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### POLYMER CHEMISTRY

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CRC Press **A well-rounded and articulate examination of polymer properties at the molecular level, Polymer Chemistry focuses on fundamental principles based on underlying chemical structures, polymer synthesis, characterization, and properties. It emphasizes the logical progression of concepts and provide mathematical tools as needed as well as fully derived problems for advanced calculations. The much-anticipated Third Edition expands and reorganizes material to better develop polymer chemistry concepts and update the remaining chapters. New examples and problems are also featured throughout. This revised edition: Integrates concepts from physics, biology, materials science, chemical engineering, and statistics as needed. Contains mathematical tools and step-by-step derivations for example problems. Incorporates new theories and experiments using the latest tools and instrumentation and topics that appear prominently in current polymer science journals. Polymer Chemistry, Third Edition offers a logical presentation of topics that can be scaled to meet the needs of introductory as well as more advanced courses in chemistry, materials science, polymer science, and chemical engineering.**

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### POLYMER CHEMISTRY

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### INTRODUCTION TO POLYMER SCIENCE AND CHEMISTRY

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### A PROBLEM-SOLVING APPROACH

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CRC Press **With such a wide diversity of properties and applications, is it any wonder that industry and academia have such a fascination with polymers? A solid introduction to such an enormous and important field is critical to the modern polymer scientist-to-be, but most of the available books do not stress practical problem solving or include recent advances. Serving as the polymer book for the new millennium, Introduction to Polymer Science and Chemistry: A Problem Solving Approach unites the fundamentals of polymer science and polymer chemistry in a seamless presentation. Emphasizing polymerization kinetics, the author uses a unique question-and-answer approach when developing theory or introducing new concepts. The first four chapters introduce polymer science, focusing on physical and molecular properties, solution behavior, and molecular weights. The remainder of the book explores polymer chemistry, devoting individual, self-contained chapters to the main types of polymerization reactions: condensation; free radical; ionic; coordination; and ring-opening. It introduces recent advances such as supramolecular polymerization, hyperbranching, photoemulsion polymerization, the grafting-from polymerization process, polymer brushes, living/controlled radical polymerization, and immobilized metallocene catalysts. With numerical problems accompanying the discussion at every step along with numerous end-of-chapter exercises, Introduction to Chemical Polymer Science: A Problem Solving Approach is an ideal introductory text and self-study vehicle for mastering the principles and methodologies of modern polymer science and chemistry.**

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### PRINCIPLES OF COLLOID AND SURFACE CHEMISTRY

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### PRINCIPLES OF POLYMERIZATION

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John Wiley & Sons **The new edition of a classic text and reference The large chains of molecules known as polymers are currently used in everything from "wash and wear" clothing to**

rubber tires to protective enamels and paints. Yet the practical applications of polymers are only increasing; innovations in polymer chemistry constantly bring both improved and entirely new uses for polymers onto the technological playing field. Principles of Polymerization, Fourth Edition presents the classic text on polymer synthesis, fully updated to reflect today's state of the art. New and expanded coverage in the Fourth Edition includes: \* Metallocene and post-metallocene polymerization catalysts \* Living polymerizations (radical, cationic, anionic) \* Dendrimer, hyperbranched, brush, and other polymer architectures and assemblies \* Graft and block copolymers \* High-temperature polymers \* Inorganic and organometallic polymers \* Conducting polymers \* Ring-opening polymerization \* In vivo and in vitro polymerization Appropriate for both novice and advanced students as well as professionals, this comprehensive yet accessible resource enables the reader to achieve an advanced, up-to-date understanding of polymer synthesis. Different methods of polymerization, reaction parameters for synthesis, molecular weight, branching and crosslinking, and the chemical and physical structure of polymers all receive ample coverage. A thorough discussion at the elementary level prefaces each topic, with a more advanced treatment following. Yet the language throughout remains straightforward and geared towards the student. Extensively updated, Principles of Polymerization, Fourth Edition provides an excellent textbook for today's students of polymer chemistry, chemical engineering, and materials science, as well as a current reference for the researcher or other practitioner working in these areas.

