



UWS Academic Portal

Enhanced lipid production by homogeniser approach from microalgae *Chlorella vulgaris* in biodiesel production

Krishnamoorthy, Amarnath; Rodriguez, Cristina; Durrant, Andy

Published: 07/11/2022

Document Version
Peer reviewed version

[Link to publication on the UWS Academic Portal](#)

Citation for published version (APA):

Krishnamoorthy, A., Rodriguez, C., & Durrant, A. (2022). *Enhanced lipid production by homogeniser approach from microalgae Chlorella vulgaris in biodiesel production*. 10th Global Conference on Global Warming-2022, Sharjah, United Arab Emirates.

General rights

Copyright and moral rights for the publications made accessible in the UWS Academic 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.

Take down policy

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

Enhanced lipid production by homogeniser approach from microalgae *Chlorella vulgaris* in biodiesel production

Amarnath Krishnamoorthy*, Cristina Rodriguez, Andy Durrant

School of Engineering and Computing, University of the West of Scotland, Paisley, PA1 2BE, United Kingdom

*Corresponding author e-mail: Amarnath.Krishnamoorthy@uws.ac.uk

Abstract: The Earth's temperature is surging, and oligotrophication is already becoming visible. Algae use carbon and nutrients to form important biomolecules such as lipids in this challenging environment. Microalgae is a sustainable and renewable biomass with a high percentage of lipids, that can be used to produce third generation microalgae-based biofuels, and this is regarded as the potential alternative biofuel, replacing non-renewable fossil fuels. Cell disruption is a significant pre-treatment for the effective lipid recovery from microalgae before they are processed in biofuel production, but increased energy requirements are viewed as a concern for low-valued biodiesel. However, the relationship among lipid generation and environmental change remains unexplored. Therefore, this study investigated lipid extraction from microalgae *Chlorella vulgaris* using high speed homogeniser technique for pre-treatment along with deep eutectic solvents like methanol and hexane for extraction. The results found that, enhanced lipid yield of 18.65% was obtained from *Chlorella vulgaris* and this study tried to suggest that the cell wall was disrupted, allowing the solvents for diffusion and extraction of lipids. Gas chromatography analysis found the major components of the characterization of biodiesel, and this could be used as a feedstock in producing biodiesel.

Keywords: Renewable energy; Pre-treatment; high speed homogeniser; Lipid; Biodiesel; Temperature increase.