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Recycling of Flexible Plastic Packaging - Michael Niaounakis 2019-12-04
Recycling of Flexible Plastic Packaging presents thorough and detailed information on the management and recycling of flexible plastic packaging, focusing on the latest actual/potential methods and techniques and offering actionable solutions that minimize waste and increase

product efficiency and sustainability. Sections cover flexible plastic packaging and its benefits, applications and challenges. This is followed by in-depth coverage of the materials, types and forms of flexible packaging. Other key discussions cover collection and pre-treatment, volume reduction, separation from other materials, chemical recycling, post-processing and

reuse, current regulations and policies, economic aspects and immediate trends. This information will be highly valuable to engineers, scientists and R&D professionals across industry. In addition, it will also be of great interest to researchers in academia, those in government, or anyone with an interest in recycling who is looking to further advance and implement recycling methods for flexible plastic packaging. Presents state-of-the-art methods and technologies regarding the processing of flexible plastic packaging waste Addresses the challenges currently associated with both waste management and available recycling methods Opens the door to innovation, supporting improved recycling methods, manufacturing efficiency and industrial sustainability

Electronic Waste Management and Treatment Technology - Majeti

Narasimha Vara Prasad

2019-03-14

Electronic Waste Management

and Treatment Technology applies the latest research for designing waste treatment and disposal strategies. Written for researchers who are exploring this emerging topic, the book begins with a short, but rigorous, discussion of electric waste management that outlines common hazardous materials. such as mercury, lead, silver and flame-retardants. The book also discusses the fate of metals contained in waste electrical and electronic equipment in municipal waste treatment. Materials and methods for the remediation, recycling and treatment of plastic waste collected from waste electrical and electronic equipment (WEEE) are also covered. Finally, the book covers the depollution benchmarks for capacitors, batteries and printed circuit boards from waste electrical and electronic equipment (WEEE) and the recovery of waste printed circuit boards through pyrometallurgy. Describes depollution benchmarks for capacitors, batteries and

printed wiring boards from waste electronics Covers metals contained in waste electrical and electronic equipment in municipal waste Provides tactics for the recycling of mixed plastic waste from electrical and electronic equipment

Hazardous Waste

Management - Deepak Yadav
2021-11-29

Hazardous Waste Management: An Overview of Advanced and Cost-Effective Solutions includes the latest practical knowledge and theoretical concepts for the treatment of hazardous wastes. The book covers five major themes, namely, ecological impact, waste management hierarchy, hazardous waste characteristics and regulations, hazardous wastes management, and future scope of hazardous waste management. It serves as a comprehensive and advanced reference for undergraduate students, researchers and practitioners in the field of hazardous wastes and focuses on the latest emerging

research in the management of hazardous waste, the direction in which this branch is developing as well as future prospects. The book deals with all these components in-depth, however, particular attention is given to management techniques and cost-effective, economically feasible solutions for hazardous wastes released from various sources.

Comprehensively explores the impact of hazardous wastes on human health and ecosystems Discusses toxicity across solid waste, aquatic food chain and airborne diseases Categorically elaborates waste treatment and management procedures with current challenges Discusses future challenges and the importance of renewing technologies

Emerging Trends to Approaching Zero Waste -
Chaudhery Mustansar Hussain
2021-12-04

Emerging Trends to Approaching Zero Waste: Environmental and Social Perspectives thoroughly examines the impact of various technological innovations,

current guidelines and social awareness on the reduction of waste, with the ultimate aim of achieving the zero-waste target. Insights in the book will help users adopt the best possible methodologies at grass-root levels and show how modern societal procedures are becoming sustainable, with a goal of zero waste. It comprehensively discusses the scientific contributions of the environmental and social sector, along with the tools and technologies available for achieving the zero-waste targets. This book is the first step toward understanding state-of-the-art practices in making the zero-waste goal a reality. It will be especially beneficial to researchers, academics, upper-level students, waste managers, engineers and managers of industries researching or hoping to implement zero-waste techniques. Uses fundamental, interdisciplinary and state-of-the-art coverage of zero waste research to provide an integrated approach to tools, methodology and

indicators for waste minimization Presents a unique look at environmental and social perspectives, challenges and solutions to zero waste Includes up-to-date references and web resources at the end of each chapter, as well as a webpage dedicated to providing supplementary information

Paper Recycling and the Waste Paper Business in Japan - 8077iied -

International Institute for Environment & Development
1996

Handbook of Recycled Concrete and Demolition Waste
- Fernando Pacheco-Torgal
2013-09-30

The civil engineering sector accounts for a significant percentage of global material and energy consumption and is a major contributor of waste material. The ability to recycle and reuse concrete and demolition waste is critical to reducing environmental impacts in meeting national, regional and global environmental targets.

