

Drilling a well involves the formation of a mud filter throughout productive intervals in order to prevent drilling fluid from entering the formation and its subsequent clogging. At the same time, it is practically impossible to induce inflow without removing the filter cake. It allows to remove the mud cake and proceed with the operation to call inflow.

For the designated purpose, acid is used as the injection agent. It in oil and gas wells is carried out in the presence of inorganic sediments, such as: calcium carbonate, iron carbonate, sulfate salts and iron oxides. In such cases is carried out to remove inorganic sediments from the well. The most commonly used injection agent in the removal of inorganic sediments is acid, which, among other things, reduces the skin factor. There is another condition under which it is necessary to conduct it. At low reservoir permeability, there is extensive experience with the use of it to create wormholes in the rock by dissolving it, which increases the productivity or injectivity of the well (depending on whether it is producing or injecting). Acid treatment is a non-stationary non-isothermal three-dimensional process of injection of an agent into a pore medium, which is accompanied by chemical reactions. At the moment when the injection agent enters the reservoir, the rock begins to dissolve in acid, which results in irreversible changes in its reservoir properties (porosity and permeability).

Acid consumption also implies mass transfer processes and changes in concentrations. In addition to the above, there is a change in the temperature of the entire system in accordance with the laws of an exothermic reaction that occurs with the participation of acid and rock. During the process there is a continuous change in the concentration of acid. The rate of depletion of acid is equal to the constant change in the concentration of acid in the superficial conditions, erected to the degree of coefficient, taking into account the change in thermobaric conditions. The function of the concentration of acid depends on the two variables: the reaction time and the distance from the bottom of the well. There are two types of chemical reactions: homogeneous and heterogeneous. If the acid reacts with the breed, then this is a heterogeneous reaction in which the acid is a liquid phase, and the breed is a solid phase. Hydrogen ion should first differ in the breed, react with it, and then the reaction product diffuses back into volume (dissolves). Thus, there are two stages of diffusion and one step of reaction, which cannot belong to a homogeneous reaction, which implies that both phases are liquid. It is obvious that in the process is accompanied by a heterogeneous reaction between the acid (liquid phase) and the breed (solid phase). Technologies for carbonate and terrigenous collectors are fundamentally different. Carbonate breeds (limestone and dolomite) actively react with hydrochloric acid, and reaction products are well soluble in water.