (3m)
5. i.) A small bubble rises from the bottom of a lake where the temperature and pressure are 6°C and 4 atm. to the water surface, where the temperature is 25°C and pressure is 1 atm. Calculate the final volume in (mL) of the bubble, if its initial volume is 1.5 mL. (3m)
- ii) Give the mathematical expression that relates gas volume and moles. Describe in words what the mathematical expression means. (2m)
6. Write the Van der Waals equation for a real gas. Explain the correction term for pressure and volume
7. i.) Sulphur hexafluoride is a colourless, odourless gas; calculate the pressure exerted by 1.82 moles of the gas in a steel vessel of volume 5.43 dm³ at 69.5 °C, assuming ideal gas behavior. (3m)
- ii) What is the compressibility factor?
8. Describe an experiment to verify Boyle's law.
9. i.) What is inversion temperature? How it is related to vander waals constants? (3m)
- ii) define the standard atmospheric pressure. (2m)

UNIT- 7**Thermodynamics**

1. Explain how heat absorbed at constant volume is measured using bomb calorimeter with a neat diagram.
2. List the characteristics of Gibbs free energy.
3. Write down the Born-Haber cycle for the formation of CaCl₂
4. Derive the relation between ΔH and ΔU for an ideal gas. Explain each term involved in the equation.
5. i.) Calculate the enthalpy of hydrogenation of ethylene from the following data. Bond energies of C – H, C – C, C = C and H – H are 414, 347, 618 and 435 kJ mol⁻¹. (3m)
- ii) short notes on gibbs free energy. (2m)
6. state IInd law of thermodynamics.
7. Derive the relation between ΔH and ΔU for an ideal gas. Explain each term involved in the equation.
8. Suggest and explain an indirect method to calculate lattice enthalpy of sodium chloride crystal.
9. Explain how heat absorbed at constant volume is measured using bomb calorimeter with a neat diagram.
10. i.) Calculate the work done when 2 moles of an ideal gas expands reversibly and isothermally from a volume of 500 ml to a volume of 2 L at 25°C and normal pressure. (3m)
- ii) Define Entropy and its unit. (2m)

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