
Concern about the fate of waste products produced by a wide range of industrial processes has led to the realization that they may have potential uses and therefore value in an effort to develop more sustainable processes and reduce waste storage the use of waste as a resource has been gaining attention worldwide consequently there have been a large number of studies aimed at utilizing such wastes conversion of large scale wastes into value added products discusses various selected classes of large scale waste and their current applications and potential future applications this book provides a snapshot of a continually evolving field which includes both well established processes and a drive toward developing strategies for new applications of wastes the first chapter provides a general introduction to the area of large scale waste utilization including drivers for waste recovery and secondary processes and products for waste reuse subsequent chapters discuss applications and potential applications in specific classes of large scale waste various types of waste generated from different metal processing operations waste generated by coal combustion a major source of power generation that produces enormous quantities of waste waste electrical and electronic equipment important for recycling finite resources and reducing health and environmental risks food waste a significant and diverse waste stream with economic and environmental impacts the final chapter presents a general conclusion to the broad subject of waste utilization summarizing the topics and addressing future trends in waste research although many available metal recycling methods are simple and fast they are also expensive and cause environmental pollution biohydrometallurgical processing of metals offers an alternative to overcome these issues as the use of biological means not only helps to conserve dwindling ore resources but also fulfills the need for the unambiguous need to extract metals in nonpolluting low energy and low cost way this book covers biohydrometallurgy and its application in the recovery of metals from secondary sources like wastes it aims to provide readers with a comprehensive overview of different wastes for metal recovery and biological treatment methods that are both environmentally friendly and economically viable this book presents an overview of the characterization of electronic waste in addition processing techniques for the recovery of metals polymers and ceramics are described this book serves as a source of information and as an educational technical reference for practicing scientists and engineers as well as for students this collection features papers presented at the 148th annual meeting exhibition of the minerals metals materials society this book discusses microbial diversity in various habitats and environments its role in ecosystem maintenance and its potential applications e g biofertilizers biocatalysts antibiotics other bioactive compounds exopolysaccharides etc the respective chapters all contributed by renowned experts offer cutting edge information in the fields of microbial ecology and biogeography the book explains the reasons behind the occurrence of various biogeographies and highlights recent tools e g metagenomics that can aid in biogeography studies by providing information on nucleic acid sequence data thereby directly identifying microorganisms in various habitats and environments in turn the book describes how human intervention results in depletion of biodiversity and how numerous hotspots are now losing their endemic biodiversity resulting in the loss of many ecologically important microorganisms in closing the book underscores the importance of microbial
diversity for sustainable ecosystems electronic waste management and treatment technology applies the latest research for designing waste treatment and disposal strategies written for researchers who are exploring this emerging topic the book begins with a short but rigorous discussion of electric waste management that outlines common hazardous materials such as mercury lead silver and flame retardants the book also discusses the fate of metals contained in waste electrical and electronic equipment in municipal waste treatment materials and methods for the remediation recycling and treatment of plastic waste collected from waste electrical and electronic equipment weee are also covered finally the book covers the depollution benchmarks for capacitors batteries and printed circuit boards from waste electrical and electronic equipment weee and the recovery of waste printed circuit boards through pyrometallurgy describes depollution benchmarks for capacitors batteries and printed wiring boards from waste electronics covers metals contained in waste electrical and electronic equipment in municipal waste provides tactics for the recycling of mixed plastic waste from electrical and electronic equipment this book identifies emerging technologies that allow the reuse and regeneration of industrial wastewater with innovative and applied approaches throughout the wastewater treatment cycle today it is increasingly clear that treated urban wastewater whose reuse has become an important component of long term water management worldwide is a key source of chemical pollutants and emerging biological concerns current water quality guidelines for reclaimed wastewater predominantly address the risks associated with the presence of microbial organisms and chemical parameters such as biological oxygen demand chemical oxygen demand e coli and worms and in some cases heavy metals however they are insufficient for the full evaluation of risks the global growth of population is concentrated in urban areas therefore most of the challenges and solutions related to wastewater reside in urban treatment plants unless wastewater management and wastewater governance processes are significantly improved within a decade it is likely that our societies will face severe and prolonged water insecurity and urban floods the application of sustainable technologies can eliminate or minimize micro contaminants in wastewater several organizations focus on the potential impacts to humans and their environments by wastewater reuse this book gathers new research and reviews work from researchers and scientists to identify the main barriers and limitations that will need to be overcome so that wastewater reuse strategies gain more momentum and will be adopted more efficiently worldwide the book is designed for engineers scientists and other professionals who are seeking an excellent introduction to and basic knowledge of the principles of environmental bioremediation technologies the use of synthetic chemical dyes in various industrial processes including paper and pulp manufacturing plastics dyeing of cloth leather treatment and printing has increased considerably over the last few years resulting in the release of dye containing industrial effluents into the soil and aquatic ecosystems the textile industry generates high polluting wastewaters and their treatment is a very serious problem due to high total dissolved solids tds presence of toxic heavy metals and the non biodegradable nature of the dyestuffs in the effluent the chapters in this book provide an overview of the problem and its solution from different angles these problems and solutions are presented in a genuinely holistic way by world renowned researchers discussed are various promising techniques to remove dyes including the use of nanotechnology ultrasound microwave catalysts biosorption enzymatic treatments advanced oxidation processes etc all of which are green green chemistry for dyes removal from wastewater comprehensively discusses different types of dyes their working and
methodologies and various physical chemical and biological treatment methods employed application of advanced oxidation processes AOPs in dye removal whereby highly reactive hydroxyl radicals are generated chemically photochemically and or by radiolytic sono-lytic means the potential of ultrasound as an AOP is discussed as well nanotechnology in the treatment of dye removal types of adsorbents for removal of toxic pollutants from aquatic systems photocatalytic oxidation process for dye degradation under both UV and visible light application of solar light and solar photocatalytic reactor in dye degradation the 4e of the science and technology of rubber provides a broad survey of elastomers with special emphasis on materials with a rubber like elasticity as in previous editions the emphasis remains on a unified treatment of the material exploring chemical aspects such as elastomer synthesis and curing through recent theoretical developments and characterization of equilibrium and dynamic properties to the final applications of rubber including tire engineering and manufacturing updated material stresses the continuous relationship between ongoing research in synthesis physics structure and mechanics of rubber technology and industrial applications special attention is paid to recent advances in rubber like elasticity theory and new processing techniques for elastomers exciting new developments in green tire manufacturing and tire recycling are covered provides a complete survey of elastomers for engineers and researchers in a unified treatment from chemical aspects like elastomer synthesis and curing to the final applications of rubber including tire engineering and manufacturing contains important updates to several chapters including elastomer synthesis characterization viscoelastic behavior rheology reinforcement tire engineering and recycling includes a new chapter on the burgeoning field of bioelastomers this book besides discussing challenges and opportunities will reveal the microbe metal interactions and strategies for e waste remediation in different ecosystems it will unveil the recent biotechnological advancement and microbiological approach to sustainable biorecycling of e waste such as bioleaching for heavy metal extraction valorization of precious metal biodegradation of e plastic the role of the diverse microbial community in e waste remediation genetically engineered microbes for e waste management the importance of microbial exopolysaccharides in metal biosorption next generation technologies omics based technologies etc it also holds the promise to discuss the conservation utilization and cataloging indigenous microbes in e waste polluted niches and promising hybrid technology for sustainable e waste management revolution in the area of information technology and communication is constantly evolving due to scientific research and development concurrently the production of new electrical and electronic equipment also thus uplifting in this era of revolution these technological advancements certainly have problematic consequences which is the rise of huge amounts of electronic obsolesces or electronic waste e waste improper management of both hazardous and nonhazardous substances of e waste led to a major concern in our digital society and environment therefore a sustainable approach including microbial candidates to tackle e waste is the need of the hour nevertheless the continuous demand for new generation gadgets and electronics set this high tech evolution to a new frontier in the last few years with this continuing trend of technological development e waste is expanding exponentially worldwide in the year of 2019 the worldwide generation of e waste was approximately 53.6 mt of which only about 17.4 of e waste was collected and recycled and the other 82.6 was not even documented e waste contains various heterogeneous waste complexes such as metals 60 blends of many polymers 30 and halogenated compounds radioactive elements and other pollutants 10 respectively the sustainable efficient and economic management of
