

Optimization of cellulose acetate hollow fiber reverse osmosis membrane production using Taguchi method

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Abstract

Cellulose acetate hollow fiber membranes for reverse osmosis (RO) were spun using a forced convection technique. In this study, a systematic experimental design based on Taguchi's method (which is a fractional factorial method) has been employed for discussing the relationship between the rejection rate coefficient, permeation rate and the dry-wet spinning conditions for making cellulose acetate hollow fibers for RO. The factors considered in the experimental design included the polymer contents (PCs), the ratio of the solvent (acetone) to swelling agents (formamide) in the dope solution, the dope extrusion rate (DER), the type of bore fluid (BF), the residence time (RT) and the nitrogen gas flushing rate (GR). The results indicate that the BF and the DER are the two most important factors in determining the performance of the RO membranes. © 2002 Elsevier Science B.V. All rights reserved.

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