Handbook of recycled concrete and demolition waste summarises key recent research in achieving these goals. Part one considers techniques for managing construction and demolition waste, including waste management plans, ways of estimating levels of waste, the types and optimal location of waste recycling plants and the economics of managing construction and demolition waste. Part two reviews key steps in handling construction and demolition waste. It begins with a comparison between conventional demolition and construction techniques before going on to discuss the preparation, refinement and quality control of concrete aggregates produced from waste. It concludes by assessing the mechanical properties, strength and durability of concrete made using recycled aggregates. Part three includes examples of the use of recycled aggregates in applications such as roads, pavements, high-performance concrete and alkali-activated or

geopolymer cements. Finally, the book discusses environmental and safety issues such as the removal of gypsum, asbestos and alkali-silica reaction (ASR) concrete, as well as life-cycle analysis of concrete with recycled aggregates. Handbook of recycled concrete and demolition waste is a standard reference for all those involved in the civil engineering sector, as well as academic researchers in the field. Summarises key recent research in recycling and reusing concrete and demolition waste to reduce environmental impacts and meet national, regional and global environmental targets Considers techniques for managing construction and demolition waste, including waste management plans, ways of estimating levels of waste, the types and optimal location of waste recycling plants Reviews key steps in handling construction and demolition waste

Solid Waste Recycling and Processing - Marc J. Rogoff

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2013-11-18

Solid Waste Recycling and Processing, Second Edition, provides best-practice guidance to solid waste managers and recycling coordinators. The book covers all aspects of solid waste processing, volume reduction, and recycling, encompassing typical recyclable materials (paper, plastics, cans, and organics), construction and demolition debris, electronics, and more. It includes techniques, technologies, and programs to help maximize customer participation rates and revenues, as well as to minimize operating costs. The book is packed with lessons learned by the author during the implementation of the most successful programs worldwide, and includes numerous case studies showing how different systems work in different settings. This book also takes on industry debates such as the merits of curbside-sort versus single-stream recycling and the use of advanced technology in materials recovery facilities. It

provides key facts and figures, and brief summaries of legislation in the United States, Europe, and Asia. An extensive glossary demystifies the terminology and acronyms used in different sectors and geographies. The author also explains emerging concepts in recycling such as zero waste, sustainability, LEED certification, and pay-as-you-throw, and places waste management and recycling in wider economic, environmental (sustainability), political, and societal contexts. Covers single- and mixed-waste streams Evaluates the technologies and tradeoffs of recycling of materials vs. integrated solutions, including combustion and other transformational options Covers recycling as part of the bigger picture of solid waste management, processing and disposal

Environmental Waste Management - Ram Chandra
2016-04-19

Rapid industrialization has resulted in the generation of huge quantities of hazardous

waste, both solid and liquid. Despite regulatory guidelines and pollution control measures, industrial waste is being dumped on land and discharged into water bodies without adequate treatment. This gross misconduct creates serious environmental and public health

Handbook of Recycling -

Ernst Worrell 2013-09-15 Advancing the science of recycling, recovery and reuse of industrial materials and byproducts represents a multifaceted challenge for researchers. Resource efficiency has become a major topic on the political agenda throughout the world and has served to prioritize materials recycling as part of effective resource management strategies within industry and academia alike. This is reflected in increasing interest in resource efficiency, as commodity prices have steadily increased and geo-political issues around access to strategic resources arise again. Moreover, increased environmental pressure,

including climate change, will increase interest in recycling as part of the environmental and waste management toolbox. Edited by Dr Ernst Worrell of Utrecht Univeristy, Editor-in-Chief of Resources, Conservation and Recycling and composed of strictly edited, multidisciplinary expert articles, this work directly addresses this research challenge, fostering comprehension not only of currently deployed industrial practice from a professional / user perspective, but within context of the underpinning resource conservation, waste reduction and sustainable development. 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 implications and economics, to present a real-world portrait useful to engineers and

professionals as well as academics

Tire Waste and Recycling -

Trevor M. Letcher 2021-03-25

Tire Waste and Recycling takes a methodical approach to the recycling of tires, providing a detailed understanding on how to manage, process, and turn waste tires into valuable materials and industrial applications. Sections cover fundamental aspects such as tire use, composition, trends, legislation, the current global situation, the possibilities for moving towards a circular economy, lifecycle options, treatment methods, and opportunities for re-use, recycling and recovery. Subsequent sections of the book focus on specific technologies that enable the utilization of waste tires in the development of high value materials and advanced applications. Finally, the future of tire recycling is considered. This is an essential resource for scientists, R&D professionals, engineers and manufacturers working in the tire, rubber, waste, recycling,

automotive and aerospace industries. In academia, the book will be of interest to researchers and advanced scientists across rubber science, polymer science, materials engineering, environmental science, chemistry and chemical engineering. Offers systematic coverage of tire recycling, covering composition, lifecycle, processing options, material developments and latest technologies Explains end-of-life-options in detail, considering approaches and methods for reduction, re-use, recycling and recovery Explores key application and product areas for recycled tire materials, from civil engineering, sports and leisure, to roads and transport, construction, automotive, and many more

