

Aculyn 38 Rheology Modifier Dow Chemical Company

This is the first single-volume handbook with the information a researcher needs to select the best rheology modifiers for his/her project. Information on 20 different types of rheology modifiers manufactured by 26 companies worldwide is described. These range from Acrylic Polymers to Xanthan Gum. This handbook was written because, in the authors' experience, the selection of a rheology modifier for specific applications is an arduous task. It requires researching the technical literature of numerous suppliers, contacting them for current information and recommendations, and paring the list of candidates from hundreds to a few dozen. This book will enable readers to easily identify the best candidates for an application with a minimum investment of time. The book is divided into four sections. Part I reviews rheology fundamentals. Part II presents details on the products available from the 26 represented companies. Part III focuses on the selection of suitable rheology modifier candidates. Part IV is a formulary containing the contributions of the suppliers.

This practical guide is devoted to the field of physical chemistry and chemical technology of disperse systems and materials. It provides a novel approach describes and allows to understand the physical chemistry of structure formation and materials synthesis under dynamic conditions. Substantiated by experimental results, the general theory is developed in the first two chapters. The following chapters deal with the fundamental aspects of rheology, vibrorheology, and superfluidity of structured dispersed systems within the framework of physicochemical dynamics, and the last chapter exemplifies the technological applications of the developed methodology.

TRB's Transportation Research Record: Journal of the Transportation Research Board, No. 2106 includes 16 papers that explore sketch models for air transport demand estimation, supporting aircraft manufacturers to systematically formulate and implement sustainable development strategies, mixed logit analysis of international airline choice, conceptual framework for collecting online airline pricing data, quantifying the relationship between airline load factors and flight cancellation trends, and a modeling framework for airline competition in the U.S. domestic network. This issue of the TRR also examines depeaking strategies for improving airport ground operations productivity at midsize hubs, a modeling framework for airport terminal planning and performance evaluation, route choice control of automated baggage handling systems, value of flight cancellation and cancellation decision modeling, resource allocation in flow-constrained areas, prioritizing aircraft operations at congested airports, design of ground delay programs, considering hydroplaning in runway geometric design, characterizing the distribution of safety occurrences in aviation, and analysis of the workload of training captains.

Natural and synthetic water soluble polymers are used in a wide range of familiar industrial and consumer products, including coatings and inks, papers, adhesives, cosmetics and personal care products. They perform a variety of functions without which these products would be significantly more expensive, less effective or both. Written for research, development and formulation chemists, technologists and engineers at graduate level and beyond in the fine and specialty chemicals, polymers, food and

pharmaceutical industries, the Handbook of Industrial Water Soluble Polymers deals specifically with the functional properties of both natural and synthetic water soluble polymers. By taking a function based approach, rather than a “polymer specific” approach the book illustrates how polymer structure leads to effect, and shows how different polymer types can be employed to achieve appropriate product properties.

With about 10–20% of the adult population in Europe being tattooed, there is a strong demand for publications discussing the various issues related to tattooed skin and health. Until now, only a few scientific studies on tattooing have been published. This book discusses different aspects of the various medical risks associated with tattoos, such as allergic reactions from red tattoos, papulo-nodular reactions from black tattoos as well as technical and psycho-social complications, in addition to bacterial and viral infections. Further sections are dedicated to the composition of tattoo inks, and a case is made for the urgent introduction of national and international regulations. Distinguished authors, all specialists in their particular fields, have contributed to this publication which provides a comprehensive view of the health implications associated with tattooing. The book covers a broad range of topics that will be of interest to clinicians and nursing staff, toxicologists and regulators as well as laser surgeons who often face the challenge of having to remove tattoos, professional tattooists and producers of tattoo ink.

First Published in 1986, this book offers a full, comprehensive guide to the application of hydrogels in medicine. Carefully compiled and filled with a vast repertoire of notes, diagrams, and references this book serves as a useful reference for students of medicine and other practitioners in their respective fields.

