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OBTAINING SEVERAL GRADES OF E-466 WITH INCREASED PURITY FOR THE MEDICAL AND PHARMACEUTICAL FIELD

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Abstract

The technical process of purified KMTs includes the following steps: Preparation of products and solutions; Extraction; Squeeze; Drying of purified Na-KMTs; Grinding; Packaging of the finished product; Cleaning the used solution. In this section, research has been conducted on the production of several brands of high-purity E-466 for the pharmaceutical and medical industries from fibrous waste from ginneries and cellulose obtained from pavlonia tree and banana stalks.

Keywords: pentosan, alkali sediment, suffocation, ash content, moisture, cellulose, concentration, parameter, extraction process banana cellulose,, basic substance content, cotton lint, polymerization rate, optimal conditions, destruction.

Strengthening the independence of the Republic of Uzbekistan in the economic sphere provides for the creation of its own production facilities for the production of pulp and paper industry products based on local cellulose-containing plants. Cellulose, as the most widespread natural polymeric material, is one of the most important semi-finished products used in the paper, textile and chemical industries. The main plant raw material for the production of cellulose is softwood, hardwood and cotton lint. Cellulose can also be obtained from such non-woody plant species as flax, cotton stalks (guza-pay), hemp, jute, kenaf, etc. However, over the past 20-30 years, annual plants have also become widespread: rye, barley straw , wheat, rice and cane. Abroad, cellulose is also obtained from bamboo and bagasse. The economic feasibility of processing short-staple cotton lint (delint) and rice straw into bleached and unbleached pulp, suitable for producing paper and cardboard for various purposes, is shown. At present, the share of products of the paper industry of Uzbekistan in this is still only 10-12%, the rest of the paper is imported mainly from Russia.

It should be emphasized that the amount of rice straw in the Republic of Uzbekistan is annually at least 300 thousand tons, and cotton lint 100-120 thousand tons, the processing of which can meet the republic's need for paper and cardboard products. For example, in the near future it is planned to build a plant in the city of Shirin, Syrdarya region for the production of paper from agricultural waste of cotton stalks (guza-pai) and wheat straw with a capacity of 160 tons per day based on Chinese technology. But despite the presence of a significant raw material base, in recent years, researchers and technologists have been intensively searching for new types of cellulose-containing raw materials for the production of cellulose and, based on it, paper and paper products. The large-scale application of a single cellulose and its simple and complex esters in the above-mentioned industries gives promising results. This in turn is the pulp for these industries and the production of organic-based organic substances, simple and complex esters for export-oriented and import-substituting modified composite polymer materials and the creation of large innovative technologies for industrial-scale implementation and the application of positive results in production.

In this regard, the production of organic substances and products based on them in our country on the basis of innovative approaches based on them - the development of a variety of materials technologies - the creation of a new range as well as a number of studies with positive results on expanding the export of their analogues by reducing imports [1-9]. The Action Strategy for the further development of the Republic of Uzbekistan states important tasks aimed at: “Development of production of completely new types of products and technologies, including foreign and ensuring the production of competitive local products in domestic markets”.

In this regard, further development of the chemical industry through the transition to a new stage, which is considered to have an innovative content produced and scientific research in the direction of creating new product manufacturing technology with diversification. Development of production of handicraft building materials wood and wood shavings in the Republic to meet the demand for wood products in the furniture industry sharply reduce imports as well as the Cabinet of Ministers of the Republic of Uzbekistan to meet the needs of the population in alternative energy “ON MEASURES FOR THE RESTORATION OF FAST-GROWING AND INDUSTRIAL PAVLOVNY TREE PLANTATIONS IN THE REPUBLIC” Resolution № 520 of 27 August 2020.

In accordance with this, the Ministry of Agriculture of the Republic of Uzbekistan with the involvement of scientists from the Ministry of Agriculture of the Republic of Uzbekistan will allocate at least 100 hectares of land for each project to establish pavlovnia plantations to ensure the production of wood and wood chips, increase the efficiency of the furniture and pellet industry, based on the biological characteristics of the peacock tree and the soil-climatic conditions of the regions, to provide scientific recommendations for the establishment of peacock plantations [10-21].

