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Technologies of Drilling Fluids of Various Degrees of Mineralization, Treated with Carboxymethylated Cellulose Ethers

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Annotation: Article shows the process of hydrolysis of polysaccharides with various by activity acids. By hydrolysis speed of these hydrolyzing agents was determined theirs active row, and shown that the hydrolysis of polysaccharides is advisable to carry out in environment of acetic acid.

Keywords: Plant raw materials, hydrolysis, hemicellulose, pentosans, cellulose, monosaccharides

Introduction

The creation of innovative technologies for increasing the productivity of cotton and textile enterprises through waste recycling and reducing their impact on the environment is one of the current problems of the industry. There is a lot of research on the production of high-quality cellulose and by-products based on chemical and mechanical processing of fibrous waste. Cellulose and a number of brands of polyaniontellulose required for various industries, including light and textile, construction, pharmaceutical, food, perfumery, paper and paper products, oil and gas industries. One of the current problems of the industry is the creation of innovative technologies to increase the productivity of processing, cotton and textile enterprises and improve its impact on the environment.

The sodium salt CMC has the greatest practical value. Similarly CMC, it represents amorphous white substance in density of 1,59 g/sm3 whereas the bulk density of this joint makes 300-800 kg/m3. Possessing softening temperature 170°C, the sodium salt CMC is soluble in water, and also in aqueous solutions of alkalis, ammonia and sodium chloride, and solubility extent is caused by the degree of cellulose esterification.

On the contrary, CMC does not dissolve in organic dissolvents and petroleum oil. Research results of the synthesis of CMC from cotton microcrystalline cellulose are presented in this work. The sodium salt CMC is obtained by interaction of alkaline cellulose with chloroacetic acid with the semicontinuous and monoapparatus methods. The essence of synthesis of CMC consists in the semicontinuous way in preliminary alkaline machining of cellulose and MCC, an aqueous solution of alkali concentration 225-235 g/l the subsequent extraction, the maturation and esterification of alkaline cellulose- chloroacetic acid.

Because of valuable physical and chemical properties the representative of cellulose ethers - Nacarboxymethyl cellulose is made commercially mainly on the basis of wood cellulose all over the world, and its technical brands are widely enough applied in the oil and gas extraction mountain chemical, textile, paper industry, in the manufacture of synthetic washing-up liquids, tooth-pastes and glues for the building industry. Samples Na-CMC of high purity degree are widely used in medical, perfumery-cosmetic and the food-processing industries.

The periodic method of obtaining CMC, in turn, can be divided into three groups, which refer to: traditional-classical, monoapparatus and suspension. However, the specified methods have a number of essential deficiencies, the main thing from which is bulkiness and labour content of the basic production operations, polytypic the equipment for which disposing the big floor spaces are required. These deficiencies are largely eliminated at obtaining CMC by a monoapparatus method. The essence of a monoapparatus way of synthesis of CMC consists in conducting of a stage of alkaline machining of cellulose and MCC with settlement quantity of a solution of alkali promoting to expel a stage of quench of alkaline cellulose. The monoapparatus method is based on conducting of all stages of synthesis in one apparatus by means of loaded settlement quantities of

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components and their subsequent drying. Advantage of a monoapparatus method consists in exclusion of a separate stage mercerization, and also the equipment for the dialyzers used at regeneration of completed alkali. Necessity for bulky soda station for preparation and storage of solutions of alkali is thus expelled.

All these lead to considerable decrease of quantity of attendants, clearing of an effective area and according to decrease in the cost price of products. In the course of obtaining CMC on the abovestated method, under condition of the small maintenance of water in a stock high efficiency of use MAN to 84 % is attained. In the capacity of initial raw materials in a monoapparatus method wood (sulphatic, sulphitic) cellulose is used, and also more low-cost aspects of raw materials: the sawdust, the regenerated cellulose, wood flour, chalk mass and other various cellulosecontaining waste. Solubility, viscosity, degree of polymerization, level of replacement and other operational properties CMC largely depend on its obtaining way and raw materials quality indicators.

Therefore, a great interest represents conducting of comparative researches of samples Na – CMC from the same raw materials – cellulose and obtained by various methods. The purpose of the given work there was a comparison of composition and properties of CMC obtained in equal conditions from various raw materials through semicontinuous and monoapparatus method. In table 1 comparative characteristics of samples of CMC obtained from various raw materials are presented.

