SUBSTANTIATION OF THE MODEL OF SOLID PIECES DESTRUCTION SPLINTERS DISTRIBUTION ON SIZE DURING DISINTEGRATORS OPERATION

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Purpose. Setting of interrelation between the solid pieces destruction splinters distribution on size and the material reduction ratio in order to develop the energy effective modes of mining rocks treatment.

Methodology. The usage of the logarithmic gamma distribution of mining rocks destruction splinters on their size during processing in disintegrators of various types is substantiated analytically based on mathematical analogies. The data comparison with experimental results for a press unit, a vibrational mill and an impact crusher is fulfilled.

Findings. Theoretical distribution of the product on the size during the mining rocks narrow size class crushing in disintegrators is substantiated, assuming that the probability of definite particle destruction doesn't depend on its size. The formula obtained in the work corresponds to the gamma distribution on the logarithmic reduction ration for the material separate size classes. Experimental tests on the granite destruction between press plates, the grinding of silicon carbide in a vertical vibrational mill and the limestone destruction by a throwing unit are fulfilled. The received characteristics of particle size distribution have been approximated in accordance with the previously obtained formula of logarithmic gamma distribution. The satisfactory coincidence of theoretical and experimental values for the cases of the compression by the press unit and the crushing by single impact are fixed. Also there have been high approximation errors for the description of size distribution characteristics of the vertical vibrational mill product. The developed equation gives the possibility to bind the distribution curve dispersion and shape directly with the achieved reduction ratio of product. The results will be used for the specification of the disintegrators operating units' parameters calculation techniques for the purpose of specific energy consumption reducing.

Key words: disintegrator, size distribution, gamma distribution, press unit, throwing unit, vertical vibrational mill

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SCIENTIFIC SUBSTANTIATION OF ENERGY-EFFICIENT AND LOW-WASTE TECHNOLOGY OF CARBOHYDRATE RESOURCES DEVELOPMENT

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Purpose. Scientific substantiation and development of energy-efficient low-waste technology for hydrocarbon raw materials extraction by changing its aggregate state by physico-chemical interference, taking into account the peculiarities of changing the geomechanical state of the environment to improve the completeness of the useful components extraction.

Methodology. The complex methodical approach, which contains the analysis of world and domestic experience in the field of thermochemical formation of hydrocarbon raw materials and hydrate formation, methods of mathematical statistics, conducting of analytical researches, computer simulation of the stress deformed state of rock massif, laboratory research were used.

Findings. The character of combustible and ballast gases concentration distribution depending on the type of blast supplied to the underground gasifier