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TECHNOLOGY FOR PRODUCING STABILIZING ETHER OF DRILLING MIXTURES POLYPATS FOR THE OIL AND GAS INDUSTRY BASED ON FIBROUS WASTE FROM POLYESTER PRODUCTION

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Abstract
At present, the production of organic substances and materials based on them, reagents of composite composition based on the processing of separated waste by mechanochemical and other methods is one of the most important tasks. This, in turn, exerts its influence with radical changes on the equipment of production of existing industrial enterprises, i.e. on the principles of constant technological sequence - step by step loads the tasks of reconstruction and modernization at the enterprise.
According to the illuminated world experiences and subsequent results, one of the important problems is their large-scale implementation in production and the creation of innovative start-up technologies for obtaining composite polymers based on waste from manufacturing enterprises of polyester fibers used for the production of household and hygienic products, as well as textiles from natural fibers, carpets and carpet products.

Keywords: Polyester fibers, polyethylene terephthalate, lavsan, trilene, inhibitor, reagents, drilling mud, well, cellulose, polyanionic cellulose, carboxymethyl cellulose, degree of polymerization.

Introduction

Currently, intensive practical work is being carried out to obtain various composite products by recycling waste from various industrial enterprises. In this regard, promising innovative projects are emerging based on production in various industries at the level of start-up commercial projects. The result leads to the development of various large and small businesses, the production of export-oriented products that can replace competitive imports, and most importantly, the prevention of environmental pollution. The need to recycle waste from 5-10% to 45-50% of industrial enterprises, including industries such as the oil and gas industry, mining of precious ores, metallurgy, textile, pharmaceutical, perfume, food, and construction industries remains one of the main problems.

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In this regard, the raw material base in our country is sufficient and it is recommended to use polyester fibers used for the production of household and hygiene products, as well as waste from enterprises producing textiles from natural fibers, carpets and carpet products, but their use in production is still lagging behind.

waste from carpet and carpet product manufacturing enterprises, were used as objects .

Today, the production of carpets and carpet products in the Samarkand region alone accounts for 27.2 percent of the textile industry [2]. The number of enterprises producing carpets and carpet products in the region is 24, of which 12 are in the city of Samarkand, 6 in the Urgut region, 3 in the Payarik region, 2 in the Samarkand region and 1 in the Okdarya region.

The production capacity of the enterprises is 42,006 thousand square meters, 37,913 thousand square meters of carpets and carpet products have been produced. Today, 3,661 employees work in the industry.

In 2020, the export plan for light industry products amounted to $95 million, of which 40.6 percent or $38.7 million were carpets and carpet products.

In this case, polyester fiber waste makes up from 5% to 15%, i.e. 3,033 thousand square meters – 1000 tons of polyester fiber waste.

POLYESTER FIBRES — synthetic fibres made of polyethylene terephthalate. Polyester fibres are superior to all known natural and synthetic fibres in terms of heat resistance. Polyester fibres are resistant to abrasion, light rays, and interactions with hot and concentrated alkali solutions. Technical polyester fibres are used in the production of conveyor belts and various mechanisms, ropes, filter materials, etc. Used in the production of textile yarn (crimplene, melan, etc.), knitwear, and various fabrics. Trade names: lavsan (CIS countries), terylene (Great Britain), dacron (USA), elana (Poland), tesil (Czech Republic).

At the initial stages of implementing the above-mentioned tasks, polyester fibers from local industrial enterprises used for the production of household and hygiene products, as well as

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waste from enterprises producing textiles from natural fibers, carpets and carpet products, were used as the object.

In our country, the demand for artificial and chemical fibers (polyester, polypropylene) is 100 thousand tons. Among them are 60 thousand tons of polyester, 20 thousand tons of acrylic, as well as 20 thousand tons of lycra, viscose, nitron, spandex. In 2023, it is planned to process 60 thousand tons of polyester, acrylic and other types of artificial fibers [3].

In 2022, 40 thousand tons of artificial fibers worth 145 million dollars were produced, of which 28 thousand tons of polyester (PET), 8 thousand tons of acrylic, 4 thousand tons of lycra, spandex, viscose, netron fibers and 410 million square meters of fabric with mixed synthetic fibers were imported.

By 2030, it is planned to produce 3.6 billion square meters of fabric and 670 thousand tons of knitted fabric, and deliver 85 percent of them for processing. As a result, the industry's production volume is planned to increase to 20 billion dollars (or 2.5 times more than in 2023), and the export potential to 10 billion dollars (or 3 times).

