Thermal Decomposition Of Saccharina Japonica Alga Under Slow Pyrolysis Conditions

Through pyrolysis, Macro-algae (Saccharina japonica) can be converted into bio-oil, gas and char. In this study, we investigated the thermal decomposition of Saccharina japonica under slow pyrolysis conditions in fixed-bed reactor. The results showed that the liquid yield was 43.96%, obtained at a pyrolysis temperature of 350oC with a carrier gas flow rate of 300ml/min. The bio-oil is composed of highest selectivity of di-anhydromannitol (22.73%) and 2-Methyl Furyl Ketone (10.58%). 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. The gas products include CO, CO2, hydrocarbon (C1~C4) were similar for all reaction conditions, but the selectivity of gas composition varied with conditions. These results will be compared to those of pyrolysis in bubbling fluidized-bed reactor.