



## Preparation and characterization of organic-inorganic porous membranes: Evaluation of their performance in ultrafiltration

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Received 25 March 2008; Accepted in revised form 1 October 2009

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### ABSTRACT

Flat membranes of polysulfone (PSf)/zirconium oxide ( $ZrO_2$ ) with several oxide percentages were synthesized by the phase inversion process adding  $ZrO_2$  to the casting solution. The effect of inorganic material concentration on the pore mean diameter, on the hydraulic permeability and on the decline of permeate flow in the ultrafiltration of an oil emulsion was analyzed. The results indicate that mean pore radius increases with zirconium oxide content. The presence of zirconium oxide in the casting solution produces membranes with a higher hydraulic permeability. There is an optimum oxide concentration for which the stationary permeate flow is 30% higher than that of an oxide-free membrane.

*Keywords:* Organic–inorganic membranes;  $ZrO_2$ ; O/W separation; Fouling

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