245e The Pervaporation Dehydration of Isopropanol by Btda-Tdi/MDI (P84) Co-Polyimide Membranes

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Previous polymeric pervaporation dehydration membranes were mainly focused on flat membranes. The study of integrally-skinned asymmetric hollow fibers for pervaporation was rarely reported. In this work, integrally skinned BTDA-TDI/MDI (P84) co-polyimide hollow fibers for pervaporation dehydration of isopropanol have been successfully developed, which have superior flux and selectivity towards water. The effects of spinning conditions such as air gap distance, coagulation temperature, and dope/bore fluid flow rates on membrane formation, morphology and pervaporation performance have been determined. It was found the silicone rubber coating can effectively seal the membrane defects, and remarkably improves the selectivity because of its nature of high water permeability. Annealing tremendously increased the separation factor / selectivity especially at 300°C, though densification of selective skin layer and reduction of free volume. The performance of newly developed P84 hollow fibers after heat treatment is superior to most previously reported hollow fibers.