

# **Read Book Engineering Bacteria For Bioremediation Intech Free Download Pdf**

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of Polluted Systems Recent Insights in Petroleum Science and  
Engineering Advances in Bioremediation of Wastewater and  
Polluted Soil Introduction to Enhanced Oil Recovery (EOR)  
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Bioremediation: Challenges and Advancements

*Biodegradation* Sep 24 2022 This book contains a collection of different research activities where several technologies have been applied to the optimization of biodegradation processes. The book has three main sections: A) Hydrocarbons biodegradation, B) Biodegradation and anaerobic digestion, and C) Biodegradation and sustainability.

*Biodegradation and Bioremediation of Polluted Systems* Feb 27 2023 This book contains a collection of research works focused on the biodegradation of different types of pollutants, both in water and solids. The book is divided in three major sections: A) Biodegradation of organic pollutants in solids and wastewater, B) Biodegradation of complex pollutants, and C) Novel technologies in biodegradation and bioremediation.

*Blue Biotechnology* Jan 17 2022 With its integral treatment of ecosystem and resource management, this is the only overview of the field to address current thinking and future trends. All contributions have been written with the novice in mind, explaining the basics and highlighting recent developments and achievements. Unmatched in scope, this two-volume reference covers both traditional and well-established areas of marine biotechnology, such as biomass production, alongside such novel ones as biofuels, biological protection of structures and bioinspired materials. In so doing, it ties together information usually only found in widely dispersed sources to assemble a grand unified view of the current state of and prospects for this

multi-faceted discipline. The combination of the breadth of topics and the focus on modern ideas make this introductory book especially suitable for teaching purposes and for guiding newcomers to the many possibilities offered by this booming field.

**Introduction to Enhanced Oil Recovery (EOR) Processes and Bioremediation of Oil-Contaminated Sites** Nov 26 2022

This book offers practical concepts of EOR processes and summarizes the fundamentals of bioremediation of oil-contaminated sites. The first section presents a simplified description of EOR processes to boost the recovery of oil or to displace and produce the significant amounts of oil left behind in the reservoir during or after the course of any primary and secondary recovery process; it highlights the emerging EOR technological trends and the areas that need research and development; while the second section focuses on the use of biotechnology to remediate the inevitable environmental footprint of crude oil production; such is the case of accidental oil spills in marine, river, and land environments. The readers will gain useful and practical insights in these fields.

*Progress in Molecular and Environmental Bioengineering* May 21 2022 This book provides an example of the successful and rapid expansion of bioengineering within the world of the science. It includes a core of studies on bioengineering technology applications so important that their progress is expected to improve both human health and ecosystem. These studies provide an important update on technology and achievements in molecular and cellular engineering as well as in the relatively new field of environmental bioengineering. The book will hopefully attract the interest of not only the bioengineers, researchers or professionals, but also of everyone who appreciates life and environmental sciences.

*Biodegradation* Jul 23 2022 This book contains a collection of different biodegradation research activities where biological processes take place. The book has two main sections: A)

Polymers and Surfactants Biodegradation and B) Biodegradation: Microbial Behaviour.

DNA Microarrays and Gene Expression Jun 09 2021 Massive data acquisition technologies, such as genome sequencing, high-throughput drug screening, and DNA arrays are in the process of revolutionizing biology and medicine. Using the mRNA of a given cell, at a given time, under a given set of conditions, DNA microarrays can provide a snapshot of the level of expression of all the genes in the cell. Such snapshots can be used to study fundamental biological phenomena such as development or evolution, to determine the function of new genes, to infer the role individual genes or groups of genes may play in diseases, and to monitor the effect of drugs and other compounds on gene expression. Originally published in 2002, this inter-disciplinary introduction to DNA arrays will be of value to anyone with an interest in this powerful technology.

