

Pyrolysis Of Saccharina Japonica Alga In A Fluidized-Bed Reactor For Bio-Oil Production

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Macro-algae are recognized as one of the potential feedstock for renewable energy and fuel production. *Saccharina japonica* is a kind of macro-algae, which is extensively cultivated in Korea. Through fast pyrolysis, *Saccharina japonica* can be converted into bio-oil, gas and char. In this study, pyrolysis of *Saccharina japonica* was performed in bubbling fluidized-bed reactor under different reaction conditions (pyrolysis temperature, flow rate of fluidizing medium, biomass particle size) to investigate the effect of these parameters on the product yields and the qualities of bio-oil. The results showed that the highest yield of bio-oil was 40.87%, obtained at a pyrolysis temperature of 350°C with a gas flow rate of 9.6L/min, and a feeding rate of 100g/hr. The particle size of biomass material also affected the bio-oil yield. The bio-oil is composed of highest selectivity of propanone (43.93%) and di-anhydromannitol (22.19%). The ¹³C NMR results of bio-oil showed that shorter aliphatic carbons and lower molecular weight compounds of alcohol, carbohydrate, and ketone were generated during pyrolysis at higher temperatures due to secondary decomposition reactions.