
THE INFLUENCE OF CHEMICAL IMPURITIES AND MECHANOCHEMICAL ACTIVATION ON THE RHEOLOGICAL PROPERTIES OF COAL-WATER SUSPENSIONS

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It is shown that the use of water-coal fuel mixtures as an energy resource in the production of heat and electric energy can not only significantly expand the resource base of the heat and power industry, but also improve the environmental performance of coal combustion on heat power equipment. One of the main problems of using coal-water fuel is its high viscosity, which complicates the processes of pumping and spraying during combustion. Optimization of the viscosity and other rheological properties of these fuel mixtures is achieved by adding chemical reagents-plasticizers. The experimental studies of the effect on the rheological properties of coal-water fuel mixtures of the use in the process of their production of plasticizers of various origins and modes of mechanochemical activation (grinding of the dispersed phase) have been carried out.

For the research, plasticizing reagents were selected, which are used in various technologies for the preparation of water-coal fuel mixtures, and new reagents have been proposed. It was concluded that triethylamine has an advantage in use due to its effectiveness and relatively low cost. In this regard, a study of changes in the rheological properties of coal-water fuel with the addition of this reagent-plasticizer in the range from 0,5 to 3% of the total mass of the fuel mixture was carried out. The graphical dependence of the viscosity of coal-water fuel on the concentration of triethylamine has been obtained. An intensive decrease in fuel viscosity (from 0,95 to 0,8 Pa · s) was revealed in the range of additive concentrations of 0,5-1,0%.

The study of the influence of the duration of hydrocavitation mechanochemical activation on the rheological properties of coal-water fuel has been carried out. A graphical dependence of the change in the viscosity of coal-water fuel on the duration of mechanochemical activation, which is characterized by a significant minimum of viscosity at the level of processing duration equal to 60 s, has been obtained.

Keywords: coal-water fuel, mechanochemical activation, plasticizing reagents, dynamic viscosity.

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