

Basics of Inorganic Chemistry I

Course Code: BEB106

Credit: 04 (L-3, T-1, P-0)

Contact Hours: 60

MM: 100

After going through the course the teacher trainee will be able to –

- Understand atomic structure and bonding models.
- Students can write electronic configuration of atoms and ions, understanding the meaning of ground versus excited state.
- They can now predict variation in atomic properties with position in the periodic table.

Course Outline:

Unit I: Atomic Structure

- Bohr's atomic model: Bohr's Theory as applied to hydrogen atom and its limitations
- de Broglie's concept of dual nature of matter: de Broglie's wave equation;
- confirmation of quantization of angular momentum (Bohr's theory) by de Broglie's concept
- Pauli's exclusion Principle Hund's rule of maximum multiplicity; Rule of stability of half – filled and completely filled orbitals, Aufbau's Principle. (n+1) rule
- Electronic configuration of elements up to Atomic No. 30

Unit II: Chemical Bonding-I

- Different types of Chemical Bonds; Ionic bond, Covalent bond, Coordinate bond, Failure of octet rule,
- Valence Bond Theory, σ and π bonds
- Dipole moment and its applications; Concept of resonance; Fajjan's Rules; Diagonal relationship; Hydrogen Bonding; Vander Waals forces. Bond length, Bond angle, bond energy and their applications; Bond order or bond multiplicity

Unit III: Chemical Bonding-II

- Salient features of Molecular Orbital Theory, Characteristics of π – molecular orbitals; Comparison of (i) bonding and antibonding molecular orbitals (ii) sigma and pi molecular orbitals; Comparison between VBT and MOT.
- VSEPR Theory – assumptions and postulates of VSEPR Theory:
- shapes of molecules and ions; Hybridization: salient features and rules of hybridization; different types of hybridization.

Unit IV: Chemistry of s block elements

- Introduction and General Characteristics; Group IA: H, Li, Na, K, Rb, Cs, Fr (Alkali metals);
- Group IIA: Be, Mg, Ca, Sr, Ba, Ra (Alkaline earth metals); Comparison between alkaline earth metals and alkali metals;
- Magnesium acting as a bridge between groups IIA and IIB elements.


Unit V: Chemistry of p block elements


- Introduction and general characteristics; (Except Metallurgy)
- Group IIIA: B, Al, Ga, In, Tl;
- Group IVA: C, Si, Ge, Sn, Pb;
- Group VA: N, P, As, Sb, Bi;
- Group VIA: O, S, Se, Te, Po;
- Group VII A: F, Cl, Br, I, At (Halogens);

Suggested Reading:


- Advanced Inorganic Chemistry Vol. I & II by Satya Prakash, G. D. Tuli, S. K. Basu & R. D. Madan S Chand & Sons
- Selected Topics in Inorganic Chemistry by Wahid U. Malik, G. D. Tuli, R. D. Madan, S Chand.


Registrar
Invertis University
Bareilly


Dean
Faculty of Education
Invertis University


Faculty of Education
Invertis University

- Basic Inorganic Chemistry by Cotton, Wilkinson & Gaus John - Wiley.
- Advanced Inorganic Chemistry by Cotton F. Albert John - Wiley.
- Concise Inorganic Chemistry by J. D. Lee Blackwell.
- Inorganic Chemistry: Principles of Structure & Reactivity By Huheey, E. A. Keiter, R. Keiter, O. K. Medhi, Pearson Publications.
- Vogel, A.I. A text book of quantitative Inorganic Analysis, ELBS. 1978.



Faculty of Education,
Invertis University
Bareilly-243123, U.P.



Head
Department of Education
Faculty of Education & Mass Comm.
Invertis University, Bareilly (UP)



Registrar
Invertis University,
Bareilly