DEVELOPMENT OF A COMPOSITION OF REAGENTS FOR DRILLING FLUIDS

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ABSTRACT

The article presents new information on the topic of drilling fluids in the production of LLC "Karbonam" in Namangan. Technology for preparing drilling fluids using technical salt Na-CMC (sodium carboxymethyl cellulose) and humic acids containing coals (from the coals of the Shargum deposits of the Republic of Uzbekistan and Kizil Kiya of the Republic of Kirgizstan.

Keywords: cellulose ethers, sodium carboxymethyl cellulose, humic alkaline reagent, drilling mud, fluid loss, fillers.

INTRODUCTION

The Namangan enterprise Carbonam LLC is the only producer of refined carboxymethyl cellulose (CMC) in Central Asia that has no competitors in the region, 30% of all production is supplied to the domestic market, the rest is exported. The production capacity of the plant is 13,000 tons of technical CMC, 2,600 tons of purified CMC per year. The manufactured products have a certificate of origin and conformity, consumers are enterprises of the oil refining and cosmetic industries [1].

CMC is an amorphous colorless substance with weak acidic properties. CMC has the following characteristics: easily soluble in water, promotes thickening of all aqueous solutions; does not change viscosity for a long time;

holds water well; has stable stabilizing and binding properties; exhibits a synergistic effect with protein biopolymers (casein, soy protein);

forms a transparent and durable film; does not dissolve in organic solvents, oils and fats;

odorless and tasteless, physiologically harmless. Usually, carboxymethylcellulose is understood as its sodium salt (Na-CMC), which is of the greatest practical importance. This salt is a white solid; salt density - 1.59 g / cm^2, bulk density - 400-800 kg / m^3, softening temperature - 170 ° C. The sodium salt of CMC (hereinafter - CMC) is soluble in water, as well as in aqueous solutions of alkalis, ammonia and sodium chloride, and the degree of solubility is determined by the degree of cellulose esterification.

METHODOLOGY

The product does not dissolve in organic solvents and mineral oil. When dissolved in water, the sodium salt of CMC forms viscous transparent solutions with pseudoplasticity, and for some varieties of the product, thixotropy (i.e., the ability to spontaneously restore the original structure destroyed as a result of mechanical action). In aqueous solutions, the sodium salt of CMC, exhibiting the properties of a surfactant (surfactant), is well combined with other water-soluble cellulose ethers, natural and synthetic polymers, and many salts of alkali, alkaline earth metals and ammonium. In aqueous solutions of inorganic acids and alkalis in the presence of oxygen, the compound decomposes [2]. This standard covers the physical properties and testing methods for drilling fluid materials. The standard considers barite, hematite, bentonite, unmodified bentonite, bentonite of the OSMA standard, attapulgite, sepiolite, low-viscosity CMC of technical purification (CMC-NVT), high-viscosity CMC (CMC-VVT) of technical purification, starch, polyanionic cellulose with low viscosity), high viscosity polyanionic cellulose (PAK-BB) and xanthan gum for drilling. This International Standard is intended for manufacturers of the above products.

Objects and research methods. Drilling fluids resistant to high temperatures were prepared on the basis of technical Na-CMC produced by OOO Karbonam, and humic alkaline solution (HSC) was prepared from cubic cubes formed during the extraction process. The high efficiency of the products obtained during the drilling process has been confirmed. The pH of the solutions was measured using an ionomer. The density of the solutions was measured using a hydrometer. The viscosity of the solutions was determined using a viscometer. The results obtained and their discussion. A new technology for the preparation of a drilling fluid called a himic alcaline reagent (HSC) has been developed at the LLC Karbonam enterprise. This product is made on the basis of a high-density substance containing 1 kg of gum from a coal mine of the Kyrgyz Republic and alkaline effluents used by LLC "Karbonam". The cost of the reagent is 10 times cheaper than the technical Na-CMC. Below are the physicochemical properties of the humic alkaline reagent (table. 1.).

