

Ultra-large-scale Fabrication of Bio-compatible Micro-porous Membrane with Highly Ordered Regular Structure via a Multi-layer Coating Method

부반티엔, 최호석[†]

충남대학교

(hchoi@cnu.ac.kr[†])

The membrane was prepared through multi-layer coating and solvent/non-solvent phase separation. First, the separated bi-layers composed of water-soluble material and polymer were alternatively coated onto a substrate, and left in air for complete drying. Second, the dried layers were exposed to a mixture of solvent and non-solvent to induce phase separation, resulting in the highly ordered micro-patterns with through-pore structure. Chloroform and methanol, used as a solvent and non-solvent, respectively, show highly effective sensitivity not only to control pore sizes, but also to manage the areal number density of pores in the membrane. The membrane can be prepared at the interface of water-soluble solid layer and air with high reproducibility. Furthermore, this method can be extensively applied to other general purpose polymers such as polystyrene and poly(methyl methacrylate). Considering easy scale-up in fabrication as well as good bio-compatibility of PLA, the membrane can meet both demands of special functionality and economic productivity.