

Pharmaceutical Analysis-I

(Code: BP102T)

Semester I - First Year B. Pharmacy

As Per PCI Regulations

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PPH04A Price ₹ 285/-



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First Edition : October 2021 (As per New Syllabus)

This edition is for sale in India, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, Sri Lanka and designated countries in South-East Asia. Sale and purchase of this book outside of these countries is unauthorized by the publisher.

ISBN : 978-93-89889-67-3

Published By

TECHKNOWLEDGE PUBLICATIONS

Printed @

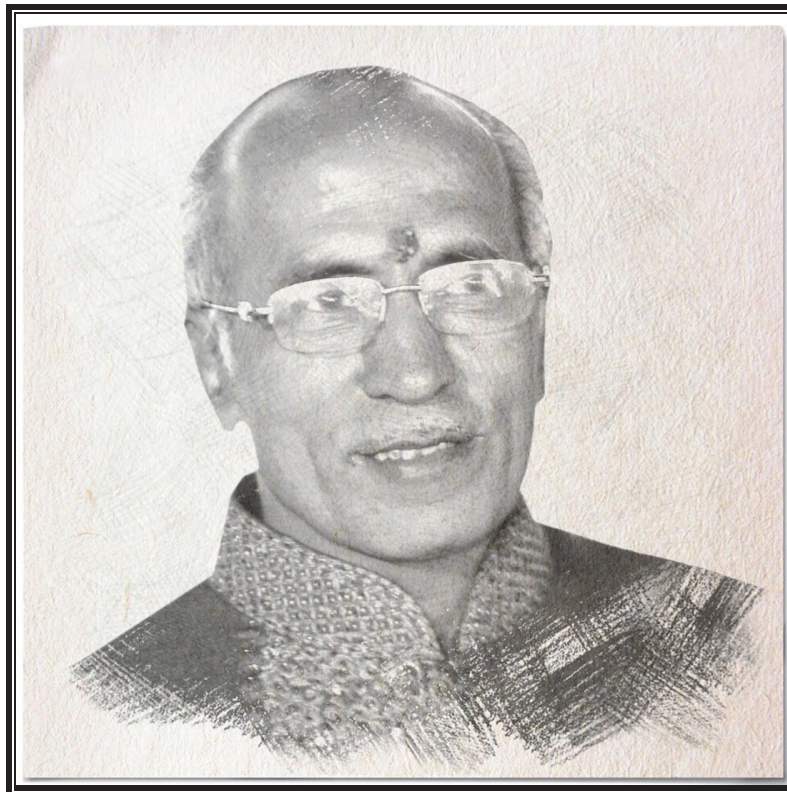
37/2, Ashtavinayak Industrial Estate,
Near Pari Company,
Narhe, Pune, Maharashtra State, India.
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Ph : 91-20-24221234, 91-20-24225678.
Email : info@techknowledgebooks.com,
Website : www.techknowledgebooks.com

Subject Code : BP102T
Book Code : PPH04A

We dedicate this Publication soulfully and wholeheartedly,
in loving memory of our beloved founder director,
Late Shri. Pradeepji Lalchandji Lunawat,
who will always be an inspiration, a positive force and strong
support behind us.



“My work is my prayer to God”

- Lt. Shri. Pradeepji L. Lunawat

**Soulful Tribute and Gratitude for all Your
Sacrifices, Hardwork and 40 years of Strong Vision...**

Preface

My Dear Students,

We extremely happy to present this book on “Pharmaceutical Analysis-I” for you. We have divided the subject into small chapters so that the topics can be arranged and understood properly. The topics within the chapters have been arranged in a proper sequence to ensure smooth flow of the subject.