Recycling in Textiles -

Youjiang Wang 2006-03-20

An increasing amount of waste is generated each year from textiles and their production. For economic and environmental reasons it is necessary that as much of this

waste as possible is recycled instead of being disposed of in landfill sites. In reality the rate of textile recycling is still relatively low. On average, approximately ten million tonnes of textile waste is currently dumped in Europe and America each year. Considering the diversity of fibrous waste and structures, many technologies must work in concert in an integrated industry in order to increase the rate of recycling. Recycling in textiles shows how this can be achieved. The first part of the book introduces the subject by looking at the general issues involved and the technologies concerned. Part Two explores the chemical aspects of textile recycling. Part Three focuses on recycled textile products, including nonwovens and alternative fibres. Finally, the last part of the book discusses possible applications of recycled textiles, including using recycled products in the operating theatre, for soil stabilisation and in concrete reinforcement. Recycling in textiles presents several

promising technologies and ideas for recycling systems. This is the first book of its kind to bring together textile recycling issues, technology, products, processes and applications. It will prove an invaluable guide to all those in the industry who are now looking for ways to recycle their textile waste. Provides extensive coverage of this hot topic An invaluable guide for all in the textile industry Learn how to increase the rate of recycling

Sustainable Apparel - Richard Blackburn 2015-08-28

Sustainability is an issue that increasingly concerns all those involved in the apparel industry, including textile manufacturers, apparel designers, retailers and consumers. This important book covers recent advances and novel technologies in the key areas of production, processing and recycling of apparel. Part One addresses sustainable finishing and dyeing processes for textiles. The first two chapters concentrate on the

environmental impact of fabric finishing, including water consumption, emissions and waste management. Further chapters focus on plasma and enzymatic treatments for sustainable textile processing, and the potential for improving the sustainability of dyeing technologies. Part Two covers issues of design, retail and recycling, and includes discussions of public attitudes towards sustainability in fashion, methods of measuring apparel sustainability and social trends in the re-use of apparel. Reviews sustainable finishing and dyeing processes for textiles Addresses social attitudes towards and methods for measuring sustainability in the apparel industry and retail sectors Covers recycling of apparel

Recycling and Reuse of Materials and Their

Products - Yves Grohens
2013-01-23

This important book is an overall analysis of different innovative methods and ways of recycling in connection with various types of materials. It

aims to provide a basic understanding about polymer recycling and its reuse as well as presents an in-depth look at various recycling methods. It provides a thorough knowledge about the work being done in recycling in different parts of the world and throws light on areas that need to be further explored. Emphasizing eco-friendly methods and recovery of useful materials The book covers a wide variety of innovative recycling methods and research, including • Green methods of recycling • Effective conversion of biomass and municipal wastes to energy-generating systems • A catalyst for the reuse of glycerol byproduct • Methods of adsorption to treat wastewater and make it suitable for irrigation and other purposes • Disposal of sludge • The use of calcined clay to replace both fine and coarse aggregates • Recycling of rubbers • The production of a sorbent material for paper mill sludge • Replacing polypropylene absorbent in oil spill sanitations • The use of

natural fibers for various industrial applications • Cashew nut shell liquid as a source of surface active reagents • Integrated power and cooling systems based on biomass • Recycling water from household laundering • much more

Polymer Recycling - John Scheirs 1998-09-16

Provides an overview of state-of-the-art recycling techniques together with current and potential applications. Presents material that is normally only available in the form of conference proceedings Includes flow charts detailing the recycling process Helps identify the problems encountered in the recycling of polymers Presents pie graphs and photographs of commercial outlets A comprehensive volume which will prove to be invaluable for polymer manufacturers, recyclers and marketers as well as environmental authorities and materials engineers.

Environmental Water - V.K.

Gupta 2012-11-29

The world is facing a drinking

water crisis. Besides continuous population growth, uneven distribution of water resources and periodic droughts have forced scientists to search for new and effective water treatment, remediation and recycling technologies. Therefore, there is a great need for the development of suitable, inexpensive and rapid wastewater treatment and reuse or conservation methods. This title discusses different types of wastewater treatment, remediation and recycling techniques, like adsorption, membrane filtration and reverse osmosis. It also provides guidance for the selection of the appropriate technologies or their combinations for specific applications so that one can select the exact and accurate technology without any problem. The book comprises detailed discussion on the application of various technologies for water treatment, remediation and recycling technologies and provides an update on the development in water

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treatment, detailed analysis of their features and economic analysis, bridging the current existing information gap. Each chapter is also documented by references and updated citations. Provides guidance for the selection of the appropriate technologies to industrialists and government authorities for the selection of exact, inexpensive technologies for specific problem solving. Discusses the developments of inexpensive and rapid wastewater treatment, remediation and recycling. Gives information on the application of analytical techniques, such as GC, LC, IR, and XRF for analysing and measuring water. Provides an updated development in water treatment technologies, detailed analysis of their features and economic analysis, enabling to choose a problem-specific solution. Completely updates the current knowledge in this field, bridging the current existing information gap.

