Department of Applied Chemistry

Course completion unit plan

CH-91107

(Analytical Chemistry)

Academic Year 2023-24

Lecture duration = 1 hour

Lecture No.	Date	Topic to be taught	Reference/ Remark
Unit 1: Basics of Analytical chemistry			
1		Introduction of Analytical chemistry: types of analytical techniques.	**Gary D. Christian**
2		Qualitative analysis and Quantitative analysis , and Difference between in it.	-
3		Techniques of Data analysis in different analysis techniques.	-
4.		Techniques of Data Handling in different analysis techniques.	-
5.		Methods of Data interpretation used in analytical techniques.	-
6.		Significant numbers and significant of it	-
7.		Errors and limits , Types of errors , Accuracy and precision	-
8		Mean, Median, Deviation, Standard deviation formula.	
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		Unit 2: Introduction of Spectroscopy	
9		(A)Fundamental principles of Spectroscopy Introduction of EMR, Definition, Properties and parameters	**B.K.sharma Y.R sharma**

10		Electromagnetic spectrum, Spectroscopy , Difference between Spectroscopy and Spectrometry.	-
11		Different spectroscopic methods in different electromagnetic region.	-
12		Types of spectra and interaction mechanism.	-
13		(B) UV and Visible Spectroscopy Types of absorption bands, Diffence between Absorption and Emission spectroscopy.	-
14		Principle , Instrumentation and application of UV spectroscopy.	-
15		Empirical rule for Predicting the onward wavelength of absorption peaks, some examples	-
16		Introduction of Visible Spectroscopy , Its advantages over colorimetery.	-
Unit 3:Different analytical techniques			
17		Principle, Instrumentation of colorimetry.	**B.K. Sharma**
18		Application of colorimetry, introduction of polarization , Plan polarized light(PPL), factors affecting the rotation of PPL.	-
19		Principle, Instrumentation and application of polorimeter.	-
20		Introduction of Conducting cell, types, conductivity, Specific conductance , Molar conductance.	-
21		Factors affecting the conductance , Principle, instrumentation and application of Conductometry.	-
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22		Principle, instrumentation and application of Conductometry.	-
23		Principle, Instrumentation and application of PH metry.	-
24		Principle, Instrumentation and application of Polarography.	-
Unit 4: Separation techniques used in Analysis			
25		Introduction of Separation techniques used in Analysis, Different types of Separation techniques.	A.K. Shrivastav, P.C. Jain

26		Introduction to chromatography, Types of chromatographic methods, mobile phase, stationary phase.	-
27		Principle, Instrumentation and application of Column and Gas chromatography.	-
28		Principle, Instrumentation and application of Paper chromatography.	-
29		Principle, Instrumentation and application of Gas-Liquid chromatography.	-
30		Principle, Instrumentation and application of Ion-Exchange chromatography.	-
31		Introduction of Electrophoresis, types of ele3ctrophoresis, SDS-PAGE Electrophoresis.	-
32		Membrane separation techniques: Bio-separation	Shivashanker B.
Unit 5:ORD and CD, Gravimetric Analysis			
33		Introduction of Absorption and Dispertion optical Activity Fundamental principle of ORD and CD.	**S. Kirschner**
34		Fundamental principle of ORD and CD, circular birefringence.	-
35		Cotton effect, Molecular amplitude, octant rule.	-
36		Helo-ketone rule, Application of ORD and CD.	-
37		Introduction of gravimetric analysis and its types of gravimetric analysis.	-
38		Principle, Instrumentation and application of Thermo-gravimetric analysis	-
49		Principle, Instrumentation and application of Differential Thermo-gravimetric analysis	-
40		Principle, Instrumentation and application of Flame Photometry.	-