3rd International Conference and Expo on

OIL AND GAS

July 13-14, 2017 Berlin, Germany

Poster

Mohammed Ali Saleh Yahya Atiah, J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

Enhanced oil recovery

Mohammed Ali Saleh Yahya Atiah
NIMS University, India

Statement of enhance oil recovery is the way that nowadays using, due to the limit of coming years for the extraction of crude oil and also due to the decreases of production of oil and gas from the reservoir. While the production of oil and gas for many years that production decreases due to the reserve estimation that had been calculated, also due to the decreases of reservoir pressure, so that the reduction of oil and gas production occurs. The major consideration is how to improve the production of oil and gas continuously as same the previous extraction quantities which were calculated by the study of reserve estimation of well. The main aim of EOR is to improve the extraction and production of oil and gas from the reservoir by the methods and techniques given by petroleum industry which includes: (1) EOR by steam water well injection; (2) EOR by natural gas well injection; (3) EOR by CO_2 well injection; and (4) EOR by methane gas.

Biography

Mr. Mohammed Ali is an outstanding having brilliant analytical power which led to achieving his target. He proves his ability to be an independent thinker and motivated enough to carry out the assigned work on regularly basis. To begin with, he is an excellent student; with a lively curiosity that makes his dissatisfied with superficial explanations.

hamoudi.ali919@gmail.com

Notes:

3rd International Conference and Expo on

OIL AND GAS

July 13-14, 2017 Berlin, Germany

e-Poster

Oil Gas Expo 2017

Forough Ameli et al., J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

Evaluation of Fast-SAGD process in naturally fractured heavy oil reservoir using the optimization procedure

Forough Ameli and **Kaveh Mohammadi**
Iran University of Science and Technology, Iran

Steam assisted gravity drainage (SAGD) is one of the most practical methods in enhanced oil recovery processes for heavy oil reservoirs. Fast-SAGD is a modification for SAGD process in which OFFSET wells are drained alongside the SAGD well pair for cyclic production and injection. Offset wells are applied for increasing the steam chamber laterally which is cost effective in comparison to SAGD process. There is limited number of studies for Fast-SAGD process in comparison to other EOR processes. In previous studies, the effective parameters of Fast-SAGD process have been optimized manually and sensitivity analyses are done based on these results. The studied parameters include, paired wells of SAGD, the locus of offset wells, injection pressure, production rate, starting time for the injection through offset wells and production time for the offset wells. In the present study, all the stated parameters are optimized through reservoir simulation using genetic algorithm in a naturally fractured heavy oil reservoir in Iran. To do this, CMG-STARS software was coupled to MATLAB toolbox to optimize this process. Results showed that optimized conditions were achieved for the locus of the wells using this technique which lead to more ultimate recovery factor (RF) for 5 to 15% in various conditions. The amount of the injected gas was also reduced significantly in comparison to previous studies which lead to lower economic cost and higher income.

Figure-1: The developed model for the study

Biography

Forough Ameli is an Assistant Professor at Iran University of Science and Engineering since 2016. She has completed her PhD degree in Chemical Engineering (Petroleum) from Amirkabir University of Technology in 2013. Her research fields include reservoir simulation, well testing, unstructured mesh generation algorithms, asphaltene precipitation and deposition, population balance and computational intelligence scheme. She has published many papers in reputed journals.

Ameli@Iust.ac.ir

Notes:

