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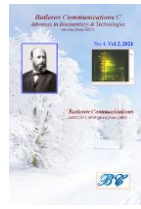

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Experimental testing of the modes of the wood pyrolysis process during production raw materials for a sorbent for medical purposes

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Abstract

It is promising to use wood as a raw material for the production of a sorbent for medical purposes. Firstly, charcoal active carbons are relatively cheap, are distinguished by a high degree of purity and microporosity, due to which the demand for them in medicine, industry, and processes for purifying drinking water is steadily increasing; secondly, wood is one of the main sources of renewable natural resources; thirdly, the possibility of using woodworking industry waste as a raw material makes it possible to eliminate environmental problems associated with their utilization and increase resource conservation of production. The article presents a diagram of an experimental setup for studying the process of obtaining raw materials for the production of a sorbent for medical purposes, which consists of block for determining kinetic parameters, allows using thermocouples to register the temperature of the pyrolysis process directly in the chamber and in the sample, as well as using a strain gauge sensor to register the change in the mass of the pyrolyzed material with a frequency of up to 10 times per second. Moreover, the received data is stored in the computer database with a specified time interval. The connection of temperature sensors with a computer makes it possible to register temperature values with a high frequency when a large number of temperature sensors are connected. The parameters registered by the sensors are saved in the database and processed in real time. The experimental values on the graphs are indicated by triangles, the calculated ones are shown by lines. As a result of data processing from the strain gauge, the change in the mass of the pyrolyzed sample, the nature and duration of the pyrolysis phases are determined. As a result of the studies, a number of dependencies of the quantitative yield of volatile components depending on the pressure of the vapor-gas mixture were revealed. The vacuum in the chamber helps to increase

the yield of liquid products, since they are quickly removed from the apparatus without interacting with charcoal, a strong catalyst for chemical reactions. At elevated pressures, an increase in the yield of non-condensable gases is observed, which is explained by the decomposition of certain chemicals (such as, for example, acetone) when interacting with charcoal.

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