**Remediation of Contaminated Environments** Mar 07 2021 Remediation of Contaminated Environments summarises - amongst other things - what happened to the people and environment around Chernobyl (and other nuclear sites) and what measures need to be taken in future in the event of nuclear accidents etc. plus it has a very important and currently topical use in detailing what to do in the event of a terrorist dirty bomb attack on a city. Remediation, including characterization of contaminated sites; safety requirements; remediation planning; effectiveness of individual measures in different environments; social, ethical and economic considerations; application of modern decision aiding technologies Applicable to different categories of contaminated environments and contaminants, comprising areas contaminated by radiation accidents and incidents, nuclear weapon tests, natural radionuclides associated with nuclear fuel cycle, fossil material mining and gas and oil production Associated side effects (environmental and social) and human based remediation measures, comprising perception of

this activity by the population; with particular regard to stakeholders and population involvement in making decisions on environmental safety and remediation of contaminated sites

*Wastewater Treatment Engineering* Aug 12 2021 This book provides useful information about bioremediation, phytoremediation, and mycoremediation of wastewater and some aspects of the chemical wastewater treatment processes, including ion exchange, neutralization, adsorption, and disinfection. Additionally, this book elucidates and illustrates the wastewater treatment plants in terms of plant sizing, plant layout, plant design, and plant location. Cutting-edge topics include wet air oxidation of aqueous wastes, biodegradation of nitroaromatic compounds, biological treatment of sanitary landfill leachate, bacterial strains for the bioremediation of olive mill wastewater, gelation of arabinoxylans from maize wastewater, and modeling wastewater evolution.

*Nano-Bioremediation: Fundamentals and Applications* Feb 03 2021 Nano-Bioremediation: Fundamentals and Applications explores how nano-bioremediation is used to remedy environmental pollutants. The book's chapters focus on the design, fabrication and application of advanced nanomaterials and their integration with biotechnological processes for the monitoring and treatment of pollutants in environmental matrices. It is an important reference source for materials scientists, engineers and environmental scientists who are looking to increase their understanding of bioremediation at the nanoscale. The mitigation of environmental pollution is the biggest challenge to researchers and the scientific community, hence this book provides answers to some important questions. As an advanced hybrid technology, nano-bioremediation refers to the integration of nanomaterials and bioremediation for the remediation of pollutants. The rapid pace of urbanization, massive development of industrial sectors, and modern agricultural practices all cause a controlled or uncontrolled release of

environmentally-related hazardous contaminants that are seriously threatening every key sphere, including the atmosphere, hydrosphere, biosphere, lithosphere, and anthroposphere. Explores the current and potential applications of nano-bioremediation in the remediation of hazardous pollutants Outlines the major properties and classes of nanomaterials that make them efficient bioremediation agents Assesses the major challenges of effectively implementing bioremediation techniques at the nanoscale

### Hazardous Pollutants in Biological Treatment Systems Jan 05

2021 Hazardous pollutants are a growing concern in treatment engineering. In the past, biological treatment was mainly used for the removal of bulk organic matter and the nutrients nitrogen and phosphorous. However, relatively recently the issue of hazardous pollutants, which are present at very low concentrations in wastewaters and waters but are very harmful to both ecosystems and humans, is becoming increasingly important. Today, treatment of hazardous pollutants in the water environment becomes a challenge as the water quality standards become stricter. Hazardous Pollutants in Biological Treatment Systems focuses entirely on hazardous pollutants in biological treatment and gives an elaborate insight into their fate and effects during biological treatment of wastewater and water. Currently, in commercial and industrial products and processes, thousands of chemicals are used that reach water. Many of those chemicals are carcinogens, mutagens, endocrine disruptors and toxicants. Therefore, water containing hazardous pollutants should be treated before discharged to the environment or consumed by humans. This book first addresses the characteristics, occurrence and origin of hazardous organic and inorganic pollutants. Then, it concentrates on the fate and effects of these pollutants in biological wastewater and drinking water treatment units. It also provides details about analysis of hazardous pollutants, experimental methodologies, computational tools used to assist

experiments, evaluation of experimental data and examination of microbial ecology by molecular microbiology and genetic tools. Hazardous Pollutants in Biological Treatment Systems is an essential resource to the researcher or the practitioner who is already involved with hazardous pollutants and biological processes or intending to do so. The text will also be useful for professionals working in the field of water and wastewater treatment.

**Molecular Approaches to the Study of the Ocean** May 09 2021 Marine biological science is now studied at the molecular level and although research scientists depend on information gained using molecular techniques, there is no book explaining the philosophy of this approach. Molecular Approaches to the Study of the Ocean introduces the reasons why molecular technology is such a powerful tool in the study of the oceans, describing the types of techniques that can be used, why they are useful and gives examples of their application. Molecular biological techniques allow phylogenetic relationships to be explored in a manner that no macroscopic method can; although the book deals with organisms near the base of the marine food web, the ideas can be used in studies of macroorganisms as well as those in freshwater environments.

