

ELECTIVE Paper – VII-(B)

ST. JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM

VI SEMESTER

CHEMISTRY

TIME: 3Hrs/week

CH 6201 (3) ANALYTICAL METHODS IN CHEMISTRY Max. Marks: 60

W.e.f. 2017 – 2018 'AC' Batch SYLLABUS

OBJECTIVES: To enable the students to –

- Study of analytical principles to understand the various steps and mechanisms involved in the conduct of reactions, titrations and –other laboratory techniques.
- Understand the separation techniques in chemical analysis.
- Acquire knowledge of Chromatography.

UNIT-I

1. Quantitative analysis:

a) Importance in various fields of science, steps involved in chemical analysis. Principles of volumetric analysis :. Theories of acid-base, redox, complexometric, iodometric and precipitation titrations - choice of indicators for these titrations.

b) Principles of gravimetric analysis: precipitation, coagulation, peptization, coprecipitation, post precipitation, digestion, filtration and washing of precipitate, drying and ignition.

2. Treatment of analytical data:

Types of errors, significant figures and its importance, accuracy - methods of expressing accuracy, error analysis and minimization of errors, precision - methods of expressing precision, standard deviation and confidence limit.

UNIT-II

3. SEPARATION TECHNIQUES IN CHEMICAL ANALYSIS:

SOLVENT EXTRACTION: Introduction,principle,techniques,factors affecting solvent extraction, Batch extraction, continuous extraction and counter current extraction. Synergism., Application - Determination of Iron (III)

ION EXCHANGE :Introduction,action of ion exchange resins,separation of inorganic mixtuers,applications, Solvent extraction: Principle and process,

4. Chromatography: Classification of chromatography methods, principles of differential migration adsorption phenomenon, Nature of adsorbents, solvent systems, R_f values, factors effecting R_f values.

Paper Chromatography: Principles, R_f values, experimental procedures, choice of paper and solvent systems, developments of chromatogram - ascending, descending and radial. Two dimensional chromatography, applications.

UNIT -III

5. Thin layer Chromatography (TLC): Advantages. Principles, factors effecting R_f values. Experimental procedures. Adsorbents and solvents. Preparation of plates. Development of the chromatogram. Detection of the spots. Applications.

6. Column Chromatography: Principles, experimental procedures, Stationary and mobile Phases, Separation technique. Applications. HPLC : Basic principles and applications.

List of Reference Books

1. Analytical Chemistry by Skoog and Miller
2. A textbook of qualitative inorganic analysis by A.I. Vogel
3. Nanochemistry by Geoffrey Ozin and Andre Arsenault
4. Stereochemistry by D. Nasipuri
5. Organic Chemistry by Clayden

Practical paper – VII B

ST. JOSEPH'S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM

VI SEMESTER

CHEMISTRY

TIME: 3Hrs/week

CH 6253(1) INSTRUMENTAL ANALYSIS & CHROMATOGRAPHY TECHNIQUES

Max. Marks: 50

w. e .f 2017-2018'AC' batch PRACTICAL SYLLABUS

OBJECTIVES: To enable the students to –

- understand the utility and apply pH Meter, Potentiometer and Colorimeter in quantitative chemical analysis
 - study the structure of molecules through interpretation of IR spectral data
1. Acid-base titrations using pH meter.
 2. Red-ox titration of iron (II) with dichromate using Potentiometer
 3. Determination of iron using Colorimeter
 4. Checking the purity of compounds by TLC.
 5. Determination of R_f values and identification of organic compounds by TLC.

REFERENCES :

1. Instrumental methods of chemical analysis B.K.Sharma GOEL Publishing House, Meerut, 26th Edition.
2. Instrumental methods of Analysis – H.H.Willard, L.L. Merritt, J.A.Dean & F.A.Settle – CBS Publishers & Distributors, Delhi – VI Editions.
3. Senior Practical Physical Chemistry – B.D.Khosla, V.C.Garg & Adarsh Khosla, R.Chand & Co., Delhi, V Edition.
4. Instrumental methods of Chemical Analysis – GR Chatwal SK Anand, Himalaya Publishing House V Edition.
5. C N Banwell: Fundamentals of Molecular Spectroscopy