
DISTRIBUTION OF MINERAL COMPONENTS DURING THE EXTRACTION OF HUMIC ACIDS FROM LIGNITE

© **V.V. Savchenko** (State Enterprise “Ukrainian State Research Institute for Carbochemistry (UKHIN)”, 7 Vesnina str., Kharkiv, 61023, Ukraine), **I.O. Lavrova**, Ph.D. in technical sciences (National Technical University "Kharkiv Polytechnic Institute", 2, Kyrpychova str., Kharkiv, 61002, Ukraine)

The paper deals with the distribution of mineral components of lignite during extraction with caustic soda followed by acid precipitation and separation of humic acids. The content of mineral components was analysed by X-ray fluorescence in three samples: the initial lignite, its residue after extraction, and the obtained humic acids. The development of lignite extraction methods is important because it affects the purity of humic acids and the further use of residual coal. The study of the redistribution of mineral components helps to optimise the extraction of humic substances and expand their industrial application. The process of extracting humic substances from lignite is accompanied by a specific redistribution of metal elements, which depends on their chemical form and extraction conditions. It was found that silicon is predominantly in an insoluble mineral form, which remains in a solid residue after the removal of organic components. The content of Al and Mg hardly changes during the extraction process, which indicates their presence in chemically stable forms. The original lignite contains potassium in a form that actively interacts with humic substances, as evidenced by the high conversion factor of potassium to humic acids (7.5). In the case of hydrothermal treatment of lignite, this coefficient can increase to 14.5. External mineral inclusions (e.g., silicates) and the specific interaction of potassium with acidic groups of humic macromolecules significantly affect the composition of humic substances, which is important for their further use in technological processes.

Keywords: lignite, humic acids, extraction, caustic soda, acid precipitation, X-ray fluorescence analysis, distribution of mineral components.

Corresponding author V.V. Savchenko, [e-mail:korbinity@gmail.com](mailto:korbinity@gmail.com)

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