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Catalytic conversion of *Chlorella pyrenoidosa* to biofuels in supercritical alcohols over zeolites

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Abstract: Microalgae have been considered as the feedstock for the third generation biofuels production, given its high lipid content and fast productivity. Herein, a catalytic approach for microalgae liquefaction to biocrude is examined in a temperature range of 250-300 °C in methanol and ethanol over zeolites. Higher biocrude yield was achieved in ethanol and at lower temperatures, while better quality biocrude with higher light biocrude ratio and lower average molecular weight (M_w) was favored in methanol and at higher temperatures. Application of zeolites improves the biocrude quality significantly. Among the catalysts, HY shows the strongest acidity and performs the best to produce high quality biocrude. Solid residues have been extensively explored with thermal gravity analysis and elemental analysis. It is reported for the first time that up to 99 wt.% of sulfur is deposited in the solid residue at 250 °C for both solvents.

Keywords : Microalgae, Biocrude, Methanol, Ethanol, Zeolites

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