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## INTRODUCTION TO PHYSICAL POLYMER SCIENCE

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[John Wiley & Sons](#) An Updated Edition of the Classic Text Polymers constitute the basis for the plastics, rubber, adhesives, fiber, and coating industries. The Fourth Edition of Introduction to Physical Polymer Science acknowledges the industrial success of polymers and the advancements made in the field while continuing to deliver the comprehensive introduction to polymer science that made its predecessors classic texts. The Fourth Edition continues its coverage of amorphous and crystalline materials, glass transitions, rubber elasticity, and mechanical behavior, and offers updated discussions of polymer blends, composites, and interfaces, as well as such basics as molecular weight determination. Thus, interrelationships among molecular structure, morphology, and mechanical behavior of polymers continue to provide much of the value of the book. Newly introduced topics include: \* Nanocomposites, including carbon nanotubes and exfoliated montmorillonite clays \* The structure, motions, and functions of DNA and proteins, as well as the interfaces of polymeric biomaterials with living organisms \* The glass transition behavior of nano-thin plastic films In addition, new sections have been included on fire retardancy, friction and wear, optical tweezers, and more. Introduction to Physical Polymer Science, Fourth Edition provides both an essential introduction to the field as well as an entry point to the latest research and developments in polymer science and engineering, making it an indispensable text for chemistry, chemical engineering, materials science and engineering, and polymer science and engineering students and professionals.

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## POLYMER SOLUTIONS

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### AN INTRODUCTION TO PHYSICAL PROPERTIES

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[John Wiley & Sons](#) Polymer Solutions: An Introduction to Physical Properties offers a fresh, inclusive approach to teaching the fundamentals of physical polymer science. Students, instructors, and professionals in polymer chemistry, analytical chemistry, organic chemistry, engineering, materials, and textiles will find Iwao Teraoka's text at once accessible and highly detailed in its treatment of the properties of polymers in the solution phase. Teraoka's purpose in writing Polymer Solutions is twofold: to familiarize the advanced undergraduate and beginning graduate student with basic concepts, theories, models, and experimental techniques for polymer solutions; and to provide a reference for researchers working in the area of polymer solutions as well as those in charge of chromatographic characterization of polymers. The author's incorporation of recent advances in the instrumentation of size-exclusion chromatography, the method by which polymers are analyzed, renders the text particularly topical. Subjects discussed include: Real, ideal, Gaussian, semirigid, and branched polymer chains Polymer solutions and thermodynamics Static light scattering of a polymer solution Dynamic light scattering and diffusion of polymers Dynamics of dilute and semidilute polymer solutions Study questions at the end of each chapter not only provide students with the opportunity to test their understanding, but also introduce topics relevant to polymer solutions not included in the main text. With over 250 geometrical model diagrams, Polymer Solutions is a necessary reference for students and for scientists pursuing a broader understanding of polymers.

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## SOLID STATE POLYMERIZATION

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[John Wiley & Sons](#) The most current guide to solid state polymerization Solid State Polymerization (SSP) is an indispensable tool in the design, manufacture, and study of polymers, plastics, and fibers. SSP presents significant advantages over other polymerization techniques due to low operating temperatures, inexpensive equipment, and simple and environmentally sound procedures. Combining fundamentals of polymer science, chemistry, physical chemistry, and engineering, SSP also offers many research applications for a

wide range of students and investigators. Gathering and filtering the latest literature on SSP, Solid Solid State Polymerization offers a unique, one-stop resource on this important process. With chapters contributed by leaders in the field, this text summarizes SSP, and provides essential coverage that includes: An introduction to SSP, with chemical and physical steps, apparatus, advantages, and parameters SSP physical chemistry and mechanisms Kinetic aspects of polyesters and polyamides SSP Catalysis in SSP processes Application of SSP under high pressure conditions in the laboratory Engineering aspects regarding process modeling and industrial application Recent developments and future possibilities Solid State Polymerization provides the most up-to-date coverage of this constantly developing field to academic and industry professionals, as well as graduate and postgraduate-level students in chemical engineering, materials science and engineering, polymer chemistry, polymer processing and polymer engineering.