Bertram Maduka Ozumba, J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

Formation sensitivity assessment of Gbaran field, Niger Delta

Bertram Maduka Ozumba
Federal University Ndufu-Alike Ikwo, Nigeria

The prolific Niger Delta basin is a mature petroleum province. Therefore, further prospectivity in the basin lies within deeper plays which are high pressure and high temperature (HPHT) targets. One of the main characteristics of the Niger Delta is its unique diachronous tripartite stratigraphy. Its gross onshore and shallow offshore lithostratigraphy consists of the deep-seated Akata Formation and is virtually exclusively shale, the petroliferous paralic Agbada Formation in which sand/shale proportion systematically increases upward and at the top, the Benin Formation composed almost exclusively of sand. This stratigraphic pattern is not exactly replicated in the deep offshore part of the delta. The downward increasing shale percentage in the older and deeper parts of the basin poses a great problem to drilling. Increasing shaliness usually leads to wellbore instability and such other problems as pack-offs and stuck pipe. These hazards are the main causes of non-productive time in expensive deep-water or high temperature and high pressure (HPHT) drilling operations. Moreover clay mineral diagenesis generates mixed layer clays at higher temperatures and this tends to cause overpressures that may lead to disastrous kicks, losses and even blowouts. Predicting and managing drilling in such over-pressured or problem sections will form a major part of the evaluation for exploration and development in these parts of the delta. A formation sensitivity test consisting of the detailed study of the influence of various ions on the degree of formation damage of one of the main producing fields in the eastern Niger Delta has been studied. Analytical results of clay mineral composition obtained using X-ray diffraction (XRD) methodology were successfully applied to predict the various types of clay minerals present and hence intervals problem of shales. Further experimental formulations derived using Capillary Suction Time (CST) tests found that addition of 7% KCl to the original water based drilling fluid made drilling through the problem sequences easier leading to very good cost savings and compliance with the Nigerian environmental regulations. The operator has planned deeper drilling and further development of the field.

Biography

Bertram Maduka Ozumba is currently on early retirement after rising to the position of Head of Geological Services in Shell Petroleum Development Company of Nigeria Ltd., Nigeria. He is a well-known Philanthropist and a seasoned Manager and Geoscientist with strong technical background, broad experience and leadership roles in exploration geology. He has extensive expose and experience to a broad range of multicultural working environments for which he has positively adapted. He is a Member of several professional bodies including the American Association of Petroleum Geologist (AAPG), Nigerian Association of Petroleum Explorationist (NAPE) where he is a Fellow of the Society, Nigerian Mining and Geosciences Society (NMGS), Council of Registered Miners and Geoscientists of Nigeria (COMEG), Society of Petroleum Engineers (SPE) and a Certified Petroleum Geologist (CPG) of the United States of America. He has published and continues to publish several scholarly papers in international and local journals and has served either as Editor or Reviewer in journals.

bertram.ozumba@sbcglobal.net

Notes:

3rd International Conference and Expo on

OIL AND GAS

July 13-14, 2017 Berlin, Germany

Accepted Abstracts

J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

Role of discontinuities on hydro-mechanical properties of shale caprock overlying steam assisted gravity drainage

Abeer Heikal and **Rick Chalaturnyk**
University of Alberta, Canada

Steam assisted gravity drainage (SAGD) is used in Alberta to stimulate immobile bitumen to produce it from oil sands. The caprock is ultimate seal of bitumen that can effectively withstand stresses and strains induced from SAGD processes throughout life of reservoir. The caprock here is soft and heterogeneous. It is comprised of mudstone, shale and silt facies from clear water formation. Assessing caprock integrity is a challenging operational problem in any SAGD project. With increased heating and as steam chamber grows, caprock heaves. In past, there have been multiple documented steam and bitumen leaks. The objectives of this research include demonstrating importance of capturing shale caprock anisotropy via considering effect of natural discontinuities in the accurate determination of an equivalent continuum. The research aims to highlight fundamental role of discontinuities on hydro-mechanical properties of fractured caprock. It focuses on illustrating how discontinuities affect caprock deformability and its seal/flow characteristics. Research methodology includes fundamental characterization of clear water shale geological framework using in situ data captured by Light Detection and Ranging (LiDaR) technique. Numerical simulations have been carried out using 3D Distinct Element Code (3DEC). The index parameters needed were determined from laboratory testing. Preliminary results of an analysis comparing continuum versus discontinuum modeling illustrated the crucial role the discontinuities play in precisely determining the magnitude of uplift of caprock above SAGD. Neglecting discontinuities can result in an underestimation of heave value and overestimation of flow-resistance characteristics of caprock. New practical addition of this research is inherent in generating a fundamental integrated workflow that can be conveniently followed to build a geomechanical model from geological *in situ* data. The novel contribution of this research to the oil and gas industry includes studying a 3D DEM of a deterministic DFN of caprock.

heikal@ualberta.ca

Current status and future technical orientation of tight gas development in China

