

Degradable Polymers Recycling And Plastics Waste Management Plastics Engineering

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Polymer Products and Waste Management - Martijntje Smits 1996

Analyzing the future strategies for polymer waste management, this volume addresses the chemical/technical problems as well as the societal aspects of this area.

Plastics Waste Management - Nabil Mustafa 1993-04-28

This volume discusses the structure and growth of the plastics industry, comprehensively displaying the complete cycle of plastics from raw materials to waste and solutions related to this waste - presenting practical cost scenarios for the collection and disposal of waste.;Examining the issue of plastics waste in a broad social and environmental context, **Plastics Waste Management**: considers the regulations imposed on waste disposal and aspects of pollution control acts; provides a technical overview of polymers, classifications, and properties as well as the plastics industry, polymer production, and consumption; addresses extrusion basics and polymers' compatibility in a mixture of plastic waste; describes the recycling of mixed plastics waste; and explores design considerations and product life cycles with respect to environmentally friendly products in packaging applications.;Furnishing more than 400 bibliographic citations, **Plastics Waste Management** is a reference for pollution control, plastics, environmental, polymer and chemical engineers; recycling facility operators; plastics designers; and upper-level undergraduate and graduate students in these disciplines.

Handbook of Biodegradable Polymers - Catia Bastioli 2020-03-09

This handbook covers characteristics, processability and application areas of biodegradable polymers, with key polymer family groups discussed. It explores the role of biodegradable polymers in different waste management practices including anaerobic digestion, and considers topics such as the different types of biorefineries for renewable monomers used in producing the building blocks for biodegradable polymers.

Plastic Pollution - Sivakumaran SIVARAMANAN 2018-01-15

Plastic is a non- biodegradable organic polymer, which is very commonly used in materials, large amounts of discarded plastics accumulating in oceans as Garbage islands and in land as landfills or blocking streams and waterways. Leaching of waste plastics from land filling and fumes released during incineration resulting major health impacts to living things as well as polluting the air, water, and soil, burning PVC releases cancer causing dioxins and PCB. Addition to recycling waste plastics also used in production of energy or in co-processing. Oxo-degradable plastics end up in fragments which cannot be compostable and also resulting in particles that can cause bioaccumulation. This study analyses plastics, and their path way in the environment, it also figure out the hazardous effects of plastics to living things and to the environment, and ends with practically feasible solutions.

The Complete Book on Biodegradable Plastics and Polymers (Recent Developments, Properties, Analysis, Materials & Processes) - NIIR Board of Consultants & Engineers 2006-10-01

Biodegradable plastics made with plant based materials have been available for many years. The term biodegradable means that a substance is able to be broken down into simpler substances by the activities of living organisms, and therefore is unlikely to persist in the environment.

There are many different standards used to measure biodegradability, with each country having its own. The requirements range from 90 per cent to 60 per cent decomposition of the product within 60 to 180 days of being placed in a standard composting environment. They may be composed of either bio plastics, which are plastics whose components are derived from renewable raw materials, or petroleum based plastics which contain additives. Biodegradability of plastics is dependent on the chemical structure of the material and on constitution of the final product, not just on the raw materials used for its production. Polyesters play a predominant role as biodegradable plastics due to their potentially hydrolysable ester bonds. Bio based polymers are divided into three categories based on their origin and production; polymer directly extracted from biomass, polymers produced by classical chemical synthesis using renewable biomass monomer and polymers produces by microorganisms or genetically modified bacteria. In response to public concern about the effects of plastics on the environment and in particular the damaging effects of sea litter on animals and birds, legislation is being enacted or is pending in many countries to ban non degradable packing, finishing nets etc. This book basically deals with biodegradable plastics developments and environmental impacts, hydro biodegradable and photo biodegradable, starch synthetic aliphatic polyester blends, difference between standards for biodegradation, polybutylene succinate (pbs) and polybutylene, recent developments in the biopolymer industry, recent advances in synthesis of biopolymers by traditional methodologies, polymers, environmentally degradable synthetic biodegradable polymers as medical devices, polymers produced from classical chemical synthesis from bio based monomers, potential bio based packaging materials, conventional packaging materials, environmental impact of bio based materials: biodegradability and compostability, etc. Environmentally acceptable degradable polymers have been defined as polymers that degrade in the environment by several mechanisms and culminate in complete biodegradation so that no residue remains in the environment. The present book gives thorough information to biodegradable plastic and polymers. This is an excellent book for scientists engineers, students and industrial researchers in the field of bio based materials.

