

STUDY OF COKING COAL PROPERTIES FOR DEVELOPMENT OF A RATIONAL SCHEME FOR ITS PREPARATION

© I.V. Shulga¹, Yu.V. Teleshev²

STATE ENTERPRISE "UKRAINIAN STATE RESEARCH INSTITUTE FOR CARBOCHEMISTRY (UKHIN)", 61023, Kharkiv, 7 Vesnina St., Ukraine

¹ Shulga Igor Volodymyrovych, Ph.D. in Technical Sciences, Associate Professor, Senior Researcher, Head of the Coke Department, ORCID: 0009-0007-8677-9180, Scopus ID: 59473856500, e-mail: ko@ukhin.org.ua

² Teleshev Yuriy Volodymyrovych, Ph.D. in Technical Sciences, Scopus ID: 6602924103, e-mail: 196112juv@gmail.com

Coke-chemical enterprises use coal of various grades, which comes from a large number of suppliers. Therefore, at one of the leading coke-chemical enterprises of Ukraine, representative samples of coal included in its raw material base were selected, their granulometric composition and technological properties of size classes were studied. It was confirmed that the level of coal grinding has a significant impact on the technological properties of the coal charge. The most valuable from this point of view in petrographically homogeneous coal are size classes of 3-0.5 mm. Coarser grains have a smaller specific surface area, which does not allow them to take an active part in the surface heterogeneous interaction with other components of the coal backfill at the stages of sintering and coke formation. On the contrary, regrinding of coal grains leads to the phenomenon of so-called "self-degradation", as a result of which the realization of the sintering potential inherent in coal and charges is complicated. Petrographically heterogeneous coal has an even more complex and ambiguous dependence of technological properties on the degree of grinding, which requires special studies in each specific case. In addition, excessive grinding of coal leads to an increase in the number of solid particles carried away by the gases of the charge from the coking chamber to the gas collecting main, as a result of which the yield of fines increases and the quality of the tar deteriorates in terms of density and content of insoluble substances. Finally, excessive regrinding of coal leads to unproductive electricity consumption. With an insufficient degree of grinding of the charge, the operating conditions of coke ovens also deteriorate: the uniformity of heating of the coal charge deteriorates, the coke pushing force increases, and the quality of coke deteriorates.

Keywords: coke-chemical production; coal; coal preparation; coal charge; grinding; optimal size; coke quality.

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

Manuscript received 2026/02/18

Accepted for publication 2026/03/30

Published 2026/04/17

How to Cite:

1. Shulha I.V. Doslidzhennia vlastyvostei koksivnoho vuhillia dlia rozrobky ratsionalnoi skhemy yoho pidhotovky / I.V. Shulha, Yu.V. Teleshev // Vuhlekhimichni Zhurnal. – 2026. – № 2. – S. 3-11. <https://doi.org/10.31081/1681-309X-2026-0-2-3-11>

2. Shulga, I. V. & Teleshev, Yu. V. (2026). Doslidzhennia vlastyvostei koksivnoho vuhillia dlia rozrobky ratsionalnoi skhemy yoho pidhotovky. *Vuhlekhimichni Zhurnal*, (2), 3–11. <https://doi.org/10.31081/1681-309X-2026-0-2-3-11>

How to obtain the full text of the article:

- within 2 years from the date of publication – upon request by e-mail: post@ukhin.org.ua

- after 2 years from the date of publication – free access in the database "Scientific Periodicals of Ukraine" of the Vernadsky National Library of Ukraine by the link:

http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?Z21ID=&I21DBN=UJRN&P21DBN=UJRN&S21STN=1&S21REF=10&S21FMT=juu_all&C21COM=S&S21CNR=20&S21P01=0&S21P02=0&S21P03=0&S21COLORTERMS=0&S21STR=ukhj

http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?Z21ID=&I21DBN=UJRN&P21DBN=UJRN&S21STN=1&S21REF=10&S21FMT=juu_all&C21COM=S&S21CNR=20&S21P01=0&S21P02=0&S21P03=0&S21COLORTERMS=0&S21STR=ukhj

This article is licensed under a Creative Commons Attribution 4.0 International License
<https://creativecommons.org/licenses/by/4.0/>

References

1. Koval V.V. Optyimizatsiia skhemy pidhotovky vuhillia do koksuvannia. Dys. na zdobuttia vchenoho stupenia doktora filosofii. – Kharkiv: NTU KhPI, 2023. – 166 s. / [Elektronnyi resurs]. – Rezhym dostupu:

<https://repository.kpi.kharkov.ua/server/api/core/bitstreams/548b6809-f378-4407-8d45-b9373957c44b/content?trackerId=38008a23499b3f11>

2. Shulha I.V. Osnovy tekhnolohii koksuvannia vuhillia: / I.V. Shulha, D.V. Miroshnychenko, O.V. Bohoiavlenska. – Kharkiv – Ternopil: Krok, 2022. – 128 s.

3. Miroshnychenko D.V. Metody kontroliu yakosti tverdykh vuhletsevykh materialiv: / D.V. Miroshnychenko, I.V. Shulha, D.Iu. Bilets, I.V. Sinkevych. – Kharkiv – Ternopil: Krok, 2022. – 228 s.

4. Shulha I.V. Fizyka ta khimiia tverdykh horiuchykh kopalyn: / I.V. Shulha, D.V. Miroshnychenko. – Kharkiv – Ternopil: Krok, 2022. – 212 s.