

Semester - II

MCH -201: Inorganic Chemistry II

Unit - 1

**Electronic Spectral Studies of Transition Metal Complexes :**

Spectroscopic ground states, correlation, Orgal and Tanabe – Sugano diagrams for transition metal complexes (  $d^1$ -  $d^9$  states ), Selection rules for electronic scopy, intensity of various type electronic transition, Calculation of  $Dq$ ,  $B$  and  $\beta$  parameters, charge transfer spectra.

Unit - 2

**Magnetic Properties of Transition metal Complexes :**

Type of magnetic bodies, two sources of paramagnetism, orbital and spin effect, Curie equation and Curie – wies law, Determination of magnetic susceptibility, Quenching of orbital contribution, Anomalous magnetic moment, Spin-cross over and exchange coupling.

Unit- 3

**Metal  $\pi$  complexes :**

Metal carbonyl: Preparation, structure and bonding, vibrational spectra and important reactions of metal carbonyls, preparation, bonding, structure of transition metal nitrosyl, dinitrogen and dioxygen complexes, tertiary phosphine as ligand.



## Unit - 4

### Metal Clusters :

Higher boranes, carboranes, metelloboranes and metallocarboranes compounds, dinuclear, trinuclear, tetranuclear, hexanuclear clusters with metal metal multiple bonds.

## Unit - 5

### Optical Rotatory Dispersion and Circular Dichroism :

Linearly and circularly polarized lights: optical rotatory power and circular birefringence, Ellipticity and circular dichroism, ORD and Cotton effect, Faraday and kerr effects, Assignment of electronic transitions, application of ORD and CD for the determination (i) absolute configuration of complexes and (ii) isomerism due to non planarity of chelate rings.

### Book Suggested

1. Advanced Inorganic Chemistry, F. A. Cotton and G. Wilkinson. JohnWiley.
2. Inorganic Chemistry, J. E. Huheey, Harper and Row.
3. Chemistry of the element, N. N. Greenwood and A. Ernschow. Pergamon.
4. Inorganic Electronic Spectroscopy, A. B. P. LEVER, Elsevier.
5. Magnetochemistry, R. 1. Carlin, Springer verlag.
6. Comprehensive Coordination Chemistry eds. G. Wilkinson, R. D. Gillars and J. A. Mc Cleverty,pergamon.
7. Element of Magnetochemistry. A. Shyamal & R.L. Dutta.

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