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

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

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6 **Abstract:**

7 Removal of nutrients (phosphorus and nitrogen) as struvite from bio-oil aqueous phase generated
8 via hydrothermal liquefaction of algae was evaluated in this study. Effect of process parameters
9 such as pH, temperature and reaction time on struvite formation was studied. More than 99% of
10 phosphorus and 40-100% nitrogen (NH₄⁺-N) were removed under all experimental conditions.
11 X-ray diffraction analysis confirmed the formation of struvite, and the struvite recovered from
12 bio-oil aqueous phase can be used as a slow-release fertilizer. Biogas production from struvite
13 recovered bio-oil aqueous phase showed 3.5 times higher CH₄ yield (182 ± 39 mL/g COD) as
14 compared to non-struvite recovered BOAP fed cultures. The results from this study indicate that
15 both struvite and methane can be produced from bio-oil aqueous phase.

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

18 Algae.

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