*We present this book in the loving memory of **Late Shri. Pradeepji Lunawat**, our source of inspiration and a strong foundation of “**TechKnowledge Publications**”. He will always be remembered in my heart and motivate me to achieve my milestone.*

We thankful to Mr. Shital Bhandari, Shri. Arunoday Kumar and Shri. Chandroday Kumar for the encouragement and support that they have extended. We also thankful to Seema Lunawat for technology enhanced reading, E-books support and the staff members of TechKnowledge Publications for their efforts to make this book as good as it is. We have jointly made every possible efforts to eliminate all the errors in this book. However if you find any, please let us know, because that will help us to improve further.

We also thankful to my family members and friends for patience and encouragement.

- Authors



About The Authors

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Dr. Arti Swami

SYLLABUS

PHARMACEUTICAL ANALYSIS - I (BP102T)

Scope

This course deals with the fundamentals of analytical chemistry and principles of electrochemical analysis of drugs.

Objectives

Upon completion of the course a student shall be able to understand :

- *The principles of volumetric and electrochemical analysis.*
- *Carry out various volumetric and electrochemical titrations.*
- *Develop analytical skills*

Course Contents

UNIT I

(a) Pharmaceutical analysis : Definition and scope

(i) Different techniques of analysis

(ii) Methods of expressing concentration

(iii) Primary and Secondary standards

(Refer Chapter 1)

(b) Errors : Sources of errors, types of errors, methods of minimizing errors, accuracy, precision and significant figures. **(Refer Chapter 2)**

(C) Pharmacopoeia : Sources of Sources of impurities in medicinal agents, limit tests. **(Refer Chapter 3)**

UNIT II

(a) Acid base titration : Theories of acid base indicators, classification of acid base titrations and theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves. Preparation and standardization of sodium hydroxide, hydrochloric acid, sulphuric acid, Estimation of ammonium chloride. **(Refer Chapter 4)**

(b) Non aqueous titration : Solvents, acidimetry and alkalimetry titrations, and estimation of sodium benzoate. **(Refer Chapter 5)**

UNIT III

(a) Precipitation titrations : Mohr's method, Volhard's method, Modified Volhard's method, Fajans method, and estimation of Sodium Chloride I.P. **(Refer Chapter 6)**

(b) Complexometric titration : Classification, metal ion indicators, masking and demasking reagents, and estimation of Calcium gluconate I.P. **(Refer Chapter 7)**

(c) Gravimetry : Principle and steps involved in gravimetric analysis. Purity of the precipitate : co-precipitation and post precipitation, and estimation of Barium sulphate I. P. **(Refer Chapter 8)**

UNIT IV

Redox titrations

(i) Concepts of oxidation and reduction

(ii) Preparation and standardization of Potassium Permanganate I. P., Ceric Ammonium Sulphate I.P./B. P. and Sodium Thiosulphate I. P./B. P. **(SPPU)**

(iii) Types of redox titrations (Principles and applications) : Permanganometry, Cerimetry, Iodimetry, Iodometry, Bromatometry, Dichrometry, Titrations with Potassium Iodate I. P. **(Refer Chapter 9)**

UNIT V

(a) Electrochemical methods of analysis **(Refer Chapter 10)**

(i) Conductometry : Introduction, Conductivity cell, Conductometric titrations, applications.

(Refer Chapter 11)

(ii) Potentiometry : Electrochemical cell, construction and working of reference (Standard Hydrogen Electrode, Silver Chloride Electrode and Calomel Electrode) and Indicator Electrodes (Metal electrodes and Glass Electrode), methods to determine end point of potentiometric titration and applications. **(Refer Chapter 12)**

(iii) Polarography : Principle and Ilkovic Equation.

(Refer Chapter 13)

(b) Refractometry : Introduction, refractive index, specific and molar refraction, measurement of RI, Abbe's refractometer and applications. **(SPPU)** **(Refer Chapter 14)**

Unit I**Chapter 1 : Pharmaceutical Analysis 1-1 to 1-17**

Syllabus : Definition and scope (i) Different techniques of analysis, (ii) Methods of expressing concentration, (iii) Primary and secondary standards, (iv) Preparation and standardization of various molar and normal solutions- Oxalic acid, sodium hydroxide, hydrochloric acid, sodium thiosulphate, sulphuric acid, potassium permanganate and ceric ammonium sulphate.

