

## **Study of the Processes of Obtaining Stabilizer K-Pac-Kmts Marks to Dramatically Reduce the Volume of Flashes That Occur in Different Underground Plates during the Drilling Period**

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In the research of this section, a study of the processes of obtaining stabilizing K-PAC-KMTs brands was carried out to drastically reduce the volume of shocks that occur in various subsurface layers during drilling.

It is known that in the process of establishing oil and gas wells and later during the initial process of its excavation, drilling fluids are naturally required to be extremely stable and durable. Such stability and tolerance are characterized by increasing the density of drilling solutions. If the work of increasing the phase density of the drilling fluids is not intensified, there is a high probability that the walls of the well will cause various salts and various surface and underground waters to be mixed in the well zone. Ways to eliminate such negative consequences have been solved by scientists and technologists of the field by introducing various dry and thick bentonites into the drilling solution. Most of these approaches do not work. This means that the inclusion of soft bricks in the composition of drilling solutions does not bring the composition of the solution (1100-1350 kg/m<sup>3</sup>) to the required solution density (1700-1950 kg/m<sup>3</sup>). Even in the preparation of low density fractions of drilling fluids required for the oil and gas production process, adding soft bentonites in the solution phase is not suitable. For such low-density drilling solutions, it is necessary to attract solid mineral fractions to the solution phase, that is, it is necessary to increase the amount of solid phase concentration.

It was developed during the research on the composite composition of drilling reagents, that is, during the synthesis of the reagent, lignin-based composites and reinforcing fibrous compounds were used. They were prepared in 4 main composite compositions. The consumption norms of stabilizing reagents with this composite composition are presented in the table below.

**1-Table Consumption norms of stabilizing reagents with composite content**

<b>№</b>	<b>Raw materials in the composite</b>	<b>Unit of measure, %</b>	<b>11- K-PAC-KMTs</b>	<b>2- K-PAC-KMTs</b>	<b>33- K-PAC-KMTs</b>	<b>44- K-PAC-KMTs</b>
<b>1</b>	*TKTCh	%	5	8	12	15
<b>2</b>	Lignin	%	2	5	7	10
<b>3</b>	PYaTs -85%	%	2	4	6	8
<b>4</b>	Barite	%	3	5	8	10
<b>5</b>	*PTs+TTC	%	10/90	20/80	30/70	40/60

\* TKTCh - fibrous waste cellulose of textile enterprises

PYaTs-85% - hemicellulose of rice stalk 85%

\*PTs+TTC- cellulose of rice straw and textile fibers

Based on the above standards of consumption, a simple ether of cellulose - a stabilizing reagent was obtained. Below are the quality parameters of the stabilizing agent obtained according to the developed recipe for each composite.

**2-table. Comparison of the quality indicators of K-PAC samples obtained compositely from husks and textile cellulose by grade with the requirements specified in Ts 22235949-003:2015 and Ts 22235949-003:2015**

Descriptions of indicators	85/700-C-O	85/700-PO	11-K-PAC-KMTs	2-K-PAC-KMTs	33-K-PAC-KMTs	44-K-PAC-KMTs
1. The external appearance	White powder	White powder	-	-	-	-
2. The mass percentage of water, % is not much	10	10	6	<b>7</b>	<b>6</b>	<b>5</b>
3. In terms of the degree of substitution of the carboxymethyl group, it is not less	0,7	0,6	85	84	89	85
4. The mass fraction of the amount of the main substance in the absolute dry product	97	63	75	78	81	83
5. Its solubility in water, %, is not low	-	97	98,2	98,4	98,0	98,8
6. The dynamic viscosity of a 2% aqueous solution of KMTs at a temperature of 20 <sup>0</sup> C, mPa*s, is not less than	100	100	-	-	-	2
7. Hydrogen number (pH) of KMTs solution in water with a mass fraction of 1.5%	6,7-10,0	8-10	9	<b>10</b>	<b>9</b>	<b>9</b>
8. The water return index of the KMTs soil solution with a mass fraction of 0.75% calculated on the main substance, cm <sup>3</sup> /min, not more	-	4	4,2	<b>4,0</b>	<b>3,5</b>	<b>3,2</b>
9. Degree of polymerization	700	700	670	<b>810</b>	<b>920</b>	<b>1050</b>

