

<p>XI- CHEMISTRY MINIMUM MATERIAL (Based on Public key answer) UNIT-1</p> <p>Define atomic mass unit(amu) 1/ 12th mass of Carbon-12- Atom in Ground state 1.6605x10⁻²⁷kg</p> <p>Relative atomic mass <u>Average mass of atom</u> Unified atomic mass</p> <p>Define mole 6.023 X 10²³ Elementary particle as-C-12 (proton,Neutron,Electron)</p> <p>Gram equivalent mass Mass of element Combine or displace 1 g H or 8 g O, 35.5 g Cl</p> <p>Define Oxidation number Imaginary charge O.number of oxygen is -2</p> <table><tr><th>Oxidation</th><th>Reduction</th></tr><tr><td>1.add oxygen</td><td>add Hydrogen</td></tr><tr><td>2.Remove the Hydrogen</td><td>2.Remove the oxygen</td></tr><tr><td>3.loss of e⁻</td><td>3.Gain of e⁻</td></tr><tr><td>4.O.number increases</td><td>4.O.number Decreases</td></tr><tr><td>-----</td><td>-----</td></tr><tr><th>Molecular mass</th><th>Molar mass</th></tr><tr><td>Mass of the molecule</td><td>Mass of One mole of substance</td></tr><tr><td><u>Unified atomic mass</u></td><td>Sum of the relative atomic mass</td></tr><tr><td>CO₂=44 u</td><td>mass CO₂ =44 g</td></tr></table>	Oxidation	Reduction	1.add oxygen	add Hydrogen	2.Remove the Hydrogen	2.Remove the oxygen	3.loss of e ⁻	3.Gain of e ⁻	4.O.number increases	4.O.number Decreases	-----	-----	Molecular mass	Molar mass	Mass of the molecule	Mass of One mole of substance	<u>Unified atomic mass</u>	Sum of the relative atomic mass	CO ₂ =44 u	mass CO ₂ =44 g	<p>Limiting &Excess reagent One reactant completely consumed It limit the further reaction Another reagent excess is excess reagent</p> <p>Caffine and fructose/Glucose M.formula E.Formula C₆H₁₂O₆ - CH₂O C₈H₁₀N₄O₂ - C₄H₅N₂O</p> <p>Oxidation state calculation CO₂ and SO₂ X+2(-2)=0, X+(-4)=0, ans=+4</p> <p>Auto Redox reaction Same compound undergo Oxidation and reduction .Ex- H₂O₂</p> <p>Redox reaction Oxidation +Reduction =Redox reaction (nv)</p> <p>-----</p> <p>UNIT-2</p> <p>Rutherford observation α-particle-passed through the coil Some deflected-small angle Some reflected-180°</p> <p>Bohr atom model observation Electron-energy-Quantised e- revolve Circular bath-orbit electron $mvr=nh/2\pi$ e⁻ higher energy –lower energy excess energy emitted as light</p> <p>Limitation of Bohr atom model One electron species not multi electron species Not explain Zeeman & stark effect Not explain $mvr=nh/2\pi$</p> <p>Zeeman -Splitting of spectral line In magnetic and Electric (stark)</p>	<table><tr><th>P.Q.number</th><th>Azi.Q.number</th></tr><tr><td>Energy</td><td>Shape</td></tr><tr><td>Denote by n</td><td>Denote by l</td></tr><tr><td>n=1,2,3,4</td><td>L= 0,1,2,3,4</td></tr><tr><td>K,L M,N</td><td>S, p, d,f,g</td></tr><tr><td>No of electron</td><td>No of electron</td></tr><tr><td>2n²</td><td>2(2l+1)</td></tr></table> <p>(Pub-2023)</p> <p>De-broglie equation $E=h\nu$, $E=mc^2$, $\lambda = h/mc$, $\lambda = h/mv$</p> <p>What is n+l rule Orbital n+l value low –low energy Orbital n+l value Hig –High energy Two orbital same n+l value Which orbital low n value it low energy.</p> <p>What is Aufbau Principle e⁻ are filled in orbital – increasing order of energy low energy orbital first filled then higher energy orbital filled.</p> <p>What is Pauli exclusion Principle No 2 electron in an atom have same set four Q.number</p> <p>What is Hund's rule Degenerate orbitals pairing does not takes place. Until all available orbital contain one e⁻.