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Mechanical and Chemical Processing of Wool Fiber Technology

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Abstract
This article discusses the methods of mechanical and chemical processing of wool fiber technology, as well as their application in practice.

Keywords: fiber, washing technologies, high energy, supercooling methods

Introduction
Wool Fiber It is advisable to produce high-quality spun yarn from wool from local sheep, goats, and camels, while improving the surface appearance of the fiber will also increase demand. As a result of the fact that the primary processing of wool fiber is carried out mainly in households, no high-quality wool fiber is produced, the quality of which meets certain standards. In addition, the preparation of fiber at different times does not ensure the stability of its quantity over time or does not allow to make a forecast [1].

At present, there is a significant shortage of primary processed fiber in the textile industry for the production of wool fiber-based assortments. The use of imported semi-finished products leads to an increase in the cost of the finished product and, consequently, a decrease in the competitiveness of this product, as well as the profitability of production. It is possible to make a significant contribution to the economy of the republic through the primary processing of wool fiber with the help of chemicals.

Object and subject of research. Local coarse sheep wool is the object of research. Its subject is washing, bleaching and bleaching of coarse sheep wool, as well as the study of its properties. In view of the above, the main purpose of this dissertation is to develop a technology for the preparation of local wool fiber for spinning in the textile industry. The breeds of sheep and goats raised in our country are Sarodzhin and Tajik sheep with semi-coarse wool, karakul, Hisori and Jaydari sheep with coarse wool. It can make a significant contribution to the economy of the republic through the primary processing of wool fiber with the help of chemicals. Primary processing of local wool fibers by chemical methods - the development of effective washing technologies, which is achieved by removing natural waste and contaminants from the washed wool fiber. The purpose of washing is to remove various types of waste, natural oil residues, mineral waste from wool fiber materials. The complex composition of the waste, in addition to natural waste, requires the selection of special technology and equipment for the preparation of starch, its hydrolysis products, PVS, PAA, mineral oil, etc., which are also used in enterprises. The composition of the washing solution consists of surfactants and soda. Under the influence of soda, the fats and oils in the fiber become soluble, while the surfactant emulsifies the fats and oils in this soluble state. Various surfactants and soap solutions were used to wash the local wool fiber. The fiber obtained by shearing the hair of animals is called natural wool. The wool collected during the processing of animal skins is called factory-obtained wool. The fiber obtained by processing old wool yarns is called regenerated wool. Wool fiber is obtained from the fur coat on the skins of sheep, camels, goats, cattle and rabbits. Wool fibers consist of roots and body parts [2].

Practical significance of scientific research When wool is a hygroscopic fiber, when dried at a temperature of 100-105°C, it loses moisture, the fiber becomes rough and its mechanical properties deteriorate. Re-wetting leads to a gradual restoration of the initial properties of wool fiber. However, prolonged heating above 105°C deteriorates the physical and mechanical
properties of wool fiber. Organic acids have almost no effect on wool fibers. Under the influence of alkalis, wool deteriorates its physical and mechanical properties. For example, when wool is boiled in 3% sodium hydroxide solution, its complete dissolution is observed immediately.

If the fibers are separated mechanically in the hot-humid conditions of processing, they are preferentially separated in the direction of least resistance to the type of bonded fiber. If the movement continues for too long, a single fiber will begin to take the form of a ring and become tangled. The yarn or fiber structure is thin and dense. If controlled, the result can be like a fluffy coating for the surface of a billiard table or as a grinding process for the production of compacted fibers used in the manufacture of coats. If left unchecked, for example during washing, excessive stretching can be observed. A two-step method of cleaning wool has been reported by scientists. This method uses high energy to clean wool from natural waste, and the process consists of the following operations: mechanical cleaning of wool, high-energy processing for 3 minutes, washing wool using SAM, washing and drying wool in clean water. In these studies, the solution formed by washing the wool was analyzed and found to be a coarsely dispersed system containing 18.6% wool oil. In addition, up to 96% of the fat content of the processed wool was achieved through the use of high energy. The physicochemical characteristics of the extracted oil were determined and the experimental results were compared with the properties of the oil extracted from the solution formed in the traditional method of washing wool. According to the results of the comparison, the superiority of the quality indicators of oils formed when processed in a high-energy environment was recognized.

Absorbed under the influence of very hot sulfuric acid, other acids are not affected. Soluble in weak alkaline solution. When boiled, the wool dissolves in a 2% soda solution. Under the influence of mixed acids, the strength of wool increases. Concentrated nitric acid turns yellow under the influence of wool, under the influence of concentrated sulfuric acid - turns into charcoal. Insoluble in phenol and acetone [2]. In order to achieve the production of high quality textile products, it is necessary to preserve the natural properties of wool yarn during processing.

In the process of primary processing of wool, in particular, various chemical reagents are applied. Reactions under the influence of chemical reagents are associated with the chemical conversion of molecular chains and, above all, the destruction and cross-linking of macro molecules. When washing wool, fatty acid is adsorbed on the fiber. In this case, caustic sodium keratin reacts with the wool, which leads to the formation of micro-starches in the fiber optic, as well as the destruction of the transverse intermolecular keratin bonds of salt and cystine. With a stronger effect, interactive intercellular changes occur in the intramolecular polypeptide chains, which affect the tensile properties of the fibers. In a highly alkaline environment, the top of the fibers dissolves and the mass of washed wool is lost by 1-2% [3].

**Conclusion** Wool fiber is removed from the satellite in the form of fiber, as well as in the form of yarn and fabric. Emulsion, extraction and supercooling methods of purification are known, mainly emulsion method is used. Wool washing consists of the following stages: degreasing, waxing, washing, soaping, rinsing. To remove waxy and inverted substances, wool is washed in cold water at 16°C, with a solution pH of 5.5-8.8. This solution is separated from the wool, cleaned and heated to 60°C, soda is added and used to emulsify the waxy substances in the wool, a process that emulsification of the substances is completed during saponification.

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