

Functionalized Polymeric Inverse-Opal Structures for Hierarchically Porous Nanomembranes

유필진*

성균관대학교 화학공학부

(pjyoo@skku.edu*)

In this study, a low-shrinkage UV-curable polymer is employed for generating a large-scale, defect-free and free-standing film-phased three-dimensional inverse-opal (3D-IO) macroporous structures. The subsequent process of polymeric coating and functionalization enables to create secondary structure of nanopores, leading to the applications for nanofiltration and ultrafiltration membranes. The macroporous 3D-IO structures are coated with layer-by-layer assembled polyelectrolyte multilayers or cylindrically phase-separated block copolymer thin films, forming hierarchically porous nanochannels or nanoflanges. This hierarchically porous structure is used as a nanofiltration membrane for removal of multivalent ions or a ultrafiltration membrane for separating quantum dot nanoparticles or biomolecules.