Polymer Chemistry Hiemenz And Lodge Solution

Diffusion and Eletrophoretic NMR experiments resolve chemical compounds based on their molecular motion. This publication introduces the basics of these methods and explains how they can be used to measure the size of molecules and aggregates, to determine degree of polymerization and to solve other chemical problems. Supplied with many case studies, the book is a must-have for students and researchers who work with practical NMR measurements.

A thorough introduction to environmental monitoring in the oil and gas industry Analytical Techniques in the Oil and Gas Industry for Environmental Monitoring examines the analytical side of the oil and gas industry as it also provides an overall introduction to the industry. You'll discover how oil and natural gas are sourced, refined, and processed. You can learn about what's produced from oil and natural gas, and why evaluating these sourced resources is important. The book discusses the conventional analyses for oil and natural gas feeds, along with their limitations. It offers detailed descriptions of advanced analytical techniques that are commercially available, plus explanations of gas and oil industry equipment and instrumentation. You'll find technique descriptions supplemented with a list of references as well as with real-life application examples. With this book as a reference, you can prepare to apply specific analytical methods in your organization's lab environment. Analytical Techniques can also serve as your comprehensive resource on key techniques in the characterization of oil and gas samples, within both refinery and environmental contexts. Understand of the scope of oil and gas industry techniques available Consider the benefits and limitations of each available process Prepare for applying analytical techniques in your lab See real examples and a list of references for each technique Read descriptions of off-line analytics, as well as on-line and process applications As a chemist, engineer, instructor, or student, this book will also expand your awareness of the role these techniques have in environmental monitoring and environmental impact assessments.

The Handbook of Fiber Chemistry, Third Edition provides complete coverage of scientific and technological principles for all major natural and synthetic fibers. Incorporating new scientific techniques, instruments, characterization, and processing methods, the book features important technological advances from the past decade, particularly in fiber production and novel applications. It contains the latest data and insight into the chemistry and structural properties made possible by these advances. Authored by leading experts in the field of fiber science, most chapters in this third edition of a bestseller are either new or extensively updated. Chapters on synthetic fibers detail their formation from monomers, while those on natural fibers cover extraction and purification methods. Each chapter encompasses definitions, morphology, and fine structure; properties, testing, processing methods, and equipment; and the conversion into marketable products. Taking into account the recent expansion and

diversification of markets for various fibers, this book also offers a solid foundation in the principles used for developing new fibers, including biologically and electronically active fibers. The Handbook of Fiber Chemistry, Third Edition offers a better understanding of the structure–property relationships of fibers and fiber-related phenomena. It is an ideal volume for scientists, technologists, and engineers working to develop novel and innovative products and technologies using natural and synthetic fibers.

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.

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.

The book provides an up-to-date overview of the diverse medical applications of advanced polymers. The book opens by presenting important background information on polymer chemistry and physicochemical characterization of polymers. This serves as essential scientific support for the subsequent chapters, each of which is devoted to the applications of polymers in a particular medical specialty. The coverage is broad, encompassing orthopedics, ophthalmology,

tissue engineering, surgery, dentistry, oncology, drug delivery, nephrology, wound dressing and healing, and cardiology. The development of polymers that enhance the biocompatibility of blood-contacting medical devices and the incorporation of polymers within biosensors are also addressed. This book is an excellent guide to the recent advances in polymeric biomaterials and bridges the gap between the research literature and standard textbooks on the applications of polymers in medicine.

Organized to present the subject clearly to a person with no prior knowledge of polymer systems. Serves also as a broadening tool for scientists and engineers with partial experience in the field. New edition has added more than 300 general references and over 35 original problems. Annotation copyrighted by Book News, Inc., Portland, OR

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.

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.

Elastomer Technology Handbook is a major new reference on the science and technology of engineered elastomers. This contributed volume features some of the latest work by international experts in polymer science and rubber technology. Topics covered include theoretical and practical information on characterizing rubbers, designing engineering elastomers for consumer and engineering applications, properties testing, chemical and physical property characterization, polymerization chemistry, rubber processing and fabrication methods, and rheological characterization. The book also highlights both conventional and emerging market applications for synthetic rubber products and emphasizes the latest

technology advancements. Elastomer Technology Handbook is a "must have" book for polymer researchers and engineers. It will also benefit anyone involved in the handling, manufacturing, processing, and designing of synthetic rubbers.

