

A Research on the Effect of Pretreatment on Non-catalytic Thermal Decomposition of Macroalgae Biomass

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Macroalgae biomass non-catalytic thermal decomposition process is highly interested strategy technology to be able to produce bio-oil for power generation and transportation[1-2]. The geographic features of Korea which is surrounded by water on three sides have the advantages of enabling sustainable supply of macroalgae biomass and studying of biomass non-catalytic thermal decomposition process. In the present study, the effect of the macroalgae biomass of before and after pretreatment on the non-catalytic thermal decomposition is investigated. A lab scale fixed bed reactor diagram is shown in Fig. 1. In order to analysis the properties of macroalgae biomass, proximate analysis are carried out and the basic non-catalytic thermal decomposition characteristic is investigated by TGA (thermogravimetric analysis) method. The water content of before and after pretreatment on biomass is confirmed. Before and after pretreatment composition resulting from proximate analysis are increased volatile 38.9 to 47.7%, fixed-C 16.3 to 19.9% and Ash 26.9 to 32.8%. In the result on TGA analysis, the more temperature ramping speed slow, the more conversion efficient is increased, the amount of thermal decomposition is increased in the range of 400-600 °C. As shown in Fig. 2, the water content of macroalgae biomass after pretreatment is decreased about 15% after 8 hrs. Fig. 3 shows the efficiency with drying temperature in the thermal decomposition of macroalge biomass.

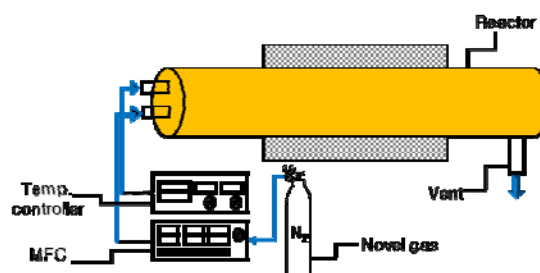


Fig. 1. Schematic diagram for the fixed-bed reactor of lab-scale.

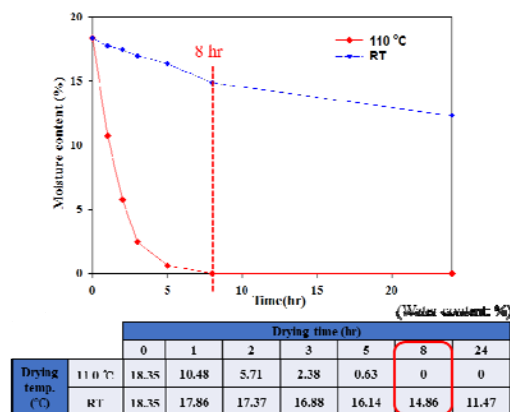


Fig. 2. The change of the water content by time.

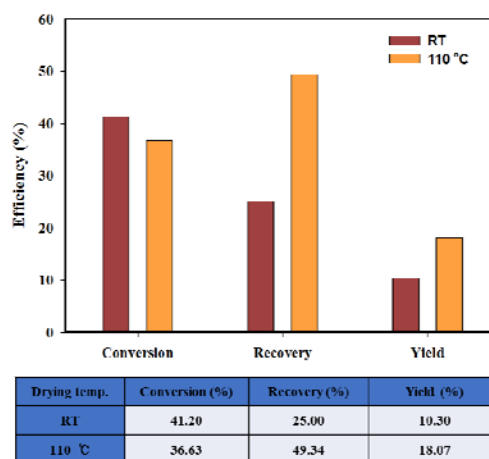


Fig. 3. The efficiency with drying temperature in the thermal decomposition of macroalge biomass.

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