

Exploring a novel circular economy concept for the valorisation of crude glycerol from biodiesel production

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Summary

Biodiesel is primarily made from vegetable oils and fats, and the production process yields crude glycerol as by-product. Pure glycerol is low-value thus not presenting economic incentive to the biodiesel industry. However, crude glycerol can be converted into lactic acid via hydrothermal treatment. This project will explore optional technologies for the conversion of crude glycerol into added value chemicals.

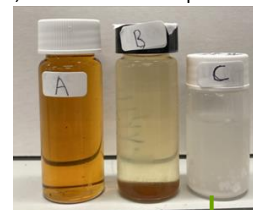
Aims

- Explore efficient and economic uses of glycerol
- Provide added value to crude glycerol
- Assess feasibility of using liquefied lactic acid obtained through hydrothermal conversion of crude glycerol to grow microbes that produce high value nanomaterials

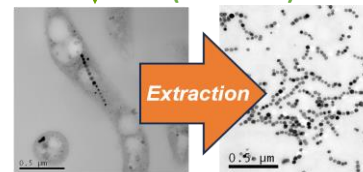
Outcomes

- Developed new process to transform crude glycerol into lactic acid and other organic acids
- Used lactic acid is a carbon source to grow magnetotactic bacteria producing magnetosomes, which are used in many biotechnological applications

A: Crude glycerol; B: Processed crude glycerol; C: Lactic acid- rich product



Feed (nutrients)



M. gryphiswaldense Magnetosomes

"The outcomes of the project have paved the way for a novel, circular and cleaner process that reduces waste generation from the bio-diesel industry, and contributes to the production of sustainable chemicals, energy and materials."
Alfred Fernandez-Castane,
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