Rare Earths Industry - Ismar Borges De Lima 2015-09-10

Rare Earths elements are composed of 15 chemical elements in the periodic table. Scandium and yttrium have similar properties, with mineral assemblages, and are therefore referred alike in the literature. Although abundant in the planet surface, the Rare Earths are not found in concentrated forms, thus making them economically valued as they are so challenging to obtain.

Rare Earths Industry: Technological, Economic and Environmental Implications provides an interdisciplinary orientation to the topic of Rare Earths with a focus on technical, scientific, academic, economic, and environmental issues. Part I of book deals with the Rare Earths Reserves and Mining, Part II focuses on Rare Earths Processes and High-Tech Product Development, and Part III deals with Rare Earths Recycling Opportunities and Challenges. The chapters provide updated information and priceless analysis of the theme, and they seek to present the latest techniques, approaches, processes and

technologies that can reduce the costs of compliance with environmental concerns in a way it is possible to anticipate and mitigate emerging problems. Discusses the influence of policy on Rare Earth Elements to help raise interest in developing strategies for management resource development and exploitation Global contributions will address solutions in countries that are high RE producers, including China, Brazil, Australia, and South China End of chapter critical summaries outline the technological, economic and environmental implications of rare earths reserves, exploration and market Provides a concise, but meaningful, geopolitical analysis of the current worldwide scenario and importance of rare earths exploration for governments, corporate groups, and local stakeholders

Environmental Impacts of Waste Paper Recycling - Yrjo Virtanen 2013-07-04
Public concern for the

conservation of natural resources and a general awareness of the environmental consequences of waste disposal is reflected in current legislation aimed at reducing waste. Recycling is commonly cited as one of the preferred methods of waste reduction and this book summarizes a recent study of paper recycling in Europe, which investigated the entire production and disposal process using a life-cycle methodology. The results of the study underline the economic and environmental advantages of paper recycling, but more controversially, they also show how, under certain conditions, the renewable character and the high energy content of paper seem to make energy recovery more attractive than recycling.

Management, Recycling and Reuse of Waste Composites - Vanessa Goodship 2009-12-18
This authoritative reference work provides a comprehensive review of the management, recycling and reuse of waste composites. These are issues

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which are of increasing importance due to the growing use of composites in many industries, increasingly strict legislation and concerns about disposal of composites by landfill or incineration. Part one discusses the management of waste composites and includes an introduction to composites recycling and a chapter on EU legislation for recycling waste composites. Part two reviews thermal technologies for recycling waste composites with chapters on pyrolysis, catalytic transformation, thermal treatments for energy recovery and fluidized bed pyrolysis. Part three covers mechanical methods of recycling waste composites. This section includes chapters on additives for recycled plastic composites, improving mechanical recycling and the quality and durability of mechanically recycled composites. Part four discusses improving sustainable manufacture of composites, with chapters on environmentally-friendly filament winding of FRP

composites, process monitoring and new developments in producing more functional and sustainable composites. Part five gives a review of case studies including end-of-life wind turbine blades, aerospace composites, marine composites, composites in construction and the recycling of concrete. With its distinguished editor and international team of contributors, Management, recycling and reuse of waste composites is a standard reference for anyone involved in the disposal or recycling of waste composites. Reviews the increasingly important issues of recycling and reuse as a result of the increased use of composites Discusses the management of waste composites and EU legislation with regards to recycling Examines methods for recycling, including thermal technologies and mechanical methods

Biotechnology for Pulp and Paper Processing - Pratima Bajpai 2018-02-14

The book provides the most up-

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to-date information available on various biotechnological processes useful in the pulp and paper industry. The first edition was published in 2011, covering a specific biotechnological process or technique, discussing the advantages, limitations, and prospects of the most important and popular processes used in the industry. Many new developments have taken place in the last five years, warranting a second edition on this topic. The new edition contains about 35% new material covering topics in Laccase application in fibreboard; biotechnology in forestry; pectinases in papermaking; stickies control with pectinase; products from hemicelluloses; value added products from biorefinery lignin; use of enzymes in mechanical pulping.