</p> <p>Copper ,Chromium Electronic configuration Actual electronic configuration Cr-24-[Ar] 4S¹ 3d⁵ Cu-29-[Ar] 4S¹ 3d¹⁰ Expected electronic configuration Cr-24-[Ar] 4S² 3d⁴</p>	P.Q.number	Azi.Q.number	Energy	Shape	Denote by n	Denote by l	n=1,2,3,4	L= 0,1,2,3,4	K,L M,N	S, p, d,f,g	No of electron	No of electron	2n ²	2(2l+1)	<p>Cu-29-[Ar] 4S² 3d⁹</p> <p>Define Exchange Energy 2 or more e⁻ same spin in degenerate orbital Exchange their position energy is released.</p> <p>Davision and Germer Experiment Beam of electron –On Ni crystal- get Diffraction pattern- this is -similar to X-ray pattern x-ray wave nature so electron also wave nature. (Nv)</p> <p>Heisenberg's Uncertainty Principle (unit-2) $\Delta X.\Delta P\geq h/4\pi$ Impossible determine both position and momentum- microscopic particle. (Nv)</p> <p>UNIT-3</p> <p>Define Triads Atomic weight – middle element Arithmetic mean of two element</p> <p>Modern periodic law Physical and chemical properties- Periodic function –atomic number</p> <p>Define periodicity Repeat the Physical and chemical properties-Regular interval</p> <p>Effective nuclear charge net nuclear charge by the valance electron $Z_{eff}=Z-S$</p> <p>Why N& Be high ionisation energy N,Be-half filled e⁻ configuration</p> <p>Why Noble gas high ionisation energy- Stable Electronic configuration ns² np⁶ (nv)</p>
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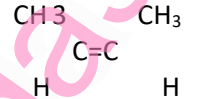
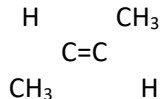
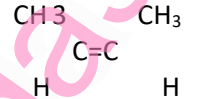
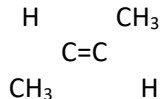
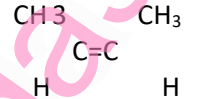
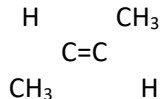
<p>Define iso electronic species Different element-Same electron</p> <p>Define Ionization Energy Isolated gaseous atom +energy -Cation+ e⁻</p> <p>Define Electron affinity Isolated gaseous atom +electron- anion +energy</p> <p>Define Valency Number of valence electron e in outer shell 8-valance electron= Valency</p> <p>What is Diagonal relationship Diagonal placed elements –similar properties Be-Al , B-Si</p> <p>Define Electro negativity Atom attract the shared pair of electron towards itself</p> <p>E.Configuration of Lant @ Acti Lanthanoid :- 4f¹⁻¹⁴ , 5d⁰⁻¹ 6s² Actinoid: 5f⁰⁻¹⁴ , 6d⁰⁻² 7s²</p> <p>Why Halogen oxidising agent ? Halogen have high E.affinity why? Electronic configuration ns² np⁵ Accept one electron - ns² np⁶</p> <p style="text-align: center;">UNIT-4</p> <p>Define isotope Atomic number same Mass number different ${}_1^1\text{H} \quad {}_1^2\text{H} \quad {}_1^3\text{H}$</p> <p>Define Ortho and Para Hydrogen Spin of 2 hydrogen nuclei-same Spin of 2 hydrogen nuclei-differen</p>	<p>How Convert to Para to ortho Heating above 800 °C Electrical discharge Using O₂ ,NO ,NO₂ Using Catalyst Pt\Fe</p> <p>Water Gas or Syn gas C+H₂O→CO+H₂ (1000°C)</p> <p>Water Gas Shift reaction CO+H₂O→CO₂+H₂</p> <p>Deutrium exchange reaction CH₄+2 D₂→CD₄+2H₂ NH₃+3D₂→2ND₃+3H₂</p> <p>Uses of Heavy water Moderator, tracer, coolant.