E waste is thus a challenging task today and in the coming decades conventional techniques such as the use of chemicals incineration and informal ways of e waste dismantling trigger serious health risks and contamination to the human population and environment respectively due to the liberation of toxic and hazardous substances from the waste in this context bio candidates especially microorganisms could be sharp edged biological recycling tools to manage e waste sustainably as microbes are omnipresent and diverse in their physiology and functional aspects they offer a wide range of bioremediation 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 waste electrical and electronic equipment weee generation is a global problem despite the growing awareness and deterring legislation most of the weee is disposed improperly i.e. landfilled or otherwise shipped overseas and treated in sub standard conditions informal recycling of weee has catastrophic effects on humans and the environment weee contains considerable quantities of valuable metals such as base metals precious metals and rare earth elements ree metal recovery from weee is conventionally carried out by pyrometallurgical and hydrometallurgical methods in this phd research novel metal recovery technologies from weee are investigated using acidophilic and cyanide generating bacteria copper and gold were removed from crushed electronic waste with removal efficiencies of 98.4 and 44.0 respectively the leached metals in solution were recovered using sulfidic precipitation and electrowinning separation techniques finally a techno economic assessment of the technology was studied this research addresses the knowledge gap on two metal extraction approaches namely chemical and biological from a secondary source of metals the essential parameters of the selective metal recovery processes scale up potential techno economic and sustainability assessment have been studied this book introduces a new technology for environmental protection namely plasma cleaning it brings together technological advances and research on plasma generators and their application in environmental science and engineering including contaminated soil remediation waste water degradation metal recovery from waste solution sterilization and polluted air remediation it provides a balanced and comprehensive discussion of the core principles novel plasma reactors and diagnostics and state of the art environmental applications of plasma as such it represents a valuable reference guide for scientists engineers and graduate students in the fields of environmental science and plasma physics iron ore mineralogy processing and environmental sustainability second edition covers all aspects surrounding the second most important commodity behind oil as an essential input for the production of crude steel iron ore feeds the world’s largest trillion dollar a year metal market and is the backbone of the global infrastructure the book
explores new ore types and the development of more efficient processes technologies to minimize environmental footprints this new edition includes all new case studies and technologies along with new chapters on the chemical analysis of iron ore thermal and dry beneficiation of iron ore and discussions of alternative iron making technologies in addition information on recycling solid wastes and p bearing slag generated in steel mills sustainable mining and low emission iron making technologies from regional perspectives particularly europe and japan are included this work will be a valuable resource for anyone involved in the iron ore industry provides an overall view of the entire value chain from iron ore to metal includes specific information on process stage operation in the value chain discusses challenges and developments along with future trends in the iron ore and steel industries incorporates new sustainable mining techniques resource recovery in industrial waste waters provides a holistic approach for discovering and harnessing valuable resources from industrial wastewaters the cutting edge technologies required and a discussion on the new findings in three volumes the books stress the importance of contaminated waters remediation including surface waters municipal or industrial wastewaters and treating these waters as a new source of nutrients minerals and energy it introduces polluted waters as new and sustainable sources rather than seeing wastewaters as only a source of hazardous organic and inorganic matters sections discuss wastewater treatment and recovery and contribute to generate a sustainable approach of wastewater by providing the main advantages and disadvantages of both wastewater polluted water treatment and recovery reviews the current status of industrial wastewater treatment methods discusses the growing need of resource recovery from industrial wastewater along with the challenges describes the importance of water reuse for combating water scarcity by describing current techniques and challenges evaluates the potential of the current market and status towards industrial wastewater resource recovery considers cutting edge technologies for resource recovery contains comprehensive discussions on possibility of almost all recoverable resources from industrial wastewater the analysis development and or operation of high temperature processes that involve the production of ferrous and nonferrous metals alloys and refractory and ceramic materials are covered in the book the innovative methods for achieving impurity segregation and removal by product recovery waste minimization and or energy efficiency are also involved eight themes are presented 1 high efficiency new metallurgical process and technology 2 fundamental research of metallurgical process 3 alloys and materials preparation 4 direct reduction and smelting reduction 5 coking new energy and environment 6 utilization of solid slag wastes and complex ores 7 characterization of high temperature metallurgical process this text details the plant assisted remediation method phytoremediation which involves the interaction of plant roots and associated rhizospheric microorganisms for the remediation of soil contaminated with high levels of metals pesticides solvents radionuclides explosives crude oil organic compounds and various other contaminants each chapter highlights and compares the beneficial and economical alternatives of phytoremediation to currently practiced soil removal and burial practices this book covers state of the art approaches in phytoremediation written by leading and eminent scientists from around the globe phytoremediation management of environmental contaminants volume 1 supplies its readers with a multidisciplinary understanding in the principal and practical approaches of phytoremediation from laboratory research to field application fungi bio prospects in sustainable agriculture environment and nanotechnology is a three volume series that has been designed to explore the huge potential of the many diverse applications of fungi to
human life the series unveils the latest developments and scientific advances in the study of the biodiversity of fungi extremophilic fungi and fungal secondary metabolites and enzymes while also presenting cutting edge molecular tools used to study fungi readers will learn all about the recent progress and future potential applications of fungi in agriculture environmental remediation industry food safety medicine and nanotechnology volume 1 will cover the biodiversity of fungi and the associated biopotential applications this volume offers insights into both basic and advanced biotechnological applications in human welfare and sustainable agriculture the chapters shed light on the different roles of fungi as a bio fertilizer a bio control agent and a component of microbial inoculants they also focus on the various applications of fungi in bio fuel production nano technology and in the management of abiotic stresses such as drought salinity and metal toxicity provides a deep understanding of fungi and summarizes fungi’s various applications in the fields of microbiology and sustainable agriculture describes the role of fungal inoculants as biocontrol agents and in improved stress tolerance and growth of plants char and carbon materials derived from biomass production characterization and applications provides an overview of biomass char production methods pyrolysis hydrothermal carbonization etc along with the characterization techniques typically used scanning electronic microscopy x ray fluorescence nitrogen adsorption etc in addition the book includes a discussion of the various properties of biomass chars and their suitable recovery processes concluding with a demonstration of applications as biomass can be converted to energy biofuels and bioproducts via thermochemical conversion processes such as combustion pyrolysis and gasification this book is ideal for professionals in energy production and storage fields as well as professionals in waste treatment gas treatment and more provides a discussion of sources of biomass feedstocks such as agricultural woody plants and food processing residue discusses the various production processes of biomass chars including pyrolysis and hydrothermal carbonization explores various applications of biomass chars within different industries including energy and agronomy four brothers embark on a journey takes them to a world that they have never heard of before they become more and more intrigued especially when they find that the citizens of kavosava already know who they are and treat them like royalty after travelling to different parts of the land they realize they have returned to kavosava to assist the people in ridding themselves of the evil lord whipstein and his minions biomassekarbonisate biokohlen besitzen signifikant unterschiedliche eigenschaften die von den herstellungsverfahren prozessbedingungen und ausgangssubstraten abhängen im buch sind die technisch verfügbaren verfahren zur erzeugung von biokohle beschrieben und die thermochemischen prozesse erörtert anhand von zahlreichen farbigen abbildungen sind die prozesse eigenschaften und einsatzmöglichkeiten veranschaulicht der fokus des buches liegt auf den großtechnischen anwendungen als energieträger als reduktions oder aufkohlungsmittel in metallurgischen verfahren in recyclingprozessen oder in kraft und zementwerken aber auch die anwendung von biomassekarbonisaten in der landwirtschaft als bodenhilfsstoff oder in der tierhaltung ist aufgezeigt metagenomics to bioremediation applications cutting edge tools and future outlook provides detailed insight into metagenomics approaches to bioremediation in a comprehensive manner thus enabling the analysis of microbial behavior at a community level under different environmental stresses during degradation and detoxification of environmental pollutants the book summarizes each and all aspects of metagenomics applications to bioremediation helping readers overcome the lack of updated information on advancement in microbial ecology dealing with pollution abatement users will find insight
