NEW TECHNOLOGIES FOR THE ENERGY USE OF BIOMASS

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Abstract: At the UN World Climate Conference (December 2015, Paris), it was recommended to limit the use of fossil fuels to 10% of available reserves by 2050. With the implementation of these measures, the increase in the temperature of our planet should not exceed 2 °C by 2050. Within the limits indicated, approximately 80% of the world's coal reserves, 50% of natural gas, and 30% of oil would remain unused. The priority solution to the problems of reducing the harmful impact of energy on the natural balance is the use of biomass including waste of various types in the form of fuel. The article provides information about new technologies for energy use of biomass developed at the Joint Institute for High Temperatures of the Russian Academy of Sciences.

Keywords: biomass; low-carbon energy; synthesis gas; pyrocarbon; torrefication

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Figure Captions

Figure 1 Relative change in the heating value as a function of the torrefication temperature for various types of biomass: *1* — wood; *2* — straw; and *3* — peat

Figure 2 The hygroscopicity limit of the initial and torrefied samples at different torrefication temperatures

Figure 3 The JIHT RAS torrefication unit with a capacity of 150 kg/h

Figure 4 Energy balance for obtaining 1 kg of torrefied product by three different torrefication schemes: *1* — electrical power; *2* — thermal energy; *3* — torrefication consumption; and *4* — pollutant emissions

Figure 5 Photograph and properties of carbon-containing materials obtained by the joint processing of biomass (wood waste) and hydrocarbon (associated) gases

Table Caption

The composition of gases produced by the JIHT RAS technology from various biomass feedstocks

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