



Effects of temperature on the permeability and critical flux of the membrane in a moving bed membrane bioreactor

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Received 19 September 2013; Accepted 4 December 2013

ABSTRACT

Effects of temperature on the permeate flux and the permeability of the membrane have been studied in a membrane bioreactor system with a moving bed pilot plant to treat real urban wastewater. In the present study, the permeability of the membrane has been determined under four different suspended solids concentrations and three different degrees of fouling in order to compare the effects of the temperature in different operational conditions. The permeate flux, critical flux and permeability of the membrane at seven different temperatures between 10 and 35°C have been checked. The study showed that the permeate flux increased to 19.2 and 21.2% between 10 and 15°C and between 15 and 20°C respectively, which was higher than the 8.70% obtained between 20 and 25°C, and similarly it increased to 15.6 and 15.6% obtained between 25 and 30°C and between 30 and 35°C, respectively. This trend has been also observed in critical flux values, under the different conditions of suspended solids and fouling degree tested. The data obtained on the permeability of the membrane was fitted to a multiple linear regression using dynamic viscosity and temperature as independent variables.

Keywords: Temperature; Permeate flux; Critical flux; Permeability; Membrane bioreactor

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