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Abstract

In this study, novel kinds of mixed matrix membranes (MMMs) were prepared by incorporating g-C₃N₄ nanosheets into the matrix of polymers of intrinsic microporosity (PIM-1). The PIM-1/g-C₃N₄ MMMs were characterized using field emission scanning electron microscope (FESEM), thermal gravimetric analysis (TGA), differential scanning calorimetry (DSC), X-ray diffraction meter (XRD) and an electronic stretching machine. Pure gas permeation tests of the MMMs were conducted for the following gas species: CO₂, CH₄, N₂ and H₂. Gas permeation properties of the MMMs were rationally tuned with the incorporation of g-C₃N₄ nanosheets. Firstly, the 2D structural g-C₃N₄ with high surface area ratio can efficiently affect the packing of PIM-1 polymer chains and create additional transport pathways at the interface

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