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# Nutrient Removal and Energy Production from Aqueous Phase of Bio-Oil Generated via Hydrothermal Liquefaction of Algae

Saravanan R. Shanmugam, Sushil Adhikari‡, Rajdeep Shakya

[1]Department of Biosystems Engineering, Auburn University, Auburn, Alabama, USA, 36849.

**Abstract:**

Removal of nutrients (phosphorus and nitrogen) as struvite from bio-oil aqueous phase generated via hydrothermal liquefaction of algae was evaluated in this study. Effect of process parameters such as pH, temperature and reaction time on struvite formation was studied. More than 99% of phosphorus and 40-100% nitrogen ($NH_4^+$-N) were removed under all experimental conditions. X-ray diffraction analysis confirmed the formation of struvite, and the struvite recovered from bio-oil aqueous phase can be used as a slow-release fertilizer. Biogas production from struvite recovered bio-oil aqueous phase showed 3.5 times higher $CH_4$ yield (182 ± 39 mL/g COD) as compared to non-struvite recovered BOAP fed cultures. The results from this study indicate that both struvite and methane can be produced from bio-oil aqueous phase.

***Keywords**:* Bio-oil aqueous phase; struvite; methane production; hydrothermal liquefaction; Algae.

‡ Corresponding author. Tel: +1 334 844 3543; fax: +1 334 844 3530
Email address: sushil.adhikari@auburn.edu (S. Adhikari)