

## Polymer Science And Engineering

*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>*

*Principles of Polymer Science and Technology in Cosmetics and Personal Care*

*The Definitive Guide to Polymer Principles, Properties, Synthesis, Applications, and Simulations Now fully revised, Polymer Science and Technology, Third Edition, systematically reviews the field's current state and emerging advances. Leading polymer specialist Joel R. Fried offers modern coverage of both processing principles and applications in multiple industries, including medicine, biotechnology, chemicals, and electronics. This edition's new and expanded coverage ranges from advanced synthesis to the latest drug delivery applications. New topics include controlled radical polymerization, click chemistry, green chemistry, block copolymers, nanofillers, electrospinning, and more. A brand-new chapter offers extensive guidance for predicting polymer properties, including additional coverage of group correlations, and new discussions of the use of topological indices and neural networks. This is also the first introductory polymer text to fully explain computational polymer science, including molecular dynamics and Monte Carlo methods. Simulation concepts are supported with many application examples, ranging from prediction of PVT values to permeability and free volume. Fried thoroughly covers synthetic polymer chemistry; polymer properties in solution and in melt, rubber, and solid states; and all important categories of plastics. This revised edition also adds many new calculations, end-of-chapter problems, and references. In-depth coverage includes Polymer synthesis: step- and chain-growth; bulk, solution, suspension, emulsion, solid-state, and plasma; ionic liquids, and macromers; and genetic engineering Amorphous and crystalline states, transitions, mechanical properties, and solid-state characterization Polymers and the environment: degradation, stability, and more Additives, blends, block copolymers, and composites—including interpenetrating networks, nanocomposites, buckyballs, carbon nanotubes, graphene, and POSS Biopolymers, natural polymers, fibers, thermoplastics, elastomers, and thermosets Engineering and specialty polymers, from polycarbonates to ionic polymers and high-performance fibers Polymer rheology, processing, and modeling Correlations and simulations: group contribution, topological indices, artificial neural networks, molecular dynamics, and Monte Carlo simulations*

*This book provides a unified mechanics and materials perspective on polymers: both the mathematics of viscoelasticity theory as well as the physical mechanisms behind polymer deformation processes.*

*Introductory material on fundamental mechanics is included to provide a continuous baseline for readers from all disciplines. Introductory material on the chemical and molecular basis of polymers is also included, which is essential to the understanding of the thermomechanical response. This self-contained text covers the viscoelastic characterization of polymers including constitutive modeling, experimental methods, thermal response, and stress and failure analysis. Example problems are provided within the text as well as at the end of each chapter. New to this edition:*

- One new chapter on the use of nano-material inclusions for structural polymer applications and applications such as fiber-reinforced polymers and adhesively bonded structures*
- Brings up-to-date polymer production and sales data and equipment and procedures for evaluating polymer characterization and classification*
- The work serves as a comprehensive reference for advanced seniors seeking graduate level courses, first and second year graduate students, and practicing engineers*

*Fundamentals and Applications*

*An Introductory Text and Reference for Engineers and Chemists  
Textbook of polymer science*

*Modern Methods in Polymer Research and Technology*

Thiol-X chemistries are already well established techniques, but it is only recently that they have been exploited for the functionalization and synthesis of polymers and other materials. As such, information on these techniques is scattered across the literature and *Thiol-X Chemistries in Polymer and Materials Science* is the first book to compile work specifically focussing on the application of thiol-based chemistries in materials design and synthesis. The book introduces the various thiol-X chemistries currently available and applications where they have been successfully used, including examples of 'click' processes, in polymerizations, polymer synthesis, and polymer modification. Short 'how to' sections within the chapters also provide general experimental techniques to employ the various chemistries described. Written by leading experts in the field, this book is a comprehensive resource for postgraduates, academics and industrial practitioners interested in polymer and materials applications.

*Basics of Polymer Chemistry* is of great interest to the chemistry audience. The basic properties of polymers, including diverse fundamental and applied aspects, are presented. This book constitutes a basis for understanding polymerization, and it presents a comprehensive overview of the scientific research of polymers. The chapters presented can be used as a reference for those interested in understanding the sustainable development in polymers. *Basics of Polymer Chemistry* provides a balanced coverage of the key developments in this field, and highlights recent and emerging technical achievements. The topics covered present a comprehensive overview of the subject area and are therefore of interest to professors and students. The recent developments in polymerization using catalysts, homo and copolymerization are presented, and it contains current efforts in designing new polymer architectures. Improved property performance attributes of the polymers by controlling their molecular-structural characteristics such as molecular weight distribution, comonomer type content distribution, and branching level are also discussed.