Hydrocarbon Pollution and its Effect on the Environment Aug 24 2022 This book covers hydrocarbon pollution, measurement techniques for hydrocarbons, risk assessment, and environmental impact. This comprehensive book takes a broad view of the subject and integrates a wide variety of approaches. This book attempts to address the needs of graduate and postgraduate students and other professionals or readers interested in food, soil, water, and air pollution. The aim of this book is to explain and clarify important studies, and compare and develop the new and groundbreaking measurement techniques. Written by leading experts in their respective areas, the book is highly recommended to professionals interested in environmental and human health

because it provides specific and comprehensive examples.

Methods for Bioremediation of Water and Wastewater Pollution

Apr 19 2022 This book presents advanced techniques for wastewater treatment and the chapters review the environmental impact of water pollution, the analysis of water quality, and technologies for the preservation of water resources. Also outlined in this volume is the bioremediation of heavy metals, dyes, bisphenols, phthalates, cyanobacteria in contaminated water and wastewater. Another focus of this book is the use of natural remediation techniques such as bacterial biofilms and enzymes.

Environmental Chemistry and Recent Pollution Control

Approaches Mar 31 2023 In recent years, there have been significant advances in the techniques of sampling and analysis, which has allowed the more accurate recording of environmental levels of many substances present in the environment. At the same time, processes for the remediation of contaminated matrices have evolved, through the application and/or combination of biological, physical, and chemical procedures. The purpose of this book is to present new studies aimed at determining levels of environmental pollution in various parts of the world. It also shows new alternatives for the remediation of contaminated matrices.

**Chemical Enhanced Oil Recovery (cEOR)** Dec 16 2021

Commercial application of chemical enhanced oil recovery (cEOR) processes is expected to grow significantly over the next decade. Thus, **Chemical Enhanced Oil Recovery (cEOR): A Practical Overview** offers key knowledge and understanding of cEOR processes using an evidence-based approach intended for a broad audience ranging from field operators, researchers, to reservoir engineers dealing with the development and planning of cEOR field applications. This book is structured into three sections; the first section surveys overall EOR processes. The second section focuses on cEOR processes, while the final section describes the



electrorheology technology. These sections are presented using a practical and realistic approach tailored for readers looking to improve their knowledge and understanding of cEOR processes in a nutshell.

Recent Insights in Petroleum Science and Engineering Jan 29

2023 This book presents new insights into the development of different aspects of petroleum science and engineering. The book contains 19 chapters divided into two main sections: (i)

Exploration and Production and (ii) Environmental Solutions.

There are 11 chapters in the first section, and the focus is on the topics related to exploration and production of oil and gas, such as characterization of petroleum source rocks, drilling technology, characterization of reservoir fluids, and enhanced oil recovery. In the second section, the special emphasis is on waste technologies and environmental cleanup in the downstream sector. The book written by numerous prominent scholars clearly shows the necessity of the multidisciplinary approach to sustainable development in the petroleum industry and stresses the most updated topics such as EOR and environmental cleanup of fossil fuel wastes.

*Nanobiotechnology in Diagnosis, Drug Delivery and Treatment*

May 28 2020 Presents nanobiotechnology in drug delivery and disease management Featuring contributions from noted experts in the field, this book highlights recent advances in the nano-based drug delivery systems. It also covers the diagnosis and role of various nanomaterials in the management of infectious diseases and non-infectious disorders, such as cancers and other malignancies and their role in future medicine.

*Nanobiotechnology in Diagnosis, Drug Delivery and Treatment* starts by introducing how nanotechnology has revolutionized drug delivery, diagnosis, and treatments of diseases. It then focuses on the role of various nanocomposites in diagnosis, drug delivery, and treatment of diseases like cancer, Alzheimer's disease, diabetes, and many others. Next, it discusses the application of a

variety of nanomaterials in the diagnosis and management of gastrointestinal tract disorders. The book explains the concept of nanotheranostics in detail and its role in effective monitoring of drug response, targeted drug delivery, enhanced drug accumulation in the target tissues, sustained as well as triggered release of drugs, and reduction in adverse effects. Other chapters cover aptamer-incorporated nanoparticle systems; magnetic nanoparticles; theranostics and vaccines; toxicological concerns of nanomaterials used in nanomedicine; and more. Provides a concise overview of state-of-the-art nanomaterials and their application like drug delivery in infectious diseases and non-infectious disorders Highlights recent advances in the nano-based drug delivery systems and role of various nanomaterials Introduces nano-based sensors which detect various pathogens Covers the use of nanodevices in diagnostics and theranostics Nanobiotechnology in Diagnosis, Drug Delivery and Treatment is an ideal book for researchers and scientists working in various disciplines such as microbiology, biotechnology, nanotechnology, pharmaceutical biotechnology, pharmacology, pharmaceuticals, and nanomedicine.