</p> <p>Type of Covalent Hydrides Electron rich-C₂H₆ , CH₄ Electron deficient B₂H₆ Electron precise-NH₃, CH₄</p> <p>Hydrogen bonding Hydrogen + electro negative atom Joined by covalent bond</p> <p>Type of Hydrogen bond Inter molecular hydrogen bonding (H-bond in between molecule) Intra molecular hydrogen bonding (H-bond with in the molecule) nv</p> <table><tr><th>H₂O</th><th>H₂O₂</th></tr><tr><td>Bent shape</td><td>Open book like</td></tr><tr><td>Polar</td><td>shape</td></tr><tr><td></td><td>Non polar</td></tr><tr><td>104^{0.5'}</td><td>94.8⁰</td></tr></table> <p>Uses of Hydrogen- Rocket fuel, Solvent,Fuel cell, Reducing agent</p>	H ₂ O	H ₂ O ₂	Bent shape	Open book like	Polar	shape		Non polar	104 ^{0.5'}	94.8 ⁰	<p>Position of Hydrogen P.table E.Configuration 1S¹ ,Unipositive, Reducing agent, Ionisation energy H> Alkalimetal Electron affinity H<X +1 Oxidation state, Form halide,Sulphide</p> <p>Preparation of Tritium ${}_3^6\text{Li} + {}_2^4\text{He} \rightarrow {}_2^3\text{He} + {}_1^3\text{H}$</p> <p>Haber process(NH₃Preparation) N₂+3H₂ →2NH₃(200atm /Fe)</p> <p>Soft and Hard water Water contain soluble salt Mg,Ca,Mn (SO₄,Cl,CO₃) Water free from soluble salt.</p> <p>Clark's method Mg(HCO₃)+2Ca(OH)₂-→ 2CaCO₃+ Mg(OH)₂+2H₂O</p> <p>Explain about Hydride H+metal and non metal Ionic Hydride Hydrogen +alkali metal or alkaline earth metal Transfer of e from metal to H Prepare at 400°C. White crystal High-M.Point example LiH Covalent Hyrdide Hydrogen +Non metal Sharing of electron between H and non metal .example NH₃ H₂O Metallic hydride Hydrogenation of metal Light inexpensive</p>	<p>Thermally unstable Example Ti,Zr</p> <p style="text-align: center;">UNIT-5</p> <p>Distinctive behavior Be,Li Small size, High polarizing power, High Hydration energy Absence of d orbital</p> <p>Why alkali metal colour? Unpaired electron Absorb energy Low energy –high energy High energy- low energy Excess energy emitted as light Gives washing soda(Solvey process)</p> <p>How will you Prepare Soda ash Na₂CO₃.10H₂O-→ Na₂CO₃ .+10H₂O Above 393 k</p> <p>Preparation of plaster of Paris 2Ca SO₄.2H₂O→2Ca SO₄.H₂O+3H₂O Temperature 393K</p> <p>Uses of P.Paris Dental problem, Bulding construction ,ornamental, Statues, bone fracture.</p> <p>How prepare Dead burnt Plaster Above 393 k plaster Paris loss all the water molecule Anhydrous CaSO₄</p> <p>Washing soda preparation NH₃+H₂O+CO₂→Amm.carbonate Amm.carbonate +water +CO₂ → Amm. Bi-carbonate +NaCl→ Sodium carbonate +Amm.Chloride</p>
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<p>Why alkali metal less ionisation energy Loss one electron become stable.</p> <p>Biological importance of Ca & Mg Adult human-25g Mg.1200 g Ca DNA-synthesis Stability and proper function of DNA- Balance the electrolyte .used in Biochemical reaction Ca present Bones and teeth. Mg-present –Chlorophyll used in Photosynthesis Deficiency of Ca-Blood clot time longer Mg deficiency-Convulsion Hydrogen occupies interstitial site Non stichiometry (nv)</p>	<table><tr><td>Avogadro's law</td><td>$V \propto n$ nv</td></tr><tr><td>Boyle's law</td><td>$V \propto 1/P$</td></tr><tr><td>Charles law</td><td>$V \propto T$ tv</td></tr><tr><td>Ideal gas equation</td><td>$PV= nRT$</td></tr><tr><td>Gay lussac's</td><td>$P \propto T$</td></tr><tr><td colspan="2">-----</td></tr><tr><td>Diffusion</td><td>Effusion</td></tr><tr><td>One gas moved</td><td>Gas escaped from small hole . Ex-</td></tr><tr><td>another gas</td><td>Foot ball</td></tr><tr><td>Ex –Perfume</td><td></td></tr></table>	Avogadro's law	$V \propto n$ nv	Boyle's law	$V \propto 1/P$	Charles law	$V \propto T$ tv	Ideal gas equation	$PV= nRT$	Gay lussac's	$P \propto T$	-----		Diffusion	