*Polymer Science and Nanotechnology: Fundamentals and Applications* brings together the latest advances in polymer science and nanoscience. Sections explain the fundamentals of polymer science, including key aspects and methods in terms of molecular structure, synthesis, characterization, microstructure, phase structure and processing and properties before discussing the materials of particular interest and utility for novel applications, such as hydrogels, natural polymers, smart polymers and polymeric biomaterials. The second part of the book examines essential techniques in nanotechnology, with an emphasis on the utilization of advanced polymeric materials in the context of nanoscience. Throughout the book, chapters are prepared so that materials and products can be geared towards specific applications. Two chapters cover, in detail, major application areas, including fuel and solar cells, tissue engineering, drug and gene delivery, membranes, water treatment and oil recovery. Presents the latest applications of polymers and polymeric nanomaterials, across energy, biomedical, pharmaceutical, and environmental fields. Contains detailed coverage of polymer nanocomposites, polymer nanoparticles, and hybrid polymer-metallic nanoparticles. Supports an interdisciplinary approach, enabling readers from different disciplines to understand

*polymer science and nanotechnology and the interface between them*  
*Successful characterization of polymer systems is one of the most important objectives of today's experimental research of polymers. Considering the tremendous scientific, technological, and economic importance of polymeric materials, not only for today's applications but for the industry of the 21st century, it is impossible to overestimate the usefulness of experimental techniques in this field. Since the chemical, pharmaceutical, medical, and agricultural industries, as well as many others, depend on this progress to an enormous degree, it is critical to be as efficient, precise, and cost-effective in our empirical understanding of the performance of polymer systems as possible. This presupposes our proficiency with, and understanding of, the most widely used experimental methods and techniques. This book is designed to fulfill the requirements of scientists and engineers who wish to be able to carry out experimental research in polymers using modern methods. Each chapter describes the principle of the respective method, as well as the detailed procedures of experiments with examples of actual applications. Thus, readers will be able to apply the concepts as described in the book to their own experiments. Addresses the most important practical techniques for experimental research in the growing field of polymer science The first well-documented presentation of the experimental methods in one consolidated source Covers principles, practical techniques, and actual examples Can be used as a handbook or lab manual for both students and researchers Presents ideas and methods from an international perspective Techniques addressed in this volume include: Light Scattering Neutron Scattering and X-Ray Scattering Fluorescence Spectroscopy NMR on Polymers Rheology Gel Experiments*

*Principles of Polymer Science*

*Emerging Themes in Polymer Science*

*Macromolecular Engineering*

*Applied Polymer Science*

*Thiol-X Chemistries in Polymer and Materials Science*

**Elements of Polymer Science & Engineering**An Introductory Text and Reference for Engineers and ChemistsElsevier

Polymer Engineering focuses on the preparation and application of polymers in several hot topics such as artificial photosynthesis, water purification by membrane technologies, and biodiesel production from wastewater plants. The authors not only describe the latest developments in polymer science, but also support these experimental results by computational chemistry and modelling studies.

Tremendous developments in the field of polymer science, its growing importance, and an increase in the number of polymer science courses in both physics and chemistry departments have led to the revision of the First Edition. This new edition addresses subjects as spectroscopy (NMR), dynamic light scattering, and other modern techniques unknown before the publication of the First Edition. The Second Edition focuses on both theory (physics and chemistry) and engineering applications which make it useful for chemistry, physics, and chemical engineering departments. Key Features \* Focuses on

applications of polymer chemistry, engineering and technology \* Explains terminology, applications and versatility of synthetic polymers \* Connects polymerization chemistry with engineering applications \* Leads reader from basic concepts to technological applications \* Highlights the vastly valuable resource of polymer technology \* Uses quantitative examples and problems to fully develop concepts \* Contains practical lead-ins to emulsion polymerization, viscoelasticity and polymer rheology

