



PARVATHANENI BRAHMAYYA
SIDDHARTHA COLLEGE OF ARTS & SCIENCE
Autonomous
 Siddhartha Nagar, Vijayawada-520010
Re-accredited at 'A+' by the NAAC

22CH4D2:TECHNIQUES FOR MODERN INDUSTRIAL APPLICATIONS

Course Code	22CH4D2	I A Marks	30
No. of Lecture Hours / Week	4	End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Seminar	-	Exam Hours	03

S.No	COURSE OUTCOMES	PO's
	The student will be able to	
1.	Memorise the concepts of purification and chromatographic methods.	2,7
2	Understand the concepts of purification methods and chromatographic methods.	1,2,7
3	Apply the knowledge gained in purification and chromatographic techniques in their chosen job role.	1, 6
4	Analyse that how far the purification and chromatographic techniques are useful in assessing the purity of the compound.	1, 7
5	Evaluate that how far a compound is purified / separated using purification and chromatographic techniques.	1, 7

CO-PO MATRIX								
COURSE CODE 22CH4D2	CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
	CO1		H					M
	CO2	M	M					L
	CO3	H					H	
	CO4	H						M
	CO5	H						M

UNIT-I

Classical Methods of purification

Recrystallization: Basic principles, choice of solvent, seeding, filtration and centrifugation and drying. Concepts of fractional crystallization.

Distillation: Basic principles. Distillation types- continuous distillation, batch distillation, fractional distillation, vacuum distillation and steam distillation.

UNIT-II

Thin Layer chromatography:

Basic Principles. Common stationary phases, Methods of preparing TLC plates, Selection of mobile phase, Development of TLC plates, Rf value. Application of TLC in monitoring organic reactions. identification and quantitative analysis.

UNIT-III

Paper chromatography:

Basic Principles. Ascending and descending types. Selection of mobile phase, Development of chromatograms, One and two dimensional paper chromatography, Applications of paper chromatography.

UNIT-IV

Gas chromatography:

Basic Principles. Different types of GC techniques. Selection of columns and carrier gases. Instrumentation. detectors; Rf values. Applications in the separation, identification and quantitative analysis of organic compounds.

UNIT-V

High Performance liquid chromatography(HPLC):

Basic Principles. Normal and reversed Phases. Selection of column and mobile phase. Instrumentation. Detectors; Rf values. Applications in the separation, identification and quantitative estimation of organic compounds.

SUGGESTED BOOKS:

1. Principles of Instrumental Analysis by D. A. Skoog, F. J. Holler and T. A. Nieman, Harcourt College Pub.
2. Separation Techniques by M. N. Sastri, Himalaya Publishing House (HPH), Mumbai.
3. Bio Physical Chemistry by A. Upadhyay, K. Upadhyay and N. Nath,(HPH) , Mumbai.
4. A Hand Book of Instrumental Techniques for Analytical Chemistry- Ed-F. A. Settle, PrearsonEdn, Delhi.27
5. Introduction to Organic Laboratory Techniques-D. L. Pavia, G. M. Lampman,G. S. Kriz and R. G. Engel, Saunders College Pub (NY).
6. Instrumental methods of Chemical Analysis by B. K. Sharma, Goel Publish House, Meerut.
7. Instrumental methods of Chemical Analysis by H. Kaur, Pragati Prakasan, Meerut.
8. Protein Purification-Principles and practice, III Edn- R. K. Scopes, Narosa Publishing House , Delhi.

**M.Sc. DEGREE EXAMINATION
FOURTH SEMESTER
22CH4D2::TECHNIQUES FOR MODERN INDUSTRIAL APPLICATIONS**

Time: 3 hours

Maximum Marks: 70

SECTION – A

Answer all the questions

5x4=20M

- 1) (a) Discuss the role of choice of solvent in purification of compounds. (CO-2,L-2)
(OR)
(b) Explain the principle involved in batch distillation. (CO-2,L-2)
- 2) (a) Write the basic principle involved in TLC. (CO-2,L-2)
(OR)
(b) Give an account on selection of mobile phase in TLC. (CO-2,L-2)
- 3) (a) Elaborate the role of paper chromatography in separation of components in a mixture. (CO-3,L-3)
(OR)
(b) Describe two dimensional paper chromatography. (CO-3,L-3)
- 4) (a) Explain the basic principle involved in Gas chromatography. (CO-2,L-2)
(OR)
(b) List out various types of carrier gases used in Gas chromatography. (CO-2,L-2)
- 5) (a) Compare normal phase and reverse phase techniques in HPLC. (CO-4,L-4)
(OR)
(b) Write a short note on selection of mobile phase in HPLC. (CO-4,L-4)

SECTION – B

(5x10=50M)

UNIT – I

- 6) (a) Explain the role of the following
(i) seeding (ii) filtration (iii) centrifugation (iv) drying (CO-3,L-3)
(OR)
(b) Explain the role of the following (i) continuous distillation (ii) steam distillation. (CO-3,L-3)

UNIT – II

- 7) (a) What are the methods that are involved in the preparation of TLC plates? Which method is much useful? (CO-4,L-4)
(OR)
(b) Write a note on applications of TLC. Elaborate its role in synthesis. (CO-4,L-4)

UNIT – III

- 8) (a) Elaborate Ascending and Descending paper chromatography. (CO-3,L-3)
(OR)
(b) Write applications of paper chromatography. (CO-3,L-3)

UNIT – IV

- 9)(a) Discuss different types of columns used in gas chromatography. (CO-3,L-3)
(OR)
(b) Explain few applications of gas chromatography. (CO-3,L-3)

UNIT – V

- 10) (a) Describe instrumentation of HPLC. How do you assess the role of various parameters in method development. (CO-5,L-5)
(OR)
b) Give a detailed account on applications of HPLC. Evaluate the importance of HPLC over normal column chromatography. (CO-5,L-5)
