

Special Issue on Wastewater Treatment Technologies

Jaechul Yu ^{1,2} ¹ Institute for Environment and Energy, Pusan National University, Busan 46241, Korea; yjcall0715@pusan.ac.kr² Department of Civil and Environment Engineering, Pusan National University, Busan 46241, Korea

Wastewater treatment technology has a history spanning thousands of years, while the activated sludge process is only 100 years old. Wastewater treatment technology has been developed by combining basic science such as chemistry, microbiology, and biochemistry with various engineering technologies such as civil engineering, chemical engineering, and biotechnology. To solve global problems such as water shortages and energy crises, wastewater is recognized as a resource, and various wastewater treatment technologies are being researched.

This Special Issue aimed to collect and present all breakthrough research on all wastewater treatment technologies, including activated sludge, anaerobic digestion, membrane bioreactors, membrane aerated biofilm reactors, microbial electrochemical technology and others, removal mechanisms, and microbial communities.

A total of nine papers (seven research papers and two review papers) in various fields of wastewater treatment technology including advanced oxidation, microbial fuel cell, anammox, and bioflocculant are presented in this Special Issue. Oh et al. [1] reported that high-concentration *N*-methyldiethanolamine wastewater was successfully treated using a wastewater treatment configuration consisting of advanced oxidation and biological wastewater treatment technology. Kim et al. [2] reported that the augmentation of calcium and magnesium contributes to alleviating the salinity stress on anammox granules, and is expected to allow for the application of the anammox process to saline wastewater treatment. Yu et al. [3] proposed a method for conveniently measuring anammox bacteria activity using a respirometer, and it is expected to be applied in the real wastewater treatment plant. Benettayeb et al. [4] reported that magnetic glycine-modified chitosan has low selectivity and can adsorb many metal ions in the treated leachate. Hwang et al. [5] suggested that modeling using a specific SS deposit can provide an accurate description of the granular media layer performance under a highly variable influent SS concentration in upflow granular media filtration devices widely used in rainfall runoff treatment. Yu et al. [6] suggested that an easy way to connect MFCs with different volumes can be a new option to avoid voltage reversal and minimize energy loss. Peacock et al. [7] developed a mathematical tool to evaluate the economic advantages of in situ chemical regeneration of fixed-bed industrial adsorbents of granular activated carbon for cooling water treatment systems in Cuban power plants and determined the optimal number of regeneration cycles for a maximum economic profit in the regeneration strategy. Li et al. [8] identifies and compares planted and unplanted CWMFCs regarding their efficiency in COD removal and electricity generation based on previous and recent studies. Microbial bioflocculants have attracted much attention because of their degradability and environmental friendliness. In particular, there is insufficient information on the application of the actinomycete coagulant isolated in the marine environment. Awoulusi et al. [9] investigated and summarized culture conditions and other parameters influencing biocoagulant production using response surface models or artificial neural networks.

Although submissions for this Special Issue have been closed, more in-depth research in the field of wastewater treatment technologies continues to address the challenges we face today, such as climate change, water shortages, and energy crises.



Citation: Yu, J. Special Issue on Wastewater Treatment Technologies. *Appl. Sci.* **2022**, *12*, 6504. <https://doi.org/10.3390/app12136504>

Received: 13 June 2022

Accepted: 22 June 2022

Published: 27 June 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Funding: This research received no external funding.

Acknowledgments: Thanks to all the authors and peer reviewers for their valuable contributions to this Special Issue ‘Wastewater Treatment Technology’. I would also like to express my gratitude to all the staff and people involved in this Special Issue. Finally, special thanks to Delia Pan.

Conflicts of Interest: The author declares no conflict of interest.

References

1. Oh, G.-T.; Ahn, C.-K.; Lee, M.-W. Advanced oxidation pretreatment for biological treatment of reclaimer wastewater containing high concentration *N*-methyldiethanolamine. *Appl. Sci.* **2022**, *12*, 3960. [[CrossRef](#)]
2. Kim, Y.; Yu, J.; Jeong, S.; Kim, J.; Park, S.; Bae, H.; Rhee, S.-K.; Unno, T.; Ni, S.-Q.; Lee, T. Differences in the effects of calcium and magnesium ions on the anammox granular properties to alleviate salinity stress. *Appl. Sci.* **2022**, *12*, 19. [[CrossRef](#)]
3. Yu, J.; Kim, Y.; Kim, J.; Jeong, S.; Park, S.; Lee, T. A simple analysis method of specific anammox activity using a respirometer. *Appl. Sci.* **2022**, *12*, 1121. [[CrossRef](#)]
4. Benettayeb, A.; Morsli, A.; Elwakeel, K.; Hamza, M.F.; Guibal, E. Recovery of heavy metal ions using magnetic glycine-modified chitosan—Application to aqueous solutions and tailing leachate. *Appl. Sci.* **2021**, *11*, 8377. [[CrossRef](#)]
5. Hwang, Y.; Seo, Y.; Ko, S.; Kim, D. Modeling of suspended solid removal of a granular media layer in an upflow stormwater runoff filtration system. *Appl. Sci.* **2021**, *11*, 6202. [[CrossRef](#)]
6. Yu, J. Effects of a hydraulic series connection and flow direction on electricity generation in a stack connected with different volume MFCs. *Appl. Sci.* **2021**, *11*, 1019. [[CrossRef](#)]
7. Peacock, T.M.; Sario, H.C.; Torres, J.P.; Yperman, J.; Roca, A.S.; Carleer, R.; Garcia, L.L. Mathematical tool based on breakthrough curves to evaluate the economic advantages of chemical regeneration of activated carbon in power plant: A comparative study. *Appl. Sci.* **2021**, *11*, 11786. [[CrossRef](#)]
8. Li, K.; Qi, J.; Zhang, F.; Miwornunyuie, N.; Amaniampong, P.S.; Koomson, D.A.; Chen, L.; Yan, Y.; Dong, Y.; Setordjie, V.E.; et al. The Role of Wetland Plants on Wastewater Treatment and Electricity Generation in Constructed Wetland Coupled with Microbial Fuel Cell. *Appl. Sci.* **2021**, *11*, 7454. [[CrossRef](#)]
9. Awolusi, O.O.; Ademakinwa, A.N.; Ojo, A.; Ersamus, M.; Bux, F.; Agunbiade, M.O. Marine actinobacteria bioflocculant: A storehouse of unique biotechnological resources for wastewater treatment and other application. *Appl. Sci.* **2020**, *10*, 7671. [[CrossRef](#)]