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
Degradable Polymers, Recycling, and Plastics Waste Management - Albertsson 2019-08-30
Based on the International Workshop on Controlled Life-Cycle of Polymeric Materials held in Stockholm, this work examines degradable polymers and the recycling of plastic materials. It highlights recent results on recycling and waste management, including topics such as renewable resources, degradation, processing and products, and environmental issues.

Plastic Waste and Recycling - Trevor M. Letcher 2020-03-12

Plastic Waste and Recycling: Environmental Impact, Societal Issues, Prevention, and Solutions begins with an introduction to the different types of plastic materials, their uses, and the concepts of reduce, reuse and recycle before examining plastic types, chemistry and degradation patterns that are organized by non-degradable plastic, degradable and biodegradable plastics, biopolymers and bioplastics. Other sections cover current challenges relating to plastic waste, explain the sources of waste and their routes into the environment, and provide systematic coverage of plastic waste treatment methods, including mechanical processing, monomerization, blast furnace feedstocks, gasification, thermal recycling, and conversion to fuel. This is an essential guide for anyone involved in plastic waste or recycling, including researchers and advanced students across plastics engineering, polymer science, polymer chemistry, environmental science, and sustainable materials.

Degradation of Plastics - Inamuddin 2021-05-20

The degradation of plastics is most important for the removal and recycling of plastic wastes. The book presents a comprehensive overview of the field. Topics covered include plastic degradation methods, mechanistic actions, biodegradation, involvement of enzymes, photocatalytic degradation and the use of cyanobacteria. Also covered are the market of degradable plastics and the environmental implications. Keywords: Degradable Plastics, Bioplastics, Biodegradable Plastics, Enzymes, Cyanobacteria, Photocatalytic Degradation, Wastewater Treatment, Degradable Plastic Market, Polyethylene, Polypropylene, Polystyrene, Polyvinyl Chloride, Polyurethane, and Polyethylene Terephthalate.

Plastics and the Environment - Anthony L. Andrady 2003-02-20

Plastics offer a variety of environmental benefits. However, their production, applications, and disposal present many environmental concerns. *Plastics and the Environment* provides state-of-the-art technical and research information on the complex relationship between the plastic and polymer industry and the environment, focusing on the sustainability, environmental impact, and cost—benefit tradeoffs associated with different technologies. Bringing together the field's leading researchers, Anthony Andrady's innovative collection not only covers how plastics affect the environment, but also how environmental factors affect plastics. The relative benefits of recycling, resource recovery, and energy recovery are also discussed in detail. The first of the book's four sections represents a basic introduction to the key subject matter of plastics and the environment; the second explores several pertinent applications of plastics with environmental implications—packaging, paints and coatings, textiles, and agricultural film use. The third section discusses the behavior of plastics in some of the environments in which they are typically used, such as the outdoors, in biotic environments, or in fires. The final section consists of chapters on recycling and thermal treatment of plastics waste. Chapters include: Commodity Polymers Plastics in Transportation Biodegradation of Common Polymers Thermal Treatment of Polymer Waste Incineration of Plastics The contributors also focus on the effectiveness of recent technologies in mitigating environmental impacts, particularly those for managing plastics in the solid waste stream. Plastic and design engineers, polymer chemists, material scientists, and ecologists will find *Plastics and the Environment* to be a vital resource to this critical industry.

Packaging and the Environment - Susan Selke 2022-02-27

The leading book on packaging and the environment—now expanded and updated This is a

detailed examination and objective analysis of all aspects of environmental problems related to packaging: resource depletion, pollution, solid waste management, recycling, degradability, package design considerations, and legislation. The author is a leading authority on the subject. The presentation is well documented and non-partisan. This new edition is expanded and completely updated.

