Shyam Lal College

Teaching Plan (January 2024, even Semester)
B.Sc. IInd Year (Hons.), Semester IV, and B.Sc. Ist Year (Prog.) Semester II.

By
Dr. Ompal Singh Yadav

Week days	Topics to be covered
Week -01	Werner's Coordination theory, simple problems based on this theory. Electronic configuration of the atoms.
Week-02	IUPAC nomenclature of coordination compounds Stability of half –filled and completely filled orbitals.
Week-03	Isomerism in coordination compounds (coordination numbers 4) Concept of exchange energy, inert pair effect.
Week-04	Isomerism in coordination compounds (coordination numbers 6) General group trends of s, p and d block elements.
Week-05	Valence bond theory and its application to complexes of coordination numbers 4 and 6. Ionization Enthalpy, Electron gain enthalpy.
Week-06	Crystal field theory, measurement of Δo. Calculation of CFSE in weak and strong fields, concept of pairing energies. Electronegative
Week-07	Factors affecting the magnitude of Δo. Octahedral vs. tetrahedral coordination. Enthalpy of Atomiczation, oxidation state.
Week-08	Tetragonal distortions from octahedral geometry: Jahn-Teller theorem, square planar geometry. Colour, Metallic character.
Week-09	Qualitative aspect of Ligand field and MO Theory (for octahedral σ-donor, π- acceptor and π- donor complexes). Magnetic properties.

Week-10	Semester Break
Week-11	**Stability of complexes and Inorganic Reaction Mechanism:** Brief discussion of thermodynamic and kinetic stability. Catalytic properties.
Week-12	Factors affecting stability of complexes, such as chelate effect. Ability to form complex.
Week-13	Macrocyclic effect, resonance effect etc., trends in step wise formation constant, interpretation of lability and inertness based on VBT and CFT. General Characteristic of ionic bonding, Lattice Enthalpy and Salvation.
Week-14	Introduction to inorganic reaction mechanisms, concept of reaction pathways, transition state, intermediate and activated complex. Enthalpy and there relation to stability and solubility of ionic compounds.
Week-15	Substitution reactions in square planar complexes. Born –Lande equation for calculation of Lattice Enthalpy. Born Haber cycle and its application, polarizing power and polarizability.
Week-16	Factors affecting the rate of Substitution reactions in square planar complexes- such as charge effect, solvent effect and Trans- effect (Theories of trans-effect). Fajan's rules, ionic character in covalent compounds, bond moment and percentage ionic character.