

Lesson Plan

Class:

B.Sc- I

Semester:

Second Semester

Subject with Paper Code:

Inorganic Chemistry CH 201, Chemistry Practical CH 204

Teacher:

Ms. Ekta

Lectures	Topics
March 2022	Inorganic Chemistry: Hydrogen Bonding & Vander Waals Forces, Hydrogen Bonding-Definition, Types, effects of hydrogen bonding on properties of substances, application. Brief discussion of various types of Vander Waals Forces. Metallic Bond and Semiconductors: Metallic Bond Brief introduction to metallic bond, band theory of metallic bond. Semiconductors- Introduction, types and applications. (Assignment and Class test) Chemistry Practical: Qualitative Analysis of the any one of the following Inorganic cations and anions by paper chromatography (Pb^{2+} , Cu^{2+} , Ca^{2+} , Ni^{2+} , Cl^- , Br^- , I^- and PO_4^{3-} and NO_3^-).
April 2022	Inorganic Chemistry: S-Block Elements, Comparative study of the elements including diagonal relationships, salient features of hydrides (methods of preparation excluded), solvation and complexation tendencies including their function. Chemistry of noble gases. (Assignment and Class test) Chemistry Practical: Preparation and purification of p-Bromoacetanilide from acetanilide, Dibenzalacetone from acetone and benzaldehyde & Aspirin from salicylic acid. To study the process of sublimation of camphor and phthalic acid.
May 2022	Inorganic Chemistry: p-Block Elements: Emphasis on comparative study of properties of p-block elements (including diagonal relationship and excluding methods of preparation). Boron family: Diborane – properties and structure (as an example of electron – deficient compound and multicentre bonding), Borazene – chemical properties and structure Trihalides of Boron – Trends in Lewis acid character structure of aluminium (III) chloride. Carbon Family: Catenation, p π – d π bonding (an idea), carbides, fluorocarbons, silicates structural aspects), silicon – general methods of preparations, properties and uses. Nitrogen Family: Oxides – structures of oxides of N, P, oxyacids – structure and relative acid strengths of oxyacids of Nitrogen and phosphorus. Structure of white, yellow and red phosphorus. (Assignment and Class test) Chemistry Practical: To study the process of sublimation of camphor and phthalic acid.
June 2022	Inorganic Chemistry: Nitrogen Family: Oxides – structures of oxides of N, P, oxyacids – structure and relative acid strengths of oxyacids of Nitrogen and phosphorus. Structure of white, yellow and red phosphorus. Oxygen Family: Oxyacids of Sulphur-structures and acidic strength H_2O_2 –structure, properties and uses. Halogen Family: Basic properties of halogen, interhalogens types properties, hydro and oxyacids of Chlorine-structure and comparison of acid strength. (Assignment and Class test) REVISION.

Sent by mail

Lesson Plan

Class: B.Sc- II

Semester: IVth Semester

Subject with Paper Code: Inorganic Chemistry CH 401, Physical Chemistry CH 402,
Chemistry Practical CH 404