The 75th Anniversary Celebration of the Division of Polymeric Materials: Science and Engineering of the American Chemical Society, in 1999 sparked this third edition of Applied Polymer Science with emphasis on the developments of the last few years and a serious look at the challenges and expectations of the 21st Century. This book is divided into six sections, each with an Associate Editor responsible for the contents with the group of Associate Editors acting as a board to interweave and interconnect various topics and to insure complete coverage. These areas represent both traditional areas and emerging areas, but always with coverage that is timely. The areas and associated chapters represent vistas where PMSE and its members have made and are continuing to make vital contributions. The authors are leaders in their fields and have graciously donated their efforts to encourage the scientists of the next 75 years to further contribute to the well being of the society in which we all live. Synthesis, characterization, and application are three of the legs that hold up a steady table. The fourth is creativity. Each of the three strong legs are present in this book with creativity present as the authors were asked to look forward in predicting areas in need of work and potential applications. The book begins with an introductory history chapter introducing readers to PMSE. The second chapter introduces the very basic science, terms and concepts critical to polymer science and technology. Sections two, three and four focus on application areas emphasizing emerging trends and applications. Section five emphasizes the essential areas of characterization. Section six contains chapters focusing of the synthesis of the materials.

Encyclopedia of Polymer Science and Engineering: A-Die design

Surface Engineering of Polymer Membranes

Essentials of Polymer Science and Engineering

An Introductory Text, Second Edition

Polymer Science and Engineering

This reference book provides a comprehensive overview of the nature, manufacture, structure, properties, processing, and applications of commercially available polymers. The main feature of the book is the range of topics from both theory and practice, which means that physical properties and applications of the materials concerned are described in terms of the theory, chemistry and manufacturing constraints which apply to them. It will therefore enable scientists to understand the commercial implications of their work as well as providing polymer technologists, engineers and designers with a

theoretical background. Provides a comprehensive overview of commercially available polymers Offers a unique mix of theory and application Essential for both scientists and technologists

W ALL ARE SURROUNDED by plastic materials and cannot imagine modern life and utilities without the synthetic polymers. And yet, how many of us can distinguish between polyethylene and PVC? After all, most people name any polymer as "Nylon. /l Is there any distinction between polymers and plastics? This introductory textbook tries to answer these questions and many others. It endeavors to provide the basic information required in modern life about the best utilization of new materials in the plastics era; the chemical sources of synthetic polymers, and the processes in which small "simple" molecules are converted to giant macromolecules, namely, high polymers; and the understanding of the role of these unique structures, their behavior and performance, their mechanical and thermal properties, flow and deformation. As we are mainly interested in the final product, the processing of plastics, through shaping and forming, presents a significant challenge to polymer engineering. All this is broadly discussed, ending with modern issues like composites, ecology and future prediction, followed by up-to-date information and data about old as well as novel high performance polymers. The text is particularly targeted towards senior students of science and engineering (chemical, material, mechanical and others) who may use it as the first window to the world of polymers. At the same time many professionals who are involved in the resin or plastics industry may prefer this approach without elaborate math or overloading.

Polymer Science and Innovative Applications: Materials, Techniques, and Future Developments introduces the science of innovative polymers and composites, their analysis via experimental techniques and simulation, and their utilization in a variety of application areas. This approach helps to unlock the potential of new materials for product design and other uses. The book also examines the role that these applications play in the human world, from pollution and health impacts, to their potential to make a positive contribution in areas including environmental remediation, medicine and healthcare, and renewable energy. Advantages, disadvantages, possibilities, and challenges relating to the utilization of polymers in human society are included.

Presents the latest advanced applications of polymers and their composites and identifies key areas for future development Introduces the simulation methods and experimental techniques involved in the modification of polymer properties, supported by clear and detailed images and diagrams Supports an interdisciplinary approach, enabling readers across different fields to harness the power of new materials for innovative applications

"Principles of Polymer Science introduces several basic and advanced aspects of polymers for the undergraduate and graduate students in chemistry, chemical engineering and materials science. The second and thoroughly revised edition includes the technical aspects of synthesis, characterization, behaviour and technology in a straightforward and lucid manner. Separate chapters on natural, inorganic and specialty polymers would attract readers from interdisciplinary courses."--BOOK JACKET.

Fundamentals of Polymer Engineering, Third Edition

Materials, Techniques, and Future Developments

The Elements of Polymer Science and Engineering

## Basics of Polymer Chemistry

### A Textbook for Engineers and Technologists

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.

Many books offer coverage of the current work of top researchers, but rarely is any attempt made to look beyond the present day. *Emerging Themes in Polymer Science* is a unique book which not only documents the latest research but also provides an insight into the likely future of polymer science. At the heart of the debate, and a key feature of the book, is the relationship between polymer science and biology. Also discussed are polymer semi-conductors and devices; polymer colloids; biomaterials; tissue engineering and polymers; neutron and synchrotron research; theory; and rheology. Anyone involved in polymer research, including those in the fields of electronics and nanotechnology, will welcome this book.