In the modern textile industry, innovative technologies are used to improve the production of high-quality synthetic fibers and yarn, increasing the physical and mechanical properties of synthetic fibers (polyester) and making them safe for the environment. All over the world, the production of high-quality fibers from secondary raw materials is rapidly increasing every year using effective methods for recycling polyethylene terephthalate waste. Therefore, the creation of a technology for obtaining high-quality fiber from secondary polyethylene terephthalate (IPET) is relevant.

Table-1 Determination of polysaccharide content in waste polyester fiber products used for household and hygiene products in copper ammonia solution

No.	Name of samples	Amount of polysaccharides, %	Quality indicators		Quantity of polyester fibers,%	Quality indicators	
			PD	Stuttering		Molecular weight	Intrinsic viscosity
1	Wet towel	12	420	150	88	29874	72.1
2	Diaper (Pampers)	87	510	155	13	20148	61.4
3	Bath towel	69	1400	150	31	34478	0.92
4	Hand towel	48	900	150	52	32127	0.87

Table 1 shows the percentage of polysaccharides in polyester fibers. The table shows the quality indicators of the amount of polysaccharide and polyester fibers when processing

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different samples of objects in an ammonia solution. The purpose of processing in a copper-ammonia solution is to determine the proportion of cellulose in the composition of polyester objects.
According to Table 1, the wet towel contains 12% polysaccharide, 88% polyester fibers. Diapers contain 87% polysaccharide, 13% polyester composite fibers. The contents of bath towels and hand towels were tested in the same way and the results were entered into the table.
The table below presents some quality indicators of natural polymer based on polysaccharide compositions of polyester fibers .

Table-2 SOME QUALITY INDICATORS OF NATURAL POLYMERS BASED ON POLYSACCHARIDE COMPOSITIONS OF POLYESTER FIBERS
(The quality indicators of the specified cellulose pulp are determined in accordance with the standards given in GOST 11208-82 , TU 24095100-02:2014. GOST 595-79.)

Sample Index	Name of samples			
	1 Wet towel	2 Diaper (Pampers)	3 Bath towel	4 Hand towel
productivity , %	12	13	69	48
α-cellulose, %	98, 5	99, 6	98, 7	98, 8
Degree of polymerization	420	510	1400	900
Humidity, %	3 ,8	4, 7	4, 6	4, 2

That is, for each object, different quality indicators are defined, the productivity of a wet towel is 12%, the degree of polymerization is 420, the humidity is 3.8%. The productivity of baby diapers is 13%, the degree of polymerization is 510, the humidity is 4.7%.

Table-3 Vapor permeability cellulose samples at 25 ^{0} C

Samples	Wet towel	Diaper (Pampers)	Bath towel	Hand towel
Specific humidity , %	Permeability degree , %.			
10	0.20	0.25	0.24	0.31
20	0.42	0.49	0.82	1.00
30	0.61	0.64	1.21	1.31
40	0.71	0.81	1.30	1.60
50	0.89	1.01	1.47	3.11
60	1.02	1.38	2.01	6.27
70	2.00	2.25	3.35	8.29
80	2.30	2.92	3.45	9.17

One of the main factors for directing the obtained cellulose to promising chemical processing is its vapor permeability. Table 3 shows the vapor permeability of objects. The results show that according to certain results, the activity of the reactivity of objects gave a positive conclusion.

Table-4 Characteristics of capillary porosity of cellulose samples

Samples	1 Wet towel	2 Diaper (Pampers)	3 Bath towel	4 Hand towel
X_m, g / g	0,0151	0,0145	0.0154	0,0160
Specific surface area , S_{spec} *m2 / g	48,812	47,792	44,092	45, 019
Total pore volume * Wo , cm3 / g	0.087	0.056	0.081	0.091
Capillary radius R_k, A ^{0}	39.1	48.1	78.7	101

Above in Table 4, the characteristics of the capillary porosity of the samples are presented, which is characterized by the fact that it allows for the active implementation of the process of combining functional groups.

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The degree of CMC exchange is mainly controlled by the ratio of cellulose and sodium monochloroacetate, and the concentration of water and alkali in the composition of alkali cellulose is no exception.

Table-5 Dependence of the ratio of reagents on the degree of CMC exchange (cellulose: NaOH: water=1:2:12 in molar ratio)

Cellulose: $ClCH_2COONa$ in molar ratio	1 :0 , 1	1:0 , 25	1 : 0.5	1 : 0.7	1: 1.0	1 :1 , 2	1 : 1.4	1 : 1.7	1: 2.0	1 : 3.0
CMC exchange rate	7.1	12.6	25.2	32	44	55	62	72	87	102

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