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KNIT CONNECTION EFFECT OF VARIABLE PRESSURE I ON FILTRATION PROPERTIES OF POROUS MEDIA

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ABSTRACT

In this article, the effect of vibration on the filtration of the surrounding layers of the well bottom with the influence of vibration waves and the influence of vibration frequency, which is one of the influencing mechanisms, is partially covered.

INTRODUCTION

The propagation of sound frequency hydraulic shock waves in a porous medium and the mechanism of their influence on oil reservoirs have not been sufficiently explored and are of great theoretical and practical interest. It is of primary importance to find a solution to the problems of the effect of pressure fluctuations on the process of filtering liquids in a porous permeable medium.

There are no research data on the effect of waves on liquid filtration through a porous medium such as an oil reservoir. However, there is some information about the processes that occur in conditions close to this state, for example, in the experiments by Brouera on fabric dyeing, it was shown that its dyeing is accelerated at frequencies of 22 and 175 kG. Also, at 100 Hz, coloring was accelerated, but the efficiency was much lower. In other such conditions, vibration has been shown to increase the speed of the dye solution through the fabric. The uniformity of coloring also increases.

MAIN PART

The process of fluid filtration under the influence of variable pressure caused by a vibrator is of great interest for the vibration method of impacting the well bottom zone. In this case, it is important to determine which zone is actually covered by the vibration treatment and its size, depending on the vibration frequency and other parameters . we estimate the size.

From the general points:

$$x = e\ (f\ k\ )\ (1)$$

By applying the P-theorem, we get

$$x \approx \sqrt{\frac{\varkappa}{f}}(2)$$

The formula (1) shows that the effective impact zone of the bottom zone of the wells is proportional to the square root of the frequency f. As for k , then k =k/m m c ; where k is the permeability of the layer, m is the viscosity of the liquid, c= $\frac{1}{\rho}\frac{dP}{d\rho}$= const - fluid compressibility, m - porosity

Let's calculate for a liquid state with the following properties: k=10 D, m=20%, m= 40sP , f=500 Hz, at

$$c = \frac{1}{\rho}\frac{dP}{d\rho} (1)$$

$$c = \frac{1}{2*10^4 kgs/sm^2} = \frac{1}{2*10^7 g/sm^2};$$

k =k/m m c (2)

k =0.001*10*2*10 ^{4} / 40*20*0.01=0.25*10=2.5

$$x_{max} \approx \sqrt{\frac{2{,}25*10}{2*3{,}14*500}} = 0.38 \text{ m}$$

f=60 Hz, x_{max} is equal to 1.13 m.

The obtained result shows the dependence of the processing depth on the frequency f within 0.4-1.14 m. As you can see, the zone It was found that exposure to high-frequency vibrations has a smaller area of influence than exposure to low -frequency vibrations . In order to fully visualize the coverage with vibrations, an assessment is made based on the physical properties of the layer (permeability, porosity , etc.). However, this requires a more complex mathematical formula .

CONCLUSION

Nowadays, several new types of such devices are appearing. Therefore, there are important issues such as determining the area of influence of vibration on the bottom of the well and its penetration depth. Any scientific innovation is created on the basis of several interrelated technical, technological and mining geological data. Therefore, having complete and accurate information about the geophysical structure of each well bottom region indicates that 50% of the work is done correctly.

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