

ACADEMIC PLANNER & UNITIZATION OF SYLLABUS

Department of Chemistry

Bankura Christian College

ACADEMIC YEAR: 2023-24 (Even Semester: January, 2023 to June, 2023)

2nd Semester (GE) Theory

GE T2: Inorganic Chemistry-II

Name of Chapter: Chemical Bonding and Molecular Structure

Name of faculty member: Dr. Saugata Sain

Unit – 1:

Ionic Bonding: General characteristics of ionic bonding. Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds. Statement of Born-Landé equation for calculation of lattice energy, Born-Haber cycle and its applications, polarizing power and polarizability. Fajan's rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character.

Unit – 2:

Covalent bonding: VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements.

Unit – 3:

Concept of resonance and resonating structures in various inorganic and organic compounds.

Unit – 4:

MO Approach: Rules for the LCAO method, bonding and antibonding MOs and their characteristics for s-s, s-p and p-p combinations of atomic orbitals, nonbonding combination of orbitals, MO treatment of homonuclear diatomic molecules of 1st and 2nd periods. (including idea of s-p mixing) and heteronuclear diatomic molecules such as CO, NO and NO⁺. Comparison of VB and MO approaches.

MONTH	WEEK	TOPICS to be TAUGHT
March	2	General characteristics of ionic bonding. Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds.
March	3	Statement of Born-Landé equation for calculation of lattice energy, Born-Haber cycle and its applications.
March	4	Polarizing power and polarizability. Fajan's rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character.
April	1	VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR
April	2	Hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements.
April	3	Concept of resonance and resonating structures in various inorganic and organic compounds.

April	4	Revision of Unit-1
May	1	Revision of Unit-2 & Unit-3
May	2	MO Approach: Rules for the LCAO method, bonding and antibonding MOs and their characteristics for s-s, s-p and p-p combinations of atomic orbitals and nonbonding combination of orbitals
May	3	MO treatment of homonuclear diatomic molecules of 1st and 2nd periods. (including idea of s- p mixing)
May	4	Heteronuclear diatomic molecules such as CO, NO and NO+. Comparison of VB and MO approaches.
June	1	Revision of Unit-4
June	2	Class Test: Unit-1& Unit-2
June	3	Class Test: Unit-3 & Unit-4