This companion volume to "*Fundamental Polymer Science*" (Gedde and Hedenqvist, 2019) offers detailed insights from leading practitioners into experimental methods, simulation and modelling, mechanical and transport properties, processing, and sustainability issues. Separate chapters are devoted to thermal analysis, microscopy, spectroscopy, scattering methods, and chromatography. Special problems and pitfalls related to the study of polymers are addressed. Careful editing for consistency and cross-referencing among the chapters, high-quality graphics, worked-out examples, and numerous references to the specialist literature make "*Applied Polymer Science*" an essential reference for advanced students and practicing chemists, physicists, and engineers who want to solve problems with the use of polymeric

materials.

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.

The Shifting Research Frontiers

Polymer Science and Nanotechnology

Encyclopedia of Polymer Science and Engineering: A-Amorphous polymers

Polymer Engineering Science and Viscoelasticity

Polymer Engineering

Your search for the perfect polymers textbook ends here - with *Polymer Science and Technology*. By incorporating an innovative approach and consolidating in one volume the fundamentals currently covered piecemeal in several books, this efficient text simplifies the learning of polymer science. The book is divided into three main sections: polymer fundamentals; polymer formation and conversion into useful articles; and polymer properties and applications. *Polymer Science and Technology* emphasizes the basic, qualitative understanding of the concepts rather than rote memorization or detailed mathematical analysis. Since the book focuses on the ultimate property of the finished product, it minimizes laborious descriptions of experimental procedures used for the characterization of polymers. Instead, the author highlights how the various stages involved in the production of the finished product influence its properties. Well-organized, clear-cut, and user-friendly, *Polymer Science and Technology* is an outstanding textbook for teaching junior and senior level undergraduates and first year graduate students in an introductory course covering the challenging subject of polymers.

This is an introductory textbook on polymer science aimed at lecturers/professors, undergraduate and graduate students of polymer science and technology courses as well as engineering (materials, chemical, civil, food, etc.), chemistry, and physics. It is also aimed at engineers and technologists. Each chapter is written starting from simple concepts and progressively getting more complex towards its end, to help the reader decide how deep to go into each topic. Each chapter also presents the solution of many proposed problems, guiding the reader to solve numerically the everyday problems polymer technologists face, by applying theoretical concepts. Additionally, at every chapter's end there is a list of problems for the reader to check his/her understanding of the topics. The book contains a list of more than 10 experiments to perform in the laboratory, linked to some of the concepts discussed in the book. It also serves as a long-term

reference with many figures, diagrams, tables, chemical equations containing frequently needed information. It contains as well an appendix with a long list of chemical structures of the main commercially available polymers.

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

Filling a gap in the market, this textbook provides a concise, yet thorough introduction to polymer science for advanced engineering students and practitioners, focusing on the chemical, physical and materials science aspects that are most relevant for engineering applications. After covering polymer synthesis and properties, the major section of the book is devoted to polymeric materials, such as thermoplastics and polymer composites, polymer processing such as injection molding and extrusion, and methods for large-scale polymer characterization. The text concludes with an overview of engineering plastics. The emphasis throughout is on application-relevant topics, and the author focuses on real-life, industry-relevant polymeric materials.

**Principles of Polymer Engineering**

**Fundamentals of Polymer Science for Engineers**

**Fundamentals of Polymer Engineering**

**Experimental Methods in Polymer Science**

**Polymer Science and Innovative Applications**

When fibres in a composite are discontinuous and are shorter than a few millimetres, the composite is called a 'short fibre reinforced composite (SFRP)'. SFRPs have found extensive applications in automobiles, business machines, durable consumer items, sporting goods and electrical industries owing to their low cost, easy processing and superior mechanical properties over the parent polymers. The book summarises recent developments in this area, focusing on the fundamental mechanisms that govern the mechanical properties including strength, modulus, fracture toughness and thermal properties of SFRP materials. This book covers the following topics: extrusion compounding and injection moulding, major factors affecting mechanical performance, stress transfer, strength, elastic modulus flexural modulus, thermal conductivity and expansion, non-linear stress-strain behaviour and fracture mechanics of short fibre reinforced polymers. With its distinguished team of authors, Science and engineering of short fibre reinforced polymer composites is a standard reference for anyone involved in the development, manufacture and use of SFRPs. It will also provide an in-depth understanding of the behaviour of these versatile materials. Reviews the mechanical properties and functions of short fibre reinforced polymer composites (SFRP) Examines recent developments in the fundamental mechanisms of SFRP's Assesses major factors affecting mechanical performance such as stress transfer and strength