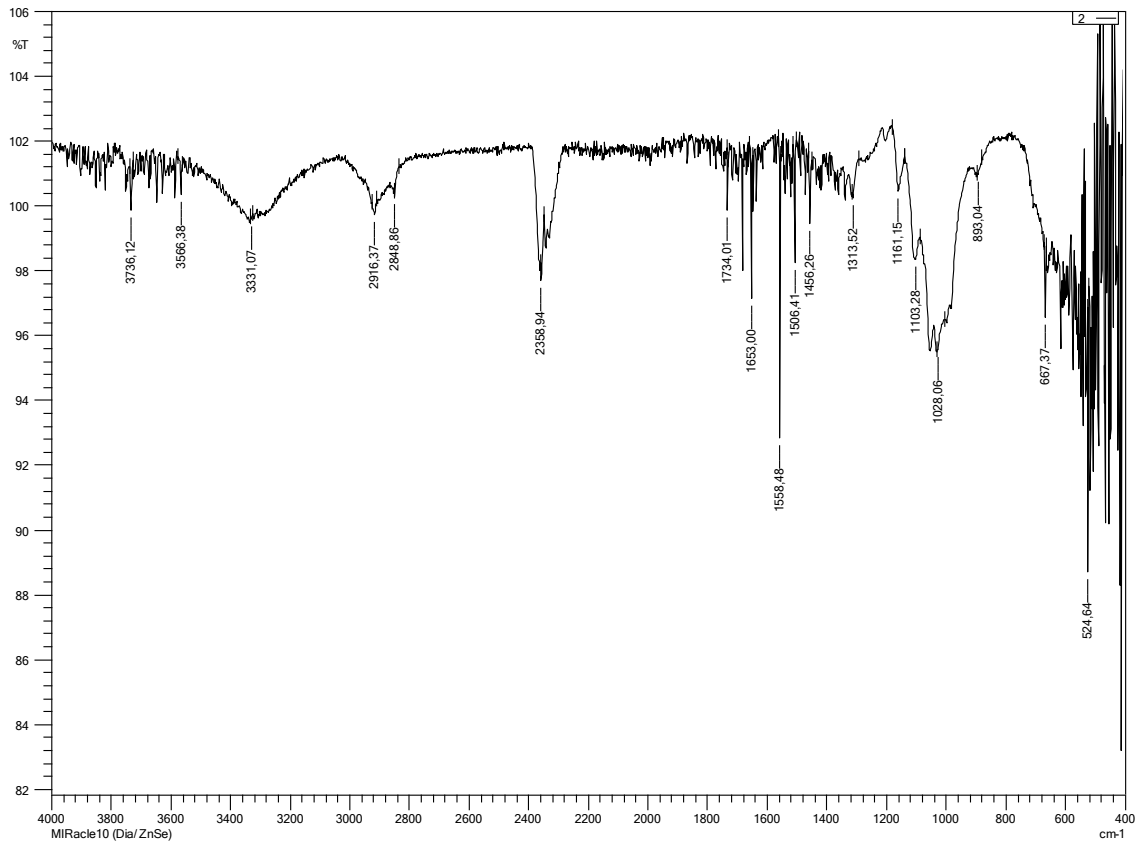
\*1- tukimachilik tolalari asosida olingan cellulose K- KMTs

\*2- K-PAC based on cellulose husk

It can be observed from the table that the lignin structure between the fillers in the composites and the inclusion of fiber reinforcing elements in the composition, the stabilizing agent of the drilling mixes, have a positive effect on the quality indicators.

Mastering various factors of the received K-PAC-KMTs stabilizing reagents, i.e. physico-chemical and mechanical properties.

Below is an IR spectrum diagram of the basis of the stabilizing reagent, i.e. natural fiber-based cellulose from the textile industry.