According to the resolution, pavlovnia plantations will be established in 2020-2024 on a pilot basis in unused reserve areas with water shortages, groundwater levels below 30 meters, as well as in lands with water shortages or saline soils of the forest fund.

According to the resolution, 2 million 990 thousand saplings of peacock trees will be planted on 4,000 hectares of reserve lands and 747,500 peacock trees on 1,000 hectares of forest lands through the establishment of pavlovnia plantations in the country in the coming years.

The Council of Ministers of the Republic of Karakalpakstan, regional khokimiyats allocate land plots to applicants for the cultivation of pavlovnia on a lease basis.

Not less than 100 hectares of land will be allocated for each project for the construction of Pavlovnia plantations. Also, the pavlovnia tree as part of the annual week of innovative ideas from 2021 and manufacturing entrepreneurs with samples of products derived from it and farmers will be introduced on a large scale [22-38].

In this dissertation research, for many years, research has been conducted on the synthesis of some brands of cellulose that are suitable for chemical processing on the basis of Pavlonia tree stems.

It is known that various chemical processes are used during cellulose synthesis. The sodium method was used in this study. Because the soft and delicate structure of the Pavlonia tree does not require a 2-3 step sequence in the synthesis process.

During the study, cellulose synthesis was carried out in parallel from samples of Pavlonia wood belonging to different years, i.e. delegnefication process was carried out in an autoclave under high pressure, as well as by hydrolysis at 95-1000C. In the process of cellulose synthesis, the balance of the 2nd, 4th, and 18-year-old stems of the Pavlonia tree was used to make a stalk.

TABLE-1 Qualitative characteristics of cellulose obtained from Pavlonia tree stalks grown in different years Influence of NaOH concentration (0.5-2.0% HNO3 30 minutes hydrolysis at 98-1000C)

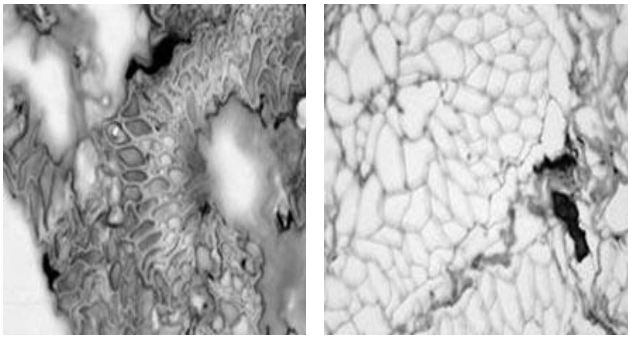
№	Description	Chemical consumption		Yield of cellulose, %	Sol, %	DP- degree polymerization	whiteness, %
		HNO_3, %	NaOH, г/л				
1	Paulownia 2 years	0,5	25	72	6,4	-	-
		1,0	**30**	**64**	**4,3**	**1280**	**66,73**
		1,5	35	62	4,0	1150	67,02
		2,0	40	56	3,8	980	69,24
2	Paulownia 4 years	0,5	25	69	5,3	-	-
		1,0	**30**	**66**	**4,1**	**1270**	**65,21**
		1,5	35	61	4,0	1090	67,02
		2,0	40	55	3,8	950	68,94
3	Paulownia 6 years	0,5	25	67	5,6	-	-
		1,0	**30**	**65**	**3,9**	**1320**	**68,10**
		1,5	35	60	3,7	1010	69,01
		2,0	40	51	3,1	870	69,98
4	Paulownia 18 years	0,5	25	64	4,7	1260	65,94
		1,0	**30**	**56**	**3,7**	**820**	**70,02**
		1,5	35	51	4,8	740	70,82
		2,0	40	48	5,4	640	72,30

It can be seen from Table 1 that the quality of cellulose obtained from the stems of trees of different years of the Pavlonian tree is almost indistinguishable. On the contrary, the soft porosity of the structure of the Pavlonian tree made it easier to delegate due to less chemical reagents and energy savings due to acid hydrolysis. That is, after hydrolysis of HNO_3 solution from 0.1% to 2.0%, the yield of cellulose under the influence of different concentrations of NaOH (from 25g / l to 40g / l) is 66%, the degree of polymerization is 1320, the ash content is 6.4 to 3, A decrease of 1%, the initial whiteness level of 69% without the action of cellulose bleaching reagents released at the end of the synthesis process was mastered as a result of experiments. This can be seen from the quality indicators given in the table the high reactivity of cellulose is due to its simple for chemical processing and it is known to be useful in obtaining complex ethers.

