

A Study of Sorption Processes of Anionic Dye by Carbon-Containing Adsorbents Based on Oil Extraction Waste Products

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Abstract: The article presents the results of studies of the nature of the sorption processes of the acid dye eosin H on the surface of native and chemically activated carbon-containing sorption materials – TKSh₅₀₀, prepared by thermolysis at a temperature of 500 °C of spent kieselguhr sludge – waste from oil extraction production. 1M sodium hydroxide solution, concentrated nitric acid and its 10 % and 30 % solutions, 30 % hydrogen peroxide solution, 20 % sodium chloride solution were used as activators. According to the obtained results, the maximum sorption capacity (0.0047 mmol/g) is characteristic of TKSh₅₀₀ activated by a 30 % HNO₃ solution. The adsorption value and equilibrium concentration of the sorption materials under consideration were mathematically processed using regression equations of sorption models to obtain determination coefficients. Thermodynamic parameters of the adsorption process for each sorbent were determined – sorption equilibrium constants and Gibbs free energy. The results obtained showed that the sorption of the eosin H dye is predominantly polymolecular.