

## Preparation, characterization and performance of phenolphthalein polyethersulfone ultrafiltration hollow fiber membranes

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### ABSTRACT

Phenolphthalein polyethersulfone (PES-C) is potentially an excellent candidate as a membrane. This assumption is based upon its mechanical and thermal properties. Here we report the manufacture of hollow-fiber membranes using the PES-C using a dry-wet spinning technique. The influence of different hollow-fiber contact forming conditions including solvent, composition of PES-C temperature, internal quench medium extrusion pressure and winding-up velocity on the structure and properties of prepared membranes were investigated. The content of PES-C in the spinning solution affects the properties of the membranes prepared, including porosity, average pore diameter and water flux. These decrease with increasing content of PES-C. Water flux of membrane increases with casting solution temperature. When the temperature reaches 40°C, water flux is maximum while retention reaches a minimum. Furthermore, water flux increases with increasing internal quench medium extrusion pressure, while inner and outer diameters increases and wall thickness decreases with increasing internal quench medium extrusion pressure. The inner and outer diameters of hollow membrane decreases with increasing winding-up velocity, the outer diameter decreases more than the inner diameter, which leads to a decrease of membrane wall thickness.

**Keywords:** Phenolphthalein polyethersulfone; Hollow-fiber membrane; Ultrafiltration; Internal quench medium extrusion pressure; Biaxial stretch

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