

Zeolitic Imidazolate Frameworks with Large Pore Aperture for Hydrocarbon Adsorptive Separation

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Metal organic frameworks (MOFs) are microporous crystalline materials with high surface area, high pore volume and pore tunability. Among various MOFs, zeolitic imidazolate frameworks (ZIFs) have gained interest due to its exceptional chemical and thermal stability, especially water stability, unlike general MOF. But, most ZIFs have pore apertures of less than 4Å and thus are primarily used for gas separation. Recently, ZIFs with extra-large pore dimensions with 12-membered ring structure and multi-ligand system have been reported. These large pores are useful in the separation of hydrocarbons with a kinetic diameter larger than 4.5 Å. In this study, the sorption and diffusion properties of large-pore ZIFs were investigated thoroughly for energy-efficient separation of various hydrocarbons.