Reconsidering the Impact of Climate Change on Global Water Supply, Use, and Management Sep 12 2021 Changes in the planet's climate in recent years have led to significant impacts on natural resources and ecosystems. New strategies must be adopted in order to support the protection and continued development of numerous natural resources. Reconsidering the Impact of Climate Change on Global Water Supply, Use, and Management is a pivotal reference source for the latest scholarly material on the relationship between global climate changes and the planet's water ecosystems. Highlighting relevant environmental, social, and economic issues, this book is ideally designed for academics, researchers, policy makers, students, and practitioners interested in the impacts of climate change on global water resources.

**Environmental Risk Assessment of Soil Contamination** Jun 21 2022 Soil is an irreplaceable resource that sustains life on the planet, challenged by food and energy demands of an increasing population. Therefore, soil contamination constitutes a critical issue to be addressed if we are to secure the life quality of present and future generations. Integrated efforts from researchers and policy makers are required to develop sound risk assessment procedures, remediation strategies and sustainable soil management policies. Environmental Risk Assessment of Soil Contamination provides a wide depiction of current research in soil contamination and risk assessment, encompassing reviews and case studies on soil pollution by heavy metals and organic pollutants. The book introduces several innovative approaches for soil remediation and risk assessment, including advances in phytoremediation and implementation of metabolomics in soil sciences.

**Recent Advances in Microbial Degradation** Jun 29 2020 Microbes play a major role in the degradation of various pollutants. Therefore, microbes find potential application in the area of energy and environmental technology. The book provides in-depth literature on the topics of environmental and industrial importance. It is compiled to explore the application of microbe used in the degradation of aflatoxin, polymers, biomass into fuel, disinfectants, food products, xenobiotic compounds, lipids, steroids, organic pollutants, proteins, oil waste, and wastewater pollutants. This book will be of interest to teachers, researchers, scientists, and capacity builders. Also, the book serves as additional reading material for undergraduate and graduate students of microbiology and environmental sciences. National and international remediation and restoration scientists, policymakers will also find this to be a useful read.

**Microorganisms in the Deterioration and Preservation of Cultural Heritage** Aug 31 2020 This open access book offers a comprehensive overview of the role and potential of

microorganisms in the degradation and preservation of cultural materials (e.g. stone, metals, graphic documents, textiles, paintings, glass, etc.). Microorganisms are a major cause of deterioration in cultural artefacts, both in the case of outdoor monuments and archaeological finds. This book covers the microorganisms involved in biodeterioration and control methods used to reduce their impact on cultural artefacts. Additionally, the reader will learn more about how microorganisms can be used for the preservation and protection of cultural artefacts through bio-based and eco-friendly materials. New avenues for developing methods and materials for the conservation of cultural artefacts are discussed, together with concrete advances in terms of sustainability, effectiveness and toxicity, making the book essential reading for anyone interested in microbiology and the preservation of cultural heritage.

**Environmental Degradation: Causes and Remediation**

**Strategies** Dec 04 2020 The compliance of this book is helpful for academicians, researchers, students, as well as other people seeking the relevant material in current trends of studies on the topic of environmental degradation.

Fungi in Bioremediation Feb 15 2022 An authoritative account of the application of fungi to the treatment of environmental pollution.

Omics Insights in Environmental Bioremediation Jul 11 2021 Environmental pollution emanating from rapid industrialization, population growth, and urbanization has been considered a major problem in recent years that affects biodiversity, ecosystems, and human health by contaminating soil and water. This book brings out a comprehensive collection of information on valuable insights into different cutting-edge omics technologies, such as metagenomics, metatranscriptomics, metaproteomics, and metabolomics, along with advanced next-generation sequencing technologies as well as bioinformatic tools, which led to a better understanding of microbial communities and their adaptability to