RESULTS

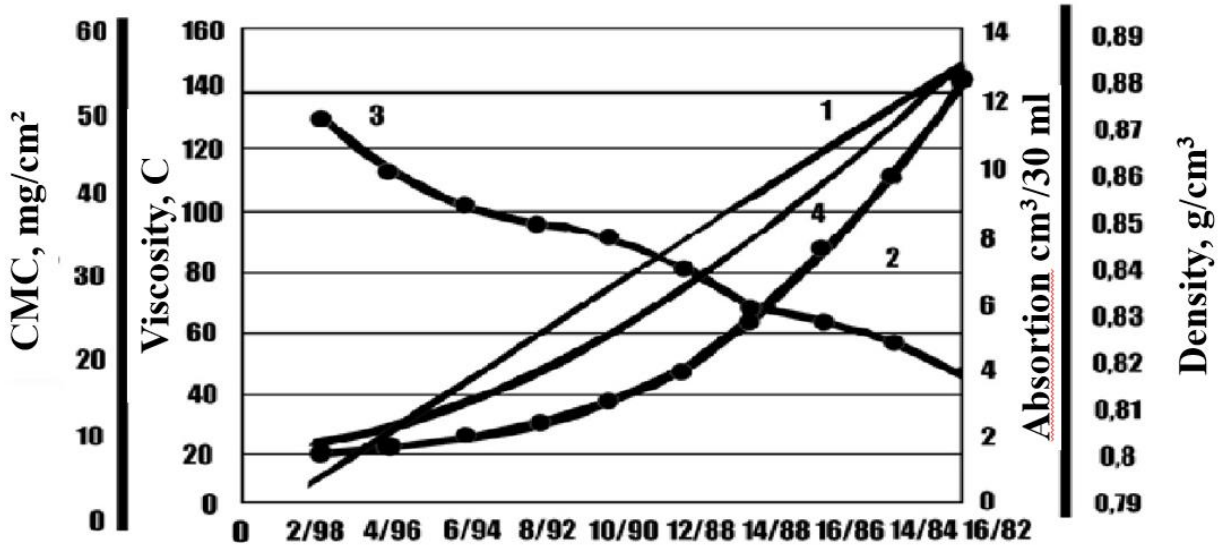
Table 1.

Physicochemical properties of humic alkaline reagent

№	Indicator name	Value	Control method
1	Appearance	Black pasty mass	Visually
2	Mass fraction of water% no more	45,0	To 4.2. real TU
3	Density of an aqueous solution of the reagent, g / cm3	1,00-1,05	By 4.3. real TU

	within 10% 15% 1,00-1,05 1,03-1,07	1,03-1,07	
4	Activity of hydrogen ions pH of an aqueous solution of a reagent with a concentration (10-15% at a temperature of 20 ° C, within 9,0-12,0	9,0-12,0	By 4.4. real TU
5	Filtration of 10-15% aqueous solution of the reagent, cm3 30 min no more 8	8	By 4.5. real TU

On the basis of "Nedopal" and "Na-CMC", a composition of composite chemical reagents has been developed. Figure 1 shows the dependence of the physicochemical and technological properties of a 10% drilling mud obtained at Nedopal and Na-CMC prepared using saline water from the Severny Berdakh mine on the ratio of reagents and quantity.



DISCUSSION

Analysis of the curves shown in Fig. 1, depending on the ratio and amount of Na-CMC, 5-10% drilling fluids have different physicochemical and technological properties. It should be noted that with an increase in the amount of Na-CMC, the physicochemical and technological parameters of the drilling fluid exceed the water separation indicator. This can be understood from the fact that Na-CMC is a high molecular weight polymer. Separation of water in 30 min. decreases from 11.5 to 4.0 cm2, the density of CMC to 56-10 mg / cm3. From Fig. 1 it follows that the most

optimal amount of thickener in the composition of the drilling fluid is the CMC content by weight within 8-14%. At such concentrations, water separation is high, which leads to an increase in the penetration of the drilling fluid layer and an increase in its consumption. With an increase in the amount of Na-CMC in the composition from 6% to 14%, all technological parameters of the drilling fluid are normalized and can be used for drilling oil and gas wells when passing through a formation with abnormally low formation pressure. When the amount of Na-CMC exceeds 14% with subsequent increase, the increase in density and CMC leads to a decrease in viscosity, a decrease in drilling speed and a decrease in productivity when drilling wells with abnormally low pressure, despite the decrease in water separation. These data suggest that one or more formulations developed may vary depending on drilling conditions [3].

CONCLUSION

Based on the results obtained, we proposed the use of raw coal from the Shargun deposits of the Republic of Uzbekistan and Kizil-kiya of the Republic of Kirgizstan, since the amount of humic acids contained in the raw material is higher than in the raw materials from other sections (more than 14%). The humic alkaline reagent proposed by us increases fluid loss, increases heat resistance, and the cost of this product is 1 order of magnitude cheaper than foreign analogues.

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