

Bioenergy And Biofuel From Biowastes And Biomass

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Waste Biorefinery Springer Science & Business Media
 Current Developments in Biotechnology and Bioengineering: Solid Waste Management provides extensive coverage of new developments, state-of-the-art technologies, and potential future trends, reviewing the latest innovative developments in environmental biotechnology and bioengineering as they pertain to solid wastes, also revealing current research priority areas in solid waste treatment and management. The fate of solid wastes can be divided into three major areas, recycling, energy recovery, and safe disposal. From this foundation, the book covers such key areas as biotechnological production of value added products from solid waste, bioenergy production from various organic solid wastes, and biotechnological solutions for safe, environmentally-friendly treatment and disposal. The state of the art situation, potential advantages, and limitations are discussed, along with proposed strategies on how to overcome limitations. Reviews available bioprocesses for the production of bioproducts from solid waste

Outlines processes for the production of energy from solid waste using biochemical conversion processes Lists various environmentally friendly treatments of solid waste and its safe disposal
Biomass as Energy Source BoD - Books on Demand
 Interest in anaerobic digestion (AD), the process of energy production through the production of biogas, has increased rapidly in recent years. Agricultural and other organic waste are important substrates that can be treated by AD. This book is one of the first to provide a broad introduction to anaerobic digestion and its potential to turn agricultural crops or crop residues, animal and other organic waste, into biomethane. The substrates used can include any non-woody materials, including grass and maize silage, seaweeds, municipal and industrial wastes. These are all systematically reviewed in terms of their suitability from a biological, technical and economic perspective. In the past the technical competence and high capital investment required for industrial-scale anaerobic digesters has limited their uptake, but the authors show that recent advances have made smaller-scale systems more viable through a greater understanding of optimising bacterial metabolism and productivity. Broader issues such as life cycle assessment and energy policies to promote AD are also discussed.

Handbook of Algal Biofuels Springer Science & Business Media

This book is a printed edition of the Special Issue "Bioconversion Processes" that was published in *Fermentation*

Frontiers in Bioenergy and Biofuels BoD - Books on Demand

Biofuel is a renewable energy source produced from natural materials. The benefits of biofuels over traditional petroleum fuels include greater energy security, reduced environmental impact, foreign exchange savings, and socioeconomic issues related to the rural sector. The most common biofuels are produced from classic food crops that require high-quality agricultural land for growth. However, bioethanol can be produced from plentiful, domestic, cellulosic biomass resources such as herbaceous and woody plants, agricultural and forestry residues, and a large portion of municipal and industrial solid waste streams. There is also a growing interest in the use of vegetable oils for making biodiesel. "Biofuels: Securing the Planet's Future Energy Needs" discusses the production of transportation fuels from biomass (such as wood, straw and even household waste) by Fischer-Tropsch synthesis. The book is an important text for students and researchers in energy engineering, as well as professional fuel engineers.

Biofuels CRC Press

Valorization of biomass focuses on the transformation of biomass molecules into substitutes for petroleum-based chemicals that can be reused. Valorizing Biomass and Biowaste discusses the chemistry and composition of alternative biomass sources. Later chapters will introduce new markets and discuss efficient, green methods of process intensification and catalysis in order to increase conversion of biomass/biowastes.

Biomass, Biofuels, Biochemicals BoD – Books on Demand

Systems analysis for sustainability is an emerging discipline where technologies, processes or policies are evaluated comprehensively for sustainability. Trifold sustainability metrics such as technical feasibility, economic viability and environmental impacts are commonly used to assess sustainability. In addition to these metrics, it is important to consider resource sustainability, policies and social aspects for evaluating the sustainability of any proposed alternative. Green-Economy: Systems Analysis for Sustainability provides a theoretical background to perform such analyses and detailed case studies. The first part of this book introduces methods and tools to perform technical feasibility analysis, economic viability analysis, environmental impacts assessment, environmental risk assessment, resource sustainability assessment, policy and social aspects of technologies, general logic-based sustainability assessment for green products and introduces resilience thinking. The second part of the book focuses on case studies with an emphasis on solar energy, biofuels and bioproducts from across the globe. Covers sustainability analysis for bioeconomy Provides theoretical background for conducting sustainability analysis Includes case studies from around the world that use these methods Examines techno-economic analysis, life cycle assessment, resource assessment, environmental risk analysis, policy and social aspects of technologies