Containing contributions from leading academic and industrial researchers, this book provides a much needed update of foam science research. The first section of the book presents an accessible summary of the theory and fundamentals of foams. This includes chapters on morphology, drainage, Ostwald ripening, coalescence, rheology, and pneumatic foams. The second section demonstrates how this theory is used in a wide range of industrial applications, including foam fractionation, froth flotation and foam mitigation. It includes chapters on suprafroths, flotation of oil sands, foams in enhancing petroleum recovery, Gas-liquid Mass Transfer in foam, foams in glass manufacturing, fire-fighting foam technology and consumer product foams. Key features: Foam fractionation is an exciting and emerging technology, starting to gain significant attention Discusses a vital topic for many industries, especially mineral processing, petroleum engineering, bioengineering, consumer products and food sector Links foam science theory to industrial applications, making it accessible to an engineering science audience Summarizes the latest developments in this rapidly progressing area of research Contains contributions from leading international researchers from academia and industry

Thanks to their outstanding hydrogen selectivity, palladium membranes have attracted extensive R&D interest. They are a potential breakthrough technology for hydrogen production and also have promising applications in the areas of thermochemical biorefining. This book summarises key research in palladium membrane technologies, with particular focus on the scale-up challenges. After an introductory chapter, Part one reviews the fabrication of palladium

membranes. Part two then focuses on palladium membrane module and reactor design. The final part of the book reviews the operation of palladium membranes for synthesis gas/hydrogen production, carbon capture and other applications. Review of manufacture and design issues for palladium membranes Discussion of the applications of palladium membrane technology, including solar steam reforming, IGCC plants, NGCC plants, CHP plants and hydrogen production Examples of the technology in operation

Foams and froths are an important feature of everyday life; one only has to think of shaving foam, foam upholstery, fire fighting foam, bread, bear head, and ice cream. Less obvious but equally important are the foams and foaming processes which are being exploited in ever more complex and imaginative ways in industry. However, the unusual nature of foams, the fact that they are neither solids or liquids, and their very fragility has prevented scientists from obtaining a thorough understanding of even the basic principles of foam formation and stability. This volume presents papers on the physics, chemistry, structure and ultrastructure of foams by contributors from a wide range of backgrounds and research disciplines. The aim of the book is to present a unique multi-disciplinary cross section of work currently being undertaken on the subject of foams.

Each section contains brand name and supplier's formulations. Brand name sections include manufacturer, active ingredients and concentration and other ingredients. Supplier's section includes supplier, ingredients, and mixing procedure.

This book aims to inform chemistry professionals, including managers and technologists, on the large potential of glycerol as versatile biofeedstock for the production of a variety of chemicals, polymers and fuels. Whilst filling a gap in the current literature, this nicely illustrated book is written in a clear, concise style and presents the numerous uses of glycerol as a new raw material which are starting to have an impact on industry worldwide. Elucidation of the principles governing the new chemistry of glycerol goes along with updated industrial information that is generally difficult to retrieve. Through its 10 chapters, the monograph tells the story of a chemical success that of converting glycerol into value added products and highlights the principles that made it possible. Whether as solvent, antifreeze, detergent, monomer for textiles or drug, new catalytic conversions of glycerol have been discovered that are finding application for the synthesis of products whose use range from everyday's life to the fine chemical industry. Readers are also shown how a number of practical limitations posed by glycerol chemistry, such as the low selectivity encountered employing traditional stoichiometric and older catalytic conversions, were actually solved based on the understanding of the fundamental chemistry of glycerol and by application of catalysis science and technology. Readers also find a thorough discussion on the sustainability issues of bioglycerol production covering societal, environmental and economic

dimensions to reflect the needs of politicians and citizens of today who require cross border research. By explaining the advantages and problems as well as offering solutions the book aids understanding as to whether biodiesel and glycerol refineries are convenient and economically sound.

