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PHYSICAL ANALYSIS OF BLACK CARBON

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The black carbon is produced on an industrial scale and is also produced in large quantities as a by-product in the high-temperature processing of carbon sources. It is used in the production of rubber, various cables, ebonite, insulating materials. It is also used in adsorption purification of aqueous solutions, in medicine as a drug to prevent from poisoning and as a source of combustion. The composition of the black carbon, especially its properties vary and depend on the process of the formation of the structure, the raw material, technological processes and temperature.

The study aimed to reduce the solubility of the black carbon formed from methane pyrolysis. There are 20 different brands of the organization in the world, which are classified as the following: by method of production; on the composition of raw materials; on the specific surface; on the structural level. The following brands of the black carbon are used for the production of rubber: DG-100, TM-70, TM-50, TGM-33, TGM-30, TM-15, TeG-10, PM-75 and others. The first letter represents the method of production: D-diffusion flame, T-hydraulic flame, P-furnace, Te-air thermal decomposition without participation. The last letters represent raw materials: G-gas, M-oil, GM-gas and oil mixtures.

Navoiazot JSC has processed the secondary product of acetylene production from methane pyrolysis. The structure was treated with hydrochloric acid of different concentrations at different time intervals and the solubility of the resulting product was determined. Determination of the composition of samples of raw materials and purified products under acidic conditions was carried out using a scanning electron microscope called SEM – EVO MA 10. The results of analysis show that the concentration of hydrochloric acid increases in the range of 1 %...30 %, the degree of sol of the treated black carbon decreases from 15,8 % to 2,0 %. Acid treatment time also plays an important role in improving the quality of the black carbon.

At the same time, the mixing time under stationary conditions was taken from 1 to 5 hours.

A sharp decrease in the level of the sol was observed when applied for 1 hour at 20 % in acid treatment.

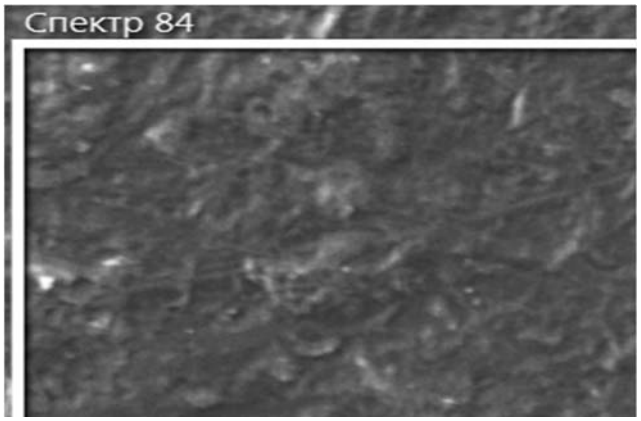

Fig. 1. SEM image of the dry sample (treated in 15 % acid)

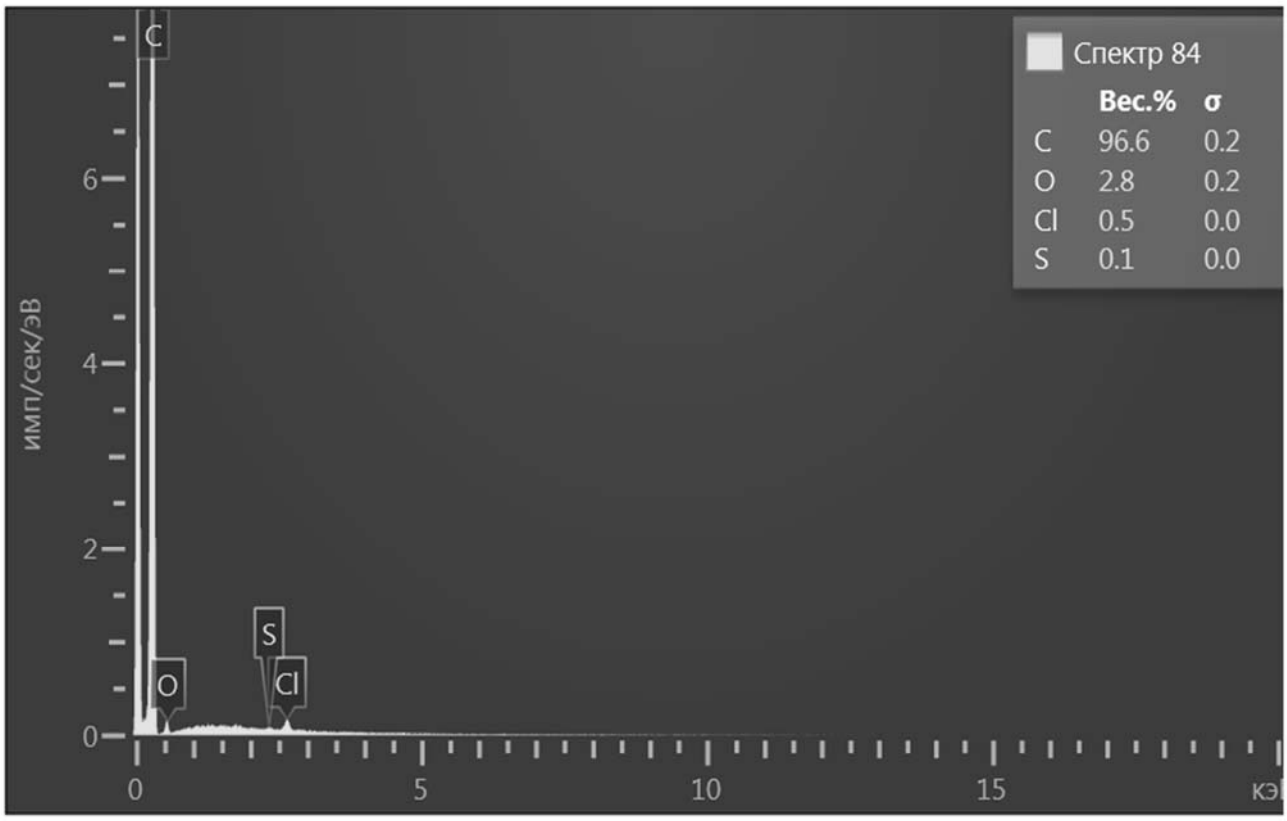

Fig. 2. SEM analysis of the dry sample (treated in 15 % acid)

The results of analysis show that the structure of the sample treated with 15 % hydrochloric acid in the image taken by scanning electron microscope has a porous structure and the surface part is rough.

As a result of acid treatment of the black carbon, its quality has improved, the level of the degree of sol has been reduced. The effect of hydrochloric acid concentration on the improvement of the quality of the structure was determined and the process conditions were optimized.

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