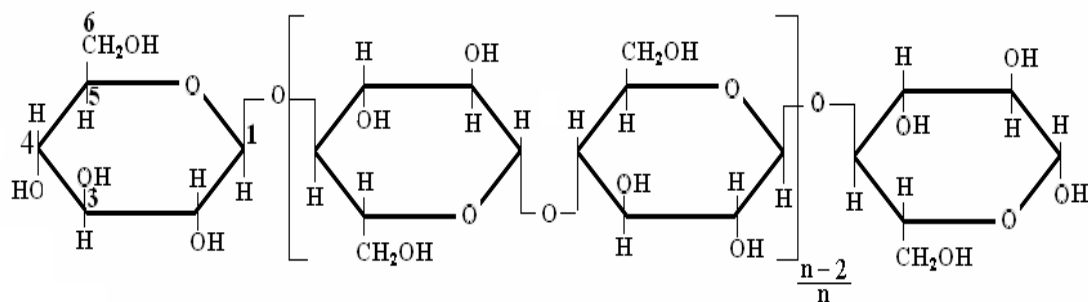


**Pic-1: IR-spectrogram of cellulose obtained on the basis of textile fiber waste**

Here you can see a picture of a de-ligninized cellulose sample. It can be observed that the composition of the amorphous sands and the crystalline parts have been eroded as a result of the reaction.

It can be observed that during the deligninization process, the location of hydroxyl groups is given in the picture, and the processes of degradation and delignification of amorphous layers are intense compared to crystal joints.

The ability of cellulose to enter into a chemical reaction mainly reacts when the hydroxyl groups are characteristic of simple lower molecular alcohols. The structural structure of the cellulose macromolecule is as follows:



Cellulose macromolecules are interconnected by 1,4-glycosidic bonds and consist of  $\beta$ -D-anhydro glucopyranose residues. Each elementary ring of cellulose is composed of three hydroxyl groups. The hydroxyl group on the sixth carbon atom is primary, and the hydroxyl groups on the second and third carbon atoms are secondary. They form aldehyde and carboxyl groups under the influence of alkalis such as lower molecular alcohols - alcohols, under the influence of acids. In the production of cellulose, cellulose derivatives are obtained on the basis of the above-mentioned types of reactions. Cellulose has a high molecular weight, and the

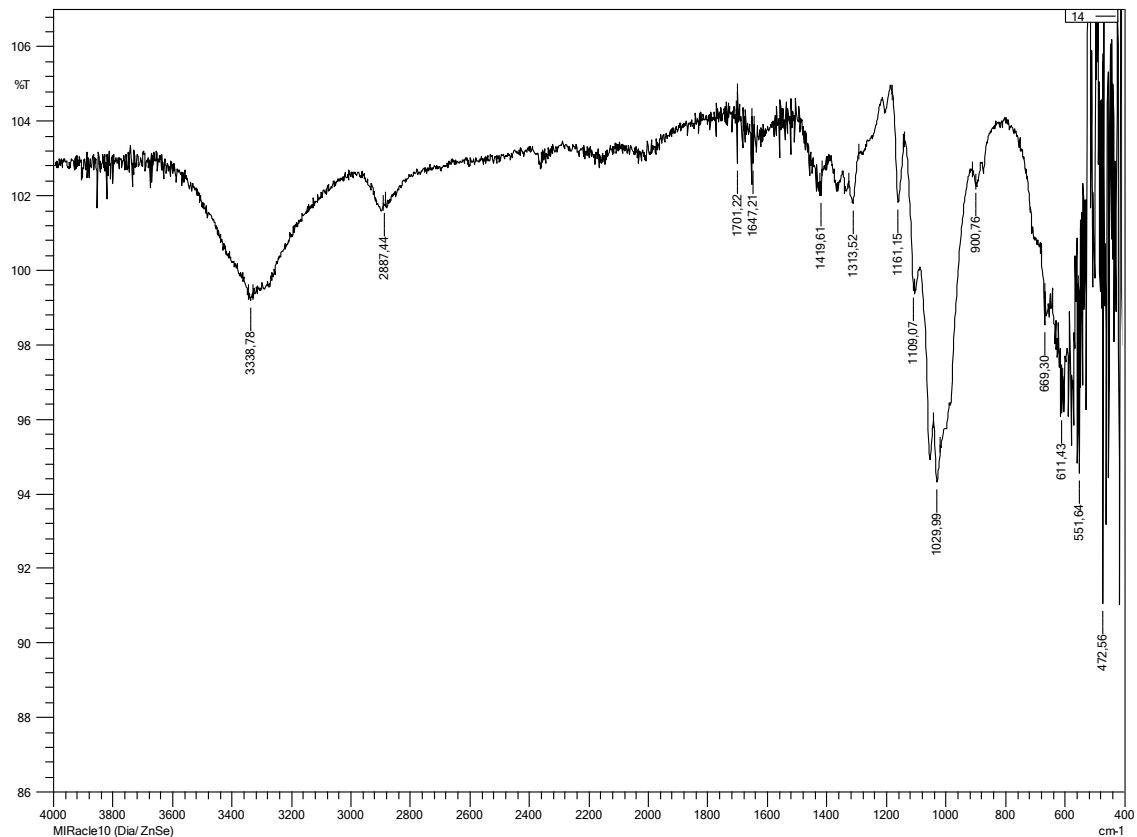
molecular weight can be from tens of thousands to several million. Cellulose is considered to be a polycyclic high molecular compound containing many polarized hydroxyl groups, and its macromolecule chain is not flexible, because the macromolecule is highly ordered, it is densely packed. Therefore, cellulose is soluble in certain solvents. All the properties of cellulose depend on the degree of polymerization and the mutual arrangement of macromolecules.

