

Accepted Manuscript

Influence of the methodology of inoculation in the performance of air-breathing microbial fuel cells

F. Vicari, S. Mateo, F.J. Fernandez, P. Cañizares, A. Galia, O. Scialdone, M.A. Rodrigo



PII: S1572-6657(17)30645-8
DOI: doi: [10.1016/j.jelechem.2017.09.024](https://doi.org/10.1016/j.jelechem.2017.09.024)
Reference: JEAC 3518

To appear in: *Journal of Electroanalytical Chemistry*

Received date: 13 June 2017
Revised date: 7 September 2017
Accepted date: 11 September 2017

Please cite this article as: F. Vicari, S. Mateo, F.J. Fernandez, P. Cañizares, A. Galia, O. Scialdone, M.A. Rodrigo, Influence of the methodology of inoculation in the performance of air-breathing microbial fuel cells, *Journal of Electroanalytical Chemistry* (2017), doi: [10.1016/j.jelechem.2017.09.024](https://doi.org/10.1016/j.jelechem.2017.09.024)

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 methodology of inoculation in the performance of air-breathing microbial fuel cells.

F. Vicari¹, S. Mateo², F.J. Fernandez², P. Cañizares², A. Galia¹, O. Scialdone¹, M.A. Rodrigo^{2,*}

¹Università degli Studi di Palermo, Dipartimento di Ingegneria Chimica, Gestionale, Informatica, Meccanica, Viale delle Scienze, Palermo, Italy

²University of Castilla-La Mancha, Faculty of Chemical Sciences & Technologies, Chemical Engineering Department, Avenida Camilo José Cela, 12. 13071 Ciudad Real, Spain.

Abstract

In this work, four air-breathing microbial fuel cells (AB-MFC) were operated for 1 month in order to determine if the methodology of inoculation affects the steady-state performance of this type of MFCs. For this purpose, anaerobic and aerobic sludge were fed to two identical AB-MFCs without any external carbon source into a tight sealed environment during the first three days of start-up. For comparison purposes, other two AB-MFCs were operated mixing the initial sludge and an amount of sodium acetate as substrate. Results point out that the inoculation procedure does not affect the steady-state treatment capacity of the cells but it affects very seriously the production of electricity. Only the system fed with concentrated aerobic sludge was able to develop an efficient culture of bioelectrogenic microorganisms, while the other three systems failed in this purpose. This result was confirmed in a second independent series of experiments and by a last operation test, which consists of a re-inoculation of a low active MFC with microorganisms obtained from the best-performing cell in order to evaluate how much the MFC performance can be enhanced.

Download English Version:

<https://daneshyari.com/en/article/4907552>

Download Persian Version:

<https://daneshyari.com/article/4907552>

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