

Lesson Plan

Name of Assistant Professor : Hardeep

Class : Bsc (Non medical and medical)

Semester : 3rd

Subject : Chemistry (Physical chemistry)

Lesson Plan : From November 2020 to February 2021

2.11.2020-15.2.2021 : Thermodynamic of ideal solutions and Raoult's law, deviations from Raoult's law-non ideal solution, vapor pressure composition and temperature composition curve of ideal and non ideal solutions, Distillations of solutions, colligative properties of solutions, thermodynamic derivation of relation between amount of solute and elevation in boiling point and depression in freezing point, partial miscibility of liquids, critical solution temperature, effect of impurity on partial miscibility of liquid, immiscibility liquids-principle of steam distillation.
Week 1 16.11.2020-23.11.2020 : Phase components and degree of freedom of a system, criteria of phase equilibrium, Gibbs phase rule and its thermodynamics derivation, derivation of clausius clapeyron equation and its importance in phase equilibria.
Week 2 24.11.2020-1.12.2020 : Phase diagram of one and two components system involving eutectic congruent and incongruent melting point (lead, silver and Na-K only)
Week 3 2.12.2020-9.12.2020 : Conductivity, equivalent and molar conductivity and their variation with dilution for weak and strong electrolytes, Kohlrausch law of independent migration of ions.
Week 4 10.12.2020-17.12.2020 : Transference number, ionizing mobility, Application of conductance measurements: determination of degree of ionization of weak electrolyte
Week 5 18.12.2020-25.12.2020 : solubility and solubility products of sparingly soluble salts, ionic product of water, hydrolysis constant of salt, class test
Week 6 26.12.2020-2.1.2021 : conductometric titrations (only acid-base), concept of P-H and pka, buffer solutions Buffer action, buffer action, handerson hazel blac equation, Assignments
Week 7 4.1.2021-11.1.2021 : Reversible and irreversible cell, concept of emf of a cell, measurement of emf of a cell, Nernst equation and its importance, type of electrodes, standard electrodes potential, electro chemical series, thermodynamic of a reversible cell, calculation of thermodynamic properties: ΔG , ΔH and ΔS from emf data.
Week 8 12.1.2021-19.1.2021 : calculation of equilibrium constant from emf data, concentration

cells with transference and without transference, liquid junction potential and salt bridge, PH determination using H electrodes and quinhydrone electrode, potentiometric titrations qualitative treatments (acid-base and oxidation-reduction only), Class test

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Name of Assistant Professor : Hardeep

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Subject : Chemistry (Organic)

Lesson Plan : From November 2020 to February 2021

<p>Week 9 20.1.2021-27.1.2021 : Carboxylic-acid and their derivative, preparation: acidic and alkaline hydrolysis of acid Reactions: Hell-Vohlard-Zelinsky reaction Carboxylic acid derivative (aliphatic): preparation: Acid chlorides, Anhydrides, esters and amide from acids and their interconversion Reactions: comparative study of nucleophilicity of acyl derivatives. Reformatsky reaction, perkin condensation</p>
<p>Week 10 28.1.2021- 4.2.2021: Amin and diazonium salts ; Amines Preparations: from alkyl halide, Gabriel's Phthalimid Synthesis, Hofmann Bromamide reaction Reactions: Hofmann vs. Saytezeff elimination, Electrophilic substitution: nitration, bromination, sulphonation Diazonium salts: preparation: from aromatic amines: Reactions: conversion to benzene, phenol, dyes</p>
<p>Week 11 5.2.2021-12.2.2021 Preparation of amino acid: strecker synthesis using Gabriel's phthalimide synthesis. Zwitter ion, isoelectric point and electrophoresis Reactions of amino acid: ester of COOH group, acetylation of NH₂ group, complexation with Cu²⁺ ions, ninhydrin test. Overview of primary, secondary, tertiary and quaternary structure of proteins, Determination of primary structure of peptides by degradation edmann degradation and c-terminal</p>
<p>Week 12 13.2.2021-20.2.2021 Synthesis of peptides by N-protection and C- activating groups and Merrifield solid-phase synthesis. Carbohydrates: classification, and general properties, Glucose and fructose.</p>
<p>Week 13 22.2.2021-27.2.2021 Determination of configuration of monosaccharides, absolute configuration of glucose and fructose, mutarotation, ascending and descending in monosaccharides. Structure of disacharrides and polysacharrides excluding their structure elucidation.</p>

Lesson Plan (2020-21)

Name of Assistant/ Associate Professor: Mr. Hardeep

Class: B.Sc I sem-1st

Subject: Inorganic chemistry

Lesson Plan: From November 2020 to February 2021

November 2020	
Week of Month	Topic Covered
Week 1 (2 nd November to 7 th November)	<p>Chemical bonding:-</p> <p>General characteristics of ionic bonding, Energy consideration in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds. Statement of Born-Landé equation for calculation of lattice energy, Born-Haber cycle and its application, polarizing power and Polarizability.</p>
Week 2 (9 th November to 15 November)	<p>Fajan's Rule, ionic character in covalent compound, bond moment, dipole moment and percentage ionic character,</p> <p>Covalent bonding:-</p> <p>VBH approach- Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, Square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements, concept of resonance and resonating structures in various inorganic and organic compounds.</p>
Week 3 (16 th to 21 November)	<p>molecular Structure:-</p> <p>MO approach- Rules for the LCAO method, bonding and antibonding MOs.</p>
Week 4 (23 to 28 November))	<p>characteristics for s-s, s-p, and p-p combinations of atomic orbitals, Non bonding combination of orbitals.</p>
Week 5 (1 st to 5 th December)	<p>MO treatment of homonuclear diatomic molecules of 1st and 2nd periods (including idea of s-p mixing)</p>
Week 6 (7 th to 12 th December)	<p>MO treatment of heteronuclear diatomic molecules such as CO, NO and NO⁺, Comparison of VB and MO approaches</p>
Week 7 (14 th to 19 th December)	<p>Atomic structure-1</p> <p>Review of Bohr's theory and its limitations, Dual behavior of matter and radiation, De-Broglie's Relationship, Heisenberg Uncertainty principle</p>
Week 8 (21 st to 26 th December)	<p>Hydrogen atom Spectra, Need of a new approach to atomic structure.</p>

Week 9 (28 th to 31st December)	what is Quantum mechanics?, Time independent Schrodinger equation and meaning of various terms in it.
Week 10 (1st & 2nd January)	Significance of ψ and ψ^2 , Schrodinger equation for hydrogen atom.
Week 11 (4th to 9th January)	Radial and angular parts of the hydrogenic wave functions (atomic orbitals) and their variations for 1s, 2s, 2p, 3s, 3p, 3d orbitals (only graphical representation)
Week 12 (11th to 16th January)	Atomic structure-2 Radial and angular nodes and their significance, Radial distribution function and the concept of the most probable distance with special reference to 1s and 2s atomic orbital.
Week 13 (18 th to 23rd January)	Significance of Quantum numbers, orbital angular momentum and Quantum number M_l and M_s .
Week 14 (25 th to 30th January)	Shapes of s, p and d orbitals, nodal planes.
Week 15 (01 to 06 Feb.)	Discovery of spin, spin quantum number(s) and magnetic d orbital (M_s)
Week 16 (08 to 13 Feb.)	Rules for filling electron in various orbitals, electronic configuration of the atoms.
Week 17 (15 to 20 Feb.)	Stability of half filled and completely filled orbitals.
Week 18 (22 to 29 Feb.)	Concept of exchange energy, relative energies of atomic orbital, Anomalous electronic configuration.

Head of Department
Teacher

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Signature of Teacher