

THE DETERMINATION OF SOME QUALITATIVE CHARACTERISTICS OF PRODUCTS OF CAKING OF COAL BLENDS WITH PARTICIPATION OF SAPROPELIC COALS

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There have been considered issues of using of the sapropelic coals, which are mining from the working layers of the State Enterprise "Lvivvugillya", located within the Lviv-Volyn coal basin. A significant amount of bad-quality raw materials accumulated at the enterprises of the coal processing industry in this region requires to be involved in the treatment technique. The technical characteristics of the sapropelic coals of the kennelys class hinders to use it in the energy industry. We have proposed to use the low-ash grades of sapropelic coals as a component of the coking blends to improve its technical properties. For this purpose, samples of such coal were removed from the Mezhirechenskaya mine, coal layer n_8^V (thin 2, lava No. 595), sampling depth 437.1 m. The second material for testing was samples of so named "gas " coal" (G), taken from the Lesnaya mine, layer n_7^N , which has the ability to coke formation.

Samples of the blends of different composition, including individual components, were tested for swelling number in a crucible according to ISO 501-81 and for the volatiles matter yield. Tests have shown that the swelling number of the blend samples does not exceed 3 on the standard scale, decreasing with an increase of the mass fraction of sapropelic coals, and the yield of volatile substances naturally decreases with an increase of the content of G in the mixture.

Blends have also been tested for caking power by Gray-King method in accordance with ISO 502-82. At the same time the yield of liquid (the sum of tar and water) and gaseous (in summary) coking products were determined. It has been established that the formation of tar depends upon the composition of the blend, its maximum is observed when the ratio of the components by weight is 25 parts of sapropelic coal and 75 parts of G. It is shown that the addition of sapropelic coals to G improves coke quality and reduces the swelling number. The coking tar has been fractionated and investigated by IR- and UV-spectroscopy. It has been found that it is a mixture of aromatic compounds (represented by mono- and polycondensed structures) and alkanes. Oxygen-containing structures are represented by phenolic hydroxyl and ethers.

Keywords: sapropelic coal; coking; tar; swelling; caking power.

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