METHOD FOR DETERMINING INTERFACE POSITION

Background
During oil recovery various impurities come to the surface together with crude oil. Among them are water, rock particles, and salts and gases dissolved in oil. At various stages of oil production many producers face the problem of determining «water – oil» interface position in tanks, and in the process piping.

The presence of water in storage tanks and process piping causes the formation of highly viscous stable oil – water emulsions and impedes determination of the tank’s useful capacity volume and control of production operations.

This paper presents the results of experiments aimed at determination of the interface position necessary to determine the useful capacity volume of the tank and to control of industrial operations. The laboratory method developed for this purpose is described in detail.

Aims and Objectives
Development of an improved and reliable method for determination of the interface position.

Methods
Experimental studies using modern methods of mathematical and physical modeling and statistical methods of data processing.

Results
As a result of experimental studies a method based on high-frequency conductance measuring was developed to determine the interface position. Media with different densities, such as water, oil, kerosene, transformer oil, and air were chosen for investigation. Obtained results show that the method is effective, if the dielectric constant values of the media differ greatly, as was observed with «air – water», «oil – water» and «oil – air» media. The method appeared less effective for «kerosene – air» and «transformer oil – air» media.

Key words: laboratory method, interface position, viscous-flow oil, conductance-measuring method

References
The authors

- Shaykhutdinova Margarita Sh.
  Institute of Energy Resources Transportation GUP
  Post-graduate Student
  144/3, October ave., Ufa, 450055, Russian Federation
  tel: (347) 284-38-16
  e-mail: margo_mt@bk.ru

- Yamaletdinova Klara Sh., Doctor of Technical Sciences, Professor
  Institute of Energy Resources Transportation GUP
  Chief Researcher of Hydrodynamic Modeling of Engineering Processes in Oil Production Department
  144/3, October ave., Ufa, 450055, Russian Federation
  tel: (347) 284-38-16
  e-mail: clara-yk@yandex.ru

- Sushko Boris K., Doctor of Technical Sciences, Associate Professor
  Baskir State University
  Professor of Infocommunication Technologies and Nanoelectronics Chair
  32, Zaki Validi str., Ufa, 450076, Russian Federation
  tel: (347) 229-96-74
  e-mail: sushko_b@mail.ru

- Gots Sergey S., Doctor of Physical and Mathematical Sciences, Professor
  Baskir State University
  Professor of Physical Electronics and Nanophysics Chair
  32, Zaki Validi str., Ufa, 450076, Russian Federation
  tel: (347) 229-96-47
  e-mail: g_ss@rambler.ru