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## **SEYMOUR/CARRAHER'S POLYMER CHEMISTRY**

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### **SIXTH EDITION**

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CRC Press This revolutionary and best-selling resource contains more than 200 pages of additional information and expanded discussions on zeolites, bitumen, conducting polymers, polymerization reactors, dendrites, self-assembling nanomaterials, atomic force microscopy, and polymer processing. This exceptional text offers extensive listings of laboratory exercises and demonstrations, web resources, and new applications for in-depth analysis of synthetic, natural, organometallic, and inorganic polymers. Special sections discuss human genome and protonics, recycling codes and solid waste, optical fibers, self-assembly, combinatorial chemistry, and smart and conductive materials.

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## **INTERMOLECULAR AND SURFACE FORCES**

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Academic Press This reference describes the role of various intermolecular and interparticle forces in determining the properties of simple systems such as gases, liquids and solids, with a special focus on more complex colloidal, polymeric and biological systems. The book provides a thorough foundation in theories and concepts of intermolecular forces, allowing researchers and students to recognize which forces are important in any particular system, as well as how to control these forces. This third edition is expanded into three sections and contains five new chapters over the previous edition. · starts from the basics and builds up to more complex systems · covers all aspects of intermolecular and interparticle forces both at the fundamental and applied levels · multidisciplinary approach: bringing together and unifying phenomena from different fields · This new edition has an expanded Part III and new chapters on non-equilibrium (dynamic) interactions, and tribology (friction forces)

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## **PRINCIPLES OF POLYMER CHEMISTRY**

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Cornell University Press

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## **ADVANCED POLYMER CHEMISTRY**

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### **A PROBLEM SOLVING GUIDE**

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Marcel Dekker Incorporated This volume employs a practical, problem-solving approach to understanding the detailed chemistry, kinetics and mechanisms of polymer synthesis. It provides a comprehensive analysis of the methods of synthesis and techniques of characterization unique to polymers.

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## **POLYMERS**

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## **CHEMISTRY AND PHYSICS OF MODERN MATERIALS, 2ND EDITION**

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CRC Press This text follows a broad sequence of preparation, characterization, physical and mechanical properties and structure-property relations. **Polymers: Chemistry and Physics of Modern Materials, Second Edition** covers several methods of polymerization, properties, and advanced applications such as liquid crystals and polymers used in the electronics industry. Topics also include Step-Growth, Free Radical Addition, and Ionic Polymerization; Copolymerization; Polymer Stereochemistry and Characterization; Structure-Property Relationship; Polymer Liquid Crystals; and Polymers for the Electronics Industry.

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## POLYMERS

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### CHEMISTRY AND PHYSICS OF MODERN MATERIALS, THIRD EDITION

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[CRC Press](#) Extensively revised and updated to keep abreast of recent advances, *Polymers: Chemistry and Physics of Modern Materials, Third Edition* continues to provide a broad-based, high-information text at an introductory, reader-friendly level that illustrates the multidisciplinary nature of polymer science. Adding or amending roughly 50% of the material, t

### SYNTHETIC METHODS IN STEP-GROWTH POLYMERS

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[John Wiley & Sons](#) *Synthetic Methods in Step-Growth Polymers* provides a concise source of information on synthetic techniques, purification, and characterization methods for step-growth polymers and also addresses future synthetic trends.

### INTRODUCTION TO SOL-GEL PROCESSING

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[Springer Nature](#) This book presents a broad, general introduction to the processing of Sol-Gel technologies. This updated volume serves as a general handbook for researchers and students entering the field. This new edition provides updates in fields that have undergone rapid developments, such as Ceramics, Catalysis, Chromatography, biomaterials, glass science, and optics. It provides a simple, compact resource that can also be used in graduate-level materials science courses.

## POLYURETHANES

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### SCIENCE, TECHNOLOGY, MARKETS, AND TRENDS

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[John Wiley & Sons](#) This book, cohesively written by an expert author with supreme breadth and depth of perspective on polyurethanes, provides a comprehensive overview of all aspects of the science and technology on one of the most commonly produced plastics. Covers the applications, manufacture, and markets for polyurethanes, and discusses analytical methods, reaction mechanisms, morphology, and synthetic routes Provides an up-to-date view of the current markets and trend analysis based on patent activity and updates chapters to include new research Includes two new chapters on PU recycling and PU hybrids, covering the opportunities and challenges in both

## POLYMERIC MATERIALS

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### SURFACES, INTERFACES AND BIOAPPLICATIONS

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[MDPI](#) This book collects the articles published in the Special Issue "Polymeric Materials: Surfaces, Interfaces and Bioapplications". It shows the advances in polymeric materials, which have tremendous applications in agricultural films, food packaging, dental restoration, antimicrobial systems, and tissue engineering. These polymeric materials are presented as films, coatings, particles, fibers, hydrogels, or networks. The potential to modify and modulate their surfaces or their content by different techniques, such as click chemistry, ozonation, breath figures, wrinkle formation, or electrospray, are also explained, taking into account the relationship between the structure and properties in the final application. Moreover, new trends in the development of such materials are presented, using more environmental friendly and safe methods, which, at the same time, have a high impact on our society.

