SRI VENKATESWARA UNIVERSITY - TIRUPATI

B.S.c., (Honours) in **CHEMISTRY**

(W.E.F. Academic Year 2023 - 24)

II-SEMESTER

(MINOR)

Course Code 1:GENERAL AND INORGANIC CHEMISTRY

Credits:03

Course Out comes : At the end of the course the student will be able to

1. Understand the structure of atom and the arrangement of elements in the periodic table.
2. Understand the nature and properties of ionic compounds.
3. Identify the structure of a given inorganic compound.
4. Explain the existence of special types of compounds through weak chemical forces.
5. Define acid sand base sand predict the nature of salts.

Syllabus:

Unit I: Atomic Structure and Periodic table (9h)

Electronic configuration: Bohr theory, duel nature of electrons, Heisenberg uncertainty principle, the Schrodinger equation, significance of wave functions, radial and angular wave functions, Pauli's exclusion principle, Hund's rule, sequence of energy levels (Aufbau principle).

Periodicity: periodic lawand arrangement of elements in the periodic table, IUPAC nomenclature and group number, horizontal, vertical, and diagonal relationships in the periodic table.General properties of atoms: size of atoms and ions-atomic radii, ionic radii, covalent radii; trend in ionic radii, ionization potential, electron affinity; electronegativity. oxidation states and variable valency, inert-pair effect.

UNIT2: Ionic bond (9h)

Properties of ionic compounds, factors favouring the formation of ioniccompoundsLatticeenergy:definition,factorsaffectinglatticeenergy,Born-Habercycle-enthalpyofformationofioniccompound and stability. Solubility and thermal stability of ionic compounds. Covalent character in ionic compounds. solubility, melting points, and thermal stability of typical ionic compounds.

UNIT3: The Covalent Bond (9 h)

Valance Bond theory-arrangement of electrons in molecules, hybridization of atomic orbitals and geometry of molecules-$BeCl_2$, BF_3, CH_4, PCl_5, SF_6– VSEPR model- effect of bonding and nonbonding electrons on the structure of molecules, effect of electro negativity,Iso electronic principle, illustration of structures by VESPR model-NH_3,H_2O,SF_4, XeF_4, XeF_6

Molecular orbital theory -LCAO method, construction of M.O. diagrams for homo- nuclear and hetero-nuclear diatomic molecules (N_2, O_2, CO and NO)

UNIT4:MetallicandWeakBonds (9 h)

The Metallic bond: metallic properties, free electron theory, Valence Bond Theory, band theory of metals. Explanation of conductors, semiconductors and insulators.

Weak bonds: hydrogen bonding-intra- and intermolecular hydrogen bonding, influence on the physical properties of molecules, and properties of hydrogen bonded N, O and F compounds; ion dipole-dipole interactions.

UNIT 5:Acids and Bases (9h)

Theoriesofacidsandbases:Arrheniustheory,Bronsted-Lowrytheory,Lewistheory, the solvent system, Nonaqueous solvents: classification-protonic and aprotic solvents, liquid ammonia as solvent.

Typesofchemicalreactions:acid-base,oxidation-reduction,calculationofoxidation number. Definition of pH, Types of salts, Salt hydrolysis. Pearson's concept, HSAB principle & its importance.

List of Reference Books:

1. J.D. Lee, Concise InorganicChemistry,5th ed.,BlackwellScience,London,1996.
2. .B.R. Puri , L.R. Sharma, K.C.Kalia, Principles of Inorganic Chemistry, Shoban Lal Nagin Chand and Co., 1996.
3. D.F.ShriverandP.W.Atkins,InorganicChemistry,3rd ed.,W.H.Freeman and Co, London.

SRI VENKATESWARA UNIVERSITY - TIRUPATI
B.S.c., (Honours) in **CHEMISTRY**
FIRST YEAR – II SEMESTER(MINOR)

(W.E.F. Academic Year 2023 - 24)

Course Code 3:GENERAL AND INORGANICCHEMISTRY

Credits:01

PRACTICAL-IQUALITATIVE ANALYSISOFSIMPLE SALT

Qualitative inorganic analysis(Minimum of Six simple salts should be analysed) 50 M

I. Course outcomes:

At the end of the course, the student will be able to;

1. Understand the basic concepts of qualitative analysis of inorganic simple salt.
2. Useglassware,equipmentandchemicalsandfollow experimentalprocedures in the laboratory
3. Applytheconceptsofcommonioneffect,solubilitypro ductandconceptsrelated to qualitative analysis

II. Laboratory course

Syllabus: Analysis of Simple Salt 50M

Analysis of simple salt containing ONE anion and ONE cation from the following:

Anions: Carbonate, Sulphate, Chloride,

Bromide, Acetate, Nitrate, Borate, Phosphate.

Cation

s:Lead,Copper,Iron,Aluminium,Zinc,Manganese,

Calcium, Strontium, Barium, Magnesium and

Ammonium.

Co-curricular activities and Assessment Methods

1. Continuous Evaluation: Monitoring the progress of student's learning.

2. Class Tests, Worksheets and Quizzes

3. Presentations, Projects and Assignments and Group Discussions: Enhances critical thinking skills and personality

4. SEMESTER-End Examination: critical indicator of student's learning and teaching methods adopted by teachers through out the SEMESTER

Reference books:

1.Vogel'sQuanlitative Inorganic Analysis, Seventh edition, Pearson.