

Thesis Title	Pretreatment of Polysulfone Ultrafiltration Membrane by Brij-58 for Reduction of Antifoam Fouling
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### Abstract

The objective of this thesis was to study the pretreatment of polysulfone ultrafiltration membrane with nonionic surfactant (Brij-58) for reducing membrane fouling of 2 antifoams, Disfoam CE-120 and silicone oil. Two pretreatment methods were compared, i.e., the static method in which the membrane was immersed in surfactant solution for 24 hours and the dynamic method in which the surfactant solution was circulated through the membrane at 4 pressures; 20.68, 34.47, 48.26 and 68.94 kPa for 2 hours.

The experimental results showed that the permeation fluxes of antifoam solutions of the pretreated membranes were higher than the untreated membranes since the surfactant increased the hydrophilicity of the membranes or reduced the hydrophobic-hydrophobic interaction between the membrane and antifoam. Pretreatment by dynamic method gave higher flux than static method because the surfactant, under high pressure, was able to deposit on the surface and in the pores of the membrane to the greater extent.

Dynamic pretreatment at 68.94 kPa gave the maximum flux of antifoams. Calculation of transport resistances showed that fouling resistance was the major resistance for flux decline. Pretreatment reduced all transport resistances by approximately 15-45 %.

**Keywords** : Ultrafiltration / Polysulfone Membrane / Fouling / Surfactant / Antifoam /  
Membrane Pretreatment