



MICROBIAL GRANULATION TECHNOLOGY FOR NUTRIENT REMOVAL FROM WASTEWATER

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Microbial Granulation Technology For Nutrient Removal From Wastewater

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Microbial Granulation Technology For Nutrient Removal From Wastewater:

Microbial Granulation Technology for Nutrient Removal from Wastewater Yu Liu, Lei Qin, Shu-Fang Yang, 2007
Aerobic granulation technology for wastewater treatment has been widely exploited in recent years. Currently, research on aerobic granulation is being intensively conducted in universities, institutes, private or public interest research organisations world wide. This book provides the latest research outcomes on the fundamentals and applications of this technology for biological nutrient removal from wastewater. The book offers researchers and practitioners in wastewater treatment engineering up to date knowledge and understanding of this novel nutrient removal biotechnology. Technologies for the Treatment and Recovery of Nutrients from Industrial Wastewater Val del Río, Ángeles, Campos Gómez, José Luis, Mosquera Corral, Anuska, 2016-10-21 The production of wastewater from various human and industrial activities has a harsh impact on the environment. Without adequate treatment, the disposal of this wastewater poses a threat to the quality of water globally. Technologies for the Treatment and Recovery of Nutrients from Industrial Wastewater investigates emergent research and best practices within the field of wastewater management. Highlighting novel technological tools in wastewater treatment, effective nutrient removal technologies and innovative solutions to quality water preservation practices, this book is a critical reference source for professionals, scientists, academics and students. **Biogranulation Technologies for Wastewater Treatment** Joo-Hwa Tay, Stephen Tiong-Lee Tay, Yu Liu, Kuan Yeow Show, Volodymyr Ivanov, 2006-06-16 Microbial granules have practical importance in anaerobic and aerobic biological wastewater treatment. Advantages of granules are retention of biomass in reactor, diversity of microorganisms, complex structure and resistance to unfavorable conditions. Microbial granules can be used to treat municipal and industrial wastewater for removal of organic matter, xenobiotics, nutrients and heavy metals. The book covers almost all aspects of formation and use of microbial granules in wastewater treatment. The data on aerobic microbial granulation are related mostly to laboratory systems due to few pilot systems in the world using aerobic microbial granules. However, by the analogy with anaerobic granulation, which is now used worldwide, it is possible to predict wide applications of aerobic granulation. This book will help researchers and engineers develop these new biotechnologies of wastewater treatment based on aerobic granulation. Covers all aspects of formation, organization and use of microbial granules in wastewater treatment. Integrates engineering, microbiology and biotechnology of microbial granules. Comprises of deep fundamental data as well as practical information for applications of microbial granules in wastewater treatment. Water Infrastructure for Sustainable Communities Xiaodi Hao, Vladimir Novotny, Valerie Nelson, 2010-07-31 A new model for water management is emerging worldwide in response to water shortages, polluted waterways, climate change and loss of biodiversity. Cities and towns are questioning the ecological and financial sustainability of big pipe water stormwater and sewer systems and are searching for lighter footprint, more sustainable solutions. Pilot projects are being built that use treat, store and reuse water locally and that build distributed designs into restorative hydrology. This book has

been developed from the conference on Sustainable Water Infrastructure for Villages and Cities of the Future SWIF2009 held in November 2009 in Beijing China that brought together an international gathering of experts in urban water and drainage infrastructure landscape architecture economics environmental law citizen participation utility management green building and science and technology development Water Infrastructure for Sustainable Communities China and the World reveals how imaginative concepts are being developed and implemented to ensure that cities towns and villages and their water resources can become ecologically sustainable and provide clean water With both urban and rural waters as a focal point the links between water quality and hydrology landscape and the broader concepts of green cities villages and smart development are explored The book focuses on decentralized concepts of potable water stormwater and wastewater management that would provide clean water It results in water management systems that would be resilient to extreme events such as excessive flows due to extreme meteorological events severe droughts and deteriorated water and urban ecosystem quality A particular emphasis is placed on learning lessons from the many innovative projects being designed in China and other initiatives around the world The principal audience for the book is university faculty and students scientists in research institutes water professionals governmental organizations NGOs urban landscape architects and planners Visit the IWA WaterWiki to read and share material related to this title <http://www.iwawaterwiki.org/xwiki/bin/view/Articles/WaterInfrastructureforSustainableCommunities> Edited by Professor Xiaodi Hao Beijing University of Civil Engineering and Architecture P R of China Professor Vladimir Novotny Northeastern University Boston USA and Dr Valerie Nelson Coalition for Alternative Wastewater Treatment MA USA