Effusion	One gas moved	Gas escaped from small hole . Ex-	another gas	Foot ball	Ex –Perfume		<p>Define Compressibility factor $Z=PV/nRT$ $Z=1$ideal . $Z>1$, $Z<1$ real gas</p> <p>Joule Thomson effect Tem of gas is decreases Gas Adiabatically Expand from High pressure to Low pressure</p> <p>Inversion temperature Below this temperature gas obeys the Joule Thomson effect $T_i= 2a/Rb$</p> <p>Define Critical temperature T_c The above T the gas can't be liquefied even high P</p> <p>Define Critical Pressure P_c minimum pressure required to liquefy one mole of gas at T_c</p> <p>Define Critical volume V_c. The Volume occupied by one mole of gas at T_c and P_c</p>	<p>spontaneous process</p> <p>Define Entropy measure of disorder II law of thermodynamics Entropy- isolated system increases-spontaneous process</p> <p>Classius statement Impossible heat transfer cold body to hot body without doing work</p> <p>Characteristics of internal energy Extensive Property State function Internal energy change $\Delta U=U_f.U_i$ Internal energy is negative. $\Delta U=U_f.U_i= -ve$ $U_f<U_i$ Internal energy is positive. $\Delta U=U_f.U_i= +ve$ $U_f>U_i$</p> <p>Efficiency $=\{1-T_c/T_h\} \times 100$</p> <p>Kelvin statement Impossible to construct engine absorb heat from the hot source Heat-Work-cyclic process Without transfer heat to cold sink Entropy state ment</p> <p>Entropy of Isolated System increases during The Spontaneous Process Efficiency Percentage $(1-T_c/ T_h) \times 100$</p> <p>Third law of thermodynamics Entropy of pure crystalline substance is zero at Absolute zero $S=0$,$T=0$</p> <p>N.VELLAICHAMY M.SC B.Ed</p>
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<p>UNIT-6 Gaseous law (NV)</p> <p>Define Pressure Pressure= Force/Area SI unit is Pascal.</p>																							

Extensive Properties System properties depend on size or mass. Ex ,volume State function Properties of system depends on state Ex -P,V,T	Intensive Properties System properties depend on size or mass. Ex B.p Path function Properties of system depends on path Ex- Work ,heat	Calorific Value of Food And unit Heat produced- one gram substance Completely Burnt SI unit is J Kg ⁻¹ Define Enthalpy of Combustion Change in Enthalpy one mole of substance –burnt–using air Methane -87.78 KJ mol ⁻¹ Define Molar Heat Capacity The amount of Heat absorbed by one mole substance to raise temperature 1 Kelvin What is Enthalpy Of Neutralisation Enthalpy Change neutralisation One gram equivalent acid + One gram equivalent base –dil solution. Derive Relation between H and U H=U+PV H ₁ =U ₁ +PV ₁ . H ₂ =U ₂ +PV ₂ ΔH= ΔU +PΔV First law ΔU= q +W ΔH= q =w +PΔV q = -PΔV ΔH= -P ΔV +PΔV ΔH= q Sign Convention of work and Heat Worke done by the system -W Work done on the system +W Heat is liberated by system -q Heat is absorbed by the system +q Isothermal -dT=0 Isobaric - dP=0 Adiabatic -dq=0 isochoric - dv=0	VOLUME-II UNIT-8 Why chemical.Equ... called dyamamic equilibrium? Forward and back ward same rate No macroscopic change Law of mass action Relation between K_p and K_c K _c =[C] ^l [D] ^m /[A] ^x [B] ^y K _p =P _c ^l P _D ^m / P _A ^x P _B ^y K _p =K _c (RT) ^{Δng} Lechateliers Principle(Pub-2023) If the a system at equilibrium is disturbed Then, the system shift itself in direction That nullifies the effect of that Distrubance Effect of pressure -Few