

Exceptional high quality ZIF-8 membranes synthesized by secondary growth method for propylene/propane separation

Tran Nguyen Tien, 김진수[†]
경희대학교
(jkim21@khu.ac.kr[†])

During the last decade, ZIF-8 membranes have demonstrated their potential as promising molecular sieves for propylene/propane separation based on its intrinsic ultra-microporous feature with exceptional thermal and chemical stability. Although propylene/propane separation is very important in the petrochemical industry, conventional separation processes such as adsorption and cryogenic distillation require high energy consumption. However, membrane-based processes can significantly reduce this energy consumption. In this study, ZIF-8 membrane was synthesized through a simple and feasible secondary growth method in presence of sodium formate. After dip-coating of seed particles, the seed layer was modified by sodium formate which was found to promote the intergrowth of ZIF-8 crystals. The resulting ZIF-8 membrane showed consistent propylene/propane separation factors as high as 115 and propane permeance of 0.18×10^{-10} mol/m² s Pa. This provides the great potential applications in applications for industrial gas separation.