DOI: 10.31081/1681-309X-2024-0-5-34-48 Specialty 161. U.D.C. 662.749.3

ASPECTS OF INFLUENCE ON THE VALUE OF COAL BLEND BURSTING PRESSURE AND METALLURGICAL PROPERTIES OF COKE. MESSAGE 1. FORMATION OF BURSTING PRESSURE DEPENDING ON THE PROPERTIES OF COAL CONCENTRATES

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It is shown that when forming the composition of coal charges for coking, it is necessary to solve not only the problem of producing metallurgical coke with high physical and mechanical characteristics, but also to ensure optimal operating conditions and preservation of the furnace stock, taking into account the bursting pressure of coal raw materials. The article defines the bursting pressure, i.e. the pressure exerted by a coal mass that has passed into a plastic state, provided that it is deprived of the ability to expand freely. The main reason for the development of the burst pressure is the pressure in the plastic layer of vapour-gas products of thermal decomposition of coal, which is transmitted through the semi-coke-coke to the refractory wall of the heating wall of the coking chamber, causing its deflection.

Based on the study of the plastic-viscous properties of coal concentrates by the Giseler method, the connection between the peculiarities of the plastic state of coal of different degrees of metamorphism and the bursting pressure (P^b), which it develops during coking, was confirmed. The minimum values of Pn were recorded for coals of grades DG, G, and GZh (P^b_{av} = 2.5 kPa), the maximum values were recorded for coking and low-sintering coals (P^b_{av} from 7.9 to 25.3 kPa).

The correlation between the bursting pressure and genetic and technological properties of coal raw materials (volatile matter yield and vitrinite reflectance) was established. The regression equations for predicting the bursting pressure were developed taking into account the vitrinite reflectance, vitrinite and fuseness content, maximum fluidity temperature and volatile matter yield of the charge. The developed equations are characterised by high correlation coefficients r (0.89-0.9), which indicates their statistical significance and the possibility of using them to predict this indicator. The use of the proposed equations makes it possible to predict the bursting pressure using the data on the properties of coal concentrates, which must be determined at a coke plant to control the quality of raw materials.

Keywords: bursting pressure, plastic-viscous properties, component composition, petrographic characteristics, volatile yield.

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