

8th International Conference on

BIOFUELS, BIOENERGY & BIOECONOMY

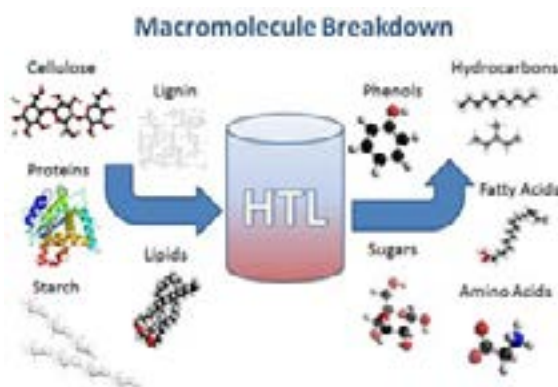
December 04-05, 2017 | Sao Paulo, Brazil

Review of algae hydrothermal liquefaction

Wennan Zhang

Mid Sweden University, Sweden

Hydrothermal liquefaction (HTL) of algae biomass has been shown to be a feasible technique to treat large amount of wet algae biomass for the production of a biocrude suitable to be used as biofuel similar to fossil oil. From HTL process, biocrude or bio-oil is produced at temperature of 250 to 370 °C and pressure of 5 to 25MPa with a residence time of 5 to 60 min. In the process, up to 85% of the oxygen contained in biomass can be removed as CO₂ and water. Thus, only about 10% oxygen remains in the HTL biooil which leads to a high heating value of 35MJ/kg (fossil diesel 42MJ/kg) in comparison to pyrolysis oil with oxygen content 38% and heating value 18MJ/kg. A further process of hydrotreatment and hydrocracking can remove the 10% oxygen completely and finally a drop-in fuel, gasoline or diesel, can be produced. Comparing biomass gasification and pyrolysis, HTL uses wet feedstock and avoids high temperature operation and energy consumption for feedstock drying. However, HTL technology development is so far in the stage of lab-scale study. This paper is to review algae-HTL-diesel process and to identify the feasibility of HTL application to algae. The algae properties and different operation conditions such as temperature, pressure, loading rate, catalysts, heating rate etc. may lead to different quality and composition of end products from algae HTL, which will be reviewed in this paper.



Biography

Wennan Zhang received PhD at Chalmers University of Technology in Energy Engineering in 1995. He has been working on bioenergy since 1996 at Mid Sweden University as a Senior Lecturer and Associate Professor. His main work is to lead a biomass gasification research group which is turned to be BTL (biomass-to-liquid) group. A BTL laboratory at Mid Sweden University has been built up under his leadership. The central unit of the laboratory is a 150kW biomass dual fluidized bed gasifier developed by him and his colleague for synthetic gas production. He had been the coordinator of a 4th EU frame-work project "Process simulation of CFB with combustion/gasification of biomass", from 1998 to 2001. He has developed and taught two courses, "Biofuels" and "Bio-automotive fuels", to engineer education students at Mid Sweden University since 1998. He is also guest professor in Chinese Academy of Science.

wennan.zhang@miun.se

Notes: