
Polyolefin Compounds And Materials Fundamentals And Industrial Applications

Springer Series On Polymer And Composite Materials

Recent Developments in Plastic Recycling
Plastics Materials and Processes
Applied Plastics Engineering Handbook
Applied Plastics Engineering Handbook
Recent Advances, New Perspectives and Applications
Processing and Materials
Polymer Green Flame Retardants
Handbook of Polyolefins
Catalysis for Clean Energy and Environmental Sustainability
Reactive Polymers: Fundamentals and Applications
Alkenes
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Polymerization and Characterization
A Concise Guide to Industrial Polymers
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Fundamentals of Polymer Engineering, Third Edition
Developments in Surface Contamination and Cleaning - Fundamentals and Applied Aspects
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Polymer Science and Technology
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Materials for Biomedical Engineering: Thermoset and Thermoplastic Polymers
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Fundamentals And Industrial
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HANNAH KOBE

Recent Developments in Plastic Recycling John Wiley & Sons
Up-to-date, comprehensive coverage on radiation-processed polymer materials and their applications Offering a unique perspective of the industrial and commercial applications of the radiation processing of polymers, this insightful reference examines the fundamental scientific principles and cutting-edge developments advancing this diverse field. Through a variety of case studies, detailed examples, and economic feasibility analysis, *Radiation Processing of Polymer Materials and Its Industrial Applications* systematically explains the commercially viable ways to process and use radiation-processed polymeric materials in industrial products. In addition, this one-of-kind text: Covers important chemistry and processing fundamentals, while emphasizing their translation into practical applications of radiation-processed polymers Incorporates new applications in nanotechnology, biomaterials, and recycling Systematically discusses new developments in the field and summarizes past achievements By helping readers—from students to scientists, engineers, technicians, and sales and marketing professionals—understand and solve problems associated with radiation processing of polymers, *Radiation Processing of Polymer Materials and Its Industrial Applications* serves as an essential reference and fills an important gap in the literature.

Plastics Materials and Processes John Wiley & Sons
This book focuses on inorganic nanosheets, including various oxides, chalcogenides, and graphenes, that provide two-dimensional (2D) media to develop materials chemistry in broad fields such as electronics, photonics, environmental science, and biology. The application area of nanosheets and nanosheet-based materials covers the analytical, photochemical, optical, biological,

energetic, and environmental research fields. All of these applications come from the low dimensionality of the nanosheets, which anisotropically regulate structures of solids, microspaces, and fluids. Understanding nanosheets from chemical, structural, and application aspects in relation to their "fully nanoscopic" characters will help materials scientists to develop novel advanced materials. This is the first book that accurately and concisely summarizes this field including exfoliation and intercalation chemistries of layered crystals. The book provides perspective on the materials chemistry of inorganic nanosheets. The first section describes fundamental aspects of nanosheets common to diverse applications: how unique structures and properties are obtained from nanosheets based on low dimensionality. The second section presents state-of-the-art descriptions of how the 2D nature of nanosheets is utilized in each application of the materials that are developed.

Applied Plastics Engineering Handbook Springer Nature
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. *Applied Plastics Engineering Handbook* CRC Press
Polymer Compounding, Volume 1 focuses on aspects of the raw materials used in polymer processing. Polymer compounding comprises a complex heterogeneous system of polymers and other ingredients and, in many ways, the preparation of these materials is still very much an art. It is a powerful tool that will eventually be required as one of the basics of polymer processing. This book provides readers with a wide array of state-of-the-art strategies to develop their knowledge about compounding and the use of polymers while minimising wastage during processing. Details about polymer properties and additives are assembled to provide a one-source repository for compounding. Another important point to be considered in the book is the combination of polymers and additives and the essentials required for the development of economic and environmental incentives in polymer processing. This book will encourage further studies to understand the scientifically challenging polymer processing issues arising during the manufacture of parts for end-use applications. Finally, this volume presents an overview of polymer compounding requirements, as well as an idea of some of the future directions, advances and challenges of polymer processing.

