

Kinetic study of dilute acid hydrolysis using rice straw

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Rice straw is lignocellulosic biomass, especially agricultural waste that can be converted to ethanol. The major components of lignocellulosic biomass are hemicellulose, cellulose and lignin. Hemicellulose and cellulose can be converted into reducing sugar by acid or enzymatic hydrolysis. This study using the acid hydrolysis is to explore the kinetics of rice straw. These one grams of rice straw was mixed with 10ml of 0.5%~2% sulfuric acid solution then was heated at 140°C~200°C in an oil bath. The reaction was expected to be constant temperature, but before that temperature was achieved, reaction has occurred. The first sample was taken at temperature 120°C and repeated every 5 minute interval. It was observed that the degradation has significant effect on the ethanol production. The kinetic constants can be expressed by Arrhenius equation with the frequency factors for hydrolysis and sugar degradation.