

## **Development of the technology of obtaining composite polymeric materials on the basis on cellulose-containing raw materials**

**M. Murodov, R. Sayfutdinov, A. Sodiqov**  
**(+99897 317-72-77) muzaffarrr@mail.ru**  
**Tashkent chemical-technological institute**

Manufacture of cellulose products in the world has increased by 10 %, and requirement for it by 11 %. At the same time, the requirement on the composition of polymeric materials on the basis of cellulose, paper and paper products has increased by 7 %, and their export by 16,3 %. In particular, export of writing and toilet paper has increased from 11,720 thousand tons<sup>1</sup> to 32,260 thousand tons<sup>1</sup>. Large producers are the USA, Brazil, Japan, Finland and Russia<sup>1</sup>.

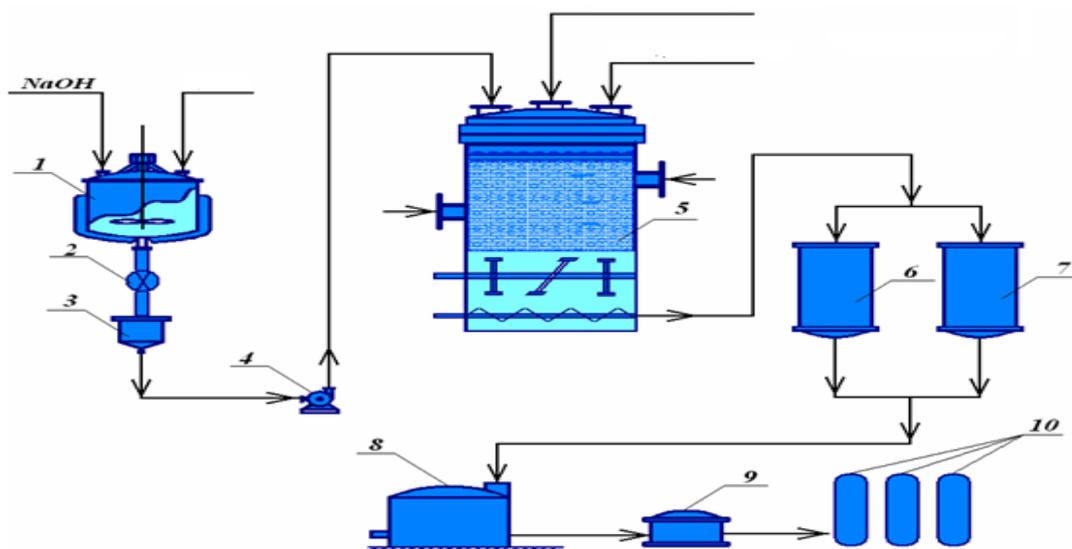
In view of the fact that the requirement of our Republic for cellulose, its ethers and esters, paper and paper products, and also composite materials on their basis is growing up day by day, due to the organisation of scientific researches at high level and wide provisions spent on maintenance of home market with qualitative cellulose and its products, in this sphere the big results have been attained. For expansion of stocks of cellulose and its ethers except cotton lint, there are other aspects annual and perennial plants, fibre waste of the various industrial factories. These cellulose-containing plants such as stem of plant topinambour, poplar, wheat straw, rice straw. The main characteristic of these is high quality ratings of cellulose and composition polymeric materials on their basis with high molecular weight at their synthesis.

For today in the world, synthesis of new derivatives and cellulose products, and creation on their basis of high-quality ethers of cellulose and composite materials is one of the burning problem. Important scientific researches in the field of studying of processes directed on decrease in agency of destructive factors in the course of cellulose reception, studying of parameters influencing these processes, creation of nano compositions, creation of production engineering on obtaining writing papers resistant to moisture and organic solvents, obtaining cellulose which is important raw material for chemical processing, and also obtaining carboxymethyl cellulose (Na-CMC), nitrocellulose (collodion) on its basis have been carried out.

As a result above-presented researches the new technology has been introduced and the non-standard equipment for manufacture CMC has been recommended. According to them the basic production processes, and namely mercerization, alkalization, maturing have been implemented just in the same equipment «MONOAPPARAT».

It is visible in the technological circuit design, obtaining process of CMC is simplified notably, the basic processes occur in the equipment "MONOAPPARAT" (1). As it has been noted above, the reason for the advantages of the method "MONOAPPARAT", complexity of its inner designs, security of efficiency of the stages fitting to each process at obtaining CMC, sharp decrease of destruction, high production capacities. These factors allowed to produce CMC with various brands for various branches of national economy.

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1 – capacitors for the preparation of alkali; 2 – valve; 3 – doser; 4 – pump; 5 – stirrer, “MONOAPPARAT” device, intended to produce CMC on the method of “MONOAPPARAT”; 6,7 – capacitors intended to mature half-finished material; 8 – drying chamber; 9 – chopper (mill); 10 – packaging

**Figure 1. Principle technological circuit of producing CMC on the method of “MONOAPPARAT”**

The basic technological circuit design of producing composite polymeric materials on the basis of local raw materials is depicted below.

**Table 1  
Physical and chemical parameters of samples of CMC produced on the traditional technology and the method "MONOAPPARAT"**

CMC Samples	Indicators of CMC						
	Humidity, %	Degree of displacement in carboxyl groups	Amount of basic product, %	Dynamic viscosity of aqueous solution of 2%, MPa*s	Solubility in water, %	pH	PD
CMC on base of the sort “Fayz-Baraka” of a topinambour plant							
1*	12	82	50	105,4	98,2	12	420
2*	7	85	58	135,4	98,8	11	600
CMC on the base of *FWTF							
1*	11	84	51	118,2	98,4	11	500
2*	9	85	53	215,8	98,8	9	650

1\* - Physical and chemical parameters of CMC produced on the traditional technology.

2\* - Physical and chemical parameters of CMC produced by the method "MONOAPPARAT".

\* - FWTF - fibre waste of the textile factories.

### BIBLIOGRAPHY

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