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Surfactants: Chemistry, Interfacial Properties, Applications-D. Möbius

This publication provides comprehensive material on the chemical and physical attributes of surfactants and new models for the understanding of structure-property relationships. Surfactants Chemistry, Interfacial Properties, Applications
provides efficient instruments for the prognostication of principal physicochemical properties and the technologic applicability from the structure of a surfactant through the discussion of interrelations between the chemical structure, physicochemical properties and the efficiency of technologic application. Also included are informative overviews on new experimental techniques and abundant reference material on manufacturers, nomenclature, product properties, and experimental examples. The publication is accompanied by a CD-ROM, which is needed for the application of the thermodynamic and kinetic models to experimental data.

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Ionic Liquid-Based Surfactant Science-Bidyut K. Paul 2015-09-21 This volume will be summarized on the basis of the topics of Ionic Liquids in the form of chapters and sections. It would be emphasized on the synthesis of ILs of different types, and stabilization of amphiphilic self-assemblies in conventional and newly developed ILs to reveal formulation, physicochemical properties, microstructures, internal dynamics, thermodynamics as well as new possible applications. It covers: Topics of ionic liquid assisted micelles and microemulsions in relation to their fundamental characteristics and theories Development bio-ionic liquids or greener, environment-friendly solvents, and manifold interesting and promising applications of ionic liquid based micelles and micremulsions Encyclopedia of Surface and Colloid Science-P. Somasundaran 2006 Surfactant Science and Technology-Drew Myers 2020-08-04 A solid introduction to the field of surfactant science, this new edition provides updated information about surfactant uses, structures, and preparation, as well as seven new chapters expanding on technology applications. Offers a comprehensive introduction and reference of the science and technology of surface active materials Elaborates, more fully than prior editions, aspects of surfactant crystal structure as well as their effects on applications Adds more information on new classes and applications of natural surfactants in light of environmental consequences of surfactant use Surface Chemistry of Surfactants and Polymers-Bengt Kronberg 2014-09-26 This book gives the reader an introduction to the field of surfactants in solution as well as polymers in solution. Starting with an introduction to surfactants the book then discusses their environmental and health aspects. Chapter 3 looks at fundamental forces in surface and colloid chemistry. Chapter 4 covers self-assembly and 5 phase diagrams. Chapter 6 reviews advanced self-assembly while chapter 7 looks at complex
behaviour. Chapters 8 to 10 cover polymer adsorption at solid surfaces, polymers in solution and surface active polymers, respectively. Chapters 11 and 12 discuss adsorption and surface and interfacial tension, while Chapters 13-16 deal with mixed surfactant systems. Chapter 17, 18 and 19 address microemulsions, colloidal stability and the rheology of polymer and surfactant solutions. Wetting and wetting agents, hydrophobization and hydrophobizing agents, solid dispersions, surfactant assemblies, foaming, emulsions and emulsifiers and microemulsions for soil and oil removal complete the coverage in chapters 20-25.

Solid - Liquid Dispersions-
Bohuslav Dobias 1999-03-04 Reviews a range of fundamental concepts, recent developments and practical applications in dispersion theory, along with relevant insights from colloidal and interfacial science. The text contains new work on the stabilization of solid-liquid dispersions. It focuses on topics as varied as electrostatics, hydrodynamics and rheology.

Physico-Chemical Properties of Selected Anionic, Cationic and Nonionic Surfactants-
N.M. van Os 2012-12-02 The number of physico-chemical investigations of surfactants in solution, whether aqueous or nonaqueous, has dramatically increased in recent years. However, literature reports on surfactants in solutions are scattered over a plethora of scientific journals and books which differ widely in scope and readership. Such data are often difficult to retrieve because there have been no systematic compilations, with the exception of those for CMCs and for micelle aggregation numbers. The present compilation meets that need by covering, as completely as possible, the physico-chemical properties of selected series of homologous surfactants. These surfactants are in most cases isomerically pure, are well-known, and have been used in numerous academic and industrial studies. The properties include aggregation number, cloud point, CMC, 13C-NMR, correlation length, counterion
binding, density, enthalpy of micelle formation, entropy of micelle formation, Gibbs' free energy of micelle formation, head group area, 1H-NMR, hydration number, Krafft temperature, melting point, micelle radius, microscopic viscosity, miscibility curve, partial molar volume, phase inversion temperature, refractive index, self-diffusion coefficient, surface tension, and upper critical temperature. The book also contains two- and three-component phase diagrams of many nonionic surfactants. The solvent is water in most cases; however, some data refer to properties in D2O, electrolyte solutions, and nonaqueous solvents. The variables are temperature and concentration. Where possible, the method of measurement is given. Data on the purity of the compounds and the accuracy of the measurement methods are not included, as these can easily be found in the original sources, which mostly date from the period 1970-1991 and are given at the end of each chapter. The Index section contains a compound index, a property index, a symbol index and a cross index which facilitate easy access to the data. This valuable collection of data will be of great use to anyone involved in Colloid and Surface Science, academics as well as industrial workers, and will stimulate further work.

