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Hazardous Chemicals Associated with Plastics in the Marine Environment
Hideshige Takada 2018-10-13 This volume consists of 15 chapters and focuses on hazardous chemicals, how

they are associated with plastics, and their environmental risks. It includes background information on plastics and additives chemistry, and their observed or potential effects on living organisms as well as the

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oceanographic aspects of marine debris dispersion. The respective chapters provide insights into the sorption/desorption of chemicals in and out of plastics, the mechanisms and kinetics, but also the scale of the concentrations of chemicals found in marine debris, particularly in microplastics. The occurrence of the various chemicals is analyzed, as well as the distribution profiles of the chemicals in microplastics throughout the world's oceans. The implications of the fact that plastics carry within them several chemicals are discussed in detail. In closing, new research topics that warrant further attention are identified. The book will appeal to all scientists who are already working or interested in starting to work on the topic of marine debris, as well as policymakers, NGOs and the broader informed public.

Circular Economy of Polymers Dimitris I. Collias 2021

Encyclopedia of Polymer Applications, 3 Volume Set Munmaya Mishra

2018-12-17 Undoubtedly the applications of polymers are rapidly evolving. Technology is continually changing and quickly advancing as polymers are needed to solve a variety of day-to-day challenges leading to improvements in quality of life. The Encyclopedia of Polymer Applications presents state-of-the-art research and development on the applications of polymers. This groundbreaking work provides important overviews to help stimulate further advancements in all areas of polymers. This comprehensive multi-volume reference includes articles contributed from a diverse and global team of renowned researchers. It offers a broad-based perspective on a multitude of topics in a variety of applications, as well as detailed research information, figures, tables, illustrations, and references. The encyclopedia provides

introductions, classifications, properties, selection, types, technologies, shelf-life, recycling, testing and applications for each of the entries where applicable. It features critical content for both novices and experts including, engineers, scientists (polymer scientists, materials scientists, biomedical engineers, macromolecular chemists), researchers, and students, as well as interested readers in academia, industry, and research institutions.

Electron Microscopy of Polymers Goerg H. Michler 2008-07-05 The study of polymers by electron microscopy (EM) needs special techniques, precautions and preparation methods, including ultramicrotomy. General characteristics of the different techniques of EM, including scanning force microscopy, are given in this hands-on book. The application of these techniques to the study of morphology and properties,

particularly micromechanical properties, is described in detail. Examples from all classes of polymers are presented.

Materials and Contact

Characterisation IX S. Hernández 2019-07-23 Including papers from the 9th edition of the International Conference on Computational Methods and Experiments in Material and Contact Characterisation this volume presents the work of selected researchers on the subject. Material and contact characterisation is a rapidly advancing field and this volume contains the latest research. Of particular interest to industry and society is the knowledge of surface treatment and contact mechanics of these materials to determine the in-service behaviour of components subject to contact conditions. Modern society requires systems that operate at conditions that use resources effectively. In terms of components durability, the

understanding of surface engineering wear frictional and lubrication dynamics has never been so important. Current research is focussed on modification technologies that can increase the surface durability of materials. The characteristics of the system reveal which surface engineering methods should be chosen and as a consequence it is essential to study the combination of surface treatment and contact mechanics. The accurate characterisation of the physical and chemical properties of materials requires the application of both experimental techniques and computer simulation methods in order to gain a correct analysis. A very wide range of materials, starting with metals through polymers and semiconductors to composites, necessitates a whole spectrum of characteristic experimental techniques and research methods. The papers in the book cover a number of topics, including: Computer methods

and simulation; Experimental and measurement techniques; Mechanical characterisation and testing; Materials under extreme conditions; Polymers and plastics; Advances in composites; Micro and macro characterisation; Corrosion and erosion; Damage, fatigue and fracture; Recycled materials; Materials and energy; Surface problems and contact mechanics; Surface modification and treatments; Thick and thin coatings; Tribomechanics and wear mechanics; Biomechanical characterisation; Biomechanical applications and Case studies.

