

**As per New Syllabus
CBCS Pattern
of Shivaji University, Kolhapur
B.Sc. Part-II : Semester-III**

INDUSTRIAL CHEMISTRY

(CHEMISTRY : DSC-C4 : PAPER-VI)



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**(Paper VI : DSC - C4)
B.Sc. Part II : Semester III**

**As per New Revised Choice Based Credit System (CBCS)
Syllabus of Shivaji University, Kolhapur, w.e.f. June 2019**

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PREFACE

This book is basically intended for B.Sc.-II students for Semester - III Course of Shivaji University, Kolhapur. This book is written according to New Revised Choice Based Credit System (CBCS) syllabus being implemented from June 2019 prescribed by Shivaji University, Kolhapur.

It is our great pleasure to present this book to the students and respected teachers in proper time. The subject matter is presented in simple and lucid language. This book covers all the chapters mentioned in the syllabus. The material is presented in a comprehensive way and the sequence of articles in each chapter helps the students to understand the subject with ease.

Different diagrams and illustrative description is provided to enhance the learning and understanding of the matter by students as well as to enable the teachers to explain the difficult concepts properly. The solved numerical examples, long answer type questions, short answer type questions including multiple type questions are given at the end of each chapter.

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 also thank Mr. Girish Redkar (Head Marketing Dept.) for his co-operation in publishing this book.

Last but not the least we are very much indebted to Mr. Virbhaval Shinde, (Marketing Executives, Kolhapur District) and Mr. Ashok Nanavare (Marketing Executive, Sangli District) for their nice co-operation. We are very much thankful to Mr. Kiran Velankar (Proof Reading), Mrs. Anjali Muley (Graphic Design) and Mr. Malik Shaikh for a neat and error free D.T.P. of this book.

We hope that this book will be found useful by students and teachers. We will appreciate any suggestions for the improvement of the book.

– Authors

SYLLABUS

Unit I : Basic Concepts in Industrial Chemistry (10)

The difference between classical chemistry and industrial chemistry, Raw materials for the chemical industry, Material safety data sheets, Units that make up a chemical process-unit operations and unit processes, Flow diagrams, Block diagram, Process flow diagram/flow sheets, Material Balances - The purpose of mass balance calculations, Material balance equations, Mass balance calculation, procedure and simple example.

Definition and Explanation of terms : Normality, Equivalent weight, Molality, Molecular weight, Molarity, 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.

Unit II : Unit Operations (06)

Size reduction – Principle, Jaw crusher, Ball mill.

Size enlargement – Principle, Pellet mill-tumbling agglomerators

Separation – Magnetic separation, Froth flotation, Distillation - Distillation of liquid mixtures, Types of distillation, Types of columns and pickings, Condensers, Vacuum distillation, Spinning-band distillation, Steam distillation.

Unit III : Corrosion and Electroplating (09)

Introduction of corrosion, Electrochemical theory of corrosion, Factors affecting on corrosion - (i) Position of metals in the electrochemical series on the basis of standard reduction potential, (ii) Purity of metal, (iii) Effect of moisture, (iv) Effect of oxygen (differential aeration principle), (v) Hydrogen overvoltage, Methods of protections of metals from corrosion, Electroplating : Electrolysis, Faraday's laws, Cathode current efficiency, Basic principles of electroplating, Cleaning of articles, Electroplating of chromium, Anodising.

Unit IV : Paper Industry (06)

Manufacturing of pulp, Types of pulp - Sulphate, Soda, Manufacturing of paper, Calendering, Ecological problems of Indian Paper Industry, Features of good paper industry.

Unit V : Soaps and Detergents (07)

Introduction, Soaps - Raw materials, Types of soaps, Cleansing action of soap, Manufacture of soap - Boiled or Hot process, Detergents - Raw materials, Types of detergents: Anionic, Cationic and Amphoteric, Preparation of Teepol and Deriphath, Comparison between soaps and detergents.

CONTENTS

- | | |
|--|-------------------|
| 1. Basic Concepts of Industrial Chemistry | 1.1 - 1.26 |
| 2. Unit Operations | 2.1 - 2.28 |
| 3. Corrosion and Electroplating | 3.1 - 3.34 |
| 4. Paper Industry | 4.1 - 4.14 |
| 5. Soaps and Detergents | 5.1 - 5.18 |

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