Ailin Jia
China National Petroleum Corporation, China

Tight gas plays an important role in natural gas of China. After about 15 years exploration and development, the original reserves and explored reserves of tight gas have been proven to be in large scale. It has fulfilled the beneficially development in Ordos basin, Sichuan basin and Songliao basin and the total production has exceeded 30 billion cubic meters, accounting for about 1/4th of total natural gas production of China. In this paper, geological characteristics of China's tight gas reservoirs are systematically analyzed, which are divided into three kinds: Multi-layered stacked lenticular reservoir, layered reservoir and massive reservoir. Meanwhile, it is more complicated for tight gas development in China than that in the United States or in Canada through the comparison of reservoir geological characteristics. As the first large-scale used unconventional natural gas in China, tight gas development is benefit from engineering and technology based on its own geological characteristics, including high-quality reservoir prediction and well placement optimization, low-cost and fast drilling technology, large well group-multiply well group-factory operating pattern drilling technology, stimulation technology, underground restriction and low pressure transmission, water drainage technique and digital management. Even though shale gas develops fast and is scaled used, it faces with the general problem of low recovery at the same time, just around 35%. Therefore, enhance gas recovery rate has become the key issue now and in the future. Taking Sulige gas field, the largest natural gas field in China for example, four kinds of technical methods, reasonable allocation of well production, water drainage technique, old well lateral drilling and well pattern infilling are introduced to increase gas recovery efficiency. The series of techniques can also provide reference for the same kinds of reservoirs to guarantee stable and beneficial development in long term.

jal@petrochina.com.cn

J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

Longmaxi formation shale gas sweet evaluation and optimization in the Upper Yangtze region

Zhengyu Xu, Jia Dan and **Liang Xing**
PetroChina, China

The upper Yangtze region has experienced multi geological events and there is characteristic of high evolution and strong transformation of the marine shale. So that the shale gas accumulation is very complex. By the comparison of North American and the upper Yangtze shale, Longmaxi formation organic rich shale of the Upper Yangtze region is older, higher degree of evolution but the sedimentary environment and lithology basically is the same as North American Barnett shale. Due to Longmaxi shale experienced multi deformation and different burial environment, its hydrocarbon has entered the over-mature stage. North American tectonic is relatively stable and its shale is still in the middle-high mature stage. The upper Yangtze shale gas accumulation and preservation are controlled by the reservoir pore pressure and the sealing of the accumulation unit. Combined the Longmaxi shale reservoir and the stratigraphy deformation characteristics of the upper Yangtze region, the shale gas sweet is controlled by deep shelf anoxic face and structure transformation and adjustment zone. Recently, all of the found Longmaxi shale gas reservoirs locate in gentle wings and axis of residual syncline of the zone. And a series of identification technologies of the shale gas reservoir and prediction technologies of sweet distribution have been summed in the upper Yangtze region. Longmaxi shale gas layer takes it as a feature: High gamma, high acoustic time difference, low P-wave and S-wave velocity ratio and with high resistance, low density, low compensation neutron anomaly. The Longmaxi sweet layer appears low frequency wave impedance reflection and AVO anomalies. The structure transformation and adjustment zone shows the multi-source convergence and natural net-fracture reservoir conditions, therefore good accumulation units of syncline belts become shale gas high production in the upper Yangtze region marine. Therefore Longmaxi shale gas sweet is controlled by deep shelf anoxic face and tectonic transformation and adjustment zone in the upper Yangtze region.

xuzy_hz@petrochina.com.cn

3D geochemical modeling with the use of vertical and horizontal relative concentrations of oil biomarkers for the heavy oil fields development monitoring

Artyom Chemodanov[1], **Akhmadullin Robert**[2], **Vladislav Sudakov**[1] and **Sergey Usmanov**[1]
[1]Kazan Federal University, Russia
[2]Tatneft, Russia

Statement of the Problem: All heavy oil reservoirs under development in Tatarstan are presented by sands and heterogeneous, with respect to geology and, thus, the conformance of steam in the reservoir is not uniform. The purpose of this study is to detect lateral and vertical gradients of relative concentrations of biomarkers presented in oil, which allows assessing potential drainage zones in the reservoir during the reservoir production by steam injection. In this research, new method for monitoring of steam chamber development in 3D model was developed and tested.

