

## Steam Gasification Characteristics of Biomass in a Thermobalance Reactor

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Biomass is known as an important renewable alternative energy resource. Oil and gas derived from biomass can be used as substitutes for petroleum or natural gas. Sawdust and rice husk were chosen as resources of biomass, which are produced a lot and suitable for domestic power plants. Pyrolysis characteristics of volatile matter of selected biomass was determined under nitrogen atmosphere in a thermogravimetric analyzer (TGA). The char particles for gasification were prepared by devolatilization at 900°C. Steam gasification of biomass char was determined in a thermobalance reactor (0.055 m I.D. × 1.0 m height). The activation energy and the pre-exponential factor were derived from Arrhenius plot. Several gas-solid reaction models have been examined for kinetic equation of steam gasification of biomass, and the shrinking core model provides the best agreement with the experimental data. Product gas of gasification was collected from flue of the reactor, and the composition was decided by gas chromatography(GC). Calorific gases including H<sub>2</sub>, CO, CH<sub>4</sub> and several hydrocarbon gases are produced over 50% by steam gasification of selected biomass.