THE TEXTILE INDUSTRY IS ONE OF THE MOST WATER-INTENSIVE SECTORS OF THE NATIONAL ECONOMY

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Annotation: *Relevance of the work. The textile industry is one of the most water-intensive sectors of the national economy. Large amounts of water are consumed in the technological processes of washing, dyeing, printing and finishing fabrics. As a result of these processes, wastewater of complex composition is formed, containing mainly dyes, surfactants, mineral salts and other impurities. Discharging wastewater into water bodies without bringing its composition to accepted sanitary standards is unacceptable.*

Key Words: *water, technological processes of washing, dyeing, wastewater of complex composition is formed, containing mainly dyes,*

Introduction: The cleaning methods that currently exist at textile industry enterprises, such as adsorption, flotation, coagulation, ozonation, etc., require large capital and operating costs and do not always provide the required effect. Most methods make it practically impossible to preserve or capture useful components from wastewater for reuse. Therefore, recently, both in Uzbekistan and abroad, extensive research has been carried out and new physical and chemical methods of water treatment have been developed, among which reverse osmosis and ultrafiltration occupy a special place. They are characterized by compact installations. The ability to extract useful components without destruction (for example, dyes) and relatively low energy consumption. However, the widespread introduction of these processes in textile production is hampered by the fact that when used with wastewater, membranes quickly lose their performance due to clogging of pores and the formation of persistent sediments on the surface. Currently, ways have been outlined to overcome difficulties through the use of special dynamic membranes (DM). They have significant advantages over conventional static membranes, namely: resistance to aggressive media and temperature, high and stable permeability and selectivity, simple regeneration, etc. Currently, there is no data on the formation, determination of work ability and use of DM in wastewater treatment processes There is not enough textile industry. Purpose and objectives of the research. The purpose of this

work was to study and develop a method for the formation of effective DM on industrially produced ultrafilters and the creation on their basis of a membrane technology for treating wastewater after dyeing. To achieve this goal, the following main tasks were set:

1. Compare the effectiveness of DM from known and new polymer additives on industrial cellulose acetate ultrafiltration membranes for separating wastewater from dyeing and finishing production and select the most acceptable one.

2. Study the kinetics of DM formation to clarify the mechanism of their action on the membrane filtration process.

3. Study the influence of the main physicochemical and hydrodynamic parameters of membrane separation on the formation and properties of DM.

4. Check the stability of DM from a polymer membrane-forming component (MOC) under operating conditions on colored wastewater.

5. Research and develop a membrane technology for treating wastewater from dyeing and finishing production using DM from the selected IOC.

6. Conduct pilot tests of the proposed technology and evaluate its technical and economic efficiency. Scientific novelty. For the first time, the possibility of improving the characteristics of the membrane process through the formation of DM from sodium carboxymethylcellulose (Na-CMC) on cellulose acetate ultrafilters was shown when treating colored wastewater from textile production. Rational parameters for the formation, functioning and regeneration of DM are substantiated. Fundamental technological solutions for membrane treatment of colored wastewater from textile production of various compositions using DM from Na-CMC are proposed. Practical significance. Based on the conducted research, a simple method has been developed for producing DM from Na-CMC using standard ultrafilters and, on its basis, a new technology for membrane treatment of wastewater after dyeing, which allows solving the problem of improving separation characteristics and ensuring membrane regenerability. Variants of technological schemes for processing wastewater from textile production have been developed. The results of studies on the decolorization of colored wastewater from textile and knitting industry enterprises using the chemical reduction method are described in the literature. The essence of the method is the reduction of biochemically stable azo and nitro compounds that are part of most dyes to amino compounds, followed by their oxidation. This method is also called destructive. The main reducing agent is atomic hydrogen, released during the interaction of wastewater acidified with sulfuric acid with iron filings.Oxidation and mineralization of unstable amino compounds is carried out in an alkaline environment (pH 8-9) with a suspension of lime. The sediment that falls out during subsequent settling of wastewater contains CaSO4, (OH)2, Fe(OH)3 and, in addition, organic contaminants adsorbed on iron hydroxide flakes that are not subject to destruction by hydrogen - synthetic surfactants, finishing preparations, etc.The choice of the most effective of the used physicochemical methods (destruction by oxidizing and reducing agents, electrochemical treatment, ozonation) is based on the physicochemical properties