Methodology & Theoretical Orientation: Total hydrocarbon fraction was isolated from core extracts and analyzed by GCMS method (TIC) for detection of various biomarkers and assessment of lateral and vertical gradients of their concentration in lateral.

Findings: It was found that the proportion of 4- and 1-methyldibenzothiophenes (MDBT) changes in lateral and in vertical directions. These changes are caused by biodegradation of organic matter. Laboratory research shows that 1-MDBT/4-MDBT ratio in native reservoir rocks is stable under high temperatures and pressure, so it can be measured in the samples of oil produced by SAGD method. This measurement will allow assessment of location and direction of steam chamber propagation.

Conclusion & Significance: In this work the authors have developed geochemical model which can be used for assessment of oil flow directions during the development of heavy oil fields by SAGD method.

Chemodanov41659@mail.ru

J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

The low-permeability-layers of dolomite reservoir and its influence on remaining oil distribution

Cao Peng[1, 2]
[1]Petrochina Hangzhou Research Institute of Geology, China
[2]Key Laboratory of Carbonate Reservoirs, China

The YM dolomite reservoir has been into the high water production stage and the important issue is how to get the distribution of the remaining oil and to product. The low-permeability-layers are ubiquitous in this type of formation. Building the mechanism model, the sensitivity analysis is done among the permeability, thickness, attitude of the low-permeability-layers and different formation permeability. The result shows us that the effect of flow barrier is mainly close to the permeability of the low-permeability-layers and the strong flow barrier occurred when the permeability is lower than 0.01 mD. And the thicker the low-permeability-layers, the stronger the flow barrier based on the same other conditions. The different attitudes play different roles in controlling distribution of the remaining oil, the order is type I>II>III>IV. And if there are two low-permeability-layers and the effect is type V>VI. The low-permeability-layers are the fluid influent barriers in the short production time and the main control factors of the remaining oil's distribution.

caop_hz@petrochina.com.cn

Hydrocarbon production in the age of decommissioning

John Clifford Jones
Federation University Australia, Australia

In the North Sea decommissioning has begun and will continue for a decade or longer. There will be heavy investment in it and many job opportunities for engineers. There is some decommissioning at other scenes of offshore production including the GoM, North West Australia and the Adriatic. The need for decommissioning on- and offshore has arisen partly from depletion but also from reduction in demand because of the need to meet greenhouse gas emission requirements. For example, use of heavy fuel oil in power generation has declined because of the availability of electricity from sources which do not in operation produce carbon dioxide, including wind farms. Biodiesel is widely replacing mineral diesel as a fuel for compression ignition engines. This paper is not concerned with decommissioning per se but with concurrent decommissioning and production, a milieu which is developing and will remain. There are important questions to be asked. How will the price of oil at any one time be affected by investment trends? Will it be higher or lower when decommissioning activity is strong? What will be the role of OPEC in a world in which decommissioning is competing strongly with production for investment? To what extent will facilities such as semi-submersibles and offshore supply vessels be able to serve in both the provinces, production and decommissioning? How will an organization involved both in production and decommissioning be expected to meet its carbon obligations? At a location such as the North Sea could production and decommissioning share infrastructure such as umbilicals? What will be the installation-removal balance in the workload of the new generation of heavy lift vessels such as Pioneering Spirit? These questions and others will be put and pointers (no more) to answers attempted.

john.jones@federation.edu.au

J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

Experimental investigation of the extent to which different concentrations of C_3H_8, CH_4 and CO_2 affect CSI performance

