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## SYNTHESIS OF AZO DYES WITH SPECIFIED PROPERTIES

**Aim.** Synthesize of azo dye based on 5-chloro-2 (2,4-dichlorophenoxy) phenol and aniline on the cotton textile materials and investigate its antibacterial properties.

**Key words:** *textile material, antibacterial properties, 5-chloro-2 (2,4-dichlorophenoxy) phenol, dye.*

**The research objective.** One of the ways to achieve the aim is to combine the processes of finishing and obtaining special properties of textile materials. The synthesis of an insoluble azo dye on the textile material with special properties is a promising direction of research.

**Research methods.** Organic synthesis of insoluble azo dyes with uses chemical technologies of textile materials, disco-diffusion method for determining the bactericidal properties of textile samples.

**The results of the research.** The modern direction of the development of textile materials technologies is aimed at the development and implementation in the production of science-intensive technologies for obtaining materials with specified properties. Synthetic azo dyes have certain advantages over other classes of dyes and are widely used in industry. In this regard, developments in the direction of medical textiles development are of particular value [1, 2]. These are textile materials with specified properties (for example, with bactericidal and (or) fungicidal).

The method of organic synthesis was used to obtain an insoluble azo dye [3]. A diazo compound was prepared for synthesis. The preparation of diazo compounds was carried out according to the standard technology for obtaining diazo compounds. Azoamines differ in their chemical nature, so the diazotization technique for different azoamines can differ significantly. The work uses 5-chloro-2 (2,4-dichlorophenoxy) phenol (a product of the phenolic series) as the azo component of the dye, and aniline as the diazo component. When carrying out the reaction of the azo compound of a salt based on 5-chloro-2 (2,4-dichlorophenoxy) phenol with an azoamine, after diazotization, a bactericidal dye is formed.

There are many methods of determining the bactericidal properties of substances. Among the main ones, we can distinguish: the method of

determining the linear rate of radial growth of colonies of microorganisms on a solid nutrient medium, the method of determining the rate of development of microorganisms on a liquid nutrient medium based on the turbidity index and surface growth of mycelium, the method of "agar grids", and the disk-diffusion method.

To confirm the hypothesis of obtaining an antibacterial dye, the disc-diffusion method is used in the work. Dye solutions were prepared in acetone (concentration 10 g/dm<sup>3</sup>), filter paper disks with a diameter of 1 cm were immersed in the solutions. After removing moisture from the air, the disks were placed in Petri dishes on a nutrient environment infected with *E. coli* bacteria. As a nutritional diagnostic environment, a environment containing lactose was used as an acidity indicator fuchsin. Discs impregnated with an aniline-based azo dye were placed on the infected environment. Then the cups were placed in a thermostat with a temperature of 37 °C. The growth of bacteria was observed after 24 and 48 hours. Similar to the analysis with paper discs, research was carried out with samples of cotton fabrics dyed with azo dyes synthesized on the textile materials ("ice" dyeing method). An unstained tissue sample was used for comparison. The growth of bacteria was observed after 1-3 days.

The result of evaluating the antibacterial properties of the dye when using paper discs and dyed fabrics demonstrates the high efficiency of the dye (8-9 mm, the norm is 4 mm).

**Conclusion.** In this way, the synthesis of dyes with spicified antibacterial properties on the cotton textile materials has significant advantages. It is proved that the dye, which is synthesized on the basis of aniline and 5-chloro-2 (2,4-dichlorophenoxy) phenol, allows to obtain antibacterial characteristics of textile, that fully satisfy the needs of the consumer.

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