a wide range of contaminants and underlying their mechanisms in bioremediation and biodegradation of environmental pollutants. In addition, this edited volume provides critical insight into of potent microbial communities endowed with unique functional attributes through their unique metabolism catalyzed by 'signature' enzymes and degradation pathways. Step-by-step descriptions are provided of various microbial metabolic pathways of degradation and biotransformation of environmental contaminants by numerous illustrations which make the information easier to understand for the readers. Each chapter is devoted to selected examples of microbial bioremediation supported by tables, and an extensive list of references for readers interested in learning further details about the subject matter. This book is of interest to teachers, researchers to professionals, policymakers, stockholders, practitioners, environmental engineers, soil scientists, and policymakers. In addition, the book serves as additional comprehensive material for undergraduate, graduate, and doctoral students who require a working knowledge and knowhow of 'Omics' involved in and required for environmental remediation of legacy and emerging contaminants, will also find this to be a useful read.

Applied Bioremediation May 01 2023 Bioremediation technologies are gaining immense credibility in the field of waste management because of their eco-compatibility nature. Biomass can interact and confront with water and soil pollutants in both active (live) as well as passive (dead) way, thereby offering numerous opportunities of exploring them for environmental clean-up. In 21st century, wastes are no longer a waste but are recognized as a valuable Resource. Employing novel and integrated strategies for the development of modern bioremediation processes is desperate need of the hour. This edited book on Applied Bioremediation - Active and Passive Approaches contains mix of interesting chapters that will certainly add to the advancement of knowledge and will provide the required valuable resource and

stimulus to the researchers worldwide.

*Microbial Biotechnology* Apr 27 2020 Incorporates the Experiences of World-Class Researchers *Microbial Biotechnology: Progress and Trends* offers a theoretical take on topics that relate to microbial biotechnology. The text uses the "novel experimental experiences" of various contributors from around the world—designed as case studies—to highlight relevant topics, issues, and recent developments surrounding this highly interdisciplinary field. It factors in metagenomics and microbial biofuels production, and incorporates major contributions from a wide range of disciplines that include microbiology, biochemistry, genetics, molecular biology, chemistry, biochemical engineering, and bioprocess engineering. In addition, it also provides a variety of photos, diagrams, and tables to help illustrate the material. The book consists of 15 chapters and contains subject matter that addresses: Microbial biotechnology from its historical roots to its different processes Some of the new developments in upstream processes Solid-state fermentation as an interesting field in modern fermentation processes Recent developments in the production of valuable microbial products such as biofuels, organic acids, amino acids, probiotics, healthcare products, and edible biomass Important microbial activities such as biofertilizer, biocontrol, biodegradation, and bioremediation Students, scientists, and researchers can benefit from *Microbial Biotechnology: Progress and Trends*, a resource that addresses biotechnology, applied microbiology, bioprocess/fermentation technology, healthcare/pharmaceutical products, food innovations/food processing, plant agriculture/crop improvement, energy and environment management, and all disciplines related to microbial biotechnology.

*Bioremediation: Challenges and Advancements* Dec 24 2019

Waste management is one of the major challenges for environmental and public health organizations for maintaining safety standards in any area. Population growth and urbanization

increase the difficulty in maintaining a sustainable waste management system. Bioremediation refers to the use of living organisms in processes designed to remove toxic chemicals present in waste material. Bioremediation represents a sustainable way to remove a range of environmental pollutants. *Bioremediation: Challenges and Advancements* covers the subject of bioremediation in eight chapters that focus on a broad range of waste sources, their adverse impacts on the ecosystem, and the advanced strategies for their remediation. Each chapter also highlights the problems encountered in bioremediation processes. Key features: - Comprehensive coverage of bioremediation in 8 reader-friendly chapters - Highlights methods and challenges of bioremediation in one volume. - Introduces the reader to bioremediation - Explains recent biotechnological methods for removing heavy metals and xenobiotic compounds - Describes strategies including physical, chemical, and biological methods to mitigate radioactive waste from contaminated sites and water bodies - Details the use of microbial-aided remediation techniques for the management of biomedical and electronic wastes, and its impact on the ecosystem - Describes bioremediation technologies for decontamination of solid waste pollutants - Showcases the application of Omics approaches such as genomics, transcriptomics, proteomics, and metabolomics to improve bioremediation processes. - Covers bioremediation of agro-wastes - Includes detailed references This book is an informative reference for scholars (researchers, undergraduate and graduate students of environmental sciences, microbiology and biotechnology) professionals (environmental engineers) and researchers, giving each a good understanding of the significance of bioremediation in solid waste management and the restoration of contaminated sites.