Nanotechnology in Paper and Wood Engineering - Rajeev Bhat 2022-01-17

Nanotechnology in Paper and Wood Engineering: Fundamentals, Challenges and Applications describes recent

advances made in the use of nanotechnology in the paper and pulp industry. Various types of nano-additives commonly used in the paper industry for modification of raw material to enhance final products are included, with other sections covering the imaging applications of nano-papers and nano-woods in pharmaceuticals, biocatalysis, photocatalysis and energy storage. This book is an important reference source for materials scientists and engineers who are looking to understand how nanotechnology is being used to create more efficient manufacturing processes in for the paper and wood industries. Provides information on nano-paper production and its applications Explains the major synthesis techniques and design concepts of cellulosic or wooden nanomaterials for industrial applications Assesses the major challenges of creating nanotechnology-based manufacturing systems for wood and paper engineering

Recycling and Deinking of

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Recovered Paper - Pratima Bajpai 2013-11-21

Paper recycling in an increasingly environmentally conscious world is gaining importance. Increased recycling activities are being driven by robust overseas markets as well as domestic demand. Recycled fibers play a very important role today in the global paper industry as a substitute for virgin pulps. Paper recovery rates continue to increase year after year. Recycling technologies have been improved in recent years by advances in pulping, flotation deinking and cleaning/screening, resulting in the quality of paper made from secondary fibres approaching that of virgin paper. The process is a lot more eco-friendly than the virgin-papermaking process, using less energy and natural resources, produce less solid waste and fewer atmospheric emissions, and helps to preserve natural resources and landfill space. Currently more than half of the paper is produced from recovered

papers. Most of them are used to produce brown grades paper and board but for the last two decades, there is a substantial increase in the use of recovered papers to produce, through deinking, white grades such as newsprint, tissue, market pulp. By using recycled paper, companies can take a significant step toward reducing their overall environmental impacts. This study deals with the scientific and technical advances in recycling and deinking including new developments. Covers in great depth all the aspects of recycling technologies. Covers the latest science and technology in recycling. Provides up-to-date, authoritative information and cites many mills experiences and pertinent research. Includes the use of biotech methods for deinking, refining, and improving drainage. *Recycling of Plastics, Metals, and Their Composites* - R.A. Ilyas 2021-12-28. Having a solid understanding of materials recycling is of high importance, especially due to

the growing use of composites in many industries and increasingly strict legislation and concerns about the disposal of composites in landfills or by incineration. Recycling of Plastics, Metals, and Their Composites provides a comprehensive review of the recycling of waste polymers and metal composites. It provides the latest advances and covers the fundamentals of recycled polymers and metal composites, such as preparation, morphology, and physical, mechanical, thermal, and flame-retardancy properties. FEATURES Offers a state-of-the-art review of the recycling of polymer composites and metal composites for sustainability Describes a life-cycle analysis to help readers understand the true potential value and market for these recycled materials Details potential applications of recycled polymer and metal composites Includes the performance of natural fiber-reinforced recycled thermoplastic polymer composites under aging

conditions and the recycling of multi-material plastics Covers recycling technologies, opportunities, and challenges for polymer-matrix composites This book targets technical professionals in the metal and polymer industries as well as researchers, scientists, and advanced students. It is also of interest to decision makers at material suppliers, recycled metal and polymer product manufacturers, and governmental agencies working with recycled metal and polymer composites. Nanomaterials Recycling - Mahendra Rai 2021-10-31 Nanomaterial Recycling provides an update on the many benefits nanomaterials can provide on both environmental and economic issues. Sections cover the appropriate recycling strategies of nanowastes, nanowaste regulations (including nanowaste disposal and recycling standards), promising applications (reuses) of these recycled nanomaterials, and various methods used for the

separation of nanoparticles, including (i) centrifugation, (ii) solvent evaporation, (iii) magnetic separation, (iv) using pH/thermal responsive materials, (v) molecular antisolvents, (vi) nanostructured colloidal solvents, and more. This book is an important reference source for materials scientists and engineers who are seeking to increase their understanding of nanomaterials, recycling processes and techniques. As nanomaterials can be recycled from both new/pure products (from nano manufacturing) and used products (nano waste: waste from nano integrated products), this book is a welcomed addition to many disciplines. Provides information on how nanoscale recycling techniques can mitigate the most hazardous effects of nanomaterials Explains the major recycling processes and techniques used for nanoscale materials Assesses the major challenges of implementing nanoscale recycling approaches in a scalable and cost-effective

manner

*TOWARDS A SUSTAINABLE
Paper Cycle Sub-Study Series -*

**Environmentally Compatible
Food Packaging** - E. Chiellini
2008-07-24

Food packaging performs an essential function, but packaging materials can have a negative impact on the environment. This collection reviews bio-based, biodegradable and recycled materials and their current and potential applications for food protection and preservation. The first part of the book looks at the latest advances in bio-based food packaging materials. Part two discusses the factors involved in choosing alternative packaging materials such as consumer preference, measuring the environmental performance of food packaging, eco-design, and the safety and quality of recycled materials. Part three contains chapters on the applications of environmentally-compatible materials in particular product sectors, including the packaging of fresh horticultural

produce, dairy products and seafood. This section also covers active packaging, modified atmosphere packaging and biobased intelligent food packaging. The book finishes with a summary of the legislation and certification of environmentally-compatible packaging in the EU. With its distinguished editor and contributors, Environmentally-compatible food packaging is a valuable reference tool for professionals in the food processing and packaging industries. Reviews bio-based, biodegradable and recycled materials and their current and potential applications

Discusses consumer preference, environmental performance, eco-design and the quality of recycled materials as factors involved in choosing alternative packaging materials Summarises EU legislation and certification of environmentally compatible packaging

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.

