

Contents

Preface iii

Contributors ix

Part One Surfactant Synthesis and Transformations

1. Industrial Surfactant Syntheses 1
Ansgar Behler, Manfred Biermann, Karlheinz Hill, Hans-Christian Raths, Marie-Esther Saint Victor, and Günter Uphues
2. Cleavable Surfactants 45
Krister Holmberg
3. Gemini Surfactants and Surfactant Oligomers 59
Martin In
4. New Glycolipids Having Biological Activities: Key Role of Their Organization 111
Armand Lattes, Isabelle Rico-Lattes, Emile Perez, and Muriel Blanzat
5. Surfactants for Supercritical and Near-Critical Fluids 129
Terri Carson, Sharon L. Wells, and Joseph M. DeSimone
6. Acid- and Oxidatively Labile Vinyl Ether Surfactants: Synthesis and Drug Delivery Applications 145
Jong-Mok Kim and David H. Thompson
7. Three Principles for Active Control of Interfacial Properties of Surfactant Solutions 155
Jason Y. Shin, Lana I. Jong, Nihal Aydogan, and Nicholas L. Abbott

Part Two Chemistry in Isotropic Phases and in Mesophases

8. Reactivity Control by Aqueous Amphiphilic Self-Assembling Systems 175
Gianfranco Savelli, Raimondo Germani, and Lucia Brinchi
9. Diels-Alder Reactions in Micellar Media 247
Sjibren Otto and Jan B. F. N. Engberts
10. Interfacial Compositions of Surfactant Assemblies by Chemical Trapping with Arenediazonium Ions: Method and Applications 265
Laurence S. Romsted

11. Electro-Organic Synthesis in Macro- and Microheterogeneous Solutions: Emulsions, Micelles, and Related Systems 295
Marc Thomalla
12. Mediated Electro-Organic Synthesis in Microemulsions 323
James F. Rusling
13. Chemical Activation in Micelles, Pseudomicelles, and Microemulsions 337
Isabelle Rico-Lattes, Armand Lattes, Emile Perez, Ferdinand Gonzaga, and Andreea Ruxandra Schmitzer
14. Reactions and Synthesis in Microemulsions and Emulsions in Carbon Dioxide 349
Keith P. Johnston, J. D. Holmes, G. B. Jacobson, C. T. Lee, G. Li, P. Psathas, and M. Z. Yates
15. Reactions in Multiphase (Liquid/Liquid) Micellar Systems 359
Turgut Battal and James F. Rathman
16. Chemical Detoxification in Amphiphilic Systems 373
Raymond A. Mackay
17. Colloidal Chemistry of Lubricating Oils 385
Duncan C. Hone, Brian H. Robinson, Jane R. Galsworthy, and Roger W. Glyde
18. Giant Vesicles as Microchemical Vessels 395
Stephen J. Lee and Jason S. Keiper
19. Electroless Plating of Organic Pigment Thin Films Using Surfactants with an Azobenzene Group 407
Tetsuo Saji
20. Kinetic and Thermodynamic Modeling of Micellar Autocatalysis 413
Jean-Claude Micheau and R. Nagarajan

Part Three Polymerization Chemistry

21. Emulsion Polymerization 429
Klaus Tauer
22. Free Radical Polymerization in Microemulsions 455
Carlos C. Co, Renko de Vries, and Eric W. Kaler
23. Heterophase Polymerization in Inverse Systems 471
Katharina Landfester and Hans-Peter Hentze
24. Vesicular Polymerization 501
Jutta Hotz and Wolfgang Meier
25. The Use of Surfactant Self-Assembly in the Enzymatic Synthesis of Novel Polymers 515
Glen Irvin, Sukanta Banerjee, Ramannair Premachandran, Blake A. Simmons, Sichu Li, Vijay T. John, Gary McPherson, Joseph Akkara, David Kaplan, and Weilie Zhou
26. Material Synthesis by Polymerization in Surfactant Mesophases 525
Eric J. Paul and Robert K. Prud'homme
27. Admicellar Polymerization 537
John O'Haver, Brian Grady, Jeffrey H. Harwell, and Edgar A. O'Rear
28. Polymerizable and Polymeric Surfactants 547
Alain Guyot and Klaus Tauer

Part Four Particle Precipitation

29. Organic Particle Precipitation 577
John Texter

- 30. Synthesis of Inorganic and Organic Nanoparticles in Microemulsions 609
L. Jeunieu, F. Debuigne, and Janos B.Nagy
- 31. Colloidal Nanoparticles and Nanoparticulate Films Grown at the Air-Water Interface 633
Janos H. Fendler
- 32. Formation of Nanoparticles in Organized Amphiphilic Films 639
Karen Grieve, Franz Grieser, and D. Neil Furlong

Part Five Supramolecular Synthesis

- 33. The Role of Steric Constraints and Intermolecular Interactions in the Formation of Surfactant Phases 667
Sönke Svenson
- 34. Stereochemistry of Lipid Micelles and Vesicles That Survive Drying 715
Jürgen-Hinrich Fuhrhop
- 35. Synthesis and Properties of Amphiphile-Based Gene Carriers 729
Nily Dan
- 36. Synthesis of Microporous Materials from Reverse Micelles 737
Ramsharan Singh, Mario Castagnola, and Prabir K. Dutta
- 37. Mesoscopic Films at Interfaces 761
Srinivas Manne, R. K. Workman, and J. L. Wolgemuth
- 38. Synthesis of Mesoscopic Silica Films at Fluid-Fluid Interfaces 779
Yoon Seob Lee and James F. Rathman
- 39. Inorganic Nanostructure Design with Amphiphilic Block Copolymers 797
Christine Göltner
- 40. The Role of Surfactants and Amphiphiles in the Synthesis of Porous Inorganic Solids 819
Andreas Stein and Brian J. Melde

Index 853