Design and Manufacturing of Plastics Products Antonio Pouzada 2021-08-14
Design and Manufacturing of Plastics Products: Integrating Conventional Methods and Innovative Technologies brings together detailed information on design, materials selection, properties, manufacturing, and the performance of plastic products

incorporating the utilization of the latest novel techniques and additive manufacturing technologies. The book integrates the design of molded products and conventional manufacturing and molding techniques with recent additive manufacturing techniques to produce performant products and cost-effective tools. Key areas of innovation are explained in detail, including hybrid molds, the integration of processing options with product properties and performance, and sustainability factors such as eco-design strategies, recycling, and lifecycle assessment. Other sections cover the development of plastics products, including design methodologies, design solutions specific to plastics, and design for re-use, as well as manufacturing and performance, with an emphasis on thermoplastic molding techniques, recent advances on plastics tooling, and the appraisal of the influence of

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processing options on product performance. This is a valuable resource to plastics engineers, design engineers, mold makers, and product or part designers across industries. It will also be of interest to researchers and advanced students in plastics engineering, polymer science, additive manufacturing and mechanical engineering. Offers a thorough grounding in plastics part design, thermoplastic material selection, properties, manufacture and performance of plastic parts Presents the latest advances, including the integration of additive manufacturing in the plastics product development cycle, hybrid molds, and lifecycle and recycling considerations Enables the reader to utilize traditional methods alongside cutting-edge technologies in the production of performant plastic products and parts

Thermoplastics and Thermoplastic Composites Michel Biron 2012-12-31

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This book bridges the technology and business aspects of thermoplastics, providing a guide designed for engineers working in real-world industrial settings. The author explores the criteria for material selection, provides a detailed guide to each family of thermoplastics, and also explains the various processing options for each material type. More than 30 families of thermoplastics are described with information on their advantages and drawbacks, special grades, prices, transformation processes, applications, thermal behaviour, technological properties (tenacity, friction, dimensional stability), durability (ageing, creep, fatigue), chemical and fire behaviour, electrical properties, and joining possibilities. Biron explores the technological properties and economics of the major thermoplastics and reinforced thermoplastics, such as polyethylene, and emerging

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polymers such as polybenzimidazole, Thermoplastic Elastomers (TPEs) and bioplastics. In the second edition, a new section 'plastics solutions for practical problems' provides over 25 case studies illustrating a wide range of design and production challenges across the spectrum of thermoplastics, from metal and glass replacement solutions, to fire retardant plastics and antimicrobials. In addition, Biron provides major new material on bioplastics and wood plastic composites (WPCs), and fully updated data throughout. Combining materials data, information on processing techniques, and economic aspects (pricing), Biron provides a unique end-to-end approach to the selection and use of materials in the plastics industry and related sectors. Includes a new section of case studies, illustrating best practice across a wide range of applications and industry sectors. New material on

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bioplastics and sustainable composites

Recycling of Polyurethane Foams Sabu Thomas 2018-06-06 Recycling of Polyurethane Foams introduces the main degradation/depolymerization processes and pathways of polyurethane foam materials, focusing on industrial case studies and academic reviews from recent research and development projects. The book can aid practitioners in understanding the basis of polymer degradation and its relationship with industrial processes, which can be of substantial value to industrial complexes the world over. The main pathways of polymer recycling via different routes and industrial schemes are detailed, covering all current techniques, including regrinding, rebinding, adhesive pressing and compression moulding of recovered PU materials that are then compared with depolymerization approaches. The book examines life

cycle assessment and cost analysis associated with polyurethane foams waste management, showing the potential of various techniques. This book will help academics and researchers identify and improve on current depolymerization processes, and it will help industry sustainability professionals choose the appropriate approach for their own waste management systems, thus minimizing the costs and environmental impact of their PU-based end products. Offers a comprehensive review of all polyurethane foam recycling processes, including both chemical and mechanical approaches Assesses the potential of each recycling process Helps industry-based practitioners decide which approach to take to minimize the cost and environmental impact of their end product Enables academics and researchers to identify and improve upon current processes of degradation

