



Formation behavior and performance studies of novel antifouling EVAL/PEO–PPO–PEO blend membranes for oil/water separation

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ABSTRACT

Novel anti-fouling poly (ethylene-co-vinyl alcohol)/polyethylene oxide-polypropylene oxide-polyethylene oxide (EVAL/PEO–PPO–PEO) blend membranes were prepared by immersion precipitation method with different EVAL/PEO–PPO–PEO ratios. Thermodynamic and kinetic parameters which govern the formation of membrane were studied by viscosity and precipitation kinetics. Polyethylene oxide–polypropylene oxide–polyethylene oxide (PEO–PPO–PEO) content in the membrane solution controls phase separation by thermodynamic enhancement and kinetic hindrance. The addition of PEO–PPO–PEO is favorable for the formation of spongy like pores and higher porosity surface, which results in larger water flux and higher oil rejection rate through the membrane. Improved hydrophilicity and fouling resistance which have great significance in oil/water separation field were observed by the presence of PEO–PPO–PEO in the membrane. Fourier transform infrared spectroscopy results proved the residual PEO–PPO–PEO in the blend membranes.

Keywords: PEO–PPO–PEO; Poly (ethylene-co-vinyl alcohol); Blend membrane; Oil/water separation; Antifouling property

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