

International Conference and Expo on

# Separation Techniques

August 10-12, 2015 San Francisco, USA

## MFI zeolite membranes for water desalination

Catia Algieri<sup>1</sup>, Angelo Garofalo<sup>1</sup>, Laura Donato<sup>1</sup>, Enrico Drioli<sup>1</sup>, Alessandra Criscuoli<sup>1</sup>, Maria Concetta Carnevale<sup>1</sup>, Omar Alharbi<sup>2</sup> and Saad Aljilil<sup>2</sup>

<sup>1</sup>Institute on Membrane Technology-CNR, Italy

<sup>2</sup>King Abdulaziz City for Science and Technology, Saudi Arabia

Zeolite membranes due to their crystalline structure and to their pore diameters close to the molecular size of different species have attracted the interest of many researchers in the separation processes field. They can be also used as membrane reactors owing to their high thermal and chemical resistance. Considering all these properties, water separation from organic solvents and water treatment are other possible applications of these membranes. For example, about the ion removal from water, very interested in desalination process is the employ of MFI membranes, because their pore size (about 5.5 Å) is lower than the major kinetic diameters of various hydrated ions. In this work MFI zeolite membranes were synthesized on  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> tubular supports. In particular, the membranes were prepared by a secondary growth method using the cross-flow seeding procedure. Subsequently, these membranes were characterized by means of single gas and pure water permeation tests and then used in vacuum membrane distillation to investigate their potential application in water desalination. The membrane performance in distillation process was investigated using both distilled water and salt solutions with different NaCl concentration (0.2, 0.6 and 1.2 M) and using two different operating conditions. In the first case the membranes were tested in a continuous way without washing treatment. In the second one the system was washed at the end of each experiment. The results evidenced high and constant fluxes and salt rejection values higher than 98% for all the concentration considered.

## Biography

Catia Algieri is researcher at the Institute on Membrane Technology (ITM-CNR, ITALY) from 2001. Her research activity is focused on the preparation and characterization of organic and inorganic membranes for gas separations, water treatment and catalytic reactions. She has published many papers in reputable journals and she has presented numerous invited lectures in different international congresses. She is member of the Editorial Board in Journal of Crystallography and referee of several international Journals.

[c.algieri@itm.cnr.it](mailto:c.algieri@itm.cnr.it)

Notes: