

Characterization of hydrophilic hollow fiber membranes prepared from poly(vinyl alcohol)

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ABSTRACT

Hydrophilic hollow fiber membranes were prepared from a aqueous solution of poly(vinyl alcohol) (PVA) by a gel fiber spinning method. In order to control the water content of the hollow fiber membranes, the membranes were cross-linked physically by annealing, and then crosslinked chemically using glutaraldehyde (GA) solutions changing GA concentration. The diameter of the membranes was ca. 1.0 mm and the thickness of the membranes was ca. 100 μm . Permeation experiments were carried out in a diffusion dialysis system: NaNO_3 solution/membrane/mixed NaNO_3 and NaCl solution to examine ionic permselectivity of the membranes. The flux of both nitrate ions and chloride ions through the membranes decreases with increasing GA concentration. This is due to the fact that membrane water content decreases with increasing GA content. The selectivity coefficient for nitrate ions through the membranes increases with GA content because of the decreasing in the water content. The hollow fiber membrane prepared in this study will have potential application to separation of trace ions in ground water.

Keywords: Poly(vinyl alcohol); Hollow fiber membrane; Permselectivity; Diffusion dialysis

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