### INTRODUCTION TO POLYMER CHEMISTRY, FOURTH EDITION

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[CRC Press](#) *Introduction to Polymer Chemistry* provides undergraduate students with a much-needed, well-rounded presentation of the principles and applications of natural, synthetic, inorganic, and organic polymers. With an emphasis on the environment and green chemistry and materials, this fourth edition continues to provide detailed coverage of natural and synthetic giant molecules, inorganic and organic polymers, elastomers, adhesives, coatings, fibers, plastics, blends, caulks, composites, and ceramics. Building on undergraduate work in foundational courses, the text fulfills the American Chemical Society Committee on Professional Training (ACS CPT) in-depth course requirement

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## HANDBOOK OF SURFACE AND COLLOID CHEMISTRY

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[CRC Press](#) This new edition of the Handbook of Surface and Colloid Chemistry informs you of significant recent developments in the field. It highlights new applications and provides revised insight on surface and colloid chemistry's growing role in industrial innovations. The contributors to each chapter are internationally recognized experts. Several chapter

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## CELLULOSE DERIVATIVES

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### SYNTHESIS, STRUCTURE, AND PROPERTIES

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[Springer](#) This book summarizes recent progress in cellulose chemistry. The last 10 years have witnessed important developments, because sustainability is a major concern. Biodegradable cellulose derivatives, in particular esters and ethers, are employed on a large scale. The recent developments in cellulose chemistry include unconventional methods for the synthesis of derivatives, introduction of novel solvents, e.g. ionic liquids, novel approaches to regioselective derivatization of cellulose, preparation of nano-particles and nano-composites for specific applications. These new developments are discussed comprehensively. This book is aimed at researchers and professionals working on cellulose and its derivatives. It fills an important gap in teaching, because most organic chemistry textbooks concentrate on the relatively simple chemistry of mono- and disaccharides. The chemistry and, more importantly, the applications of cellulose are only concisely mentioned.

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## POLYMER PHYSICS

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[Springer Science & Business Media](#) This book is the result of my teaching efforts during the last ten years at the Royal Institute of Technology. The purpose is to present the subject of polymer physics for undergraduate and graduate students, to focus the fundamental aspects of the subject and to show the link between experiments and theory. The intention is not to present a compilation of the currently available literature on the subject. Very few reference citations have thus been made. Each chapter has essentially the same structure: starting with an introduction, continuing with the actual subject, summarizing the chapter in 300-500 words, and finally presenting problems and a list of relevant references for the reader. The solutions to the problems presented in Chapters 1-12 are given in Chapter 13. The theme of the book is essentially polymer science, with the exclusion of that part dealing directly with chemical reactions. The fundamentals in polymer science, including some basic polymer chemistry, are presented as an introduction in the first chapter. The next eight chapters deal with different phenomena (processes) and states of polymers. The last three chapters were written with the intention of making the reader think practically about polymer physics. How can a certain type of problem be solved? What kinds of experiment should be conducted? This book would never have been written without the help of my friend and adviser, Dr Anthony Bristow, who has spent many hours reading through the manuscript, criticizing the content.

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## POLYMER PHYSICS

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[OUP Oxford](#) Polymer Physics provides an introduction to the field for upper level undergraduates and first year graduate students. Any student with a working knowledge of calculus, physics and chemistry should be able to read this book. The essential tools of the polymer physical chemist or engineer are derived in this book without skipping any steps.

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## TEXTBOOK OF POLYMER SCIENCE

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[John Wiley & Sons](#) This Third Edition of the classic, best-selling polymer science textbook surveys theory and practice of all major phases of polymer science, engineering, and technology, including polymerization, solution theory, fractionation and molecular-weight measurement, solid-state properties, structure-property relationships, and the preparation, fabrication and properties of commercially-important plastics, fibers, and elastomers.

