

Advancements in Water and Wastewater Treatment: Innovative Membrane Technologies and Process Optimization

Preface

Water and wastewater treatment remain at the forefront of global environmental challenges, driving the need for innovative and sustainable solutions. This special issue explores cutting-edge research on membrane technology, process intensification, and emerging treatment strategies to address pressing concerns such as hydrophilicity enhancement, high-strength wastewater treatment, resource recovery, and microplastic removal. The included studies provide insights into diverse aspects of water treatment: from surface modification of poly(tetrafluoroethylene) (PTFE) membranes for improved hydrophilicity to the feasibility of aerobic granular sludge (AGS) for treating anaerobic digestate. Additionally, novel approaches such as CO₂ absorbent-based draw solutions in forward osmosis, dissolved air flotation for microplastic removal, and solvent extraction desalination under varying conditions are explored. By presenting these advancements, this special issue aims to contribute to the ongoing development of more efficient, resilient, and environmentally friendly water treatment technologies, offering valuable perspectives toward sustainable water management.

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