

AperTO - Archivio Istituzionale Open Access dell'Università di Torino

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

**This is the author's manuscript**

*Original Citation:*

*Availability:*

This version is available <http://hdl.handle.net/2318/1572818> since 2016-06-27T14:02:50Z

*Terms of use:*

Open Access

Anyone can freely access the full text of works made available as "Open Access". Works made available under a Creative Commons license can be used according to the terms and conditions of said license. Use of all other works requires consent of the right holder (author or publisher) if not exempted from copyright protection by the applicable law.

(Article begins on next page)

## 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*

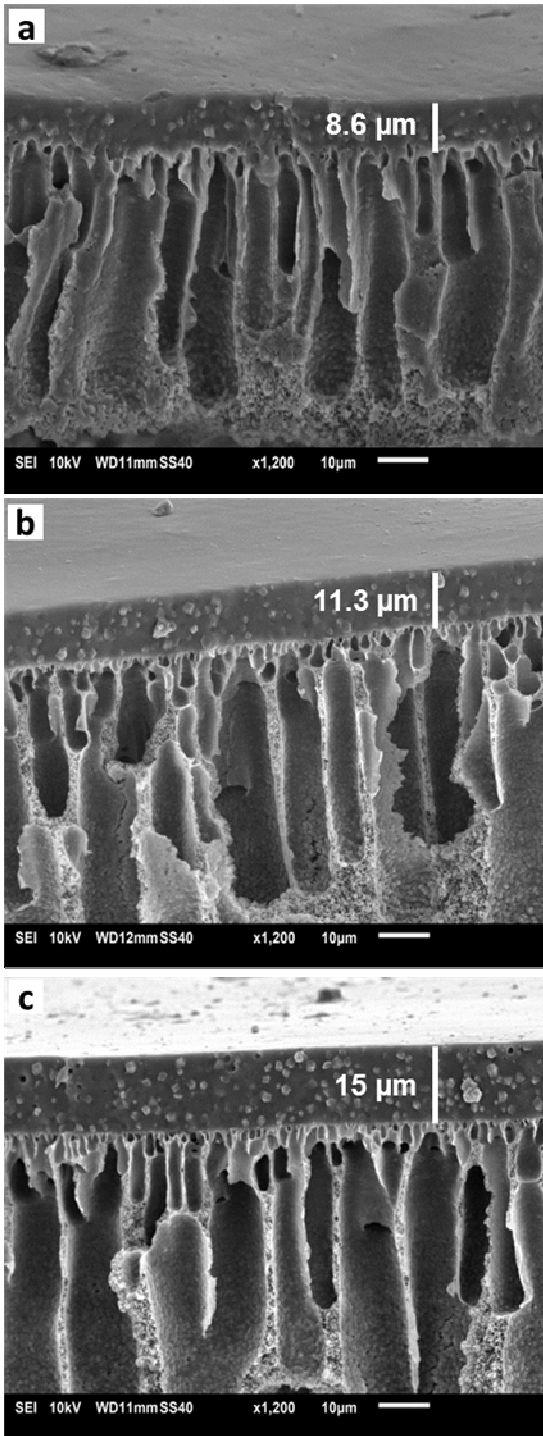
*Lik H. Wee, \* Yanbo Li , Kang Zhang , Patrizia Davit , Silvia Bordiga , Jianwen Jiang Ivo F.  
J. Vankelecom , \* and Johan A. Martens*

Adv. Funct. Mater. 2015, 25, 516–525 DOI: 10.1002/adfm.201402972

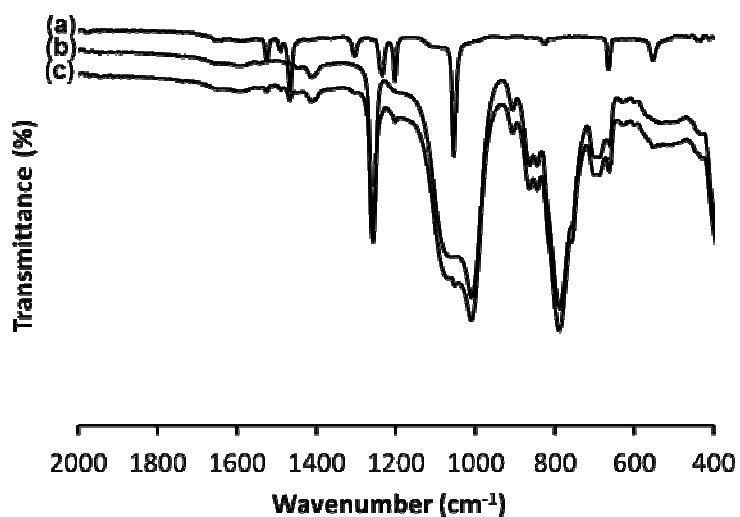
***The definitive version is available at:***

