TECHNOLOGY OF PATS GETTING BY MONOAPPARAT

Urozov Mustafoqul Qulturaevich
Senior Research Fellow, Tashkent Research Institute Of Innovative Chemical Technologies.
Urazov.Mustafo.81@Mail.Ru
Chuliev Lutfullo Elievich
Senior Research Fellow, Tashkent Research Institute Of Innovative Chemical Technologies.
Agrokimyohimoya@Bk.Ru
Murodov Muzaffar Murodovich
Director Of The Tashkent Research Institute Of Innovative Chemical Technologies, Doctor Of Technical Sciences, Professor.
Professor.1977@Bk.Ru
Khalilov Shavkat Uralovich
Senior Research Fellow, Tashkent Research Institute Of Innovative Chemical Technologies.

Annotation - Since cellulose is a polycyclic high molecular weight compound that contains many polar hydroxyl groups, its macromolecular chain is not flexible, it is tightly packed because the macromolecule is highly ordered. From this it can be concluded that cellulose is soluble only in some solvents, but not in various solvents. It is a concentrated solution of a copper-ammonium complex and a lattice quaternary ammonium base.

Key words - Carboxymethyl cellulose, cellulose ethers, degree of polymerization, degree of substitution, ash content, temperature, humidity, mercerization

Аннотация - Поскольку целлюлоза представляет собой полициклическое высокомолекулярное соединение, которое содержит много полярных гидроксильных групп, ее макромолекулярная цепь не гибкая, она плотно упакована, поскольку макромолекула высоко упорядочена. Из этого можно сделать вывод, что целлюлоза растворима только в некоторых растворителях, но не в различных растворителях. Это концентрированный раствор медно-аммиачного комплекса и решетчатого четвертичного аммониевого основания

Ключевые слава – карбокиметилцеллюлоза, целлюлоза, эфиры целлюлозы, степень полимеризация, степень замещения, зольность, температура, влажность, мерсеризация

The physical, chemical, mechanical and similar properties of cellulose depend on the degree of its polymerization, the interaction of macromolecules and the relative position of the elemental rings in the macromolecule.
Because cellulose is a polycyclic high-molecular compound that contains many polar hydroxyl groups, its macromolecular chain is not flexible, and the macromolecule is densely packed because it is highly ordered. From this it can be concluded that cellulose is soluble only in some solvents, not in various solvents. It is a concentrated solution of copper-ammonia complex and lattice quaternary ammonium bases.
At present, in addition to the production of various products based on artificial polymers, cellulose, which is a natural polymer, is used to produce simple and complex esters, which are necessary for various sectors of the economy. Cellulose is the most common natural polymer in nature. It forms the main part of all plant cells.
In the early stages of the research, the process of obtaining cellulose from poplar, wheat and rice straw, which are local raw materials, was studied. As a result, the optimal parameters of cellulose production on the basis of plants containing natural polymers in all three components were determined. The quality of the cellulose obtained on their basis was considered to be important due to its suitability for chemical processing. That is, the porosity of cellulose samples, the large

number of amorphous sites - is characterized by the goodness of their reactivity and the fact that they are more convenient in the stages of obtaining simple or complex esters.

Among the esters of cellulose, the most widely used ether, which has become the main raw material for industry, is carboxymethylcellulose (KMTs). Although the production of synthetic polymers is currently at its peak, the industrial production and application of cellulose, which is considered a natural polymer, is several times higher than theirs. It is known that KMTs have been developed in an intermittent manner on an industrial scale over the years. This in turn leads to a number of technological complexities. This, in turn, leads to additional labor, electricity consumption and increased production costs.

Instead of the classical technology described above, the introduction of the intermittent "monoapparat" method of obtaining KMTs is now important. In the mono-apparatus method, the mercerization and alkylation of cellulose are carried out sequentially in a single unit. The reagents required for each process in the unit are pumped from pre-prepared closed containers through pipes. At the end of the ripening process, KMTs with a moisture content of 38-40% are dried in a drying unit. The drying unit is also a unit built on the basis of a number of drying devices based on specific technologies. From this drying unit the finished product is transferred to the grinding mills with a moisture content of 6-8%.