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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

WEEE Recycling - Alexandre Chagnes 2016-07-26

WEEE Recycling: Research, Development, and Policies covers policies, research, development, and challenges in recycling of waste electrical and electronic equipment (WEEE). The book introduces WEEE management and then covers the environmental, economic, and societal applications of e-waste recycling, focusing on the technical challenges to designing efficient and sustainable recycling processes—including physical separation, pyrometallurgical, and hydrometallurgical processes. The development of processes for recovering

strategic and critical metals from urban mining is a priority for many countries, especially those having few available ores mining. Describes the two metallurgical processes—hydro- and pyrometallurgy—and their application in recycling of metals Provides a life cycle analysis in the WEEE recycling of metals Outlines how to determine economic parameters in the recycling of waste metals Discusses the socio economic and environmental implication of metal recycling

Material Recycling - Dimitris Achilias 2012-03-16

The presently common practice of wastes' land-filling is undesirable due to legislation pressures, rising costs and the poor biodegradability of commonly used materials. Therefore, recycling seems to be the best solution. The purpose of this book is to present the state-of-the-art for the recycling methods of several materials, as well as to propose potential uses of the recycled products. It targets

professionals, recycling companies, researchers, academics and graduate students in the fields of waste management and polymer recycling in addition to chemical engineering, mechanical engineering, chemistry and physics. This book comprises 16 chapters covering areas such as, polymer recycling using chemical, thermo-chemical (pyrolysis) or mechanical methods, recycling of waste tires, pharmaceutical packaging and hardwood kraft pulp and potential uses of recycled wastes.

Encyclopedia of Forest Sciences - Julian Evans
2004-04-02

A combination of broad disciplinary coverage and scientific excellence, the *Encyclopedia of Forest Sciences* will be an indispensable addition to the library of anyone interested in forests, forestry and forest sciences. Packed with valuable insights from experts all over the world, this remarkable set not only summarizes recent

advances in forest science techniques, but also thoroughly covers the basic information vital to comprehensive understanding of the important elements of forestry. The *Encyclopedia of Forest Sciences* also covers relevant biology and ecology, different types of forestry (e.g. tropical forestry and dryland forestry), scientific names of trees and shrubs, and the applied, economic, and social aspects of forest management. Valuable key features further enhance the utility of this *Encyclopedia* as an exceptional reference tool. Also available online via ScienceDirect - featuring extensive browsing, searching, and internal cross-referencing between articles in the work, plus dynamic linking to journal articles and abstract databases, making navigation flexible and easy. For more information, pricing options and availability visit www.info.sciencedirect.com. Edited and written by a distinguished group of editors and contributors Well-organized encyclopedic format

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provides concise, readable entries, easy searches, and thorough cross-references
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Complete, up-to-date coverage of over 60 areas of forest sciences - sure to be of interest to scientists, students, and professionals alike! Editor-in-Chief is the past president of the International Union of Forestry Research Organizations, the oldest international collaborative forestry research organization with over 15,000 scientists from 100 countries
Plastic Waste for Sustainable Asphalt Roads - Filippo Giustozzi 2022-01-13
Waste polymers have been studied for various applications such as energy generation and biochemical production; however, their application in asphalt roads still poses some questions. Over the last decade, several studies have reported the utilization of waste plastics in roads using

different methodologies and raw materials, but there is still significant inconsistency around this topic. What is the right methodology to recycle waste plastics for road applications? What is the correct type of waste plastics to be used in road applications? What environmental concerns could arise from the use of waste plastics in road applications? Plastic Waste for Sustainable Asphalt Roads covers the various processes and techniques for the utilization of waste plastics in asphalt mixes. The book discusses the various material properties and methodologies, effects of various methodologies, and combination of various polymers. It also provides information on the compatibility between bitumen and plastics, final asphalt performance, and environmental challenges. Discusses the processes and techniques for utilization of waste plastics in asphalt mixes. Features a life-cycle assessment of waste plastics in

road surfaces and possible Environmental Product Declarations (EPD). Includes examples of on-field usage through various case studies.

McGraw-Hill Recycling Handbook, 2nd Edition - Herbert F. Lund 2001

This edition covers the following topics - medical waste recycling, recycling old, closed landfills, recycling sports stadiums, malls, and amusement parks, flow control legal decisions and recycling product development.

