



SUBSTANTIATION OF OIL PRODUCTION TECHNOLOGY WITH HIGH VISCOSITY

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Abstract

The development of the oil industry in the last decade is characterized by the discovery of new fields and increased production rates from old ones. Among the researchers and production specialists are the problems of using complex structural oil and gas dumps, viscous and highly viscous carbonate reservoirs and their solutions. The structure, geological physical characteristics, and saturation properties of such deposits with such fluids make extraction difficult.

Keywords: Petroleum industry, carbonate reservoirs, oil reservoirs, reserves, reservoirs, porosity, reservoir, gravitational forces, oil production.

Introduction

QOVUSHQOQLIGI YUQORI BO'LGAN NEFTLARNI QAZIB OLISH TEXNOLOGIYASINI ASOSLASH

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Annotatsiya

So‘nggi o‘n yillikda neft’ sanoatining rivojlanishi yangi konlarning ochilishi va eski konlardan qazib chiqarish sur‘atlarini kuchaytirish ishlari bilan tavsiflanadi. Ilmiy xodimlardan va ishlab chiqarish mutaxassislaridan murakkab tuzilmali neft’ va gaz uyumlarini, qovushqoq va yuqori qovushqoqli karbonat kollektorlarini ishlatish muammosini va uning yechimini topish masalalari turadi. Bunday uyumlarning tuzilishi, geologik fizik spetsifika hamda ularning bunday flyuidlar bilan to‘yinganlik xossalari, qazib chiqarishni qiyinlashtiradi.

Kalit so‘zlar: Neft sanoati, karbonat kollektorlari, neft uyumlari, zaxiralar, kollektorlar, g‘ovaklik, uyum, gravitatsiya kuchlari, neft’ qazib chiqarish.

In most oil-producing countries (Mexico, Canada, the Middle East, and the Middle East), the main oil reservoirs are cut (encapsulated) by carbonate reservoirs. In the Republic of Uzbekistan, Surkhandarya region includes such high-viscosity oil deposits. Worldwide, methods of exploiting such deposits show that the final oil production rate does not exceed 0.25-0.27.

The properties of the slotted type carbonate collectors are as follows:

- the absolute value of the conductivity is not very large;
- The capacity of the cracks is low, not exceeding 2-3%;
- increase in porosity due to the growth of pores;
- lack of bound water in cracks and hidden cavities;
- The absence of bound water in cracks and crevices.

In the porous-fractured reservoirs of carbonate collectors, oil and gas have a system of flow-volume, form pore channels, and the fractured system has a bending significance. In the porous-fractured reservoirs of carbonate collectors, oil and gas have a system of flow-volume (SV), form pore channels, and the fractured system has a bending significance. In fractured-porous carbonate reservoirs, the opposite situation occurs, where the volumetric system of permeability is mainly formed by fractured systems, which include channels of pores.



In the heap of one plot of complex structured carbon collectors, there will be conditions in the horizontal direction, optimal for the leakage of oil' and gas, and in other plots there will be a leak in a steep direction, in the third plot – in an “irregular” direction. Carbonate rocks are characterized by a discontinuous structure. Therefore, the hydrodynamic network of the pile is disrupted because the channels are not connected to each other. A thick mass of carbonate rocks is re-layered without strong compaction, practically no seepage occurs, that is, it does not have vertical permeability. It is difficult to calculate and use the reserves obtained from such structures, and to monitor their technological indicators. The presence of horizontal vertical fractures in low-permeability carbonate reservoirs plays a practical role in the capillary filtration mechanism [4,5]. In this type of carbonate reservoirs, capillary imbibition is the mechanism of "hydrodynamic" flow.

In layers with large fractures and steep fractures, gravitational forces play an important role. In addition to studying the materials of the field, the hydraulic study of wells and formations plays an important role in calculating oil and gas deposits in carbonate reservoirs, selecting the technology of production, and conducting research. Oil and gas in carbonate reservoirs are not inferior to terrigenous reservoirs in all geophysical parameters. The structure of productive formations in carbonate reservoirs limits the possibility of using natural variability, reservoir pressure, and recent oil recovery enhancement methods.

In the above-mentioned types of collectors, in reservoirs saturated with low-viscosity oil, it is possible to use the method of water injection within the reservoir to maintain reservoir pressure and increase ultimate oil recovery. Experience data from the operation of carbonate reservoir oil fields shows that the method of injecting water into the reservoir and into the field is ineffective for such fields.

In carbon collector deposits, high sulfur and sulfur oil ' (30 mPa and greater) content is required, in which the latter oil requires the use of special combination exposure methods (polymer, thermal, etc.) with the aim of increasing beraolish.

Generalized experience in the operation of carbonate reservoir oil fields shows the following:

1. The fact that the productive layer is different relative to each other and clearly does not contain the law of the description of the change of different sexes, that is, the thickness and the spread of the oil' heap, and the lack of information about the methods of change of these parameters complicates the determination of Insufficient



reliability and incontinence of determining the parameters of the productive layer, predicting the data of the magnitude of the balance of the oil' and gas reserve and technological indicators of its use, data collected in the production of debit and oil', the dynamics of the solubility of the extracted product, the indicator of oil release, technical and economic indicators and otherthe heap leakage-volumetric parameters.

2. Insufficient reliability and incontinence of determining the parameters of the productive layer, predicting the data of the magnitude of the balance of the oil' and gas reserve and technological indicators of its use, data collected in the production of debit and oil', the dynamics of the solubility of the extracted product, the indicator of oil release, technical and economic indicators and other.