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## MECHANICAL PROPERTIES OF SOLID POLYMERS

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[John Wiley & Sons](#) Providing an updated and comprehensive account of the properties of solid polymers, the book covers all aspects of mechanical behaviour. This includes finite elastic behavior, linear viscoelasticity and mechanical relaxations, mechanical anisotropy, non-linear viscoelasticity, yield behavior and fracture. New to this edition is coverage of polymer nanocomposites, and molecular interpretations of yield, e.g. Bowden, Young, and Argon. The book begins by focusing on the structure of polymers, including their chemical composition and physical structure. It goes on to discuss the mechanical properties and behaviour of polymers, the statistical molecular theories of the rubber-like state and

describes aspects of linear viscoelastic behaviour, its measurement, and experimental studies. Later chapters cover composites and experimental behaviour, relaxation transitions, stress and yielding. The book concludes with a discussion of breaking phenomena.

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### **PHYSICS IN MOLECULAR BIOLOGY**

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Cambridge University Press This book, first published in 2005, is a discussion for advanced physics students of how to use physics to model biological systems.

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### **FUNDAMENTALS OF POLYMER ENGINEERING, THIRD EDITION**

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CRC Press Exploring the chemistry of synthesis, mechanisms of polymerization, reaction engineering of step-growth and chain-growth polymerization, polymer characterization, thermodynamics and structural, mechanical, thermal and transport behavior of polymers as melts, solutions and solids, Fundamentals of Polymer Engineering, Third Edition covers essential concepts and breakthroughs in reactor design and polymer production and processing. It contains modern theories and real-world examples for a clear understanding of polymer function and development. This fully updated edition addresses new materials, applications, processing techniques, and interpretations of data in the field of polymer science. It discusses the conversion of biomass and coal to plastics and fuels, the use of porous polymers and membranes for water purification, and the use of polymeric membranes in fuel cells. Recent developments are brought to light in detail, and there are new sections on the improvement of barrier properties of polymers, constitutive equations for polymer melts, additive manufacturing and polymer recycling. This textbook is aimed at senior undergraduate students and first year graduate students in polymer engineering and science courses, as well as professional engineers, scientists, and chemists. Examples and problems are included at the end of each chapter for concept reinforcement.

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### **CHEMISTRY OF SUSTAINABLE ENERGY**

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CRC Press Understanding the chemistry underlying sustainable energy is central to any long-term solution to meeting our future energy needs. Chemistry of Sustainable Energy presents chemistry through the lens of several sustainable energy options, demonstrating the breadth and depth of research being carried out to address issues of sustainability and the gl

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### **SUSTAINABLE POLYMERS FROM BIOMASS**

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John Wiley & Sons Offering a unique perspective summarizing research on this timely important topic around the globe, this book provides comprehensive coverage of how molecular biomass can be transformed into sustainable polymers. It critically discusses and compares a few classes of biomass - oxygen-rich, hydrocarbon-rich, hydrocarbon and non-hydrocarbon (including carbon dioxide) as well as natural polymers - and equally includes products that are already commercialized. A must-have for both newcomers to the field as well as established researchers in both academia and industry.

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### **POLYMER MORPHOLOGY**

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#### **PRINCIPLES, CHARACTERIZATION, AND PROCESSING**

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John Wiley & Sons With a focus on structure-property relationships, this book describes how polymer morphology affects properties and how scientists can modify them. The book covers structure development, theory, simulation, and processing; and discusses a broad range of techniques and methods. • Provides an up-to-date, comprehensive introduction to the principles and practices of polymer morphology • Illustrates major structure types, such as semicrystalline morphology, surface-induced polymer crystallization, phase separation, self-assembly, deformation, and surface topography • Covers a variety of polymers, such as homopolymers, block copolymers, polymer thin films, polymer blends, and polymer nanocomposites • Discusses a broad range of advanced and novel techniques and methods, like x-ray diffraction, thermal analysis, and electron microscopy and their applications in the morphology of polymer materials

