



Editors

Christian Kennes | Maria C. Veiga

# Air Pollution Prevention and Control

*Bioreactors  
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# Air Pollution Prevention And Control Bioreactors And Bioenergy

**Zhe Xu**



## **Air Pollution Prevention And Control Bioreactors And Bioenergy:**

**Air Pollution Prevention and Control** Christian Kennes, Maria C. Veiga, 2013-05-13 Over the past two decades the use of microbes to remove pollutants from contaminated air streams has become a widely accepted and efficient alternative to the classical physical and chemical treatment technologies This book focuses on biotechnological alternatives looking at both the optimization of bioreactors and the development of cleaner biofuels It is the first reference work to give a broad overview of bioprocesses for the mitigation of air pollution Essential reading for researchers and students in environmental

engineering biotechnology and applied microbiology and industrial and governmental researchers Biodegradation and Bioconversion of Hydrocarbons Kirsten Heimann, Obulisamy Parthiba Karthikeyan, Subramanian Senthilkannan

Muthu, 2016-11-10 This book details three main topics the screening and characterization of hydrocarbons from air soil and water technologies in the biodegradation of hydrocarbons and the bioconversion of hydrocarbons for biofuel chemicals as well as recent developments in the remediation of hydrocarbons and their environmental benefits The first section focuses on screening methods qualitative and quantitative analysis of hydrocarbons from soil air and water environments speciation of hydrocarbons and natural bioremediation strategies in such environments The second section examines technologies for removing hydrocarbon contaminants from various environments especially advanced technologies for the removal of hydrocarbons and in situ and ex situ remediation strategies and problems as well as concrete case studies The last section covering the bioconversion of hydrocarbons for biofuel chemicals highlights the biochemicals and bioproducts developed from hydrocarbons with a particular focus on biochemical and chemical technologies used to produce biopolymers biofuel precursors and commodity chemicals from hydrocarbons *Comprehensive Biotechnology*, 2019-07-17 Comprehensive Biotechnology Third Edition Six Volume Set unifies in a single source a huge amount of information in this growing field The book covers scientific fundamentals along with engineering considerations and applications in industry agriculture medicine the environment and socio economics including the related government regulatory overviews This new edition builds on the solid basis provided by previous editions incorporating all recent advances in the field since the second edition was published in 2011 Offers researchers a one stop shop for information on the subject of biotechnology Provides in depth treatment of relevant topics from recognized authorities including the contributions of a Nobel laureate Presents the perspective of researchers in different fields such as biochemistry agriculture engineering biomedicine and environmental science

**Advances in Biofuels Production, Optimization and Applications** Mejdi Jeguirim, Antonis A. Zorpas, 2023-09-08 Advances in Biofuels Production Optimization and Applications discusses the optimization of chemical biochemical thermochemical and hydrothermal processes for biofuels With a strong focus on applications the book bridges the gap between technological developments and prospects of commercialization Initial chapters review efficient hydrolysis and biofuel and bio alcohol production before reviewing key processes such as biomass gasification syngas conversion to biofuel

and pyrolysis techniques Several biofuel applications are presented including those within the transport industry as well as domestic and industrial boilers The book then finishes with a review of the circular economy biofuel policies and ethical considerations This will act as a systematic reference on the range of biomass conversion processes and technologies in biofuels production It is an essential read for students researchers and engineers interested in renewable energy biotechnology biofuels production and chemical engineering Provides recent advances in the processes and technologies currently used for biofuel production Addresses the technology transfer of integrated biofuel upgrading and production at large scale Highlights policy and economics of biofuel production biofuel value chains and how to accomplish cost competitive results and sustainable development Examines recent development in engines and boiler technologies for the eco friendly applications of these biofuels in the industry and transport sectors

**Innovative Wastewater Treatment & Resource Recovery Technologies: Impacts on Energy, Economy and Environment** Juan M. Lema, Sonia Suarez Martinez, 2017-06-15 This book introduces the 3R concept applied to wastewater treatment and resource recovery under a double perspective Firstly it deals with innovative technologies leading to Reducing energy requirements space and impacts Reusing water and sludge of sufficient quality and Recovering resources such as energy nutrients metals and chemicals including biopolymers Besides targeting effective C N Re Thinking which implies a substantial flowsheet modification and Re Imagining with completely new conceptions Tools are presented for Modelling Optimising and Selecting the most suitable plant layout for each particular scenario from a holistic technical economic and environmental point of view

