Journal of Natural Sciences

№3
(2021)

http: //natscience.jspi.uz

Муассис-Жиззах давлат педагогика институти

Журнал 4 марта чикарилади

(ҳар чоракда)

Журналда чоп этилган маълумотлар аниқлиги ва тўғрилиги учун муаллифлар масъул

Журналдан кўчириб босилганда манбаа аниқ кўрсатилиши шарт

Жиззах давлат педагогика институти Табиий фанлар факултети

Табиий фанлар-Journal of Natural Sciences-электрон журнали

/http/www/natscience.jspi.uz

DEVELOPMENT OF EFFECTIVE COMPOSITE CHEMICAL REAGENTS AND DRILLING MUDS BASED

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Abstract. The article presents the results of research on the creation of effective composite chemical reagents based on organic and inorganic ingredients for drilling fluids used in drilling oil and gas wells. Comparative descriptions of drilling fluids with drilling fluids used in other countries, such as Russia, USA, are given.

Keywords: Composition, chemical reagents, organic and inorganic ingredients, drilling fluids.

Rapid intensification of global oil and gas industry is related to the constant increase in demand for hydrocarbon products. Over the past 10 years, the volume of oil and gas in the world increased to 60 %, the volume of prospecting and exploration works increased by 3 times.

Uzbekistan is one of the leading natural gas producer. In the oil and gas promyshlennoysti Uzbekistan over the past 20 years there have been dramatic changes. To date, the oil and gas sector is one of the most important areas of the economy. Intensive development of oil and gas fields (Gazly, Shurton, Kukdumalok, Zevardy, Kandy Dengizkul, Havzak, Garbo Alan, Urga, etc.) Makes it possible to increase production of oil and gas {6-7}.

Intensification and development of oil and gas industry is of prime economic value in today's world. In this connection the enhancement of efficiency of oil and gas production through the development and usage of new composite chemical reagents for oil and gas well drilling that allow increasing the mechanical drilling speed and wear resistance of rock cutting drilling tool, rise in temperature of drilling fluid operation, revelation of producing oil and gas horizons, improving stability of well drilling processes and maintenance of environmental security is the main technical and economic problem facing scientists, material scientists and technologists. This problem may be solved through the development and usage of effective chemical reagents for drilling fluids {1-3}.

In order to implement these measures, the problem of creating and implementing innovative technologies in the field of composite chemical reagents, which ensure enhancing the efficiency of oil and gas production, is topical and relevant.

The quality of drilling fluids significantly depends on the composition, structure and properties of chemical reagents. It should be noted that chemical reagents currently used for well drilling in Uzbekistan are not sufficiently effective and quite expensive.

In view of the above, the development and assimilation of technologies for production of effective, import-substituting and export-oriented, as well as less costly composite chemical reagents using organic and inorganic ingredients based on local raw materials, production waste and drilling fluids, is a pressing problem.

Nowadays, the priority course in the field of accident-free wiring and development of oil and gas wells, as well as increasing the debit of hydrocarbon products is a comprehensive study and improvement of the rheological properties of drilling muds, the study of mechanisms of interaction of chemical ingredients of drilling muds, and the development of chemical compositions with predetermined properties, as well as the development of technologies directed regulation of the basic parameters of drilling fluids based on them.

Next there have been considered the main characteristics of the gossypol tar, modification and conversion into powder form. The studies have been conducted using Gossypol (KPGS) tar of Andizhan oil and fat plant (AMZK), characterized by the following indicators: appearance - homogeneous thick-flowing mass; the color - from dark brown to black; the acid number of KOH -70-100 mg; ash - 1.0%; moisture and volatiles - 4.0%; solubility in acetone - 80%; specific gravity - 0.99 g/cm^3; the saponification value KOH from 80 to 130 mg {3-5}.

To achieve these objectives by regulating the formulations we have received three grades of composite chemical reagents - CPGT-1 CPGT-2, CPGT-3, physical and chemical properties of which are given in table 1.