1.1	Introduction.....	1-1
1.1.1	Definition.....	1-1
1.1.2	Scope.....	1-1
1.2	Different Techniques of Analysis.....	1-2
1.2.1	Based upon Type of Method.....	1-2
1.2.1(A)	Qualitative Analysis.....	1-2
1.2.1(B)	Quantitative Analysis.....	1-2
1.2.2	Based upon its Nature.....	1-2
1.2.2(A)	Chemical Methods.....	1-3
1.2.2(B)	Electrochemical Methods.....	1-6
1.2.2(C)	Instrumental Methods of Analysis.....	1-6
1.2.2(D)	Biological Methods.....	1-7
1.3	Methods of Expressing Concentration.....	1-7
1.3.1	The Chemical Method of Expressing Concentration.....	1-7
1.3.2	Percent Concentration.....	1-7
1.4	Primary and Secondary Standards.....	1-8
1.4.1	Primary Standard Solution.....	1-8
1.4.2	Secondary Standard Solution.....	1-9
1.5	Preparation and Standardization of Various Molar and Normal Solutions.....	1-10
1.5.1	Sodium Hydroxide.....	1-11
1.5.2	Hydrochloric Acid.....	1-12

1.5.3	Sodium Thiosulphate.....	1-12
1.5.4	Sulphuric Acid.....	1-13
1.5.5	Potassium Permanganate.....	1-13
1.5.6	Ceric ammonium Sulphate.....	1-14
1.5.7	Calculations.....	1-14

Chapter 2 : Errors 2-1 to 2-15


Syllabus : Sources of errors, types of errors, methods of minimizing errors, accuracy, precision and significant figures.

2.1	Introduction.....	2-1
2.1.1	Sources of Errors.....	2-1
2.1.2	Basic Terminology.....	2-2
2.2	Types of Errors in Pharmaceutical Analysis.....	2-3
2.2.1	Systematic or Determinate Errors.....	2-3
2.2.2	Indeterminate (Random) Errors.....	2-6
2.2.3	Gross Error.....	2-7
2.3	Methods of Minimizing Errors.....	2-7
2.4	Accuracy and Precision.....	2-10
2.4.1	Accuracy.....	2-10
2.4.2	Precision.....	2-10
2.5	Significant Figures.....	2-12
2.5.1	Rules and Conventions for Significant Figures.....	2-13
2.5.2	Conventions Addressing Significant Figures.....	2-13

Chapter 3 : Pharmacopeia 3-1 to 3-30

Syllabus : Pharmacopoeia, Sources of impurities in medicinal agents, limit tests.

3.1	Introduction.....	3-1
3.1.1	History of Pharmacopoeia.....	3-1
3.1.2	Indian Pharmacopoeia (IP).....	3-3
3.1.3	British Pharmacopoeia (BP).....	3-5
3.1.4	United State Pharmacopoeia (USP).....	3-6