Management of Wastewater and Sludge Izharul Haq Farooqi, Saif Ullah Khan, 2023-05-12 Management of micropollutants and disinfection of byproducts in municipal wastewater and extraction of energy from the sludge produced in wastewater treatment plants is under constant focus This book presents a detailed know how regarding sustainable management of waste produced in municipal and industrial activities through novel state of the art techniques used for the treatment of toxic industrial wastes and municipal wastewater It deals with the management of municipal sludge and solid waste including leachates produced from landfill sites It also provides detailed information for achieving the stringent standards set by regulatory bodies for municipal and industrial effluents Features Covers development of new novel reactor configurations for wastewater treatment Describes handling and removal of emerging contaminants like pharmaceutical compounds endocrine disruptors and disinfection byproducts Deliberates combination of wastewater and micropollution Contains an in depth discussion on treatment and disposal of fecal sludge Highlights new economically feasible techniques to enhance biogas recovery from treatment plant sludges This book is aimed at researchers and graduate students in environmental engineering wastewater treatment mechanical engineering chemical engineering and energy engineering

Waste Management: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources, 2019-12-06 As the world's population continues to grow and economic

conditions continue to improve more solid and liquid waste is being generated by society Improper disposal methods can not only lead to harmful environmental impacts but can also negatively affect human health To prevent further harm to the world's ecosystems there is a dire need for sustainable waste management practices that will safeguard the environment for future generations Waste Management Concepts Methodologies Tools and Applications is a vital reference source that examines the management of different types of wastes and provides relevant theoretical frameworks about new waste management technologies for the control of air water and soil pollution Highlighting a range of topics such as contaminant removal landfill treatment and recycling this multi volume book is ideally designed for environmental engineers waste authorities solid waste management companies landfill operators legislators environmentalists policymakers government officials academicians researchers and students

Microbial Biofilms in Bioremediation and Wastewater Treatment Y.V. Nancharaiyah,Vayalam P. Venugopalan,2019-10-18 Biofilms represent the natural living style of microbial communities and play a pivotal role in biogeochemical cycles and natural attenuation Biofilms can be engineered for biodegradation and biotransformation of organic and inorganic contaminants for both in situ bioremediation and ex situ treatment in bioreactors This book focuses on microbial biofilms and their potential technological applications for sustainable development It covers recent advances in biofilm technologies for contaminant remediation coupled to recovery of resources and serves as a complete reference on the science and technology behind biofilm mediated bioremediation and wastewater treatment

Microbial Wastewater Treatment Maulin P. Shah,Susana Rodriguez-Couto,2019-06-12 Microbial Wastewater Treatment focuses on the exploitation of microorganisms as decontaminating tools to treat polluted wastewater a worldwide concern Microorganism based processes are seen as promising technologies to treat the ever increasing problem of polluted wastewater The book covers recently developed process technologies to solve five major trends in the field of wastewater treatment including nutrient removal and recovery trace organic compounds energy saving and production sustainability and community involvement Illustrates the importance of microorganisms in wastewater treatment Points out the reuse of the treated wastewater Highlights the recovery of resources from wastewater Pays attention to the occurrence of novel micro pollutants Introduces new trends in wastewater technology

Biological and Hybrid Wastewater Treatment Technology Makarand M. Ghangrekar,Shalini Yadav,Ram Narayan Yadava,2024-08-02 This book provides technical information on different biological and hybrid wastewater treatment systems for the treatment of wastewater and reuse and tracks their progress towards practical and field scale applications including strategies to be adopted for minimizing the losses and maximizing the benefits as well as protecting the environment through the application of advanced biological and hybrid wastewater treatment Technology In addition it discusses the crucial parts that science technology and innovation play in the formulation implementation and administration of wastewater treatment policy It highlights the challenges that must be overcome to adopt biological and hybrid wastewater treatment infrastructure regulations successfully and provides some answers Also it

