

The Thermochemical Conversion of Lactic Acid in Subcritical and Supercritical Water

Authors : Shyh-Ming Chern, Hung-Chi Tu

Abstract : One way to utilize biomass is to thermochemically convert it into gases and chemicals. For conversion of biomass, glucose is a particularly popular model compound for cellulose, or more generally for biomass. The present study takes a different approach by employing lactic acid as the model compound for cellulose. Since lactic acid and glucose have identical elemental composition, they are expected to produce similar results as they go through the conversion process. In the current study, lactic acid was thermochemically converted to assess its reactivity and reaction mechanism in subcritical and supercritical water, by using a 16-ml autoclave reactor. The major operating parameters investigated include: The reaction temperature, from 673 to 873 K, the reaction pressure, 10 and 25 MPa, the dosage of oxidizing agent, 0 and 0.5 chemical oxygen demand, and the concentration of lactic acid in the feed, 0.5 and 1.0 M. Gaseous products from the conversion were generally found to be comparable to those derived from the conversion of glucose.

Keywords : lactic acid, subcritical water, supercritical water, thermochemical conversion

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020