Table 1

Physical-chemical properties of composite of KPGS

Water sol. obtained using reagents, %			**Solution parameters**			
CPGT -1	CPGT -2	CPGT -3	γ, г/см^3	$T_{500,C}$	B, см^3	pH
5	-	-	0,95	15,2	22	8
10	-	-	0,89	16,3	15	8
15	-	-	0,78	18,1	11	8
-	5	-	0,92	15,8	21	9
-	10	-	0,86	17,2	17	9
-	15	-	0,76	18,6	12	9,5

-	-	5	0,88	17,1	20	9,5
-	-	10	0,80	18,8	12	10
-	-	15	0,64	20,6	9	10

As is clear from table 1, the solutions based on CPGT-3 composition have the best technology parameter, especially with regard to water loss and viscosity, which is very important for drilling muds properties.

As is clear from the curves of figure 1, 10% drilling fluids have different physical and chemical properties depending on the ratio of CPGT and Na-CMC. It has been found that with increase of CPGT the drilling fluid shows reduction of main indicators, except for water loss, and when Na-CMC is increased, there is an inverse relationship.

Figure 1 shows how physical-chemical properties of 10% drilling fluids, obtained using CPGT reagents, green coke and Na-CMC, prepared on saline water of North Berdakh deposits, depend on their ratio and content.

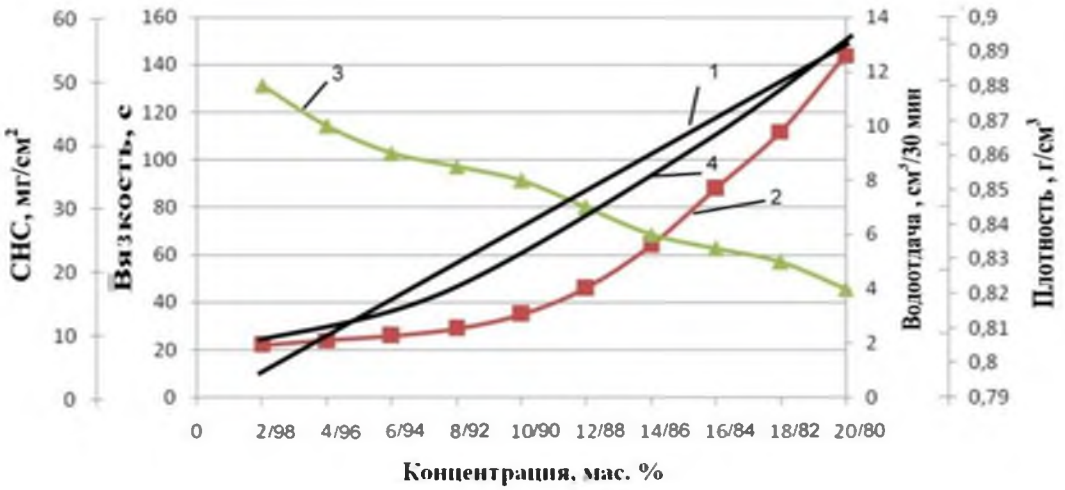

Fig. 1. Relation between density (1), viscosity (2), water loss (3) and static shear stress (4) and the ratio of CPGT and Na-CMC

When changing the ratio of CMC and CPGT from 2/98 to 20/80, the density values of drilling fluid are respectively within 0.8 -0.89 g/cm^3, viscosity - 22-144 s, water loss reduces from 11.5 to 4.0 cm^3/ 30 min, static shear stress varies within 56-10 mg/cm^2.

Conclusion it has been established that addition to drilling fluid of the developed composite chemical reagents, thanks to their good water solubility and high lubricant effect, as well as through good physical and chemical interaction with the components that make up the compositions, contributes to the synergy, reduces filtration and wall building coefficient, which secures a high stabilizing effect on the properties of fluids, improves the quality of enveloping of drilling chips from under

the bit, ensures a good flushing of bottom hole, and also increases the mechanical drilling speed by 10-15%, increases revelation of producing horizon for oil and gas by 30-35%, and also maintains environmental security.

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