"Compiles nearly 400 fully assigned NMR spectra of approximately 300 polymers and polymer additives, representing all major clases of materials: polyolefins, styrenics, acrylates, methacrylates, vinyl polymers, elastomers, polyethers, polyesters, polymides, silicones, cellulosics, polyurethanes, plasticizers, and antioxidants."

“Highly recommended!” – CHOICE New Edition Offers Improved Framework for Understanding Polymers Written by well-established professors in the field, Polymer Chemistry, Second Edition provides a well-rounded and articulate examination of polymer properties at the molecular level. It focuses on fundamental principles based on underlying chemical structures, polymer synthesis, characterization, and properties. Consistent with the previous edition, the authors emphasize the logical progression of concepts, rather than presenting just a catalog of facts. The book covers topics that appear prominently in current polymer science journals. It also provides mathematical tools as needed, and fully derived problems for advanced calculations. This new edition integrates new theories and experiments made possible by advances in instrumentation. It adds new chapters on controlled polymerization and chain conformations while expanding and updating material on topics such as catalysis and synthesis, viscoelasticity, rubber elasticity, glass transition, crystallization, solution properties, thermodynamics, and light scattering. Polymer Chemistry, Second 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, and chemical engineering.

"A well-rounded and articulate examination of polymer properties at the molecular level, this book 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, and fully derived problems for advanced calculations. This book expands and reorganizes material within chapters 2-5 to better develop polymer chemistry concepts and update the remaining chapters. New examples and problems will be added throughout"--

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.

This book emphasizes the scientific origin of deformation and damage of FRP composites under various environmental effects and analyses present understanding on degradation mechanisms, role of interfaces and addition of nanofillers Discusses micro-characterization of

composites and interfaces, also includes micro-mechanisms and microscopic evidences to establish the structure-property correlation Elucidates advantages and limitations of FRP composites in supercritical applications

Introduction to Polymers, Second Edition discusses the synthesis, characterization, structure, and mechanical properties of polymers in a single text, giving approximately equal emphasis to each of these major topics. It has thus been possible to show the interrelationship of the different aspects of the subject in a coherent framework. The book has been written to be self-contained, with most equations fully derived and critically discussed. It is supported by a large number of diagrams and micrographs and is fully referenced for more advanced reading. Problems have been supplied at the end of each chapter so that students can test their understanding and practice the manipulation of data.

Providing an updated and comprehensive account of the propertiesof solid polymers, the book covers all aspects of mechanicalbehaviour. This includes finite elastic behavior, linearviscoelasticity and mechanical relaxations, mechanical anisotropy,non-linear viscoelasicity, yield behavior and fracture. New to thisedition is coverage of polymer nanocomposites, and molecularinterpretations 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 ofpolymers, the statistical molecular theories of the rubber-likestate and describes aspects of linear viscoelastic behaviour, itsmeasurement, and experimental studies. Later chapters cover composites and experimental behaviour,relaxation transitions, stress and yielding. The book concludeswith a discussion of breaking phenomena.

This practical book sets the standard as a valuable, time-saving resource offering systematic fundamental information about industrial radiation technologies. This new edition explores updates to emerging applications of ultraviolet (UV) and electron beam (EB) radiation to polymer processing and offers updates throughout to detail changes changes, new trends, and general issues in radiation technology. It presents vital, cutting-edge information to aid further reduction of volatile organic compounds and toxic substances in the environment, develop alternative sources of energy, and harness energy in both medical and industrial applications. New features of this edition include: Stresses the practical aspects of UV/EB technology and its industrial application Includes updates on UV radiation processes and applications of UV radiation Explores new engineering data of selected commercial products Written by an expert with over forty years of experience, this book would make an excellent resource for scientists and engineers in the fields of materials science and polymer chemistry.

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

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.

Providing a comprehensive and up-to-date introduction to the theory and applications of slow-neutron scattering, this detailed book equips readers with the fundamental principles of neutron studies, including the background and evolving development of neutron sources, facility design, neutron scattering instrumentation and techniques, and applications in materials phenomena. Drawing on the authors' extensive experience in this field, this text explores the implications of slow-neutron research in greater depth and breadth than ever before in an accessible yet rigorous manner suitable for both students and researchers in the fields of physics, biology, and materials engineering. Through pedagogical examples and in-depth discussion, readers will be able to grasp the full scope of the field of neutron scattering, from theoretical background through to practical, scientific applications.

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. The number of homework problems has been greatly increased, to over 350 in all. The worked examples and figures have been augmented. More examples of relevant synthetic chemistry have been introduced into Chapter 2 ("Step-Growth Polymers"). More details about atom-transfer radical polymerization and reversible addition/fragmentation chain-transfer polymerization have been added to Chapter 4 ("Controlled Polymerization"). Chapter 7 (renamed "Thermodynamics of Polymer Mixtures") now features a separate section on thermodynamics of polymer blends. Chapter 8 (still called "Light Scattering by Polymer Solutions") has been supplemented with an extensive introduction to small-angle neutron scattering. 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.

The applications of ionic liquids can be enormously expanded by arranging the organic ions in the form a polymer architecture. Polymerized ionic liquids (PILs), also known as poly(ionic liquid)s or polymeric ionic liquids, provide almost all features of ionic polymers plus a rare versatility in design. Written by leading authors, the present book provides a comprehensive overview of this exciting area, discussing various aspects of PILs and their applications as smart materials. The book will appeal to a broad readership including students and researchers from materials science, polymer science, chemistry, and physics.

Membrane processes today play a signifi cant role in the replacement therapy for acute and chronic organ failure diseases. Current extracorporeal blood purifi cation and oxygenation devices employ membranes acting as selective barriers for the removal of endogeneous and exogeneous toxins and for gas exchange, respectively. Additionally, membrane technology offers new interesting opportunities for the design of bioartificial livers, pancreas, kidneys, lungs etc. This book reviews the latest developments in membrane systems for bioartificial organs and regenerative medicine, investigates how membrane technology can improve the quality and efficiency of biomedical devices, and highlights the design procedures for membrane materials covering the preparation, characterization, and sterilization steps as well as transport phenomena. The different strategies pursued for the development of membrane bioartifi cial organs, including crucial issues related to blood/cell-membrane interactions are described with the aim of opening new and exciting frontiers in the coming decades. The book is a valuable tool for tissue engineers, clinicians, biomaterials scientists, membranologists as well as biologists and biotechnologists. It is also a source of reference for students, academic and industrial researchers in the topic of biotechnology, biomedical engineering, materials science and medicine.

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

This book provides comprehensive, up-to-date, and accessible coverage of the relationship between fundamental chemistry and the uses of polymers. With help from new co-author James Mark, the book presents a complete overview of the synthetic, kinetic, structural, and applied aspects of modern polymer chemistry as well as coverage of industrial and medical applications. For chemists and chemical engineers involved in polymer chemistry.

This thesis explores the fabrication of gyroid-forming block copolymer templates and the optical properties of the resulting gyroid optical metamaterials, significantly contributing to our understanding of both. It demonstrates solvent vapour annealing to improve the long-range order of the templates, and investigates the unique crystallisation behaviour of their semicrystalline block. Furthermore, it shows that gyroid optical metamaterials that exhibit only short-range order are optically equivalent to nanoporous gold, and that the anomalous linear dichroism of gyroid optical metamaterials with long-range order is the result of the surface termination of the bulk gyroid morphology. Optical metamaterials are artificially engineered materials that, by virtue of their structure rather than their chemistry, may exhibit various optical

properties not otherwise encountered in nature (e.g. a negative refractive index). However, these structures must be significantly smaller than the wavelength of visible light and are therefore challenging to fabricate using traditional “top down” techniques. Instead, a “bottom up” approach can be used, whereby optical metamaterials are fabricated via templates created by the self-assembly of block-copolymers. One such morphology is the gyroid, a chiral, continuous and triply periodic cubic network found in a range of natural and synthetic self-assembled systems.

The second edition of Principles of Polymer Engineering brings up-to-date coverage for undergraduates studying materials and polymer science. The opening chapters show why plastics and rubbers have such distinctive properties and how they are affected by temperature, strain rate, and other factors. The rest of the book concentrates on how these properties can be exploited to produce functional components within the constraints placed on them. The main changes for the second edition are a new chapter on environmental issues and substantially rewritten sections on yield and fracture and forming. To request a copy of the Solutions Manual, visit: http://global.oup.com/uk/academic/physics/admin/solutions

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.

