Выводы

Исследованием электромагнитных характеристик энергооборудования выявлена загрязненность вблизи электрощитовых (корпус № 3 и общежитие № 2) по магнитной составляющей напряженности ЭМП (5,43 А/м и 5,27 А/м соответственно при норма 5 А/м). Электрическая составляющая напряженности ЭМП не превышает допустимых величин. Исследованием электромагнитных характеристик трансформаторной подстанции (внутренний дворик) не выявило превышение нормативных величин как по электрической так и по магнитной составляющих напряженности ЭМП [1].

Список использованных источников

1. Об утверждении гигиенических нормативов [Электронный ресурс] : постановление Совета Министров Респ. Беларусь, 25 янв. 2021 г., № 37 // Национальный правовой Интернет-портал Республики Беларусь. – Режим доступа: https://pravo.by/document/?guid=12551&p0=C22100037&p1=1&p5=0. – Дата доступа: 02.04.2023.

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THE INFLUENCE OF ULTRASOUND VIBRATIONS ON THE OXIDATION PROCESSES OF CELLULOSE

Khabibullayev J.A., junior researcher., Abdurakhmanov J.A., PhD student., Shomurotov Sh.A., doctor of science., Akhmedov O.R., PhD.
Institute of Bioorganic Chemistry, Tashkent, Uzbekistan

Today, the advanced achievements of chemical technology are widely used to eliminate a number of problems of the pharmaceutical industry. In particular, energy-efficient, less time consuming and ecologically friendly production lines are becoming an integral part of the industry. Here, there are a lot of problems waiting to be solved in the medical equipment manufacturing industry, which are difficult to solve from a technological point of view. These problems can also be observed in the production process of oxidized cellulose, which is currently widely used in medicine as a blood-stopping agent. In particular, the oxidation method using NO_2 is one of the most common methods of obtaining a hemostatic agent based on oxidized cellulose. The disadvantage of this method is that the oxidation process takes a long time (up to 48 hours). This leads to a decrease in economic efficiency in terms of energy. It is known that ultrasonic vibrations are one of the physical factors that actively affect heat and mass exchange processes, the speed of heterogeneous chemical reactions in liquids, as well as the structure and properties of solids. Therefore, the use of ultrasound in the production of medical devices leads to many positive effects. The effect of ultrasound is primarily related to the development of the phenomenon of acoustic cavitation, which occurs in the reaction medium during the propagation of ultrasound. Under normal conditions, the rate of most heterogeneous reactions is very low, which is determined by the size of the reaction surface of the reacting components. Ultrasonic vibrations provide particle dispersion and increase the reaction active surface of the reacting elements. And this, in turn, leads to the acceleration of the reaction.

Taking into account the above, the influence of ultrasound on the reactions of obtaining oxidized cellulose in a heterogeneous environment was studied. Currently, the method of obtaining oxidized cellulose by oxidizing cellulose in a solution of an oxidizing mixture

containing HNO_3/H_3PO_4-$NaNO_2$ is also widely used. Therefore, in our research, we applied ultrasonic vibrations to the oxidation reactions of cellulose with HNO_3/H_3PO_4-$NaNO_2$ mixture. We determined important parameters such as the degree of oxidation, structure, morphology and degree of crystallization of the obtained samples. The experiments were carried out on a GT SONIC-D6 digital ultrasound device operating at a frequency of 40 kHz, with an ultrasonic power of 150 W, equipped with a temperature and time control system. The operation mode of the ultrasound generator was set to "normal" mode (frequency 40 kHz). Temperature 25°C, reaction time 4 hours. The physical and chemical properties of the samples are related to the oxidation level of the product, which was determined using the standard calcium acetate method. In this case, the amount of carboxyl groups in the samples obtained using the ultrasonic method is 21.6 %. Under similar conditions, cotton wool oxidation reactions were carried out without the influence of ultrasound waves for 4 hours at a temperature of 25°C. In this a sample containing 9.14 % carboxyl groups was obtained.

The analysis of the samples on the X-ray diffractometer device showed that the degree of crystallization decreased as the oxidation time increased in the obtained samples. In order to determine the structure of the obtained products, when the IR spectra were analyzed, it was found that the samples contain absorptions specific to carboxyl groups. Morphological studies showed that cracks of different sizes were formed on the surface of the fibers. This may be related to the phenomenon of cavitation.

Concluding from the results of the study, it can be said that the application of the ultrasonic factor to the oxidation process can reduce the oxidation time several times. This method allows to reduce the oxidation time from 48 hours to 4 hours and to produce a product with sufficient oxidation level in less time. This is due to the formation of high pressure between the particles due to the cavitation effect of ultrasound vibrations in cellulose molecules during the reaction. In addition, ultrasonic vibrations provide an increase in the reactive surface of cellulose fibers.

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ИССЛЕДОВАНИЕ ПРОЦЕССА ОБЕЗЖИРИВАНИЯ ПРИ ОБРАБОТКЕ ШКУР СТРАУСА

Улугмуратов Ж.Ф., ст.преп., Туреniязов А.А., маг., Исматуллаев И.Н., ст.преп., Бегалиев Х.Х., к.т.н., доц.
Ташкентский институт текстильной и легкой промышленности,
г. Ташкент, Республика Узбекистан

Кожа, получаемая из шкур страуса, считается одним из видов экзотических кож. Экзотическая кожа страуса, получаемая из части туловища и ног имеют своеобразный, красивый внешний вид. Производство кожи и меха стремительно развивается в мире, в том числе в ЮАР, Исламской Республике Иран и Пакистане, занимающих одно из ведущих мест по переработке сырья из кожи страуса. В настоящее время во всем мире производится более 1 000 000 экзотических кож страуса.

При производстве высококачественных экзотических кожаных изделий из кожевенного сырья страуса. Высокое содержание природного жира в шкуре страуса требует совершенствования технологии переработки кожевенного сырья страуса и внедрения ее в практику на основе исследований процесса обезжиривания. В процессе обезжиривания