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IQ SPECROSCOPY OF MODIFIED COLLAGEN WITH NANOEMULSIONS

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Abstract: Modification of the surface of natural vegetable tanned leather by exposure with subsequent modification . The surface morphology of the synthesized composite material was studied by scanning microscopy. The possibility of creating composite materials based on collagen for the purpose of obtaining special-purpose leathers is discussed .

The use of nanoemulsion for collagen modification gives a unique chemical bond. Strong ionic and covalent bonds are formed. At the same time, nanoemulsions give the effect of modifying the improvement of the collagen structure.

Key words: collagen, nanoemulsion , food products, catgut, sponges, microchips , genuine leather , vegetable tanning, IR exposure, structure .

One of them is related to understanding the peculiarities of chemical properties and reactivity of collagen, consisting of a large number of atoms, the study of which lays new fundamental foundations for this science. Another aspect is the use for obtaining modified collagen, stabilization of isolated molecules and their directed self-assembly into more complex protein structures. Modified collagen is widely used in various sectors of the national economy, medicine, computer technology, robotics , implants , etc.

The use of nanoemulsions for collagen modification provides a unique chemical bond. Strong ionic and covalent bonds are formed. The advantages of nanoemulsions are: High bioabsorption. Long-term stability. Protection of active substances. Pleasant texture without solid particles. In this case, the main attention should be paid to changing the properties of the resulting structures as a result of regulating the size and shape of the modifying molecules for collagen [1-3] .

Introduction. One of them is related to understanding the peculiarities of chemical properties and reactivity of collagen, consisting of a large number of atoms, the study of which lays new fundamental foundations for this science. Another aspect is the use for obtaining modified collagen, stabilization of isolated molecules and their directed self-assembly into more complex protein structures. Modified collagen is widely used in various sectors of the national economy, medicine, computer technology, robotics , etc. And also fibroblast-like collagen fibers formed a mesh structure and modified with metal oxides are used in dental implants .

Modified collagen is a convenient substance for creating liquid soft and hard eye films [1]. Also modified collagen films are used for people who have suffered burns. up to 60% in case of fire.

In this case, the main attention should be paid to changing the properties of the resulting structures as a result of regulating the size and shape of the modifying molecules for collagen [1-3] .

The aim of this work is to synthesize and apply new active antiseptic substances based on collagen modification . Our research has produced a new system based on a natural high-molecular compound by modifying it with silver substances and developed a technology for obtaining it.

Chemistry of application of the modifier composition based on nanoemulsion in collagen gave their indicators . In our works it was determined that using silver compound , it is possible to obtain collagen film samples with good appearance and improved quality. Study of collagen surface morphology and after modification .

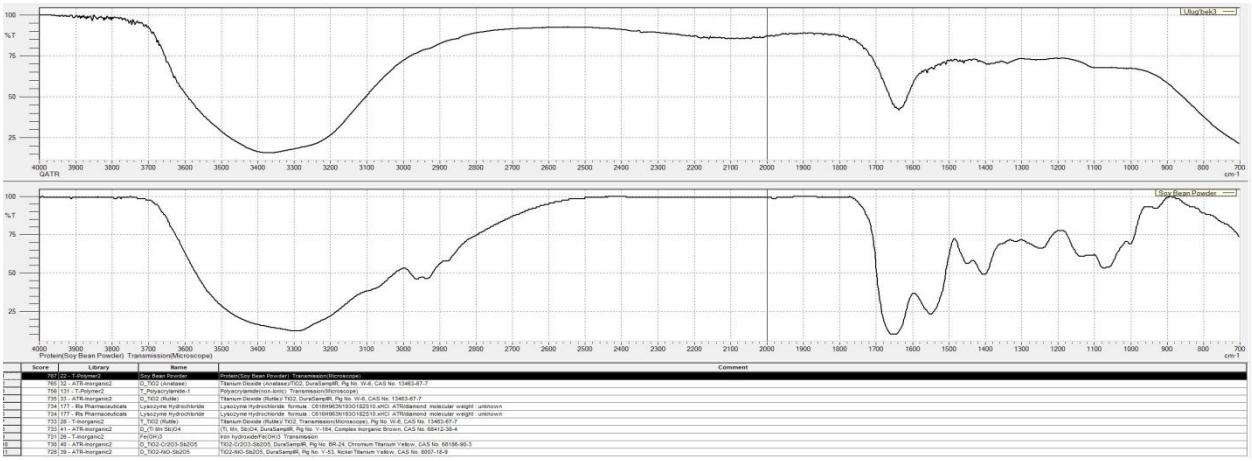

Fig. 1. IR spectrum of collagen

Materials and methods. Deeply purified collagen was used in the studies Fig. 1. Infrared spectra of collagen obtained with a Shimadzu brand spectroscope (Japan) . We used a modification of collagen with silver nanoemulsions. The collagen solution was obtained using the general method. Mixing the collagen solution, 2:0.3 was added with silver nanoemulsions. It should be noted that IR spectroscopy Shimadzu Arch (Japan) skin also depends on the wavelength. The most important endogenous chromophores that absorb radiation, are melanin, hemoglobin, collagen. Approximately 5-7 % of radiation is reflected at the level of the stratum corneum . IR spectra in the range of 1000-1500 nm scatters less and penetrates deeper than l00 microns. The leather tanning process has been studied in more detail when using silver substances . The resulting collagen films have high physical, chemical and mechanical properties.