Plastics Waste Management - Muralisrinivasan Natamai Subramanian 2019-09-02

The book provides clear explanations for newcomers to the subject as well as contemporary details and theory for the experienced user in plastics waste management. It is seldom that a day goes by without another story or photo regarding the problem of plastics waste in the oceans or landfills. While important efforts are being made to clear up the waste, this book looks at the underlying causes and focuses on plastics waste management. Plastics manufacturers have been slow to recognize their environmental impact compared with more directly polluting industries. However, the environmental pressures concerning plastics have forced the industry to examine their own recycling operations and implement plastics waste management. *Plastics Waste Management* realizes two ideals: That all plastics should be able to persist for as long as plastics are required, and that all plastics are recycled in a uniform manner regardless of the length of time for which it persists. The book examines plastics waste management and systems for the environment, as well the management approaches and techniques which are appropriate for managing the environment. It serves as an excellent and thoughtful plastics waste management handbook. This groundbreaking book: Identifies deficiencies in plastics waste management Extrapolates from experiences to draw some conclusions about plastics waste for persistence Describes methods how the waste related processing techniques should be used in recycling Shows how the consumer and industry can assess the performance of plastics waste management Explains waste utilization by recycling techniques as well as waste reduction Life cycle assessment as an important technique for recycling of persistent plastics waste.

Plastics in the Aquatic Environment - Part I - Friederike Stock 2021-10-29

This book offers a comprehensive review of how plastic pollution is affecting fresh and marine waters, and what the current challenges in plastic waste assessment and management in the aquatic environment are. Plastic waste comprises particles with heterogeneous physicochemical properties such as large size-range, different shapes and polymer types with various additives determining their environmental fate and risk. This complexity raises several open research questions which are explored in this book. Examples are the plastic uptake by aquatic organisms, degradation processes as well as sources and sinks in the environment. Readers will discover real case studies of plastic pollution detection and management in different parts of the world, including Asia, America and Europe, which provide an integrated overview of the global scope of this issue. This book and the companion volume *Plastics in the Aquatic Environment - Part II: Stakeholders' Role Against Pollution* are valuable resources to students, researchers, policymakers and environmental managers interested in plastic pollution and working towards its reduction.

H.R. 5000--recyclable Materials - United States. Congress. House. Committee on Science, Space, and Technology. Subcommittee on Natural Resources, Agriculture Research, and Environment 1988

Degradable Polymers - G. Scott 2012-12-06

Few scientific developments in recent years have captured the popular imagination like the subject of 'biodegradable' plastics. The reasons for this are complex and lie deep in the human subconscious. Discarded plastics are an intrusion on the sea shore and in the countryside. The fact that nature's litter abounds in the sea and on land is acceptable because it is biodegradable - even though it may take many years to be bioassimilated into the ecosystem. Plastics litter is not seen to be biodegradable and is aesthetically unacceptable because it does not blend into the natural environment. To the environmentally aware but often scientifically naive, biodegradation

is seen to be the ecologically acceptable solution to the problem of plastic packaging waste and litter and some packaging manufacturers have exploited the 'green' consumer with exaggerated claims to 'environmentally friendly' biodegradable packaging materials. The principles underlying environmental degradation are not understood even by some manufacturers of 'biodegradable' materials and the claims made for them have been categorized as 'deceptive' by USA legislative authorities. This has set back the acceptance of plastics with controlled biodegradability as part of the overall waste and litter control strategy. At the opposite end of the commercial spectrum, the polymer manufacturing industries, through their trade associations, have been at pains to discount the role of degradable materials in waste and litter management. This negative campaign has concentrated on the supposed incompatibility of degradable plastics with aspects of waste management strategy, notably materials recycling.

Plastics Equipment Survey - TSS Consultants 1989

Biodegradable Polymers in the Circular Plastics Economy - Michiel Dusselier 2022-05-06
Biodegradable Polymers in the Circular Plastics Economy A comprehensive overview of the burgeoning field of biodegradable plastics As the lasting impact of humanity's reliance on plastics comes into focus, scholars have begun to seek out solutions to plastic litter. In Biodegradable Polymers in the Circular Plastics Economy, an accomplished team of researchers delivers a focused guide (1) to understand plastic degradation and its role in waste hierarchy besides recycling, and (2) to create and use biodegradable plastics where appropriate. Created preferably from renewable resources, these eco-friendly polymers provide an opportunity to create sustainable and lasting solutions to the growing plastic-driven pollution problem. The broad approach to this handbook allows the authors to cover all aspects of these emerging materials, ranging from the problems present in the current plastics cycle, to the differences in type, production, and chemistry available within these systems, to end-of-life via recycling or degradation, and to life-cycle assessments. It also delves into potential commercial and policy issues to be addressed to successfully deploy this technology. Readers will also find: A thorough introduction to biodegradable polymers, focusing not only on the scientific aspects, but also addressing the larger political, commercial, and consumer concerns Mechanisms of biodegradation and the environmental impact of persistent polymers An in-depth discussion of degradable/hydrolyzable polyesters, polysaccharides, lignin-based polymers, and vitrimers Management of plastic waste and life cycle assessment of bio-based plastics Biodegradable Polymers in the Circular Plastics Economy is the perfect overview of this complicated but essential research field and will appeal to polymer chemists, environmental chemists, chemical engineers, and bioengineers in academia and industry. The book is intended as a step towards a circular plastics economy that relies heavily on degradable plastics to sustain it.