Biodegradation-Rolando Chamy 2013-06-14 This book contains a collection of different biodegradation research activities where biological processes take place. The book has two main sections: A) Polymers and Surfactants Biodegradation and B) Biodegradation: Microbial Behaviour.

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Self-Organized Surfactant Structures-Tharwat F. Tadros 2011-10-05 Highlighting recent developments as well as future challenges, this series of volumes covers such topics as emulsions, nano-emulsions, nano-dispersions and novel techniques for their investigation. It also considers the fundamental approach in areas such as controlled release, drug delivery and various applications of nanotechnology.

Structure-Performance Relationships in Surfactants-Kunio Esumi 2003-03-18 In response to intensifying interest on surfactant research brought on by recent innovation, Structure-Performance Relationships in Surfactants, Second Edition examines novel developments in our understanding of the properties and performance of surfactants at air-liquid, liquid-liquid, and solid-liquid interfaces, highlighting seven new chapters and carefully updated material to reflect current trends. This edition presents new material on the adsorption of vesicle-forming surfactants at the air-water interface, fluorinated surfactants having two hydrophobic chains, surface-active properties of telomertype surfactants having several hydrocarbon chains, and the association behavior of amphiphilic dendritic polymers, among many other topics.

Polymer-Surfactant Systems-
J.C.T. Kwak 1998-10-01
"Chronicles recent advances in our knowledge of polymer-surfactant systems, combining authoritative reviews of new experimental methods, instrumentation, and applications with fundamental discussions of classical methodologies and surveys of specific properties."
Surfactants and Interfacial Phenomena-Milton J. Rosen 2004 This book is the premier text on the properties and applications of surfactants. The third edition is completely updated and revised, including new information on gemini surfactants (a new type of powerful surfactant), superspreading (or superwetting) by aqueous surfactant solutions of highly hydrophobic surfaces (important in agricultural applications), and dynamic surface tension (an important interfacial property not covered in the first two editions). * Clearly explains the mechanisms by which surfactants operate in interfacial processes * Uses a minimum of mathematics in explanation of topics, making it easy-to-understand and very user-friendly * Problems are included at the end of each chapter * Includes many tables of data as reference that are not compiled elsewhere * Milton J Rosen is an expert in the field of Surfactant research
Utech Asia'97- 1997 Biological Small Angle Scattering: Techniques, Strategies and Tips-Barnali Chaudhuri 2017-12-29 This book provides a clear, comprehensible and up-to-date description of how Small Angle Scattering (SAS) can help structural biology researchers. SAS is an efficient technique that offers structural information on how biological macromolecules behave in solution. SAS provides distinct and complementary data for integrative structural biology approaches in combination with other widely used probes, such as X-ray crystallography, Nuclear magnetic resonance, Mass spectrometry and Cryo-electron Microscopy. The development of brilliant synchrotron small-angle X-ray scattering (SAXS) beam lines has increased the number of researchers interested in solution scattering. SAS is
especially useful for studying conformational changes in proteins, highly flexible proteins, and intrinsically disordered proteins. Small-angle neutron scattering (SANS) with neutron contrast variation is ideally suited for studying multi-component assemblies as well as membrane proteins that are stabilized in surfactant micelles or vesicles. SAS is also used for studying dynamic processes of protein fibrillation in amyloid diseases, and pharmaceutical drug delivery. The combination with size-exclusion chromatography further increases the range of SAS applications. The book is written by leading experts in solution SAS methodologies. The principles and theoretical background of various SAS techniques are included, along with practical aspects that range from sample preparation to data presentation for publication. Topics covered include techniques for improving data quality and analysis, as well as different scientific applications of SAS. With abundant illustrations and practical tips, we hope the clear explanations of the principles and the reviews on the latest progresses will serve as a guide through all aspects of biological solution SAS. The scope of this book is particularly relevant for structural biology researchers who are new to SAS. Advanced users of the technique will find it helpful for exploring the diversity of solution SAS methods and applications. Chapter 3 of this book is available open access under a CC BY 4.0 license at link.springer.com. Application and Characterization of Surfactants-Reza Najjar 2017-07-05 The surfactants are among the materials that have a significant importance in everyday life of human. The rapid growth in science and technology has opened new horizons in a very wide range, in which the surfactants play a major and vital role. Hence, the increasing number of applications as well as arising environmental issues has made this relatively old topic still a hot research theme. In the first section of this book, some of the applications of surfactants in various fields such as biology and petroleum...
industry, as well as their environmental effects, are described. In Section 2 some experimental techniques used for characterization of the surfactants have been discussed.