Farshid Torabi and **Arash Ahadi**
University of Regina, Canada

Cyclic Solvent Injection (CSI) technique holds great promise as a viable approach to produce heavy oil from thin reservoirs where thermal and gravity-dominated recovery methods fail to produce oil. CO_2 and C_3H_8 (due to their high solubility) are the main solvents that have been used in CSI. However, CO_2 is not always accessible and it causes corrosion problems during implementation. In addition, low saturation pressure of C_3H_8 limits the application of pure C_3H_8 for heavy oil extraction. On the other hand, CH_4 is widely accessible and has high saturation pressure. In this study, different concentrations of C_3H_8 in CH_4 stream (i.e., 15, 30, and 50 mole %) are tested. A sandpack model with porosity and permeability of 32.4% and 9.7 d, and a heavy crude oil with viscosity of 6430 mPa.s are used to represent a typical thin heavy oil formation. First, different ratios of C_3H_8 to CH_4 stream are examined to quantify the optimum solvent concentration. Second, CO_2 is introduced to the optimum CH_4-C_3H_8 concentration to investigate the extent to which CSI behavior changes by partially replacement of CH_4 with CO_2. Results show that ultimate recovery factor (RF) increases from 24.3% to 33.4% original oil in place (OOIP) when C_3H_8 concentration increases from 15 to 50 mole% in the CH_4 stream. CSI tests with higher C_3H_8 concentration reaches the maximum cyclic recovery with lower number of injection cycles due to higher solubility of C_3H_8 compared with CH_4. Solvent utilization factor (SUF) data also confirms this as lesser volume of solvent with higher C_3H_8 concentration is required to produce oil. Virtual observations also shows that the foamy oil produced during the process lasts longer with higher concentration of C_3H_8 (2 min for 85% CH4-15% C3H8 case and 180 min for 50% CH_4-50% C_3H_8 case). Upon addition of CO_2 to the mixture, the oil production is slightly improved as the ultimate RF increases to 35.9% OOIP. The produced foamy oil also lasts for 197 min for 50% C_3H_8-35% CH_4-15% CO_2 case. In general and for all cases, the solvent oil ratio (SOR) increases with cycle numbers, specifically during the last two cycles, highlighting that large portion of the injected solvent is produced instead of diffusing into the oil phase.

farshid.torabi@uregina.ca

J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

Analytically evaluate relative permeability at unsteady-state core flooding

Hisham Khaled Ben Mahmud[1] and **Walid Mohamed Mahmud**[2]
[1]Curtin University, Malaysia
[2]University of Tripoli, Libya

Simulation of multiphase flow in porous media requires knowledge of relative permeability, which is one of the essential measurements in reservoir engineering due to the common existence of two-phase flow in the reservoir. The precise test of relative permeability can be performed either by steady-state or unsteady-state flow method. The aim of coring and core analysis is to reduce uncertainty during reservoir evaluation via providing reservoir data *in situ* conditions. The advances in core flooding and core analysis techniques provide the premise to obtain essential petrophysical properties and to simultaneously find other reservoir rock dependent parameters. Thus, the aim of this work is to develop a model is utilizing Sendra software (Ref) for unsteady-state displacement method validated by two-phase flow experimental measurements. This model is based on a novel generalization of the classical Buckley-Leverett fractional flow theory for constant pressure boundary conditions. It includes the effect of fluids viscosities and the average fluid saturation at the breakthrough moment as measured by the rapid displacement method. Under constant pressure boundaries, relative permeability and fluid saturation were determined from unsteady-state measurements using Johnson, Bossler and Naumann (JBN), Pirson's correlations and Sandra simulation software. Based on analytical results, the most accurate relative permeability measurements were made on a native-state core, where the reservoir wettability was preserved. Moreover, Sendra software and JBN methods yielded close non-wetting phase relative permeabilities of an oil-wet sample while Pirson method yielded somewhat significant difference. Water-wet core samples were characterized by limited oil production after water breakthrough but generally yielded good recoveries and low water relative permeabilities at residual oil saturation.

