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Performances of nanofiltration and reverse osmosis in textile industry waste water treatment

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ABSTRACT

In this paper experimental results obtained from the treatment by different membrane based processes, namely, microfiltration (MF), nanofiltration (NF) and reverse osmosis (RO) of Sitex industry waste water pretreated by biological activated sludge are presented and compared. The results obtained from direct NF performed at different transmembrane pressures (8 < TMP < 14 bar) and at a temperature (T = 25°C) show that the permeate fl ux decreased from initial value of 19 to 9 l/h·m^2 for a volume reduction factor (VRF) of 4 and that the osmotic pressure π = 4 bar. A high quality of treated effluent in terms of colour removal and desalination was obtained for a VRF of 2: salinity retention rate (R) 57% and decolourization almost 100% at pressure of 12 bar. While, the permeate flux obtained using the combination MF/RO at a different pressures 10 < TMP < 24 bar decreased from initial value of 35 to 20l/h· m^2 for a VRF of 7 indicating an important fouling. The optimum salinity and colour retention rate were 86% and 100%, respectively obtained at a VRF of 2.

Keywords: Textile industry waste water; Direct nanofi ltration; Reverse osmosis; Salinity; Decolouration; Retention rate

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