Recent Advances, New Perspectives and Applications CRC Press

Thoroughly revised edition of the classic text on polymer processing The Second Edition brings the classic text on polymer processing thoroughly up to date with the latest fundamental developments in polymer processing, while retaining the critically acclaimed approach of the First Edition. Readers are provided with the complete panorama of polymer processing, starting with

fundamental concepts through the latest current industry practices and future directions. All the chapters have been revised and updated, and four new chapters have been added to introduce the latest developments. Readers familiar with the First Edition will discover a host of new material, including: * Blend and alloy microstructuring * Twin screw-based melting and chaotic mixing mechanisms * Reactive processing * Devolatilization--theory, mechanisms, and industrial practice * Compounding--theory and industrial practice * The increasingly important role of computational fluid mechanics * A systematic approach to machine configuration design The Second Edition expands on the unique approach that distinguishes it from comparative texts. Rather than focus on specific processing methods, the authors assert that polymers have a similar experience in any processing machine and that these experiences can be described by a set of elementary processing steps that prepare the polymer for any of the shaping methods. On the other hand, the authors do emphasize the unique features of particular polymer processing methods and machines, including the particular elementary step and shaping mechanisms and geometrical solutions. Replete with problem sets and a solutions manual for instructors, this textbook is recommended for undergraduate and graduate students in chemical engineering and polymer and materials engineering and science. It will also prove invaluable for industry professionals as a fundamental polymer processing analysis and synthesis reference.

Processing and Materials Springer Nature

This book describes industrial applications of polyolefins from the researchers' perspective. Polyolefins constitute today arguably the most important class of polymers and polymeric materials for widespread industrial applications. This book summarizes the present state of the art. Starting from fundamental aspects, such as the polymerization techniques to synthesize polyolefins, the book introduces the topic. Basic knowledge about polyolefin composites and blends is explained, before applications aspects in different industry sectors are discussed. The spectrum comprises a wide range of applications and industry sectors, such as the packaging and food industry, the textile industry, automotive and buildings, and even biomedical applications. Topics, which are addressed in the various chapters, comprise synthesis and processing of the materials; their classification;

mechanical, physical and technical requirements and properties; their characterization; and many more. In the end of the book, even the disposal, degradation and recycling of polyolefins are addressed, and light is shed on their commercial significance and economic value. In this way, the book follows the entire 'lifetime' of polyolefin compounds and materials: from their synthesis and processing, over applications, to the recycling and reuse of disposed or degraded polyolefin substrates.

Polymer Green Flame Retardants Springer

The book covers preparation, designing and utilization of nanohybrid materials for biomedical applications. These materials can improve the effectiveness of drugs, promote high cell growth in new scaffolds, and lead to biodegradable surgical sutures. The use of hybrid magneto-plasmonic nanoparticles may lead to non-invasive therapies. The most promising materials are based on silica nanostructures, polymers, bioresorbable metals, liposomes, biopolymeric electrospun nanofibers, graphene, and gelatin. Much research focuses on the development of biomaterials for cell regeneration and wound healing applications. Keywords: Biomedical Materials, Cell Growth, Cell Regeneration, Wound Healing, Surgical Sutures, Non-invasive Therapies, Drug Transport, Tissue Engineering, Cardiovascular Implants, Fracture Repair Implants, Biodegradable Materials, Hybrid Magneto-plasmonic Nanoparticles, Silica Nanostructures, Polymers, Bioresorbable Metals, Liposomes, Biopolymeric Electrospun Nanofibers, Graphene, Gelatin-based Hydrogels.

