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Obtaining Cellulose With High Reaction Activity On The Basis Of Local Raw Materials

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ABSTRACT

The product is a white or yellow powder in appearance, odorless or tasteless. The substance has high thermal and salt resistance, does not contain toxins. If the reagent is introduced into the aqueous phase of the solution, it acts as a thickener and helps to reduce the filtration rate. The moisture content of the substance is less than 10 percent. The material complies with international standards for this substance.

KEYWORDS

Wood, cotton linters, apricots, waste, sodium caustic, concentration, temperature, duration, carboxymethyl cellulose, cellulose, cellulose ethers, degree of polymerization, degree of substitution, ash content, temperature, humidity, mercerization

INTRODUCTION

Recently, in China, India, the Netherlands, Spain, France, the United States (southern states) and Latin America, where wood resources are scarce and rich in plant biomass, fiber waste from cotton ginning and textile enterprises and pulp extraction technology from annual plants are developing. However, these technologies are somehow copying the technology of obtaining cellulose from wood with all its shortcomings. Research has been conducted on the chemical recycling of fibrous waste. These studies were performed on St-

3/7/11 brand fiber waste. The simple ether of the cellulose was directed to the production of carboxymethylcellulose, which was positively determined by determining some of the qualitative parameters of the cellulose formed during chemical processing after its mechanical purification. However, it must be acknowledged that the Finnish companies Chempolis and IRM have developed an environmentally friendly technology for processing wheat straw and cane and producing paper from it. There is currently only a laboratory version of this technology. The question of whether it is possible to organize the production of many tons of commercial cellulose on its basis has not yet been answered. The economic basis of cellulose production is also changing due to the creation of new technologies. Even despite the existing logistics costs, the construction of such new facilities is beginning to justify itself.

Russian scientists have developed a completely new technology for the production of semi-cellulose (shortened technological cycle) and cellulose (full technological cycle) from annual plants, free from the shortcomings of the previous technology.

The technology is based on a continuously moving multifunctional reactor capable of simultaneously "boiling", delignification of straw and crushing of cellulose fibers. This cellulose, which is separated from the plant, is obtained without a catalyst, at atmospheric pressure and at a temperature of 100 ° C. In the process of squeezing and washing the water is provided by a continuously moving centrifuge, environmentally safe hydrogen peroxide is used for bleaching, and the drying of the fiber mass is carried out by microwave equipment.

In contrast to the technology developed by the above Russian scientists, for the first time in our technology not only annual plants, but also the absence of water during centrifugation (when the cellulose is directed to the process of obtaining KMTs) after extraction of cellulose from fibrous wastes of ginneries and textile enterprises Used 5-7 times, it is distinguished by the presence of chemical processing of the sediment separated at the end of the process, in a word, it is a waste-free technology.

Processing of cotton ginning waste into high-quality cotton cellulose, which is a raw material for chemical, light and textile industries, to increase the productivity of cotton enterprises and improve its impact on the environment, the superiority of existing technologies in cellulose extraction, as well as deciduous and coniferous trees. obtained by the fact that the obtained sulfate and sulfide, bisulfide celluloses do not lag behind the physicochemical and mechanical properties. The technology also provides for the synthesis of cellulose products obtained on the basis of waste from ginneries into assortments in various industries. The technology is based on the project's simplicity and high-precision control of the modes in the required quality parameters, ie changing the concentration, time, temperature to obtain the desired yield, polymerization rate and a-cellulose cellulose, as well as simple cellulose esters with high quality. is distinguished by the ability to give.

Taking into account the above, the process of processing fibrous waste of ginneries of different brands was carried out. The following are the quality indicators of fibrous waste.

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St-3/7/11	Pollution level %	amount of cellulose %	The degree of polymerization	The amount of slavery,%
	27,2	74,8	-	-

As can be seen from the table, fiber waste of St-3/7/11 grade is considered to be highly polluted. The low amount of cellulose in it is characterized by the proportion of various additional impurities in the composition. In order to remove impurities from the fiber and increase the amount of cellulose, it is necessary to carry out enrichment processes. Several stages of process have been carried out in this regard.

First, the fiber was mechanically cleaned from waste, followed by boiling in various solutions of alkali (NaOH). The effects of different parameters in the fiber cooking process were studied in parallel. From such parameters, alkali concentration, boiling time and boiling point were studied. The following are some quality indicators of cellulose formed during chemical processing after mechanical treatment of St-3/7/11 fiber waste.

Some quality indicators of cellulose formed during chemical processing after mechanical treatment of St-3/7/11 fiber waste (under the influence of alkali concentration)

1-table

NaOH, г/л	Time of boiling, min	Temperature of boiling	cellulose yield %	α-cellulose, %	PD	Amount of slavery %	Suffocation, %
10	120	98-100	82	86,3	1470	1,9	90
20	120	98-100	91	93,1	1360	1,1	124
30	120	98-100	94	95,7	1240	0,6	141
40	120	98-100	96	97,2	1190	0,3	152
50	120	98-100	96	97,8	1040	0,2	160

It can be seen from the table that some properties of cellulose formed under the influence of different alkaline concentrations have different performance. When the concentration of alkali alone increased by 20 g ⁄ l, the yield of cellulose increased from 22% to 91%, and of α-cellulose from 86.3% to 93.1%. In contrast, the degree of polymerization fell from 1470 to 1360. The amount of ash was also a positive indicator.

Increasing the concentration of alkali has a positive effect on the yield of cellulose, α-cellulose, the degree of saturation. In the process, 30 g ⁄ l was selected as the optimal mode of alkali concentration.

The time of alkaline boiling of fibrous waste is studied below.

Some quality indicators of cellulose formed during chemical processing after mechanical treatment of St-3/7/11 fiber waste (boiling time effect)

2-table

NaOH г/л	Time of boiling,%	Temperature of boiling	Cellulose yield, %	α-sellulose, %	PD	Slavery amount, %	Suffocation %
30	60	98-100	84	90,1	1360	1,2	98
30	120	98-100	94	95,7	1240	0,8	141
30	180	98-100	96	96,9	1080	0,6	148
30	240	98-100	98	97,8	920	0,3	155
30	260	98-100	98,1	98,0	890	0,2	155

It can be seen from the table that increasing the boiling time during alkaline cooking has a positive effect on the yield of cellulose. At the same time, cellulose yields increase from 84% to 98%. while α-cellulose increases from 90.1% to 97.8%. The degree of polymerization of the resulting cellulose decreases sharply, from 1360 to 920.

One of the main quality indicators of cellulose, as well as an indicator of its high reactivity, is its viscosity. We can see from the table that increasing the boiling time has a positive effect on the solubility of the resulting cellulose, i.e., the solubility of the cellulose increases from 98% to 155%. This indicator indicates the high reactivity of the resulting cellulose.

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