3.1.5	Pharmacopoeia Internationals (International Pharmacopoeia).....	3-7	4.7.1	Neutralization curve for Strong Acid and Strong Base Titration.....	4-16
3.1.6	Martindale : The extra Pharmacopoeia.....	3-7	4.7.2	Neutralization Curve for Weak Acid and Strong Base Titration.....	4-18
3.1.7	Pharmaceutical Index.....	3-7	4.7.3	Neutralization Curve for Weak Base and Strong Acid Titration	4-21
3.2	Pharmacopoeial Description/Presentation	3-8	4.7.4	Neutralization curve for Weak Acid and Weak Base Titration.....	4-22
3.3	Sources of Impurities in Medicinal Agents	3-14	4.8	Standardization and Assay of Pharmaceuticals by Acid Base Titration	4-23
3.4	Limit tests.....	3-19	4.9	Applications of Acid-Base Titration	4-24
3.4.1	Limit Test for Chloride.....	3-19	<hr/>		
3.4.1(A)	Modified Limit Test for Chlorides.....	3-20	Chapter 5 : Non-aqueous Titration 5-1 to 5-12		
3.4.2	Limit Test for Sulphate	3-21	<hr/>		
3.4.2(A)	Modified Limit Test for Sulphates.....	3-22	Syllabus : Solvents, acidimetry and alkalimetry titration and estimation of Sodium benzoate and Ephedrine HCl.		
3.4.3	Limit Test for Iron.....	3-23	5.1	Introduction.....	5-1
3.4.4	Limit Test for Arsenic.....	3-24	5.1.1	Theory of Non-aqueous Acids and Bases	5-1
3.4.5	Limit Test for Lead.....	3-26	5.1.2	Advantages and Disadvantages of Non-aqueous Titration.....	5-2
3.4.6	Limit Test for Heavy Metals	3-27	5.1.3	Need of Non-aqueous Titrations	5-3
Unit II			5.2	Solvents used in Non-aqueous Titration	5-3
<hr/>			5.2.1	Properties of Solvent used in Non-aqueous Titration.....	5-4
Chapter 4 : Acid Base Titration 4-1 to 4-25			5.2.2	Different Types of Solvent used in Non-aqueous Titration.....	5-4
<hr/>			5.3	Types of Non-aqueous Titrations.....	5-8
Syllabus : Theories of acid base indicators, classification of acid base titrations and theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves.			5.3.1	Alkalimetry Titration.....	5-8
4.1	Introduction.....	4-1	5.3.2	Acidimetry.....	5-9
4.2	Concept of Acids and Bases.....	4-1	5.4	Estimation of Sodium Benzoate and Ephedrine Hydrochloride.....	5-10
4.2.1	Arrhenius Theory.....	4-1	5.4.1	Sodium Benzoate (C ₆ H ₅ COONa)	5-10
4.2.2	Lowry and Bronsted Theory.....	4-2	<hr/>		
4.2.3	Lewis Theory.....	4-3			
4.3	Theory involved in Acid-Base Titration	4-4			
4.4	Concept of Strong and Weak-Acids and Bases.....	4-6			
4.5	Buffer Equation and Buffer Capacity	4-7			
4.6	Theories of Acid-Base Indicators	4-11			
4.7	Neutralization Curve.....	4-16			

5.4.2	Ephedrine Hydrochloride	5-11
5.5	Applications of Non-aqueous Titration	5-11

Unit III

Chapter 6 : Precipitation Titration 6-1 to 6-16

Syllabus : Mohr's method, Volhard's, Modified Volhard's, Fajans method, estimation of sodium chloride.

6.1	Introduction	6-1
6.1.1	Theory of Precipitation	6-1
6.2	Solubility Product and Precipitation	6-2
6.3	Factors Affecting Solubility	6-3
6.3.1	Common Ion Effect	6-3
6.3.2	Effect of Temperature	6-5
6.3.3	Effect of Solvent	6-5
6.3.4	Effect of pH	6-5
6.4	Titration Curve	6-6
6.4.1	Phases in Titration Curve	6-6
6.5	Detection of Endpoint	6-7
6.5.1	Formation of Coloured Precipitate (Mohr's Method)	6-7
6.5.1(A)	Precipitation Titration based on Mohr's Method	6-9
6.5.2	Formation of Soluble Coloured Compound (Volhard's Method)	6-10
6.5.2(A)	Preparation and Standardization of 0.1 M Ammonium Thiocyanate	6-11
6.5.2(B)	Modified Volhard's Method	6-12
6.5.3	Adsorption Indicator (Fajan's Method)	6-13
6.5.4	Turbidity Method (Gay Lussac's Method)	6-15
6.6	Application of Precipitation Titration	6-15

Chapter 7 : Complexometric Titration 7-1 to 7-24

Syllabus : Classification, metal ion indicators, masking and demasking reagents, estimation of Magnesium sulphate, and calcium gluconate I.P.