Teacher: Ms. Ekta

Lectures	Topics
March 2022	<p>Inorganic Chemistry: Lanthanides: Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.</p> <p>Physical Chemistry: Thermodynamics: Second law of thermodynamics, need for the law, different statements of the law, Carnot's cycles and its efficiency, Carnot's theorem, Thermodynamics scale of temperature. Concept of entropy – entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physical change, entropy as criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases. (Assignment and Class test)</p> <p>Chemistry Practical: Gravimetric Analysis: To verify Beer - Lambert law for $\text{KMnO}_4/\text{K}_2\text{Cr}_2\text{O}_7$, determine the concentration of the given $\text{KMnO}_4/\text{K}_2\text{Cr}_2\text{O}_7$ solution, Preparation of Cuprous chloride.</p>
April 2022	<p>Inorganic Chemistry: Actinides: General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from U, Comparison of properties of Lanthanides and Actinides and with transition elements.</p> <p>Physical Chemistry: Thermodynamics: Third law of thermodynamics: Nernst heat theorem, statement of concept of residual entropy, evaluation of absolute entropy from heat capacity data, Gibbs and Helmholtz functions; Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, A & G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation of G and A with P, V and T. (Assignment and Class test) Chemistry Practical: Preparation of Prussian blue from iron fillings, tetraamminecupric sulphate, chrome alum, potassium trioxalatochromate(III).</p>
May 2022	<p>Inorganic Chemistry: Theory of Qualitative and Quantitative Inorganic Analysis: Chemistry of analysis of various acidic radicals, Chemistry of identification of acid radicals in typical combinations, Chemistry of interference of acid radicals including their removal in the analysis of basic radicals.</p> <p>Physical Chemistry: Electrochemistry: Electrolytic and Galvanic cells – reversible & Irreversible cells, conventional representation of electrochemical cells. EMF of cell and its measurement, Weston standard cell, activity and activity coefficients. Calculation of thermodynamic quantities of cell reaction. Types of reversible electrodes – metal metal ion gas electrode, metal –insoluble salt- anion and redox electrodes. Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential. Standard Hydrogen electrode, reference electrodes, standard electrodes potential, sign</p>

P.T.O.

	<p>conventions, electrochemical series and its applications. (Assignment and Class test)</p> <p>Chemistry Practical: To determine the CST of phenol – water system, To determine the solubility of benzoic acid at various temperatures and to determine the ΔH of the dissolution process, To determine the enthalpy of neutralisation of a WA/WB vs. SB/SA and determine the enthalpy of ionisation of the WA/WB.</p>
2022	<p>Inorganic Chemistry: Chemistry of analysis of various groups of basic radicals, Theory of precipitation, coprecipitation, Post-precipitation, purification of precipitates.</p> <p>Physical Chemistry: Electrochemistry: Concentration cells with and without transference, LJP, application of EMF measurement, potentiometric titration, Determination of pH using Hydrogen electrode, Quinhydrone electrode and glass electrode by potentiometric methods. (Assignment and Class test) REVISION.</p> <p>Chemistry Practical: To determine the enthalpy of solution of solid calcium chloride, To study the distribution of iodine between water and CCl_4.</p>

Lesson Plan

Class: B.Sc-III
 Semester: VIth Semester
 Subject with Paper Code: Physical Chemistry CH 602, Chemistry Practical CH 604
 Teacher: Ms. Ekta

Lectures	Topics
March 2022	<p>Physical Chemistry: Electronic Spectrum: Concept of potential energy curves for bonding and antibonding molecular orbitals, qualitative description of selection rules and Franck- Condon principle. Qualitative description of sigma and pie and n molecular orbital (MO) their energy level and respective transitions. (Assignment and Class test)</p> <p>Chemistry Practical: To determine the strength of the given acid solution (mono and dibasic acid) conductometrically, To determine the solubility and solubility product of a sparingly soluble electrolyte conductometrically. To determine the strength of given acid solution (mono and dibasic acid) potentiometrically.</p>
April 2022	<p>Physical Chemistry: Dilute Solutions and Colligative Properties: Ideal and non-ideal solutions, methods of expressing concentrations of solutions, activity and activity coefficient. Dilute solution, Colligative properties, Raoult's law, relative lowering of vapour pressure, molecular weight determination, Osmosis law of osmotic pressure and its measurement, determination of molecular weight from osmotic pressure. Elevation of boiling point and depression of freezing point, Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties. Abnormal molar mass, degree of dissociation and association of solutes. (Assignment and Class test)</p> <p>Chemistry Practical: To determine the molecular weight of a non-volatile solute by Rast Method, To standardize the given acid solution (mono, dibasic acid) Potentiometrically.</p>
May 2022	<p>Physical Chemistry: Electrochemistry: Electrolytic and Galvanic cells – reversible & Irreversible cells, conventional representation of electrochemical cells. EMF of cell and its measurement, Weston standard cell, activity and activity coefficients. Calculation of thermodynamic quantities of cell reaction. Types of reversible electrodes – metal metal ion gas electrode, metal –insoluble salt- anion and redox electrodes. Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential. Standard Hydrogen electrode, reference electrodes, standard electrodes potential, sign conventions, electrochemical series and its applications. (Assignment and Class test)</p> <p>Chemistry Practical: To prepare o-chlorobenzoic acid from anthranilic acid, To prepare p-bromoaniline from p-bromoacetanilide.</p>
June 2022	<p>Physical Chemistry: Phase Equilibrium: Statement and meaning of the terms – phase component and degree of freedom, thermodynamic derivation of Gibbs phase rule, phase equilibria of one component system (H_2O, S) Phase equilibria of two component systems solid-liquid equilibria, simple eutectic i.e. Pb-Ag system, desilverisation of lead.</p> <p>Chemistry Practical: To prepare m-nitroaniline from m-dinitrobenzene, To prepare S-Benzyl-iso-thiouonium chloride from thiourea. (Assignment and Class test) REVISION.</p>