Handbook of Polyolefins Smithers Rapra

This book deals with polyolefins prepared via Ziegler-Natta catalysis, from a polymer chemist's viewpoint, i.e. with emphasis on their preparation and on their basic composition and properties. In addition to chapters on catalysts, polymerization behaviour and polymer properties such as tacticity, crystallinity, morphology etc., a chapter is also devoted to characterization methods. The main part of this work is reserved for polypropylene in all its forms, namely, homopolymer, random copolymer and toughened ('block') copolymers, for which extensive own-experience was present. The other polyolefins are also covered by means of a thorough literature review. This book is intended for scientists active in the field of polyolefins, including catalyst development, but should also prove an invaluable medium in academia to illustrate the growth of understanding in catalysis,

kinetics and characterization of a commercially very important class of polymers.

Catalysis for Clean Energy and Environmental Sustainability CRC Press

A handbook on polyolefins. This second edition includes new material on the structure, morphology and properties of polyolefin (PO) synthesis. It focuses on synthetic advances, the use of additives, special coverage of PO blends, composites and fibres, and surface treatments. It also addresses the problem of interfacial and superficial phenomena.

Reactive Polymers: Fundamentals and Applications John Wiley & Sons

Surface contamination is of cardinal importance in a host of technologies and industries, ranging from microelectronics to optics to automotive to biomedical. Thus, the need to understand the causes of surface contamination and their removal is very patent. Generally speaking, there are two broad categories of surface contaminants: film-type and particulates. In the world of shrinking dimensions, such as the ever-decreasing size of microelectronic devices, there is an intensified need to understand the behavior of nanoscale particles and to devise ways to remove them to an acceptable level. Particles which were functionally innocuous a few years ago are ôkiller defectsö today, with serious implications for yield and reliability of the components. This book addresses the sources, detection, characterization and removal of both kinds of contaminants, as well as ways to prevent surfaces from being contaminated. A number of techniques to monitor the level of cleanliness are also discussed. Special emphasis is placed on the behaviour of nanoscale particles. The book is amply referenced and profusely illustrated. • Excellent reference for a host of technologies and industries ranging from microelectronics to optics to automotive to biomedical. • A single source document addressing everything from the sources of contamination to their removal and prevention. • Amply referenced and profusely illustrated.

Alkenes Elsevier

This book is part of a two-volume work that offers a unique blend of information on realistic evaluations of catalyst-based synthesis processes using green chemistry principles and the environmental sustainability applications of such processes for biomass conversion, refining, and petrochemical production. The

volumes provide a comprehensive resource of state-of-the-art technologies and green chemistry methodologies from researchers, academics, and chemical and manufacturing industrial scientists. The work will be of interest to professors, researchers, and practitioners in clean energy catalysis, green chemistry, chemical engineering and manufacturing, and environmental sustainability. This volume focuses on the potentials, recent advances, and future prospects of catalysis for biomass conversion and value-added chemicals production via green catalytic routes. Readers are presented with a mechanistic framework assessing the development of product selective catalytic processes for biomass and biomass-derived feedstock conversion. The book offers a unique combination of contributions from experts working on both lab-scale and industrial catalytic processes and provides insight into the use of various catalytic materials (e.g., mineral acids, heteropolyacid, metal catalysts, zeolites, metal oxides) for clean energy production and environmental sustainability.

Food Contact Materials Analysis CRC Press

Characterization of Polymers and Fibres addresses an integral part of fiber and polymer manufacturing processes that is crucial in helping manufacturers ensure that final products achieve intended specifications. The characterization of fiber and polymers is needed for attributes including molecular weight, morphology, dyeing behavior, tensile, optical and thermal behavior. This book covers a wide range of characterization techniques, including thermal, X-ray diffraction, solubility, tensile, optical, hygroscopic and particle size distribution. Introductions and definitions are provided where beneficial to make topics accessible to a broad range of readers in both academia and industry. Addressing advances from the fields of bioscience, polymer science, material science, and textile science, this book is wide in scope, drawing on the latest research to provide details of characterization techniques and equipment. Provides a thorough description of the material quality control process, including the latest industry practice Presents material characterization at all levels, from the atomic level to surface structure Covers technical advice on natural fiber characterization methods, including XRD, XPS, TGA, SEM, TEM, AFM, Contact angle, Particle size analysis, FTIR, and NMR

