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Microporous polypropylene membrane prepared via TIPS using environment-friendly binary diluents and its VMD performance

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Abstract

Growing attention given to non-toxic solvents for membrane preparation has been the motivation for membrane scientists to develop future generation membranes due to increasing concerns for environmental impacts and strict rules. In this study, a novel preparation approach for polypropylene (PP) membranes via TIPS using non-toxic binary diluents consisting of carnauba wax as latent solvent and soybean oil as good solvent was developed successfully. Water and ethanol were used as a quenching bath and extractant of diluents in the membrane, respectively. Impacts of both polymer weight fraction and carnauba wax weight fraction on the phase diagram (phase separation behaviors) of the PP/binary diluents system were investigated firstly. The liquid-liquid (L-L) phase separation region can be enlarged with the continuously increasing of carnauba wax. The effect of adding the second latent diluent on the