

SCA-S. 402
Andhra University

Department of Inorganic and Analytical Chemistry

M.Sc Fianl Chemistry

Syllabus for IVth Semester

Specialisation : *Analytical Chemistry*

Paper – II Traditional Methods of Analysis - II

W.E.S. 2005-2006 Adm. Head Balakrishna

Unit – I Precipitation methods - 1

- (a) Crystal habit and super saturation, nucleation and crystal growth, homogeneous and heterogeneous nucleation, solubility and particle size, colloids, completeness of precipitation, effect of excess precipitant, pH, complex formation, temperature, purity of precipitates, aging.
- (b) *Co-precipitation and post precipitation* : theory of adsorption of salts having an ion in common with the main precipitate, co-precipitation in colloidal precipitates, adsorption of solvents, mixed crystal formation by occlusion and entrapment, re-precipitation with examples, Post-precipitation – theory of post-precipitation, examples of post-precipitation, conditions for obtaining pure and quantitative precipitates.
- (c) *Precipitation Titrations* : Principle, Indicators for precipitation titrations, determination of halides.

Unit – II Precipitation methods - 2

- (a) *Precipitation from Homogeneous Solution (PFHS)*: theory of PFHS, methods of PFHS – increase in pH, decrease in pH, cation release, anion release, reagent synthesis, change in oxidation state, photochemical reactions, precipitation from mixed solvents
- (b) *Gravimetric determinations*: nature of species, preparation of solutions, limitations, interferences, inorganic precipitants-chloride and sulphate, organic precipitants-dimethyl glyoxime (DMG), oxine, benzidine, salicylaldehyde, benzoin oxime, sodium tetraphenyl boron, tetraphenyl arsonium chloride.
- (c) *Electro-gravimetric analysis*: principle, important terms in electrogravimetry, decomposition voltage or decomposition potential, over voltage and their importance, instrumentation, electrolysis at constant current, determination of Co^{2+} by constant current electrolysis, electrolysis at controlled potentials, determination of Cu, Pb, Sn in brass and bronze by controlled potential electrolysis.

Unit – III Reductant systems – Principles and applications in analysis

Analytical chemistry of some selected reductant systems – formal, standard and normal potentials in various media, stability of the solutions, species responsible for the reduction properties, standardization, requirement for the selection of the reductants, selection of suitable indicators for various reductant systems.

- (a) Inorganic Systems – Cr (II), V (II), Ti (III), Sn (II), Fe (II) in H_3PO_4 and hydrazine,
- (b) Organic Systems – hydroquinone and Ascorbic acid.