

Investigation of New Polyester Nanofiltration (NF) Membrane Fouling with Humic Acid Solution

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ABSTRACT

Ultrafiltration (UF) polyethersulfone membrane support has been modified by interfacial polymerization technique using reaction of aqueous solution and organic solution to form thin film composite (TFC) nanofiltration (NF) membrane. A new polyester layer were produced on the top surface of UF support by the reaction between triethanolamine (TEOA) (6% w/v) in the aqueous solution and solution containing trimesoyl chloride (TMC) (0.15%w/v) at different of reaction times (15, 25 and 35 min). The decrease of membrane permeability was related to the changes of the membrane morphology (i.e. membrane thickness) as the reaction times were increased. Irreversible membrane fouling has been studied by using humic acid as model of natural organic matter (NOM) solutions at two different pH values (7 and 3). At pH 7, it was observed that the NF TFC membranes exhibited practically less tendency to be irreversibly fouled by humic acid. However, the permeate flux was decreased and the irreversible fouling factor was increased with decreasing the pH to a value of 3.

KEYWORDS: Interfacial polymerization; nanofiltration; fouling; humic acid

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