

FOULING AND CLEANING PHENOMENA FOR ETHANOL PRETREATED MEMBRANES USED TO ULTRAFILTER BLACK TEA LIQUOR

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ABSTRACT

This paper reports the use of polymeric ultrafiltration (UF) membrane ethanol pre-treatment as a strategy to improve filtration performance in terms of both flux increase, and membrane water flux recovery following cleaning. A 4-fold pure water flux (PWF) increase was observed for a 100 kDa polysulfone membrane. Marked increases in permeate flux were recorded for ethanol treated UF membranes over a range of molecular weight cut-off values. Ethanol treatment also aided fluxes over multiple foul-clean cycles, and enabled the enhanced transmission of polyphenols during UF for the clarification of black tea liquor. Following tea fouling and NaOH cleaning repetitions, PWF values of treated membranes were returned to values of >150% of the untreated virgin membrane PWF over 4/5 consecutive cycles, indicating that the ethanol pre-treatment strategy adopted had a prolonged effect upon subsequent performance.