HYDROTHERMAL LIQUEFACTION OF PERENNIAL BIOMASS FEEDSTOCKS FOR PRODUCTION OF TRANSPORTATION FUELS

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Biomass as renewable energy sources is receiving worldwide attention for several reasons. These include the desire to develop sustainable energy sources, decreasing dependence on oil, and decreasing the rate of depletion of the fossil fuel reserves. Perennial grasses had many characteristics make them an ideal alternative energy sources. They can potentially be produced in reliable quantities with greater inexpensive price stability, also, they can provide extensive environmental benefits to soil, water and air through reduction of hazardous gas emissions. The aim of this work is to utilize some perennial grasses greatly available at Southern United States such as switchgrass and giant miscanthus for production of transportation fuels. The promising hydrothermal liquefaction (HTL) conversion processes will be applied for this study. The most important parameters that effect hydrothermal liquefaction as time, pressure, temperature and catalyst will be studied. Full physical and chemical characterization for the properties of the produced bio-oil will be performed. Finally, the bio-oil with the best physical and chemical properties will be upgraded into liquid bio-fuels and some evaluation tests will be performed.