7.1	Introduction	7-1
7.2	Ligands (Complexing Agents)	7-2
7.2.1	Classification of Ligands	7-3
7.2.2	Chelating Agents	7-3
7.2.3	Bonding in Complexes	7-4
7.2.4	Coordination Number or Werner Coordination Number	7-4
7.2.5	Disodium EDTA as a Complexing Agent	7-6
7.3	Stability of Complexes	7-7
7.3.1	Factors affecting Stability Constant in Complex Formation	7-8
7.4	Types of Complexometric Titration	7-10
7.5	Detection of Endpoint	7-11
7.5.1	Visual Indicators	7-12
7.5.1(A)	Metallochromic Indicators/pM Indicators/Metal Indicators	7-12
7.5.1(B)	pH Indicators in Complexometric Titrations	7-16
7.5.2	Instrumental Methods	7-16
7.5.3	Titration Curve	7-17
7.6	Titration of Mixtures	7-18
7.6.1	Masking Agents	7-18
7.6.2	Demasking Agents	7-19
7.7	Estimation of Magnesium Sulphate and Calcium Gluconate	7-20
7.7.1	Estimation of Magnesium Sulphate	7-21
7.7.2	Estimation of Calcium Gluconate	7-22
7.8	Applications of Complexometric Titration	7-23

Chapter 8 : Gravimetry 8-1 to 8-27

Syllabus : Principle and steps involved in gravimetric analysis. Purity of the precipitate: co-precipitation and post precipitation, and estimation of Barium sulphate I. P.

8.1	Introduction	8-1
-----	--------------------	-----

8.1.1	Classification of Gravimetric Analysis.....	8-1	9.1	Introduction.....	9-1
8.1.2	Advantages and Disadvantages of Gravimetric Analysis	8-2	9.2	Concepts of Oxidation and Reduction.....	9-1
8.2	Steps Involved in Gravimetric Analysis (Unit Operations)	8-3	9.2.1	Oxidation.....	9-1
8.3	Precipitation	8-8	9.2.1(A)	Oxidizing Agents.....	9-1
8.3.1	Theories of Precipitation.....	8-8	9.2.1(B)	Oxidation Number or Oxidation State.....	9-2
8.3.2	General Rules of Precipitation	8-10	9.2.2	Reduction	9-2
8.3.3	Properties of Precipitation	8-11	9.2.2(A)	Reducing Agents	9-3
8.3.4	Conditions of Precipitation.....	8-11	9.3	Half Reaction	9-4
8.3.5	Mechanism of Precipitation	8-11	9.3.2	Balancing of Half Reactions.....	9-4
8.4	Precipitation Process.....	8-11	9.3.2(A)	Electron Balance Method	9-4
8.5	Types of Precipitate	8-15	9.3.2(B)	Ion-Electron Balance Method.....	9-5
8.5.1	Crystalline Precipitate	8-15	9.4	Redox Equivalent Weight.....	9-6
8.5.2	Colloidal precipitate (Curdy Precipitate)	8-16	9.5	Redox Potential.....	9-7
8.5.3	Gelatinous Precipitate.....	8-17	9.5.1	Nernst Equation.....	9-8
8.6	Purity of Precipitate.....	8-18	9.5.1(A)	Equilibrium Constant of Redox System.....	9-9
8.6.1	Co-precipitation.....	8-18	9.6	Detection of End Point.....	9-10
8.6.2	Post Precipitation.....	8-21	9.6.1	Self Indicator	9-11
8.7	Estimation of Barium as Barium Sulphate.....	8-22	9.6.2	External Indicator	9-11
8.8	Applications of Gravimetric Analysis	8-23	9.6.3	Internal Indicators.....	9-11
8.9	Diazotization Titration (Nitrite Titrations)	8-23	9.6.4	Instrumental Techniques	9-13
			9.6.5	Specific Indicator.....	9-13
			9.7	Titration Curve	9-13
			9.8	Types of Redox Titration.....	9-16
			9.8.1	Potassium Permanganate Titration	9-16
			9.8.2	Cerimetry or Cerimetric Titration.....	9-17
			9.8.3	Iodine Titration.....	9-18
			9.8.3(A)	Iodimetric Titration	9-20
			9.8.3(B)	Iodometry Titration	9-21
			9.8.4	Bromatometry (Potassium Bromate Titration)	9-22
			9.8.5	Potassium Dichromate Titration	9-22