investigates how the biological and hybrid wastewater treatment technology may be used in a wide variety of fields sets apart from other on the shelf publications on the market Also it delves into the core concepts of Biological and Hybrid Wastewater Treatment Systems It explores how these concepts can be modified to fit a variety of contexts and uses Applications such as managing facilities dealing with pandemics urban wastewater treatment and reuse farming and other applications are included in this book As a consequence this book's content is engaging and it will pique the interest of a diverse audience of readers who come from a wide variety of different professional backgrounds Therefore the book is written by local experts in the topic who dealing with the treatment of wastewater treatment technologies for a long time in India This book will be helpful to researchers entrepreneurs professionals planners policymakers environmental engineers and others interested in biological and hybrid wastewater treatment system management strategies through the application of breakthroughs in biological and hybrid wastewater treatment technologies The 6th International Symposium on Water Resource and Environmental Management Haoqing Xu, 2024-04-29 This book is designed to be the introductory work in the Water Energy Environment Governance from Interdisciplinary Perspectives Series and provides an in depth look at sustainable development and management in the water sector across The water energy environment nexus WEEN represents important interstate connections of water energy and the environment Present day water and energy systems are interdependent Water is used in all phases of energy production and electricity generation Energy is required to extract convey and deliver water of appropriate quality for diverse human uses and then again to treat waste waters prior to their return to the environment Security in water energy and the environment is associated with human economic and environmental sustainability This interweaving is strengthening under aggregating natural resource scarcity and climate change This book includes selected papers from the 6th International Symposium on Water Resource and Environmental Management WREM 2023 and consists of themes pertaining to water resource and environmental management It provides readers with comprehensive information and formulation of solutions leading to a set of Water Energy Environment Governance from Interdisciplinary Perspectives through our forum and the publication of your research As a reference it is of interest to students scientists engineers government officials and water resource managers **Green Innovation, Sustainable Development, and Circular Economy** Nitin Kumar Singh, Siddhartha Pandey, Himanshu Sharma, Sunkulp Goel, 2020-10-14 Although green innovation and technology is not new so far very limited information is available regarding the diversified approaches for green technologies and engineering This book highlights the challenges and opportunities offering a roadmap for using various approaches in the most cost effective way The book discusses the interrelationship between a circular economy and green technologies It presents the dimensions of green innovations and illustrates the challenges of industrialization especially in terms of material synthesis and utilized processes It covers the current environmental and health challenges of societies and describes the role of stakeholders in developing sustainable

societies and industries This book provides a line of approach to core and interdisciplinary students academicians research scientists and various industry personnel to present their ideas of green innovations with a common vision of sustainable development of community and industries in mind Features Discusses the interrelationship between a circular economy and green technologies Presents the dimensions of green innovations Illustrates the challenges of industrialization especially in terms of material synthesis and utilized processes Covers the current environmental and health challenges of societies Offers the identification and role of stakeholders in the sustainable development of societies and industries **Innovative**

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

Environmental Technologies to Treat Nitrogen Pollution Francisco J. Cervantes, 2009-06-30 Environmental Technologies to Treat Nitrogen Pollution provides a thorough understanding of the principles and applications of environmental technologies to treat nitrogen contamination The main focus is on water and wastewater treatment with additional coverage of leachates and off gasses The book brings together an up to date compilation of the main physical chemical and biological processes demanded for the removal of nitrogenous contaminants from water wastewater leachates and off gasses It includes a series of chapters providing a deep and broad knowledge of the principles and applications required for the treatment of nitrogen pollution Each chapter has been prepared by recognized specialists across the range of different aspects involved in the removal of nitrogenous contaminants from industrial discharges Environmental Technologies to Treat Nitrogen Pollution is the first book to provide a complete review of all the different processes used for the global management of nitrogen pollution It also contains updated information about strategies to achieve nitrogen recovery and reuse in different industrial sectors Several case studies document the application of different environmental technologies to manage nitrogen pollution This book will be of interest to lecturers and graduate students in the following subject areas Environmental Engineering Environmental Biotechnology wastewater treatment plant design water pollution control contaminants recovery and reuse The book will also be an attractive reference for environmental engineering consultants Sewage - Management and Treatment Techniques Hassimi Abu Hasan, 2025-03-26 Sewage Management and Treatment Techniques explores innovative strategies to treat and manage sewage It provides a comprehensive overview of technological and socio environmental aspects making it a valuable resource for policymakers academicians researchers engineers and students The book discusses

biological treatment techniques covering both aerobic and anaerobic processes It emphasizes microbial interactions treatment efficiency and the advantages of each approach in reducing organic and inorganic pollutants in sewage Microalgae and black soldier fly larvae are also promising biological methods for sewage treatment emphasizing their role in nutrient recovery and environmental sustainability This book also discusses the treatment and recovery of biosolids using a natural biopolymer based approach The approach offers an eco friendly alternative for sludge recovery from sewage wastewater To intensify treatment technologies artificial intelligence and Internet of Things integration in sewage management are gaining attention This autonomous system can enhance real time monitoring predictive analytics and operational efficiency in sewage treatment plants Additionally a perspective on sewage management s socio economic and environmental effects is discussed Different scales of recycling systems are evaluated while considering ecological value and sustainable sewage management practices This book serves as a guide for developing sustainable sewage management systems globally by integrating scientific advancement emerging technologies and socio environmental aspects