*La versione definitiva è disponibile alla URL:*

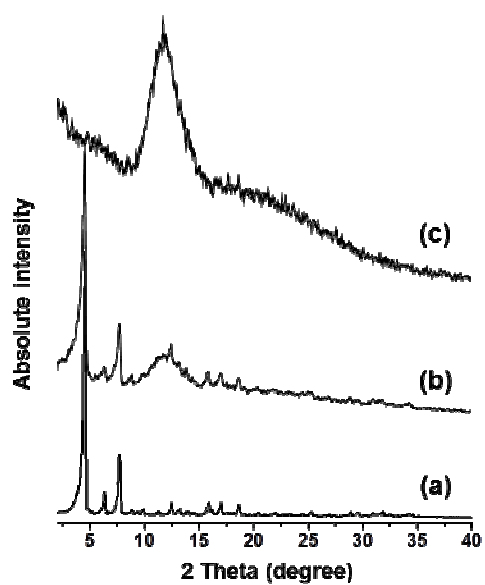
*[<http://onlinelibrary.wiley.com/doi/10.1002/adfm.201402972/full>]*



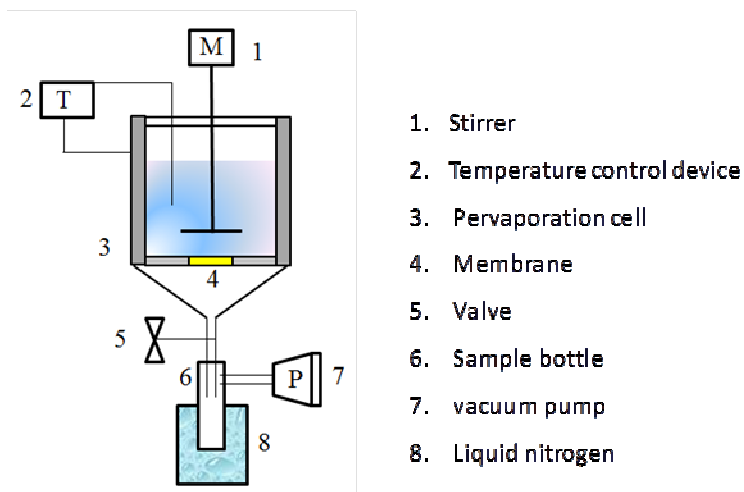
**Figure S1.** Cross-sectional views SEM images of micron-sized ZIF-71 filled composite membranes prepared from 20% PDMS with MOF loadings of (a) 20 wt%, (b) 30 wt% and (c) 40 wt%.



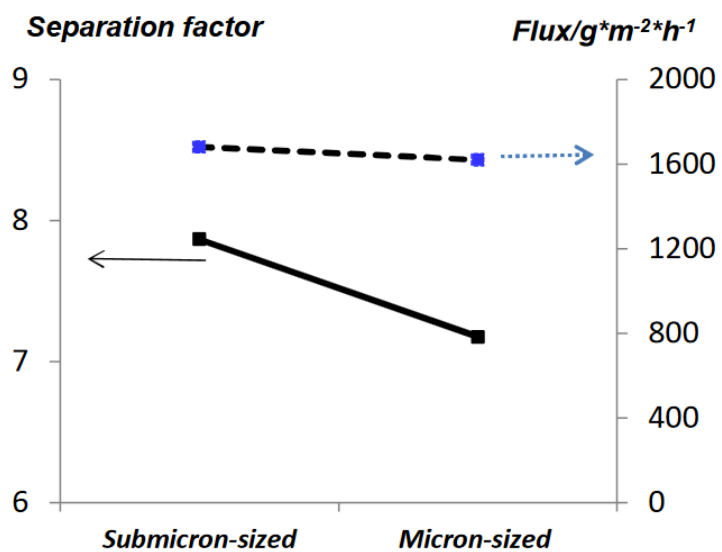
**Figure S2.** ATR-IR spectra of (a) submicron-sized ZIF-71 crystals, (b) typical submicron-sized ZIF-71 filled PDMS membrane and (c) PDMS.



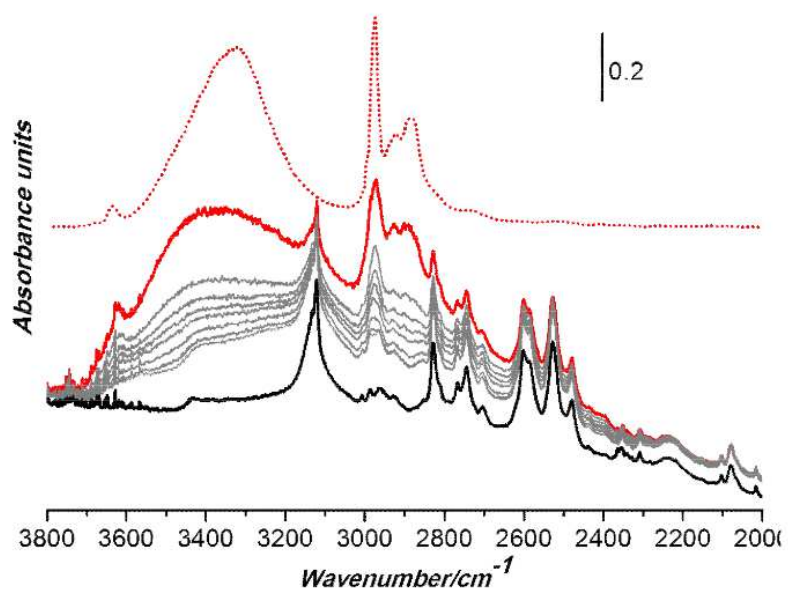
**Figure S3.** XRD patterns of (a) submicron-sized ZIF-71 crystals, (b) typical submicron-sized ZIF-71 filled PDMS membrane and (c) PDMS.



**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