Biodegradable Polymers and Plastics - Italy) World Conference on Biodegradable Polymers & Plastics (7th : 2002 : Tirrenia 2003-10-31

Synthetic and semi-synthetic polymeric materials were originally developed for their durability and resistance to allforms of degradation including biodegradation. Special performance characteristics are achieved in items derived therefrom through the control and maintenance of their molocular weight and functionality during the processing and under service conditions. Polymeric materials were and are currently widely accepted because of their ease of processability and amenability to provide a large variety of cost effective items that help enhancing the comfort and quality of life in the modern industrial society.

Polymers and the Environment - Gerald Scott 1999

This book reviews the and industrial applications of properties polymers and discusses their environmental benefits compared with traditional materials. It also addresses the issues of polymer durability, recycling processes to aid waste minimization, and biodegradable polymers. This book introduces the non-specialist to the benefits and limitations of polymeric materials from an environmental viewpoint.

Plastic Waste and Recycling - Trevor M. Letcher 2020-03-10

Plastic Waste and Recycling: Environmental Impact, Societal Issues, Prevention, and Solutions begins with an introduction to the different types of plastic materials, their uses, and the concepts of reduce, reuse and recycle before examining plastic types, chemistry and degradation patterns that are organized by non-degradable plastic, degradable and biodegradable plastics, biopolymers and bioplastics. Other sections cover current challenges relating to plastic waste, explain the sources of waste and their routes into the environment, and provide systematic coverage of plastic waste treatment methods, including mechanical processing, monomerization, blast furnace feedstocks, gasification, thermal recycling, and conversion to fuel. This is an essential guide for anyone involved in plastic waste or recycling, including researchers and advanced students across plastics engineering, polymer science, polymer chemistry, environmental science, and sustainable materials. Presents actionable solutions for reducing plastic waste, with a focus on the concepts of collection, re-use, recycling and replacement Considers major societal and environmental issues, providing the reader with a broader understanding and supporting effective implementation Includes detailed case studies from across the globe, offering unique insights into different solutions and approaches

Handbook of Plastic Films - Elsayed M. Abdel-Bary 2003

Plastic films are high-performance materials which play an essential part in modern life. The plastics films industry uses state-of-the-art manufacturing processes and is continuously seeking out new technologies to improve its performance. The understanding of the nature of plastic films, their production techniques, applications and their characterisation is essential for producing new types of plastic films. This handbook has been written to discuss the production and main uses of plastic films. Plastic films are high-performance materials which play an essential part in modern life. Plastic films are mostly used in packaging applications but as will be seen from this book they are also used in the agricultural, medical and engineering fields. The plastics films industry uses state-of-the-art manufacturing processes and is continuously seeking out new technologies to improve its performance. The understanding of the nature of plastic films, their production techniques, applications and their characterisation is essential for producing new types of plastic films. This handbook has been written to discuss the production and main uses of plastic films.

Biodegradable Plastics and Polymers - Y. Doi 2013-10-22

In the past 25 years, plastic products have gained universal use not only in food, clothing and shelter, but also in the transportation, construction, medical and leisure industries. Whereas previously synthetic plastics were developed as durable substitute products, increasing concern for the global environment and solid waste management has resulted in an urgent demand for biodegradable plastics. The main topics of the Third International Scientific Workshop were as follows: 1. Biodegradation of polymers and plastics 2. Environmental degradation of plastics 3. Synthesis and properties of new biodegradable plastic materials 4. Biodegradation and morphologies of polymer blends 5. Development of biodegradation test methods 6. Governmental policy, regulation and standards.