Unit IV

Chapter 9 : Redox Titration **9-1 to 9-26**

Syllabus : Concepts of oxidation and reduction, Preparation and standardization of Potassium Permanganate I. P., Ceric Ammonium Sulphate I. P./B. P. and Sodium Thiosulphate I. P./B. P.

Types of redox titrations (Principles and applications) : Permanganometry, Cerimetry, Iodimetry, Iodometry, Bromatometry, Dichrometry, Titrations with Potassium Iodate I.P.

9.8.6	Iodometry (Potassium Iodate Titration).....	9-24
9.9	Application of Redox Titration	9-24

Unit V

Chapter 10 : Electrochemical Methods of Analysis 10-1 to 10-8

Syllabus : Electrochemical Methods of Analysis.

10.1	Types of Electroanalytical Techniques.....	10-1
10.2	Electrochemical Cell.....	10-3
10.3	Conduction of Current in Cell.....	10-4
10.4	Potentials in an Electrochemical Cell	10-4
10.5	Mass Transfer Processes	10-5
10.6	Nernst Equation.....	10-5

Chapter 11 : Conductometry 11-1 to 11-23

Syllabus : Introduction, Conductivity cell, Conductometric titrations, applications..

11.1	Introduction.....	11-1
11.2	Principle of Conductometry	11-1
11.3	Theory and Important Laws with Terms Used in Conductometry.....	11-1
11.3.1	Conductance (G, Reciprocal of Ohms or Mhos)	11-1
11.3.2	Specific Resistance (ρ).....	11-2
11.3.3	Specific Conductance (k)	11-2
11.3.4	Equivalent Conductance (λV).....	11-2
11.3.5	Molecular Conductance (μv).....	11-2
11.3.6	Relation between Specific Conductance and Equivalent Conductance	11-2
11.4	Factors Affecting Conductance	11-3
11.4.1	Dilution.....	11-3
11.4.2	Temperature.....	11-4

11.4.3	Geometry Related Errors (Field Effects) and Size of Electrodes.....	11-4
11.4.4	Ion Mobility/Types of Ions.....	11-4
11.5	Conductance Measurement.....	11-5
11.5.1	Conductivity Cell and Electrodes.....	11-5
11.5.2	Conductivity Water	11-6
11.5.3	Source of AC Current.....	11-7
11.5.4	The Conductivity Meter.....	11-7
11.5.5	Conductivity Bridge (Kohlrausch Bridge).....	11-7
11.6	Method of Conductance Measurement.....	11-8
11.6.1	Cell Constant.....	11-8
11.6.2	Maintenance and Storage of Instrument	11-9
11.7	Conductometric Applications.....	11-9
11.7.1	Ionic Product of Water	11-9
11.7.2	Solubility of Sparingly Soluble Salts.....	11-10
11.7.3	Degree of Dissociation of Weak Electrolytes.....	11-10
11.7.4	Basicity of Organic Acids	11-11
11.7.5	Degree of Hydrolysis	11-11
11.7.6	Total Organic Content (TOC) Determination.....	11-11
11.7.7	Determination of Total Dissolved Solids (TDS, mg/l).....	11-12
11.7.8	Salinity Measurements.....	11-12
11.7.9	Conductometric Titrations	11-12
11.7.9(A)	Neutralization Titration.....	11-13
11.7.9(B)	Replacement Titrations.....	11-16
11.7.9(C)	Precipitation Titration.....	11-16
11.7.9(D)	Complexometric Titrations	11-18
11.7.9(E)	Redox (Oxidation-Reduction) Titrations.....	11-18
11.8	Recommendations for Maintenance and Storage	11-20