Removal of Emerging Contaminants Through Microbial Processes Maulin P Shah,2020-10-14 The abundance of organic pollutants found in wastewater affect urban surface waters Traditional wastewater management technologies focus on the removal of suspended solids nutrients and bacteria however new pollutants such as synthetic or naturally occurring chemicals are often not monitored in the environment despite having the potential to enter the environment and cause adverse ecological and human health effects Collectively referred to as emerging contaminants they are mostly derived from domestic activities and occur in trace concentrations ranging from pico to micrograms per liter Environmental contaminants are resistant to conventional wastewater treatment processes and most of them remain unaffected causing contamination of receiving water This in turn leads to the need for advanced wastewater treatment processes capable of removing environmental contaminants to ensure safe fresh water sources This book provides an up to date overview of the current bioremediation strategies including their limitations challenges and their potential application to remove environmental pollutants It also introduces the latest trends and advances in environmental bioremediation and presents the state of the art in biological and chemical wastewater treatment processes As such it will appeal to researchers and policy makers as well as undergraduate and graduate environmental sciences students

Biological Treatment of Industrial Wastewater Maulin P Shah,2021-11-18 Many industrial processes use water as a solvent and therefore produce wastewater containing chemicals from that process The amounts of these chemicals and the types will vary hugely depending on the industry and the processes running and may include things that are hazardous to health or the environment This makes the treatment of industrial wastewater both extremely important and highly complex One route for industrial wastewater treatment is the use of bioreactors Biological Treatment of Industrial Wastewater presents a comprehensive overview of the latest advances and trends in the use of bioreactors for treating industrial wastewater Several different types of bioreactor and their applications are discussed

alongside trends and considerations important in designing bioreactors Bringing together a wealth of different approaches and voices this book will be a useful resource for anyone working in water treatment or looking at how industrial processes can be made more environmentally friendly

Optimization and Applicability of Bioprocesses Hemant J. Purohit,Vipin Chandra Kalia,Atul N. Vaidya,Anshuman A. Khardenavis,2018-01-02 This book argues that the sustainable management of resources requires a systematic approach that primarily involves the integration of green innovative biotechnological strategies and eco engineering It discusses how microbial community intelligence can be used for waste management and bio remediation and explains how biological processes can be optimized by integrating genomics tools to provide perspectives on sustainable development The book describes the application of modern molecular techniques such as fluorescence in situ hybridization FISH highly sensitive catalyzed reporter deposition CARD FISH in situ DNA hybridization chain reaction HCR and methods for detecting mRNA and or functional genes to optimize bioprocessess These techniques supplemented with metagenomic analysis reveal that a large proportion of micro organisms still remain to be identified and also that they play a vital role in establishing bioprocesses

Water Pollution and Remediation: Organic Pollutants Inamuddin,Mohd Imran Ahamed,Eric Lichtfouse,2021-03-08 Wastewater pollution is a major issue in the context of the future circular economy because all matter should be ultimately reused calling for efficient depollution techniques This book present timely reviews on the treatment of wastewater contaminated by organic pollutants with focus on aerobic granulation and degradation Organic pollutants include microplastics phthalates humic acids polycyclic aromatic hydrocarbons pharmaceutical drugs and metabolites plastics oil spills petroleum hydrocarbons personal care products tannery waste dyes and pigments

Handbook of Metal-Microbe Interactions and Bioremediation Surajit Das,Hirak Ranjan Dash,2017-04-07 Around the World metal pollution is a major problem Conventional practices of toxic metal removal can be ineffective and or expensive delaying and exacerbating the crisis Those communities dealing with contamination must be aware of the fundamentals advances of microbe mediated metal removal practices because these methods can be easily used and require less remedial intervention This book describes innovations and efficient applications for metal bioremediation for environments polluted by metal contaminates

Circular Economy Applications for Water Security Erick R. Bandala,2024-08-13 In arid and semi arid regions where water demand exceeds water availability water security is becoming a significant concern not only related to water availability but also to rigorous and costly requirements to remove conventional and emerging contaminants from effluents discharging into drinking water sources or as water reuse becomes an alternate water supply for communities in these regions Water and wastewater treatment demands a great amount of energy and resources highlighting the need for novel applications of the circular economy concept Circular Economy Applications for Water Security examines knowledge gaps avenues of future research and challenges related to the potential of enhanced underutilized waste materials as a transition to circular economy applications for ensuring the proper quality of water This book includes fundamental

information and practical examples that helps to better understand the concepts included The circular economy concept is helpful to incept sustainability in the water treatment processes Every chapter includes the identification of knowledge gaps avenues for further research and challenges that guide readers towards real state of the art analysis Contributors are experts in their areas and will commit to explaining concepts in a user friendly way without missing scientific rigor

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