

Accepted Manuscript

Treatment of Domestic Sewage with Anoxic/oxic Membrane-less Microbial Fuel Cell with Intermittent Aeration

Guodong Zhang, Duu-Jong Lee, Fangqin Cheng

PII: S0960-8524(16)30970-1

DOI: <http://dx.doi.org/10.1016/j.biortech.2016.07.006>

Reference: BITE 16768

To appear in: *Bioresource Technology*

Received Date: 25 April 2016

Revised Date: 30 June 2016

Please cite this article as: Zhang, G., Lee, D-J., Cheng, F., Treatment of Domestic Sewage with Anoxic/oxic Membrane-less Microbial Fuel Cell with Intermittent Aeration, *Bioresource Technology* (2016), doi: <http://dx.doi.org/10.1016/j.biortech.2016.07.006>

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.



Treatment of Domestic Sewage with Anoxic/oxic Membrane-less Microbial Fuel Cell with Intermittent Aeration

Guodong Zhang^{a,b}, Duu-Jong Lee^{b,c*}, Fangqin Cheng^a

^aInstitute of Resources and Environment Engineering, Shanxi University, Taiyuan 030006, China

^bDepartment of Chemical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan 10617

^cDepartment of Chemical Engineering, National Taiwan University, Taipei 106, Taiwan

Corresponding author at: Tel.: +886-2-33663028, Fax: +886-2-23623040(D.J. Lee).

E-mail addresses: djlee@ntu.edu.tw (D.J. Lee).

Abstract: An anoxic/oxic microbial fuel cell (MFC) reactor was applied to treat domestic sewage with intermittent aeration at cathodic chamber. The MFC yielded maximum power density of 2.05 W/m^3 at current density 6.05 A/m^3 , $91.7 \pm 0.3\%$, and the chemical oxygen demand (COD) and $98.2 \pm 0.3\%$ ammonia-nitrogen ($\text{NH}_3\text{-N}$) removals could be reached with most of the hydrophilic (HPI), hydrophobic acid (HPO-A), transphilic acid (TPI-A) of the former being consumed with minimal residual aromatics and the most of $\text{NH}_3\text{-N}$ being converted to N_2 . When the circuit was opened, the COD removal was dropped to $81.1 \pm 0.6\%$ and $\text{NH}_3\text{-N}$ to $80.4 \pm 0.9\%$ with most of the HPI, TPI-A and hydrophobic neutral (HPO-N) fractions of the former being consumed with excess aromatic residue and 60% of the latter being converted to $\text{NO}_2^- \text{-N}$ or $\text{NO}_3^- \text{-N}$ in effluent. Bioelectrochemical reactions in the tested MFC enhance COD and $\text{NH}_3\text{-N}$ removals from domestic sewage.

Keywords: Domestic sewage, dissolved organic matters, removal, ammonium-nitrogen.

Download English Version:

<https://daneshyari.com/en/article/7070340>

Download Persian Version:

<https://daneshyari.com/article/7070340>

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