Principles And Applications Of Emulsion Polymerization

Encyclopedia of Emulsion TechnologyEmulsionsEncyclopedia of Emulsion TechnologyFood Emulsifiers and Their ApplicationsMultiple EmulsionEmulsion Formation and StabilityEmulsions, Microemulsions and FoamsParticle-Stabilized Emulsions and ColloidsPrinciples and Applications of Emulsion PolymerizationEmulsionsEmulsions, Foams, and SuspensionsEmulsions and Emulsifier ApplicationsReport on colloid chemistry and its general and industrial applications. v.2, 1919Report on Colloid Chemistry and Its General and Industrial ApplicationsReport on Colloid Chemistry and Its General and Industrial ApplicationsMunicipal Journal and Public WorksEthers—Advances in Research and Application: 2013 EditionSubmicron Emulsions in Drug Targeting and DeliveryAmerican Highway & Transportation MonthlyMunicipal Journal and Engineer Daniel Schuster Tharwat F. Tadros Daniel Schuster Gerard L. Hasenhuettl Abraham Aserin Tharwat F. Tadros Dominique Langevin To Ngai Chorng-Shyan Chern Reinhard Miller Laurier L. Schramm S. Torrey British Association for the Advancement of Science S Benita

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volume 4 of the encyclopedia of emulsion technology completes this unique and compact 4 volume work by extending the discussion of basic theory and applications featured in volumes 1 3 more importantly this volume presents the latest developments on new applications in emulsion technology introducing scientists and engineers to the most recent concepts

chapter 1 general introduction definition of emulsions and the role of the emulsifier classification based on the nature of the emulsifier classification based on the structure of the system general instability problems with emulsions creaming sedimentation flocculation ostwald ripening coalescence and phase inversion importance of emulsions in various industrial applications chapter 2 thermodynamics of emulsion formation and breakdown application of the second law of thermodynamics for emulsion formation balance of energy and entropy and non spontaneous formation of emulsions breakdown of the emulsion by flocculation and coalescence in the absence of an emulsifier role of the emulsifier in preventing flocculation and coalescence by creating an energy barrier resulting from the repulsive energies between the droplets chapter 3 interaction forces between emulsion droplets van der waals attraction and its dependence on droplet size hamaker constant and separation distance between the droplets electrostatic repulsion resulting from the presence of electrical double layers and its dependence on surface or zeta potential and electrolyte concentration and valency combination of the van der waals attraction with double layer repulsion and the theory of colloid stability steric repulsion resulting from the presence of adsorbed non ionic surfactants and polymers combination of van der waals attraction with steric repulsion and the theory of steric stabilisation chapter 4 adsorption of surfactants at the oil water interface thermodynamic analysis of surfactant adsorption and the gibbs adsorption isotherm calculation of the amount of surfactant adsorption and area per surfactant molecule at the interface experimental techniques for measuring the interfacial tension chapter 5 mechanism of emulsification and the role of the emulsifier description of the factors responsible for droplet deformation and its break up role of surfactant in preventing coalescence during emulsification definition of the gibbs dilational elasticity and the marangoni effect in preventing coalescence chapter 6 methods of emulsification pipe flow static mixers and high speed stirrers rotor stator mixer laminar and turbulent flow membrane emulsification high pressure homogenisers and ultrasonic methods chapter 7 selection of emulsifiers the hydrophilic lipophilic balance hlb and its application in surfactant selection calculation of hlb numbers and the effect of the nature of the oil phase the phase inversion temperature pit method for emulsifier selection the cohesive energy ratio method for emulsifier selection chapter 8 creaming sedimentation of emulsions and its prevention driving force for creaming sedimentation effect of gravity droplet size and density difference between the oil and continuous phase calculation of the rate of creaming sedimentation in dilute emulsions influence of increase of the volume fraction of the disperse phase on the rate of creaming sedimentation reduction of creaming sedimentation balance of the density of the two phases reduction of droplet size and effect of addition of thickeners chapter 9 flocculation of emulsions and its prevention factors affecting flocculation calculation of fast and slow flocculation rate definition of stability ratio and its dependence on electrolyte concentration and valency definition of the critical coagulation concentration and its dependence on electrolyte valency reduction of flocculation by enhancing the repulsive forces chapter 10 ostwald ripening and its reduction factors responsible for ostwald ripening difference in solubility between small and large droplets and the kelvin equation calculation of the rate of ostwald ripening reduction of ostwald ripening by incorporation of a small amount of highly insoluble oil reduction of ostwald ripening by the use of strongly adsorbed polymeric surfactant and enhancement of the gibbs elasticity

chapter 11 emulsion coalescence and its prevention driving force for emulsion coalescence thinning and disruption of the liquid film between the droplets the concept of disjoining pressure for prevention of coalescence methods for reduction or elimination of coalescence use of mixed surfactant films use of lamellar liquid crystalline phases and use of polymeric surfactants chapter 12 phase inversion and its prevention distinction between catastrophic and transient phase inversion influence of the disperse volume fraction and surfactant hlb number explanation of the factors responsible for phase inversion chapter 13 characterisation of emulsions measurement of droplet size distribution optical microscopy and image analysis phase contrast and polarising microscopydiffraction methods confocal laser microscopy back scattering methods chapter 14 industrial application of emulsions 14 1 application in pharmacy 14 2 application in cosmetics 14 3 application in agrochemicals 14 4 application in paints 14 5 application in the oil industry

