

Polymer Gel and Low Gill Drilling Mixes Made From Local Raw Materials Made In Uzbekistan

Ashirov Furkat Usubovich¹, Khasanov Jahongir Sheralievich², Masariddinov Aziz Khamidovich³, Yusupov Azizbek Alisherovich⁴

¹“Institute Of Mineral Resources” DM.head of the laboratory "Drilling solutions and bulk mixtures"

²Master student of TSTU, Assistant to the Deputy Chairman of the State Committee for Geology of the Republic of Uzbekistan

³Master's student of TSTU geologist II category SE Geological and mine surveying service under the State Committee for Geology of the Republic of Uzbekistan

⁴Master's student at TDTU, geologist of Tashkentgeology JSC under the State Committee for Geology of the Republic of Uzbekistan

Annotation: *On the types of polymer-gel, low-alloy drilling solutions based on technological materials and chemical reagents made from local raw materials, and recipes for drilling solutions that reduce the volume of imports. The main task of the State Geological Committee is to drill wells in the geological prospecting areas with modern equipment and technology, to clean the bottom of the well and to obtain quality samples of rocks using a diamond drill bit. When drilling complex geological prospecting wells, a low-clay chemical mixture is used for such a solution. Before use, the drilling fluid must be treated, the treatment is carried out in laboratory conditions in various ways. Solutions that meet the requirements of modern updated equipment and technology are only polymer alloys.*

Keywords: polymer gel, kamgil, PAA, slimy liquids, PBMB-A type bentonite powder, soda ash, NQ and HQ complex and table salt.

I. INTRODUCTION

The main goal of the people of Uzbekistan in 2017-2021 is to expand the search for mineral resources, further strengthen them, increase the productivity of the mineral resource base, increase the efficiency of the economy and social development of the country.

The production uses modern foreign drilling techniques and technologies for rock drilling, including NQ and HQ complexes, a gel solution for these complexes, drispak polymer (DRISPAK-polyanion cellulose), and polyacrylamide (PHPA-Partially Hydrolyzed Polyacrilam).) contains high quality bentonite powder (QUIK-GEL) products for use in addition to these reagents. With such products made abroad, it is economically difficult to fully supply the areas where the GQI is conducted. Because such semi-finished products imported from abroad are expensive and are imported in foreign currency. Therefore, the task is to make such chemical products from local raw materials produced in Uzbekistan [1,2].

Therefore, in the laboratory "Drilling fluids and tamponade mixtures" DM "MRI" developed and implemented recipes for new drilling fluids made from local raw materials in Uzbekistan.

Such drilling fluids include low clay and polymer gel fluids. Drilling fluids include polyacrylamide (PAA) reagent, liquid glass (liquid glass), soda ash, etc.

Mainly bentonite powder containing low clay drilling fluid

OOO is made of PBMB-A type bentonite powder produced at the Bentonite plant.

Low clay drilling fluid is widely used in geological exploration in the field of geological prospecting all over the world, it contains 2-4% bentonite powder.

II. MATERIAL AND METHODS

Bentonite and bentonite clays are present in almost all regions of the Republic of Uzbekistan.

However, most of these clays are unsuitable for use in drilling operations, for which they are thoroughly studied in the laboratory and then drilling muds are prepared.

The Republic of Uzbekistan has Kasantov, Kushanata, Navbahor, Chimgan, Logon, Shorsuv and several other new fields, which are widely used in drilling.

Today, with gel and polymer gel solutions, it is the only high-tech to prevent and eliminate almost all the problems encountered during the drilling process, fluid absorption, instability of well walls.

The method of preparation of a new type of drilling polymer gel solution based on polyacrylamide (PAA) in the laboratory is given in Table 1-2.

Table-1

№	Drilling mud composition, %	Indicator	
1	Water	Viscosity	400 sec
2	PAA	Density	1.02 g / cm ³
3	Salt	Water separation	5 cm ³ / 30min
4	Silicate fluids	pH	10

Table-2

№	Drilling mud composition, %	Indicator	
1	Water	Viscosity	35 sec
2	PAA	Density	1,0 g / cm ³
3	Salt	Water separation	9 cm ³ / 30min
4	Silicate fluids	pH	8

As can be seen from Tables 1-2, if we reduce the percentage of PAA, table salt, and silicate liquids in the resulting solution by adding only water, we see a decrease in the density, viscosity, and pH of the solution. But the water separation changed according to the normal conditions.

