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EDUCATION-WATER EMULSIONS IN SITU AND THEIR APPLICATION FOR WATER SHUT-IN PRODUCTION WELLS

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ABSTRACT

The process of formation and transformation of oil-water emulsion in situ and their use for water shut-in production wells. The existence of connection drops to the dispersion medium and its influence on the stability and viscosity of the oil disperse system.

KEYWORDS: Analysis, Education-Water Emulsions, Production Wells, Effective Method

INTRODUCTION

The analysis of dehydration of water-in-oil emulsion from dispersed content is carried out. It is shown that the dispersed system has the connection with drops water-in-oil emulsion and its influence on viscosity and on stability these systems.

One effective method of maintaining reservoir pressure is flooding reservoirs, which can provide a high rate of development and the achievement of maximum oil recovery. However, an inevitable consequence of this method is the flooding of oil reservoirs and wells which can lead to lower workover. Therefore, the problem of limiting the inflow of water into oil wells is of great importance.

Extraction of oil from oil reservoirs accompanied by mixing oil with water and form a water-oil emulsions. Mixing oil with water and formation water emulsion (VNE) often occurs already in situ in the process of oil displacement by water. In the near-wellbore zone (CCD), the motion of the emulsion takes place in a pressure reduction.

Changes in temperature and pressure conditions is accompanied by partial separation of gas components of oil, the formation of micro-dispersions of high molecular compounds. The latter can be adsorbed on the surface of the water droplets in the emulsion to be deposited on the walls of the reservoirs in the well bottom zone, on the walls of pipes transporting oil. On the surface of the water droplets and adsorbed natural emulsion stabilizers present in the oil. As a result of the hydrodynamic of sorption processes, and a change in the particulate composition in the direction of reducing the size of water droplets and increase the stability of the emulsion / 1, 2, 3 /.

The presence of certain forces of interaction of water droplets with a dispersion medium is the cause of increasing the sustainability of VNE, there is also an increase in its viscosity. This interaction manifests itself in the presence of a solvate adsorption layer (ACC) on the surface of water drops, depending on the thickness and composition of the layer, the water droplet size (area contacting surfaces). Quantitatively, it can be expressed in terms of the interaction force per unit of surface of the drop. Interaction with drops of the dispersion medium (DS) in the form of attractive forces can be explained by the presence of thixotropic properties of oil disperse systems and the nature of the non-Newtonian flow of liquids. These fluids are characterized by limiting shear stress, the overcoming of which is necessary to ensure its flow.Adsorption of the surfactant on the oil drop component leads to the fact that the latter is connected to a shell of a substance with the homogeneous dispersion medium. Any movement of the droplets with respect to the DS will be possible only after overcoming the forces of interaction with it. The value of this force per unit area is the ultimate shear stress to drop.

The process of watering holes improves the condition of the field development. Limitation of water presents problems not only technological, but also directly related to oil recovery. Therefore, carrying out insulation work is necessary to align the profile of water and oil discharge stormwater exception of highly permeable zones of the formation. There are various methods of water shut-in production wells: polymer and silicate-gel technology, foam technology, methods of electro stimulation and acoustic effects using the water-oil emulsions such as reverse / 1, 2, 3 /.

The method is based on the phenomena electroinfluence changes permeability of the filtrate (water and oil), and change the filtration properties of the medium by passing electric current through it in a special mode. By passing an electric current through the producing formation occur following physical phenomena: --nagrev and cooling fluid in the confined spaces rock pore channels, resulting in cyclic and extreme pressure and facilitate the separation of resin-asphaltene deposits from the walls of the pore channels in the oil and aqueous phase; --termoplasticheskie stresses arising as a result of a variety of thermal and electrical parameters of rock and fluid will also contribute to the separation of resin-asphaltene deposits; --protsessy medium heat by passing a current through the rock will be followed by the release of gas from the oil and steam generation of water which is the result of pressure increase and the formation of shock waves. These phenomena take place more intensively in the capillaries filled with water. The "more oil capillaries" these processes are to a lesser degree.

Formation of the resin-asphaltene deposits on the walls of the pore channels occurs when filtering oil thereon. It is accompanied by a reduction in their permeability, which is more pronounced in the less permeable reservoirs. With more permeable formations and the oil is separated quickly to these channels begin intensive water inflow to the production wells. When heating or other effects resin-asphaltene deposits are separated from the walls of the reservoirs, are dispersed to form a water-oil emulsion with high aggregate and sedimentation stability.

The resulting emulsions have a viscosity much greater than oil, and water. Their filterability through the pore channels is very small, so the flow is directed in such a VNE more highly permeable pores and clogs. This leads to a redistribution and equalization Profile discharge of oil, growth of oil recovery. It was treated by the method of electrical action in the 34 wells Uzen. Results were as follows: success to reduce water cut of 85%, to increase oil production by 94%, water content decreased by an average of 9%, oil production grew well by 3.2 tons / day.

Education VNE at reservoir conditions can also occur at other physical effects on the producing formation bottomhole zone wells. This acoustic effect in which the sound waves of high intensity cleans the walls of the reservoir in the well bottom zone of asphalt-resin-paraffin deposits, disperses water to form a VNE / 1, 3 /. The method is based on the acoustic effects of the phenomena of change permeability leachate (water and oil), and change the filtration properties of the medium.

The oil reservoir is presented as solid and liquid phases, in it there is a complex interaction of a combination of longitudinal and transverse fields. Under the influence of a longitudinal wave porozapolnyayuschaya liquid tends to move towards the pressure drop in the flowing adjacent pores, while at the same time as the shear stress rigid skeleton attached fluid reservoir torque. Thus, movement of the fluid occurs in the form of a vortex flow, which makes intense reciprocating motion. These processes determine the nature of the motion of the fluid in the pores of the reservoir.Acoustic waves are reflected from the walls of the collectors, that leads to a superposition of the incident and reflected waves form standing waves. The amplitude of the pressure fluctuations within the wavelength at these sites is increased about twice. Such zones are formed at the walls of reservoir/3/. When the acoustic impact on the producing formation occur following physical phenomena: --vihrevoe reciprocating filtrate into bottlenecks rock pore channels, resulting in a cyclic and extreme pressure and will contribute to the mixing of water and oil to form a water-oil emulsion (VNE).

CONCLUSIONS

Will lead to the separation of resin-asphaltene deposits from the walls of the pore channels and their transfer into the oil and water phase, which increase the stability of the resulting VNE; It was treated by the method of acoustic impact on the 3 wells Uzen. Results were as follows: success to reduce water content of 100%, to increase oil production by 100% water cut decreased on average by 11%, oil production grew well by 2.2 tons / day.

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