and depolymerization

Mare Plasticum – The Plastic Sea

Marilena Streit-Bianchi 2020-07-23

This book, written by a multidisciplinary team of authors comprising scientists, artists and communicators, explores one of the most pressing issues of our time – the menace plastics pose to marine environments and organisms. It takes readers on a journey that begins on the beaches of Galicia, where the beach litter formed the starting point for an exhibition that combines art and science to alert the audience to the urgent need for action. The journey culminates with a short “plastic story”, which reveals a disturbing vision of the future significance of plastics for humans, and an example of how comics can deliver information to a younger audience. Along the way there is plenty of fascinating science, such as insights into the impacts of plastics and microplastics; the new

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marine ecosystem, known as the “plastisphere”; and the current status of the oceans, from the Arctic to the Mediterranean. The book also explores the historical developments; sustainable solutions, including the use of circular economy methodologies; and protective measures, like those being tried in China and the Far East. Lastly, it describes the role played by rivers as transport vectors for plastic, with special reference to the Danube, and to complete the picture, since most of the plastic is of terrestrial origin, it investigates problems related to microplastics in soils. [Encyclopedia of Renewable and Sustainable Materials](#) 2020-01-09 Encyclopedia of Renewable and Sustainable Materials provides a comprehensive overview, covering research and development on all aspects of renewable, recyclable and sustainable materials. The use of renewable and sustainable materials

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in building construction, the automotive sector, energy, textiles and others can create markets for agricultural products and additional revenue streams for farmers, as well as significantly reduce carbon dioxide (CO2) emissions, manufacturing energy requirements, manufacturing costs and waste. This book provides researchers, students and professionals in materials science and engineering with tactics and information as they face increasingly complex challenges around the development, selection and use of construction and manufacturing materials. Covers a broad range of topics not available elsewhere in one resource Arranged thematically for ease of navigation Discusses key features on processing, use, application and the environmental benefits of renewable and sustainable materials Contains a special focus on sustainability that will lead to the reduction of carbon emissions and

enhance protection of the natural environment with regard to sustainable materials

Heat Release in Fires V. Babrauskas
1990-12

From Waste to Resource Elisabeth Lacoste 2007 In the past, humans regarded their resources as rare, knowing that their demands outweighed supply. Everything available had to be used, and almost nothing went to waste. However, the Industrial Revolution embraced development and the seemingly unlimited use of renewable and nonrenewable resources. Little by little, though, wastes were seen as pollutants that had to be discreetly collected, hidden, or buried in the most environmentally friendly way possible. Each year the world produces as much waste as it does grain and steel. The world survey detailed in this book offers the most complete picture to date of the global waste economy, from collection through to recovery and

recycling. It analyzes in depth three different methods of waste treatment: recycling, composting, and waste treatment. The authors deem it critical that changes in and the future of the waste management economy need to be viewed as part of the general issue of resource scarcity. Through effective and efficient resource recovery, global waste production offers the potential for equivalent amounts of energy and organic and secondary raw material resources.

Energy Technology Transitions for Industry International Energy Agency 2009 Industry accounts for one-third of global energy use and almost 40% of worldwide CO2 emissions. Achieving substantial emissions reduction in the future will require urgent action from industry. What are the likely future trends in energy use and CO2 emissions from industry? What impact could the application of best available technologies have on these

trends? Which new technologies are needed if these sectors are to fully play their role in a more secure and sustainable energy future? Energy Technology Transitions for Industry looks at these questions through detailed sectoral and regional analyses, building on IEA findings, such as Energy Technology Perspectives 2008: Scenarios and Strategies to 2050. It contains new indicators and methodologies as well as scenario results for the following sectors: iron and steel, cement, chemicals, pulp and paper and aluminium sectors. The report discusses the prospects for new low-carbon technologies and outlines potential technology transition paths for the most important industrial sectors.