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### **POLYMER CHEMISTRY**

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## AN INTRODUCTION

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Ellis Horwood Limited

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## SURFACTANTS AND POLYMERS IN AQUEOUS SOLUTION

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**Wiley** Many industrial formulations such as detergents, paints, foodstuff and cosmetics contain both surfactants and polymers and their interaction govern many of the properties. This book is unique in that it discusses the solution chemistry of both surfactants and polymers and also the interactions between the two. The book, which is based on successful courses given by the authors since 1992, is a revised and extended version of the first edition that became a market success with six reprints since 1998. Surfactants and Polymers in Aqueous Solution is broad in scope, providing both theoretical insights and practical help for those active in the area. This book contains a thorough discussion of surfactant types and gives information of main routes of preparation. A chapter on novel surfactants has been included in the new edition. Physicochemical phenomena such as self-assembly in solution, adsorption, gel formation and foaming are discussed in detail. Particular attention is paid to the solution behaviour of surfactants and polymers containing polyoxyethylene chains. Surface active polymers are presented and their interaction with surfactants is a core topic of the book. Protein-surfactant interaction is also important and a new chapter deals with this issue. Microemulsions are treated in depth and several important applications such as detergency and their use as media for chemical reactions are presented. Emulsions and the choice of emulsifier is discussed in some detail. The new edition also contains chapters on rheology and wetting. Surfactants and Polymers in Aqueous Solution is aimed at those dealing with surface chemistry research at universities and with surfactant formulation in industry.

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## INTRODUCTION TO COLLOID AND SURFACE CHEMISTRY

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The colloidal state; Kinetic properties; Optical properties; Liquid-gas and liquid-liquid interfaces; The solid-gas interface; Charged interfaces; Colloid stability; Rheology; Emulsions and foams.

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## SEPARATION PROCESS PRINCIPLES WITH APPLICATIONS USING PROCESS SIMULATORS, 4TH EDITION

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**Wiley Global Education** Separation Process Principles with Applications Using Process Simulator, 4th Edition is the most comprehensive and up-to-date treatment of the major separation operations in the chemical industry. The 4th edition focuses on using process simulators to design separation processes and prepares readers for professional practice. Completely rewritten to enhance clarity, this fourth edition provides engineers with a strong understanding of the field. With the help of an additional co-author, the text presents new information on bioseparations throughout the chapters. A new chapter on mechanical separations covers settling, filtration and centrifugation including mechanical separations in biotechnology and cell lysis. Boxes help highlight fundamental equations. Numerous new examples and exercises are integrated throughout as well.

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## CARRAHER'S POLYMER CHEMISTRY, TENTH EDITION

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**CRC Press** Carraher's Polymer Chemistry, Tenth Edition integrates the core areas of polymer science. Along with updating of each chapter, newly added content reflects the growing applications in Biochemistry, Biomaterials, and Sustainable Industries. Providing a user-friendly approach to the world of polymeric materials, the book allows students to integrate their chemical knowledge and establish a connection between fundamental and applied chemical information. It contains all of the elements of an introductory text with synthesis, property, application, and characterization. Special sections in each chapter contain definitions, learning objectives, questions, case studies and additional reading.

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## HANSEN SOLUBILITY PARAMETERS

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## A USER'S HANDBOOK, SECOND EDITION

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**CRC Press** Hansen solubility parameters (HSPs) are used to predict molecular affinities, solubility, and solubility-related phenomena. Revised and updated throughout, Hansen Solubility Parameters: A User's Handbook, Second Edition features the three Hansen solubility parameters for over 1200 chemicals and correlations for over 400 materials including polymers, inorganic salts, and biological materials. To update his groundbreaking handbook with the latest advances and perspectives, Charles M. Hansen has invited five renowned experts to share their work, theories, and practical applications involving HSPs. New discussions include a new statistical thermodynamics approach for confirming existing HSPs

and how they fit into other thermodynamic theories for polymer solutions. Entirely new chapters examine the prediction of environmental stress cracking as well as absorption and diffusion in polymers. Highlighting recent findings on interactions with DNA, the treatment of biological materials also includes skin tissue, proteins, natural fibers, and cholesterol. The book also covers the latest applications of HSPs, such as ozone-safe "designer" solvents, protective clothing, drug delivery systems, and petroleum applications. Presenting a comprehensive survey of the theoretical and practical aspects of HSPs, Hansen Solubility Parameters, Second Edition concludes with a detailed discussion on the necessary research, future directions, and potential applications for which HSPs can provide a useful means of prediction in areas such as biological materials, controlled release applications, nanotechnology, and self-assembly.