not only on the fundamentals of metagenomics and bioremediation but also on recent trends and future expectations this book will appeal to readers from diverse backgrounds in biology chemistry and life sciences reviews recently developed metagenomics approaches strategies technologies to solve five major trends in environmental clean up including nutrient removal and resource recovery organometallic compounds detoxification energy saving and production sustainability and community involvement compiles authoritative information on recent advances in microbial biotechnological approaches including the latest descriptions of the relationship between microbes and the environment describes the knowledge gaps and future directions in the field of bioremediation of environmental contaminants covers underlying microbial mechanisms with metabolic pathways for degradation and detoxification of emerging organic and inorganic contaminants discharged in environment the series advances in polymer science presents critical reviews of the present and future trends in polymer and biopolymer science it covers all areas of research in polymer and biopolymer science including chemistry physical chemistry physics material science the thematic volumes are addressed to scientists whether at universities or in industry who wish to keep abreast of the important advances in the covered topics advances in polymer science enjoy a longstanding tradition and good reputation in its community each volume is dedicated to a current topic and each review critically surveys one aspect of that topic to place it within the context of the volume the volumes typically summarize the significant developments of the last 5 to 10 years and discuss them critically presenting selected examples explaining and illustrating the important principles and bringing together many important references of primary literature on that basis future research directions in the area can be discussed advances in polymer science volumes thus are important references for every polymer scientist as well as for other scientists interested in polymer science as an introduction to a neighboring field or as a compilation of detailed information for the specialist review articles for the individual volumes are invited by the volume editors single contributions can be specially commissioned readership polymer scientists or scientists in related fields interested in polymer and biopolymer science at universities or in industry graduate students microbes are the predominant form of life on the planet due to their broad range of adaptation and versatile nutritional behavior the ability of some microbes to inhabit hostile environment incompatible with most forms of life means that their habitat defines the extent of the biosphere and delineates the barrier between the biosphere and geosphere the direct and indirect role of microbes that include bacteria fungi actinomycetes viruses mycoplasma and protozoans are very much important in development of modern human society for food drugs textiles agriculture and environment furthermore microorganisms and their enzyme system are responsible for the degradation of various organic matters microbes for sustainable development and bioremediation emphasizes the role of microbes for sustainable development of ecosystem environmental microbiology role in biogeochemical cycle and bioremediation of environmental waste is major theme which comprises the following aspects bacterial phytoextraction mechanism of heavy metals by native hyperaccumulator plants from complex waste contaminated site for eco restoration role of microbial enzyme for eco friendly recycling of industrial waste field scale remediation of crude oil contaminated desert soil and treatment technology microbial technology for metal recovery from e waste printed circuit board impact of genomic data on sustainability of ecosystem methane monooxygenases their regulations and applications role of microbes in environmental sustainability and food preservation this book will be directly beneficial to researchers and classroom students in areas of biotechnology environmental
microbiology molecular biology and environmental engineering with specialized collection of cutting edge knowledge bridging the gap in expertise between coal and coalbed gas subfields in which opportunities for cross training have been nonexistent coal and coalbed gas sets the standard for publishing in these areas this book treats coal and coalbed gas as mutually inclusive commodities in terms of their interrelated origin accumulation composition distribution generation and development providing a balanced understanding of this energy mix currently considered a non renewable energy resource coalbed gas or coalbed methane is a form of natural gas extracted from coal beds in recent years countries have begun to seek and exploit coal for its clean gas energy in an effort to alleviate environmental issues that come with coal use making a book on this topic particularly timely this volume takes into account processes of coalification gasification and storage and reservoir characterization and evaluation and looks at water management and environmental impacts as well covers environmental issues in the development of coalbed gas includes case studies field guides and data examples and analytical procedures from previous studies and investigations accessible by a large multidisciplinary market by one of the world's foremost experts on the topic selenium se and tellurium te are metalloids of commercial interest due to their physicochemical properties the water soluble oxyanions of these elements selenite selenate tellurite and tellurate exhibit high toxicities hence their release in the environment is of great concern this study demonstrates the potential use of fungi as se and te reducing organisms the response of phanerochaete chrysosporium to the presence of selenite and tellurite was evaluated as well as its potential application in wastewater treatment and production of nanoparticles growth stress and morphological changes were induced in p chrysosporium when exposed to selenite and tellurate synthesis of se0 and te0 nanoparticles entrapped in the fungal biomass was observed as well as the formation of unique se0 te0 nanocomposites when the fungus was cultivated concurrently with se and te the response of p chrysosporium to selenite exposure was investigated in different modes of fungal growth pellets and biofilm a bioprocess for selenite removal and se0 nanoparticles recovery using an up flow fungal pellet reactor was developed 70 selenite removal 10 mg se l 1 d 1 was achieved under continuous mode the use of se0 nanoparticles immobilized in p chrysosporium pellets as a new sorbent material for the removal of heavy metals from wastewater was demonstrated this book provides up to date information on the state of the art in applications of biotechnological and microbiological tools for protecting the environment written by leading international experts it discusses potential applications of biotechnological and microbiological techniques in solid waste management wastewater treatment agriculture energy and environmental health this first volume of the book environmental microbiology and biotechnology covers three main topics solid waste management agriculture utilization and water treatment technology exploring the latest developments from around the globe regarding applications of biotechnology and microbiology for converting wastes into valuable products and at the same time reducing the environmental pollution resulting from disposal wherever possible it also includes real world examples further it offers advice on which procedures should be followed to achieve satisfactory results and provides insights that will promote the transition to the sustainable utilization of various waste products this book provides state of the art description of various approaches techniques and some basic fundamentals of bioremediation to manage a variety of organic and inorganic wastes and pollutants present in our environment a comprehensive overview of recent advances and new development in the field of bioremediation research are provided within relevant theoretical framework to improve our
understanding for the cleaning up of polluted water and contaminated land the book is easy
to read and language can be readily comprehended by aspiring newcomer students
researchers and anyone else interested in this field renowned scientists around the world
working on the above topics have contributed chapters in this edited book we have
addressed the scope of the inexpensive and energy neutral bioremediation technologies the
scope of the book extends to environmental agricultural scientists students consultants site
owners industrial stakeholders regulators and policy makers this book provides a timely
review of strategies for coping with polluted ecosystems by employing bacteria fungi and
algae it presents the vast variety of microbial technologies currently applied in the
bioremediation of a variety of anthropogenic toxic chemicals mining and industrial wastes
and other pollutants topics covered include microbe mineral interactions biosensors in
environmental monitoring iron mineral transformation microbial biosurfactants
bioconversion of cotton gin waste to bioethanol anaerobe bioleaching and sulfide oxidation
further chapters discuss the effects of pollution on microbial diversity as well as the role of
microbes in the bioremediation of abandoned mining areas industrial and horticultural
wastes wastewater and sites polluted with hydrocarbons heavy metals manganese and
uranium sustainable sources of energy and a supply of good quality water are two major
challenges facing modern societies across the globe biomass from cultivated plants may be
used to generate energy but at the cost of contaminated surface waters from pesticide and
fertiliser use this two volume set examines the potential use of biomass as both a source of
sustainable energy and a resource to tackle contaminated soils and wastewaters
consideration is given to non food crops bacteria and fungi as sources of biomass and the
book enables the reader to identify the best local bioresources according to the desired
application with contributions from across the globe this is an essential guide to meeting the
demand for energy and pollution remediation by exploiting local and renewable resources
the example scenarios given will inspirational to policy makers and local officers while
chemical engineers and environmental scientists in both academia and industry will benefit
from the comprehensive review of current thinking and application the global environment
has significantly changed due to a number of factors such as industrial pollution expansion
of agricultural land way beyond the fringe forest zones destruction of virgin forests loss of
quality agricultural lands due to soil erosion loss of global wildlife and biodiversity climate
change global warming devastating forest fires floods draughts melting of glaciers to
mention a few human or anthropogenic impacts are in turn devastating the planet with our
attention being shifted only to the shining aspect of our civilizations the most alarming fact
about this hidden factor is that they are all directly or indirectly impacted by human
activities in some way or other the present work environment at crossroads deals with
various environmental problems like climate change global warming food security
bioremediation of waste oil spills and problems of heavy metal toxicity control strategies like
use of gene therapy conservation of mangroves revival of river vishwamitri and role of plant
and animals in biodiversity conservation is discussed this collection focuses on energy
efficient technologies including innovative ore beneficiation smelting technologies recycling
and waste heat recovery the volume also covers various technological aspects of sustainable
energy ecosystems processes that improve energy efficiency reduce thermal emissions and
reduce carbon dioxide and other greenhouse emissions papers addressing renewable energy
resources for metals and materials production waste heat recovery and other industrial
energy efficient technologies new concepts or devices for energy generation and conversion
energy efficiency improvement in process engineering sustainability and life cycle
Assessment of energy systems as well as the thermodynamics and modeling for sustainable metallurgical processes are included. This volume also includes topics on CO2 sequestration and reduction in greenhouse gas emissions from process engineering. Sustainable technologies in extractive metallurgy as well as the materials processing and manufacturing industries with reduced energy consumption and CO2 emission contributions from all areas of non-nuclear and non-traditional energy sources such as solar wind and biomass are also included. Papers from the following symposia are presented in the book:

