Effect of anaerobic time on biological nitrogen removal in a modified SBR

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ABSTRACT

A new modified sequencing batch reactor (SBR) was proposed to treat wastewater. The modified SBR consists of 4 tanks with different anaerobic/anoxic/aerobic function. The organic substrate degradation and nitrification could occur sequentially in the different tank of the modified SBR. The dominant microorganisms grew in different tank to avoid the impact of high organic loadings. The results showed that the modified SBR was a high efficient reactor. The average $\text{NH}_4^+$-N and total nitrogen removal efficiency was 98 and 52, respectively. The ratio of influent $\text{NH}_4^+$-N/TN was equal approximately to TN removal efficiency, indicating that the TN removal efficiency was affected by the influent $\text{NH}_4^+$-N concentration. The longer anaerobic time was favored for the nitrogen removal. The optimal anaerobic time should be set at 1 h. The optimal ratio of aerobic/anaerobic time ($T_{O/A}$) was 0.5.

Keywords: Modified SBR; Nitrogen removal; Municipal wastewater; MLSS; EBPR

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