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Preparation of PVDF-CTFE hydrophobic membrane by non-solvent induced phase inversion: Relation between polymorphism and phase inversion

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Abstract

Semi-crystalline polymers poly(vinylidene fluoride) and PVDF-based copolymer were common membrane materials which have found broad application. In an attempt to illuminate the relation between phase inversion and the polymer crystalline polymorphism, the effect of LiCl on PVDF polymorphs, membrane morphology, pore structure, hydrophobicity, thermal property, and permeability were investigated for Poly(vinylidene fluoride-co-chlorotrifluoroethylene) (PVDF-CTFE) membrane prepared by non-solvent induced phase inversion method. Both thermodynamic and kinetic effect were observed, and LiCl was found to favor the crystallization process. The phase inversion route and rate were significantly influenced by LiCl, result in the increase of the content of β -phase, membrane crystallinity, thermo-resistance, overall pore size, and pore interconnectivity when increase LiCl content. The surface pore size and porosity increased firstly when LiCl content was lower than 5%, but

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