**From Biofiltration to Promising Options in Gaseous Fluxes Biotreatment** Gabriela Soreanu, Éric Dumont, 2020-04-03 From Biofiltration to Promising Options in Gaseous Fluxes Biotreatment Recent Developments New Trends Advances and Opportunities provides an overview on the biological tools used for the treatment of the gaseous fluxes with emphasis on traditional and perspective options opening new horizons for research and implementation in practice It is known that air pollution is an emergent global issue and a priority within the international environmental programs Moreover technologies based on biological methods are significantly contributing to the sustainable development concept Thus this book provides tools for solving air pollution issues in a sustainable manner These issues can be solved at different levels e g end of pipe gaseous streams indoor outdoor air closed environments which can be approached by the different biotechniques presented in the book from classical biofiltration techniques part 1 to phytotreatment and microalgae based techniques part 2 Although all options have their particularities that make them special for certain applications a special attention is drawn to the potential of the last one which offers multiple possibilities for biomass valorization Scientists from worldwide with relevant experience in their field have been contributed to the development of this book Presents the main biotechnological aspects applied for gas purification focusing on process understanding limitations and capability in different applications Promotes a sustainable future of the biofiltration process by enhancing their performance together with the simultaneously economic

and environmental impacts Implements new aspects of scientific research and development in the field      Encyclopedia of Renewable Energy, Sustainability and the Environment ,2024-08-09 Encyclopedia of Renewable Energy Sustainability and the Environment Four Volume Set comprehensively covers all renewable energy resources including wind solar hydro biomass geothermal energy and nuclear power to name a few In addition to covering the breadth of renewable energy resources at a fundamental level this encyclopedia delves into the utilization and ideal applications of each resource and assesses them from environmental economic and policy standpoints This book will serve as an ideal introduction to any renewable energy source for students while also allowing them to learn about a topic in more depth and explore related topics all in a single resource Instructors researchers and industry professionals will also benefit from this comprehensive reference Covers all renewable energy technologies in one comprehensive resource Details renewable energies processes from production to utilization in a single encyclopedia Organizes topics into concise consistently formatted chapters perfect for readers who are new to the field Assesses economic challenges faced to implement each type of renewable energy Addresses the challenges of replacing fossil fuels with renewables and covers the environmental impacts of each renewable energy      Bioscience, Colorado ,2011      *BioCycle* ,2005 Journal of composting recycling      **Chemical Abstracts** ,2002

**Biotechniques for Air Pollution Control and Bioenergy** ,2012      *Using Bioreactors to Control Air Pollution* Bob Blaszcak,United States. Environmental Protection Agency,United States. Environmental Protection Agency. Office of Air Quality Planning and Standards,United States. Environmental Protection Agency. Office of Air Quality Planning and Standards. Information Transfer and Program Integration Division,United States. Environmental Protection Agency. Office of Air Quality Planning and Standards. Information Transfer Group,Clean Air Technology Center (U.S.),2003      *Biotechniques for Air Pollution Control & Bioenergy* Luc Malhautier,2013-09-26 The fifth International Conference on Biotechniques for Air Pollution Control and Bioenergy held in the city of N mes France on 11 13 September 2013 aims to overview recent scientific advances and technological discoveries which led to the development of improved operating strategies and novel bioreactors configurations for the removal of volatile pollutants with high efficiencies and reduction of malodorous nuisance With respect to the energy sector sustainable gas treatment concepts have rapidly been developed through for example the conversion of waste gas emissions into cleaner bio fuels which can thus be obtained from cheaper sources than fossil fuels Additional aspects are considered as well among which the production or and recovery of compounds and by products from the waste gas streams The fifth International Conference on Biotechniques for Air pollution Control and Bioenergy provides a good opportunity for a diverse community of specialized researchers PhD students and professionals to share information on recent advances in the use of bioprocesses and bioenergy for solving air pollution problems      **Bioreactors for Microbial Biomass and Energy Conversion** Qiang Liao,Jo-shu Chang,Christiane Herrmann,Ao Xia,2018-04-20 This book discusses recent trends and developments in the microbial conversion process which serves as an important route for biofuel