New Polymer Nanocomposites for Environmental Remediation Chaudhery Mustansar Hussain 2018-02-19 New Polymer Nanocomposites for Environmental Remediation summarizes

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recent progress in the development of materials' properties, fabrication methods and their applications for treatment of contaminants, pollutant sensing and detection. This book presents current research into how polymer nanocomposites can be used in environmental remediation, detailing major environmental issues, and key materials properties and existing polymers or nanomaterials that can solve these issues. The book covers the fundamental molecular structure of polymers used in environmental applications, the toxicology, economy and life-cycle analysis of polymer nanocomposites, and an analysis of potential future applications of these materials. Recent research and development in polymer nanocomposites has inspired the progress and use of novel and cost-effective environmental applications. Presents critical, actionable guidelines to the structure and property design of nanocomposites in environmental

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remediation Focuses on taking technology out of the lab and into the real world Summarizes the latest developments in polymer nanocomposites and their applications in catalytic degradation, adsorptive removal and detection of contaminants in the environment Enables researchers to stay ahead of the curve, with a full discussion of regulatory issues and potential new applications and materials in this area

Southern Economist 1993

Biorefineries Michele Aresta

2015-08-31 *Biorefineries* compiles the basic science and technologies used to convert terrestrial and aquatic biomass into essential molecular compounds and polymeric materials. The book provides in depth insights into this fairly recent concept of industrial chemistry that aims to achieve optimal economic profits while minimizing the environmental impact. Chapters written by renowned

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experts cover, amongst others, the application of catalysis, downstream processing, biomass sourced olefins, lignin biorefinery techniques and biogas. The authors thoroughly examine and explain the value chain for biomass conversion into platform molecules and their transformation into final products. A comprehensive thematic overview on the topic giving beginners access to fundamental concepts is presented. Supplemented by numerous full color figures and tables, the contents impart knowledge about the involved techniques. Advanced students and experts in the field will find the summary of state-of-the-art research and current literature of valuable interest. Explores the enormous potential of biomass conversion as a future source for fuels and chemicals Focuses on both general scientific background and current innovations in the field of biorefinery Targets students and researchers in Chemistry, Chemical

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Engineering, Biotechnology, and Materials Science About the Editors Prof. Michele Aresta, Chair of the Scientific Committee of CIRCC in Italy and holds the IMM Chair at the Department of Chemical and Biomolecular Engineering at NUS, Singapore. He is author of over 200 papers and Author or Editor of nine books. Prof. Angela Dibenedetto, Associate Professor at the Department of Chemistry of the University of Bari (Italy) focused on carbon dioxide utilization by applying biorefinery concepts; and Director of the Interuniversity Consortium on Chemical Reactivity and Catalysis-CIRCC. Prof. Franck Dumeignil, Deputy Director of the CNRS joint Unit of Catalysis and Chemistry of Solid (UCCS) of Lille University (France); project coordinator of several projects on chemistry, including the EuroBioRef Project for designing next generation biorefineries.

Handbook of Engineering and Specialty

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Thermoplastics, Volume 3 Sabu Thomas
2011-04-28 The book summarizes many of the recent technical research accomplishments in the area of engineering polymers, such as oxygen containing main chain polymers (Polyether and Polyesters). The book emphasizes the various aspects of preparation, structure, processing, morphology, properties and applications of engineering polymers. Recent advances in the development and characterization of multi component polymer blends and composites (macro, micro and nano) based on engineering polymers are discussed in detail. The content of the book is unique as there are no books which deal with the recent advances synthesis, morphology, structure, properties and applications of engineering polymers and their blends and composites including nanocomposites. It covers an up-to-date record on the major findings and observations in the

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field.

