

INORGANIC CHEMISTRY (BS-ADP 5th Semester)

Module Code:	Chem-305
Module title:	Chemical Bonding Theories
Name of Scheme:	BS-ADP 5th Semester
Department:	School of Chemistry
Faculty:	Science
Module Type:	Compulsory
Module Rating:	2 credits

OBJECTIVES

This course will help in understanding basic principles of chemical Bonding and Coordination Compounds. This will assist students in understanding the structural chemistry of metal complexes and inorganic molecules.

SYLLABUS OUTLINE:

Theoretical aspects of inorganic compounds:

- (a) VSEPR model followed by VB theory (Hybridization, Resonance etc.,) explanation of the structure of AB₂, AB₃, AB₂E, AB₄, AB₃E, AB₂E₂, AB₅, AB₃E₃, AB₆, AB₅E, AB₄E₂, AB₇, AB₆E, AB₈ and AB₉ type molecules.
- (b) Discussion of molecular orbitals and molecular structures of homo nuclear molecules and ions, hetero nuclear diatomic and polyatomic molecules and ions.
- (c) Bent bond, bridge bond, four electrons-three centre bond.
- (d) Shielding effect and effective nuclear charge, Factors affecting the magnitude of σ and Z_{eff} and their variation in the period table, Applications of Slater's rules, Polarization of ions, Fajan's rules and its applications.
- (e) Correlation diagram for triatomic and tetraatomic molecules.
- (f) Metallic bond on the basis of band model, X-ray spectra and N(E) curves, n(E) curves. Binding energy in metals, conductors, semi-conductors and insulators. Effect of temperature and impurities on conductivity.

RECOMMENDED BOOKS:

1. Theoretical Principles of Inorganic Chemistry by Manko, G.S. 1980, McGraw Hill.
2. Coordination Chemistry by B.A. Basallo and R. Johnson 1972 W.A. Benhamen, London.
3. Coordination Compounds by S.F.A. Kettle, 1971, Nelson, (Nauohi Kenya).
4. Selected topics of Inorganic Chemistry by G.D Tuli.
5. Haq Nawaz Bhatti and Rabia Rehman, "Advanced Inorganic Chemistry", Carvan Book House Lahore.
6. Stereochemistry and bonding in Inorganic Chemistry by J.E. Ferguson 1974, Prentice Hall, New Jersey.
7. Advanced Inorganic Chemistry by F.A. Cotton and G. Wilkineon 1972, Interscience, Publishers, London.