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Contribution of Soluble Microbial Products on Dissolved Organic Nitrogen in Wastewater Effluent from Moving Bed Biofilm Reactor

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Abstract : Dissolved organic nitrogen (DON) is known as one of the persistence nitrogenous pollutant being originated from secondary treated effluent of municipal sewage treatment plant. However, effect of key system operating condition on the fate and behavior of residual DON in the treated effluent is still not known. This study aims to investigate effect of organic loading rate (OLR) on the residual level of DON in the biofilm reactor effluent. Synthetic municipal wastewater was fed into moving bed biofilm reactors at OLR of 1.6x10-3 and 3.2x10-3 kg SCOD/m3-d. The results showed higher organic removal efficiency was found in the reactor operating at higher OLR. However, DON was observed at higher value in the effluent of the higher OLR reactor than that of the lower OLR reactor evidencing a clear influence of OLR on the residual DON level in the treated effluent of the biofilm reactors. It is possible that the lower DON being observed in the reactor at lower OLR is likely to be a result of providing the microbe with the additional period for utilizing the refractory DON molecules during operation at lower organic loading. All the experiments were repeated using raw wastewaters and similar trend was obtained.

Keywords : dissolved organic nitrogen, hydraulic retention time, moving bed biofilm reactor, soluble microbial products
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