Bioconversion Processes CRC Press

Production and utilization of sustainable energy toward maintaining a clean environment is a major challenge. At the same time, the continued depletion of fossil fuels and the global dependency on non-renewable fuels is a chief concern. Moreover, the long-term economic and environmental issues associated with the high utilization of fossil fuel, such as global warming, are also important, particularly in the context of the predicted increase in the global population to around 5 billion by 2050. In recent years, researchers have been investigating alternative, renewable fuels to replace fossil fuels. Of the various options, biofuels are especially attractive due to their low production costs and the fact that they are pollution free. Also known as transportation fuels, their energy is derived from biological resources or through the biological processes. Biofuels such as biohydrogen, biomethane, biogas, ethanol and butanol offer a number of advantages and can be economically produced from cellulosic biomass. As such, they can play a vital role in sustainably meeting future energy demands. Biofuels have the potential to become a global primary energy source, offering significant reductions in greenhouse gas emissions as well as opportunities to increase economic and social development in rural communities and reduce the problems associated with waste disposal. However, low yields and lack of process technology are some of the aspects that need to be addressed. This book offers an overview of existing biofuels and the technologies to solve the problems associated with their practical implementation. Evaluating the biofuel options and discussing the opportunities and risks in relation to resources, technologies, practices, markets and policy, it provides insights into the development of economically viable bioenergy industries.

Springer Nature

Frontiers in Bioenergy and Biofuels presents an authoritative and comprehensive overview of the possibilities for production and use of bioenergy, biofuels, and coproducts. Issues related to environment, food, and energy present serious challenges to the success and stability of nations. The challenge to provide energy to a rapidly increasing global population has made it imperative to find new technological routes to increase production of energy while also considering the biosphere's ability to regenerate resources. The bioenergy and biofuels are resources that may provide solutions to these critical challenges. Divided into 25 discreet parts, the book covers topics on characterization, production, and uses of bioenergy, biofuels, and coproducts. Frontiers in Bioenergy and Biofuels provides an insight into future developments in each field and extensive bibliography. It will be an essential resource for researchers and academic and industry professionals in the energy field.

Biotechnology for Waste Biomass Utilization CRC Press

Biofuel and bioenergy produced from biowastes and biomass is a clean energy source which can

be produced renewably. The 21 chapters of this book provide state-of-the-art reviews, current research, and technology developments with respect to 1st, 2nd, and 3rd generation biofuels and bioenergy. The book focuses on the biological/ biochemical pathway, as this option has been reported to be the most cost-effective method for biofuel/bioenergy production. The opening chapter covers the overview of the current status of biofuel and bioenergy production. The rest of the chapters are grouped into seven categories; they cover biomethane production, microbial fuel cells, feedstock production, preprocessing, biomass pretreatment, enzyme hydrolysis, and syngas fermentation. Algal processes for biofuel production, biobutanol production, bioreactor systems, and value-added processing of biofuel residues are included. This book addresses life cycle analyses (LCA) of 1st and 2nd generation biofuels (from corn, soybean, jatropha, and cellulosic biomass) and the emerging applications of nanotechnology in biofuel/bioenergy production. The book is organized in such a way that each preceding chapter builds a foundation for the following one. At the end of each chapter, current research trends and further research needs are outlined. This is one of the first books in this emerging field of biofuel/bioenergy that provides in-depth technical information on the broad topics of biofuel and bioenergy with extensive illustrations, case studies, summary tables, and up-to-date references. This book will be valuable to researchers, instructors, senior undergraduate and graduate students, decision-makers, professionals, and others interested in the field of biofuel/bioenergy.

Biomass, Biofuels, Biochemicals BoD – Books on Demand

Biodiesel Production: Technologies, Challenges, and Future Prospects provides in-depth information on fundamentals, approaches, technologies, source materials and associated socio-economic and political impacts of biodiesel production.