The continuous "Monoapparat" method was first tested in 1999 in a special laboratory of the Tashkent Research Institute of Chemical Technology. Initially, the unit, equipped with special auger mixers and attachments, was mercerized with straw cellulose, the process was transferred from the alkylation and bottom of the unit to the maturation section by conveyors, from where it was continuously dried and shredded to the finished product. Initially, 75 kg of Na-KMTs were obtained from this mini-technology on the basis of straw cellulose. Then Na-KMTs with higher quality indicators than cotton cellulose - later poplar tree cellulose - were obtained.

As a result of in-depth research conducted by the Scientific Research Institute of Chemical Technology in 1999-2000, for the first time in the country developed a continuous technology for the production of Na-KMTs by mono-apparatus from cotton, straw and poplar cellulose, which are local raw materials.

The influence of various factors on the quality of KMTs was studied. Among the quality indicators of KMTs, the quality that has the highest character is its degree of polymerization. When the degree of polymerization of KMTs is high, its viscosity as well as various parameters also give a positive result.

In order to have such a high degree of polymerization, its maintenance at high rates during the extraction process depends on a number of factors. One such factor is its maturation process. It is known that as a result of an exothermic reaction during the maturation process, the mass from 60 ° C to 105 °C in some cases has a higher temperature. As a result, we can observe a decrease in the molecular mass of KMTs, in addition to ethylation.

1-table

The effect of the temperature of the maturation process on the degree of polymerization of KMTs obtained on the basis of cotton, poplar and straw cellulose

KMTs obtained on the basis of cotton cellulose		KMTs obtained on the basis of poplar cellulose		KMTs obtained on the basis of straw cellulose	
The temperature of the maturation process, °C	degree of polymerization (PD)	The temperature of the maturation process, °C	degree of polymerization (PD)	The temperature of the maturation process, °C	degree of polymerization (PD)
60	1600	60	800	60	700
70	1520	70	770	70	620

80	1390	80	640	80	510
90	1210	90	560	90	420
100	1160	100	530	100	370
110	1020	110	490	110	340
120	980	110	470	120	340

The increase in the temperature of the maturation process, i.e. the thermal destruction of the KMTs samples, leads to a decrease in its polymerization rate.

High PD of cellulose is important in obtaining KMTs. However, if the steps in the process of obtaining KMTs have a technologically weak set of joints, i.e. adjusting or tempering the mercerization temperature and allowing for a lack of similar chemical and mechanical factors, KMTs are obtained from celluloses with high molecular weight even lower quality.

2–table

Differences between the stages of obtaining KMTs by the method of intermittent "Monoapparat", as well as the stages of production conditions at the enterprise "Karbonam"

Stage names	Monoapparat	OCT 605-386-80 Stages of production conditions at Karbonam.
Mercerlan process temperature, °C	10–18	18–20
Mercerization process time, min	15-30	60
The rate of extrusion of cellulose from alkali	3	2,6
NaOH content in alkaline cellulose,% %	17	18
Grinding time of alkaline cellulose, hours	0,5	2
The temperature of the reaction mixture in the crushing, °C	20-25	27
Alkylation temperature,°C	30-35	25-33
Alkylation time, min	60	120
Maturation process temperature, °C	70	75-90

Therefore, strict adjustment of the above factors during the process allows to produce KMTs with high quality indicators. The second table shows the stages of conditions for obtaining KMTs by the method of intermittent "Monoapparat", as well as the stages of production conditions at the enterprise "Karbonam". This is the simplification of mercerization, alkylation, ethylation and similar stages of obtaining KMTs by the method of "Monoappart", the novelty of the created technology.

Currently, the technology of obtaining KMTs by the method of intermittent "Monoapparat" is used by several enterprises, private firms and private entrepreneurs in the country. A number of reputable companies, construction companies and joint ventures in the country use the drugs of KMTs, which are produced on the basis of new technologies, as the main raw material for the production of their quality products.

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