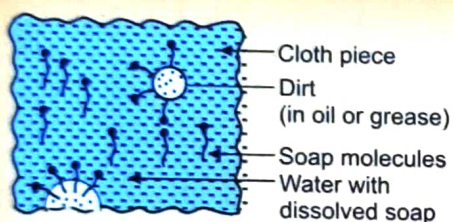


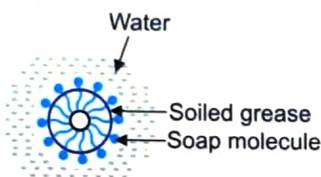
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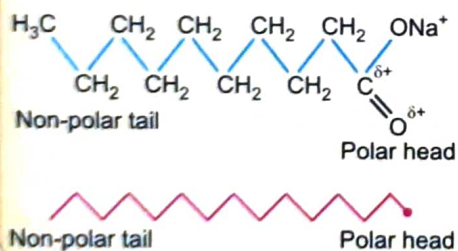


(a) Soiled fabric wetted in soap solutions

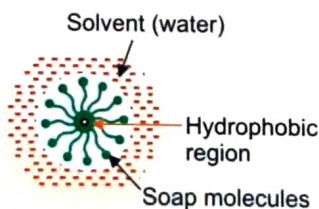


(b) Soap coated soiled oil drop

Cleansing Action of Soap

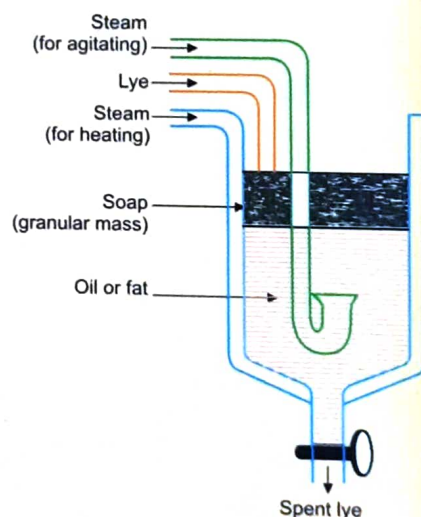


(a) Amphipathic



(b) Micelle

Structure of Soap and Micelle Formation



Vertical Kettle

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A TEXT BOOK OF
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(DSC-4B : PAPER-IV)

FOR

B.Sc. Part I Chemistry : Semester-II

**New Changed CBCS Syllabus of Shivaji University,
Kolhapur w.e.f. June 2023 as per NEP-2020**

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PREFACE

We have great pleasure in presenting this book to B.Sc. Part I Semester II Analytical Chemistry students of Shivaji University Kolhapur. This book has been written according to the new prescribed syllabus of CBCS pattern (as per NEP 2022) of Shivaji University, Kolhapur.

The simple language and the lecture style used by the authors make the reader to understand the subject very easily. All the topics have been dealt at sufficient length and every attempt is made to prepare a text complete in itself. Theory topics are supplemented with sufficient number of figures and illustrations. Wherever possible solved and unsolved problems are given at the end of each chapter. The exercise at the end of each chapter includes multiple choice questions, long answer questions and short answer questions to test the understanding of the student.

Authors has no claim to the original research in preparing the book. Liberal use of the material available in the works of eminent authors has been made. The authors are thankful to these eminent authors for their valuable work.

We are thankful to Nirali Prakashan, Pune for making us a part of their team of Authors. We thank Mr. Dineshbhai Furia and Mr. Jignesh Furia for publishing this book.

We are grateful to Mr. Virbhaval Shinde (Marketing Executive, Kolhapur District) for his nice co-operation. We are very much thankful to Mr. Kiran Kamble (Proof Reading), Mrs. Anjali Muley (Graphic Design) and Mr. Malik Shaikh for a neat and error free D.T.P. of this book.

Errors might have crept in despite utmost care to avoid them and author shall be grateful if these are pointed out along with valuable suggestions for the improvement of the quality of the book.

We hope that this book will be useful for students and teachers.

Authors

SYLLABUS

1. Introduction to Analytical Chemistry (06 Hrs.)

- 1.1 Introduction
- 1.2 Importance of analysis
- 1.3 Analytical processes (Qualitative and Quantitative)
- 1.4 Methods of Analysis (Only classification)
- 1.5 Sampling of solids, liquids and gases
- 1.6 Errors, Types of errors (determinate and indeterminate), Methods of expressing accuracy (Absolute and Relative error)
- 1.7 Significant figures, Mean, Median, Standard deviation (Numerical problems are expected)

2. Fundamentals of Industrial Chemistry and IPR (07 Hrs.)

- 2.1 Difference between Classical and Industrial chemistry, Raw materials for chemical industry, Material safety data sheets (MSDS)
- 2.2 Definition and Explanation of terms - Molecular weight, Equivalent weight, Molarity, Normality, Molality, Molarity of mixed solution, Acidity of base, Basicity of acid, ppt, ppm, ppb solutions, Mole fraction, Weight fraction, Percentage composition by W/W, W/V, V/V. Problems based on normality, molarity, mole fraction, mixed solution, etc.
- 2.3 IPR - Introduction to IPR and its significance in present scenario

3. Chromatography (06 Hrs.)

- 3.1 Introduction, Basic principle of chromatography, Basic terms, Classification of chromatography
- 3.2 Paper chromatography - Principle, Methodology-Types of papers and treatment, Sample loading, Choice of solvent, Development-Ascending, Descending, Circular, Location of spots, Determination of R_f value, applications, advantages and disadvantages
- 3.3 Thin layer chromatography - Principle, Solvent system, Stationary phases, Preparation of TLC plate, Detecting reagents, Methodology - Sample loading, Development, Detection of spot, R_f value, Applications, advantages and disadvantages
- 3.4 Comparison of Paper chromatography and TLC

4. Theory of Titrimetric Analysis (06 Hrs.)

- 4.1 Introduction
- 4.2 Acid-Base Indicators
- 4.3 Theory of Indicators w.r.t. Ostwald's Ionization Theory and Quinonoid Theory

4.4 Neutralization Curves and Choice of Indicators for

- (a) Strong acid-Strong base
- (b) Strong acid-Weak base
- (c) Strong base-Weak acid

4.5 Complexometric Titrations

- (a) Introduction
- (b) Types of EDTA titrations
- (c) Metallochromic indicators-Eriochrome black-T
- (d) Indicator action of Eriochrome black-T

5. Soaps and Detergents

(06 Hrs.)

5.1 Introduction

5.2 Soaps - Raw materials, Types of soaps, Cleansing action of soap, Manufacture of soap - Boiled or Hot Process, Cold process.

5.3 Detergents - Types of Detergents: Anionic, cationic and amphoteric (with example), Preparation of Teepol and Deriphat.

5.4 Preparation of Shampoos.

5.5 Comparison between Soaps and Detergents

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