



CONTENTS

| | Title | Page No. |
|------------------|---|----------|
| Chapter I | | 1-85 |
| I.1 | Surfactants..... | 1 |
| | 1.1.1 Natural Surfactants..... | 2 |
| | 1.1.2 Synthetic Surfactants..... | 3 |
| I.2 | Classification of Surfactants..... | 3 |
| I.3 | Micelles..... | 8 |
| I.4 | Micellar Structure..... | 10 |
| I.5 | Micellar Shape..... | 14 |
| I.6 | Dynamic Aspects of Micelle Formation..... | 17 |
| I.7 | Critical Micelle Concentration..... | 20 |
| I.8 | Factors Affecting Critical Micelle Concentration..... | 22 |
| | 1.8.a Surfactant Structure..... | 23 |
| | 1.8.b Additives..... | 25 |
| | 1.8.c Temperature..... | 29 |
| | 1.8.d Pressure..... | 31 |
| I.9 | CMC/C₂₀ Ratio..... | 32 |
| I.10 | Solubility-Temperature Relationship..... | 34 |
| | 1.10.1 Krafft Point..... | 34 |
| | 1.10.2 Cloud Point..... | 36 |
| I.11 | Methods to Investigate the Micellar Solutions..... | 38 |
| | 1.11.1 Macroscopic Techniques..... | 38 |
| | 1.11.2 Scattering Techniques..... | 39 |
| | 1.11.2.1 Small-angle neutron scattering (SANS)..... | 40 |
| | 1.11.2.2 SANS Spectrometer..... | 40 |
| | 1.11.2.3 Dynamic light scattering (DLS)..... | 43 |
| | 1.11.3 Spectroscopic Techniques..... | 44 |
| I.12 | Performance Properties of Surfactants..... | 45 |
| I.13 | Thermodynamics of Micellization..... | 47 |
| I.14 | Adsorption at Interfaces..... | 51 |
| I.15 | Thermodynamics of Adsorption..... | 54 |
| I.16 | Mixed Surfactant Systems..... | 55 |
| | 1.16.1 Binary Mixed surfactant Systems..... | 55 |
| | 1.16.2 Molecular Interaction in the Mixture of Surfactants..... | 56 |
| | 1.16.2.a Ideal Mixing Theory..... | 57 |
| | 1.16.2.b Nonideal Mixing Theory..... | 57 |
| | 1.16.3 Synergism or Negative Synergism..... | 59 |
| I.17 | Nonionic Surfactants and Dimeric (gemini) Surfactants..... | 62 |
| | 1.17.1 Nonionic Surfactants..... | 62 |
| | 1.17.2 Gemini or dimeric Surfactants..... | 64 |
| I.18 | Scope of the Present Work..... | 66 |
| | References..... | 68 |

... cont

Contents
Page No.

| | Title | |
|---------------------|---|---------|
| Chapter II A | Studies of Mixed Surfactant Solutions of Cationic Dimeric (gemini) Surfactant with Nonionic Surfactant $C_{12}E_6$ in Aqueous Medium..... | 86-106 |
| Chapter II B | Self Aggregation of Binary Surfactant Mixture of Cationic Dimeric (gemini) Surfactant with Nonionic Surfactants in Aqueous Medium II..... | 107-130 |
| Chapter III | Self Aggregation of Cationic-Nonionic Surfactant Mixture in Aqueous Media: Tensiometric, Conductometric, Density, Light Scattering, Potentiometric and Fluorimetric Studies..... | 131-154 |
| Chapter IV A | Thermodynamics of Micellization and Interfacial Adsorption of Polyoxyethylene (10) Lauryl Ether ($C_{12}E_{10}$) in Water..... | 155-166 |
| Chapter IV B | Study of the Cloud Point of $C_{12}E_n$ Nonionic Surfactants: Effect of Additives..... | 167-182 |
| Chapter V | Investigation of the Properties of Decaoxyethylene n-Dodecyl Ether, $C_{12}E_{10}$ in Aqueous Sugars-rich Region..... | 183-217 |
| Chapter VI | Investigation of the Properties of Polyoxyethylene (10) lauryl ether: $C_{12}E_{10}$ in Aquo Alcohols-rich Region..... | 218-251 |
| Chapter VII | Physicochemical and Microstructural Changes in Nonaoxyethylene n-Dodecyl Ether in Aqueous-Amino Acids Region: Tensiometric, Small Angle Neutron Scattering, Dynamic Light Scattering and Rheological Studies..... | 252-288 |
| Chapter VIII | Summary..... | 289-299 |
| | Appendix..... | X-XLI |
| | Reprints of Published Paper | |