

Abstract

Hollow fiber poly(vinyl chloride) membranes were prepared by using the dry/wet spinning method. Cross-section, internal, and external surfaces of the hollow fibers structure were studied by SEM. The pore size and pore size distribution of the hollow fibers were measured by a PMI capillary flow porometer. UF experiments of pure water and aqueous solution of PVP K-90 were carried out. The effect of the PVC concentration on the hollow fibers mechanical properties was also investigated. It was found that the PVC fibers cross-sectional structure was affected by the polymer concentration in the dope solution. In particular, reduction of macrovoids size was observed when increasing PVC concentration from 15 to 19 wt%. The pore size distribution of the PVC hollow fibers was controlled by adjusting the PVC concentration. Indeed, an increase of PVC concentration up to 19 wt% leads to fibers with sharp pore size distribution (the 99% of pores is about 0.15 μm). The pure water permeation flux decreased from 162 to 128 ($\text{l}=\text{m}^2\cdot\text{h}\cdot\text{bar}$), while the solute separation performance increased from 82 to 97.5%, when increasing the PVC concentration. The elongation at break, the ten-sile strength, and the Young's modulus of the PVC hollow fibers were improved with PVC concentration in dope solution.