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Membrane Bioreactors for Wastewater Treatment: A review of mechanical cleaning by scouring agents to control membrane fouling

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Abstract

Membrane bioreactor (MBR) is a reliable and promising technology for wastewater treatment and reclamation applications. In spite of more than a decade of significant advances in developing fouling mitigation methods, different physical and cleaning protocols are still necessary to be developed to limit the membrane fouling. The use of scouring agents in MBR applications has been paid attention as a new approach as an energy-efficient way to control membrane fouling. Recently, mechanical cleaning by scouring agents is becoming as intense research area considering high efficiency of fouling reduction while requiring low energy consumption. In this review, fundamental and comprehensive assessments of the mechanical cleaning concepts and their applications with porous and nonporous scouring agents for MBR system are critically reviewed. The existing challenges and future research prospects on the mechanical cleaning technology associated with scouring agents for the MBR applications are also discussed.

Keywords: Membrane fouling, mechanical cleaning process, membrane bioreactor, scouring agent, hydrodynamics

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