- Energy technologies and CO2 management
- Advanced materials for energy conversion and storage
- Deriving value from challenging waste streams
- Recycling and sustainability
- Joint sessions
- Solar cell silicon
- Stored renewable energy in coal
- Waste management and resource recycling in the developing world provides a unique perspective on the state of waste management and resource recycling in the developing world offering practical solutions based on innovative tools and technologies along with examples and case studies. The book is organized by waste type including electronic, industrial, and biomedical hazardous with each section covering advanced techniques such as remote sensing and GIS as well as socioeconomic factors, transnational transport, and policy implications. Waste managers, environmental scientists, sustainability practitioners, and engineers will find this a valuable resource for addressing the challenges of waste management in the developing world. There is high potential for waste management to produce energy and value-added products.

Sustainable waste management based on a circular economy not only improves sanitation but also provides economic and environmental benefits in addition to waste minimization. Waste to energy and waste to economy have become integral parts of waste management practices. A proper waste management strategy not only leads to reduction in environmental pollution but also moves toward generating sufficient energy for improving environmental sustainability. In coming decades, the book presents case studies in every section to illustrate practical applications across the globe. It includes lessons learned from developed regions that can be applied to developing regions organized by type of waste and consistent coverage in each section to promote ease of navigation.

Biochar application outlines the cutting edge research on the interactions of complex microbial populations and their functional structural and compositional dynamics as well as the microbial ecology of biochar application to soil. The book includes chapters analyzing all aspects of biochar technology and application to soil from ecogenomic analyses and application ratios to nutrient cycling and next generation sequencing written by a team of international authors with interdisciplinary knowledge of biochar. This reference will provide a platform where collaborating teams can find a common resource to establish outcomes and identify future research needs throughout the world. The book includes multiple tables and figures per chapter to aid in analysis and understanding. It includes a comprehensive table of the methods used within the contents, ecosystems, contaminants, future research, and application opportunities explored in the book.
complex microbial populations and their functional structural and compositional dynamics offers an assessment of the impacts of biochar on soil and ecosystems electronic and electric waste e waste defined as end of life electronic products including computers television sets mobile phones transformers capacitors wires and cables are a major global environmental concern the crude recycling of e waste releases persistent toxic substances such as heavy metals polybrominated diphenyl ethers pbdes polychlorinated dibenzodioxins pcddsfcds polychlorinated dibenzofurans pcdfs polycyclic aromatic hydrocarbons pahs and polychlorinated biphenyls pcbs and the environmental pollution and health risks caused by the improper disposal of e waste has become an urgent issue this book offers an overview of e waste history sources and entry routes in soil air water and sediment it also addresses e waste transport and fate bioavailability and biomonitoring e waste risk assessment impacts on the environment and public health in addition it discusses the impact of e waste on soil microbial community diversity structure and function and reviews the treatment and management strategies such as bioremediation and phytoremediation as well as policies and future challenges given its scope it is a valuable resource for students researchers and scholars in the field of electronics manufacturing environmental science and engineering toxicology environmental biotechnology soil sciences and microbial ecology as well as and plant biotechnology very few materials have attracted so much attention in recent years both from researchers and industry as layered double hydroxides ldhs have ldhs which are also referred to as anionic clays or hydrotalcites are a wide class of inorganic ionic lamellar clay materials consisting of alternately stacked positively charged metal hydroxide layers with intercalated charge balancing anions in hydrated interlayer regions their unique properties such as their extremely high versatility in chemical composition and intercalation ability extraordinary tuneability in composition as well as morphology good biocompatibility and high anion exchangeability have triggered immense interdisciplinary interest for their use in many different fields of chemistry biology medicine and physics indeed the applications of ldhs are constantly growing ldhs in the form of aggregated lamellar clusters exfoliated single layer nanosheets or hierarchical films of interconnected nanoplatelets can be effectively used as nanoscale vehicles in drug delivery heterogeneous catalysts and supports for molecular catalysts ion exchangers and adsorbents solid electrolytes or fillers in electrochemistry for the fabrication of superhydrophobic surfaces water treatment and purification and the synthesis of functional thin films this book gathers the contributions to the special issue layered double hydroxides of crystals which includes two review articles and seven research papers
Conversion of Large Scale Wastes into Value-added Products 2013-12-12

Concern about the fate of waste products produced by a wide range of industrial processes has led to the realization that they may have potential uses and therefore value in an effort to develop more sustainable processes and reduce waste storage. The use of waste as a resource has been gaining attention worldwide, consequently, there have been a large number of studies aimed at utilizing such wastes. Conversion of large scale wastes into value-added products discusses various selected classes of large scale waste and their current applications and potential future applications. This book provides a snapshot of a continually evolving field which includes both well-established processes and a drive toward developing strategies for new applications of wastes. The first chapter provides a general introduction to the area of large scale waste utilization including drivers for waste recovery and secondary processes and products for waste reuse. Subsequent chapters discuss applications and potential applications in specific classes of large scale waste. Various types of waste generated from different metal processing operations, waste generated by coal combustion, a major source of power generation that produces enormous quantities of waste, waste electrical and electronic equipment, important for recycling finite resources and reducing health and environmental risks, food waste, a significant and diverse waste stream with economic and environmental impacts, the final chapter presents a general conclusion to the broad subject of waste utilization summarizing the topics and addressing future trends in waste research.

Biohydrometallurgical Recycling of Metals from Industrial Wastes 2017-09-11

Although many available metal recycling methods are simple and fast, they are also expensive and cause environmental pollution. Biohydrometallurgical processing of metals offers an alternative to overcome these issues as the use of biological means not only helps to conserve dwindling ore resources but also fulfills the need for the unambiguous need to extract metals in nonpolluting low energy and low cost way. This book covers biohydrometallurgy and its application in the recovery of metals from secondary sources like wastes. It aims to provide readers with a comprehensive overview of different wastes for metal recovery and biological treatment methods that are both environmentally friendly and economically viable.