**Heavy Metals** Nov 14 2021 Fundamental societal changes resulted from the necessity of people to get organized in mining, transporting, processing, and circulating the heavy metals and

their follow-up products, which in consequence resulted in a differentiation of society into diversified professions and even societal strata. Heavy metals are highly demanded technological materials, which drive welfare and progress of the human society, and often play essential metabolic roles. However, their eminent toxicity challenges the field of chemistry, physics, engineering, cleaner production, electronics, metabolomics, botany, biotechnology, and microbiology in an interdisciplinary and cross-sectorial manner. Today, all these scientific disciplines are called to dedicate their efforts in a synergistic way to avoid exposure of heavy metals into the eco- and biosphere, to reliably monitor and quantify heavy metal contamination, and to foster the development of novel strategies to remediate damage caused by heavy metals.

#### Advances in Bioremediation of Wastewater and Polluted Soil Dec

28 2022 The pollution of soil and groundwater by heavy metals and other chemicals is becoming a serious issue in many countries. However, the current bioremediation processes do not often achieve sufficient remediation, and more effective processes are desired. This book deals with advances in the bioremediation of polluted soil and groundwater. In the former chapters of this book, respected researchers in this field describe how the optimization of microorganisms, enzymes, absorbents, additives and injection procedures can help to realize excellent bioremediation. In the latter chapters, other researchers introduce bioremediation processes that have been performed in the field and novel bioremediation processes. Thus, the readers will be able to obtain new ideas about effective bioremediation as well as important information about recent advances in bioremediation.

#### Biodegradation and Bioremediation Jan 23 2020

In this volume, experts from universities, government labs and industry share their findings on the microbiological, biochemical and molecular aspects of biodegradation and bioremediation. The text covers



numerous topics, including: bioavailability, biodegradation of various pollutants, microbial community dynamics, properties and engineering of important biocatalysts, and methods for monitoring bioremediation processes. Microbial processes are environmentally compatible and can be integrated with non-biological processes to detoxify, degrade and immobilize environmental contaminants.

Advances in Bioremediation and Phytoremediation Oct 26 2022

The pollution of soil and groundwater by harmful chemical compounds and heavy metals is becoming very serious in many countries. Although remediation is necessary as soon as possible, the performance of conventional bioremediation processes is not sufficient. This book deals with advances in bioremediation and phytoremediation processes by using excellent strains and a combination of processes. In the chapters of this book, the researchers have introduced the overall status of contamination; the characteristics of bioremediation using halobacteria, *Candida* yeast, and autochthonous bacteria; and phytoremediation using macrophytes. Moreover, other researchers introduced a process using biochar and electric currents, and this combination of processes and phytoremediation enhances the overall process.

Selected Bioremediation Techniques in Polluted Tropical Soils

Mar 19 2022 Selected Bioremediation Techniques in Polluted Tropical Soils.

Microbial Rejuvenation of Polluted Environment Apr 07 2021

Pollution is one of the most serious issues facing mankind and other life forms on earth. Environmental pollution leads to the degradation of ecosystems, loss of services, economic losses, and various other problems. The eco-friendliest approach to rejuvenating polluted ecosystems is with the help of microorganism-based bioremediation. Microorganisms are characterized by great biodiversity, genetic and metabolic machinery, and by their ability to survive, even in extremely polluted environments. As such, they are and will remain the most

important tools for restoring polluted ecosystems / habitats. This three-volume book sheds light on the utilization of microorganisms and the latest technologies for cleaning up polluted sites. It also discusses the remediation or degradation of various important pollutants such as pesticides, wastewater, plastics, PAHs, oil spills etc. The book also explains the latest technologies used for the degradation of pollutants in several niche ecosystems. Given its scope, the book will be of interest to teachers, researchers, bioremediation scientists, capacity builders and policymakers. It also offers valuable additional reading material for undergraduate and graduate students of microbiology, ecology, soil science, and the environmental sciences.

Microbial Action on Hydrocarbons Feb 24 2020 The book discusses ways to overcome the side effects of using hydrocarbon-based products as energy sources. Hydrocarbons produce raw crude oil waste of around 600,000 metric tons per annum, with a range of uncertainty of 200,000 metric tons per year. The various chapters in this book focus on approaches to reduce these wastes through the application of potential microbes, in a process called bioremediation. The book is a one-stop reference resource on the methods, mechanisms and application of the bio-composites, in the laboratory and field. Focusing on resolving a very pressing environmental issue, it not only provides details of existing challenges, but also offers deeper insights into the possibility of solving problems using hydrocarbon bioremediation.

