



Novel membranes for industrial laundry wastewater treatment

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ABSTRACT

This work focuses on the development of new polymeric membranes with hydrophilic properties for use in industrial laundry wastewater treatment. Composite heterogeneous membranes containing polymer matrix and organic and inorganic fillers were prepared. Different fillers were sought that would improve the wettability of the membrane surface. Based on the literature data, both inorganic compounds—metal oxide nanoparticles (ZnO , ZrO_2 , Al_2O_3) as well as organic compounds such as polyacrylic acid–PAA and polyethylene oxide–PEO were selected. Process tests were carried out using modified membranes and the contact angle of the developed materials was measured as well. The results show that for the membranes modified with ZrO_2 or PEO the obtained permeate volumetric flow was higher than for the unmodified membranes. This is due to the improvement of the hydrophilic properties of the modified membranes, which is confirmed by the reduction of the contact angle for new materials. The formation of a new thin layer on the surface of the support membrane has also been confirmed in microscopic photographs.

Keywords: Laundry wastewater treatment; Microfiltration; Modified membrane; Flow coating

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