PHYSICOCHEMICAL PROPERTIES OF SULFOCATIONITES FROM WALNUT SHELLS

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Annotation: *In the article, the reduction of the concentration of oils in the polluted waters of factories and car washes by means of sorption was studied based on the composition of vermiculite and polyacrylonitrile (PAN). The expansion of vermiculite mineral under the influence of temperature was investigated. Using vermiculite, based on its combined composition with PAN, experimental work was carried out to determine the properties of anion exchange in water, besides, the ability of spongy vermiculite to absorb lignin and motor oil in water was studied.*

The rapid development of the chemical industry, the increase in the extraction of raw materials, and the increase in the use of transport cause a lot of waste to be thrown into the environment. Pollution of the environment (water, air, soil) leads to disruption of the normal functioning of the hydrosphere and biosphere, climate change, extinction of plant and animal species, and deterioration of public health [1].

Water pollution is becoming a global environmental problem today. A lot of work is being done on these problems in the world and in Uzbekistan. Usually, suspended substances and mineral rocks contained in polluted waters are cleaned mechanically and biologically. Which of the wastewater treatment methods to choose depends on the physical and chemical properties and share of suspended substances in the water, wastewater consumption, and the required level of purification. The use of the sorption method in the reuse of purified water in the water supply of an industrial enterprise and the subsequent disposal of valuable compounds extracted from wastewater is extremely effective [2].

Freshwater forms rivers, lakes and swamps on the surface of continents. People build artificial ponds and large reservoirs for their needs. Hence, fresh water can be flowing and non-flowing. From this point of view, freshwater ecosystems can be divided into the following groups:

• quiet ecosystems, that is, non-flowing waters (for example, lakes, ponds, reservoirs, etc.);

• flood ecosystems, that is, flowing waters (for example, rivers, tributaries (streams), springs, etc.);

• wetlands (for example, wetlands with water levels that change over the years, seasons, wetlands, etc.).

Freshwater ecosystems are of great importance to mankind. The reason for this can be explained as follows:

1) that fresh water is practically the only source for domestic and industrial needs;

2) that freshwater ecosystems are the most convenient and inexpensive system of waste processing;

3) water has a unique thermodynamic property that allows reducing sudden changes in ambient temperature.

In aquatic environments, water temperature, clarity, flow and salinity are the main limiting factors. Aquatic animals are extremely sensitive to water temperature, clarity and flow. Also, the amount of oxygen and biogenic salts (nitrates and phosphates) in the water can be a limiting factor.

Organisms adapted to live in the water environment are collectively called hydrobionts. Simply put, a hydrobiont is an organism that lives in an aquatic environment. Flow speed has a great influence on the adaptation and distribution of hydrobionts to sheltered (favorable) places [3].

In the following work, some physico-chemical properties of sulfocationite were obtained from cellulose of walnut husks, which are discarded as waste for the purpose of wastewater treatment. The structural morphology of the obtained samples before and after modification was studied on the basis of microphotographs taken using a scanning electron microscope.

Water pollutants are divided into three groups:

• chemical pollutants of water;

• biological pollutants of water;

• physical water pollutants.

The main groups of water pollutants:

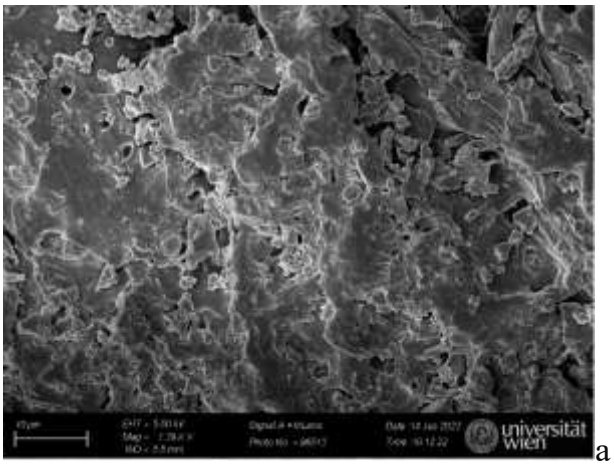
Table 1

CHEMICAL	BIOLOGICAL	PHYSICS
a pollutant	a pollutant	pollutants
substances	substances	1. Radioactive elements
1. Acids	1. Viruses	2. Heat
2. Alkalis, heavy metals	2. Bacteria	3. Powders
3. Salts (ammonium and nitrite salts)	3. Pathogenic organisms	4. Sand
4. Oil and oil products		5. Mud