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the improved second edition of food emulsifiers and their applications integrates theoretical background with practical orientation and serves as a highly significant reference on the applications of emulsifiers in food systems it offers practitioners an overview of the manufacture analysis physical properties interactions and applications of emulsifiers used in processed food the book is written for food technologists as well as r d and product development personnel

the comprehensive single source reference on multiple emulsions in theory multiple emulsions have significant potential for breakthrough applications in food agricultural pharmaceutical nutraceutical and cosmetic industries in which they can facilitate the sustained release and transport of active material however in practice multiple emulsions are thermodynamically unstable this book presents recent findings that can help formulators understand how to enhance their stability with chapters contributed by leading experts from around the world it covers the definition and properties of multiple emulsions their formation and stability and potential applications with an emphasis on medical and pharmaceutical applications in one definitive resource it presents recent findings and achievements in the field including new theoretical approaches and modeling to characterize the transport mechanism droplet size reduction and increased shelf life stability through the use of polymeric amphiphiles and complex adducts the use of new emulsification techniques to enhance the monodispersibility of the droplets potential applications in drug delivery systems where clinical studies have proven their efficacy this is a core hands on reference for surface and colloid scientists physical chemists chemical engineers soft materials scientists food chemists controlled release scientists and pharmaceutical scientists in drug delivery applications as well as for graduate students in these

disciplines the editor and contributors hope this logical consolidation of current information will further the understanding of multiple emulsions and lead to new practical applications

the importance of emulsification techniques their use in the production of nanoparticles for biomedical applications as well as application of rheological techniques for studying the interaction between the emulsion droplets is gathered in this reference work written by some of the top scientists within their respective fields this book 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

this book takes an interface science approach to describe and understand the behavior of the dispersions we call emulsions microemulsions and foams the one thing all these dispersions have in common is the presence of surface active species surfactants adsorbed at the interfaces between the two fluid phases that make up the emulsions microemulsions or foams the interfacial layers formed by the surfactants control most of the properties of the dispersions the book describes the properties of interfacial layers thin films and bulk fluids used in the elaboration of the various dispersions and it explains how such properties relate to the dispersion properties of these soft matter systems structure rheology and stability these dispersion properties are far from being fully understood in particular foam and emulsion stability in discussing the state of the art of the current knowledge the author draws interesting parallels between emulsions microemulsions and foams that enlighten the interpretation of previous observations and point to a deeper understanding of the behavior of these materials in the future

there has been much scientific interest in the behaviour of colloidal particles at liquid interfaces from a research aspect they provide model systems for fundamental studies of condensed matter physics from a commercial aspect they provide applications for making new materials in the cosmetics food and paint industries in many cases of colloidal particles at interfaces the mechanism of particle interactions is still unknown particle stabilized emulsions and colloids looks at recent studies on the behaviour of particles at liquid interfaces the book first introduces the basic concepts and principles of colloidal particles at liquid liquid interfaces including the interactions and conformations the book then discusses the latest advances in emulsions and bicontinuous emulsions stabilized by both solid and soft particles and finally the book covers applications in food science and oil extraction with contributions from leading experts in these fields this book will provide a background to academic researchers engineers and graduate students in chemistry physics and materials science the commercial aspects will also be of interest to those working in the cosmetics food and oil industry

up to date coverage of methods of emulsion polymerization this book provides a comprehensive reference on emulsion polymerization methods focusing on the fundamental mechanisms and kinetics of each process as well as howthey can be applied to the manufacture of environmentally friendly polymeric materials topics covered include conventional emulsion polymerization miniemulsion polymerization microemulsion polymerization industrial emulsion polymerization processes primarily the semibatch and continuous reactions systems the role of various colloidal phenomena in emulsion polymerization important end use properties of emulsion polymer latex products information on industrial applications in paints coatings adhesives paper and board and more this is a hands on reference for graduate students and professionals in polymerchemistry chemical engineering and materials science who are involved in researchon coatings adhesives rubber latex paints finishes and other materials that can becreated using various methods of emulsion polymerization

until now colloid science books have either been theoretical or focused on specific types of dispersion or on specific applications this then is the first book to provide an integrated introduction to the nature formation and occurrence stability propagation and uses of the most common types of colloidal dispersion in the process related industries the primary focus is on the applications of the principles paying attention to practical processes and problems this is done both as part of the treatment of the fundamentals where appropriate and also in the separate sections devoted to specific kinds of industries throughout the treatment is integrated with the principles of colloid and interface science common to each dispersion type presented for each major physical property class followed by separate treatments of features unique to emulsions foams or suspensions the first half of the book introduces the fundamental principles introducing readers to suspension formation and stability characterization and flow properties emphasizing practical aspects throughout the following chapters discuss a wide range of industrial applications and examples serving to emphasize the different methodologies that have been successfully applied overall the book shows how to approach making emulsions foams and suspensions with different useful properties how to propagate them and how to prevent their formation or destabilize them if necessary the author assumes no prior knowledge of colloid chemistry and with its glossary of key terms complete cross referencing and indexing this is a must have for graduate and professional scientists and engineers who may encounter or use emulsions foams or suspensions or combinations thereof whether in process design industrial production or in related r d fields

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it is anticipated that submicron emulsion and lipid suspension will find numerous and novel medical applications in the near future the purpose of this multi authore book is to provide the reader with an up to date general overview of submicron emulsions and lipid suspensions solid lipid nanoparticles as well as to emphasize the various methods of preparation characerization evaluation and potential applications in various therapeutic areas leading authors have contributed to this unique book which contains all state of the art and detailed knowledge related to the physico chemical pharmaceutical and medical aspects of these most interesting but complex dosage forms thus making this information easily available to the reader this book will be of interest to scientists working in the field of drug delivery and targeting in universities as well as in the pharmaceutical food cosmetic veterinary and chemical industries

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