ANALYSIS OF MICROGRAPH OF ACTIVATED ADSORBENTS

Dilnoza Jumaeva
Institute of General and Inorganic Chemistry Academy of Sciences
Republic of Uzbekistan
email:d.jumayeva@list.ru

Raximov Umidjon
PhD of Namangan Institute of Engineering and Technology, Uzbekistan
email: rumid8887@mail.ru

Muxtorjonov Muxammadali
student of Namangan Institute of Engineering and Technology, Uzbekistan
email: muxammadalimuxtorjonov@gmail.com

ABSTRACT

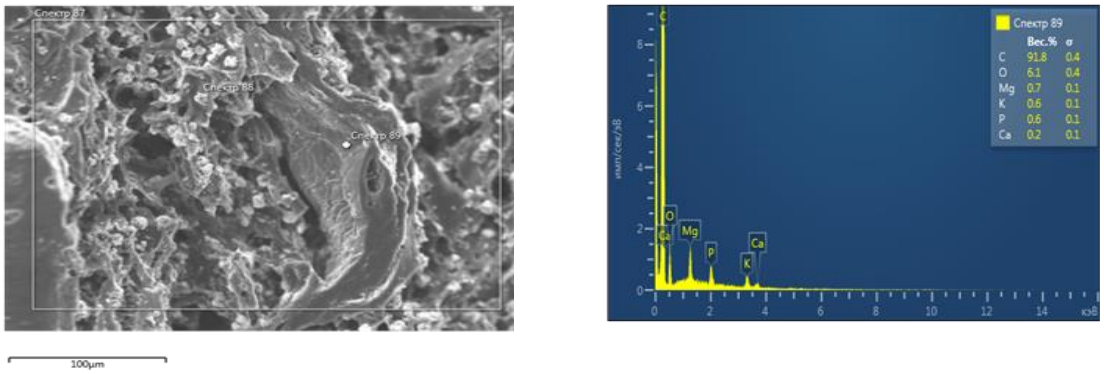
In this article, research was conducted on the methods of obtaining adsorbents, using the problem of waste generated in the process of the juice production enterprise as a solution to its economic problems. In the results of scanning electron microscope image analysis of adsorbent samples activated thermally and with water vapor at temperatures of 700°C, 800°C in the presence of waste extracted from grape seed juice, the results of the spectra of the distribution of elements with the morphology of adsorbents on the surface of the sample are presented.

Keywords: Grape seed, thermal activation, water vapor activation, scanning electron microscope image analysis, surface

INTRODUCTION

In the process of juice production in the industry, after separating the grape fruit under certain conditions, obtaining a secondary product as a result of the waste processing [2,3] helps to eliminate the problem of waste generated in the production. Research work was conducted on methods of obtaining adsorbents, using the problem of waste generated in the process in the juice production enterprise as a solution to its economic problems. In the results of scanning electron microscope image analysis of adsorbent [5-7] samples activated thermally and with water vapor at temperatures of 700°C, 800°C in the presence

of waste extracted from grape seed juice, the morphology of adsorbents is presented in the spectra of the distribution of existing elements on the surface of the sample (Fig. 1 and 2).