Plastics and Their Environmental Impacts - Henry Koi 2005

Plastics - Nancy Wolf 1991

Examines the use of plastic in the American economy, and discusses package design, disposal of waste plastics, and current controversies concerning recyclability and nondegradability

Feedstock Recycling of Plastic Wastes - Jose Aguado 2007-10-31

The use of plastic materials has seen a massive increase in recent years, and generation of plastic wastes has grown proportionately. Recycling of these wastes to reduce landfill disposal is problematic due to the wide variation in properties and chemical composition among the different types of plastics. Feedstock recycling is one of the alternatives available for consideration, and Feedstock Recycling of Plastic Wastes looks at the conversion of plastic

wastes into valuable chemicals useful as fuels or raw materials. Looking at both scientific and technical aspects of the recycling developments, this book describes the alternatives available. Areas include chemical depolymerization, thermal processes, oxidation and hydrogenation. Besides conventional treatments, new technological approaches for the degradation of plastics, such as conversion under supercritical conditions and coprocessing with coal are discussed. This book is essential reading for those involved in plastic recycling, whether from an academic or industrial perspective. Consultants and government agencies will also find it immensely useful.

Biodegradability of Conventional Plastics - Anjana Sarkar 2022-09-30

Biodegradability of Conventional Plastics: Opportunities, Challenges, and Misconceptions brings together innovative research on the biodegradability of conventional plastics, providing an extensive overview of approaches and strategies that may be implemented, while also highlighting other methods for alleviating the eventual environmental impact of plastics. The book begins by providing a lifecycle assessment of plastics, the environmental impact of plastic waste, and the factors that affect the biodegradability of plastics. The different categories and terminologies surrounding bio-based plastics and biodegradable plastics are then defined and explained in detail, as are the issues surrounding bioplastics. Other sections discuss biodegradability, approaches for enhanced biodegradability of various major types of plastics, including polyolefins, polyethylene terephthalate (PET), polystyrene, poly(vinyl chloride), automotive plastics and composites, and agricultural plastic waste. The final part of the book focuses on further techniques and emerging areas, including the utilization of chemical additives, nanomaterials, the role of microbes in terms of microbial degradation and microbial attaching, revalorization of plastic waste through industrial biotechnology, and future opportunities and challenges. Explains the fundamentals of plastic waste, lifecycle assessment and factors that influence the biodegradability of plastics Provides novel techniques for improved biodegradability, exploring areas such as pre-treatment, chemical additives, nanomaterials and microbial degradation Addresses current challenges and limitations in relation to bio-based and biodegradable plastics, microplastics and nanoplastics from bioplastics and plastic waste

Degradable Polymers, Recycling, and Plastics Waste Management - Albertsson 1995-07-07

Based on the International Workshop on Controlled Life-Cycle of Polymeric Materials held in Stockholm, this work examines degradable polymers and the recycling of plastic materials. It highlights recent results on recycling and waste management, including topics such as renewable resources, degradation, processing and products, and environmental issues.

Life Cycle Assessment and Environmental Impact of Polymeric Products - T. J. O'Neill 2003

This review describes the process of life cycle analysis in some detail. It describes the different organisations involved in researching and applying these techniques and the database resources being used to generate comparative reports. The overview explains the factors to be considered, the terminology, the organisations involved in developing these techniques and the legislation which is driving the whole process forward. The ISO standards relating to environmental management are also discussed briefly in the document. Design for the environment is covered in the report. This review is accompanied by summaries of selected papers on life cycle analysis and environmental impact from the Rapra Polymer Library database.

Plastics--waste Management Alternatives - 1992

Management of Marine Plastic Debris - Michael Niaounakis 2017-07-04

Management of Marine Plastic Debris gives a thorough and detailed presentation of the global problem of marine plastics debris, covering every aspect of its management from tracking, collecting, treating and commercial exploitation for handling this anthropogenic waste. The book is a unique, essential source of information on current and future technologies aimed at reducing the impact of plastics waste in the oceans. This is a practical book designed to enable engineers to tackle this problem—both in stopping plastics from getting into the ocean in the first place, as

well as providing viable options for the reuse and recycling of plastics debris once it has been recovered. The book is essential reading not only for materials scientists and engineers, but also other scientists involved in this area seeking to know more about the impact of marine plastics debris on the environment, the mechanisms by which plastics degrade in water and potential solutions. While much research has been undertaken into the different approaches to the increasing problem of plastics marine debris, this is the first book to present, evaluate and compare all of the available techniques and practices, and then make suggestions for future developments. The book also includes a detailed discussion of the regulatory environment, including international conventions and standards and national policies. Reviews all available processes and techniques for recovering, cleaning and recycling marine plastic debris Presents and evaluates viable options for engineers to tackle this growing problem, including the use of alternative polymers Investigates a wide range of possible applications of marine plastics debris and opportunities for businesses to make a positive environmental impact Includes a detailed discussion of the regulatory environment, including international conventions and standards and national policies

Recycled Materials for Construction Applications - Luís Eduardo Pimentel Real 2022-10-27

This book presents the state of the art on the topic of recycling of plastic building materials, comprising a synthetic market analysis, and presenting the latest developments in plastic recycling technologies. The book also makes recommendations to optimize the success of recycling and encourage the circular economy, while acknowledging the environmental and sustainability implications of plastic recycling for building construction. The distinctive features of this book are the variety of topics covered on sustainable plastic recycling, the discussion of advances in plastic recycling technology, detailed illustrations, and summarized descriptions of separation processes. This book is a guide for both technical and non-technical readers, and for anyone involved in plastic waste or recycling, including researchers and students in plastics engineering, polymer science, polymer chemistry, environmental science, and sustainable materials.

On the Conversion of Plastic Wastes into Oil - Rasib Afridi 2019-02-14

Seminar paper from the year 2018 in the subject Business economics - Economic Policy, grade: A, University of Dhaka (Institute of Business Administration), course: Entrepreneurship, language: English, abstract: This work analyzes an alternative to traditional recycling. It focuses on the conversion of plastics, a non-biodegradable material. There is a huge amount of plastic wastes lying around and no systematic process present in order to recycle them. The primary reason why the rising pile of plastic is concerning for Bangladesh is its 'Non-Biodegradability'. When being thrown on land, it destroys the fertility of the soil. Similarly, for the same reason, it is harming the sea, river and oceans' lives when thrown on it. Through this business plan, I want to bring insight to an alternative energy production mean, that is the plastic waste to crude oil conversion. With superior efficiency level, industrial waste will also reduce by a huge extent as plastic waste constitutes most of these wastes. Plastic is a non-biodegradable product, which means it cannot be dumped into the ground. Plastic recycling has now become a very key element to protect the nature. Whether in Asia or in Europe, a number of countries are involved in plastic waste recycling. However, that is not quite observed in our country. As a result of which, the pile of plastic is perpetually rising. With superior efficiency level, industrial waste will also be reduced by a huge extent as plastic waste constitutes most of these wastes. Plastic pollution is an ever-concerning issue. We should not only look for steps to reduce it, but also to re-use the ones that are being wasted. Through this social business plan, the primary goal is to help reduce industrial wastes by a large extent. The need for crude oil is massive for most industries. If plastic wastes generated in those industries and factories were in fact converted into oil, that would reduce the operational expenses by a sharp margin and, more importantly, will reduce a big chunk of their waste.

Degradable Polymers - G. Scott 2012-09-19

Few scientific developments in recent years have captured the popular imagination like the subject of 'biodegradable' plastics. The reasons for this are complex and lie deep in the human subconscious. Discarded plastics are an intrusion on the sea shore and in the countryside. The fact that nature's litter abounds in the sea and on land is acceptable because it is biodegradable - even though it may take many years to be bioassimilated into the ecosystem. Plastics litter is not seen to be biodegradable and is aesthetically unacceptable because it does not blend into the natural environment. To the environmentally aware but often scientifically naive, biodegradation is seen to be the ecologically acceptable solution to the problem of plastic packaging waste and litter and some packaging manufacturers have exploited the 'green' consumer with exaggerated claims to 'environmentally friendly' biodegradable packaging materials. The principles underlying environmental degradation are not understood even by some manufacturers of 'biodegradable' materials and the claims made for them have been categorized as 'deceptive' by USA legislative authorities. This has set back the acceptance of plastics with controlled biodegradability as part of the overall waste and litter control strategy. At the opposite end of the commercial spectrum, the polymer manufacturing industries, through their trade associations, have been at pains to discount the role of degradable materials in waste and litter management. This negative campaign has concentrated on the supposed incompatibility of degradable plastics with aspects of waste management strategy, notably materials recycling.

