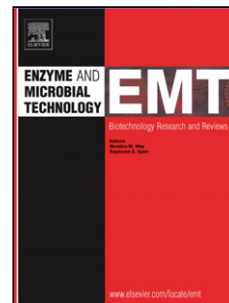


## Accepted Manuscript

Title: Decolourisation of Acid orange 7 in a microbial fuel cell with a laccase-based biocathode: Influence of mitigating pH changes in the cathode chamber

Author: Priyadharshini Mani Taj Keshavarz T.S Chandra  
Godfrey Kyazze



PII: S0141-0229(16)30209-5  
DOI: <http://dx.doi.org/doi:10.1016/j.enzmictec.2016.10.012>  
Reference: EMT 8999

To appear in: *Enzyme and Microbial Technology*

Received date: 11-7-2016  
Revised date: 16-10-2016  
Accepted date: 17-10-2016

Please cite this article as: Mani Priyadharshini, Keshavarz Taj, Chandra TS, Kyazze Godfrey. Decolourisation of Acid orange 7 in a microbial fuel cell with a laccase-based biocathode: Influence of mitigating pH changes in the cathode chamber. *Enzyme and Microbial Technology* <http://dx.doi.org/10.1016/j.enzmictec.2016.10.012>

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.

# **Decolourisation of Acid orange 7 in a microbial fuel cell with a laccase-based biocathode: Influence of mitigating pH changes in the cathode chamber.**

Priyadharshini Mani\*, Taj Keshavarz\*, T.S Chandra\*\* and Godfrey Kyazze\*

\*Faculty of Science and Technology, University of Westminster, London W1W 6UW

\*\* Department of Biotechnology, Indian Institute of Technology (Madras), Chennai-36.

Address for correspondence: Priyadharshini Mani, Faculty of Science and Technology, University of Westminster, London W1W 6UW.

## **Highlights of Research**

1. First Study to observe the influence of mitigating pH changes and its effect on laccase activity in a microbial fuel cell (MFC).
2. Decoupling pH and salinity in the cathode chamber of MFC.
3. Correlation of laccase activity with performance of the system.
4. Comparison on efficiency of Nafion and CEM membrane in a MFC relative to laccase activity.

## **Abstract**

Biocathodes may be a suitable replacement of platinum in microbial fuel cells (MFCs) if the cost of MFCs is to be reduced. However, the use of enzymes as bio-cathodes is fraught with loss of activity as time progresses. A possible cause of this loss in activity might be pH increase in the cathode as pH gradients in MFCs are well known. This pH increase is however, accompanied by simultaneous increase in salinity; therefore salinity may be a confounding variable.

This study investigated various ways of mitigating pH changes in the cathode of MFCs and their effect on laccase activity and decolourisation of a model azo dye Acid orange 7 in the anode chamber. Experiments were run with catholyte pH automatically controlled via feedback control or by using acetate buffers (pH 4.5) of various strength (100 mM and 200 mM), with CMI7000 as the cation exchange membrane. A comparison was also made

Download English Version:

<https://daneshyari.com/en/article/4752872>

Download Persian Version:

<https://daneshyari.com/article/4752872>

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