Finite Difference Methods in Heat Transfer, Second Edition focuses on finite difference methods and their application to the solution of heat transfer problems. Such methods are based on the discretization of governing equations, initial and boundary conditions, which then replace a continuous partial differential problem by a system of algebraic equations. Finite difference methods are a versatile tool for scientists and for engineers. This updated book serves university students taking graduate-level coursework in heat transfer, as well as being an important reference for researchers and engineering. Features Provides a self-contained approach in finite difference methods for students and professionals Covers the use of finite difference methods in convective, conductive, and radiative heat transfer Presents numerical solution techniques to elliptic, parabolic, and hyperbolic problems Includes hybrid analytical–numerical approaches Wetting and Spreading Dynamics explains wetting phenomena when a liquid partially or completely wets solid or immiscible liquid surfaces. Written for both newcomers and experienced researchers in the field, the book uses principles and terminology from colloid science, fluid mechanics, and thermodynamics to solve equilibrium and dynamic problems in wetting and spreading. This book explains how surface forces acting at the three-phase contact line determine equilibrium, hysteresis contact angles, and all other equilibrium and kinetics features of liquids when in contact with solids or other immiscible liquids. It examines the interaction of surface forces, capillary forces, and properties of the transition zone between the bulk liquid (drop or meniscus) and solid substrate. Detailing the kinetics of spreading over both porous and nonporous substrates, the book observes how surface forces remove “singularity” at the moving three-phase contact line in the latter. The authors introduce novel universal spreading laws that apply to the spreading over porous substrates, which were experimentally verified. They also investigate the influence of surfactants on kinetics of spreading over hydrophobic substrates, spontaneous imbibition into hydrophobic or partially hydrophilic porous bodies. Drawing together theory and experimental data while presenting over 150 figures to illustrate the concepts, Wetting and Spreading Dynamics discusses open questions, challenges, and future directions for research and myriad applications of equilibrium and dynamics of wetting.

In this book, beginners, engineers, and researchers entering the field can easily find clear, up-to-date answers to their questions regarding the physical and physico-chemical properties of aqueous foams, as well as their numerous industrial applications, explained using current knowledge of their structure, their stability, and their rheology.

Presenting the first comprehensive review of the subject's theory and applications in more than 15 years, this outstanding

reference encompasses the most-up-to-date advances in lognormal distributions in thorough, detailed contributions by specialists in statistics, business and economics, industry, biology, ecology, geology, and meteorology. Lognormal Distributions describes the theory and methods of point and interval estimation as well as the testing of hypotheses clearly and precisely from a modern viewpoint—not only for the basic two-parameter lognormal distribution but also for its generalizations, including three parameters, truncated distributions, delta-lognormal distributions, and two or more dimensions. Featuring over 600 references plus author and subject indexes, this volume reviews the subject's history . . . gives explicit formulas for minimum variance unbiased estimates of parameters and their variances . . . provides optimal tests of hypotheses and confidence interval procedures for various functions of the parameters in the two-parameter model. . . and discusses practical methods of analysis for truncated, censored, or grouped samples.

In the 20 years since the publication of the author's multi-contributor volume on defoaming, a vast amount of new work has been published and many new insights have been revealed. A cohesive, single-authored book, *The Science of Defoaming: Theory, Experiment and Applications* provides comprehensive coverage of the topic. It describes the mode of action of antifoams, presenting the relevant theory and the supporting experimental evidence. Beginning with an introductory chapter that discusses the intrinsic properties of foam, the book then describes experimental methods for measuring foam properties important for studying antifoam action and techniques used in establishing the mode of action of antifoams. Since most commercially effective antifoams are oil based, a chapter is devoted to the entry and spreading behavior of oils and the role of thin film forces in determining that behavior. The book reviews the mode of action of antifoams, including theories of antifoam mechanisms and the role of bridging foam films by particles and oil drops. It also addresses issues related to the effect of antifoam concentration on foam formation by air entrainment and the process of deactivation of mixed oil–particle antifoams during dispersal and foam generation. For applications where chemical antifoam use is unacceptable, the text examines mechanical means of defoaming, such as the use of rotary devices and ultrasound. The final chapters consider the application of defoaming in radically different contexts including waterborne latex paints and varnishes, machine washing of textiles, gas–oil separation in crude oil production, and cardiopulmonary bypass surgery. Focusing on the basic science of defoaming, this book presents a balanced view, which also addresses the challenges that may arise for these specific defoaming applications.

