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Real-time monitoring of biofoulants in a membrane bioreactor during saline wastewater treatment for anti-fouling strategies

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Abstract

This work presents a novel, fast and simple monitoring-responding method at the very early stages of membrane bio-fouling in a membrane bioreactor (MBR) during saline wastewater treatment. The impacts of multiple environmental shocks on membrane fouling were studied. The transmembrane pressure exceeded the critical fouling pressure within 8 days in the case of salinity shock or temperature shock. In the case of DO shock, the transmembrane pressure exceeded the critical fouling pressure after 16 days, showing the lower impact of DO shock on the MBR. In another study, the membrane fouling was observed within 4 days responding to mixed environmental shocks. To decrease the potential of membrane bio-fouling, another bioreactor was integrated immediately with the MBR as a quickly-responded countermeasure, when an early warning of membrane bio-fouling was provided. After the bioreactor enhancement, the time required for membrane fouling increased from 4 to 10 days.

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