moles Effect of inert gas -No effect [Nv] Effect of catalyst -No effect Vant-Hoff Equation ΔG=-RT lnK D lnK/dt =ΔH ⁰ /RT ² Log K ₂ /K ₁ =ΔH ⁰ /2.303R[T ₂ -T ₁ /T ₁ T ₂] <table><tr><td><u>Homogeneous</u> Reactants and products are differ phase H₂ g+ I₂ g->2HI_g</td><td><u>Heterogeneous</u> Reactants and products are same Phase H₂O liq->H₂O gas</td></tr></table> Effect of pressure -Few moles Effect of inert gas -No effect [Nv] Effect of catalyst -No effect	<u>Homogeneous</u> Reactants and products are differ phase H ₂ g+ I ₂ g->2HI _g	<u>Heterogeneous</u> Reactants and products are same Phase H ₂ O liq->H ₂ O gas	Reaction Quoient K _c =[C] ^l [D] ^m /[A] ^x [B] ^y Derive the K_p and K_c for HI H ₂ +I ₂ ->2HI K _c =4x ² /(a-x)(b-x) K _p =4x ² /(a-x)(b-x) Dervie the K_p and K_c for NH₃ N ₂ +3H ₂ ->2NH ₃ K _c =4x ² V ² /(a-x)(b-3x) ³ K _p =4x ² (a+b-2x) ² / P ² (a-x)(b-3x) ³ Derive the K_p and K_c for PCl₅ PCl ₅ ->PCl ₃ +Cl ₂ K _c =x ² /(a-x)V K _p =x ² P/(a-x)(a+x). Define Δng Δng=No.of moles of product-No.of moles Recatants Write K _p and K _c for this equation CaCO ₃ (s)—CaO(s) +CO ₂ (g) K _c = [CO ₂] K _p =P co2 Write the equation for K _c =[NH ₃] ⁴ [O ₂] ⁵ /[NO] ⁴ [H ₂ O] ⁶ 4NO+6H ₂ O→4NH ₃ +5O ₂ Application of Equ.constant Find Direction of reaction Find Extent of reaction Calculate Eq.Con of Reactant & products Vant-Hoff Equation ΔG=-RT lnK D lnK/dt =ΔH ⁰ /RT ² Log K ₂ /K ₁ =ΔH ⁰ /2.303R[T ₂ -T ₁ /T ₁ T ₂] Law of mass action (nv)
<u>Homogeneous</u> Reactants and products are differ phase H ₂ g+ I ₂ g->2HI _g	<u>Heterogeneous</u> Reactants and products are same Phase H ₂ O liq->H ₂ O gas					

<div>UNIT-9</div> <div>Molality=</div> <div>No .of moles of solute</div> <div>Mass of the solvent(kg)</div> <div>Molality=</div> <div>No .of moles of solute</div> <div>Volume of the solution(L)</div> <div>Normality=</div> <div>No .of grm.Equi of solute</div> <div>Volume of the solution(L)</div> <div>Define ppm</div> <div>Number of parts of</div> <div>componentsx1</div> <div>Total number of parts of all</div> <div>components</div> <div>Mass of the solute X 10⁶</div> <div>Mass of the Solution</div> <div>Advantage of Std.Solution</div> <div>Minimise the error due to</div> <div>weighing</div> <div>Prepare the different con. of</div> <div>solution , More stable.</div> <div>Define Isotonic solution</div> <div>Two solution have same osmotic</div> <div>pressure</div> <div>Significance of Osmotic pressure</div> <div>Magnitude is large</div> <div>Molecular mass of bio molecule is</div> <div>calculated (nv)</div> <div>Relative lowering V. Pressure =</div> <div>W_B x M_A / W_A x M_B=ΔP/P_A⁰</div> <div>Elivation of Boiling point M₂ =</div> <div>K_b xW₂ x1000/ ΔT_b xW₁</div> <div>Depression of Freezing point</div>	<div>Depression of Freezing point M₂</div> <div>=K_f xW₂ x1000/ ΔT_f xW₁</div> <div>Osmotic Pressure =M₂=W₂ xRT/V</div> <div>Define Hemolysis</div> <div>Solvent-Cell outside to cell</div> <div>normalize the osmotic pressure.