Electronic Waste 2015-02-20

This book presents an overview of the characterization of electronic waste in addition to processing techniques for the recovery of metals, polymers, and ceramics. It is described in this book as a source of information and as an educational technical reference for practicing scientists and engineers as well as for students.
this collection features papers presented at the 148th annual meeting exhibition of the minerals metals materials society

**Microbial Diversity in Ecosystem Sustainability and Biotechnological Applications 2019-07-17**

this book discusses microbial diversity in various habitats and environments its role in ecosystem maintenance and its potential applications e.g. biofertilizers, biocatalysts, antibiotics, other bioactive compounds, exopolysaccharides, etc. The respective chapters all contributed by renowned experts offer cutting-edge information in the fields of microbial ecology and biogeography. The book explains the reasons behind the occurrence of various biogeographies and highlights recent tools e.g. metagenomics that can aid in biogeography studies by providing information on nucleic acid sequence data thereby directly identifying microorganisms in various habitats and environments. In turn, the book describes how human intervention results in depletion of biodiversity and how numerous hotspots are now losing their endemic biodiversity resulting in the loss of many ecologically important microorganisms. In closing, the book underscores the importance of microbial diversity for sustainable ecosystems.

**Electronic Waste Management and Treatment Technology 2019-03-14**

electronic waste management and treatment technology applies the latest research for designing waste treatment and disposal strategies. Written for researchers who are exploring this emerging topic, the book begins with a short but rigorous discussion of electric waste management that outlines common hazardous materials such as mercury, lead, silver, and flame retardants. The book also discusses the fate of metals contained in waste electrical and electronic equipment in municipal waste treatment materials and methods for the remediation, recycling, and treatment of plastic waste collected from waste electrical and electronic equipment. Weee are also covered finally, the book covers the depollution benchmarks for capacitors, batteries, and printed circuit boards from waste electrical and electronic equipment. Weee and the recovery of waste printed circuit boards through pyrometallurgy describes depollution benchmarks for capacitors, batteries, and printed wiring boards from waste electronics. Covers metals contained in waste electrical and electronic equipment in municipal waste. Provides tactics for the recycling of mixed plastic waste from electrical and electronic equipment.

**Industrial Wastewater Reuse 2023-07-21**

this book identifies emerging technologies that allow the reuse and regeneration of industrial wastewater with innovative and applied approaches throughout the wastewater
treatment cycle today it is increasingly clear that treated urban wastewater whose reuse has become an important component of long term water management worldwide is a key source of chemical pollutants and emerging biological concerns. Current water quality guidelines for reclaimed wastewater predominantly address the risks associated with the presence of microbial organisms and chemical parameters such as biological oxygen demand, chemical oxygen demand, E. Coli, and worms; and in some cases heavy metals. However, they are insufficient for the full evaluation of risks. The global growth of population is concentrated in urban areas, therefore most of the challenges and solutions related to wastewater reside in urban treatment plants. Unless wastewater management and wastewater governance processes are significantly improved within a decade, it is likely that our societies will face severe and prolonged water insecurity and urban floods. The application of sustainable technologies can eliminate or minimize micro-contaminants in wastewater; several organizations focus on the potential impacts to humans and their environments by wastewater reuse. This book gathers new research and reviews work from researchers and scientists to identify the main barriers and limitations that will need to be overcome so that wastewater reuse strategies gain more momentum and will be adopted more efficiently worldwide. The book is designed for engineers, scientists, and other professionals who are seeking an excellent introduction to and basic knowledge of the principles of environmental bioremediation technologies.

**Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations for 2015**

The use of synthetic chemical dyes in various industrial processes including paper and pulp manufacturing, plastics dyeing, cloth leather treatment, and printing has increased considerably over the last few years resulting in the release of dye-containing industrial effluents into the soil and aquatic ecosystems. The textile industry generates high-polluting wastewaters, and their treatment is a very serious problem due to high total dissolved solids (TDS), presence of toxic heavy metals, and the non-biodegradable nature of the dyestuffs in the effluent. The chapters in this book provide an overview of the problem and its solution from different angles. These problems and solutions are presented in a genuinely holistic way by world-renowned researchers. Discussed are various promising techniques to remove dyes, including the use of nanotechnology, ultrasound, microwave catalysts, biosorption, enzymatic treatments, advanced oxidation processes, etc. All of which are green and based on green chemistry for dyes removal from wastewater. Comprehensively discusses different types of dyes, their working, and methodologies. And various physical, chemical, and biological treatment methods employed application of advanced oxidation processes (AOPs) in dye removal whereby highly reactive hydroxyl radicals are generated chemically, photochemically, and/or by radiolytic sonolytic means. The potential of ultrasound as an AOP is discussed as well. Nanotechnology in the treatment of dye removal and adsorbents for removal of toxic pollutants from aquatic systems. Photocatalytic oxidation processes for dye degradation under both UV and visible light application of solar light and solar photoreactor in dye degradation.
Green Chemistry for Dyes Removal from Waste Water 2015-02-25

the 4e of the science and technology of rubber provides a broad survey of elastomers with special emphasis on materials with a rubber like elasticity as in previous editions the emphasis remains on a unified treatment of the material exploring chemical aspects such as elastomer synthesis and curing through recent theoretical developments and characterization of equilibrium and dynamic properties to the final applications of rubber including tire engineering and manufacturing updated material stresses the continuous relationship between ongoing research in synthesis physics structure and mechanics of rubber technology and industrial applications special attention is paid to recent advances in rubber like elasticity theory and new processing techniques for elastomers exciting new developments in green tire manufacturing and tire recycling are covered provides a complete survey of elastomers for engineers and researchers in a unified treatment from chemical aspects like elastomer synthesis and curing to the final applications of rubber including tire engineering and manufacturing contains important updates to several chapters including elastomer synthesis characterization viscoelastic behavior rheology reinforcement tire engineering and recycling includes a new chapter on the burgeoning field of bioelastomers

The Science and Technology of Rubber 2013-05-10

this book besides discussing challenges and opportunities will reveal the microbe metal interactions and strategies for e waste remediation in different ecosystems it will unveil the recent biotechnological advancement and microbiological approach to sustainable biorecycling of e waste such as bioleaching for heavy metal extraction valorization of precious metal biodegradation of plastic the role of the diverse microbial community in e waste remediation genetically engineered microbes for e waste management the importance of microbial exopolysaccharides in metal biosorption next generation technologies omics based technologies etc it also holds the promise to discuss the conservation utilization and cataloging indigenous microbes in e waste polluted niches and promising hybrid technology for sustainable e waste management revolution in the area of information technology and communication is constantly evolving due to scientific research and development concurrently the production of new electrical and electronic equipment also thus uplifting in this era of revolution these technological advancements certainly have problematic consequences which is the rise of huge amounts of electronic obsoletes or electronic waste e waste improper management of both hazardous and nonhazardous substances of e waste led to a major concern in our digital society and environment therefore a sustainable approach including microbial candidates to tackle e waste is the need of the hour nevertheless the continuous demand for new generation gadgets and electronics set this high tech evolution to a new frontier in the last few years with this continuing trend of technological development e waste is expanding exponentially worldwide in the year of 2019 the worldwide generation of e waste was approximately 53.6 mt of which only about 17.4 of e waste was collected and recycled and the other 82.6 was not even documented e waste contains various heterogeneous waste complexes such as metals 60 blends of many polymers 30 and halogenated compounds radioactive elements and other pollutants 10
respectively the sustainable efficient and economic management of e waste is thus a challenging task today and in the coming decades conventional techniques such as the use of chemicals incineration and informal ways of e waste dismantling trigger serious health risks and contamination to the human population and environment respectively due to the liberation of toxic and hazardous substances from the waste in this context bio candidates especially microorganisms could be sharp edged biological recycling tools to manage e waste sustainably as microbes are omnipresent and diverse in their physiology and functional aspects they offer a wide range of bioremediation

