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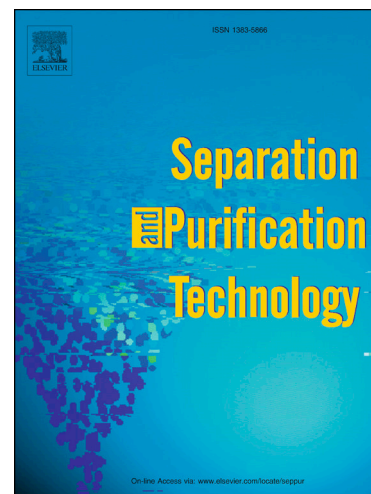
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Chemical cleaning of flat sheet ultrafiltration membranes fouled by effluent organic matter

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Abstract

This paper examines the efficiency of chemical cleaning of flat sheet UF membranes severely fouled by rendering plant secondary effluent. The rendering plant secondary effluent was treated in a laboratory cross-flow batch ultrafiltration (UF) set-up with three membranes (MW, CQ, and GM). Effluent organic matter (EfOM) caused a severe fouling, which led to an increase in hydraulic membrane resistance (HMR), 6.5 to 11.3 times the HMR of pristine membranes (R_m). In the first part, the fouled membranes were flushed with water and cleaned by chemical cleaning in two phases. The first phase included flushing and soaking with a commercial alkali cleaning agent, as in the second phase a commercial acidic cleaning agent was used. After each phase, the HMR was determinate and one membrane was removed and characterized (FTIR and SEM). The chemical cleanliness was determined from the FTIR spectra; while the hydraulic cleaning efficiency (HCE) was determined from the drop in HMR. In the second part, the cleaning was performed with individual cleaning agents. The alkali agent was tested at 25°C and 35°C as well as after the UF at different pressures. The alkali cleaning agent had the greatest impact on the cleaning of membranes fouled by EfOM.

Keywords: chemical cleaning-in-place, ultrafiltration, effluent organic matter, fouling, flat sheet membrane

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