Plastic and Microplastic in the Environment Arif Ahamad 2022-04-04
ORGANIC REACTIONS Thought-provoking discussions of the challenges posed by—and potential solutions to—plastic and microplastic pollution In *Plastic and Microplastic in the Environment: Management and Health Risks*, a team of distinguished environmental researchers delivers an up-to-date exploration of plastic and microplastic environmental contamination, conventional and advanced plastics management techniques, and the policies adopted across the globe to combat the phenomenon of plastics contamination. Containing a balanced focus on both conventional plastics and microplastics, this book discusses the potential health issues related to plastic and microplastic infiltration in a variety of global environments and environmental media, including freshwater environments

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oceanic environments, soil and sediment, and air. Insightful treatments of commercial and social issues, including the roles of corporate social responsibility initiatives and general education in the fight against plastic and microplastic pollution, are provided as well. Plastic and Microplastic in the Environment also includes: A thorough introduction to plastic debris in global environments, including its accumulation and disintegration Comprehensive explorations of policies for strengthening recyclable markets around the world Practical discussions of the prevalence of microplastics in the marine environment, air, soil, and other environmental media In-depth examinations of wastewater treatment plants as a potential source point of microplastics, as well as conventional and advanced microplastic particle removal

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technologies Perfect for academics, postgraduates and advanced undergraduates in fields related to environmental science and plastics, Plastic and Microplastic in the Environment: Management and Health Risks will also earn a place in the libraries of professionals working in the plastics industries and environmental policymakers.

Biobased Polymers Pratima Bajpai
2019-06-14 Biobased Polymers: Properties and Applications in Packaging looks at how biopolymers may be used in packaging as a potential green solution. The book addresses bio-based feedstocks, production processes, packaging types, recent trends in packaging, the environmental impact of bio-based polymers, and legislative demands for food contact packaging materials. Chapters explore opportunities for biopolymers in key end-use sectors, the penetration of biopolymer based concepts in the packaging market, and

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barriers to widespread commercialization. As the development of bio-based material is an important factor for sustainably growing the packaging industry, these recent trends in consumer markets are extremely important as we move towards greener packaging. Hence, this resource is an invaluable addition on the topic. Offers a comprehensive introduction to the subject for researchers interested in bio-based products, green and sustainable chemistry, polymer chemistry and materials science Covers the market for bio-based materials Includes discussions on legislative demands for food contact packaging materials Describes interesting new technologies, including nanotechnology approaches *Recent Developments in Plastic Recycling* Jyotishkumar Parameswaranpillai 2021-10-01 This book provides a systematic and comprehensive account of the recent

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developments in the recycling of plastic waste material. It presents state-of-the-art procedures for recycling of plastics from different sources and various characterization methods adopted in analyzing their properties. In addition, it looks into properties, processing, and applications of recycled plastic products as one of the drivers for sustainable recycling plastics especially in developing countries. This book proves a useful reference source for both engineers and researchers working in composite materials science as well as the students attending materials science, physics, chemistry, and engineering courses.

Automotive Recycling, Plastics, and Sustainability David Schönmayr

2017-05-31 This book provides transdisciplinary analyses of the automotive plastics production and recycling system, including prognoses, scenarios and solutions

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for corporate sustainability management. A book on plastics, not written by a plastics guy. But a sustainability guy. Plastics schizophrenia and the automotive abyss: The industry is facing a severe challenge. It is the inevitable and promising change towards a sustainable economy. However, the automotive industry is primarily concerned with the CO2 emissions from cars when driving, while the rise of lightweight plastics, electric drive and heavy batteries make the production and end-of-life phase ever more important. Therefore, the currently increasing use of non-sustainable virgin plastics in cars has to be tackled. The plastics and the automotive industry now have a chance, and this chance is the Recycling Renaissance. This book offers:

- Holistic and transdisciplinary overview on sustainability and automotive

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plastics from all angles including economy, ecology, technology, and politics with a focus on Europe • Concise analyses, prognoses, tools and a roadmap with solutions for companies, developed together with international experts from industry and academia • Strong scientific basis and independent research including a Europe-wide survey, expert interviews, and workshops • More than 80 illustrations and 15 tables including a SCOT analysis • Executive summaries after each chapter for fast reading “The uniqueness of this book lies within the different point of view on this topic from a critical, outstanding scientist.” – Univ.-Prof. Dipl.-Ing. Dr. mont. Pomberger, Montanuni Leoben

Edible Films and Coatings Maria Pilar Montero Garcia 2016-09-19 The search for better strategies to preserve foods with minimal changes during processing has been of great interest in recent decades. Traditionally

