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Effect of lignin addition on biomass fluidity

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Abstract. Biomass primarily consists of cellulose, hemicellulose, and lignin. These components are known to soften at a specific temperature. This phenomenon has been previously studied by wood researchers. Since biomass has a specific component ratio, the flow-starting temperature varies according to the type of biomass. In a previous study, we investigated the flow-starting temperatures of five biomasses with different moisture contents because it was previously reported that as the moisture content increases, the flow-starting temperature of hemicellulose and lignin decrease. Thus, we generated an equation for calculating the flow-starting temperature from the biomass component ratio and moisture content.

The purpose of this study was to investigate the flow-starting temperature in samples with increased lignin, obtained by mixing high-lignin biomass. Trunk and bark from Japanese cedar were used as raw material. Trunk and bark of Japanese cedar were used as raw material. The main component of the trunk biomass was cellulose, and the main component of the bark biomass was lignin. As the result, it found that the flow-starting temperature decreased as the ratio of bark in the mixture increased. Plural biomass must be mixed for industrial use because biomass resources are found shallowly and widely. Thus, this obtained data may be applicable to mixed biomass samples. Moreover, it become the basic data the formation conditions of solid biofuels and wood materials because the fluidity participates in solidification of various biomass.

Keywords: Biomass, Fluidity, Lignin.