



Characterization of an ultrafiltration membrane modified by sorption of branched polyethyleneimine

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ABSTRACT

A polyethersulfone ultrafiltration membrane was functionalized by a cationic polyelectrolyte, the branched polyethyleneimine (BPEI). Several characterization techniques were carried out to investigate the membrane modification. Atomic force microscopy and the tangential streaming potential measurement were used to characterize the outer surface of the membrane. Both techniques indicated that the surface was really modified. Electrokinetic measurements showed a charge reversal of the outer surface of the membrane when the cationic polyelectrolyte adsorbs onto the membrane. This charge reversal (from negative values for the unmodified membrane to positive values for the modified membrane) was also observed with membrane potential measurements. With the help of salt diffusion measurements, it was concluded that the charge reversal observed in membrane potential experiments resulted from the adsorption of BPEI onto the pore walls of the membrane (and not only on the outer surface of the membrane as could be concluded from single tangential electrokinetic measurements).

Keywords: Functionalized membrane; Polyethersulfone; Polyelectrolyte; Streaming potential; Membrane potential

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