Microphotographs of primary walnut shell cellulose, sodium metal-absorbed cellulose, calcium metal-absorbed cellulose, and polymers containing sulfo groups are

presented in the following figures. When we look at the cellulose surface, we can see pores with an average size of 5.5 nm (Figure 2(a)).

It can be seen from the micrographic structure of the sample containing sulfo group in cellulose (Fig. 2- (b)) that all areas of this sorbent surface consist of pores with almost the same structure. Such a structure improves the adsorption of metal ions on the surface of the sorbent. It can be seen that the morphological structure of the polymer has changed as a result of the sorption of sulfocationite metal ions in Fig. 2 (c and d).



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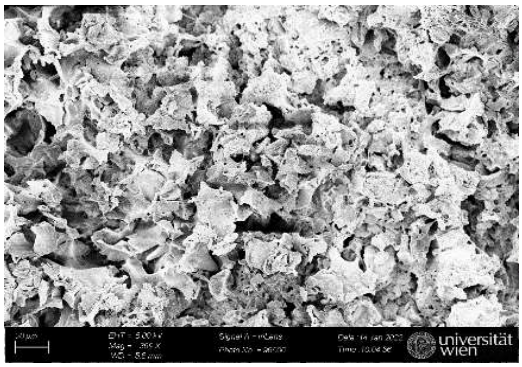

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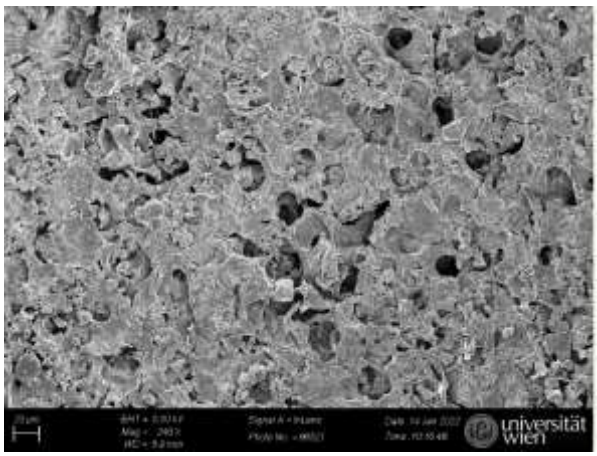

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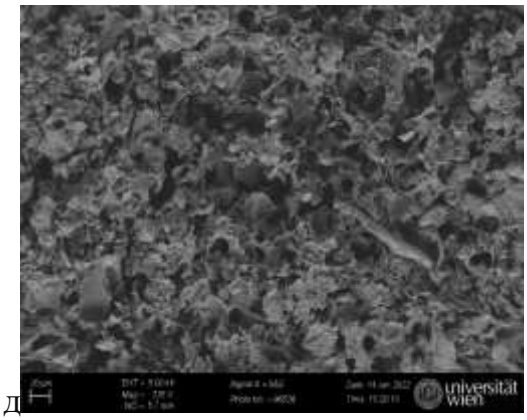

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Figure 2. SEM micrographs of (a) cellulose, (b) SO3H sulfocationite, (c) sodium metal doped sulfocationite, and (d) calcium metal doped cellulose sulfocationite polymers.

The sulfocationite based on the cellulose extracted from the walnut shell has the property of sorption of metal ions from various solutions, and the SAS according to NaOH was found to be equal to 3.36 mgeq/g.

LITERATURE:

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