Waste Age and Recycling Times - John T. Aquino 2020-01-29

This definitive Handbook, authored by the publishing division of the leading and the largest association in the field of waste management, provides information on virtually every aspect of recycling. The chapters, written by leading international authorities, cover such topics as collection of recyclables, recycling costs, safety in recycling facilities, available technology for collection and processing of waste products, and

profitability of waste products. Introductory material in the form of "waste profiles" is included at the beginning of the Handbook, providing an excellent general reference on all of the various recyclables, from newspapers to batteries. The Handbook also covers legislative issues related to recycling, including legislation in Germany, France, Britain, and Canada, and how these overseas regulations affect recycling in the United States.

Industrial Wastewater Treatment, Recycling and Reuse - Vivek V. Ranade 2014-07-21

Industrial Wastewater Treatment, Recycling and Reuse is an accessible reference to assist you when handling wastewater treatment and recycling. It features an instructive compilation of methodologies, including advanced physico-chemical methods and biological methods of treatment. It focuses on recent industry practices and preferences, along with newer methodologies for energy

generation through waste. The book is based on a workshop run by the Indus MAGIC program of CSIR, India. It covers advanced processes in industrial wastewater treatment, applications, and feasibility analysis, and explores the process intensification approach as well as implications for industrial applications. Techno-economic feasibility evaluation is addressed, along with a comparison of different approaches illustrated by specific case studies. Industrial Wastewater Treatment, Recycling and Reuse introduces you to the subject with specific reference to problems currently being experienced in different industry sectors, including the petroleum industry, the fine chemical industry, and the specialty chemicals manufacturing sector. Provides practical solutions for the treatment and recycling of industrial wastewater via case studies Instructive articles from expert authors give a concise overview of different

physico-chemical and biological methods of treatment, cost-to-benefit analysis, and process comparison Supplies you with the relevant information to make quick process decisions

Nano Technology for Battery Recycling, Remanufacturing, and Reusing - Siamak Farhad
2022-05-11

Nanotechnology for Battery Recycling, Remanufacturing, and Reusing explores how nanotechnology is currently being used in battery recycling, remanufacturing and reusing technologies to make them economically and environmentally feasible. The book shows how nanotechnology can be used to enhance and improve battery recycling, remanufacturing and reusing technologies, covering the fundamentals of battery recycling, remanufacturing and reusing technologies, the role of nanotechnology, the separation, regeneration and reuse of nanomaterials from battery waste, nano-enabled approaches for battery recycling, and nano-enabled

approaches for battery remanufacturing and reusing. This book will help researchers and engineers to better understand the role of nanotechnology in the field of battery recycling, remanufacturing and reusing. It will be an important reference source for materials scientists and engineers who would like to learn more about how nanotechnology is being used to create new battery recycling processes. Outlines practical and cost-efficient processes for recycling and reusing batteries Highlights the different types of nanomaterials used in battery recycling processes Assesses major challenges with integrating nanotechnology into battery manufacturing processes on an industrial scale

Advances in Construction and Demolition Waste Recycling -

Fernando Pacheco-Torgal

2020-02-10

Advances in Construction and Demolition Waste Recycling: Management, Processing and Environmental Assessment is

divided over three parts. Part One focuses on the management of construction and demolition waste, including estimation of quantities and the use of BIM and GIS tools. Part Two reviews the processing of recycled aggregates, along with the performance of concrete mixtures using different types of recycled aggregates. Part Three looks at the environmental assessment of non-hazardous waste. This book will be a standard reference for civil engineers, structural engineers, architects and academic researchers working in the field of construction and demolition waste. Summarizes key recent research in recycling and reusing concrete and demolition waste to reduce environmental impacts Considers techniques for managing construction and demolition waste, including waste management plans, ways of estimating levels of waste, and the types and optimal location of waste recycling plants Reviews key steps in

handling construction and demolition waste

Technology of Paper

Recycling - R. McKinney

1994-11-30

This book covers the technology of the recovery of secondary fibre for its use in paper and board manufacture. The editor, who has had substantial practical experience of designing and commissioning paper recycling plants all over the world, leads a team of experts who discuss subjects including sourcing, characterisation, mechanical handling and preparation and de-inking.

