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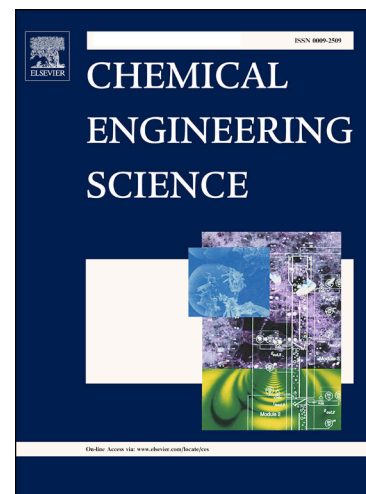
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Strategies for improving nitrogen removal under high sludge loading rate in an anammox membrane bioreactor operated at 25 °C

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Abstract

An anaerobic ammonium oxidation (anammox) membrane bioreactor operated at 25 °C was used to investigate nitrogen removal under different operation conditions, namely, different sludge retention time (SRT) and nitrogen loading rate (NLR). The inhibition processes caused by high substance concentrations and over-loading were able to be circumvented by various adjustment methods. Furthermore, specific anammox activity (SAA) tests were performed to evaluate the effects of ammonium and nitrite on the anammox sludge. Over an SRT of 500 d, the content of volatile suspended solids (VSS) gradually increased from 125 mg/L to 5590 mg/L, and the maximum nitrogen removal rate (NRR) reached 1.18 kg N/m³/d. When the SRT was decreased to 50 d, the sludge concentration declined gradually, which necessitated an increase in the sludge loading rate

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