Conclusion. We We studied the structure and chemical changes of collagen, determined the distribution of chemical elements of the sample under study, and also obtained an image of the object in a wide range of magnifications.

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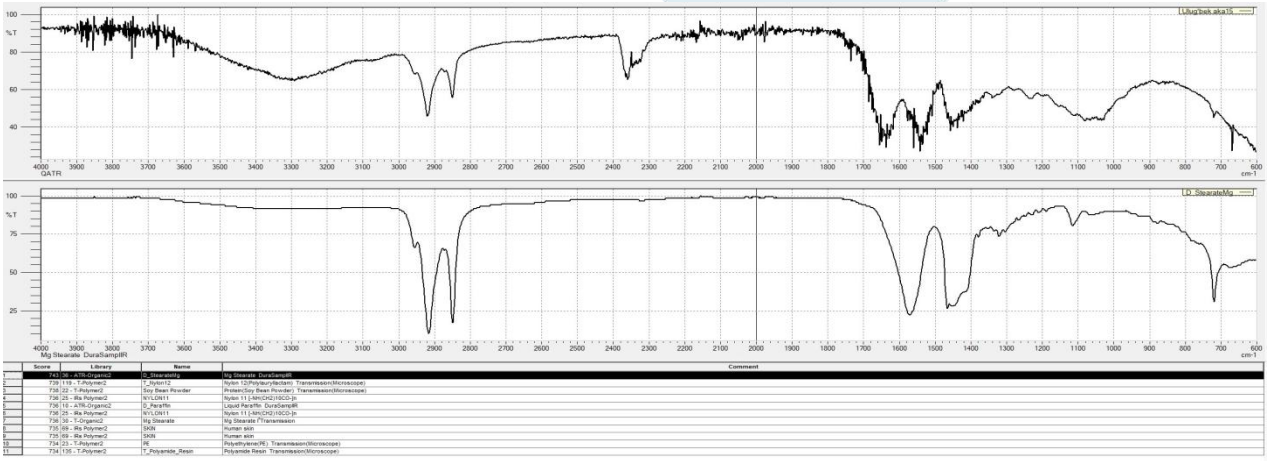
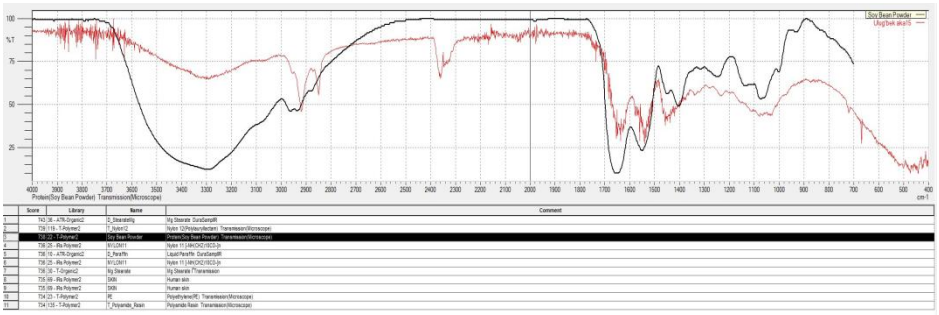


According to the results of IR spectroscopy brand Shimadzu (Japan) it is possible to draw a conclusion about the expediency of replacing traditional methods and including applied nanoelution modifiers . These products, as microheterogeneous systems, can be used for collagen modification.

It should be noted that at present, the modification of collagen with anti - eptics is relevant.



The study of the collagen film surface was conducted using a metallographic and scanning electron microscope. Modern metallographic microscopes using various optical contrasting methods make it possible to study the structures of metallic materials. In this work, an MI-1 inverted metallographic microscope was used. The skin surface was analyzed at various magnifications using dark field illumination [6-8]. The principle of dark field illumination is that the sample surface is illuminated by inclined light beams. The natural color of colored objects is preserved in a dark field. The study of the chemical composition of collagen was also conducted using a MIRA -3 scanning electron microscope with a microanalyzer system from Oxford Instruments (Great Britain). The device allows one to simultaneously study the morphology of the material surface, determine the distribution of chemical elements of the sample under study, and obtain an image of the object in a wide range of magnifications.

Based on the results achieved, it can be assumed that the modification of collagen allows obtaining protein polymers with high antiseptic properties . indicators.

Conclusions. The morphology of the film surface and the surface of natural leather after modification was studied using IR spectroscopy .

Modification of skin collagen changes the color and morphology of hair follicles, which probably creates additional surface relief.

It should be noted that currently the modification of collagen with silver compounds provides in the structure of collagen. Based on the achieved results, it can be assumed that the modification of collagen with nanoelutions allows to obtain finishing materials for leather production.

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