Effects of nitrogen/phosphate ratio on the lipid accumulation and growth of the isolated Chlorella pyrenoidosa

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ABSTRACT

Background

The feasibility of biodiesel production from microalgae as third generation biodiesel feedstock was studied in the present investigation. The oil was extracted from the algae biomass and then transesterified. The systematic characterization of algae biomass, algae oil and algae biodiesel was carried out to establish the potential of microalgae for biodiesel production.

Results

There is an optimal influent inorganic nitrogen concentration (NH₄)₂SO₄ (0.2~0.4g/L) corresponding to maximum microalgae productivity and FAMEs content and the lower (NH₄)₂SO₄ concentration is far higher than the higher (NH₄)₂SO₄ concentration. The experimental results showed the maximum specific growth rate (μmax) and total FAMEs content were 0.43 day⁻¹ and 43%, respectively, in the medium containing (NH₄)₂SO₄ concentration of 0.2 g/L. Total FAMEs content in high N/P ratio (10/1) increased about 1.19 times of the medium without phosphate, it accounted for 51%.

Conclusions

The growth and FAMEs content of G3H3-1-2 were affected by the nitrogen/phosphate ratio in the medium. In the future, G3H3-1-2 is a promising organism for feedstock production of biofuel and may be used in scaled up culture outdoors.

Keywords: Chlorella sp., nitrogen/phosphate ratio, lipid, biodiesel

REFERENCES