Accepted Manuscript

Polarized potential and electrode materials implication on electro-fermentative di-hydrogen production: Microbial assemblages and hydrogenase gene copy variation

Kotakonda Arunasri, J. Annie Modestra, Dileep KumarYeruva, K. Vamshi Krishna, S. Venkata Mohan

| PII: DOI: Reference: | S0960-8524(15)01495-9 http://dx.doi.org/10.1016/j.biortech.2015.10.091 BITE 15717 |
|---|---|
| To appear in: | Bioresource Technology |
| Received Date: Revised Date: Accepted Date: | 11 September 201526 October 201528 October 2015 |



Please cite this article as: Arunasri, K., Annie Modestra, J., KumarYeruva, D., Vamshi Krishna, K., Venkata Mohan, S., Polarized potential and electrode materials implication on electro-fermentative di-hydrogen production: Microbial assemblages and hydrogenase gene copy variation, *Bioresource Technology* (2015), doi: http://dx.doi.org/10.1016/j.biortech.2015.10.091

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.

ACCEPTED MANUSCRIPT

| 1 | Polarized potential and electrode materials implication on electro-fermentative |
|----|--|
| 2 | di-hydrogen production: Microbial assemblages and hydrogenase gene copy variation |
| 3 | Kotakonda Arunasri, J. Annie Modestra, Dileep KumarYeruva, K. Vamshi Krishna and S. |
| 4 | Venkata Mohan* |
| 5 | Bioengineering and Environmental Sciences, CSIR-Indian Institute of Chemical Technology, |
| 6 | Hyderabad 500 007, INDIA, Email: vmohan_s@yahoo.com, Telephone: 00-91-040-27191765. |
| 7 | Abstract |
| 8 | This study examined the changes in microbial diversity in response to different electrode |
| 9 | materials viz., stainless steel mesh (SS) and graphite plate as anodes in two microbial electrolysis |
| 10 | cell (MEC) each poised at 0.2 V, 0.4 V, 0.6 V and 0.8 V. Changes in microbiota prior to and |
| 11 | after pretreatment along with microbiota enriched in response to various poised potentials with |
| 12 | SS and graphite are monitored by 16S rRNA gene based DGGE profiling. Significant shifts in |
| 13 | microbial community were noticed at all these experimental conditions. Correspondingly, the |
| 14 | level of hydrogenase belonging to genera Bacillus, Pseudomonas, Rhodopseudomonas and |
| 15 | Clostridium was studied by quantitative real time PCR (RT-PCR) at various applied potentials. |
| 16 | DGGE based 16S rRNA gene profiling revealed enriched members belonging to phylum |
| 17 | Firmicutes predominantly present at 0.8 V in both MECs contributing to high hydrogen |
| 18 | production. This study first time explored the growth behavior of mixed consortia in response to |
| 19 | poised potentials and electrode materials. |
| | |

Keywords: Microbial electrolysis cell, Electrode materials, poised potential, DGGE profiling,
qRT-PCR.

Download English Version:

https://daneshyari.com/en/article/7072922

Download Persian Version:

https://daneshyari.com/article/7072922

Daneshyari.com