

Zeolitic Imidazolate Framework-8 nanosheets/6FDA-DAM mixed matrix membranes for gas separation

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Two-dimensional (2D) metal-organic frameworks (MOFs) have been used as a promising building block for gas separation membrane due to its high-aspect ratio structure. Appropriate aperture size with sheet-like morphology provides a fast transport pathway to targeted gas molecules while hinders the permeation of untargeted gas molecules. Herein, we demonstrate synthesis of zeolitic imidazolate framework (ZIF)-8 nanosheets through template conversion method from Zn nitrate hydroxide ($Zn_5(NO_3)_2(OH)_8$) precursor sheets. Synthesized ZIF-8 nanosheets were embedded in a continuous 6FDA-DAM polymer matrix to enhance the gas separation performance. According to the flexibility of the ZIF-8's aperture size (3.4 Å~4.0 Å), ZIF-8 nanosheet mixed matrix membrane can be used to separate various gas mixtures.