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Review

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Current status of the pilot-scale anaerobic membrane bioreactor treatments of domestic wastewaters: A critical review

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Abstract

This review presented the performances of the pilot-scale AnMBRs treating domestic wastewater. High COD removal efficiencies and low biosolids productions were achieved at HRTs comparable to conventional aerobic processes under ambient temperatures. The energy demands for fouling control in the pilot-scale AnMBRs ranged from 0.04 to 1.35 kWh/m³, which is lower than those of lab-scale AnMBRs and aerobic MBRs. The energy demands for fouling control were in the order of gas sparging > particle sparging > rotating membrane AnMBR. Two major factors affecting the energy demand in gas sparging AnMBRs were specific gas demands (SGD_m) and operating flux. The energy potentials in wastewater were significantly affected by influent sulfate concentrations. Energy balances indicated that five out of nine pilot-scale AnMBRs was energy positive. However, further improvements of the AnMBRs are required to implement the energy positive wastewater treatment process.

Key words: pilot-scale; anaerobic membrane bioreactor; domestic wastewater; biosolids production; energy

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