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METHODOLOGY OF RESEARCHING THE PROCESS OF OBTAINING COMPOSITE FUEL FROM COAL PROCESSING WASTE

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Purpose. In solving the problem of developing coal preparation wastes in the production of composite fuels, such as coal sludge and braize, reliable knowledge about various physical and mechanical characteristics of waste is important [1-5], since they are the initial calculated values for equipment design [6-10].

Methodology. To study the process of electrokinetic agglomeration and the choice of optimal parameters, a complex technique is required, including the determination of: physical, mechanical and chemical properties of the initial coal sludge, ways of influencing the production mode of compositions by bringing the state of the initial material to its required parameters (preparation and influence on physical and chemical properties).

Findings. The physical and mechanical characteristics of the studied waste vary in a very wide range; in particular, bulk density – 1150-2350 kg/m³, moisture content – 6-65%, particle size – from dust-like classes +0 mm to large +6 mm, etc. It should be noted that various compositions of coal sludge differ significantly in their physical and mechanical characteristics, depending not only on the composition of the components, but also on moisture content. A wide variety of the investigated slimes and braizes made it possible to create more than 1000 solid fuel compositions.

Electrokinetic agglomeration of coal sludge requires preparation, which, depending on the physical, mechanical and chemical properties of the initial material, includes the following: 1) technical analysis: determination of moisture content, ash content, volatile matter yield, heat of combustion, sintering capacity; 2) research using elemental analysis: determination of the content of carbon and hydrogen, nitrogen, sulphur; 3) possible drying of the initial charge to the required

moisture content for production (in the case of exceeding sufficient moisture content); 4) screening out a coarse fraction exceeding 10-15 mm (rocks that got into the sludge, due to production costs and the location of the storage dump).

The physical and chemical effect on the properties of coal sludge includes a number of measures and calculations for the amount and percentage of activating substances that change the sign and magnitude of the particle charge.

They contain the research, which were conducted within the project GP-505, financed by Ministry of Education and Science of Ukraine.

Keywords: electrokinetic agglomeration, waste of coal preparation, coal slime and braize, physical and mechanical characteristics, compositions.

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