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## **FUNDAMENTALS OF POLYMER SCIENCE**

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### **AN INTRODUCTORY TEXT, SECOND EDITION**

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Routledge Now in its second edition, this widely used text provides a unique presentation of today's polymer science. It is both comprehensive and readable. The authors are leading educators in this field with extensive background in industrial and academic polymer research. The text starts with a description of the types of microstructures found in polymer

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### **POLYMER MOLECULAR WEIGHTS, (2 PART)**

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CRC Press This two-part book incorporates in one definitive publication the major techniques used to determine the molecular weights of polymers as presented by some of the most respected authorities in the field. Part I of this practical guide covers membrane osmometry, end group determinations, absolute colligative property methods, and light-scattering methods. Discussions on theoretical background are included for every experimental procedure, as are examples of applications in polymeric processes. The information contained in Polymer Molecular Weights cannot be found in any other single publication, making it the most convenient source of information on molecular weight measurement for polymer chemists and physicists, analytical and physical chemists, biochemists, and other scientists in the plastics and synthetic fiber industries. Book jacket.

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## **MOLECULAR THERMODYNAMICS OF FLUID-PHASE EQUILIBRIA**

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Pearson Education The classic guide to mixtures, completely updated with new models, theories, examples, and data. Efficient separation operations and many other chemical processes depend upon a thorough understanding of the properties of gaseous and liquid mixtures. Molecular Thermodynamics of Fluid-Phase Equilibria, Third Edition is a systematic, practical guide to interpreting, correlating, and predicting thermodynamic properties used in mixture-related phase-equilibrium calculations. Completely updated, this edition reflects the growing maturity of techniques grounded in applied statistical thermodynamics and molecular simulation, while relying on classical thermodynamics, molecular physics, and physical chemistry wherever these fields offer superior solutions. Detailed new coverage includes: Techniques for improving separation processes and making them more environmentally friendly. Theoretical concepts enabling the description and interpretation of solution properties. New models, notably the lattice-fluid and statistical associated-fluid theories. Polymer solutions, including gas-polymer equilibria, polymer blends, membranes, and gels. Electrolyte solutions, including semi-empirical models for solutions containing salts or volatile electrolytes. Coverage also includes: fundamentals of classical thermodynamics of phase equilibria; thermodynamic properties from volumetric data; intermolecular forces; fugacities in gas and liquid mixtures; solubilities of gases and solids in liquids; high-pressure phase equilibria; virial coefficients for quantum gases; and much more. Throughout, Molecular Thermodynamics of Fluid-Phase Equilibria strikes a perfect balance between empirical techniques and theory, and is replete with useful examples and experimental data. More than ever, it is the essential resource for engineers, chemists, and other professionals working with mixtures and related processes.

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## **THE ENVIRONMENTAL CHEMISTRY OF ALUMINUM**

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CRC Press The Environmental Chemistry of Aluminum provides a comprehensive, fundamental account of the aqueous chemistry of aluminum within an environmental context. An excellent reference for environmental chemists and scientific administrators of environmental programs, this book contains material reflecting the many recent changes in this rapidly developing discipline. The first three chapters discuss the most fundamental aspects of aluminum chemistry: its quantitation in soils and natural waters, including speciation measurements, and its stable chemical forms, both as a dissolved solute and in a solid phase. These chapters emphasize both critical assessments of and definitive recommendations for laboratory methodologies and measured thermodynamic properties relating to aluminum chemistry. The next four chapters in The Environmental Chemistry of Aluminum build on this foundation to provide details of the polymeric chemistry of aluminum: its polynuclear and colloidal hydrolytic species in aqueous solution, its complexes with

natural organic ligands, including humic substances, and its role as an adsorptive and adsorbent in surface reactions. These chapters are grounded in experimental results rather than conceptual modeling. The final three chapters describe the chemistry of aluminum in soils, waters, and watersheds. These chapters illustrate the problems of spatial and temporal variability, metastability, and scale that continue to make aluminum geochemistry one of the great challenges in modern environmental science.