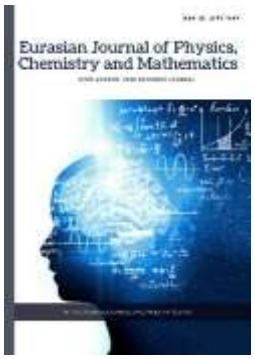

To Study the Physicochemical Basis of the Processes of Dyeing and Printing of Mixed Fiber Materials

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ABSTRACT

The article focuses on the preparation and physicochemical properties of dyes for dyeing composite fibers, provides a number of comments and examples, and describes its role in a number of studies. In addition, the physicochemical properties of mixed fibers were studied.

Keywords: Mixed fiber, research, shlichta, mane, dye.

In the present period, it is widely established to increase assortments of mixed fiber fabrics and to expand their quantity and types. The large-scale use of mixed fiber fabrics requires the production of special (physico-chemical) methods of preparing them for finishing.[1]

When preparing mixed fiber fabrics for finishing, we should pay attention to the physical and chemical properties of the fiber in the mixed fiber fabric. For dyeing and dyeing textile materials, it consists in removing additives (silt, organic residues, adhesive substances), giving them sufficient fineness, capillarity and whiteness.[1-2]

Experts concluded that mixed fiber fabrics can be bleached in both alkaline and acidic environments. Bleaching in a strongly acidic environment spoiled the quality of fabrics and made it difficult to process them. Such processes were observed in the range of PH=3-4. The essence of this method is that bleaching first takes place in a weakly acidic medium with pH=5-7, with the presence of polyphosphoric acid. In addition to polyphosphoric acid, a solution of 90-100% H2O2 with a concentration of 15 g/l is used. Processing time lasts 15-30 minutes. Then an alkaline agent is added to the bleaching bath until pH=9.6-12. T-1000C, processing time 40 minutes. Through this bleaching method, we can save H2O2 and get a high quality pure product.

Currently, one of the methods used by modern technology is the use of high energy sources in the process of preparing textile materials for finishing. This method is a one-step method. This method takes less time for the cleaning process.[4-5]

In addition, high-quality whiteness can be achieved as a result of photochemical activation of oxidants or ultrasonic activation of peroxide baths. Peroxide compounds, bleaches containing chlorine and atomic oxygen, and chlorine can be used as oxidizing agents. Ultraviolet radiation accelerates the decomposition of the bleaching agent. [6-7] This accelerates the bleaching process. The

whiteness of the fabric reaches 80-83% in 10-20 seconds.

In the real conditions of the dyeing process, the main reactions with cellulose and additional reactions with water occur at the same time, some factors accelerate both processes, that is, binding of dye with fiber and its hydrolysis in aqueous solution. Accordingly, the following additional requirements are imposed on active dyes.[8-9] high reaction ability;

their stability when stored dry and in solution;

the strength of the covalent bond between the dye and the fiber;

high degree of substance relative to fiber.

When the rational technology of dyeing is transferred and the recipe is made, it is necessary to correctly select the parameters (temperature, pH, process time, concentration of electrolytes, etc.) that ensure the maximum Absorption of the dye and its minimal loss due to hydrolysis.

In the process of dyeing various mixed fiber fabrics, it is important to pay attention to the preparation of dye solution and its physico-chemical properties. Many types of dyes and active substances have different effects on physical processes (increasing the temperature caused an increase in dye concentration and activity).[10-11]

Dyeing is carried out in an aqueous solution according to a certain modulus (volume). The ratio of the volume of dye solution to the weight of the fabric being dyed is called modulus. It is found based on the following formula: M=V/m, where M- module, mg/g, V- volume of dye solution, ml, m- fabric weight, g.

When preparing a dyeing solution, dyes and auxiliary compounds are often calculated as a percentage of the weight of the fabric to be dyed. For example: fabric weight - 1g, module - 50 ml/g, solution composition: in percentage of fabric weight. When the coloring matter is 3.5 percent, acetic acid is 6 percent, and sodium sulfate is 10 percent, the substances are calculated as follows:[13-14]

1) V= M·m = 50·1=50 ml, volume of dyeing solution,

2) 1-------- 100

If X-------3.5, X=0.035g, weight of dye,

3) 1----------100

If Y----------6, Y=0.06g, it is necessary to get acetic acid.

4) 1---------100

Z---------10 Z=0.1 sodium sulfate should be obtained.

In order to facilitate the measurement of the necessary substances, concentrated solutions of these substances are prepared:

Cb. m. = 1 g/l; CCH3COOH= 50g/l; CNa2SO4 = 100 g/l

Calculation: a) If 0.035g of dye is needed,

1g----------100 ml

0.03----------X ml

b) Acetic acid 0.05 g, if necessary, from the prepared solution

50g----------1000 ml

0.06----------X X=1.2ml is obtained.

c) sodium sulfate 0.1 g from the prepared solution if necessary

100 g ----------1000 ml

0.1 g----------X X=1 ml should be taken,

g) amount of water = 50 – (30 +1+1)=18 ml.

Table-1

Dye when the module bath is 50, the amount of dye is 1 g

composition of the solution

Name of substances	The amount is calculated as a percentage of the weight of the fabric	Amount of substance in concentrated solution, g/l	Amount of solution to be added, ml
Coloring substance	3.5	1	30
Acetic acid	6	50	1
Sodium sulfate	10	100	1
Water	-	-	18

Total: 50 ml

By making one of the various types of mixed fiber fabric components from VVM, the appearance of the product, softness and it is possible to improve its glossiness and hygienic properties. [15-16]. The purpose of using mixed fibers is to expand the range of manufactured products, improve their quality, and solve the problems of replacing natural fibers with chemical fibers, i.e. using chemical fibers instead of scarce natural fibers. Because,

by using mixed fibers, it is often possible not only to reduce the consumption of expensive natural fiber raw materials, but also to make them comfortable and convenient to use in practice. According to the types of fibers and their ratio in the mixture, the method and conditions for the preparation of gauze (canvas) based on a mixture of different types of fibers are selected for each individual case. Preparation conditions should be selected in such a way that

Usually, special equipment is not used for the preparation of products based on mixed fibers, but the equipment used for the same range of products is used, in some cases combined technical processes.

It is important to pay attention to the physico-chemical properties of fabrics in the dyeing process.

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