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Submicrometer-Sized ZIF-71 Filled Organophilic Membranes for Improved Bioethanol Recovery: Mechanistic Insights by Monte Carlo Simulation and FTIR Spectroscopy

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Supporting Information

This is an author version of the contribution published on:

Questa è la versione dell'autore dell'opera:

*Submicrometer-Sized ZIF-71 Filled Organophilic Membranes for Improved Bioethanol Recovery:
Mechanistic Insights by Monte Carlo Simulation and FTIR Spectroscopy*

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J. Vankelecom , * and Johan A. Martens*

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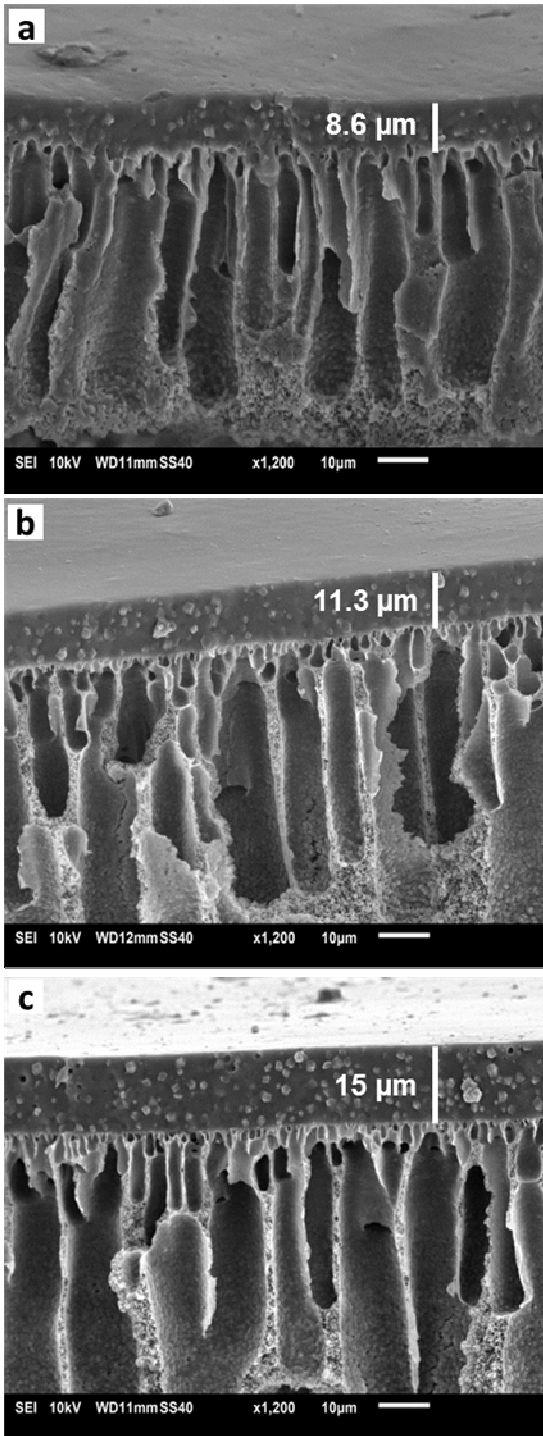


Figure S1. Cross-sectional views SEM images of micron-sized ZIF-71 filled composite membranes prepared from 20% PDMS with MOF loadings of (a) 20 wt%, (b) 30 wt% and (c) 40 wt%.

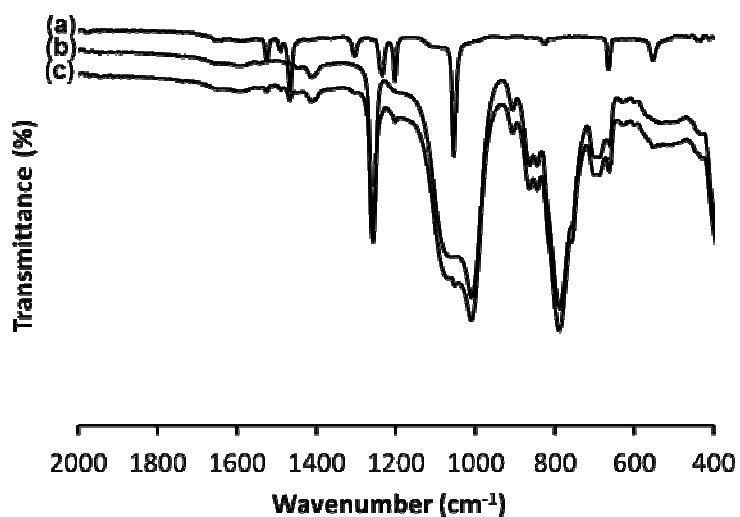


Figure S2. ATR-IR spectra of (a) submicron-sized ZIF-71 crystals, (b) typical submicron-sized ZIF-71 filled PDMS membrane and (c) PDMS.