Current Developments in Biotechnology and Bioengineering Royal Society of Chemistry

This book highlights the efforts made by distinguished scientific researchers world-wide to meet two key challenges: i) the limited reserves of polluting fossil fuels, and ii) the ever-increasing amounts of waste being generated. These case studies have brought to the foreground certain innovative biological solutions to real-life problems we now face on a global scale: environmental pollution and its role in deteriorating human health. The book also highlights major advances in microbial metabolisms, which can be used to produce bioenergy, biopolymers, bioactive molecules, enzymes, etc. Around the world, countries like China, Germany, France, Sweden and the US are now implementing major national programs for the production of biofuels. The book provides information on how to meet the chief technical challenges – identifying an industrially robust microbe and cheap raw material as feed. Of the various possibilities for generating bioenergy, the most attractive is the microbial production of biohydrogen, which has recently gained significant recognition worldwide, due to its high efficiency and eco-friendly nature. Further, the book highlights factors that can make these bioprocesses more economical, especially the cost of the feed. The anaerobic digestion (AD) process is more advantageous in comparison to aerobic processes for stabilizing biowastes and producing biofuels (hydrogen, biodiesel, 1,3-propanediol, methane, electricity), biopolymers (polyhydroxyalkanoates, cellulose, exopolysaccharides) and bioactive molecules (such as enzymes, volatile fatty acids, sugars, toxins, etc.) for biotechnological and medical applications. Information is provided on how the advent of molecular biological techniques can provide greater insights into novel microbial lineages. Bioinformatic tools and metagenomic techniques have extended the limits to which these biological processes can be exploited to improve human welfare. A new dimension to these scientific works has been added by the emergence of synthetic biology. The Big Question is: How can these Microbial Factories be improved through metabolic engineering and what cost targets need to be met?

Clean Energy and Resources Recovery Academic Press

This book offers the current state of knowledge in the field of biofuels, presented by selected research centers from around the world. Biogas from waste production process and areas of application of biomethane were characterized. Also, possibilities of applications of wastes from fruit bunch of oil palm tree and high biomass/bagasse from sorghum and Bermuda grass for second-generation bioethanol were presented. Processes and mechanisms of biodiesel production, including the review of catalytic transesterification process, and careful analysis of kinetics, including bioreactor system for algae breeding, were widely analyzed. Problem of emissivity of NOx from engines fueled by B20 fuel was characterized. The closing chapters deal with the assessment of the potential of biofuels in Turkey, the components of refinery systems for production of biodegradable plastics from biomass. Also, a chapter concerning the environmental conditions of synthesis gas production as a universal raw material for the production of alternative

fuels was also added.

Transportation Biofuels Elsevier

Waste Biorefinery: Potential and Perspectives offers data-based information on the most cutting-edge processes for the utilisation of biogenic waste to produce biofuels, energy products, and biochemicals – a critical aspect of biorefinery. The book explores recent developments in biochemical and thermo-chemical methods of conversion and the potential generated by different kinds of biomass in more decentralized biorefineries. Additionally, the book discusses the move from 200 years of raw fossil materials to renewable resources and how this shift is accompanied by fundamental changes in industrial manufacturing technologies (from chemistry to biochemistry) and in logistics and manufacturing concepts (from petrochemical refineries to biorefineries). Waste Biorefinery: Potential and Perspectives designs concepts that enable modern biorefineries to utilize all types of biogenic wastes, and to integrate processes that convert byproduct streams to high-value products, achieving higher cost benefits. This book is an essential resource for researchers and students studying biomass, biorefineries, and biofuels/products/processes, as well as chemists, biochemical/chemical engineers, microbiologists, and biotechnologists working in industries and government agencies. Details the most advanced and innovative methods for biomass conversion Covers biochemical and thermo-chemical processes as well as product development Discusses the integration of technologies to produce bio-fuels, energy products, and biochemicals Illustrates specific applications in numerous case studies for reference and teaching purposes

Biomass and Biowaste Elsevier

Advanced Biofuels: Applications, Technologies, and Environmental Sustainability presents recent developments and applications of biofuels in the field of internal combustion engines, with a primary focus on the recent approaches of biodiesel applications, low emission alternative fuels, and environmental sustainability. Editors Dr. Azad and Dr. Rasul, along with their team of expert contributors, combine a collection of extensive experimental investigations on engine performance and emissions and combustion phenomena using different types of oxygenated fuel with in-depth research on fuel applications, an analysis of available technologies and resources, energy efficiency improvement methods, and applications of oxygenated fuel for the sustainable environment. Academics, researchers, engineers and technologists will develop a greater understanding of the relevant concepts and solutions to the global issues related to achieving alternative energy application for future energy security, as well as environmental sustainability in medium and large-scale industries. Fills a gap in the literature on alternative fuel applications with in-depth research and experimental investigations of different approaches, technologies and applications Considers the important issue of sustainability using case studies to deepen understanding Includes energy security within various industries, including aviation and transport

Biomass, Biofuels, Biochemicals Elsevier

This book aims to inform readers about the recent developments in bioenergy and biofuels covering current issues from an interdisciplinary approach. It will also feature coverage of anticipated future trends related to each particular biofuel. Chapters will consist of original research presented by world class experts in their respective fields. A number of interdisciplinary areas will be incorporated such as Energy & Fuels, Biotechnology, Genomics, Economics, Optimization, Chemical Engineering, Mechanical Engineering and Algae Science. Examples will relate to a matrix of biofuel and energy types such as bioethanol, biobutanol, and biomethane.