The analysis of quality indicators of commercial samples of CMC shows that the semicontinuous way allows to obtain samples concerning low values both on replacement level, and on polymerization degree of CMC meeting the requirements of acting standards. The given fact can be explained that at a stage of a saturation of alkaline cellulose its hydrolytic splitting occurs under the influence of air oxygen that promotes decrease in the degree of polymerization of an end-product. Rather low values of their replacement level can be explained predominance of concurrent reaction of decomposition of chloroacetic sodium upto sodium glycolat under the influence of excess of alkali collecting in cellulose in the course of its extraction. Despite rather low values of RL samples of CMC obtained in the semicontinuous way rather high values as replacement levels, and degrees of polymerization at their worst values solubility in water. The given fact can be explained that use of settlement quantities of alkali solution, on stages of caustic treatment and exclusion of a stage of saturation does not allow uniform swelling of cellulose that in turn non-uniform etherification of alkaline cellulose results. Therefore obtained samples of CMC despite rather high values of replacement level and degree of polymerization dissolve in water worse.

Further we conduct comparative researches of semicontinuous and monoapparatus way of obtaining CMC from microcrystalline cellulose (MCC). Apparently from the table the samples obtained from MCC in the semicontinuous way have rather low values of replacement level (0,38-0,52) and degree of polymerization (140-210), at low values of their solubility (56-89 %) in water in comparison with the samples, obtained in the monoapparatus way (degree of polymerization - 180-240, replacement level - 0,41 – 0,52, solubility - 74-97,5 %)

It is possible to explain low values of replacement level of and degree of polymerization of CMC samples from obtained in the semicontinuous way, hydrolysis of MCC in the course of caustic treatment and saturation and a concurrent reaction high speed – decomposition chloroacetic sodium upto sodium glycolat at the etherification stage. Efficiency of reaction of carboxymethylation in the obtaining Na-CMC by the monoapparatus method largely depends on the cellulose raw materials nature and on its preliminary preparation. The greatest values of operating ratio chloroacetic sodium are attained at carboxymethylation of pulverous cellulose prepared by crushing in rolled viscose cellulose in the laboratory mill (a size of particles < 84 mkm).

It is established that such cellulose possesses a high reactive capacity. It is possible to explain high values of solubility of samples of CMC obtained from MCC in the monoapparatus way concerning its high reactive capacity after comparison with cotton linters. Thus,

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water-soluble CMC and MCC obtained in the monoapparatus way for which limiting values of replacement level and the degree of polymerization providing their solubility in water in conformity of acting standard deeds are installed. The reaction products, obtained by the monoapparatus method, have smaller solubility in comparison with samples of analogous replacement level and the degree of polymerization, obtained by the periodic method. It, probably, is spoken the inequality of distribution of carboxymethyl groups. Besides, by the monoapparatus method because of the restricted volumes of water, swelling of initial raw materials proceeds not in the full and thus gelling fraction is formed.

References

1. M.M. Murodov., G.R. Rakhmonberdiyev, M.K. Urozov, Tojiev P.J. Technology of making cellulose and its ethers by using raw materials. *International Conference* “Renewable Wood and Plant Resources: Chemistry, Technology, Pharmacology, Medicine”. *Saint-Petersburg, Russia*. June 21-24., 2011. –c. 142-143.
2. M.M. Murodov, E.A. Egamberdiev, M.Қ. Urozov, Zh.P. Tozhiev. "Based on the innovation technology, the production of cellulose and its ethers based on local raw materials." / G. Composite materials. -2011. -№1. -FROM. 39-41 c.
3. M.M. Murodov, Zh.P. Tozhiev, G.R. Raimonberdiev. The technology of Na-carboxymethylcellulose production on the basis of local cellulose-containing raw materials by t the simplified method.// Composition materials. -2010.-№3. -FROM. 49-53 c
4. Urozov M.K., Murodov M.M. Development of the technology of obtaining composite polymeric materials on the basis on cellulose-containing raw materials. Сборник тезисов международного семинара Узбекистан – Россия
5. ТТЕСИ «Технология текстиля - 2018» 19 октября.-с. 28