Functionalization of honeycomb-patterned porous polymer films using a reactive vapor in breath figure method

Bo Kyoung Shin and Do Sung Huh*
(Department of Chemistry and Nanoscience and Engineering,
Center for Nanomanufacturing Inje University,
Gimhae city, Gyeongsangnam-do, South Korea)

Abstract

A new strategy is proposed to obtain pore functionalized honeycomb-patterned porous films by in-situ polymerization during breath figure process. The polystyrene or hydrophobic polymers with an initiator such as benzoyl peroxide mixture in chloroform are casted under humid conditions generated by pumping air containing a reactive vapor such as aniline hydrochloride, KOH, etc. in water. The resulting films showed honeycomb-patterned porous morphology with functionalized pores. The formation of functionalized film is confirmed by color, conductivity, SEM, and UV-visible studies, etc. The strategy can be extended to obtain various pore functionalized films by choosing one reactant in polymer solution and other in humid vapors with a facile method of one-step breath figure process.

Research area(s): Functional polymer films