Polyacrylonitrile/starch semi-biodegradable blend membrane: preparation, morphology and performance

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\textbf{ABSTRACT}

In the present study, semi-biodegradable membrane of polyacrylonitrile was prepared by immersion precipitation technique, whereas starch, sorbitol, 1-methyl-2-pyrrolidone and water were used as natural biodegradable polymer, additive, solvent and non-solvent, respectively. Experiment design was done by response surface methodology. Effects of three parameters including starch and sorbitol concentration and coagulation bath temperature (CBT) were investigated on the membrane morphology, contact angle, biodegradability, pure water flux, as well as treatment ability. The results revealed that increasing CBT and concentration factors led to improvement in membrane porosity and thickness. Furthermore, membrane wettability and biodegradability were principally influenced by starch concentration. All three parameters were found to have direct effects on PWF and reverse effects on rejection of pollution indices of the raisin wastewater during the treatment process.

\textit{Keywords:} Polyacrylonitrile; Membrane; Starch; Biodegradability; Response surface methodology

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