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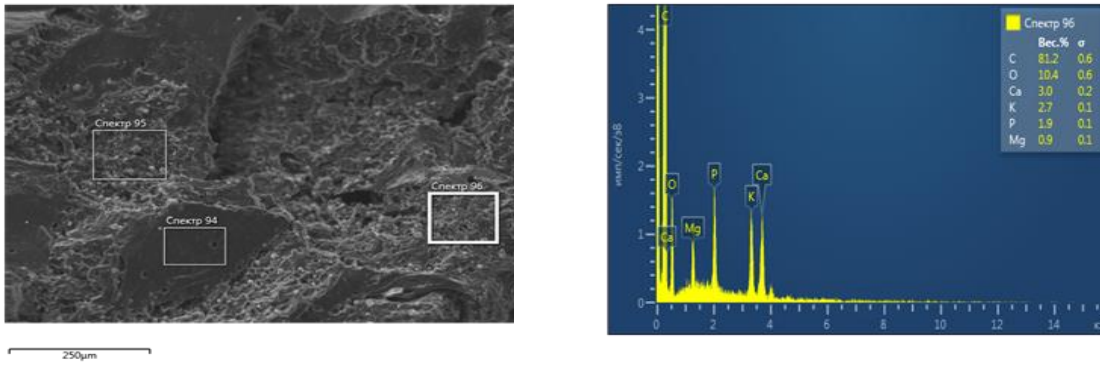
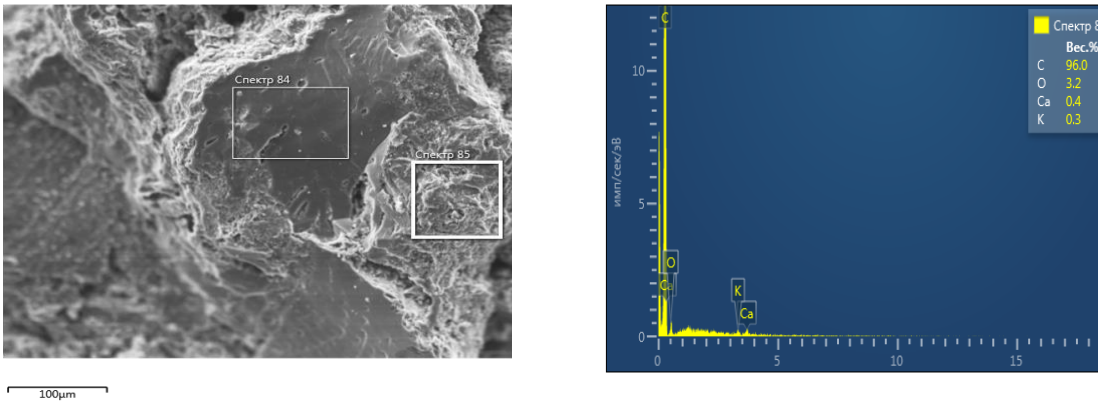
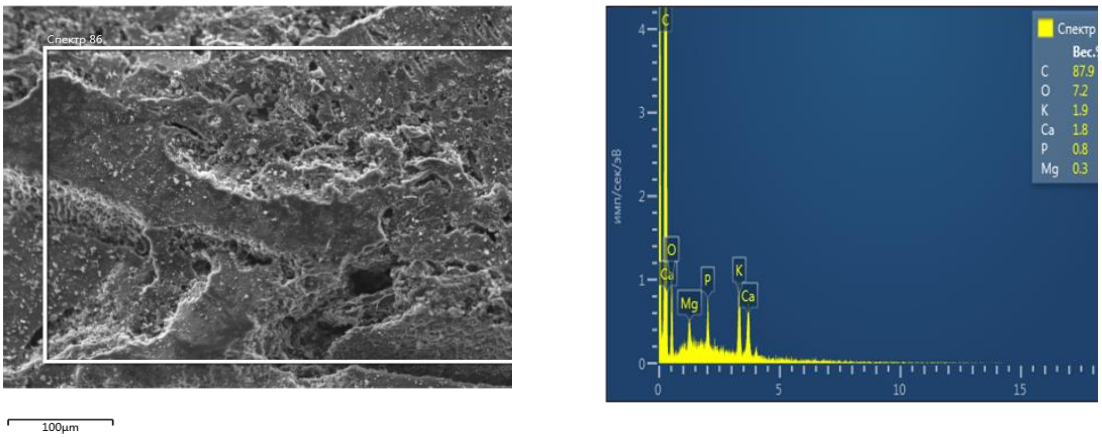


b)

Figure 1. SEM image of thermally activated USOT-A-adsorbent up to 100 µm and elements i on the surface representation of the distribution spectrum a) USOT-A 700° C; a) USOT-A 800° C



a)



b)

Figure 2. 100 µm SEM image of the steam-activated USOP-A adsorbent and elements on the surface representation of the distribution spectrum

a) USOP-A 700 °S; a) USOP-A 800 °S

METHODS

A modern scanning electron microscope has the ability to connect various additional devices, with the help of which even more information about the sample can be obtained. For example, the SEM EVO MA 10 (Carl Zeiss) scanning microscope we are researching is equipped with an energy dispersive X-ray spectrometer. With this, it is possible to obtain an elemental analysis at a specified location of the sample surface or an elemental distribution map over the entire surface.

X-ray analysis is carried out on a "Panalytical Empyrean" diffractometer equipped with a Cu tube ($K_{a}1 = 1.5406$ Å) . Experiments were performed at room temperature, with 2θ angles of 10-90 degrees and a step interval of 0.02 degrees. Morphological studies were carried out using a SEM EVO MA 10 (Carl Zeiss) scanning microscope equipped with an energy dispersive X-ray spectrometer (EDS Aztec Energy Advanced X-Act, Oxford Instruments) [1,4].

RESULTS

Scanning electron microscope images of adsorbent samples activated thermally and with water vapor at temperatures of 700°C and 800°C and the distribution spectrum of elements on the surface of the sample show that there was no significant change in the composition of elements. It can be observed that C, O, Mg, P, K, Ca elements from the chemical and elemental composition of adsorbent samples are found in all samples. In this case, when the amount of element C in the element content of the initial raw material is 66%, when the sample is activated by thermal and pargasic methods at temperatures of

700°C, it shows the characteristics of a carbon-based adsorbent up to 92% and 96%, when the activation temperature is increased, that is, thermal and when gas adsorbents are activated to a temperature of 800°C, it can be observed that the amount of carbon in the sample decreases to 81.25% and 87.93%, respectively .

CONCLUSION.

The fact that the reduction of the C (carbon) element and the O (oxygen) element correspondingly decreases with the increase in temperature can be a proof of the above idea .

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