

Nutrients Removal Control via an Intermittently Aerated Membrane Bioreactor

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Abstract : Nitrogen is among the main nutrients encouraging the growth of organic matter and algae which cause eutrophication in water bodies. Therefore, its removal from wastewater has become a worldwide emerging concern. In this research, an innovative Membrane Bioreactor (MBR) system named “moving bed membrane bioreactor (MBMBR)” was developed and investigated under intermittently-aerated mode for simultaneous removal of organic carbon and nitrogen. Results indicated that the variation of the intermittently aerated duration did not have an apparent impact on COD and NH_4^+-N removal rate, yielding the effluent with average COD and NH_4^+-N removal efficiency of more than 92 and 91% respectively. However, in the intermittently aerated cycle of (continuously aeration/0s mix), (aeration 90s/mix 90s) and (aeration 90s/mix 180s); the average TN removal efficiency was 67.6%, 69.5% and 87.8% respectively. At the same time, their nitrite accumulation rate was 4.5%, 49.1% and 79.4% respectively. These results indicate that the intermittently aerated mode is an efficient way to controlling the nitrification to stop at nitritation; and also the length of anoxic duration is a key factor in improving TN removal.

Keywords : membrane bioreactor (MBR), moving bed biofilm reactor (MBBR), nutrients removal, simultaneous nitrification and denitrification

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