Low clay drilling mud. Polymer and polymer bentonite drilling fluids with low solids content (1.5-5%) fully meet the drilling requirements with SSK column. Such solutions effectively clean the well and cool the diamond tool, reduce the hydraulic resistance, do not separate, i.e. the sludge does not mix with the solution, thus not increasing the solids content and viscosity.

III. RESULTS

Camgill drilling fluids are designed for modern diamond drilling, especially when using an SCK column with small annular cavities. Their clay concentration does not exceed 1.5-5% and the missing amount of the solid phase is covered by the addition of 0.2-0.3% of high molecular weight compounds (PAA polyacrylamide).

Cooling and lubrication properties are increased when using low-density drilling fluid, while the mechanical speed of drilling is increased, vibrations are reduced, diamond consumption is reduced, and complications and catastrophic events are prevented.

The recipe for a new type of low-clay drilling fluid based on partially hydrolyzed polyacrylamide (PAA) in the laboratory is given in Tables 3-4.

Table-3

№	Drilling mud composition, %	Indicator	
1	Water	Viscosity	600 sec
2	PAA	Density	1.02 g / cm ³
3	Bentonite powder	Water separation	4-5 cm ³ /30min
4	Calcined soda	pH	10
		Korka	film
		Daily break	0

Table-4

№	Drilling mud composition, %	Indicator	
1	Water	Viscosity	25 sec
2	PAA	Density	1,01 g / cm ³
3	Bentonite powder	Water separation	8cm ³ / 30min
4	Calcined soda	pH	7
		Korka	film
		Daily break	0

Based on Tables 3-4, if a solution is prepared from a low-clay drilling fluid based on partially hydrolyzed polyacrylamide (PAA), the elements in it will reduce the viscosity of the solution without changing the percentage of silicate fluids. As the water separation increases, a mesh film forms on the surface of the filter paper. The above drilling fluid recipes can be adjusted according to rock variation because the less additives (components) in the drilling fluid composition, the easier it is to regulate.

On the basis of the recipes of drilling fluids prepared in the laboratory on the basis of the above tables 1-4, tests were carried out and introduced at the drilling sites of industrial enterprises under the State Geological Committee of the Republic of Uzbekistan.

IV. DISCUSSIONS

The following work was carried out on the basis of research and experiments in the laboratory "Drilling fluids and tampon mixes" of the State Institution "MRI":

- New drilling polymer solutions based on cheap local raw materials and chemical reagents.
- New drilling fluid recipes based on local raw materials and chemical reagents have been developed to ensure fast and long-term operation of modern imported drilling rigs for drilling wells;
- New localized raw materials, such as polymer-gel and low-clay polymer drilling fluids, were created to replace expensive reagents imported from abroad.

As a result of the introduction and rational use of such new types of drilling fluids in the production facilities of the State Geological Committee of the Republic of Uzbekistan:

- When conducting mining geological prospecting operations with SSK drilling equipment used in GQI fields, the application of these new solutions increases the economic efficiency of the equipment;
- When drilling rocks with new modern drilling techniques and SSK complex, the use of polymer gels and low-clay alloys made of cheap local raw materials to increase the drilling volume increases the mechanical transition speed of the diamond crown;
- Complications and cracks were eliminated in the mining GQI areas, clogging of drill pipes was prevented;
- ensures the removal of crushed rock (sludge) without leaving it at the bottom of the well;
- these new drilling fluids have the ability to store crushed rock (sludge) particles in a single volume without settling to the bottom of the well when the drill pipe stops rotating;
- the well forms a very thin mesh (film) in the wall layers and at the junction of drill pipes;
- this newly created drilling fluid prevents the diamond coating (crown) from overheating and cools, lubricates the drilling column during the entire rotary motion and provides an increase in the mechanical speed of the equipment;

V. CONCLUSIONS

Mastering the formulation of these solutions is a scientific and technical change that will increase labor protection, environmental protection and productivity in all areas, as it is an environmentally friendly product, the chemical reagent is used in many areas.

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