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DEVELOPMENT OF THICKENING POLYMER COMPOSITIONS BASED ON OXIDIZED STARCH FOR PRINTING FABRIC OF MIXED FIBERS

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Abstract
Thickening compositions of a new composition have been developed for printing blended fabrics based on cotton and nitron fibers. The effect of the components of the extinguishing compositions on the rheological properties of the composition depending on their concentration has been studied. The development of a new composition of the thickening composition, its physicochemical and rheological properties has been established.

Keywords: thickener, dye, composition, fabric printing, blended fabrics, polyacrylamide, oxidized starch, color fastness, composition, concentration.

Introduction

To create a colorful pattern on the fabric, you need to look at the viscous system. A viscous system is a thickener. Thickeners are various components, high-molecular disperse systems or polymer solutions. The thickener must have such a property that there must be no bond between the fabric and the thickener. And then it should be easy to rinse.
Sodium alginate and synthetic thickeners are used in production. Due to their high cost, these thickeners make it difficult to use them on a large scale in production. That is why our main job is to obtain thickeners based on local raw materials [1].

LITERATURE AND METHODOLOGY

As we know, cotton fibers are hydrophilic, i.e. they absorb water very well. And nitron fibers are hydrophobic. Does not absorb water. Because, synthetic fibers. That is why, when printing fabric from blended fibers, all these properties are taken into account. And we are creating new thickening polymer compositions. Looking for all these properties, we choose dyes. Because all active dyes do not penetrate into synthetic fibers [2-3].
In the preparation of printing inks, the most basic characteristic of the rheological properties of aqueous solutions of thickeners is their viscosity. The viscosity of the thickener was studied at different concentrations of polyacrylamide in the polymer composition. A composition of thickening polymer compositions based on polyacrylamide, oxidized starch and K-4 for stuffing mixed fibers has been developed. As well as the viscosity of the thickening solution depends on the concentration of K-4 in the composition.

OUTCOMES

At the same time, in this case, the amount of thickening introduced into the composition of the printing ink can be reduced by 15-17% with the addition of oxidized starch, 1.0% PAA and 1.5% K-4. A preliminary economic calculation of the production of printing inks based on 6% oxidized starch and composite (obtained by the "hot" method) thickener showed that the introduction of 1.0% PAA and 1.5% K-4 in the oxidized starch paste as a whole allows to reduce production costs during the preparation of the thickener.

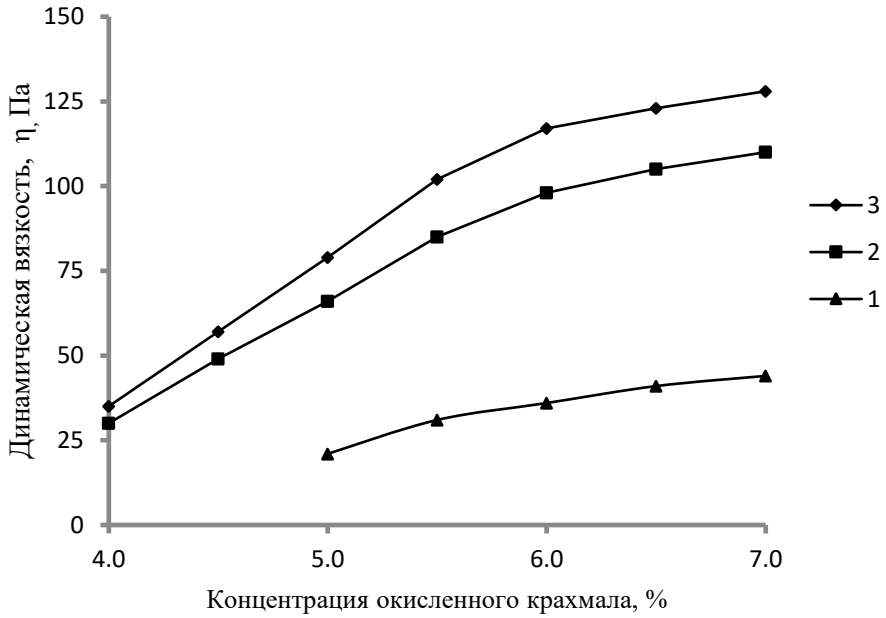

Fig.1. Effect of polymer additives on the dynamic viscosity of oxidized starch of the resulting printing compositions

1 – no additives; 2 – 1.0 % PAA; 3 – 1.0% PAA-1.5% K-4

DISCUSSION

The main function of the thickener is to penetrate the dye into the fabric. The most important task here is that the fabric and the dye must react, i.e. they must interact. Let them form a covalent bond together. Because, a covalent bond is stronger and stronger than a hydrogen bond. That is why we must form a strong bond. If a strong bond is formed, the dyes are not washed during washing. That is why, when washing, if the fabric is dyed, it means that the fixation is poorly done [5-6]. In other words, there is no good connection here. And some process did not proceed to the end. The above all these properties are the functions of a thickener.

Analyzing the data obtained, it can be concluded that the use of a thickening polymer composition based on OK-PAA-K-4 makes it possible to increase the degree of useful use of the active dye by 14-17%, as well as the resistance of colors to friction is close to such thickeners as sodium alginate and solvitosis C-5.

Table **Effect of thickener composition on fixation degrees (α) active bright red 5CX dye based on blended cotton and nitron fibers at a ratio of 70:30**

Thickener	**α, %**	Color resistance to wet friction, score
Starch, 12%	57	4/2
Carboxymethyl starch, 8%	**74**	4/3
OK-PAA-K-4 without neutralization, 8.5%	91	4/4
OK-PAA-K-4 neutralized, 8.5 %	87	4/3
Solvitosis C-5, 7.0%	89	4/4
Sodium alginate, 4.0%	93	4/4
Na-CMC, 8.0%	77	4/3

The values of the effective degree of fixation given in Table 1 are different. This is due to the interaction of the active dye with the fiber. The practical significance of the results of the study is determined by the fact that thickening polymer compositions based on polyacrylamide, oxidized starch and the preparation K-4 have been developed, which can be successfully used in fabric printing as a thickener for printing inks [7]. It has been established that the use of these thickeners improves the physical, mechanical and coloristic properties of printed fabrics.

CONCLUSION

Our experiments have shown that the components of the thickening polymer compositions are compatible with the selected active dyes. To determine the effect of the components of thickening compositions on the quality and color stability, the printing quality parameters were evaluated: color saturation, the degree of dye fixation, resistance to wet and mechanical treatments - resistance to washing, sweat and friction according to generally accepted methods.

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