of specific wastewater contaminants and depends on their relative quantities.High requirements for the quality of water discharged after treatment and the limited capabilities of the method of chemical recovery from specific contaminants narrow the limits of the use of these treatment methods.Some difficult to oxidize contaminants found in textile wastewater can be oxidized by ozone (eg some dyes). Ozonizers are produced in plate and tubular types. Domestic industry (Kurgan Chemical Engineering Plant) produces ozonizers of the PO-2, PO-3, 110-4, PO-5 types.Extensive research on the use of ozone during wastewater treatment from textile enterprises has been carried out at LISI.Ozonation of wastewater from dyeing and finishing factories at the stage of their local treatment was carried out in two stages: removal of dyes present in the mixture of wastewater by ozonation and oxidation with ozone in model dye systems. The results of these studies at a concentration of dyes (in the first mode) in wastewater at a color intensity of 1:256 - 1:2024 are as follows: decolorization time - 50-240 minutes, ozone dose 72.5 - 1:20, decolorization effect 93-98% the effect of reducing pollution in terms of COD 79-82% Ozonation of a model system of dyes at their concentration of 75-100 mg/l showed that with an ozonation duration of 20-30 minutes, an ozone dose of 29-41 mg/l, the decolorization effect reached 98%.Dyes that are mixed with other wastewater contaminants are very difficult to oxidize. The research results showed that due to the long duration of treatment (up to 4 hours) and significant ozone consumption (up to 444 mg/l), the use of ozonation as a method of treating this type of wastewater from textile production is impractical. Analyzing the literature data on wastewater treatment from textile enterprises, the following conclusions can be drawn. The large consumption of water per unit of output, the complex composition of wastewater, high requirements for the quality of water used, and the struggle to reduce losses of reagents used in the technological process make it extremely difficult to treat wastewater while simultaneously regenerating valuable products from it. Unfortunately, the above methods of wastewater treatment in modern enterprises cannot create a drainless system. Among the currently existing wastewater treatment methods, reverse osmosis and ultrafiltration occupy a special place. These methods are promising for almost all sectors of the national economy, when there is a need to separate, purify and concentrate solutions of organic or mineral substances.

Conclusion: Currently, these methods have become quite widespread abroad and in the textile industry.In this regard, the most important research task for the effective application of this method in the textile industry is to find ways to ensure high separation efficiency.According to, the potential cost of 2x106 dal/day (N 7500 m3/day) of wastewater after dyeing fabrics of textile enterprises is $1600 (dollars), including chemical $500 (dollars), water $500 (dollars) and thermal energy $600 (dollars)), the chemical content is assumed to be 1500 mg/l and their cost is 2 cents/lb; water - 25 cents per 1000 (dollars). For the economical organization of production with a closed water use cycle, high demands are placed on the degree of regeneration of hot water (> 90% recovery) and

chemicals (for some types, for example, indigo dye -> 99% recovery), i.e. e. highly concentrated solutions are formed. An important task, from an economic point of view, is also the possibility of processing wastewater at elevated temperatures characteristic of the dyeing process (about 60 ° C) in order to conserve thermal energy, or conditions in the textile industry.

LIST OF USED LITERATURE:

1.Treatment of textile dyeing wastes by Anemically formed membranes. Quirch Ch., Brandon C.A, Y.S. Water pollution Control Feder; 1972. V.44. № 8 P. 1545-1551

2.Yohnson Y.S Yr. Polyelectrolytes in Aqueous solutions filtration, hyperfiltration, and dynamic membranes in Reverse osmosis membrane research, 1973 p. 379-403

3.Brandon C.A Johnson Y.S. Minturn. Y.Y. Porter. Complete Reuse of Textile Dyeing wastes Processed with Dynamic Membrane Hyperfiltration. Ten tile Chemist and Colorist 1973 г, V5, №7, 134-137

4. Desalinating membrane. Y. Water and waste Treatment, 1976, V. 19, № 11, P 15.

5. Brandon C.A., Sam field M. Application of Ash-Temperature hyperfiltration to unit textile processes for direct recycle – desalination, 1978 г V 24, № 1/2/3, P 97-112

6. Brandon C.A. hyperfiltration for recycle of 82℃ textile wash water desalination, 1980 г V 32, № 1/2/3, P 409.