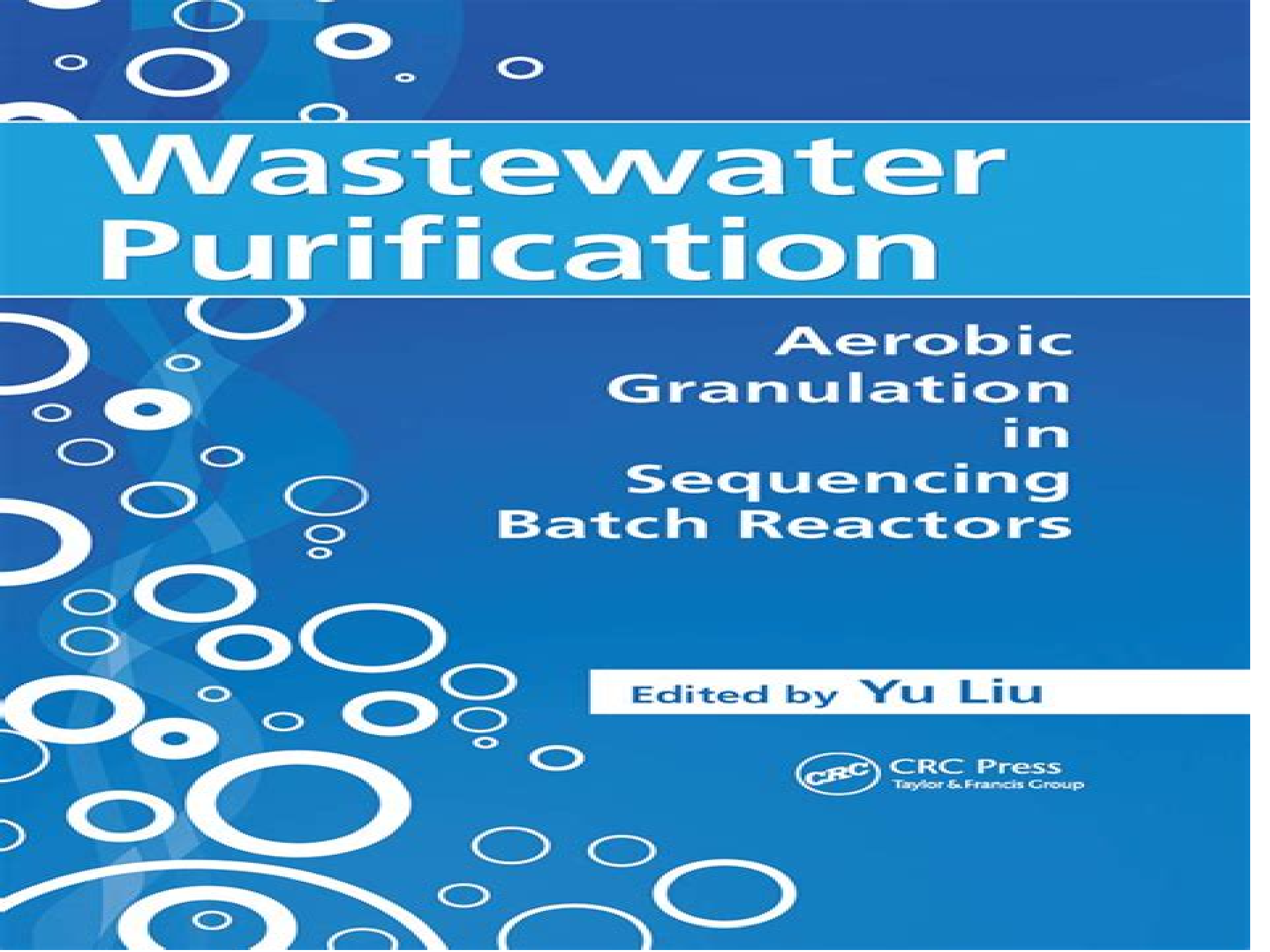




Wastewater Purification

**Aerobic
Granulation
in
Sequencing
Batch Reactors**

Edited by **Yu Liu**



CRC Press
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Wastewater Purification Aerobic Granulation In Sequencing Batch Reactors

Albert A Gayle



Wastewater Purification Aerobic Granulation In Sequencing Batch Reactors:

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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.

Sewage Treatment Plants Katerina Stamatelatou, Konstantinos P. Tsagarakis, 2015-05-15 Sewage Treatment Plants Economic Evaluation of Innovative Technologies for Energy Efficiency aims to show how cost saving can be achieved in sewage treatment plants through implementation of novel energy efficient technologies or modification of the conventional energy demanding treatment facilities towards the concept of energy streamlining. The book brings together knowledge from Engineering, Economics, Utility Management and Practice and helps to provide a better understanding of the real economic value with methodologies and practices about innovative energy technologies and policies in sewage treatment plants.

