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EVALUATION OF THE POSSIBILITIES OF INCREASING OIL YIELD IN HIGH-VISCOSITY OIL FIELDS USING THERMAL METHODS

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A B S T R A C T

The problem of increasing the level of oil extraction from the used fields or, in the expression of oilmen, increasing the final oil yield of the formations, has become one of the most important economic tasks in recent years. The economic development plans of each oil-receiving country envisage the full use of oil reserves, increasing the oil yield of layers, and in this direction, the implementation of new methods on a scientific-research, testing and industrial scale.

K E Y W O R D S

Introduction

In the energy plans of countries with developed oil extraction industry, the problem of increasing the ability of layers to produce oil is considered as one of the ways to increase the reserves of extracted oil and reduce the demand for it.After the world energy crisis of the 1970s, oil became the basis of the world fuel energy complex.

Usually, the problems of increasing the oil yield of the formations in this period, the oil yield achieved in practice in different geological and physical conditions, the influence of various indicators on it, the perspective and main directions of the methods of increasing the oil yield of the formations are discussed.

Raw materials and technical supplies that may be needed in the future, economic conditions, opportunities to increase the level of oil extraction and reserves, environmental and geological environment are of particular importance. The method of flooding mines, in spite of its widespread use in processes of different layers and implementation conditions, has not been fully studied. The condition of the remaining oil after flooding, the influence of various indicators on its size and distribution, are the cause of many discussions, and the effectiveness of this method does not meet the requirements of practice in some cases. Therefore, for the next 15-20 years, experts are looking for new methods based on the use of various factors, gases and heat in mines where this method has not been effective.

The methods of increasing the oil yield of formations is a very complex, expensive and relatively little

studied process, the effectiveness of which depends on many geological, physical and technological indicators. With these methods, the energy used to extract 1 ton of oil is 5-10 times more than the usual water suppression method. When the testing and application of new methods is carried out in uncertain geological and physical conditions, there is a high probability of obtaining ineffective results and economic losses from the methods of increasing the ability of the formations to yield oil. In the work of increasing the ability of the formations to yield oil, based on the level of learning and the information obtained as a result of the practical application of the proposed methods, it is necessary to study the current situation and problems, to clarify the difficulties in their application and to determine the conditions for their effective application.

During the history of the development of the oil industry, increasing the oil bearing capacity of the strata is one of the most pressing and urgent problems.

Structure and properties of layers.In order to effectively manage the process of extracting oil from the layers, it is necessary to have complete information about the structure and properties of the layers, the conditions of their lying, saturation, and seepage. It is too late to imagine the complexity of the structure of oil piles. The physical and seepage properties of oil and gas formations vary irregularly, as the productive layer is divided by impermeable layers, its thickness varies throughout the oil and gas field.

Oil extraction specialists are in a very difficult situation. They do not have the opportunity to directly see and measure the oil layer they are studying and working with. The formation model used as a basis for calculating oil reserves and designing its operation is based on incomplete data obtained from some wells. In many cases, the models adopted at the beginning of the oil field operation may not correspond to all the structural characteristics of the fields. On the basis of the new information obtained during the operation of oil fields, its geological structure is continuously determined and changes are made to the operation system. The operational experience of oil fields shows that their efficiency and the degree of oil extraction from the layers are greatly influenced by the macro-diversity of the layers, the oil saturation of the reservoirs, the composition of the rocks, the wettability of the porous media and other indicators. The above-mentioned indicators vary widely in oil fields, and therefore must be taken into account when solving the problems of determining the oil yield of layers.

Types of collectors. The main indicators of oil and gas reservoirs include their volumetric and seepage properties, lithological order, porosity and permeability. Oil and gas reservoirs are divided into terrigenous and carbonate types.

Terrigen-type collectors are made of mineral particles and rock fragments of different sizes and are cemented with different cements. Usually, these rocks are cemented with sandstones, siltstones and their mixtures of clay and argillite. Mineralogical grain properties are of great importance in the description of terrigenous reservoirs.

According to mineralogy, terrigenous reservoirs are divided into quartz and polymictic rocks. A quartz collector appears in nature in conditions where particles form the main part during the process of sediment accumulation.

Medium-porous and medium-permeability carbonate reservoirs have a porosity of 15-25% and a permeability of 0.01-0.3 μm2 as a result of the secondary alteration of the pore spaces. highly semonic (10-20%). Water saturation of medium-porous carbonate rocks can reach 25-30%.

Small-grained, low-permeability, low-porosity carbonate reservoirs consist of pelettomorphic rocks, porosity 8-15%, permeability 0.0001-0.01 μm2, water saturation 35-50 %. The voids of this type of carbonate reservoirs are related to porosity, and seepage properties are related to fracturing.

References

1. Методы извлечения остаточной нефти / Сургучев М.Л., Горбунов А.Т., Забродин Д.П. и др. –М.: Недра, 1991. –347 с.
2. Maxmudov N.N., Ermatov N.Kh., Agzamov A.Kh., Turdiyev Sh. Pecularities of Water Supply of Gas Wells in Massive Type Oil Rerervoirs // Energy and Environment Research. –Canada: 2019. –№1. –Pp.18-22.
3. Сургучев М.Л. Вторичные и третичные методы увеличения нефтеотдачи пластов. –М.: Недра, 1985. –308 с.
4. Гамидов Г.А., Бабаев М.В. Новый подход к оценке эффективности заводнения месторождений высоковязкой нефти // Нефтепромысловое дело. –М.: 2004. –№1. –С.21-26.
5. Закиров С.Н., Закиров Э.С., Закиров И.С. Новые принципы и технологии разработки месторождений нефти и газа. –М.: Институт проблем нефти и газа РАН, 2004. –520 с.
6 Муслимов Р.Х., Меркулова Л.И., Гинзбург А.А. Оценка эффективности методов воздействия на обводняющиеся нефтяные пласты // Нефтяное хозяйство. –М.: 1984. –№12. –С.25-31.
7. Камбаров Г.С., Алмамедов Д.Г., Махмудова Т.Ю. К определению начального извлекаемого запаса нефтяного месторождения // Азарбайджанское нефтяное хозяйство. –Баку: 1974. –№3. –С.22-23.