CALORIMETRIC ANALYSIS OF THERMOCHEMICAL CONVERSION PRODUCTS OF WORN TIRES

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Introduction. The problem of utilization of worn tires in the world is a great economic and environmental significance for all developed countries. This is due to the fact that worn-out tires are the source of long-term pollution of the environment by toxic components and unsanitary storage at places of their storage and disposal.

Today, the most common method for disposing of tires is their combustion for energy production, but it requires the use of appropriate technologies and combustion plants with a complex and costly system for the cleaning of exhaust gases from harmful components. A significant problem of industrial combustion is the logistics of the process, that is, the collection of tires, transportation and storage, which stimulates the development of mobile plants able to carry out the processing of tires in their places of accumulation.

One of the promising ways to dispose of tires is the technology of full carbon recycling by means of a previous thermochemical conversion, which is the physico-chemical transformation of the organic part of the raw material into gaseous, liquid and solid carbon-containing energy products. Their heat value is estimated by the thermal characteristics determined by calorimetric and technical analysis.

The purpose of the work is to determine the thermal characteristics of samples of products of pyrolysis of worn tires and to assess the possibility of their use for energy purposes.

Research results. The humidity, ash content and heat of combustion of the raw material in the form of rubber crumbing of worn tires and pyrolysis products of tires - liquid fuel and solid carbon are determined. Using the data of experimental measurements, the higher and net heat of combustion of the analytical sample, the fuel in the dry state and in the working condition of delivery, with allowance for corrections for the formation of sulfuric and nitric acid is determined. The value of the net heat of combustion in the delivery state for the rubber crumb of tires, liquid and solid pyrolysis product, respectively, amounted to 30.36; 40.79; 24.37 MJ / kg.

Conclusion. The determined thermal and technical characteristics of samples of pyrolysis products of worn tires indicate the possibility of their use as alternative fuel in existing power installations.