Advanced Biological Treatment Processes Lawrence K. Wang, Nazih K. Shammass, Yung-Tse Hung, 2010-03-10 The past 30 years have seen the emergence of a growing desire worldwide that positive actions be taken to restore and protect the environment from the

degrading effects of all forms of pollution air water soil and noise Because pollution is a direct or indirect consequence of waste the seemingly idealistic demand for zero discharge can be construed as an unrealistic demand for zero waste However as long as waste continues to exist we can only attempt to abate the subsequent pollution by converting it to a less noxious form Three major questions usually arise when a particular type of pollution has been identified 1 How serious is the pollution 2 Is the technology to abate it available and 3 Do the costs of abatement justify the degree of abatement achieved This book is one of the volumes of the Handbook of Environmental Engineering series The principal intention of this series is to help readers formulate answers to the last two questions above The traditional approach of applying tried and true solutions to specific pollution problems has been a major contributing factor to the success of environmental engineering and has accounted in large measure for the establishment of a methodology of pollution control However the realization of the ever increasing complexity and interrelated nature of current environmental problems renders it imperative that intelligent planning of pollution abatement systems be undertaken

Aerobic Granulation with Industrial Wastewater in Sequencing Batch Reactors Dimas Pradhasumitra Mahardika,2014

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

Design of Municipal Wastewater Treatment Plants MOP 8, Fifth Edition Water Environment Federation,2012-09-01 Contemporary Municipal Wastewater Treatment Plant Design Methods Fully revised and updated this three volume set from the Water Environment Federation and the Environmental and Water Resources Institute of the American Society of Civil Engineers presents the current plant planning configuration and design practices of wastewater engineering professionals augmented by performance information from operating facilities Design of Municipal Wastewater Treatment Plants Fifth Edition includes design approaches that reflect the experience of more than 300 authors and reviewers from around the world Coverage includes Integrated facility design Sustainability and energy management Plant hydraulics and pumping Odor control and air emissions Thoroughly updated information on biofilm reactors Biological physical and chemical liquid treatment Membrane bioreactors IFAS and other integrated biological processes Nutrient removal Sidestream treatment Wastewater disinfection Solids minimization treatment and stabilization including thermal processing Biosolids use and disposal

Environment Materials and Environment Management, EMEM2010 Zhen Yu Du,X.B. Sun,2010-06-07 Selected peer reviewed papers from the 2010 International Conference of Environment Materials and Environment Management EMEM 2010 will be held on July 24 25 2010 in Harbin China

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.

Development of a Continuous Flow Reactor for Aerobic Granular Sludge Tanner Devlin, 2019 Aerobic granular sludge is an advanced biological process that provides sustainable wastewater treatment. Compared to conventional wastewater treatment processes, aerobic granular sludge exhibits better settling, higher volumetric loading, reduced chemical and electrical requirements, and less biosolids production. Currently, aerobic granular sludge is only available as a sequencing batch reactor process. Sequencing batch reactors, however, would not be suitable for retrofit at most existing wastewater treatment facilities. Therefore, many facilities would not be able to realize the benefits of aerobic granular sludge unless significant changes to existing infrastructure were made. A more compatible technology, being a continuous flow reactor, would facilitate the implementation of aerobic granular sludge into existing facilities that would otherwise struggle with sequencing batch reactors. Thus, the goal of these studies was to develop a continuous flow reactor for aerobic granular sludge that would be suitable for retrofit into existing wastewater treatment facilities. To attain the goal, several items had to be addressed, including: 1) the suitability of aerobic granular sludge to treat low strength municipal wastewater; 2) the importance of hydrodynamic shear force for aerobic granular sludge stability; 3) the role of organic loading rate on aerobic granular sludge stability and performance; 4) the impact of selective wasting on granulation in continuous flow; and 5) the impact of reactor configuration on granulation in continuous flow. For more general items such as suitability for low strength wastewater and the role of hydrodynamic shear force, lab scale sequencing batch reactors were used. The remaining tests were carried out in lab and pilot scale continuous flow reactors. Based on the results, design and operational parameters for an aerobic granular sludge continuous flow reactor were developed and confirmed to be feasible for the treatment of low strength municipal wastewater.

