

# Hydrothermal carbonization and torrefaction of individual structural components of lignocellulosic biomass feedstock

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Currently, more and more attention is paid to the reduction of carbon dioxide, which has a tendency to aggravate the greenhouse effect. One way to reduce CO<sub>2</sub> emissions is to use energy fuels derived from biomass. Plant biomass is carbon neutral because when it is burned, the same amount of carbon dioxide is released that it absorbs during its growth. It is known that the main structural elements of biomass are cellulose, hemicellulose and lignin. The study of the transformation of individual structures by methods of obtaining biochars from biomass is a very important task. Modern methods of obtaining biochars are hydrothermal carbonization and torrefaction. Torrefaction is a mild pyrolysis occurring under anaerobic conditions at a temperature of 250-350 C. Biomass torrefaction is currently used as a method of converting raw biomass into a solid with high energy density, hydrophobic, compact, pulverizable and lower oxygen to carbon (O/C) ratio, which is suitable for commercial and domestic combustion and gasification. HTC is carried out at moderate temperatures (180-250 C) and pressure (10-20 bar) in the presence of liquid water. The main products of the reaction is biochar (“hydrocoal”). Hydrocoal is a high carbon product. The study of the influence of thermochemical methods on individual structural components is an important task that can show how the conversion of biomass into biochar occurs. This study was supported by the Russian Foundation for Basic Research (project No. 20-08-00862 A)