
DETERMINATION OF THE OPTIMAL SIZE OF THE CARBON NOZZLE OF THE ELECTROCONVERTER WHEN DISPOSING OF VISCOUS ORGANIC BY-PRODUCTS OF COKE PRODUCTION

© * D.Y. Bilets, P.V. Karnozhitsky, PhD in technical sciences, D.V. Miroshnichenko, Doctor of Technical Sciences (NTU "KhPI")

The article is devoted to the further development of the technological parameters of a new method for utilizing organic coke-chemical secondary products to produce generator gas, the composition of which can be regulated in the direction of increasing the content of combustible components in it through the use of an electro converter. The technological scheme, a photograph and a description of the operation of the electro converter are given.

The possibility of using coke breeze of varying degrees of fineness as a carbon nozzle in an electro converter for the disposal of viscous organic coke chemical materials (for example, coal fuser) to produce the generator gas is considered. To conduct the research to determine the optimal size class of coke, which is used as a carbon nozzle, a sample of marketable blast furnace coke was crushed into particle sizes 3-6; 6-10 and 10-13 mm. The mean diameter (d_{cp}), a total surface area of the backfill (S) and bulk density (Z) of various classes of coke are given. The influence of these indicators of the carbon nozzle on the energy consumption in the electro converter during the gasification of organic by-product coke wastes was investigated. In particular, the required amount of electricity was determined to heat the carbon nozzle from ambient temperature to 1000 ° C for 3 minutes.

Based on the data obtained, graphical dependences of the energy consumption on the indicators d_{cp} , S and Z of the carbon nozzle were determined. It was determined that the energy consumption decreases with an increasing grain size of coke. Equations are presented that characterize the dependence of energy consumption on the average size, the surface area, and bulk density of coke grains. It is concluded that it is better to use coke with a particle size of 10–13 mm as a carbon nozzle, since less electricity is needed to heat it and significant voltage fluctuations are not observed when heating, as while heating classes of smaller size.

Keywords: coke breeze, class size, average diameter, total surface area of the backfill, bulk density, carbonaceous sludge, electro-conversion, power consumption.

* Author for correspondence, *e-mail*: dariabilets@gmail.com