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Review

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Anaerobic membrane bioreactors for antibiotic wastewater treatment: performance and membrane fouling issues

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Abstract

Antibiotic wastewater has become a major concern due to the toxicity and recalcitrance of antibiotics. Anaerobic membrane bioreactors (AnMBRs) are considered alternative technology for treating antibiotic wastewater because of their advantages over the conventional anaerobic processes and aerobic MBRs. However, membrane fouling remains the most challenging issue in the AnMBRs' operation and this limits their application. This review critically discusses: (i) antibiotics removal and antibiotic resistance genes (ARGs) in different types of AnMBRs and the impact of antibiotics on membrane fouling and (ii) the integrated AnMBRs systems for fouling control and removal of antibiotics. The presence of antibiotics in AnMBRs could aggravate membrane fouling by influencing fouling-related factors (i.e., sludge particle size, extracellular polymeric substances (EPS), soluble microbial products (SMP), and fouling-related microbial communities). Conclusively, integrated AnMBR systems can be a practical technology for antibiotic wastewater treatment.

Keynotes: Anaerobic membrane bioreactors, antibiotic wastewater treatment, antibiotic resistance genes, membrane fouling

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