



Ethanol production in microbial electrosynthesis using *Sporomusa ovata* as biocatalyst

Ammam, Fariza; Tremblay, Pier-Luc; Zengler, Karsten; Zhang, Tian

Published in:

Book of Abstracts. DTU's Sustain Conference 2015

Publication date:

2015

Document Version

Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):

Ammam, F., Tremblay, P-L., Zengler, K., & Zhang, T. (2015). Ethanol production in microbial electrosynthesis using *Sporomusa ovata* as biocatalyst. In Book of Abstracts. DTU's Sustain Conference 2015 [B-19] Lyngby: Technical University of Denmark (DTU).

DTU Library

Technical Information Center of Denmark

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Ethanol production in microbial electrosynthesis using *Sporomusa ovata* as biocatalyst

Fariza Ammam^{1*}, Pier-Luc Tremblay¹, Karsten Zengler¹ and Tian Zhang¹.

1: DTU Biosustain, Kogle Alle 6, 2970 Hørsholm, Denmark

*Corresponding author email: faram@biosustain.dtu.dk

Microbial electrosynthesis (MES), a new promising process based on the use of bacteria as catalysts and electrical current as energy to reduce CO₂ to multi-carbon organic compounds, has emerged during the last decade as a route of excellence for exploitation of CO₂ as a chemical feedstock. To date, a few microorganisms mainly homoacetogens have been reported to be able to accept electrons from the cathode and to reduce CO₂ to mainly acetate and traces of 2-oxobutyrate. Acetogens use the Wood_Ljungdahl pathway to convert CO₂ to acetyl-CoA, which plays a central intermediate for the production of a diversity of useful organic products, including fuels. It's well established that under appropriate conditions, the metabolic flux in acetogens can be redirected to others products than acetate. The objective of this study is to investigate the impact of the growth conditions, including medium composition on the end-products generation in MES process. By varying trace metals concentrations in the growth medium, we were able to identify a positive effect of tungstate on the growth, acetate and ethanol production in H₂:CO₂ condition. A maximum production of 52 mM and 14 mM of acetate and ethanol were respectively produced when the concentration of tungstate was increased 10 fold. The optimized medium has also showed a better acetate production in MES, with 5 times increase comparing to the standard medium. Tungstate-optimized medium promoted also the production of ethanol in MES. These results demonstrate that trace elements could have a positive effect on the end-products generation from acetogens both in H₂:CO₂ and MES conditions.