Interactions of Surfactants with Polymers and Proteins-E. Desmond Goddard 2018-01-18

Interactions of Surfactants with Polymers and Proteins covers work done in this area over the last 30 years and examines in detail the physico-chemical, microstructural, and applications aspects of interactions of surfactants with polymers and proteins in bulk surfaces and at interfaces. The physical chemistry of individual components (surfactants, polymers, and proteins) is discussed, and extensive coverage of interactions of surfactants with uncharged, oppositely charged, and hydrophobe modified polymers is provided. Other topics addressed include water soluble and insoluble keratinous proteins, the principles and applications of fluorescence spectroscopy, the physical properties and microstructural aspects of polymer/protein-surfactant complexes, and implications of surfactant interactions with polymers and proteins in practical systems.

Interactions of Surfactants with Polymers and Proteins provides a wealth of information for chemists involved in a number of different research areas, including cosmetics, pharmaceutics, foods, paints, pigments, lubrication, ceramics, minerals/materials processing, and biological systems.

Molecular Modeling and Simulation: An Interdisciplinary Guide-Tamar Schlick 2010-08-03

Very broad overview of the field intended for an interdisciplinary audience; Lively discussion of current challenges written in a colloquial style; Author is a rising star in this discipline; Suitably accessible for beginners and suitably rigorous for experts; Features extensive four-color illustrations; Appendices featuring homework assignments and reading lists complement the material in the main text.

Self-Assembly-Ramanathan
Nagarajan 2019-01-07 An introduction to the state-of-the-art of the diverse self-assembly systems Self-Assembly: From Surfactants to Nanoparticles provides an effective entry for new researchers into this exciting field while also giving the state of the art assessment of the diverse self-assembling systems for those already engaged in this research. Over the last twenty years, self-assembly has emerged as a distinct science/technology field, going well beyond the classical surfactant and block copolymer molecules, and encompassing much larger and complex molecular, biomolecular and nanoparticle systems. Within its ten chapters, each contributed by pioneers of the respective research topics, the book: Discusses the fundamental physical chemical principles that govern the formation and properties of self-assembled systems Describes important experimental techniques to characterize the properties of self-assembled systems, particularly the nature of molecular organization and structure at the nano, meso or micro scales. Provides the first exhaustive accounting of self-assembly derived from various kinds of biomolecules including peptides, DNA and proteins. Outlines methods of synthesis and functionalization of self-assembled nanoparticles and the further self-assembly of the nanoparticles into one, two or three dimensional materials. Explores numerous potential applications of self-assembled structures including nanomedicine applications of drug delivery, imaging, molecular diagnostics and theranostics, and design of materials to specification such as smart responsive materials and self-healing materials. Highlights the unifying as well as contrasting features of self-assembly, as we move from surfactant molecules to nanoparticles. Written for students and academic and industrial scientists and engineers, by pioneers of the research field, Self-Assembly: From Surfactants to Nanoparticles is a comprehensive resource on diverse self-assembly systems, that is simultaneously introductory as well as the state of the art.
Selective Sorption of Polydisperse Ethoxylated Nonionic Surfactants to Aquifer Materials-Tohren Christopher Garett Kibbey 1997

Bubble and Foam Chemistry-Robert J. Pugh 2016-09-08 Combining academic and industrial viewpoints, this is the definitive stand-alone resource for researchers, students and industrialists. With the latest on foam research, test methods and real-world applications, it provides straightforward answers to why foaming occurs, how it can be avoided, and how different degrees of antifoaming can be achieved.

Gemini Surfactants-Raoul Zana 2003-10-07 Generating much interest in both academic and scientific circles, Gemini Surfactants gathers the most up-to-date research in gemini surfactant production and demonstrates how their properties and performance can revolutionize the current industrial application of these surfactants. It surveys the state of special gemini surfactants, including nonionic, zwitterionic, fluorinated, and amino-acid-based surfactants. Gemini Surfactants considers the synthesis, phase behavior, and rheology of gemini and related surfactants and clarifies the adsorption and surface tension behavior of gemini surfactants at air-water, oil-water, and solid-water interfaces. The book also details the physicochemical properties and microstructure of aqueous micellar solutions of gemini surfactants and describes mixed micellization between gemini surfactants and conventional surfactants.