SHAHEED SMARAK P.G. GOVT. COLLEGE TIGAON (FARIDABAD)

LESSON PLAN FOR SESSION 2021-22. (Even Semester) B.Sc. 3rd yr [6th Sem]

Subject Name with code and semester:--- Organic + Inorganic + Chemistry Practicals
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 CH-103 CH-101 CH-104

Teacher Name:--- Dr. Laxmi

MONTH	TOPIC
March 2022	<p><u>Organic chemistry</u>! - Heterocyclic compounds Mechanism of electrophilic and nucleophilic substitution rxn, comparison of basicity <u>Inorganic</u>! - organometallic chemistry - nomenclature Preparation, structure bonding <u>Practicals</u>! - determine strength of mono/dibasic acids determine solubility product of sparingly soluble electrolyte determine strength of given acid potentiometrically.</p>
April 2022	<p><u>Organic</u>! - Introduction to five - six membered heterocycles, their preparation and reactions organo sulphur compounds - Preparation & chemical reactions <u>Inorganic</u>! - Acids & bases - HSAB - Concepts, relative strength, synergism, hardness and softness <u>Practicals</u>! - determine mol. wt of non-volatile solid by cast method, standardize the given acid soln pH-metrically.</p>
May 2022	<p><u>Organic</u>! - synthesis via enolates, synthetic polymers. <u>Inorganic</u>! - Bioinorganic chemistry, essential & trace elements, metalloprophyrin, Hb & Mb, N-fixation <u>Practicals</u>! - To prepare o-chlorobenzonic acid from anthranilic acid, To prepare p-bromo aniline from p-bromoacetanilide.</p>
June 2022	<p><u>Organic</u>! - Amino acids, peptides and proteins classification, structure, nomenclature, end group analysis, solid - phase peptide synthesis <u>Inorganic</u>! - silicones and phosphazenes, preparation Properties, structure and uses. <u>Practicals</u>! - To prepare m-nitroaniline from m-dinitrobenzene, To prepare S-Benzyl-L-homocysteine chloride from thioacetamide</p>

Laxmi
Signature

SHAHEED SMARAK P.G. GOVT. COLLEGE TIGAON (FARIDABAD)

LESSON PLAN FOR SESSION 2021-22. (Even Semester) B.Sc. Ist year [2nd Sem]

Subject Name with code and semester:--- Organic, Physical Chemistry + Chemistry Practicals
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 CH-103 CH-102 CH-104