The degree of polymerization of cellulose is very high, and the cellulose that remains insoluble in a 17.5-18% solution of alkali is  $\alpha$ -cellulose, the degree of polymerization of which is higher than 200. Cellulose soluble in 17.5-18% solution of alkali is called hemicellulose. Its degree of polymerization will be less than 200. Depending on their chemical properties, hemicellulose is divided into  $\beta$  and  $\gamma$  cellulose. Cellulose with a degree of polymerization equal to 50-150 is called  $\beta$ -cellulose, and cellulose with a degree of polymerization less than 50 is called  $\gamma$ -cellulose.

The temperature at which cellulose changes from a glassy state to a highly elastic state under normal conditions is higher than its decomposition temperature. Therefore, when the cellulose is heated up to 200°C, it breaks down before it softens. Cellulose dissolves well in saturated solutions of zinc, bismuth, antimony, titanium, mercury and lead chlorides. However, as a result of the destruction of the cellulose macromolecule, the molecular mass is significantly reduced and the possibility of wider use of cellulose is reduced.

The good orientation of the macromolecules during the formation of cellulose mature fiber also depends on the hydrogen bonds. The high reactivity of cellulose also depends on the amount of hydrogen bonds in it. As a result of the increase in the degree of orientation and the density of arrangement of macromolecules, the influence of hydrogen bonds in it also increases. If the effect of intermolecular hydrogen bonds is reduced, the reactivity of cellulose increases. The effect of hydrogen bonds can be reduced by soaking cellulose in various liquids. As a result of the formation of linear networks of macromolecules, the density of the polymer is brought. Esterification of cellulose with alcohol and carboxylic acids creates porosity of the macromolecule, and secondly, it leads to a decrease in the amount of hydroxyl groups that interact with hydrogen bonds. Therefore, cellulose derivatives are easily soluble in most liquids, and as the temperature rises, they gradually soften, first becoming highly elastic, and then moving to a viscous-flow state. Reduction of hydrogen bonds of macromolecules also depends on the amount of substituted hydroxyl groups and the size of new functional groups formed. Because the cellulose macromolecules are tightly packed, the fibers are strong and are widely used in many branches of the fiber manufacturing industry.

The figure below shows the IR-spectrum of cellulose extracted from rice bran. In this case, it can be observed that delignification processes have absorbed lignin particles from the structure of hydroxide bonds in the case where hydroxide bonds have become moderately intense.



**2-pic: Rice Stalk Cellulose (Unbleached)**

In this case, it was observed that the lignin structure was partially preserved on the surface of certain spectra, and the amount of lignin was present in the fiber in a very small amount.

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