

The conjugated qualitative and quantitative approximation of water, salt, sulfur, asphaltene and mechanical ingredients of oil-containing systems interrelation

Kostromin R., Ivanov B., Petrovnina M., Safiullin M.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

A wide variety of production technologies and the variability of the properties of oil-containing systems cause need for their preliminary preparation. In preparing the oils in the near future it is appropriate to give preference to a combination of new technologies with chemicals, which do not require major changes to the equipment and infrastructure of the oil production fields. A systematic approach involves simultaneous consideration of the studied object as a whole, and its constituent parts individually using the principle of differentiation and integration of the phenomena. For oil-containing systems those are the functions of interphase and intraphase of physical, physicochemical and chemical interactions: the structural and group composition, natural and forced association and dissociation of these factors, as well as the resulting viscosity, interphase tension, heat capacity, density and temperatures of phase polymorphic transformation. Initial oil is significantly different from the oil extracted in the development and exploitation of the deposit. The differences are due to injection into the oil-bearing layers a substantial quantity of water having various physicochemical and microbiological properties. As a result, the oxidative processes in the residual oil are characterized by increasing the share of polycyclic fragments and oxidative groups. From this follow differences in the quality and structure of reserved and solvation shells. To optimize the process of preparing it is appropriate to apply physical and mathematical modeling. It is suggested to use the characteristic wave equation as the basic modeling equation.

Keywords

Desalting and dehydration, Oil-containing systems, The characteristic wave equation, The dual physical and mathematical modeling