Teacher Name:--- Dr. Laxmi

MONTH	TOPIC
March 2022	<p><u>Organic chemistry</u>:→ Alkene;→ Nomenclature, Methods of Preparation, Physical and chemical Properties, chemical reactions, their stability</p> <p><u>Physical chemistry</u>:→ Kinetics!→ Rate of Reaction, rate equations, factors affecting rate, order of reactions (Zero, 1st and 2nd order)</p>
April 2022	<p><u>Organic chemistry</u>:→ Aromatic and Aromaticity! - Nomenclature of benzene derivatives, Aromatic, antiaromatic and Non aromatic Compounds, Aromatic Electrophilic substitutions</p> <p><u>Physical chemistry</u>:→ 3rd order rxn, Half life period of reactions, Effect of temp. on rate of reactions, theories of reaction rate</p>
May 2022	<p><u>Organic chemistry</u>:→ Dienes and Alkynes! - Its Nomenclature, types, structure of bonding, chemical reaction and Prep of Dienes & Alkynes</p> <p><u>Physical chemistry</u>:→ Electrochemistry! - Electrolytic conductance, factors affecting to it, variations with concentration, transport no. definition and determination by Hittorf's Method</p>
June 2022	<p><u>Organic chemistry</u>:→ Alkyl and Aryl halides! - Nomenclature, classification, method of formation, physical and chemical properties, Profile diagrams</p> <p><u>Physical chemistry</u>:→ Electrochemistry II! - Kohl. Law, its applications, Calculation of Molar ionic conductance, effect of viscosity, temp. Pressure on it, degree of dissociation, pH, pKa, Buffer soly and Buffer action</p>

Laxmi
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SHAHEED SMARAK P.G. GOVT. COLLEGE TIGAON (FARIDABAD)

LESSON PLAN FOR SESSION 2021-22. (Even Semester) B.Sc. Ist yr (2nd sem)

Subject Name with code and semester:---

Organic + Physical + Chemistry
and
Inorganic
Practicals
CH-104

Teacher Name:--- Dr. Laxmi

MONTH	TOPIC
March 2022	Chemistry Practicals! — Preparation and Purification of Iodoform from ethanol/acetone through crystalli- zation or distillation and ascertaining their purity through melting point or boiling point
April 2022	Preparation and Purification of m-di- nitrobenzene from nitrobenzene, p-Bromo- acetanilide from acetanilide, aspirin from salicylic acid, dibenzalacetone from acetone and benzaldehyde
May 2022	To study the process of sublimation of camphor and phthalic acid
June 2022	Preparation and Purification of Iodoform, Qualitative analysis of the any one of the following inorganic cations and anions by paper chromatography CPb^{2+} , Cu^{2+} , Ca^{2+} , Ni^{2+} , Cl^- , Br^- , I^- and PO_4^{3-} and NO_2^-

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SHAHEED SMARAK P.G. GOVT. COLLEGE TIGAON (FARIDABAD)

LESSON PLAN FOR SESSION 2021-22. (Even Semester) B.Sc 2nd yr [IVth Sem]

Subject Name with code and semester:--- Organic chemistry + chemistry practicals
↓ ↓
CH-103 CH-104

Teacher Name:--- Dr. Laxmi

MONTH	TOPIC
March 2022	<u>IR absorption spectroscopy</u> ! - Mol. vibrations, selection rule, Hooke Law, Intensity and position of IR bands, Measurements of IR spectrum, its interpretation and Application of IR <u>chemistry Practical</u> ! → Gravimetric Analysis! - Determine the conc. of given $KMnO_4$ / $K_2Cr_2O_7$ soln. Preparation of Cuprous chloride.
April 2022	<u>Amines</u> ! → structure and Nomenclature of amines physical and chemical properties, Methods of formation separation of mixture to 1°, 2°, 3° amines. <u>chemistry Practical</u> ! → Preparation of Prussian blue from iron fillings, tetraamine cupric sulphate, chromalum, potassium trioxalatochromate (III)
May 2022	<u>Diazonium salts</u> ! - structure, Mechanism of diazotisation, coupling rxn and its applications Preparation of nitroalkane and nitro arenes & their chemical rxn. <u>Practicals</u> ! - To determine enthalpy of neutralisation of WA/WB vs SA/SB, its enthalpy of ionisation (of WA/WB), To determine enthalpy of soln. of solid $CaCl_2$, study distribution of iodine between two soln.
June 2022	<u>Aldehyde & Ketones</u> ! - Nomenclature, structure Preparation and physical-chemical properties <u>Practicals</u> ! - To determine CST of phenol-water system, To determine solubility of benzoic acid at various temp. and to determine the ΔH of the dissolution process.

Laxmi
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