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edible films and coatings have been used as a partial barrier to moisture, oxygen, and carbon dioxide through selective permeability to gases, as well as improving mechanical handling properties. The advances in this area have been breathtaking, and in fact their implementation in the industry is already a reality. Even so, there are still new developments in various fields and from various perspectives worth reporting. Edible Films and Coatings: Fundamentals and Applications discusses the newest generation of edible films and coatings that are being especially designed to allow the incorporation and/or controlled release of specific additives by means of nanoencapsulation, layer-by-layer assembly, and other promising technologies. Covering the latest novelties in research conducted in the field of edible packaging, it considers state-of-the-art

innovations in coatings and films; novel applications, particularly in the design of gourmet foods; new advances in the incorporation of bioactive compounds; and potential applications in agronomy, an as yet little explored area, which could provide considerable advances in the preservation and quality of foods in the field.

Radiation Effects in Materials

Waldemar Alfredo Monteiro 2016-07-20

The study of radiation effects has developed as a major field of materials science from the beginning, approximately 70 years ago. Its rapid development has been driven by two strong influences. The properties of the crystal defects and the materials containing them may then be studied. The types of radiation that can alter structural materials consist of neutrons, ions, electrons, gamma rays or other electromagnetic waves with different wavelengths. All of these forms of radiation have the

capability to displace atoms/molecules from their lattice sites, which is the fundamental process that drives the changes in all materials. The effect of irradiation on materials is fixed in the initial event in which an energetic projectile strikes a target. The book is distributed in four sections: Ionic Materials; Biomaterials; Polymeric Materials and Metallic Materials.

Microplastics in fisheries and aquaculture: Food and Agriculture Organization of the United Nations 2018-11-09 An overview of the occurrence and effects of microplastics on aquatic organisms, with recommendations regarding seafood safety and security, environmental risk assessment approaches and targeted monitoring of microplastics in the environment.
Polyolefin Compounds and Materials
Mariam Al-Ali AlMa'adeed 2015-12-23
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.

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Structural Biomaterials Cuie Wen
2021-04-06 Structural Biomaterials: Properties, Characteristics, and Selection serves as a single point of reference to digest current research and develop a deeper understanding in the field of biomaterials engineering. This book uses a materials-focused approach, allowing the reader to quickly access specific, detailed information on

biomaterials characterization and selection. Relevant to a range of readers, this book provides holistic coverage of the broad categories of structural biomaterials currently available and used in medical applications, highlighting the property requirements for structural biomaterials, their biocompatibility performance and their safety regulation in key categories such as metals, ceramics and polymers. The materials science perspective of this text ensures the content is accessible even to those without an extensive background in applied medicine, positioning this text not just for students, but as an overview and reference for researchers, scientists and engineers entering the field from related materials science disciplines. Provides a unique, holistic approach, covering key biomaterials categories in one text, including metals, ceramics and polymers Discusses advantages

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disadvantages, biocompatibility performance and safety regulations, allowing for accurate materials selection in medical applications Utilizes a materials science perspective, allowing those without an extensive applied medical background to learn about the field

Epoxy Composites Debdatta Ratna
2007-08

Advances in Manufacturing II Bartosz Gapiński 2019-05-02 This book covers a variety of topics related to machine manufacturing and concerning machine design, product assembly, technological aspects of production, mechatronics and production maintenance. Based on papers presented at the 6th International Scientific-Technical Conference MANUFACTURING 2019, held in Poznan, Poland on May 19-22, 2019, the different chapters reports on cutting-edge issues in constructing machine parts, mechatronic solutions and modern drives. They include new

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ideas and technologies for machine cutting and precise processing. Chipless technologies, such as founding, plastic forming, non-metal construction materials and composites, and additive techniques alike, are also analyzed and thoroughly discussed. All in all, the book reports on significant scientific contributions in modern manufacturing, offering a timely guide for researchers and professionals developing and/or using mechanical engineering technologies that have become indispensable for modern manufacturing.