Diazonium compounds are employed as a new class of coupling agents to link polymers, biomacromolecules, and other species (e. g. metallic nanoparticles) to the surface of materials. The resulting high performance materials show improved chemical and physical properties and find widespread applications. The advantage of aryl diazonium salts compared to other surface modifiers lies in their ease of preparation, rapid (electro)reduction, large choice of reactive

functional groups, and strong aryl-surface covalent bonding. This unique book summarizes the current knowledge of the surface and interface chemistry of aryl diazonium salts. It covers fundamental aspects of diazonium chemistry together with theoretical calculations of surface-molecule bonding, analytical methods used for the characterization of aryl layers, as well as important applications in the field of electrochemistry, nanotechnology, biosensors, polymer coatings and materials science. Furthermore, information on other surface modifiers (amines, silanes, hydrazines, iodonium salts) is included. This collection of 14 self-contained chapters constitutes a valuable book for PhD students, academics and industrial researchers working on this hot topic.

By-products of global biodiesel manufacturing are a modern day global fact responsible for igniting a number of year's worldwide intense research activity into human chemical ingenuity. This fully updated and revised 2nd edition depicts how practical limitations posed by glycerol chemistry are solved based on the understanding of the fundamental chemistry of glycerol and by application of catalysis science and technology. The authors report and comment on employable, practical avenues applicable to convert glycerol into value added products of mass consumption. This book is the best-selling reference book in the field. The highly anticipated 2nd Edition is essential reading for anyone interested in understanding whether biodiesel and glycerol refineries are convenient and economically sound.

The book aims at describing the most important experimental methods for characterizing liquid interfaces, such as drop profile analysis, bubble pressure and drop volume tensiometry, capillary pressure technique, and oscillating drops and bubbles.

Best known for their use as bulk materials, polymers when used in small amounts as rheology modifiers can convert simple fluids to high-performance materials. Such additives have found use in paints and coatings, fuels and lubricating oils, cosmetics and personal care products, and food. This 20-chapter book presents a strong mix of industrial and academic contributions that cover rheological concepts, gels and latices, associating polymers, polymer-polymer and polymer-solvent interactions, and deformation-related orientations.

Hydrocolloids are among the most widely used ingredients in the food industry. They function as thickening and gelling agents, texturizers, stabilisers and emulsifiers and in addition have application in areas such as edible coatings and flavour release. Products reformulated for fat reduction are particularly dependent on hydrocolloids for satisfactory sensory quality. They now also find increasing applications in the health area as dietary fibre of low calorific value. The first edition of Handbook of Hydrocolloids provided professionals in the food industry with relevant practical information about the range of hydrocolloid ingredients readily and at the same time authoritatively. It was exceptionally well received and has subsequently been used as the substantive reference on these food ingredients. Extensively revised and

expanded and containing eight new chapters, this major new edition strengthens that reputation. Edited by two leading international authorities in the field, the second edition reviews over twenty-five hydrocolloids, covering structure and properties, processing, functionality, applications and regulatory status. Since there is now greater emphasis on the protein hydrocolloids, new chapters on vegetable proteins and egg protein have been added. Coverage of microbial polysaccharides has also been increased and the developing role of the exudate gums recognised, with a new chapter on Gum Ghatti. Protein-polysaccharide complexes are finding increased application in food products and a new chapter on this topic as been added. Two additional chapters reviewing the role of hydrocolloids in emulsification and their role as dietary fibre and subsequent health benefits are also included. The second edition of Handbook of hydrocolloids is an essential reference for post-graduate students, research scientists and food manufacturers. Extensively revised and expanded second edition edited by two leading international authorities Provides an introduction to food hydrocolliods considering regulatory aspects and thickening characteristics Comprehensively examines the manufacture, structure, function and applications of over twenty five hydrocolloids

This detailed volume addresses key issues and subtle nuances involved in developing hydrophilic matrix tablets as an approach to oral controlled release. It brings together information from more than five decades of research and development on hydrophilic matrix tablets and provides perspective on contemporary issues. Twelve comprehensive chapters explore a variety of topics including polymers (hypromellose, natural polysaccharides and polyethylene oxide) and their utilization in hydrophilic matrices, critical interactions impacting tablet performance, in vitro physical and imaging techniques, and microenvironmental pH control and mixed polymer approaches, among others. In one collective volume, Hydrophilic Matrix Tablets for Oral Controlled Release provides a single source of current knowledge, including sections of previously unpublished data. It is an important resource for industrial and academic scientists investigating and developing these oral controlled release formulations.

