DOI: 10.31081/1681-309X-2024-0-1-8-15 Specialty 161. U.D.C. 661.66.2:537.311/.312

RATIONAL TECHNOLOGICAL BASES OF PRODUCTION OF COKE WITH SPECIFIED ELECTRICAL RESISTIVITY

© **I.V. Shulga**, Ph.D. in Technical Sciences, **O.V. Sytnyk**, Ph.D. in Technical Sciences (State Enterprise "Ukrainian State Research Institute for Carbochemistry (UKHIN)", 7 Vesnina str., Kharkiv, 61023, Ukraine), **O.I. Zelenskii,** Ph.D. in Technical Sciences, **V.V. Vladymirenko** (National Technical University "Kharkiv Polytechnic Institute", 2, Kyrpychova str., Kharkiv, 61002, Ukraine)

The article is devoted to the practically important issue of obtaining coke with a specific electrical resistance of no more than 0.1 Ohm·cm for the needs of blast furnace production. Achievement of this indicator should occur simultaneously with the improvement of the entire range of properties of blast furnace coke. It is noted that the concept of production of blast furnace coke of improved quality consists of the formation of a rational raw material base, ensuring proper coking technology and post-furnace coke treatment. It has been shown that the production of high-quality blast furnace coke with low resistivity requires: high sinterability and coking capacity of the charge based on highly sinterable coals; coking pressure of the coal charge not exceeding 7 kPa; coking speed not exceeding 24 mm/hour; final coking temperature of 1050-1100 °C; maximum temperature level in the heating system not exceeding 1410 °C. It is confirmed that in order to obtain a low electrical resistivity, it is necessary to produce coke with the most ordered anisotropic structure. It is shown that the resistivity of coke naturally changes when used in blast furnace production: the destruction of lumps leads to the formation of fragments of different sizes. At the same time, coarser fragments have lower resistivity values, and smaller ones, characterized by an increased concentration of structural defects that are the centers of crack formation, have a higher resistivity.

After gasification with carbon dioxide, the number of structural defects increases in grains of any size due to the weakening of the surface due to chemical interaction, so the resistivity of coke increases and becomes almost equal for both coarser and finer grains.

Keywords: hard coal coke, blast furnace production, resistivity, vertical temperature, final coking temperature, coke gasification.

Corresponding author I.V. Shulga, e-mail: ko@ukhin.org.ua