Polymerization and Characterization Springer Nature

Materials for Biomedical Engineering: Thermoset and Thermoplastic Polymers presents the newest and most interesting approaches to intelligent polymer engineering in both current and future progress in biomedical sciences. Particular emphasis is placed on the properties needed for each selected polymer and how to increase their biomedical potential in varying applications, such as drug delivery and tissue engineering. These materials are intended for use in diagnoses, therapy and prophylaxis, but are also relatable to other biomedical related applications, such as sensors. Recent developments and future perspectives regarding their use in biomedicine are discussed in detail, making this book an ideal source on the topic. Highlights the most well-known applications of thermoset and thermoplastic polymers in biological and biomedical engineering Presents novel opportunities and ideas for developing or improving technologies in materials for companies, those in biomedical industries, and others Features at least 50% of references from the last 2-3 years

A Concise Guide to Industrial Polymers William Andrew

Alkenes, which have carbon-carbon double bonds, are chemicals and energy sources that play an important role in human life, including economics and the environment. This book examines the production and synthesis of alkenes, olefins, and polyolefins, as well as environmental issues faced during industrial production of these hydrocarbons. It also discusses eco-friendly and green separation techniques.

Raw Materials Elsevier

This book is focused primarily on polymer nanocomposites, based on the author's research experience as well as open literature. The environmental health and safety aspects of nanomaterials and polymer nanocomposites, risk assessment and safety standards, and fire toxicity of polymer nanocomposites, are studied. In the final chapter, a brief overview of opportunities, trends, and challenges of polymer nanocomposites are included. Throughout the book, the theme is developed that polymer nanocomposites are a whole family of polymeric materials whose properties are capable of being tailored to meet specific applications. This volume serves as a general introduction to students and researchers just entering the field and to scholars from other subfields seeking information.

Film Properties of Plastics and Elastomers Woodhead Publishing

The definitive reference on the properties and applications of

polyolefin blends Polyolefins account for more than half of total plastics consumption in the world. In recent years, usage of and research on polyolefin blends have increased significantly due to new applications in medicine, packaging, and other fields and the development of novel polyolefins. With a special emphasis on nano- and micro-structures of crystals and phase morphology, Polyolefin Blends condenses and consolidates current information on polyolefins so that the reader can compare, select, and integrate a material solution. Focusing exclusively on the fundamental aspects as well as applications of polyolefin blends, this authoritative reference: * Features an introductory chapter that serves as a guide to polyolefin blends * Includes chapters covering formulation design, processing, characterization, modeling and simulation, engineering performance properties, and applications * Covers polyolefin/polyolefin blends and polyolefin/non-polyolefin blends * Discusses miscibility, phase behavior, functionalization, compatibilization, microstructure, crystallization, hierarchical morphology, and physical and mechanical properties * Covers new research trends including in-situ reactor blending and reactive processing, such as compatibilization/functionalization in the melt * Contains practical examples from open literature sources and commercial products With chapters contributed by leading experts from several countries, this is a must-have reference for scientists and engineers conducting research on polyolefin blends and for professionals in medical, packaging, and other commodity fields. It is also an excellent text for graduate students studying polymer science and polymer processing.

Polyolefin Fibres William Andrew

This book addresses plasma modification of polyolefin surfaces. It comprises 21 chapters divided into three major sections. The first section covers the different techniques used for plasma modification of polyolefin surfaces and the effects of various gases as a surrounding medium, while the second provides a detailed analysis of the physics and chemistry of plasma modification and discusses various innovative characterization techniques, as well as ageing of the modified surface. It focuses on the analysis of changes in polymers' surface chemistry using various spectroscopic techniques, and of changes in their surface morphology after plasma treatment using optical microscopy, electron microscopy and atomic force microscopy. In addition, it

provides detailed information on the characterization of modified polymer surfaces. The book's third and last section covers a range of applications of plasma-modified polyolefin surfaces varying from the packaging industry to the biomedical field, and shares valuable insights on the lifecycle analysis of plasma modification and modified surfaces.