This volume is the first systematic review of surfactant-modified, water-soluble polymers. The authors, representing leaders in their fields, offer practical information about associative thickeners and polymer surfactants, including spectroscopic and rheological analysis of these water-soluble polymers in aqueous solutions. In addition, aqueous gels of varying chemical types are studied with respect to their properties in numerous applications. Among the topics covered are: aqueous gels; surfactant-modified, water-soluble polymers; polyelectrolyte synthesis; elongational viscosity; and fluorescence phenomena of water-soluble polymers. A guide to further reading is provided through carefully selected references."--Jacket.

The case for revolutionizing the U.S. economy, from a leading CEO America used to define itself by the things we built. We designed and produced the world's most important innovations, and in doing so, created a vibrant manufacturing sector that established the middle class. We manufactured our way to the top and became the undisputed economic leader of the world. But over the last several decades, and especially in the last ten years, the sector that was America's great pride has eroded, costing

us millions of jobs and putting our long-term prosperity at risk. Now, as we struggle to recover from the worst recession in generations, our only chance to turn things around is to revive the American manufacturing sector—and to revolutionize it. In *Make It in America: The Case for Reinventing the Economy*, Andrew Liveris—Chairman and CEO of The Dow Chemical Company—offers a thoughtful and passionate argument that America's future economic growth and prosperity depends on the strength of its manufacturing sector. The book explains how a manufacturing sector creates economic value on a scale unmatched by any other, and how central the sector is to creating jobs both inside and outside the factory. Explores how other nations are building their manufacturing sectors to stay competitive in the global economy, and describes how America has failed to keep up. Provides an aggressive, practical, and comprehensive agenda that will put the U.S. back on track to lead the world. It's time to stop accepting as inevitable the shuttering of factories and staggering job losses that have come to define manufacturing. It's time to acknowledge the cost of inaction. There is no better company to make the case for reviving U.S. manufacturing than The Dow Chemical Company, one of the world's largest manufacturers and most global corporations. And there's no better book to show why it needs to be done and how to do it than *Make It in America*.

This volume is the ideal companion to Wiley's trilogy: *The Pigments Handbook* (1988), *Industrial Organic Pigments* (1997), and *Industrial Inorganic Pigments* (1998). High Performance Pigments have become increasingly important in recent years, with a growth rate well in advance of the more classical types of pigments. The book offers both producers and users of High Performance Pigments the opportunity to review and update their understanding of latest technologies and market issues impacting both inorganic and organic High Performance Pigments, together with assessing key regulatory affairs, in this specialty niche of the chemical industry. The manufacture of High Performance Pigments is today a global industry. This is reflected in the multinational expertise of the over twenty experts, drawn from Europe, North America and Asia, who have authored chapters in this book. No professional today can afford to waste time on unfocussed research. This book will effectively help chemists, physicists, engineers, applications and regulatory specialists, and materials scientists to stay ahead in this fast-changing field. *Droplet Wetting and Evaporation* provides engineers, students, and researchers with the first comprehensive guide to the theory and applications of droplet wetting and evaporation. Beginning with a relevant theoretical background, the book moves on to consider specific aspects, including heat transfer, flow instabilities, and the drying of complex fluid droplets. Each chapter covers the principles of the subject, addressing corresponding practical issues and problems. The text is ideal for a broad range of domains, from aerospace and materials, to biomedical applications, comprehensively relaying the challenges and approaches from the different communities leading the way in droplet research and development. Provides a broad, cross-subject coverage of theory and application that is ideal for engineers, students and researchers who need to follow all major developments in this interdisciplinary field. Includes comprehensive discussions of heat transfer, flow instabilities, and the drying of complex fluid droplets. Begins with an accessible summary of fundamental theory before moving on to specific areas such as heat transfer, flow instabilities, and the drying of complex fluid droplets.

