

Synthesis and performance of thin film composite nanofiltration polyester membrane for removal of natural organic matter substances

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ABSTRACT

Nanofiltration (NF) polyester thin-film composite (TFC) membranes have been prepared by interfacial polymerization using commercial polyethersulfone membrane support. At 6% (w/v) triethanolamine (TEAO) concentrations in the aqueous solution and a range of interfacial polymerization times in the organic solution containing trimesoyl chloride (TMC) were studied. Nanofiltration membranes were produced with varying properties through interfacial polymerization technique. The ability to use NF membranes with varying properties will improve overall process efficiency. This study has shown that through interfacial polymerization technique, the variation of reaction time as well as can affect the performance of the membrane produced. As a result, increasing the reaction time resulted in decreasing water permeabilities. Polyester with some amide group produced after interfacial polymerization occurred as shown by FT-IR spectra. Straight lines were obtained between J_w and ΔP and the water flux of distilled water shown that flux is directly proportional to transmembrane pressure (TMP). At low reaction time (5 min), the water flux has no significant effect on water permeance. So, the reaction time has a significant effect on the growth of thin film.

KEYWORDS:

Nanofiltration; Thin-Film Composite; Characteristics; Humic Acid.

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