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Study of Thermochemical Transformations of Hydrolytic Lignin and the Properties of the Produced Active Carbons

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There has been studied the influence of the conditions of heat treatment of hydrolytic lignin and its mixtures with oil slime on the yield, structure and adsorption properties of active carbons (AC). With the increase in the temperature of lignin processing from 400 to 900 °C, the yield of active carbon decreases, and its specific surface area and sorption activity reach the maximum values at 800 °C. The mutual influence of the components of the mixture of hydrolytic lignin and oil slime during the thermochemical transformations, becomes apparent in the variation of the yield and the porous structure of AC. As for the oil slime, it acts as a binding and structure forming component.

Keywords: hydrolytic lignin, oil slime, thermal transformations, active carbon, structure, adsorption properties.

The technical lignin which is formed during the chemical processing of wood at the paper and pulp and hydrolytic plants, is the waste which is the most difficult to utilize. The amount of unutilized lignins in the Ukraine (that is the waste of the yeast, forage and paper and pulp industries) makes up, according to different data, from 5 to 15 million tons, whereas in Russia and Belarus their number is greater [1]. At present there are no exhaustive technical solutions on utilizing lignins, although the survey of the scientific literature for

the past years is evidence of the great interest that the researchers show in this raw material.

Lignin is a polymer of aromatic nature. Its structural unit is presented mainly by phenylpropane units [2]. The variety of connections between the latter determines the irregular molecule lignin structure [3]. Lignin is a polyfunctional substance, containing phenolic, alcoholic, carbonyl, acidic and methoxyl groups. The number of these groups varies greatly depending on the industrial hydrolysis conditions,

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