Recycling from Waste in Fashion and Textiles - Pintu Pandit 2020-07-15

The alarming level of greenhouse gases in the environment, fast depleting natural resources and the increasing level of industrial effluents, have made every single manufacturing activity come under the scrutiny of sustainability. When all kinds of waste such as clothes, furniture, carpets, televisions, shoes, paper, food wastes etc.

end up in the landfill, only a few of them are naturally decomposed and thus a large majority remains as non-biodegradable. It is for this reason, efforts are concentrated to reduce the burden on earth by this waste, and as far as used textile products are concerned, there are now attempts to recycle or up-cycle. This book addresses the role of sustainability by using textile waste in fashion and textiles with respect to manufacturing, materials, as well as the economic and business challenges and opportunities it poses. This wide-ranging book comprises 19 chapters on the various topics including: · Solutions for sustainable fashion and textile industry · Agro and bio waste in the fashion industry · Innovating fashion brands by using textile waste · Waste in handloom textiles · Business paradigm shifting: 21st century fashion from recycling and upcycling · Utilization of natural waste for sustainable textile coloration · Circular economy in fashion and textile

from waste · Future pathways of waste utilization for fashion · Sustainable encapsulation of natural dyes from Plant waste for textiles · Agro-waste applications for bio-remediation of textile effluent

Handbook of Sustainable Concrete and Industrial Waste Management - Francesco Colangelo 2021-12-13

The Handbook of Sustainable Concrete and Industrial Waste Management summarizes key research trends in recycling and reusing concrete and industrial waste to reduce their environmental impact. This volume also includes important contributions in collaboration with the CRI-TEST Innovation Lab, Naples - Acerra. Part one discusses eco-friendly innovative cement and concrete and reviews key substitute materials. Part two analyzes the use of industrial waste as aggregates and the mechanical properties of concrete containing waste materials. Part three discusses differences between innovative binders, focusing on alkali-activated and geopolymer

concrete. Part four provides a thorough overview of the life cycle assessment (LCA) of concrete containing industrial wastes and the impacts related to the logistics of wastes, the production of the concrete, and the management of industrial wastes. By providing research examples, case studies, and practical strategies, this book is a state-of-the-art reference for researchers working in construction materials, civil or structural engineering, and engineers working in the industry. Offers a systematic and comprehensive source of information on the latest developments in sustainable concrete; Analyzes different types of sustainable concrete and innovative binders from chemical, physical, and mechanical points of view; Includes real case studies showing application of the LCA methodology.

Recycled Plastic

Biocomposites - Md Rezaur Rahman 2022-01-25

Recycled plastic biocomposites have attracted widespread attention from both

researchers and manufacturers due to the significant improvements in their physico-mechanical, thermal, rheological, and barrier properties when compared to conventional materials, as well as their potential regarding commercialization and zero waste. Recycled Plastic Biocomposites presents the latest information on recycled polymers, textiles, pulp and paper, wood plastic, rubber waste plastic, and micro and nano effects of recycled plastic waste resources that have great potential as reinforcement materials in composites because they are non-toxic, inexpensive, biodegradable, cost-effective, and available in large amounts. Recycled plastic biocomposites are now starting to be deployed in a broad range of materials applications due to their advantages over petroleum-based materials. Currently, there are no limits to the possibility of their applications. They also have exceptional sustainable and biodegradable properties when compared to

conventional materials such as polymers and composites. Recycled Plastic Biocomposites reviews the latest research advances on recycled plastic-based biocomposites, including thermoplastic, thermoset, rubber, and foams. In addition, the book covers critical assessments on the economics of recycled plastic, including a cost-performance analysis that discusses its strengths and weaknesses as a reinforcement material. The huge potential applications of recycled plastic in industry are also explored in detail with respect to low cost, recyclable and biodegradable properties, and the way they can be applied to the automotive, construction, and packaging industries. The life cycles of both single and hybrid recycled plastic-based polymer composites and biocomposites are also discussed in detail. From the viewpoint of recycled plastic-based polymer composites, the book covers not only the well-known role of recycled polymers and composites, but also advanced materials produced from micro-

, nano-, and pico-scale fillers that achieve better physical, mechanical, morphological, and thermal properties. This book will be an essential reference resource for academic and industrial researchers, materials scientists, and those working in polymer science and engineering, chemical engineering, manufacturing, and biocomposites. Places an emphasis on micro-, nano-, and pico-scale fillers that significantly improve properties. Discusses the most suitable fabrication methods, properties, and applications. Features critical assessments on the economics of recycled plastic, including a cost-performance analysis that reviews its strengths and weaknesses as a reinforcement material.

Sustainable Resource

Recovery and Zero Waste Approaches - Mohammad

Taherzadeh 2019-07-18

Sustainable Resource Recovery and Zero Waste Approaches

covers waste reduction,

biological, thermal and

recycling methods of waste

recovery, and their conversion

into a variety of products. In

addition, the social, economic

and environmental aspects are

also explored, making this a

useful textbook for

environmental courses and a

reference book for both

universities and companies.

Provides a novel approach on

how to achieve zero wastes in a

society Shows the roadmap on

achieving Sustainable

Development Goals Considers

critical aspects of municipal

waste management Covers

recent developments in waste

biorefinery, thermal processes,

anaerobic digestion, material

recycling and landfill mining