

Characteristics of hemicellulose, cellulose and lignin pyrolysis

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Biomass is considered as a promising renewable energy source that includes all aquatic and terrestrial vegetation, waste from forestry, livestock and agriculture, or sewage. The organic part of biomass consists of three components: lignin, cellulose and hemicellulose. Its ratio varies depending on the type of biomass. The properties of these components have a great influence on the pyrolysis characteristics due to their different reactivity when exposed to temperature. The objectives of the project are to study the component composition of various types of plant biomass, as well as to study the interaction of organic components in the pyrolysis process, the effect of this interaction on the yield and composition of pyrolysis products. In the course of the study, data were obtained on the influence of the conditions for pyrolysis of the main components of plant biomass separately, in a model mixture and in the origin plant biomass. Slow pyrolysis at 350, 425, 500 and 575 °C was performed. The yield and composition of biochar, bio oil and pyrolysis gas at these temperatures were determined. This reported study was funded by RFBR, project No. 20-08-00835A.