3. When using porous low-viscosity oil reservoirs, the use of the water-flooding method within the boundary gives positive results.

4. The unexpected appearance of the specific gravity of the carbonate reservoir with a geological and physical structure, SHX (porosity), in horizontal and vertical directions, necessitates the use of a dense grid of production and injection wells. This method has been used in terrigenous reservoirs. Salt-acid treatment is used to open carbonate productive layers of wells during mining and driving.

5. When using all kinds of uniformly specified shx terrigen and carbon collector oil' fields (keeping oil' production indicator, oil' production at project level, in accumulating oil' release, oil' release coefficient lifting) using water suppression method of extraction and thick placement of the type of drive Wells applied, terrigen can have a bad effect on collectors.

This method can be used in complex cases, in deposits with a complex structure, in oil fields that are very difficult to extract, and in complex situations. Collectors with a complex structure include fractured-porous limestones and dolomites of various lithologies, highly clayey sandstones, and low-permeability siltstones.

Geological and physical factors include strong and very high viscosity in layers with poor oil properties, asphaltene-resin and paraffin components, sulfur, and other elements that complicate the composition.

When the temperature of the layer in such deposits is high, that is, close to the temperature of the settling (crystallization) of the vapor, the technology of operating the deposit becomes more complicated. Difficult factors include: the presence of strong geological-lithological networks of collectors, the multi-layered nature of the



productive layer, the presence of a wide water-bearing zone, a gas cap, a low gas content in oil, etc.

In such deposits, the productive layer is complex, like a “layered pie”, with layers alternating, separated from each other by a dense impermeable layer, with a gas cap and water at the bottom of the layer. The reservoir structure of the productive layer rocks mentioned above, the high (10-30 mPa.s) and very high (30 mPa.s) due to the influence of viscosity, sulfur content, steamafin, Tar, asphaltenic components and other properties, the production technology becomes more complex.

Under such conditions, the desired oil recovery factor can be achieved when traditional methods and techniques are used in oil production.

When the type of wells is compacted, a small efficiency is achieved. Based on the results of experimental practice, it has been found that maintaining reservoir pressure, accelerating and intensifying oil production, injecting water into the oil reservoir, injecting gas and air into the oil reservoir, and other methods do not give the expected results. The expelled liquid will quickly break through the best conductive plots from which the oil is extracted and penetrate into the extractive Wells. In this case, less conductive oil does not penetrate the collectors, and the efficiency of operation will be less. The mechanism of oil squeezing and oil recovery, the drainage mode of the reservoir, and the increased and high viscosity of all types of oil are negatively affected by the injected water.

Very high oil viscosity has a greater impact on production, reduces well productivity, and negatively affects the duration of field operation and ultimate oil recovery.

Thus, the higher the viscosity of the oil, the faster the water will penetrate the well.

In accordance with the calculations, when the process of squeezing oil using a working agent is observed (water, polymer solutions, etc.k.) It is known that the efficiency index depends on the ratio of the viscosity of the squeezing agents to the viscosity of the oil.

The higher the ratio of oil viscosity to the viscosity of the squeezing working agent, the lower the oil production rate and the economic indicator of oil recovery.

When experimental data is analyzed, it depends not only on the viscosity ratio, but also on the absolute viscosity values of compressible and incompressible fluids.

The operation of oil fields is also accompanied by great difficulties, such as the presence of hydrogen sulfide in the oil, a large water zone, the presence of clayey materials in the gas cap, the productive layer, anomalously high pressure, etc.



In the context of the use of different-sex carbonaceous, brittle-porous layers, it is necessary to consider the viscosity or high viscosity of the oil to account for the imperfection of the “viscosity”, the strong diversity of the layer and the effect of dempera in the rheological state on the oil production indicator is confirmed on the basis of experimental data.

In reservoirs with complex geological structures, where oil is difficult to extract, it is difficult to apply a single universal method to economically exploit the reservoir.

Complicating features of the use of oil fields include: strong branching of the geological lithology of the Collector, multi-stratification of the zone of the productive layer, the presence of a gas doppelgänger and the size of the aqueous filtration Zone, low gas content, an abundance of asphalt-Tar, paraffin compounds in the composition of oil, the fact that it has a carbons) has viscosity.

New methods are being used to exploit such deposits, such as reducing the size of wells (500x500, 600x600).

At the beginning of operation, when using such carbonate reservoirs with complex structures, reservoirs saturated with viscous and high-viscosity oil, water injection or operation in natural mode leads to a decrease in the oil recovery coefficient and efficiency. Heat treatment is ineffective, and cold polymer processing reduces oil recovery. Heating viscous oil in low-permeability blocks and fractured-porous carbonate reservoirs had little effect.

Bunday konlardan samarali va tejankor foydalanish uchun suv omborining geologik va fizik tuzilishini, neft sifatini o‘rganish, yangi texnologiyalarni joriy etish zarur.

It is required to reduce the viscosity of oil, reduce the proportions of arable working agent and meltwater oil, combat the strong diversity of the productive layer, and solve the question of whether the Working agent will occupy (penetrate) more of the layer. Technological, theoretical and mining research is carried out, new technologies are created, which are tested in mining and applied in industry. A highly efficient new technological method of thermocyclic and thermal polymerization was scientifically substantiated, developed, and implemented for production.

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