</div> <div>What is Henry's law</div> <div>Partial pressure of gas α solute</div> <div>mole fraction of solute</div> <div>P_{Solute} X_{Solute}</div> <div>Limitation of Henry's law</div> <div>Only at Moderate T & P</div> <div>Less soluble Gases (Only)</div> <div>Gas do not react with solvent</div> <div>Gas do not Associate or Dissociate</div> <div>Define Raoult's law</div> <div>Incase of solution of volatile</div> <div>Liquid</div> <div>Partial pressure component A,B α</div> <div>Mole fraction of A,B</div> <div>Ideal</div> <div>ΔV_{mixing}=0</div> <div>ΔH_{mixing}=0</div> <div>Escaping</div> <div>tendency</div> <div>Solute=Solvent</div> <div>Non ideal</div> <div>ΔV_{mixing}≠0</div> <div>ΔH_{mixing}≠0</div> <div>Escaping</div> <div>tendency</div> <div>Solute>Solvent</div> <div>Define Osmosis</div> <div>Solvent-Lower to Higher</div> <div>Concentration</div> <div>-Semi permeable membrane</div> <div>Reverse Osmosis</div> <div>Solvent-Higher to Lower</div>	<div>Concentration</div> <div>-Semi permeable membrane</div> <div>Osmotic pressure</div> <div>Pressure used to stop the Osmosis</div> <div>Stop the movement of solvent [Nv]</div> <div>Define colligate properties</div> <div>Properties depend on the number</div> <div>of solute particle Ex- osmotic press</div> <div>Osmotic pressure</div> <div>Pressure used to stop the Osmosis</div> <div>Stop the movement of solvent [Nv]</div> <div>UNIT-10</div> <div>What is Octet rule</div> <div>The atom transfer or share</div> <div>electrons , obtain 8 electrons</div> <div>In outer most shell</div> <div>Covalent bond</div> <div>Mutual Sharing of one or more Pair</div> <div>of electron between two atom</div> <div>Lewis Dot structure.</div> <div>H₂O, H₂SO₄,NH₃, SO₃,CO₂</div> <div>Define Bond length</div> <div>Distance between the two atom</div> <div>covalently bonded</div> <div>Define Bond angle</div> <div>Covalent bond directional nature</div> <div>Oriented specific direction</div> <div>Direction nature create the angle</div> <div>Electronegativity difference A,B</div> <div>=1.7->50% Ionic 50% Covalent</div> <div>>1.7->more 50% Ionic character</div> <div><1.7->less 50% Ionic Character</div> <div>(Never lose your Confidence)</div>	<div>Define Bond Energy</div> <div>Energy required to break one</div> <div>mole of bond. unit KJmol⁻¹</div> <div>Define Bond order</div> <div>The number of bond between two</div> <div>bonded atom</div> <div>Bond order= N_b-N_a/2</div> <div>Bond Which is Strong Why</div> <div>2 atomic orbital overlap linearly</div> <div>2 atomic orbital overlap Side wise</div> <div>Bond is strong because overlap is</div> <div>maximum</div> <div>Explain Fajan's Rule</div> <div>High charge of anion & cation-</div> <div>High covalent</div> <div>Small size cation</div> <div>Large size anion</div> <div>Cucl > NaCl- Covalent</div> <div>Define Ionic Bond</div> <div>Complete transfer of electron</div> <div>form anion and cation.force btw</div> <div>these ions is called ionic bond</div> <div>Molecular orbital (MO)-Theory</div> <div>atomic orbital combine give</div> <div>Molecular orbital</div> <div>Shape of M.orbital depend on</div> <div>Atomic orbital</div> <div>Two type of Molecular orbital</div> <div>Bonding M.orbital</div> <div>Bonding M.orbital</div> <div>Antibonding M.orbital</div> <div>It following Aufbau's</div> <div>principle,pauli exclusion,Hunds</div> <div>rule.</div>