Plastics to Energy - Sultan Al-Salem 2018-10

While the ideal end-of-life route for plastic materials is in recycling, this is not always possible, due to contamination, difficulty in separating different plastic types, and other factors. Conversion of plastics and polymers to energy is an alternative route that represents an alternative for disposing of non-recyclable plastics in landfill. This book covers the main processes and pathways of conversion of polymeric materials to energy, fuel and chemicals. A particular focus is placed on industrial case studies, and academic reviews of the latest research and development in this area. The book has a practical emphasis to enable plastics practitioners involved in end-of-life aspects to employ these processes. The book will also examine life cycle and cost analysis of different plastic waste management processes, exploring the potential of various techniques in modelling, optimization, and simulation of waste management options. The book covers the important trends in the science and technology of polymer recovery, such as thermo-chemical treatment of plastics, the impact of environmental degradation on mechanical recycling, incineration and thermal unit design, and the new options in biodegradable plastics. The book also introduces product development opportunities from waste materials. Introduces new pathways for end-of-life treatment of plastics and polymers, including conversion to energy, fuel and other chemicals Compares different options to assist materials scientists, engineers, and waste management practitioners to choose the most effective, sustainable option Covers the latest trends in the science and technology of polymer energy recovery

Principles of Polymer Systems - Ferdinand Rodriguez 2014-12-09

Maintaining a balance between depth and breadth, the Sixth Edition of Principles of Polymer Systems continues to present an integrated approach to polymer science and engineering. A classic text in the field, the new edition offers a comprehensive exploration of polymers at a level geared toward upper-level undergraduates and beginning graduate stu

Biopolymers: Reuse, Recycling, and Disposal - Michael Niaounakis 2013-06-20

Biopolymers Reuse, Recycling and Disposal is the first book covering all aspects of biopolymer waste management and post-usage scenarios, embracing existing technologies, applications, and the behavior of biopolymers in various waste streams. The book investigates the benefits and weaknesses, social, economic and environmental impacts, and regulatory aspects of each

technology. It covers different types of recycling and degradation, as well as life cycle analysis, all supported by case studies, literature references, and detailed information about global patents. Patents in particular—comprising 80% of published technical literature in this emerging field, widely scattered, and often available in Japanese only—are a key source of information. Dr. Niaounakis draws on disciplines such as polymer science, management, biology and microbiology, organic chemistry, environmental chemistry, and patent law to produce a reference guide for engineers, scientists and other professionals involved in the development and production of biopolymers, waste management, and recycling. This information is also valuable for regulators, patent attorneys and academics working in this field. Explores techniques and technologies involved in managing biopolymers in the waste stream, including recycling and upcycling Provides waste management and recycling professionals the knowledge they need to plan for the exponential growth in biopolymer waste Helps engineers and product designers fully consider the end-of-life aspects of their environmentally sustainable 'green' products and solutions

Final Report of the Degradable Plastics Task Force - 1991

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

Plastic Wastes - T. Randall Curlee 1991-12-31

The information in the book is from the following documents: Methods to manage and control plastic wastes--report to Congress, prepared by the US Environmental Protection Agency, February 1990, and Plastics recycling in the industrial sector; an assessment of the opportunities and constraints, prepared by T. Randall Curlee and Sujit Das for the EPA, November 1989. The detailed table of contents substitutes for an index. Annotation copyrighted by Book News, Inc., Portland, OR

Compostable Polymer Materials - Ewa Rudnik 2016-03

The book deals with an environmentally important family of polymers designed to be disposed of in industrial and municipal compost facilities after their useful life. These compostable plastics undergo degradation and leave no visible, distinguishable or toxic residue. Environmental concerns and legislative measures taken in different regions of the world make composting an increasingly attractive route for the disposal of redundant polymers. This book provides up-to-date results and information about compostable polymer materials in a coherent and comprehensive manner. It covers the entire spectrum of preparation, properties, degradation, and environmental issues. The emphasis is on recent studies concerning compostability and ecotoxicological assessment of polymer materials--important issues from the ecological point of view. Moreover, the thermal behavior of compostable polymers is described. Their price evolution over the past decade, an estimation of the market and future perspectives are presented. Focus on the composting process, compostability standards, compost quality and composting studies Coherent and uniformly presented information about methods of preparation; properties, processing and applications Up-to-date information on ecotoxicity testing and studies of polymers Overview of thermal stability and thermal degradation process of compostable polymer materials Presents future perspectives of compostable polymers, including evolution of price during last decade Information about waste management evolution in Europe, USA and Asia (China) with emphasis on composting during the last decade