



## **DYEING OF BLENDED KNITWEAR BASED ON MODIFIED NITRON AND NATURAL SILK**

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**Annotation.** *This paper presents the results of research into the dyeing process of mixed two-layer knitwear based on modified nitron and natural silk.*

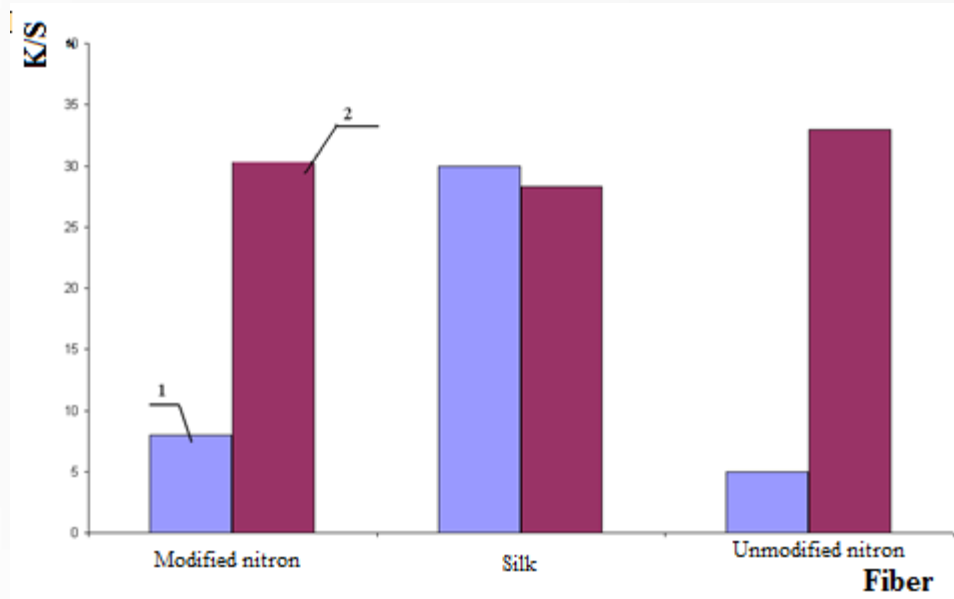
**Keywords:** *modified nitron, natural silk, reactive dye, cationic dye, raw materials*

**Theory.** Technologies of production of traditional species of chemical fibers is purposely improving in these days. Principally new kinds of fibers and fiber materials, such as: shin-gosen, clever textiles, fibers and textiles with specific functional properties are appeared. New polymer, that able complete with known one is hard to synthesis. Especially it is related to fiber forming polymers, which number is restricted. Therefore, the main way for enlargement of class of polymer materials and create the complex of new consumer features are special modification of polymers. Last years different methods of modification of vast volume producing fibers, as well as polyacrylonitril fiber-nitron take place.

**Experiment.** Solving the problem of improving the quality of light industry goods based on the creation of rational fibrous mixtures is relevant not only in terms of expanding the range of textile materials and improving their consumer properties, but also promoting a more rational use of the raw material base and saving natural raw materials.

Currently available traditional technologies provide for the coloring of only silk or only nitron products. The extended use of various mixtures of fibers requires the use of a special technology for refining products from these mixtures. Including the process of preparation and dyeing of mixed knitwear based on modified nitron and natural silk is individual and depends primarily on the nature of the polymer, its quantitative ratio in the mixture and the resulting dyeing conditions.

At the first stage of the work, the influence of the class of dyes on the intensity of colorings in both sides was studied, i.e. in the nitron and silk side of the jersey. The obtained experimental data are illustrated in Figure 1. As can be seen from Figure 1. the color intensity on modified nitron is 12 K/S, on nitron 4 K/S, and on natural silk 30 K/S. The resulting colors on the nitron side have a melange effect due to the difference in color intensity. At the same time, with the help of a cationic dye, it is possible to obtain colors of almost the same intensity. In addition, the resulting colors are characterized by brightness and uniformity. Based on the fact that the largest part of mixed knitwear is modified nitron fiber (70%), in further studies, a cationic dye was chosen as a dye.



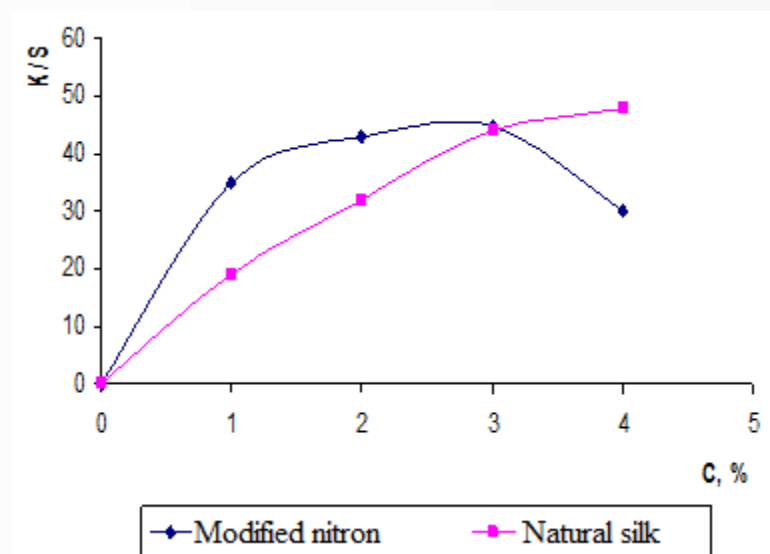
Picture 1. Dependence of color intensity on the type of dye

1 – Reactive dye;

2 – Cationic dye.

The studies were carried out according to a periodic one-factor method. Four different dye concentrations were chosen, i.e. one; 2; 3; 4% by fiber weight (pic. 2).

As the dye concentration increases, the color intensity on both sides increases accordingly. On different components of the mixture, the rates of dye selection by the fiber differ. This is due to the fact that the nitron fiber has a pronounced negative charge, and positively charged dye ions are sorbed on the fiber surface at a higher rate than on the surface of positively charged natural silk.



Picture 2. Dependence of color intensity on dye concentration



**Conclusion.** At a concentration of 3% by weight of the processed material on both components it is possible to obtain colors of similar intensity. With a further increase in the concentration of the dye on the nitron component, the color intensity decreases. The decrease in color intensity is due to the aggregation of dye molecules; due to the dense structure of the nitron fiber, aggregated dye molecules cannot diffuse into the depth of the fiber. In the silk side of the jersey, one can observe the equilibrium sorption of the dye, because with increasing dye concentration (after 3%), the color intensity does not change significantly.

**References:**

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