

Mineral indicators of percolation effects in production of oil-saturated reservoir

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Abstract

In the simultaneous filtration of the water and oil in a reservoir each of the phases is moved on the microlevel by their local channels. Herewith, percolation effects can begin when blocking of traffic through various channels lowers the overall permeability of the system. It often observed at the implementation of water flooding technologies in oilsaturated reservoir. The appearance of pores due to the effect hydrochemical heterogeneity of percolation in space leads to the increasing clays minerals structures diversity. The additions of newly formed phase were detected by differential diffraction spectra, including mica particles with a high surface charge which create reverse electroosmotic flow during their fixation in the pore space. Due to its joint action with the percolation effects and the appearance of degradation products, which can swell, filtration rate in oil-saturated reservoir decreases. Phases, which are markers of flooding, are formed much earlier, than well logging data can detect them. They allow you to identify the part of the reservoir which can be involved in the exploit of a well by controlling the flow direction. But due to the formation of electroosmotic screens in the reservoir may appear areas where any effect of external water does not exist; there aren't newly formed phases. If at the boundaries of this zone water flow is separated, then at one of them is blocked, water breakthrough increases to a production well by the other direction.

Keywords

Electroosmosis, Interstratified illite-smectite, Oil-water bearing rocks, Percolation, X-ray analysis