11.9	Comparison of Potentiometric and Conductometric Techniques	11-20
11.10	Contactless Conductivity Measurements (C4D) or High Frequency Titrations (HFT)	11-21

Chapter 12 : Potentiometry **12-1 to 12-26**

Syllabus : Electrochemical cell, construction and working of reference (Standard Hydrogen Electrode, Silver Chloride Electrode and Calomel Electrode) and Indicator Electrodes (Metal electrodes and Glass Electrode), methods to determine end point of potentiometric titration and applications.

12.1	Introduction	12-1
12.2	Principle	12-1
12.3	Cell	12-2
12.4	Electrodes	12-4
12.4.1	Reference Electrodes	12-4
12.4.1(A)	Primary Reference Electrode	12-5
12.4.1(B)	Secondary Reference Electrodes	12-5
12.4.2	Indicator Electrode	12-8
12.4.2(A)	Metallic Indicator Electrodes	12-8
12.4.2(B)	Ion-Selective Electrodes (ISE) or Membrane Electrodes	12-9
12.4.2(C)	Biosensors	12-15
12.5	Instruments for Measuring Cell Potentials	12-16
12.6	Methods to Determine End Point of Potentiometer	12-18
12.7	Summary of Errors Affecting pH Measurements with Glass Electrode/ pH Electrodes and Factors Affecting pH Measurements	12-19
12.7.1	pH Measurement in Non-Aqueous Liquids	12-19
12.7.2	Operational Definition of pH	12-20

12.8	Potentiometry Applications	12-21
12.8.1	pH Measurements	12-22
12.8.2	Potentiometric Titrations	12-22
12.8.2(A)	Types of Potentiometric Titration	12-23
12.8.3	Potentiometric End Point Determination	12-24
12.9	Advantages of Potentiometric Titrations	12-24

Chapter 13 : Polarography **13-1 to 13-12**

Syllabus : Principle and Ilkovic Equation.

13.1	Introduction	13-1
13.2	Mass Transfer Processes	13-2
13.3	Theory of Polarography	13-2
13.4	Instrumentation or Cell for Polarographic Measurements	13-4
13.4.1	Dropping Mercury Electrode (DME)	13-4
13.4.2	Rotating Platinum Electrode	13-7
13.5	Polarographic Modes	13-8
13.6	Applications of Polarography	13-9

Chapter 14 : Refractometry **14-1 to 14-9**

Syllabus : Introduction, refractive index, specific and molar refraction, measurement of RI, Abbe's refractometer and applications.

14.1	Introduction	14-1
14.2	Refractometry Principle	14-1
14.2.1	Critical Angle, Angle of Incidence and Refraction	14-2
14.2.2	Factors Affecting Refractive Index (η)	14-2
14.3	Specific Refraction (RS) and Molar Refraction (RM)	14-2
14.3.1	Optical Exaltation	14-4

14.3.2	Additivity of Molar Refraction	14-5	14.4.5	Care and Maintenance of the Instrument.....	14-7
14.4	Instrumentation.....	14-5	14.4.6	Brix Measurements	14-7
14.4.1	Abbe's Refractometer.....	14-5	14.5	Applications of Refractometry.....	14-8
14.4.2	Dipping or Immersion Refractometer.....	14-6			
14.4.3	Pulfrich Refractometer	14-6			
14.4.4	Image Displacement and Differential Refractometer	14-7			