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PHYSICO-CHEMICAL PROPERTIES OF SULFOCATIONITE BASED ON NATURAL POLYMERS FROM WALNUT SHELLS

Abstract: In this article, the physicochemical properties of sulfocationite based on natural polymers contained in walnut shells are considered. Key words: agriculture, nuts, chemistry, natural polymers.

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Introduction: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 the health of the population. The environmental problem of hydrosphere pollution with waste water is becoming urgent in the world, including in Uzbekistan. Among the common wastes in nature, wastes containing cellulose biopolymer occupy the main place. When we studied the chemical structure of cellulose, it was found that it consists of a linear polymer chain of poly β-(1,4)-D-glucose with a syndiotactic configuration of high-ratio cellobiose repeating units with a width of 2-50 nm and hundreds of lengths. Since the cellulose macromolecule has a hydroxyl group in its elementary unit, it reacts with sulfur (S) alkali metals and bases. When cellulose containing S is exposed to a concentrated alkali solution, chemical reactions as well as physicochemical processes take place, that is, cellulose swells.

Since cellulose is a renewable, stable and biodegradable polymer, sulfocation can be synthesized by attaching sulfo groups to it [1].

In the following work, the physicochemical properties of sulfocationite were synthesized from the cellulose of walnut husks, which were discarded as waste. Experimental part This research work was studied based on the value of static exchange capacity (SAS) of sulfocationite synthesized on the basis of cellulose extracted from walnut shell. The modification of sulfuric acid to walnut husks was studied.

For this purpose, walnut shells with a size of 2 mm are boiled in distilled water and then in a 20% solution of sulfuric acid for one hour, and the solution is filtered and washed in distilled water until the rN value of the sample becomes neutral. Take one gram of the resulting sample and put it in 100 ml solution of sodium alkali (NaOH) 0.1 N for one day and wash it again in distilled water until pH value becomes neutral. The sample is then treated with a 0.1 N solution of hydrochloric acid to activate it. Cationite in a neutral state is left for one day in a solution of 0.1 N sodium hydroxide. The alkali solution containing cationite is shaken with a 0.1 n solution of hydrochloric acid, and the SAS value for cationite is determined [2]. The following formula was used to calculate the SAS value of cationite:

After adding calcium to sulfocationite, the IR spectrum of the sample was studied. The appearance of new absorption bands in the region of 1700 cm-1 indicates the presence of Sa metal in sulfocationite.

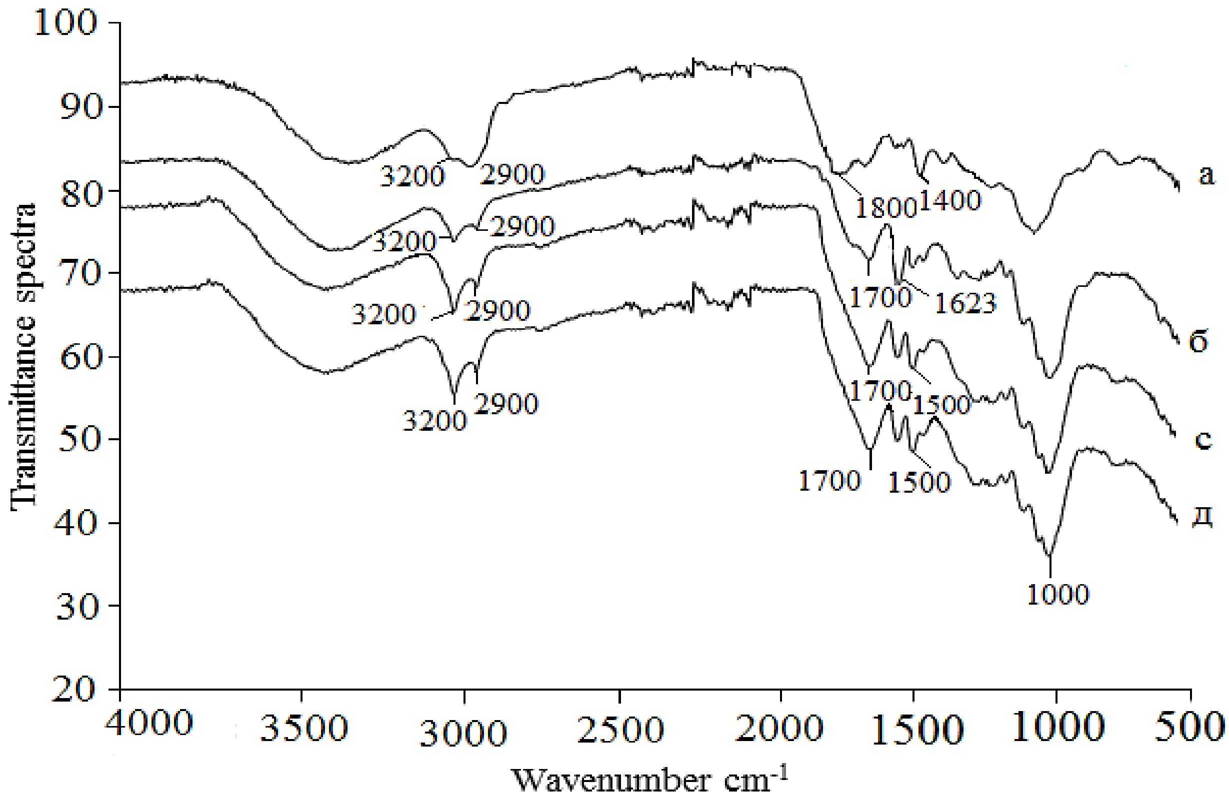

Figure 1. IR spectra of (a) cellulose, (b) sodium cellulose (calcified cellulose and (d) sulfocation.

In the IR-spectrum of glucose at a wavelength of 3100 cm^{-1} –OH and

an absorption band indicating valence vibrations of the group was observed, as well as 2900 $см^{-1}$ on $–CH_2$ vibrations of groups are formed and 1423-1321 cm^{-1} in the field -OH, -CH- groups, 1000-1150 cm^{-1} -C-O-C- valence vibrations of ether bonds are observed in the interval.

The sample with Na metal attached to cellulose (Fig. 1(b)) is the one with additional absorption bands in the spectrum 1623 cm^{-1} on , it is absorption bands typical for Na metal[3].

CONCLUSIONS AND RECOMMENDATIONS

This article investigates the properties of ionite obtained based on the modification of cellulose, a natural polymer, with sulfuric acid and is developed based on experiments. It is recommended that the main purpose of this article is to purify water from various salts and their toxic compounds. In addition, it is one of its achievements that effective results in the purification of metal ions and their anions in waste from factories and other wastewaters are obtained.

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