Microplastics in Terrestrial Environments Defu He 2020-08-21 This book focuses on microplastics as emerging persistent contaminants in terrestrial environments. Scientists from around the globe review recent advances in multi-disciplinary research on micro(nano)plastics, including analytical methods; the sources, fate and distribution of

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microplastics; ecological risks; toxicity and health risks; and control and countermeasures for microplastics in terrestrial environments. Offering a comprehensive overview of microplastics in terrestrial environments, the book is a valuable resource for environmental researchers, ecologists and toxicologists, as well as for policymakers and non-experts.

Predicasts F & S Index Europe 1992 Sustainable Composites for

Lightweight Applications Hom Dhakal
2020-11-22 Carbon and glass fibre reinforced composite materials have been used for many years in several different types of applications. However, these conventional composites are derived from non-renewable reinforcements and they pose a significant threat to the environment. Government legislation and consumer behaviour have recently forced many industries to adapt

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sustainable composites. Industries such as automotive, marine and aerospace are now seeking sustainable lightweight composites with the aim to reduce the overall weight of the components with enhanced materials and design aspects. Therefore, there is high demand on research for the development of sustainable lightweight composites. This book presents a comprehensive review of lightweight composites with the central aim to increase their use in key industrial sectors such as automotive, marine and aerospace. There is no such book currently available that is dedicated to sustainable lightweight applications covering important topics such as key drivers for lightweight composites, mechanical properties, damage characterisation, durability and environmental aspects. Key topics that are addressed include: The roles of reinforcements and matrices in composite materials Sustainable

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natural fibre reinforcements and their morphological structures
Lightweight applications and properties requirements Design, manufacturing processes and their effects on properties Testing and damage characterisation of composite materials Sustainable composites and techniques for property enhancement Future trends and challenges for sustainable composites in lightweight applications It will be a valuable reference resource for those working in material Science, polymer science, materials engineering, and industries involved in the manufacture of automotive and aerospace components from lightweight composite materials. Provides a comprehensive review of sustainable lightweight composites looking at key industrial applications such as automotive, marine, and aerospace and construction Important relationships between structure and properties are analysed in detail Enhancement of

properties through hybrid systems, are also explored with emphasis on design, materials selection and manufacturing techniques
Handbook of Recycling Ernst Worrell
2014-04-28 Winner of the International Solid Waste Association's 2014 Publication Award, Handbook of Recycling is an authoritative review of the current state-of-the-art of recycling, reuse and reclamation processes commonly implemented today and how they interact with one another. The book addresses several material flows, including iron, steel, aluminum and other metals, pulp and paper, plastics, glass, construction materials, industrial by-products, and more. It also details various recycling technologies as well as recovery and collection techniques. To completely round out the picture of recycling, the book considers policy and economic implications, including the impact of recycling on

energy use, sustainable development, and the environment. With contemporary recycling literature scattered across disparate, unconnected articles, this book is a crucial aid to students and researchers in a range of disciplines, from materials and environmental science to public policy studies. Portrays recent and emerging technologies in metal recycling, by-product utilization and management of post-consumer waste Uses life cycle analysis to show how to reclaim valuable resources from mineral and metallurgical wastes Uses examples from current professional and industrial practice, with policy and economic implications

Polymeric Materials Marta Fernández-García 2019-05-28 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.

Handbook of Sustainable Polymers for Additive Manufacturing Antonio Paesano 2022-05-12 This book provides the latest technical information on sustainable materials that are

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feedstocks for additive manufacturing (AM). Topics covered include an up-to-date and extensive overview of raw materials, their chemistry, and functional properties of their commercial versions; a description of the relevant AM processes, products, applications, advantages, and limitations; prices and market data; and a forecast of sustainable materials used in AM, their properties, and applications in the near future. Data included are relative to current commercial products and are presented in easy-to-read tables and charts. Features Highlights up-to-date information and data of actual commercial materials Offers a broad survey of state-of-the-art information Forecasts future materials, applications, and areas of R&D Contains simple language, explains technical terms, and minimizes technical lingo Includes over 200 tables, nearly 200 figures, and more than 1,700 references to

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technical publications, mostly very recent Handbook of Sustainable Polymers for Additive Manufacturing appeals to a diverse audience of students and academic, technical, and business professionals in the fields of materials science and mechanical, chemical, and manufacturing engineering.