The Proceedings of 10th Asia-Oceania Symposium on Fire Science and Technology Woodhead Publishing

Reactive Polymers: Fundamentals and Applications: A Concise Guide to Industrial Polymers, Third Edition introduces engineers and scientists to a range of reactive polymers and then details their applications and performance benefits. Basic principles and industrial processes are described for each class of reactive resin (thermoset), as well as additives, the curing process, applications and uses. The initial chapters are devoted to individual resin types (e.g., epoxides, cyanacrylates), followed by more general chapters on topics such as reactive extrusion and dental applications. Injection molding of reactive polymers, radiation curing, thermosetting elastomers, and reactive extrusion equipment are covered as well. The use of reactive polymers enables manufacturers to make chemical changes at a late stage in the production process, which, in turn, cause changes in performance and properties. Material selection and control of the reaction are essential to achieve optimal performance. Material new to this edition includes the most recent developments, applications and commercial products for each chemical class of thermosets, as well as sections on fabrication methods, reactive biopolymers, recycling of reactive polymers and case studies. Covers the basics and most recent developments, including reactive biopolymers, recycling of reactive polymers,

nanocomposites and fluorosilicones Offers an indispensable guide for engineers and advanced students alike Provides extensive literature and patent review Reflects a thorough review of all literature published in this area since 2014 Features revised and updated chapters to reflect the latest research in reactive polymers

Fundamentals of Polymer Engineering, Third Edition Royal Society of Chemistry

Shape-memory polymers (SMP) are a unique branch of the smart materials family which are capable of changing shape on-demand upon exposure to external stimulus. The discovery of SMP made a significant breakthrough in the developments of novel smart materials for a variety of engineering applications, superseded the traditional materials, and also influenced the current methods of product designing. This book provides the latest advanced information of on-going research domains of SMP. This will certainly enlighten the reader to the achievements and tremendous potentials of SMP. The basic fundamentals of SMP, including shape-memory mechanisms and mechanics are described. This will aid reader to become more familiar with SMP and the basic concepts, thus guiding them in undergoing independent research in the SMP field. The book also provides the reader with associated challenges and existing application problems of SMP. This could assist the reader to focus more on these issues and further exploit their knowledge to look for innovative solutions. Future outlooks of SMP research are discussed as well. This book should prove to be extremely useful for academics, R&D managers, researcher scientists, engineers, and all others related to the SMP research.

Developments in Surface Contamination and Cleaning - Fundamentals and Applied Aspects

Polyolefin Compounds and Materials Fundamentals and Industrial Applications

The use of reactive polymers enables manufacturers to make chemical changes at a late stage in the production process—these in turn cause changes in performance and properties. Material selection and control of the reaction are essential to achieve optimal performance. The second edition of Reactive Polymers Fundamentals and Applications introduces engineers and scientists to the range of reactive polymers available, explains the reactions that take place, and details applications and performance benefits. Basic principles and industrial processes are described for each class of reactive resin (thermoset), as well as additives, the curing process, and applications and uses. The initial chapters are devoted to individual resin types (e.g. epoxides, cyanacrylates, etc.); followed by more general chapters on topics such as reactive extrusion and dental applications. Material new to this edition includes the most recent developments, applications and commercial products for each chemical class of thermosets, as well as sections on fabrication methods, reactive biopolymers, recycling of reactive polymers, and case studies. Injection molding of reactive polymers, radiation curing, thermosetting elastomers, and reactive extrusion equipment are all covered as well. Most comprehensive source of information about reactive polymers Covers basics as well as most recent developments, including reactive biopolymers, recycling of reactive polymers, nanocomposites, and fluorosilicones Indispensable guide for engineers and advanced students alike—providing extensive literature and patent review

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