

## Accepted Manuscript

Influence of the ion-exchange membrane on the performance of double-compartment microbial fuel cells

Y. Asensio, C.M. Fernandez-Marchante, J. Lobato, P. Cañizares, M.A. Rodrigo



PII: S1572-6657(17)30446-0  
DOI: doi: [10.1016/j.jelechem.2017.06.018](https://doi.org/10.1016/j.jelechem.2017.06.018)  
Reference: JEAC 3349

To appear in: *Journal of Electroanalytical Chemistry*

Received date: 27 April 2017  
Revised date: 9 June 2017  
Accepted date: 12 June 2017

Please cite this article as: Y. Asensio, C.M. Fernandez-Marchante, J. Lobato, P. Cañizares, M.A. Rodrigo, Influence of the ion-exchange membrane on the performance of double-compartment microbial fuel cells, *Journal of Electroanalytical Chemistry* (2017), doi: [10.1016/j.jelechem.2017.06.018](https://doi.org/10.1016/j.jelechem.2017.06.018)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## **Influence of the ion-exchange membrane on the performance of double-compartment microbial fuel cells**

Y. Asensio, C.M. Fernandez-Marchante, J. Lobato, P. Cañizares, M.A. Rodrigo\*

Department of Chemical Engineering. Faculty of Chemical Sciences & Technologies. Universidad de Castilla La Mancha. Campus Universitario s/n 13071 Ciudad Real. Spain.

### **Abstract**

Four two-compartment microbial fuel cells (MFCs), equipped with the same components except for the membranes, were operated for two months within the same operation conditions, in order to evaluate the effects of the ion exchange membranes (IEM) and the hydraulic retention time (HRT). Results obtained point out that a MFC equipped with Nafion-117 achieves higher current and power densities (829 mA m<sup>-2</sup> and 268.37 mW m<sup>-2</sup>, respectively) than when the same type of MFC is equipped the cationic exchange membrane Neosepta CMX or the anionic exchange membrane Neosepta AMX, despite both membranes have higher ion exchange capacities. However, no significant differences were found in the wastewater treatment capacities of the different MFCs. In addition, hydraulic retention time (HRT) was found to play an important role in the output energy generation, because low values contributes to minimize the biofouling and, hence, to produce higher current densities.

### **Keywords**

Membranes; microbial fuel cell; nafion; neosepta; hydraulic retention time

\*Author to whom all correspondence should be addressed: manuel.rodrigo@uclm.es

Download English Version:

<https://daneshyari.com/en/article/6662322>

Download Persian Version:

<https://daneshyari.com/article/6662322>

[Daneshyari.com](https://daneshyari.com)