**Macromolecular Engineering: Design, Synthesis and Application of Polymers** explores the role of macromolecular engineering in the development of polymer systems with engineered structures that offer the desired combination of properties for advanced applications. This book is organized into sections covering theory and principles, science and technology, architectures and technologies, and applications, with an emphasis on the latest advances in techniques, materials,



properties, and end uses - and including recently commercialized, or soon to be commercialized, designed polymer systems. The chapters are contributed by a group of leading figures who are actively researching in the field. This is an invaluable resource for researchers and scientists interested in polymer synthesis and design, across the fields of polymer chemistry, polymer science, plastics engineering, and materials science and engineering. In industry, this book supports engineers, R&D, and scientists working on polymer design for application areas such as biomedical and healthcare, automotive and aerospace, construction and consumer goods. Presents the theory, principles, architectures, technologies, and latest advances in macromolecular engineering for polymer design and synthesis Explains polymer design for cutting-edge applications areas, including coatings, automotive, industrial, household and medical uses Approaches several novel materials, such as polyisobutylene (PIB), polyamide-based polyurethanes, and aliphatic polyesters

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

The field of polymer nanocomposites has become essential for engineering and military industries over the last few decades as it applies to computing, sensors, biomedical microelectronics, hard coating, and many other domains. Due to their outstanding mechanical and thermal features, polymer nanocomposite materials have recently been developed and now have a wide range of applications. Polymer Nanocomposites for Advanced Engineering and Military Applications provides emerging research on recent advances in the fabrication methods, properties, and applications of various nano-fillers including surface-modification methods and chemical functionalization. Featuring coverage on a broad range of topics such as barrier properties, biomedical microelectronics, and matrix processing, this book is ideally designed for engineers, industrialists, chemists, government officials, military professionals, practitioners, academicians, researchers, and students.

An Introduction

Introduction to Physical Polymer Science

Polyurethanes

Encyclopedia of Polymer Science and Engineering

Fundamentals of Polymer Science

*The Elements of Polymer Science and Engineering, Third Edition, is a textbook for one- or two-semester introductory courses in polymer science and engineering taught primarily to senior*

undergraduate and first-year graduate students in a variety of disciplines, but primarily chemical engineering and materials science. Since the publication of the second edition in 1999, the field of polymers has advanced considerably. A key feature of this new edition is the inclusion of new concepts such as polymer nanocomposites and metallocene catalysts in existing chapters as well as new chapters covering selected contemporary topics such as behavior of natural polymers, polymer dynamics, and diffusion in polymers. This book has been completely reorganized to become more aligned with how instructors currently teach the course. There are now several enhancements to the book's pedagogy, including the addition of numerous worked examples and new figures to better illustrate key concepts and the addition of a large number of end-of-chapter exercises, many of which are based on recently published research and relevant industrial data. This third edition will appeal to advanced undergraduate and graduate students in the physics, chemistry, and chemical engineering departments who are taking courses related to polymer science and engineering, as well as engineers new to the field of polymers. Focuses on applications of polymer chemistry, engineering, and technology Explains terminology, applications, and versatility of synthetic polymers Connects polymerization chemistry with engineering applications Contains practical lead-ins to emulsion polymerization, viscoelasticity, and polymer rheology This book is a supplement to the textbook Basic Technical Japanese. It introduces an additional 100 kanji that are important in building vocabulary for reading and translating the Japanese literature on polymer science and engineering. The text offers ten lessons, each of which introduces ten new kanji as well as exercises for mastering them. The new kanji are printed in very large type at the beginning of each chapter so that the reader can see clearly how the characters are structured. The exercises include several kinds of matching, as well as translation of sentences and short paragraphs. Full translations of some exercises allow learners to evaluate their own work. In addition, a list of thirty-five more kanji related to polymer science is provided at the end of the book. Intended for self-study, the book provides a complete on-kun index of all 135 kanji, which enables learners, if they know the pronunciation of a word, to locate the introductory discussion of the corresponding kanji in the book.

