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DEVELOPMENT OF OPTIMAL COMPOSITIONS OF COAL BLENDS FOR TAMPING. REPORT 2. STUDY OF COAL BLENDS WITH ASSESSMENT OF THE QUALITY OF COKE PRODUCED

© **D.V. Miroshnychenko**, Doctor of Technical Sciences (National Technical University "Kharkiv Polytechnic Institute", 2, Kyrpychova str., Kharkiv, 61002, Ukraine), **V.V. Koval,** Ph.D. in Technical Sciences, **I.V. Shulga,** Ph.D. in Technical Sciences, **O.V. Sytnyk,** Ph.D. in Technical Sciences, **Yu. Lutsenko,** Ph.D. in Technical Sciences (State Enterprise "Ukrainian State Research Institute for Carbochemistry (UKHIN)", 7 Vesnina str., Kharkiv, 61023, Ukraine), **S.O. Kravchenko**, Ph.D. in Technical Sciences (STATE ENTERPRISE "STATE INSTITUTE FOR DESIGNING ENTERPRISES OF COKE OVEN AND BY-PRODUCT PLANTS" (SE "GIPROKOKS"), 61002, 60 Sumska str., Kharkiv, Ukraine), **N.A. Desna**, Ph.D. in Technical Sciences (State University of Economics and Technology, 16, Medychna str., Kryvyi Rih, 50005, Ukraine)

The article describes the results of the study of the developed coal blends (charges) in the form of calculations and laboratory analyses. Their tamping ability was also studied to determine the shearing force and density of the coal cake at different levels of moisture and grinding. The values of the bursting pressure of the developed coal blends were determined. It is shown that all of them are characterised by safe values of this indicator for coking. It is determined that the greatest influence on the value of the bursting pressure of the charge is exerted by the content of class <0.5 mm. The points of extremum (optimum) of the bursting pressure function obtained by differentiating the second-degree regression equation, in which the first-order derivative is zero, are given.

The optimum range of coal charge moisture content, at which the tamping characteristics reach their maximum values, has been determined. It is shown that with a decrease in the yield of volatile substances, the value of tamping shifts to the upper limit, and vice versa. It was found that the charge with the highest amount of finely dispersed additives has the best tamping ability. Laboratory coking of the developed coal blends was carried out to evaluate the quality characteristics of the resulting cokes, the analysis of which allowed us to select the optimal compositions of coal blends. The cokes obtained from the blends characterised by the highest values of the tamping index were the best in terms of mechanical strength. It has been established that in terms of reactivity (CRI) and coke residue strength after reaction (CSR), all variants of the obtained coke have quite satisfactory values, given the unfavourable ratios of basic and acidic oxides in the chemical composition of ash.

The paper presents and substantiates the calculation of the optimal height of coking chambers. Based on the obtained values of the strength of tamped briquettes σ_{zz} from the studied compositions, the height of the coking chambers should be 5.5 m. At the same time, the tamping ratio (cake height to its width) should be no more than 13.

Keywords: tamping, coal cake, shear resistance, strength of the tamped cake, coke quality, height of the coking chamber.

Corresponding author Miroshnichenko D.V, e-mail: dvmir79@gmail.com