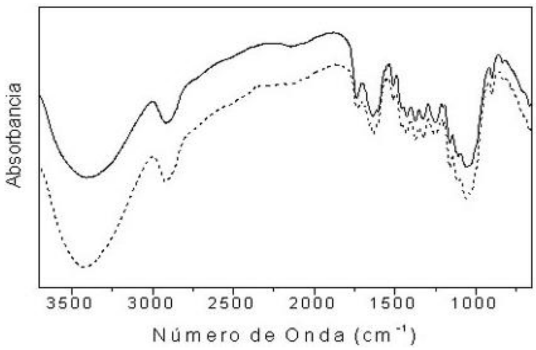
According to EADaily, in December 2017, during a visit to Karakalpakstan, the President of the Republic of Uzbekistan proposed to stop the cultivation of cotton on low-yielding lands and replace them with high-yielding plants. Uzbekistan started growing bananas on May 20, 2018.

In the field of banana growing, which is developing in the country, various mechanical treatments, as well as chemical processing of unnecessary banana stalks formed in the last stages of the growing season and practical studies of the production of organic substances and products based on them, which are necessary for the existing industries, by studying the conditions of cellulose synthesis. Inadequate consumption of fiber not only affects the activity of the digestive system, but also the activity of the whole organism. “Pollution” of the body leads to a decrease in the effectiveness of the immune system, as a result of which the human body becomes prone to various diseases. But adequate consumption of coarse dietary fiber can help treat dysbacteriosis, which is one of the most common causes of gastrointestinal disease.

From the pictures we can see that the composition of banana fibers and their high reactivity indicate their suitability for chemical processing, as well as those of wood cellulose.



Pic. -1: Optical micro-images of banana fiber sections; a) unprocessed. b) recycled (x400)



Pic-2: Infrared spectra of processed and unprocessed banana fibers; a) not processed. (...) b) processed. (-)

The research on bananas was carried out in the Andijan region on the stems of a banana fruit tree grown in hydroponic greenhouses built in cooperation with the Turkish company "Asi Modern Serachilik". At the same time, the sodium method of cellulose synthesis was used, which is considered the most optimal solution for the conditions of Uzbekistan. The effect of various parameters on some quality indicators of the resulting banana cellulose, including boiling time, alkaline (NaOH) concentrations, was studied. The following table shows the effect of alkaline boiling time.

TABLE-2 The effect of alkaline boiling time (98-100oS) on the quality characteristics of banana-based cellulose is shown.

№	Alkaline boiling		Quality indicators of the finished product.					
	NaOH concentration, g/l	Boiling time, min	fertility, %	a-cellulose, %	Gemi-Cellulose, %	DP-degree polymerization	Whiteness, %	Amount of ash, %
1	60	30	-	-	-	-	-	-
2	60	60	-	-	-	-	-	-
3	60	120	-	-	-	-	-	-
4	60	180	57,1	-	-	-	59	7,4
5	60	240	56,8	-	-	-	61	6,2
6	60	300	53,3	76,7	17,5	1350	63	5,1
7	60	360	49,8	81,1	12,1	1270	67	4,6
8	60	420	48,2	91,2	8,7	1210	72	2,8
9	60	480	42,7	92,9	5,9	960	78	2,1
10	60	540	31,2	93,6	1,7	780	80	1,7

The results of the study showed that the increase in alkali boiling time has a positive effect on some quality indicators of fiber synthesized on the basis of banana stalks that is, as a result of increasing the alkaline boiling time, the yield of cellulose is 48.2%, a-cellulose 91.2%, PD 1210. 420 minutes was selected as the optimal mode of alkaline boiling time. Optimal regime: 60g / l, alkaline boiling time 420 minutes, yield 48.2, a-cellulose 91.2%, PD 1210, whiteness 78%, ash content 2.8%.

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