STC´18

STUDENT TECHNICAL CONFERENCE

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	Main Author	Title
Drilling	Oberemok, Alexandra	Development of the cloud application for selecting the technology for wells drilling
	Sherbakova, Kseniya	Energy saving profile of the inclined wells
	Sager, Jasna	Drilling through Salt Formations - A Drilling Fluids Review
Reservoir	Hartono, Reinaldo Anityo	OIIP & GIIP Validation using Material Balance
	Stamm, Fabian Antonio	Bayesian Decision Theory in Structural Geological Modeling - How Reducing Uncertainties Affects Reservoir Value Estimations
Production	Chebotar, Sergei	The problem of developing tight, long-lived seals for piston and plunger pumps in extreme operating conditions as applied to oil production
	Goplakrishna, Suresh Babu	Investigation of distortion in quenching of seamless tubes
	Konopleva, Victoria	New Surface Tension Meter by Rhebinders Method
	Mostajeran Gortani, Masoud	Analysis of Electromagnetic Heating in Iranian Heavy Oil Reservoir
	Seitzhanov, Ansar	The system of sunlight concentration for heating heavy oil
	Yufianto, Andreas	Acidizing to Enhance Natural Gas and Oil Production in Zechstein Carbonate Reservoir
Geosciences	Firdausi, Rendy Defriza	Petrophysical and Sedimentological Characterization of a Late Permian Carbonate Reservoir Analogue
	Frohn, Vanessa	Thermal history and petrophysical properties of potential nuclear waste repositories: a numerical modeling study of Mesozoic shales, Lower Saxony Basin
	Hadavimoghaddam, Fahime	Introducing a new correlation method to predict PVT properties of Russian and Iranian crude oils
	Janocha, Julian	Depositional and structural characterization of a paleokarst system at Fortet, Billefjorden, Spitsbergen, Arctic Norway
	Krasnonosov, Kristina	Lithium extraction from geothermal brines
	Kruszewski, Michal	Influence of Elastic Properties of Cement and Rock Formation on Cement Sheath Stresses in Geothermal Reservoirs
	Roeth, Joschka	3D basin modeling of the Cooper-Eromanga Basin, Australia
	Sadiq, Rana Ammad bin	A coupled Hydro-Mechanical model of borehole breakout in granites
	Schaer, Samuel	Fractured reservoir quality analysis by aerial drone mapping, Buntsandstein, Upper Rhine Graben
	Schwarz, Dennis	Development, construction and field testing of BHA with drill string for a novel, laser induced and mechanically assisted thermal drilling process
	Spitzner, Alexander-David	Reservoir quality variations of a Buntsandstein reservoir analog, Upper Rhine Graben
	Stricker, Kai	Reservoir characterization of the Snøvhit field
	Stricker, Kai	Analysis of image and drilling logs for formation instability uncertainty analysis
	Taherdangkoo, Reza	Impacts of shale gas development on the quality of groundwater resources: A review

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New Surface Tension Meter by Rhebinders Method

Victoria Konopleva

In this study, a new instrument for precise surface tension measurements was designed. With one, experimental dependences of surface tension were obtained for aqueous solutions of oilfield surfactants depending on temperature and concentration. The data received allows plotting T-C phase diagrams indicating solubility and micellization effects.

With the instrument, which allows to measure pressure in an air bubble flowing out into solution, surface tension is calculated by maximum bubble pressure method. Pressure is measured with precision differential manometer with rated error of 0.1%. Temperature of all the experiments is maintained at a constant level of 20 degrees Celsius, using an electronic liquid thermostat. Air goes through a capillary which is calibrated with chemically pure liquids for improving reliability of results. The reference liquids were hexane, decane, o-xylene, phenylmethanol, diethylene glycol and bi-distilled water. Delphi-based software assists in collecting the data on computer and in processing the results by statistical methods.

Using the designed meter, two capillaries with inner diameters 0.536 and 0.634 mm were calibrated. During calibration and processing results with statistical methods, for each liquid mean values of the maximum pressure in the bubble were obtained. Each mean value of the maximum pressure was aligned with a known tabulated value of surface tension given at experimental temperature. This dependence of surface tension on mean maximum bubble pressure was approximated by a linear function for coherence with Laplace equation. Mean approximation error was 1.2% for the smaller capillary and 2.4% for the bigger one.

Aqueous solutions of oilfield surfactant were investigated. Their concentrations were from 0.1 to 10 g/L and the tests temperature range was from 10 to 70 degrees Celcius. Experimental results are presented in a form of 3D graphs (Ïƒ-T-C) and contour diagrams. Presenting the results as T-C diagram allows oilmen to determine directly concentration and temperature ranges of minimal surface tension, i.e. effectiveness conditions for the surfactant.

The novelty of this study is in the ability of high-precision measurement of surface tension and plotting T-C phase diagrams for oilfield surfactants, that will help to select suitable substances and not to decrease formation permeability.