Biofilm Systems IV F. Rogalla, Marinus Cornelis Maria Loosdrecht, 2000-05-31 In the last decade, biofilm systems have made staggering progress. With adaptation of the process to nitrogen removal, trickling filters

have become an economical alternative to activated sludge enabling the upgrading of thousands of plants. Better understanding of rotating biological contractors has made them a preferred technology for small scale plants and there is growing use of biological aerated filters especially in small footprint nitrogen removal. High rate fluidised bed or airlift reactors both anaerobic and aerobic with and without carriers have shown their efficiency in several hundred industrial applications leading to applications in municipal treatment. Moving bed biofilm reactors now compete with hybrid systems for upgrading existing activated sludge basins. The biofilm conference also brings together professionals studying clean water aspects of biofilms with those applying them to wastewater reactors. While the latter use the growth of fixed bacteria to optimise the efficiency of treatment systems the former aim to combat formation of biofilms in distribution networks. But many tools for analysis and modelling can be shared and the knowledge of what favours biofilm growth and performance can be used to inhibit their occurrence. These proceedings offer an unrivalled authoritative collection of current work worldwide on the research development and application of biofilm systems.

Design of Water Resource Recovery Facilities, Manual of Practice No.8, Sixth Edition Water Environment Federation, 2017-09-29 Complete Coverage of the State of the Art in Water Resource Recovery Facility Design Featuring contributions from hundreds of wastewater engineering experts this fully updated guide presents the latest in facility planning configuration and design. *Design of Water Resource Recovery Facilities* WEF Manual of Practice No 8 and ASCE Manuals and Reports on Engineering Practice No 76 Sixth Edition covers key technical advances in wastewater treatment including Advances with membrane bioreactors applications Advancements within integrated fixed film activated sludge IFAS systems and moving bed biological reactors systems Biotrickling filtration for odor control Increased use of ballasted flocculation Enhanced nutrient control systems Sidestream nutrient removal to reduce the loading on the main nutrient removal process Use and application of wireless instrumentation Use and application of modeling wastewater treatment processes for the basis of design and evaluations of alternatives Process design and disinfection practices to minimize generation of TTHMs and other organics monitored for potable water quality Approaches to minimizing biosolids production and advances in biosolids handling including effective thermal hydrolysis and improvements in sludge thickening and dewatering technologies Increasing goals toward energy neutrality and driving net zero Trend toward resource recovery

Applied and Environmental Microbiology, 2007

World Water Congress Part 4 W. O. K. Grabow, 2001 Selected Proceedings of the 1st IWA World Water Congress held in Paris France 3-7 July 2000 The World Water Congress held in Paris in July 2000 was the first under the banner of the International Water Association formed by the merger of the International Association on Water Quality and the International Water Services Association. The success of the merger was reflected in the unprecedented degree of interest and participation in the Congress with nearly two and a half thousand delegates attending for 450 oral presentations 750 poster presentations and 4 workshops and seminars. From the large number of oral presentations 43 dealing with aspects of wastewater treatment have been selected.

for this issue Topics include adsorption volatile organic emissions membrane technology particle separation large wastewater treatment plants design operation and costs instrumentation and control agro industries waste management With authors who rank among the world's leading experts in these fields tackling some of the most prominent contemporary problems these proceedings are an essential compilation of the latest advances relating to the management of impacts on the water environment *Advances in Environmental Science and Engineering* Reza Iranpour, Ji Zhao, Ai Jie Wang, Feng Lin Yang, Xin Yong Li, 2012-05-14 Selected peer reviewed papers from the 2012 International Conference on Energy and Environmental Protection ICEEP 2012 June 23-24 2012 Hohhot China **Transactions of the American Society of Civil Engineers** American Society of Civil Engineers, 2006 Vols 29-30 contain papers of the International Engineering Congress Chicago 1893 v 54 pts A-F papers of the International Engineering Congress St Louis 1904 Environmental Management Robert H. Theobald, 2008 Environmental management deals with the use and conservation of natural resources protection of habitats and control of hazards and includes the field of applied ecology this book presents the latest research from around the world in this field Anaerobic Digestion IX Jules B. van Lier, H. Lubberding, 2002-05-31 The necessity for sustainable development has stimulated interest in technologies that will lessen the impact of society on the planet With anaerobic processes as occurring in nature organic material and pollutants are converted into bio gas organic fertiliser and minerals end products that can be recycled Interest in anaerobic processes is further enhanced by the worldwide concern over the ever increasing consumption of fossil energy and the consequent drive for alternative sources of energy such as biomass As a result the development of anaerobic processes is the result of a push by the technology and a pull by society Politicians ask what role anaerobic processes can play in their plans for the future The papers selected from this congress should make a major contribution to such a dialogue by presenting the latest work from research and development programmes which are linked up with political and strategic targets The 9th Anaerobic Digestion Congress presented a comprehensive picture of the various activities in this field all over the world in universities institutes and industry From the hundreds of oral and poster presentations 58 papers covering basic research and applied processes have been selected for these proceedings Topics addressed include microbiology modelling and kinetics featuring the newly launched IWA Anaerobic Digestion Model No 1 reactor technology wastewater treatment solid waste integrated concepts and post treatment These proceedings constitute an invaluable and genuinely authoritative survey of anaerobic digestions's present status and future prospects

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