Effect of the concentration polarization on the fouling driving force of UF membranes

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ABSTRACT

The main objective of this work was to investigate the effect of foulant concentration prevailing at the membrane surface on the rate of flux decline. The significant role of foulant membrane concentration was highlighted by analysis of the well-known filtration blocking laws. All blocking mechanisms were found to predict that the initial fouling rate depends on the product of feed concentration and initial permeate flow rate. Humic acid fouling data were analyzed to provide values of the fouling rate $dJ/dt$ vs. membrane surface concentration $C_m$. The data of all runs, covering a rather broad range of conditions, fell within a narrow band thus supporting the contention that foulant concentration on the membrane is one of the main parameters governing the fouling rate.

Keywords: UF membrane; Fouling; Concentration polarization; Critical flux; Humic acid

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