Salen Metal Complexes as Catalysts for the Synthesis of Polycarbonates from Cyclic Ethers and Carbon Dioxide, by Donald J. Darensbourg.- Material Properties of Poly(Propylene Carbonates), by Gerrit. A. Luinstra and Endres Borchardt.-

*Poly(3-Hydroxybutyrate) from Carbon Monoxide*, by Robert Reichardt and Bernhard Rieger. - *Ecoflex® and Ecovio®: Biodegradable, Performance-Enabling Plastics*, by K. O. Siegenthaler, A. Künkel, G. Skupin and M. Yamamoto.- *Biodegradability of Poly(Vinyl Acetate) and Related Polymers*, by Manfred Amann and Oliver Minge.- *Recent Developments in Ring-Opening Polymerization of Lactones*, by P. Lecomte and C. Jérôme.- *Recent Developments in Metal-Catalyzed Ring-Opening Polymerization of Lactides and Glycolides: Preparation of Polylactides, Polyglycolide, and Poly(lactide-co-glycolide)*, by Saikat Dutta, Wen-Chou Hung, Bor-Hunn Huang and Chu-Chieh Lin.- *Bionolle (Polybutylenesuccinate)*, by Yasushi Ichikawa, Tatsuya Mizukoshi.- *Polyurethanes from Renewable Resources*, by David A. Babb.-

*Surface Engineering of Polymer Membranes* covers the processes that modify membrane surfaces to improve their in-service performance, meaning, to confer surface properties which are different from the bulk properties. Purposes may be to minimize fouling, modulate hydrophilicity/ hydrophobicity, enhance biocompatibility, create diffusion barriers, provide functionalities, mimic biomembranes, fabricate nanostructures, etc. First, the basics of surface engineering of polymer membranes are covered. Then topics such as surface modification by graft polymerization and macromolecule immobilization, biomimetic surfaces, enzyme immobilization, molecular recognition, and nanostructured surfaces are discussed. This book provides a unique synthesis of the knowledge of the role of surface chemistry and physics in membrane science. Dr. Zhikang Xu of the Institute of Polymer Science of Zhejiang University has eight Chinese patents and in 2006 was honored as a Distinguished Young Scholar by the National Natural Science Foundation of China (NNSFC).

*Encyclopedia of Polymer Science and Engineering, Poly (Phenylene Ether) to Radical Polymerization*

*Elements of Polymer Science & Engineering*

*Science and Engineering of Short Fibre Reinforced Polymer Composites*

*Principles of Polymer Science and Technology in Cosmetics and Personal Care*

*Design, Synthesis and Application of Polymers*

This book is at once an introduction to polymers and an imaginative invitation to the polymer science and engineering as a whole, including plastics and plastics processing. By two of the best-known scientists in America, the text explains and helps students and professionals appreciate all major topics in polymer chemistry and engineering: polymer synthesis and kinetics, applications of probability theory, structure and morphology, thermal and solution properties, mechanical properties, biological properties and plastics processing.

methods. Essentials of Polymer Science and Engineering, designed to supercede many texts (including the authors'), is unique in a number of ways. Special attention has been given to explaining fundamentals and providing high-level visuals. In addition, the text is replete with engaging profiles of polymer chemists and their discoveries. The book explains the science of polymer engineering, and at the same time, tells the story of the field from its beginning to the present, indicating when and how polymer discoveries have played a role in history and technology. The book comes well equipped with study questions and problems and is suitable for a two-semester course for chemistry students at the undergraduate and graduate level. Polymers are used in everything from nylon stockings to commercial aircraft to artificial hearts and valves, and they have a key role in addressing international competitiveness and other global issues. Polymer Science and Engineering explores the universe of polymers, describing their properties and wide-ranging potential, and presents the state of the science, with a focus on downward trends in research support. Leading experts offer findings, recommendations, and research directions. Lively vignettes provide snapshots of polymers in everyday applications. The volume includes an overview of the use of polymers in such fields as medicine and biotechnology, information and communication, housing and construction, energy and transportation, national defense, and environmental protection. The committee looks at various classes of polymers--plastics, fibers, composites, and other materials, as well as polymers used as membranes and coatings--and how their composition and specific manufacturing processes result in unparalleled usefulness. The reader can also learn the science behind polymer technology, including efforts to model polymer synthesis after nature's methods, and recent breakthroughs in characterizing polymer properties needed for twenty-first-century applications. This informative volume will be important to chemists, engineers, materials scientists, researchers, industrialists, and policymakers interested in the role of polymers, as well as to science and engineering educators and students.

Synthetic Biodegradable Polymers

Applied Polymer Science: 21st Century

Polymer Science

Science, Technology, Markets, and Trends

Polymer Science and Technology