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<p>Bond order= $N_b - N_a / 2$</p> <p>Explain VSEPR Theory</p> <p>Shape of molecule is depend on the number of valence electron</p> <p>Two type valence e^-</p> <p>Bond pair-involved in bonding</p> <p>Lone pair-Not involved in bonding</p> <p>Two pairs repel each other</p> <p>$L.P-L.P > L.P-B.P > B.P-B.P$</p> <p>Define Dipole moment</p> <p>Polarity of Covalent bond</p> <p>$m = q \times d$</p> <p>d-distance, q-charge m-dipole</p> <p>Define Hybridization</p> <p>Mixing of two atomic orbital – form-new orbital.</p> <p>Explain about The VB Theory</p> <p>Half filled tow orbital –form covalent bond</p> <p>The resultant overlaping orbital contain two electron with opposite spin</p> <p>Strength of covalent bond depend on extent of Hybridisation</p> <p>High overlap high energy relased</p> <p>Each orbital has specific direction</p> <p>Dipole moment of CO₂ is zero Why?</p> <p>In CO₂ two polar bonds are equal in magnitude but in opposite direction</p> <p>“Education is the most power full weapon we can used to change the word”</p>	<p align="center">UNIT-11</p> <p>Characteristics of organic compound</p> <p>Covalent nature</p> <p>Mostly inflammable except CCl₄</p> <p>Insoluble in water</p> <p>Functional group- atom or specific combination of bonded atom</p> <p>React in characteristic way</p> <p>Irrespective of the organic molecule</p> <p>Homologeous series</p> <p>Series of organic compound</p> <p>Same formula But differ by CH₂ –</p> <p>General formula of</p> <p>Alkane C_nH_{2n+2}</p> <p>Alkene C_nH_{2n}</p> <p>Alkyne C_nH_{2n-2}</p> <p>Define Optical isomerism</p> <p>Same Physical and chemical properties</p> <p>Different in rotation of plane of Polarized light- ex-Glucose</p> <p>Define Levo and dextro rotator.</p> <p>Comound can rotate the plane of polarized light towards Left-Levo rotate the plane of polarized light towards right-dextro</p> <p>Condition for optical isomerism</p> <p>Chiral, non-superimobile ,Assymetric</p> <p>Define Isomerism- Same Molecular Differ structure different properties called isomers phenomenon called isomerism</p>	<table><tr><th>Chain</th><th>Position</th></tr><tr><td>Same m.formula different in chain or Skeleton</td><td>Same m.formula different in position or functional grp</td></tr></table> <p>Define Metamerism</p> <p>Distribution of C-on either side functional group</p> <table><tr><th>Cis</th><th>Trans</th></tr><tr><td>Same group Same side of c=c bond More steric repulsion</td><td>Same group Same side of c=c bond More steric repulsion</td></tr><tr><td></td><td></td></tr></table> <p>Lassaigne's or Sodium fusion extract</p> <p>Na+organic compound-Fusion tube-heat-China dish-10 minutes crush and filter</p> <p>Define Chromatography</p> <p>Separation of mixture by Differential movement of individual components-</p> <p>Porous medium</p> <p>Influence of solvent</p> <p>R_f=Distance moved by substance / Distance moved by solvent</p>	Chain	Position	Same m.formula different in chain or Skeleton	Same m.formula different in position or functional grp	Cis	Trans	Same group Same side of c=c bond More steric repulsion	Same group Same side of c=c bond More steric repulsion			<p>Feature of Mechanical model of atom</p> <p>Electron energy-Quantised</p> <p>Solution of Schordinger wave equation gives allowed energy level-(orbits)</p> <p>Allowed energy level give wave function</p> <p>wave function –Explain Wave nature of electron</p> <p>The wave function no Physical meaning</p> <p>Orbital-three dimensional face</p> <p>Praobability of finding e^- maximum</p> <p>Slater rule for Sc-21(E.n.Charge)</p> <p>$1s^2 = n-3$, $2s^2 2p^6 = n-2$</p> <p>$3s^2 3p^2 3d^1 = n-1$, $4s^2 = n$</p> <p>$Z_{\text{eff}} = Z - S$ 21-8=3.