DOI: 10.31081/1681-309X-2025-0-4-27-36 Specialty 161. U.D.C. 662.7

USE OF COKE CHEMICAL ENTERPRISE WASTE IN THE PRODUCTION OF GRINDING AND POLISHING PASTES

© M.O. Borysenko[1], I.V. Sinkevich[2]

National Technical University "Kharkiv Polytechnic Institute", 2, Kyrpychova str., Kharkiv, 61002, Ukraine (NTU "KhPI")

[1]Borysenko Maksym Oleksiyovych, Postgraduate Student, Department of Oil, Gas and Solid Fuel Processing Technologies (DOGSFPT), e-mail: borysenkoomax@gmail.com
[2]Sinkevych Iryna Valeriivna, Ph.D. in Technical Sciences, Associate Professor of DOGSFPT, e-mail: ivsaam@gmail.com

The article provides an overview of the prospects for using waste and by-products of the blast furnace coke production process as basic, in particular abrasive, components in grinding and polishing pastes (GPP). It has been determined that the production of GPP, which has a wide range of applications and is in high demand, based on waste, is of considerable importance for Ukraine, as it contributes to the creation and development of a circular economy. An important aspect of managing a coke chemical enterprise (CCE) is the technical support of the blast furnace coke production process. The main functional element of technical support, along with the introduction of new technologies, automation and computerization of the technological process, is the continuous maintenance and repair of factory equipment. This element is implemented, among other things, through the use of GPP in routine and emergency repair works.

Among the areas of application of GPP at CCE, the following can be highlighted: processing of metal surfaces; polishing of paint and varnish coatings; cleaning and processing of equipment parts; polishing of parts surfaces; elimination of defects in production materials; use in laboratory and scientific research. It has been established that among the range of waste products generated in the coking of hard coal, the following can be considered as abrasive components of GPP: coal and coke dust; coke slag; gas cleaning by-products; coke oven deposits. On the other hand, by-products of chemical processes (phenols, ammonia and their derivatives) can be used in the composition of abrasive pastes, especially in the context of the synthesis of thermosetting resins or for correcting the pH and viscosity of pastes in order to achieve the desired characteristics for grinding and polishing various types of surfaces.

Keywords: pastes, grinding and polishing, abrasive component, surface, waste, by-products, coal dust, coke dust, coke slag.

Corresponding author: I.V. Sinkevich, e-mail: ivsaam@gmail.com

Manuscript received 2025/02/20
Accepted for publication 2025/09/29
Published 2025/10/20