Experimental investigations on the effect of lignin, hemicellulose and cellulose interaction in plant biomass during pyrolytic treatment

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Plant biomass is a sought-after renewable resource for the production of synthesis gas, which can be used to generate heat, power or liquid chemicals. The study of biomass organic components interaction (lignin, hemicellulose and cellulose) during the pyrolysis is fundamental to a deep understanding of the transformation mechanisms, as well as to the possibility to predict the yield of liquid and solid pyrolysis products for various types of biomass. The technology of two-stage thermal conversion of biomass is an original method of producing synthesis gas and includes pyrolysis of biomass at 350–500 °C and gasification of the obtained biochar at 900–1100 °C using pyrolysis vapor-gas products as an oxidizing agent. The main scientific target of this project is to determine the common patterns of lignin, hemicellulose and cellulose interaction during pyrolysis in the first stage, which will optimize the second stage of the proposed method in accordance with the specific characteristics of the feedstock.

The reported study was funded by RFBR, project number 20-08-00835.