

Microfiltration of oxidation pond effluent using single flexible tubular fabric membrane and polyelectrolyte dosage

ABSTRACT

Membrane separation is an effective wastewater treatment alternative. However, as with all membrane processes, the fouling effect has always been one of the major limiting factors for their usage. Of the current available membrane modules, the tubular configuration is the least affected with fouling because of the relatively large passage. A novel approach of using tubular woven fabric membranes, naturally cheaper to produce, has been studied in treating secondary oxidation pond effluent. The membrane was prepared by sewing two strips of fabric, on both sides. Its tubular configuration is obtained by the flow of aqueous solution through, at an appropriate pressure and flow rate. Thus, there is no need for housing, as with most available tubular membranes in the market. Its flexible character also facilitates external mechanical cleansing. The fabric has pore sizes ranging between 20 and 40 μm . The effects of batch dosing the secondary pond effluent with Nalco Ultrion 8109W polyelectrolytes, with the main objective of improving filtrate flux, was investigated. The batch polyelectrolyte pretreatment, at three times the optimal dosage of floe jar test, showed a tremendous increase (five fold) on filtrate pseudo-steady-state flux. The pseudo-steady-state flux was 70 $\text{l/m}^2\cdot\text{h}$ at 0.65 ml/l dosage.

Keyword: Fabric membrane; Flexible membrane; Membrane separation; Microfiltration; Polyelectrolytes; Sewage treatment