</p> <p>Ionic radii of Na F</p> <p>$d = r_c + r_A$</p> <p>$r_c \propto 1/(Z_{\text{eff}})C^+$</p> <p>$r_A \propto 1/(Z_{\text{eff}})A^-$</p> <p>$r_c = (Z_{\text{eff}})A^-$</p> <p>$r_c = (Z_{\text{eff}})C^+$</p> <p>231 pm = $r_{\text{Na}} + r_{\text{Cl}}$</p> <p>$(Z_{\text{eff}})\text{Na}^+ = 6.85$</p> <p>$(Z_{\text{eff}})\text{F}^- = 4.85$</p> <p>$r_{\text{Na}^+} = 95.9$</p> <p>$r_{\text{F}^-} = 135.1$</p> <p align="right">PREPARED BY N.VELLAICHAMY M.SC,B.Ed. CHEMISTRY</p>
Chain	Position												
Same m.formula different in chain or Skeleton	Same m.formula different in position or functional grp												
Cis	Trans												
Same group Same side of c=c bond More steric repulsion	Same group Same side of c=c bond More steric repulsion												
													

UNIT-12-13		Naming Reactions	UNIT-15		What is Eutrophication Water bodies receive Excess nutrients – excess plant growth- Algae bloom . It reduces the dissolved oxygen in water – loss of Biodiversity-Eutophication. difference between BOD and COD		
SN¹ Unimolecular First order Optically Inactive Rate=k [Alkyl halide]	SN² Bimolecular 2 nd order Optically Active Rate=k [Alkyl halide] [nucleophile]		What is Green chemistry Environmental favourable chemical Synthesis Reduce the uses and generation of hazardous substance Define Global warming and Green house effect Earth is heated by CO ₂ and CFC by absorb the IR radiation Heating earth by green house gases is called Global warming What is Acid rain The PH 5.6 2SO ₂ +O ₂ + 2H ₂ O->2H ₂ SO ₄ 2NO ₂ +O ₂ +2H ₂ O->2HNO ₃ Which is protective umbrella why Ozone it prevent the UV radiation What happens if green house gases missing from atmosphere ? Temperature of earth would be - 18 ⁰ What is Bio-Degradable and non bio degradable pollutants Substance easily decomposed by natural-Cow dung Substance easily decomposed by natural-Plastics What are Particulate and type Small solid or liquid droplet suspended in air 1.Viable-Bacteria 2.non-viable-dust,smoke	<table><tr><td>BOD Biochemical oxygen demand Expressed in PPM Decompose the waste by microorganism 5 days 20⁰C</td><td>COD Chemical oxygen demand Expressed in Mg/Lit Decompose the waste by K₂Cr₂O₇ 2 Hours</td></tr></table>		BOD Biochemical oxygen demand Expressed in PPM Decompose the waste by microorganism 5 days 20 ⁰ C	COD Chemical oxygen demand Expressed in Mg/Lit Decompose the waste by K ₂ Cr ₂ O ₇ 2 Hours
BOD Biochemical oxygen demand Expressed in PPM Decompose the waste by microorganism 5 days 20 ⁰ C	COD Chemical oxygen demand Expressed in Mg/Lit Decompose the waste by K ₂ Cr ₂ O ₇ 2 Hours						
ElectroPhile Electron Defficient +ve charge or neutral Moves towards Nucleophile Lewis acid Ex-Carbon	Nucleophile Electron rich -ve charge or Moves towards electrophile Lewis base Ex-H ₂ O	What is SN¹ and SN² Mechanism					
Inductive effect(Pub-2023) Change in polarization of Covalent bond due to atom or group Ex;-methyl chloride							
Homolytic Cleavage Break symmetrically Electro negativity same Formation of free radical	Hetreolytic cleavage Break unsymmetrically Electro negativity different Formation of carbo cation anion. (NV)				Here the key word only given by using this make the sentence - NV nvchamychemist@gmail.com (Always Proud to be INDIAN)		

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