production with particular attention to bioreactors It combines microbial conversion with multiphase flow and mass transfer providing an alternative perspective for the understanding of microbial biomass and energy production process as well as enhancement strategy This book is relevant to students and researchers who work in the fields of renewable energy engineering and biotechnology Policymakers economists and industry engineers also benefit from this book as it can be used as a resource for the implementation of renewable energy technologies *Biotechniques for Air Pollution Control and Bioenergy* Bioengin Group,2017 *Bioreactors for Waste Gas Treatment* C. Kennes,M.C. Veiga,2013-03-14 Air pollution a major concern at the end of the 20th century still remains a significant problem to be solved today Traditionally industrial waste gases have primarily been treated through physical or chemical methods The search for new efficient and cost effective alternative technologies has led to the development and more recently the improvement of gas phase bioreactors This book is the first single text to provide a complete comprehensive picture of all major biological reactors suitable for solving air pollution problems The text describes the main features and covers the major aspects from microbiological to engineering as well as economic aspects of the different types of bioreactors The book also presents an in depth review of the subject from fundamental bench scale research to industrial field applications related to the operation of full scale systems successfully treating polluted air in Europe and the United States Material dedicated to more conventional non biological technologies has also been included to provide a complete overview of the different alternative treatment processes Audience The different chapters have been written by international experts as a result of a fruitful collaboration between European and American scientists and engineers The resulting text is a high quality valuable reference tool for a variety of readers including graduate and postgraduate students researchers professors engineers and those professionals who are interested in environmental engineering and more specifically in innovative air pollution control technologies **Biotechnology for Odor and Air Pollution Control** Zarook Shareefdeen,2005-01-20 Here is the first book on biotechnological processes for controlling odor and air pollution emanating from industrial and municipal airstreams Authors from academia and industry describe biotechnological methods ranging from those in laboratory stages to pilot evaluation to full scale process implementation In addition to the basic microbiology and engineering the design modeling and control of bioreactors are discussed in detail **Biotechniques for Air Pollution Abatement and Odour Control Policies** A.J. Dragt,J. van Ham,1992-06-26 The increasing concern for odour abatement and more generally for reduction of air pollution has caused a rapid growth in the development of air pollution control techniques several of which are based on biological degradation of the polluting compounds This book presents a state of the art overview of recent developments in biological techniques for air pollution control It describes in detail processes for the prevention of odour nuisances and reduction of odour emissions It also deals with process design and construction of equipment as well as with odour policy measurements at an international level **Biotechniques for Air Pollution Control** Jan Bartacek,Christian Kennes,Piet Lens,2010-05-28 Energy and

feedstock materials for the chemical industry show an increasing demand. With constraints related to availability and use of oil, the energy and chemical industry is subject to considerable changes. The need for the use of cheaper and widely available feedstocks and the development of sustainable and environmentally friendly c      *Control and Optimization of Ecosystems in Bioreactors for Bioenergy Production* Pierre Masci, 2010. Some alternative biofuels produced by microbial ecosystems are presently studied with the aim of limiting the unreasoned resource consumption of energetic resources and greenhouse gases emissions which modify the climate. In this thesis we have considered bioreactors based on oleaginous microalgae and on anaerobic bacterial ecosystems which degrade wastes and produce methane. The aims of these works were to better understand these processes and to improve their performances. First we have developed and studied models of microalgal cultures in photobioreactors in which algal pigments cause strong light attenuation. For anaerobic digestion we have used an existing model. By rigorous mathematical analysis of these models we proposed strategies for optimizing their productivity. Then the study of natural selection between several microbial species in these two ecosystems leads to the protection of the species which wins the competition. And finally we showed how it is possible in each ecosystem to control competition and drive natural selection in order to advantage species which efficient characteristics inducing better performances.

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