OPTIMIZATION OF FAST PYROLYSIS PROCESS TOWARDS MORE SUGARS AS AN ALTERNATIVE ROUTE FOR CHEMICALS AND FUELS

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Fast pyrolysis is the most effective and commercially feasible technology for production of bio-oil from biomass. Upgrading of lignin fraction bio-oil into liquid hydrocarbon is the main route for utilization of bio-oil. Increasing the amount of sugars in the aqueous fraction bio-oil will critically increase the importance of this fraction through conversion of sugars into more valuable liquid fuels and chemicals. In this study, a new pretreatment and pyrolysis techniques were applied on green pinewood feedstock. After pyrolysis, both lignin and aqueous fractions bio-oil were fractionated by addition of water. The concentration and average molecular weight of sugars in the aqueous fraction bio-oil were determined by HPLC and GPC, respectively. The yield of sugars in the aqueous fraction bio-oil was increased from 15-24% after the pretreatment. Alfa Laval M20 membrane filtration system was used to separate sugars from the aqueous fraction bio-oil. Factors affecting the separation process such as membrane molecular weight cut off and trans-membrane pressures are still under study.