



Outside skin tubular ultrafiltration membranes for separation of proteins and polysaccharides and removal of turbidity from seawater¹

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ABSTRACT

In this study, ultrafiltration (UF) membranes were prepared in outside skin tubular configuration using polysulfone and sulfonated polysulfone polymers in order to study the effect of chemical nature of membrane surface on separation performance as well as surface fouling. Separation of polysaccharide and protein with its fouling tendency, removal efficiency of turbidity from seawater with flux recovery after fouling were evaluated. Tubular configuration was chosen, as the membrane surface is most exposed for cleaning after fouling than any other configurations. Bovine serum albumin (BSA) and sodium salt of alginic acid were used as model protein and polysaccharide, respectively, to probe the rejection behavior of these tubular membranes. Sulfonated polymeric membranes were compared with pure polymer membranes for resistance to fouling by the model protein and polysaccharide solutions. Pure water flux recovery on water flushing for polysaccharide fouled membrane was comparatively more (6–8%) than protein fouled membrane, particularly in case of polysulfone membrane. In general, the pure water flux recovery after fouling, i.e., reversibility of fouling was more (up to 10%) for sulfonated polysulfone membranes than that of pure polysulfone membranes. Finally, these membranes in tubular configurations were used for removal of turbidity from seawater as periodic washing by flow reversal recovers flux after fouling.

Keywords: Tubular module; Ultrafiltration; Separation; Fouling; Proteins and polysaccharides; Turbidity removal

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