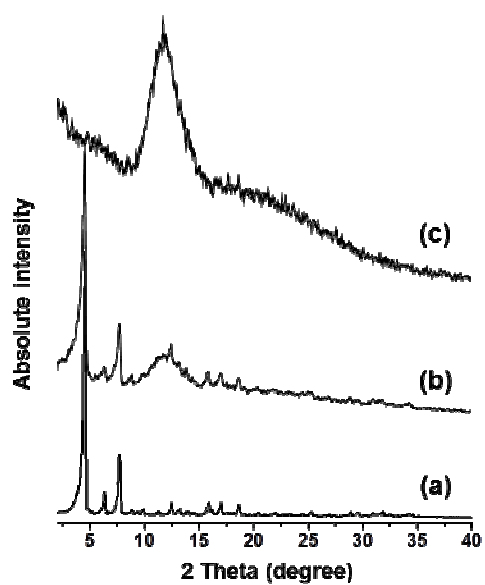


Figure S3. XRD patterns of (a) submicron-sized ZIF-71 crystals, (b) typical submicron-sized ZIF-71 filled PDMS membrane and (c) PDMS.

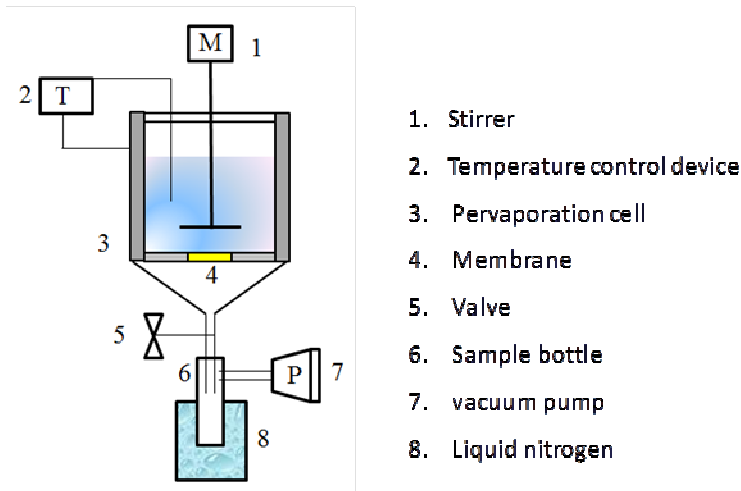


Figure S4. Schematic diagram of the pervaporation set-up.

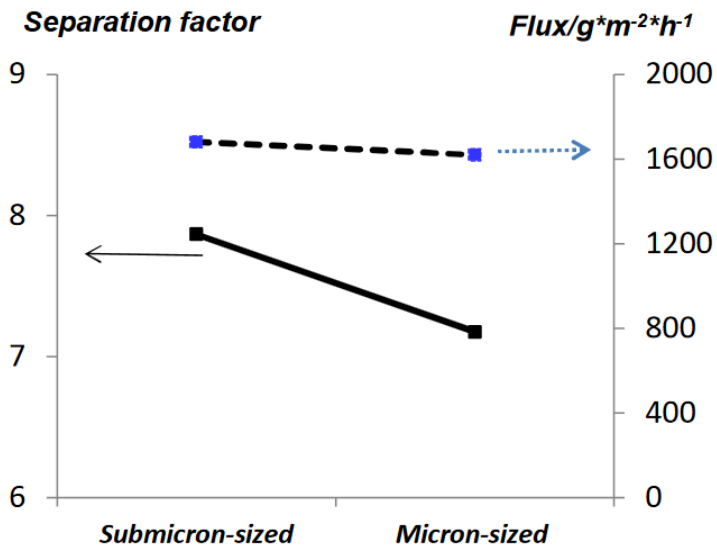


Figure S5 Pervaporation performance comparison of submicron-sized and micron-sized ZIF-71 filled membranes. The membranes were prepared by 4% PDMS with 20% ZIF-71 loading. The thickness of the membranes is 2.

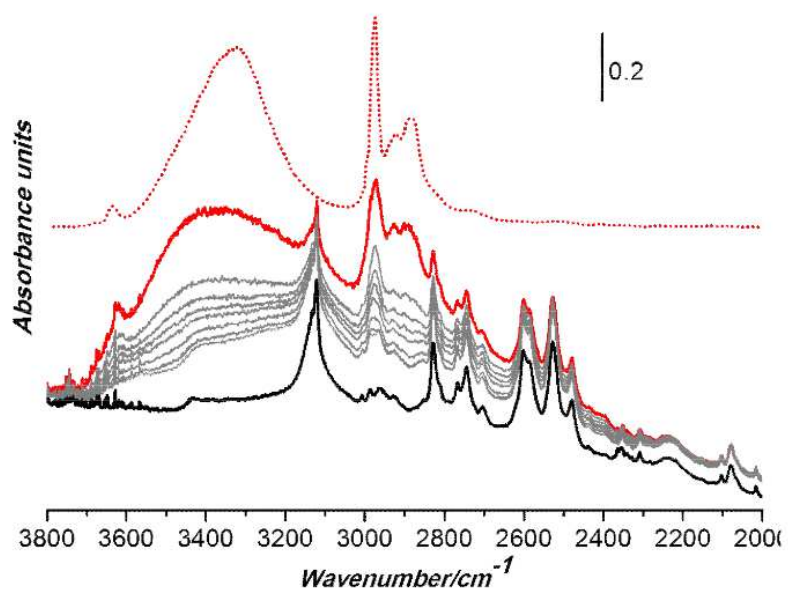


Figure S6. Collected IR spectra of ZIF-71 after activation under vacuum at 300 °C (black curve), under ethanol vapor pressure (red curve) and progressive outgassing at room temperature (grey curves) . The red-dashed curve shows the spectrum of liquid ethanol of a thin film