

The Gasification of Fructose in Supercritical Water

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Abstract : Biomass is renewable and sustainable. As an energy source, it will not release extra carbon dioxide into the atmosphere. Hence, tremendous efforts have been made to develop technologies capable of transforming biomass into suitable forms of bio-fuel. One of the viable technologies is gasifying biomass in supercritical water (SCW), a green medium for reactions. While previous studies overwhelmingly selected glucose as a model compound for biomass, the present study adopted fructose for the sake of comparison. The gasification of fructose in SCW was investigated experimentally to evaluate the applicability of supercritical water processes to biomass gasification. Experiments were conducted with an autoclave reactor. Gaseous product mainly consists of H₂, CO, CO₂, CH₄ and C₂H₆. The effect of two major operating parameters, the reaction temperature (673-873 K) and the dosage of oxidizing agent (0-0.5 stoichiometric oxygen), on the product gas composition, yield and heating value was also examined, with the reaction pressure fixed at 25 MPa.

Keywords : biomass, fructose, gasification, supercritical water

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