Soil Microenvironment for Bioremediation and Polymer Production Oct 14 2021 Describes harmful elements and their bioremediation techniques for tannery waste, oil spills, wastewater, greenhouse gases, plastic and other wastes. Microenvironmental conditions in soil provide a natural niche for ultra-structures, microbes and microenvironments. The natural biodiversity of these microenvironments is being disturbed by industrialization and the proliferation of urban centers, and

synthetic contaminants found in these micro-places are causing stress and instability in the biochemical systems of microbes. The development of new metabolic pathways from intrinsic metabolic cycles facilitate microbial degradation of diverse resistant synthetic compounds present in soil. These are a vital, competent and cost-effective substitute to conventional treatments. Highly developed techniques for bioremediation of these synthetic compounds are increasing and these techniques facilitate the development of a safe environment using renewable biomaterial for removal of toxic heavy metals and xenobiotics. Soil Microenvironment for Bioremediation and Polymer Production consists of 21 chapters by subject matter experts and is divided into four parts: Soil Microenvironment and Biotransformation Mechanisms; Synergistic Effects between Substrates and Microbes; Polyhydroxyalcanoates: Resources, Demands and Sustainability; and Cellulose-Based Biomaterials. This timely and important book highlights Chapters on classical bioremediation approaches and advances in the use of nanoparticles for removal of radioactive waste Discusses the production of applied emerging biopolymers using diverse microorganisms Provides the most innovative practices in the field of bioremediation Explores new techniques that will help to improve biopolymer production from bacteria Provides novel concepts for the most affordable and economic societal benefits.

Consequences of Microbial Interactions with Hydrocarbons, Oils, and Lipids: Biodegradation and Bioremediation Oct 02 2020 In this book international experts discuss the state-of-the-art in the biological degradation of hydrocarbons to meet remedial or disposal goals. The work focuses on practical applications, often on globally important scales including the remediation of some of the world's largest crude oil spills. Other related chapters discuss important implications of microbial transformation of hydrocarbons, including treatment of high fat processing wastes, impacts of microbial biodegradation activity on industrial

processes, and the implications of microbial oil degradation in relation to modern oil extraction processes like hydraulic fracturing of shales and extraction of oil sands.

**Biofuel Production** Jul 31 2020 This book aspires to be a comprehensive summary of current biofuels issues and thereby contribute to the understanding of this important topic. Readers will find themes including biofuels development efforts, their implications for the food industry, current and future biofuels crops, the successful Brazilian ethanol program, insights of the first, second, third and fourth biofuel generations, advanced biofuel production techniques, related waste treatment, emissions and environmental impacts, water consumption, produced allergens and toxins. Additionally, the biofuel policy discussion is expected to be continuing in the foreseeable future and the reading of the biofuels features dealt with in this book, are recommended for anyone interested in understanding this diverse and developing theme.

**InTech** Nov 02 2020

Treatment of Petroleum Refinery Wastewater with Constructed Wetlands Mar 26 2020 Pollution of waterbodies and the environment by petroleum industry is of particular concern in Nigeria. This problem can be addressed by the application of constructed wetlands (CWs) which is a nature-based system that is simple to construct, have low operational and maintenance costs in terms of supply of energy and its periodic maintenance. The application of CWs in Nigeria for polishing of petroleum refinery wastewater is an unprecedented research. This PhD thesis focused on some specific objectives which were characterization of treated secondary refinery wastewater, design, construction, operation and monitoring of planted (*T. latifolia*, *C. alternifolius* and *C. dactylon*) and unplanted vertical subsurface flow, horizontal subsurface flow and hybrid CWs for the removal of suspended solids, nutrients, heavy metals, organic matter and organic pollutants. The CWs effectively treated the

petroleum contaminated wastewater to effluent compliance limits. In this study, *T. latifolia* planted CWs had consistently higher removal efficiencies for all the measured parameters than *C. alternifolius* and *C. dactylon* planted CW systems. Therefore, in order to improve the wastewater quality discharged by Kaduna Refining and Petrochemical Company (KRPC) Nigeria, meet stringent guidelines and protect the recipient streams, installation of CWs at the effluent discharge point of KRPC is strongly recommended.

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