**Microbial Technology for Sustainable E-waste Management 2023-03-01**

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

**Official Gazette 2013**

waste electrical and electronic equipment weee generation is a global problem despite the growing awareness and deterring legislation most of the weee is disposed improperly i.e. landfilled or otherwise shipped overseas and treated in sub standard conditions informal recycling of weee has catastrophic effects on humans and the environment weee contains considerable quantities of valuable metals such as base metals precious metals and rare earth elements ree metal recovery from weee is conventionally carried out by pyrometallurgical and hydrometallurgical methods in this phd research novel metal recovery technologies from weee are investigated using acidophilic and cyanide generating bacteria copper and gold were removed from crushed electronic waste with removal efficiencies of 98.4 and 44.0 respectively the leached metals in solution were recovered using sulfidic precipitation and electrowinning separation techniques finally a techno economic assessment of the technology was studied this research addresses the knowledge gap on two metal extraction approaches namely chemical and biological from a secondary source of metals the essential parameters of the selective metal recovery processes scale up potential techno economic and sustainability assessment have been studied
Chemistry, a Sustainable Bridge from Waste to Materials for Energy and Environment 2021-03-08

this book introduces a new technology for environmental protection namely plasma cleaning it brings together technological advances and research on plasma generators and their application in environmental science and engineering including contaminated soil remediation waste water degradation metal recovery from waste solution sterilization and polluted air remediation it provides a balanced and comprehensive discussion of the core principles novel plasma reactors and diagnostics and state of the art environmental applications of plasma as such it represents a valuable reference guide for scientists engineers and graduate students in the fields of environmental science and plasma physics

Current Developments in Biotechnology and Bioengineering 2016-09-19

iron ore mineralogy processing and environmental sustainability second edition covers all aspects surrounding the second most important commodity behind oil as an essential input for the production of crude steel iron ore feeds the world s largest trillion dollar a year metal market and is the backbone of the global infrastructure the book explores new ore types and the development of more efficient processes technologies to minimize environmental footprints this new edition includes all new case studies and technologies along with new chapters on the chemical analysis of iron ore thermal and dry beneficiation of iron ore and discussions of alternative iron making technologies in addition information on recycling solid wastes and p bearing slag generated in steel mills sustainable mining and low emission iron making technologies from regional perspectives particularly europe and japan are included this work will be a valuable resource for anyone involved in the iron ore industry provides an overall view of the entire value chain from iron ore to metal includes specific information on process stage operation in the value chain discusses challenges and developments along with future trends in the iron ore and steel industries incorporates new sustainable mining techniques

Metal Recovery from Electronic Waste: Biological Versus Chemical Leaching for Recovery of Copper and Gold 2018-10-30

resource recovery in industrial waste waters provides a holistic approach for discovering and harnessing valuable resources from industrial wastewaters the cutting edge technologies required and a discussion on the new findings in three volumes the books stress the importance of contaminated waters remediation including surface waters municipal or industrial wastewaters and treating these waters as a new source of nutrients minerals and energy it introduces polluted waters as new and sustainable sources rather than seeing wastewaters as only a source of hazardous organic and inorganic matters sections discuss wastewater treatment and recovery and contribute to generate a sustainable approach of wastewater by providing the main advantages and disadvantages of
both wastewater polluted water treatment and recovery reviews the current status of industrial wastewater treatment methods discusses the growing need of resource recovery from industrial wastewater along with the challenges describes the importance of water reuse for combating water scarcity by describing current techniques and challenges evaluates the potential of the current market and status towards industrial wastewater resource recovery considers cutting edge technologies for resource recovery contains comprehensive discussions on possibility of almost all recoverable resources from industrial wastewater

**Plasma Remediation Technology for Environmental Protection 2017-02-27**

the analysis development and or operation of high temperature processes that involve the production of ferrous and nonferrous metals alloys and refractory and ceramic materials are covered in the book the innovative methods for achieving impurity segregation and removal by product recovery waste minimization and or energy efficiency are also involved eight themes are presented 1 high efficiency new metallurgical process and technology 2 fundamental research of metallurgical process 3 alloys and materials preparation 4 direct reduction and smelting reduction 5 coking new energy and environment 6 utilization of solid slag wastes and complex ores 7 characterization of high temperature metallurgical process

**Iron Ore 2021-12-02**

this text details the plant assisted remediation method phytoremediation which involves the interaction of plant roots and associated rhizospheric microorganisms for the remediation of soil contaminated with high levels of metals pesticides solvents radionuclides explosives crude oil organic compounds and various other contaminants each chapter highlights and compares the beneficial and economical alternatives of phytoremediation to currently practiced soil removal and burial practices this book covers state of the art approaches in phytoremediation written by leading and eminent scientists from around the globe phytoremediation management of environmental contaminants volume 1 supplies its readers with a multidisciplinary understanding in the principal and practical approaches of phytoremediation from laboratory research to field application

**Resource Recovery in Industrial Waste Waters 2023-07-20**

fungi bio prospects in sustainable agriculture environment and nanotechnology is a three volume series that has been designed to explore the huge potential of the many diverse applications of fungi to human life the series unveils the latest developments and scientific advances in the study of the biodiversity of fungi extremophilic fungi and fungal secondary metabolites and enzymes while also presenting cutting edge molecular tools used to study fungi readers will learn all about the recent progress and future potential applications of fungi in agriculture environmental remediation industry food safety medicine and nanotechnology volume 1 will cover the biodiversity of fungi and the associated biopotential
applications this volume offers insights into both basic and advanced biotechnological applications in human welfare and sustainable agriculture the chapters shed light on the different roles of fungi as a bio fertilizer a bio control agent and a component of microbial inoculants they also focus on the various applications of fungi in bio fuel production nano technology and in the management of abiotic stresses such as drought salinity and metal toxicity provides a deep understanding of fungi and summarizes fungi’s various applications in the fields of microbiology and sustainable agriculture describes the role of fungal inoculants as biocontrol agents and in improved stress tolerance and growth of plants

6th International Symposium on High-Temperature Metallurgical Processing 2016-12-23

char and carbon materials derived from biomass production characterization and applications provides an overview of biomass char production methods pyrolysis hydrothermal carbonization etc along with the characterization techniques typically used scanning electronic microscopy x ray fluorescence nitrogen adsorption etc in addition the book includes a discussion of the various properties of biomass chars and their suitable recovery processes concluding with a demonstration of applications as biomass can be converted to energy biofuels and bioproducts via thermochemical conversion processes such as combustion pyrolysis and gasification this book is ideal for professionals in energy production and storage fields as well as professionals in waste treatment gas treatment and more provides a discussion of sources of biomass feedstocks such as agricultural woody plants and food processing residue discusses the various production processes of biomass chars including pyrolysis and hydrothermal carbonization explores various applications of biomass chars within different industries including energy and agronomy

Phytoremediation 2015-03-03

four brothers embark on a journey takes them to a world that they have never heard of before they become more and more intrigued especially when they find that the citizens of kavosava already know who they are and treat them like royalty after travelling to different parts of the land they realize they have returned to kavosava to assist the people in ridding themselves of the evil lord whipstein and his minions