This key reference will serve as the most comprehensive source for identifying and locating products in the international chemical marketplace. It has been written for the chemists, materials scientists, end-product formulators, industrial application specialists and scientists working in associated fields.

A general and introductory survey of foams, emulsions and cellular materials. Foams and emulsions are illustrations of some fundamental concepts in statistical thermodynamics, rheology, elasticity and the physics and chemistry of divided media and interfaces. They also give rise to some of the most beautiful geometrical shapes and tilings, ordered or disordered. The chapters are grouped into sections having fairly loose boundaries. Each chapter is intelligible alone, but cross referencing means that the few concepts that may not be familiar to the reader can be found in other chapters in the book. Audience: Research students, researchers and teachers in physics, physical chemistry, materials science, mechanical engineering and geometry.

Detailing the major developments of the last decade, the Handbook of Hydraulic Fluid Technology, Second Edition updates the original and remains the most comprehensive and authoritative book on the subject. With all chapters either revised (in some cases, completely) or expanded to account for new developments, this book sets itself apart by approaching hydraulic fluids as a component of a system and focusing on key technological aspects. Written by experts from around the world, the handbook covers all major classes of hydraulic fluids in detail, delving into chemistry, design, fluid maintenance and selection, and other key concepts. It also offers a rigorous overview of hydraulic fluid technology and evaluates the ecological benefits of water and its use as an important alternative technology. This complete overview discusses pumps and motors, valves, and reservoir design, as well as fluid properties and associated topics. These include air entrainment, modulus, lubrication and wear assessment by bench and pump testing, biodegradability, and fire resistance. Contributors also present particularly important material on biodegradable fluids and the use of water as a hydraulic fluid. As the foremost resource on the design, selection, and testing of hydraulic systems and fluids used in engineering applications, this book contains new illustrations, data tables, and practical examples, all updated with essential information on the latest methods. To streamline presentation, relevant content from the first edition has been integrated into this new version, where appropriate. The result is a reference that helps readers develop an unparalleled understanding of the total hydraulic system, including essential hardware, fluid properties, and hydraulic lubricants.

The main physicochemical aspects of foam and foam films such as preparation, structure, properties, are considered, giving a special emphasis on foam stability. It is shown that the foam and foam films are an efficient object in the study of various surface phenomena and in establishing regularities common for different interfaces, in particular, water/oil interface. The techniques and results on foam films have an independent meaning and involve the latest achievement in this field, with a focus on authors' results. The book has an expressed monographic character. It reveals joint ideas, i.e. the quantitative approach in treating foams is based on foam film behaviour and the techniques for controlling the foam liquid content, developed by the authors. A major contribution represents the independent consideration of formation and stability of foam films in theoretical and experimental aspects. No monograph published so far reveals these topics in the mentioned manner. Data and information about foams,

physicochemical characterization of surfactants, phospholipids and polymers can also be found. Furthermore, the book provides information about: techniques involved in the study of foam films and foam structure and properties; foam drainage; processes of destruction in gravitational and centrifugal fields; reasons for stability of films and their role in the processes running in the foam; mechanical, rheological, optical, thermophysical, electrical properties; foam destruction upon addition of antifoams (mechanism of destruction, techniques, application); scientific principles of controlling foam properties and their application in foam separation and concentration; enhanced oil recovery; thermodynamic and non-equilibrium properties of foam films, stabilized by surfactants, phospholipids and polymers; techniques for the study of surface forces; formation and stability of foam films; black films, including bilayers; new theories of stability of amphiphile bilayer; experiments involved in this stability; application in biology and medicine. Contents of this monograph include an examination of the state of the art, and also a comprehensive review of the extended process (continuing for some 50 years) through which this branch of science came into being and continued to grow. Topics include: equilibrium and disjoining pressure of thin in

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