

Poster E15

Biofuel Production from Microalgae Residues Under Different Conditions: From Liquefaction to High Pressure High Temperature Steam

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The valorisation of microalgae residues to biofuel has been conducted under different experimental conditions, from liquefaction, steam to high pressure high temperature steam. The objective is to study the effect and role of water on the thermal decomposition reaction. At the present, the phase transition of water is considered to be a key point for rapid degradation of organic materials and in this particular case on the micro algae cells. Depending on the operating conditions, some effects as water penetration and evaporation for dispersion could be observed. The raw matter used is a microalgae residues, that means micro algae defatted by supercritical CO₂.

The experimental conditions tested are from 5 MPa, 400°C to 25 MPa, 300°C. The total weight yield of the microalgae without the reaction was 76.3% and did not reach 100%. It suggested that the microalgae included about 20% water. At all conditions, the acetone soluble yield increased, compared to the microalgae without reaction. On the other hand, the solid yield decreased. It means that some high molecule compound decompose to a product that soluble to acetone. The all carbon yield of gas consist of CO₂, and it came from oxygen that initially existed in the reactor. The gas yield increased as the water density decreased. It was because the contact with oxygen and microalgae was better at lower density.