Fungi Bio-prospects in Sustainable Agriculture, Environment and Nano-technology 2020-10-09

biomassekarbonsate biokohlen besitzen signifikant unterschiedliche eigenschaften die von den herstellungsverfahren prozessbedingungen und ausgangssubstraten abhängen im buch sind die technisch verfügbaren verfahren zur erzeugung von biokohle beschrieben und die thermochemischen prozesse erörtert anhand von zahlreichen farbigen abbildungen sind die prozesse eigenschaften und einsatzmöglichkeiten veranschaulicht der fokus des buches liegt auf den großtechnischen anwendungen als energieträger als reduktions oder aufkohlungsmittel in metallurgischen verfahren in recyclingprozessen oder in kraft und zementwerken aber auch die anwendung von biomassekarbonsaten in der landwirtschaft
Char and Carbon Materials Derived from Biomass

metagenomics to bioremediation applications cutting edge tools and future outlook provides detailed insight into metagenomics approaches to bioremediation in a comprehensive manner thus enabling the analysis of microbial behavior at a community level under different environmental stresses during degradation and detoxification of environmental pollutants the book summarizes each and all aspects of metagenomics applications to bioremediation helping readers overcome the lack of updated information on advancement in microbial ecology dealing with pollution abatement users will find insight not only on the fundamentals of metagenomics and bioremediation but also on recent trends and future expectations this book will appeal to readers from diverse backgrounds in biology chemistry and life sciences reviews recently developed metagenomics approaches strategies technologies to solve five major trends in environmental clean up including nutrient removal and resource recovery organometallic compounds detoxification energy saving and production sustainability and community involvement compiles authoritative information on recent advances in microbial biotechnological approaches including the latest descriptions of the relationship between microbes and the environment describes the knowledge gaps and future directions in the field of bioremediation of environmental contaminants covers underlying microbial mechanisms with metabolic pathways for degradation and detoxification of emerging organic and inorganic contaminants discharged in environment

Adventures in Kavosava

the series advances in polymer science presents critical reviews of the present and future trends in polymer and biopolymer science it covers all areas of research in polymer and biopolymer science including chemistry physical chemistry physics material science the thematic volumes are addressed to scientists whether at universities or in industry who wish to keep abreast of the important advances in the covered topics advances in polymer science enjoy a longstanding tradition and good reputation in its community each volume is dedicated to a current topic and each review critically surveys one aspect of that topic to place it within the context of the volume the volumes typically summarize the significant developments of the last 5 to 10 years and discuss them critically presenting selected examples explaining and illustrating the important principles and bringing together many important references of primary literature on that basis future research directions in the area can be discussed advances in polymer science volumes thus are important references for every polymer scientist as well as for other scientists interested in polymer science as an introduction to a neighboring field or as a compilation of detailed information for the specialist review articles for the individual volumes are invited by the volume editors single contributions can be specially commissioned readership polymer scientists or scientists in related fields interested in polymer and biopolymer science at universities or in industry graduate students
**Financial Accounting 2017**

Microbes are the predominant form of life on the planet due to their broad range of adaptation and versatile nutritional behavior. The ability of some microbes to inhabit hostile environments incompatible with most forms of life means that their habitat defines the extent of the biosphere and delineates the barrier between the biosphere and geosphere. The direct and indirect role of microbes that include bacteria, fungi, actinomycetes, viruses, mycoplasma, and protozoans are very much important in development of modern human society for food, drugs, textiles, agriculture, and environment. Furthermore, microorganisms and their enzyme systems are responsible for the degradation of various organic matters. Microbes for sustainable development and bioremediation emphasize the role of microbes for sustainable development of ecosystem. Environmental microbiology role in biogeochemical cycle and bioremediation of environmental waste is major theme which comprises the following aspects: bacterial phytoextraction mechanism of heavy metals by native hyperaccumulator plants from complex waste contaminated sites, role of microbial enzyme for eco-friendly recycling of industrial waste, field scale remediation of crude oil contaminated desert soil, and treatment technology. Microbial technology for metal recovery from e-waste printed circuit board, impact of genomic data on sustainability of ecosystem, methane monooxygenases and their regulations and applications role of microbes in environmental sustainability and food preservation. This book will be directly beneficial to researchers and classroom students in areas of biotechnology, environmental microbiology, molecular biology, and environmental engineering with specialized collection of cutting edge knowledge.

**Biokohle 2017-02-23**

Bridging the gap in expertise between coal and coalbed gas subfields in which opportunities for cross training have been nonexistent. Coal and coalbed gas sets the standard for publishing in these areas. This book treats coal and coalbed gas as mutually inclusive commodities in terms of their interrelated origin, accumulation, composition, distribution, generation, and development, providing a balanced understanding of this energy mix currently considered a non-renewable energy resource. Coalbed gas or coalbed methane is a form of natural gas extracted from coal beds in recent years. Countries have begun to seek and exploit coal for its clean gas energy in an effort to alleviate environmental issues that come with coal use. Making a book on this topic particularly timely, this volume takes into account processes of coalification, gasification, and storage and reservoir characterization and evaluation, and looks at water management and environmental impacts as well. It covers environmental issues in the development of coalbed gas includes case studies, field guides, and data examples and analytical procedures from previous studies and investigations accessible by a large multidisciplinary market by one of the world's foremost experts on the topic.

**Metagenomics to Bioremediation 2022-08-30**

Selenium (Se) and tellurium (Te) are metalloids of commercial interest due to their physicochemical properties. The water-soluble oxyanions of these elements are selenite and selenate.
tellurite and tellurate exhibit high toxicities hence their release in the environment is of great concern this study demonstrates the potential use of fungi as se and te reducing organisms the response of phanerochaete chrysosporium to the presence of selenite and tellurite was evaluated as well as its potential application in wastewater treatment and production of nanoparticles growth stress and morphological changes were induced in p chrysosporium when exposed to selenite and tellurite synthesis of se0 and te0 nanoparticles entrapped in the fungal biomass was observed as well as the formation of unique se0 te0 nanocomposites when the fungus was cultivated concurrently with se and te the response of p chrysosporium to selenite exposure was investigated in different modes of fungal growth pellets and biofilm a bioprocess for selenite removal and se0 nanoparticles recovery using an up flow fungal pelleted reactor was developed 70 selenite removal 10 mg se l 1 d 1 was achieved under continuous mode the use of se0 nanoparticles immobilized in p chrysosporium pellets as a new sorbent material for the removal of heavy metals from wastewater was demonstrated

Porous Carbons - Hyperbranched Polymers - Polymer Solvation 2014-12-26

this book provides up to date information on the state of the art in applications of biotechnological and microbiological tools for protecting the environment written by leading international experts it discusses potential applications of biotechnological and microbiological techniques in solid waste management wastewater treatment agriculture energy and environmental health this first volume of the book environmental microbiology and biotechnology covers three main topics solid waste management agriculture utilization and water treatment technology exploring the latest developments from around the globe regarding applications of biotechnology and microbiology for converting wastes into valuable products and at the same time reducing the environmental pollution resulting from disposal wherever possible it also includes real world examples further it offers advice on which procedures should be followed to achieve satisfactory results and provides insights that will promote the transition to the sustainable utilization of various waste products

Microbes for Sustainable Development and Bioremediation 2019-12-13

this book provides state of the art description of various approaches techniques and some basic fundamentals of bioremediation to manage a variety of organic and inorganic wastes and pollutants present in our environment a comprehensive overview of recent advances and new development in the field of bioremediation research are provided within relevant theoretical framework to improve our understanding for the cleaning up of polluted water and contaminated land the book is easy to read and language can be readily comprehended by aspiring newcomer students researchers and anyone else interested in this field renowned scientists around the world working on the above topics have contributed chapters in this edited book we have addressed the scope of the inexpensive and energy neutral bioremediation technologies the scope of the book extends to environmental agricultural scientists students consultants site owners industrial stakeholders regulators
Coal and Coalbed Gas 2013-10-19

this book provides a timely review of strategies for coping with polluted ecosystems by employing bacteria fungi and algae it presents the vast variety of microbial technologies currently applied in the bioremediation of a variety of anthropogenic toxic chemicals mining and industrial wastes and other pollutants topics covered include microbe mineral interactions biosensors in environmental monitoring iron mineral transformation microbial biosurfactants bioconversion of cotton gin waste to bioethanol anaerobe bioleaching and sulfide oxidation further chapters discuss the effects of pollution on microbial diversity as well as the role of microbes in the bioremediation of abandoned mining areas industrial and horticultural wastes wastewater and sites polluted with hydrocarbons heavy metals manganese and uranium

