



NUMERICAL AND EXPERIMENTAL STUDIES OF BIOMASS PYROLYSIS

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ABSTRACT

Pyrolysis is one of the most efficient thermochemical processes of organic compounds conversion, which occurs at high temperatures without oxygen.

The results of a comprehensive study of the biomass pyrolysis to produce high yield of liquid fuels are presented in the article. A mathematical model was developed that adequately describes the process of biomass pyrolysis. Experimental studies of biomass pyrolysis were carried out.

The optimal biomass particle size for high liquid products yield was defined as 1 - 3 mm. The effect of biomass moisture was studied.

Found that in order to maximize the yield of liquid pyrolysis products of good quality biomass, process temperature should not exceed 600 °C.

Chromatographic studies conducted tests of liquid pyrolysis products, which showed that the composition of the products greatly depends on the humidity of raw materials. With rapid heating and temperatures of about 500 °C (the technology of fast pyrolysis), the dominant product is a liquid with a high calorific value, consisting of complex organic compounds and water. In this case, gas-vapor mixture of products should quickly (within seconds) to cool.

Keywords: biomass, pyrolysis, mathematical model, liquid products