Encyclopedia of Colloid and Interface Science-Tharwat Tadros 2013-06-28 An authoritative and comprehensive reference relevant to all scientists and engineers in the field. This encyclopedia not only helps chemistry, materials science and physics researchers to understand the principles, but also provides practicing engineers with the necessary information for implementing practical applications, such as Food and agrochemicals Polymers and ceramics Cosmetics and detergents Paints and coatings Pharmaceuticals and drug
In addition, the encyclopedia is an important reference for industrial chemists and chemical engineers faced with a multitude of industrial systems of a colloidal nature. As wide as the range of applications that colloid and interface science has is the range of scientific disciplines that contribute to research and development in this field. These encompass chemistry, physics, biology and mathematics as well as nanoscience and nanotechnology. The encyclopedia provides easy-to-digest information for meeting these interdisciplinary challenges. While providing numerous concise definitions of key terms, the encyclopedia also features more than forty in-depth essays on topics ranging from Agrochemical Formulations to Zeta Potential. All entries are cross-referenced and include selected references to original literature as well as synonyms.

Aqueous Polymer — Cosolute Systems—Dan F. Anghel
2003-04-01 This collection of formulas has been written by applied scientists and industrial engineers for design professionals and students who work in engineering acoustics. It is subdivided into the most important fields of applied acoustics, each dealing with a well-defined type of problem. It provides easy and rapid access to profound and comprehensive information. In order to keep the text as concise as possible, the derivation of a formula is described only as far as necessary for its understanding. The interested reader can refer to the original source of the result. In addition to formulas, useful principles and computational procedures are given.

Anionic Surfactants—John Cross 1998-05-15 "Presents the most comprehensive coverage available of the detection, isolation, identification, and estimation of all anionic surfactants in a wide variety of samples in trace and macro quantities. Features new chapters on volumetric and trace analysis, molecular and mass spectroscopy, and chromatographic processes."
Mixed Surfactant Systems-Paul M. Holland 1992
Presents a broad survey of the properties, behavior, and modeling of mixed surfactant systems, including mixed micellar solutions, phenomena at interfaces, phase behavior, and mixtures with unusual surfactant types. Covers chemical reactions in mixed micelles, approaches to molecular modeling of mixed surfactant aggregates, and new experimental techniques for studying mixed micelles and adsorption on surfaces. Features contributions from leading specialists in colloid and surface science, including Robert S. Schechter, John F. Scamehorn, Milton J. Rosen, Keizo Ogino, and Denver G. Hall.

Dynamics of Surfactant Self-Assemblies-Raoul Zana 2005-03-30 Dynamics of Surfactant Self-Assemblies explains the dynamics of micellar equilibria, tracking surfactant exchange, and micelle formation/breakdown processes. Highlighting the structural similarities of amphiphilic block copolymers to surfactants, this volume elucidates the dynamics of more complex self-assemblies that surfactants and amphiphilic block copolymers form in solutions. The book first discusses self-assembling processes taking place in aqueous surfactant solutions and the dynamic character of surfactant self-assemblies. The next chapter reviews methods that permit the study of the dynamics of self-assemblies. The dynamics of micelles of surfactants and block copolymers, solubilized systems, microemulsions, vesicles, and lyotropic liquid crystals/mesophases are reviewed successively. The authors point out the similarities and differences in the behavior of these different self-assemblies. Much emphasis is put on the processes of surfactant exchange and of micelle formation/breakdown that determine the surfactant residence time in micelles, and the micelle lifetime. The last three chapters cover topics for which the dynamics of surfactant self-assemblies can be important for a better understanding of observed behaviors: dynamics of surfactant adsorption on
surfaces, rheology of viscoelastic surfactant solutions, and kinetics of chemical reactions performed in surfactant self-assemblies used as microreactors. Dynamics of Surfactant Self-Assemblies offers a unique and comprehensive review of the literature that exists on the dynamics of the various surfactant self-assemblies and a unified perspective on this topic. It provides researchers with a useful guide for the dynamics of the surfactant systems that they wish to investigate.

Surfactant Aggregation-J.H. Clint 2012-12-06 Surface Active Agents (surfactants) are vital components in biological systems, form key ingredients in consumer products and play an important role in many industrial processes. For example, cell membranes owe their structure to the aggregation of surfactants known as lipids which form a major component of the membrane. Other natural surfactants occur in the digestive system, in the lungs, and even in such substances as crude oil. Man-made surfactants are used in a wide range of domestic and industrial products and processes. In addition to detergents and personal care products, surfactants have found uses in almost every branch of the chemical industry as well as in several other industries. These include dyestuffs, fibres, mineral processing, oil field chemicals, paints, pesticides, pharmaceuticals and plastics. Surfactants are versatile materials which are manufactured in a huge variety of forms to suit all of these applications. As a result of their importance, the technical literature on all aspects of surfactant behaviour is now very extensive. Surprisingly, however, the treatment in textbooks has been somewhat fragmented, often in the form of conference proceedings or edited, multi-authored works, both lacking in continuity.

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