

Paramagnetic properties of demineralized hard coals

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Abstract

In the metamorphism of coals, a fundamental tendency appears to transform a multicomponent structure, accompanied by a series of physico-chemical transformations in which the stages of evolutionary changes alternate with qualitative transformations of the chemical composition and the restructuring of the structure of the hydrocarbon substance. Each qualitatively new state of the coal substance will differ in paramagnetic properties, and, consequently, in the value of the g-factor, whose numerical value corresponds to the degree of its carbonization.

Coals of different grades differ in the chemical composition of the organic mass, and the coals of different basins – in terms of the composition of the mineral mass. Investigations of the paramagnetic properties of fossil demineralized coals of Kuzbass.

In the course of studies performed by the EPR method it is established that coals with different degrees of metamorphism have differences in paramagnetic characteristics: different g-factor values and width. By results of researches it is shown, that there is a correlation between value g-factor and degree of a coalification of a researched sample.

The study of the influence of the mineral constituent of coals on the EPR spectrum of the investigated coals is carried out. For this purpose, the results obtained for coal containing ash part and obtained for de-impregnated coals were analyzed. According to the results obtained, the coal ash may contain paramagnetic inclusions that contribute to the EPR spectrum of coals.

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