Recycled Polymers Vijay Kumar Thakur 2015-04-27 The increasing consumption of different kinds of polymer based materials results in huge amount of waste materials. Once the polymers have fulfilled the function for which they have been manufactured, they are disposed of in landfills in large amounts each year, which is incompatible with current environmental goals. The disposal of polymer based plastics such as incineration and landfill results in environmental pollution and land occupation. These current levels of polymer disposal are not sustainable and polymer recycling, which is one

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of the most important actions currently available to reduce the negative impacts, receives increasing attention. Recycling provides opportunities to reduce oil usage, carbon dioxide emissions and the quantities of polymer wastes, as well as the negative impacts of disposal. Using recycled polymer wastes to replace virgin materials in some applications, such as non-food packaging and automotive components, can effectively decrease the demand of the amount of import oil and conserve raw materials. Further it can also lead to the energy saving and creating new jobs. Considering all the positive impacts of polymer recycling on environment, economy and society, considerable attention is being given to recover materials from polymer wastes. This book is ideal for all those who are interested in recycling of post-consumer polymer waste. It is the outcome of untiring efforts of the researchers with

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extensive experience in the field of recycled polymers. The book enables the reader to gain a thorough understanding of the chemistry and processing of recycled polymers and also provides an instrumental resource for those already working in this field. Some of the main features are: Highlights the chemistry of recycled polymers and compares with traditional polymers Discusses the processing of different kinds of recycled polymers Highlights new frontiers in the different processing techniques Evaluates the performance of recycled polymers Focus on recyclability and up-to date progress on recycled polymers Present state of polymer recycling

Chemistry and Industry 2009

Transformationsstrategien zum CO2-

neutralen Unternehmen Conrad Hannen

2021-01-01 Der Klimaschutz ist nicht

länger nur ein gesellschaftliches und

politisches Thema, sondern durch

unternehmerische

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Klimaneutralitätsstrategien auch in der Wirtschaft präsent. Zahlreiche Unternehmen aus allen Branchen verfolgen freiwillige Klimaschutzmaßnahmen. Obwohl der Begriff Klimaneutralität nicht allgemeingültig definiert ist, ist das strategische Vorgehen mit den Schritten Minimieren, Substituieren und Kompensieren anerkannt. Jedoch leisten nicht alle Emissionsverringerungsmaßnahmen in gleicherweise einen relevanten Beitrag zum Klimaschutz. Deshalb werden die unterschiedlichen Maßnahmen zur Sicherstellung einer Klimaneutralität innerhalb der drei Schritte analysiert und der jeweilige Beitrag auf Basis der Emissionsreduzierung und der spezifischen Kosten bewertet. Anhand einer Fallstudie wird eine nachhaltige Klimaneutralitätsstrategie ausgearbeitet, deren Finanzierung unternehmensintern durch einen Fonds

erfolgt. Die Ergebnisse zeigen, dass bereits moderate CO₂-Preise ausreichen die Strategie innerhalb einer realistischen Zeitspanne zu realisieren.

ICIS Chemical Business 2008

Hazardous substances in plastics

Stenmarck, Åsa 2017-02-08 The aim of the project is to create knowledge on how plastics recycling can increase without increasing the risk of emitting hazardous substances to the environment. The first general conclusion is that to be able to increase recycling there are measures needed at different levels. The following areas are of interest:

- Legislation: new legislation is not necessary, but harmonisation and clear guidance to the existing one is.
- Market: to create a market safety on content is needed.
- If substances added are less hazardous the recycled raw material would be "more safe" to use.
- There should be higher attention put on the knowledge

of the recyclers. • Traceability and content: Further work on labelling reaching the recycle part of the

value chain needs to be developed. It is also needed to develop a systematic approach towards risk assessments linked to recycling.