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Pretreatment and filterability tests of wastewater as a first step to characterize the influent to a membrane bioreactor

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ABSTRACT

Wastewater reclamation and reuse has become one of the most important environmental issues nowadays. Thus, municipal wastewater treatment plants are being upgraded converting conventional activated sludge processes into membrane bioreactors in order to improve the quality of the treated wastewater. However, operational costs increase because of higher energy consumption and membrane fouling. Wastewater composition is one of the factors affecting membrane fouling, though its influence is difficult to describe. In this work, a study about wastewater pretreatment and filterability has been carried out in view of achieving valuable information for a further implementation of a membrane bioreactor. Experiments were performed with samples of four municipal wastewater treatment plants taken from the plant influent, the biological process influent and the plant effluent. Filterability was evaluated by membrane filtration resistances using the resistance in series model. Resistances were measured with ultrafiltration tests performed with flat membranes. Results showed that suspended solids concentration was the most influential parameter on the total membrane resistance when pretreated wastewater is filtered. No statistical correlation between the membrane resistances of biological process influent and plant effluent was found.

Keywords: MBR; Membranes; Resistances model; Municipal wastewater; Wastewater pretreatment; Ultrafiltration

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