Bioreduction of Selenite and Tellurite by Phanerochaete Chrysosporium 2021-12-17

sustainable sources of energy and a supply of good quality water are two major challenges facing modern societies across the globe biomass from cultivated plants may be used to generate energy but at the cost of contaminated surface waters from pesticide and fertiliser use this two volume set examines the potential use of biomass as both a source of sustainable energy and a resource to tackle contaminated soils and wastewaters consideration is given to non food crops bacteria and fungi as sources of biomass and the book enables the reader to identify the best local bioresources according to the desired application with contributions from across the globe this is an essential guide to meeting the demand for energy and pollution remediation by exploiting local and renewable resources the example scenarios given will inspirational to policy makers and local officers while chemical engineers and environmental scientists in both academia and industry will benefit from the comprehensive review of current thinking and application

Environmental Microbiology and Biotechnology 2020-09-23

the global environment has significantly changed due to a number of factors such as industrial pollution expansion of agricultural land way beyond the fringe forest zones destruction of virgin forests loss of quality agricultural lands due to soil erosion loss of global wildlife and biodiversity climate change global warming devastating forest fires floods draughts melting of glaciers to mention a few human or anthropogenic impacts are in turn devastating the planet with our attention being shifted only to the shining aspect of our civilizations the most alarming fact about this hidden factor is that they are all directly or indirectly impacted by human activities in some way or other the present work environment at crossroads deals with various environmental problems like climate change global warming food security bioremediation of waste oil spills and problems of heavy metal toxicity control strategies like use of gene therapy conservation of mangroves revival of
river vishwamitri and role of plant and animals in biodiversity conservation is discussed

**Bioremediation Science 2021-05-21**

this collection focuses on energy efficient technologies including innovative ore beneficiation smelting technologies recycling and waste heat recovery the volume also covers various technological aspects of sustainable energy ecosystems processes that improve energy efficiency reduce thermal emissions and reduce carbon dioxide and other greenhouse emissions papers addressing renewable energy resources for metals and materials production waste heat recovery and other industrial energy efficient technologies new concepts or devices for energy generation and conversion energy efficiency improvement in process engineering sustainability and life cycle assessment of energy systems as well as the thermodynamics and modeling for sustainable metallurgical processes are included this volume also includes topics on co2 sequestration and reduction in greenhouse gas emissions from process engineering sustainable technologies in extractive metallurgy as well as the materials processing and manufacturing industries with reduced energy consumption and co2 emission contributions from all areas of non nuclear and non traditional energy sources such as solar wind and biomass are also included in this volume papers from the following symposia are presented in the book energy technologies and co2 managementadvanced materials for energy conversion and storage deriving value from challenging waste streams recycling and sustainability joint sessionsolar cell siliconstored renewable energy in coal

**Environmental Microbial Biotechnology 2015-07-15**

waste management and resource recycling in the developing world provides a unique perspective on the state of waste management and resource recycling in the developing world offering practical solutions based on innovative tools and technologies along with examples and case studies the book is organized by waste type including electronic industrial and biomedical hazardous with each section covering advanced techniques such as remote sensing and gis as well as socioeconomic factors transnational transport and policy implications waste managers environmental scientists sustainability practitioners and engineers will find this a valuable resource for addressing the challenges of waste management in the developing world there is high potential for waste management to produce energy and value added products sustainable waste management based on a circular economy not only improves sanitation it also provides economic and environmental benefits in addition to waste minimization waste to economy and waste to energy have become integral parts of waste management practices a proper waste management strategy not only leads to reduction in environmental pollution but also moves toward generating sufficient energy for improving environmental sustainability in coming decades presents case studies in every section to illustrate practical applications across the globe includes lessons learned from developed regions that can be applied to developing regions organized by type of waste with consistent coverage in each section to promote ease of navigation
Biochar application essential soil microbial ecology outlines the cutting edge research on
the interactions of complex microbial populations and their functional structural and
compositional dynamics as well as the microbial ecology of biochar application to soil the
use of different phyto chemical analyses possibilities for future research and
recommendations for climate change policy biochar or charcoal produced from plant matter
and applied to soil has become increasingly recognized as having the potential to address
multiple contemporary concerns such as agricultural productivity and contaminated
ecosystem amelioration primarily by removing carbon dioxide from the atmosphere and
improving soil functions biochar application is the first reference to offer a complete
assessment of the various impacts of biochar on soil and ecosystems and includes chapters
analyzing all aspects of biochar technology and application to soil from ecogenomic analyses
and application ratios to nutrient cycling and next generation sequencing written by a team
of international authors with interdisciplinary knowledge of biochar this reference will
provide a platform where collaborating teams can find a common resource to establish
outcomes and identify future research needs throughout the world includes multiple tables
and figures per chapter to aid in analysis and understanding includes a comprehensive table
of the methods used within the contents ecosystems contaminants future research and
application opportunities explored in the book includes knowledge gaps and directions of
future research to stimulate further discussion in the field and in climate change policy
outlines the latest research on the interactions of complex microbial populations and their
functional structural and compositional dynamics offers an assessment of the impacts of
biochar on soil and ecosystems

Environment at Crossroads Challenges and Green
Solutions 2020-07-17

electronic and electric waste e waste defined as end of life electronic products including
computers television sets mobile phones transformers capacitors wires and cables are a
major global environmental concern the crude recycling of e waste releases persistent toxic
substances such as heavy metals polybrominated diphenyl ethers pbdes polychlorinated
dibenzodioxins pcdds polychlorinated dibenzofurans pcdfs polycyclic aromatic hydrocarbons
pahs and polychlorinated biphenyls pcbs and the environmental pollution and health risks
cauised by the improper disposal of e waste has become an urgent issue this book offers an
overview of e waste history sources and entry routes in soil air water and sediment it also
addresses e waste transport and fate bioavailability and biomonitoring e waste risk
assessment impacts on the environment and public health in addition it discusses the impact
of e waste on soil microbial community diversity structure and function and reviews the
treatment and management strategies such as bioremediation and phytoremediation as well
as policies and future challenges given its scope it is a valuable resource for students
researchers and scholars in the field of electronics manufacturing environmental science
and engineering toxicology environmental biotechnology soil sciences and microbial ecology
as well as and plant biotechnology
very few materials have attracted so much attention in recent years both from researchers and industry as layered double hydroxides (LDHs) have LDHs which are also referred to as anionic clays or hydrotalcites are a wide class of inorganic ionic lamellar clay materials consisting of alternately stacked positively charged metal hydroxide layers with intercalated charge balancing anions in hydrated interlayer regions. Their unique properties such as their extremely high versatility in chemical composition and intercalation ability, extraordinary tuneability in composition as well as morphology, good biocompatibility and high anion exchangeability have triggered immense interdisciplinary interest for their use in many different fields of chemistry, biology, medicine, and physics. Indeed, the applications of LDHs are constantly growing. LDHs in the form of aggregated lamellar clusters, exfoliated single layer nanosheets, or hierarchical films of interconnected nanoplatelets can be effectively used as nanoscale vehicles in drug delivery, heterogeneous catalysts and supports for molecular catalysts, ion exchangers, and adsorbents. Solid electrolytes or fillers in electrochemistry for the fabrication of superhydrophobic surfaces, water treatment and purification, and the synthesis of functional thin films. This book gathers the contributions to the special issue layered double hydroxides of crystals which includes two review articles and seven research papers.