Bioenergy Production by Anaerobic Digestion Elsevier

This book is dedicated to the reuse of waste and residues from the agricultural sector. Plant residues, as well as animal manure and residues from animal breeding, contain useful elements that can be processed for production of fertilizers, compost for soil recultivation, and biofuels. The emerging energy and resources crisis calls for development of sustainable reuse of waste and residues. This book contains eight chapters divided into four sections. The first section contains the introductory chapter from the editor. The second section is related to the preparation of fertilizers and compost for soil amelioration from agricultural residues and waste water. The third section considers the use of agricultural waste for solid biofuels and biogas. The fourth section discusses sustainability and risk assessment related to the use of agricultural waste and residues.

Biomass, Biofuels, Biochemicals Elsevier

Fast pyrolysis and related catalytic pyrolysis are of increasing interest as pathways to advanced biofuels that closely mimic traditional petroleum products. Research has moved from empirical investigations to more fundamental studies of pyrolysis mechanisms. Theories on the chemical and physical pathways from plant polymers to pyrolysis products have proliferated as a result. This

book brings together the latest developments in pyrolysis science and technology. It examines, reviews and challenges the unresolved and sometimes controversial questions about pyrolysis, helping advance the understanding of this important technology and stimulating discussion on the various competing theories of thermal deconstruction of plant polymers. Beginning with an introduction to the biomass-to-biofuels process via fast pyrolysis and catalytic pyrolysis, chapters address prominent questions such as whether free radicals or concerted reactions dominate deconstruction reactions. Finally, the book concludes with an economic analysis of fast pyrolysis versus catalytic pyrolysis. This book will be of interest to advanced students and researchers interested in the science behind renewable fuel technology, and particularly the thermochemical processing of biomass.

Microbial Factories Elsevier

This book covers topics related to bioenergy production from various biomass sources, including agricultural residues and waste biomass from both domestic and industrial use. It includes useful data, illustrations, and case studies of bioenergy production facilities. The contents of this book will

be of interest to readers looking to scale up production and evaluate the selection and optimization of resources in order to overcome the current limitations of biomass to bioenergy conversions. The book will be of interest to researchers and industry professional alike.

Advanced Biofuels Elsevier

Advances in Enzyme Catalysis and Technologies intends to provide the basic structural and functional descriptions, and classification of enzymes. The scientific information related to the recombinant enzyme modifications, discovery of novel enzymes and development of synthetic enzymes are also presented. The translational aspects of enzyme catalysis and bioprocess technologies are illustrated, by emphasizing the current requirements and future perspectives of industrial biotechnology. Several case studies are included on enzymes for biofuels application, micro algal biorefineries, high-value bioactive molecules production and enzymes for environmental processes, such as enzymatic bioprocessing for functional food development, biocatalytic technologies for the production of functional sweetener, etc. Provides a conceptual understanding of enzyme catalysis, enzyme engineering, discovery of novel enzymes, and

technology perspectives Includes comprehensive information about the inventions and advancement in enzyme system development for biomass processing and functional food developmental aspects Gives an updated reference for education and understanding of enzyme technology

Advances in Biofuels and Bioenergy Springer

Advances in Bioenergy, Volume Six in this ongoing series, highlights new advances in the field, with this new volume presenting interesting chapters written by an international board of authors. New sections in this release include Microalgae wastewater treatment and biomass utilization, Lipid Metabolism and Metabolic Engineering of Eukaryotic Microalgae, Aquaculture, Microalgae Cultivation, Life Cycle Assessment, Integration of algae cultivation with anaerobic digestion, Bioenergy and Bioproducts from Industry Hemp, Integration of algae to anaerobic digestion for biofuel and bioenergy production, and more. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the *Advances in Bioenergy* series

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