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.

Conducting polymers are organic polymers which contain conjugation along the polymer backbone that conduct electricity. Conducting polymers are promising materials for energy storage applications because of their fast charge–discharge kinetics, high charge density, fast redox reaction, low-cost, ease of synthesis, tunable morphology, high power capability and excellent intrinsic conductivity compared with inorganic-based materials. Conducting Polymers-Based Energy Storage Materials surveys recent advances in conducting polymers and their composites addressing the execution of these materials as electrodes in electrochemical power sources. Key Features: Provides an overview on the conducting polymer material properties, fundamentals and their role in energy storage applications. Deliberates cutting-edge energy storage technology based on synthetic metals (conducting polymers) Covers current applications in next-generation energy storage devices. Explores the new aspects of

conducting polymers with processing, tunable properties, nanostructures and engineering strategies of conducting polymers for energy storage. Presents up-to-date coverage of a large, rapidly growing and complex conducting polymer literature on all-types electrochemical power sources. This book is an invaluable guide for students, professors, scientists, and R&D industrial specialists working in the field of advanced science, nanodevices, flexible electronics, and energy science.

This book is a concise textbook on polymer physics for graduate students. Researchers in physics, physical chemistry and chemical engineers who are interested in complex fluids can also benefit from the book.

Polymer Physics provides and 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.

Hot-melt extrusion (HME) - melting a substance and forcing it through an orifice under controlled conditions to form a new material - is an emerging processing technology in the pharmaceutical industry for the preparation of various dosage forms and drug delivery systems, for example granules and sustained release tablets. Hot-Melt Extrusion: Pharmaceutical Applications covers the main instrumentation, operation principles and theoretical background of HME. It then focuses on HME drug delivery systems, dosage forms and clinical studies (including pharmacokinetics and bioavailability) of HME products. Finally, the book includes some recent and novel HME applications, scale -up considerations and regulatory issues. Topics covered include: principles and die design of single screw extrusion twin screw extrusion techniques and practices in the laboratory and on production scale HME developments for the pharmaceutical industry solubility parameters for prediction of drug/polymer miscibility in HME formulations the influence of plasticizers in HME applications of polymethacrylate polymers in HME HME of ethylcellulose, hypromellose, and polyethylene oxide bioadhesion properties of polymeric films produced by HME taste masking using HME clinical studies, bioavailability and pharmacokinetics of HME products injection moulding and HME processing for pharmaceutical materials laminar dispersive & distributive mixing with dissolution and applications to HME technological considerations related to scale-up of HME processes devices and implant systems by HME an FDA perspective on HME product and process understanding improved process understanding and control of an HME process with near-infrared spectroscopy Hot-Melt Extrusion: Pharmaceutical Applications is an essential multidisciplinary guide to the emerging pharmaceutical uses of this processing technology for researchers in academia and industry working in drug formulation and delivery, pharmaceutical engineering and processing, and polymers and materials science. This is the first book from our brand new series Advances in Pharmaceutical Technology. Find out more about the series here.

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 polymer ization * 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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Among the materials found in Nature’s many diverse living organisms or produced by human industry, those made from polymers are dominant. In Nature, they are not only dominant, but they are, as well, uniquely necessary to life. Conformations: Connecting the Chemical Structures and Material Behaviors of Polymers explores how the detailed chemical structures of polymers can be characterized, how their microstructural-dependent conformational preferences can be evaluated, and how these conformational preferences can be connected to the behaviors and properties of their materials. The authors examine the connections between the microstructures of polymers and the rich variety of physical properties they evidence. Detailed polymer architectures, including the molecular bonding and geometries of backbone and side-chain groups, monomer stereo- and regiosequences, comonomer sequences, and branching, are explicitly considered in the analysis of the conformational characteristics of polymers. This valuable reference provides practicing materials engineers as well as polymer and materials science students a means of understanding the differences in behaviors and properties of materials made from chemically distinct polymers. This knowledge can assist the reader design polymers with chemical structures that lead to their desired material behaviors and properties.