hisham@curtin.edu.my

Gas plant troubleshoot hydrate problem with out of box solution

K Sabapathi and Saleh Al Jatley
KNPC, Kuwait

The train-4 gas plant is designed to process 0.9 Bcfd of Kuwait associated gases to produce methane, ethane, propane, butane and naphtha using GSP process. Column is flooding frequently and could not reach the desired recovery and purity. The potential causes like, leak in the re-boiler, feed by pass to column, tray design and damage were analyzed. Mole sieve driers were also evaluated. Feed quality and potential freeze of heavy component were analyzed and concluded that there is no problem in this regard. Product gas quality measured with multiple analyzer and moisture <0.050 ppmV, but flooding continued. Methanol injection helped improve the situation. Mercury guard bed outlet moisture is around 3 to 5 ppm. Hg guard bed inlet contains 1000 ppmV H_2S and 1 mol% CO_2 (H_2S-CO_2→COS+H_2O). COS can be formed in molecular sieve dehydration beds downstream due to absence of water. Hg bed alumina aids the formation of COS due to large surface area available for catalysis and basicity of the crystal structure in the alumina part of the adsorbent. Rate constant of this equation is function of temperature, when the temperature is higher during switching bed and the water peaks measured in the same time after bypassing the mercury guard water content to zero. Therefore, it was decided to shift the mercury guard bed in the upstream of the drier bed. This will call for shutdown of the plant, as interim measure it was decided to fill the vessel with sulfur impregnated carbon on temporary basis.

k.sabapathi@knpc.com

J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

Geochemical and palynological assessment of Oligocene Mezardere formation: Implications to petroleum source potential and paleoenvironmental link to eastern paratethys, thrace basin of NW Turkey

Kadir Gurgey[1] and **Zuhtu Bati**[2]
[1]Near East University, Turkey
[2]Turkish Petroleum Corporation, Turkey

Statement of Problem: Paratethys extent from western Central Europe to Mangslak area in Kazakhistan. Clastic and organic rich Oligocene Mezardere Formation (MF) is located on this framework but its link to Paratethys have not established yet. The MF is relatively thicker (1000-1500 m) than its coeval source rocks in the Paratethys.

Aim: The purpose of the study is to select the most organic-rich intervals of the MF and to evaluate their hydrocarbon source potential and to investigate the link between Paratethys and the MF.

Methodology: In this paper, the early/marginally mature cutting samples of the MF are geochemically, petrographically and palynologicaly analyzed and utilized.

Findings: The MF was informally subdivided into Solenovian transgressive UMF upper MF and Psekhian regressive LMF lower MF, based on the distinct differences in geochemical proxy indicators for sea level variations as well as Palynological data. The UMF is characterized by abundant Wetzeliella gotchti and Pediastrum spp. occurrences that suggest fresh water (rainfall) input as happened the source rocks of the Central and Eastern Paratethys, whereas, the LMF without Wetzeliella gotchti is characterized by normal marine conditions. Organic-rich layers are observed in UMF that showed a fair to good source rock potential (Average TOC=1.14 wt.%; HI=283 mg Oil/g TOC) and low to moderate genetic petroleum potential (GP=3.65 mg oil/g rock) and source potential index (SPI=1.44 t Oil/m^2). The LMF was not evaluated due to their apparently low organic-richness.

Conclusion & Significance: Organic geochemical data may be utilized to select transgressive and organic-rich units when the source rock candidate has considerable thickness. The UMF shows both conventional and unconventional oil potential. The results achieved provide a much-improved understanding of paleoenvironment of the Eastern Paratethys and will be useful in integrating information from this unique locality with that from the extensively studied Central-Eastern Paratethys.

kadir.gurgey@neu.edu.tr

Effect of polymer additives as foam stabilizer for CO_2 foam flooding

Khaled Abdalla Elraies and Shehzad Ahmed
Universiti Teknologi Petronas, Malaysia

Polymer enhanced foam (PEF) provides an additional strength over conventional CO_2 foams for mobilizing oil from the unswept low permeable oil rich zones during an enhanced oil recovery process. The efficiency of the process depends on two major factors i.e., stability and apparent viscosity of PEF. In this study, an experimental investigation of apparent viscosity and stability of polymer enhanced CO_2 foam is presented with an objective to access the polymer performance and to identify the best performing polymer under reservoir conditions of 1500 psi and 80°C. For this purpose, a conventional standard HPAM polymers and an associative polymer i.e., Superpusher P329 were used in combination with a widely used foamer i.e., alpha olefin sulfonate (AOS) and a foam stabilizer i.e., betaine. Foam stability tests were conducted in the presence of crude oil using FoamScan. Whereas for foam rheological study, a high pressure high temperature Foam Rheometer was utilized and the foam was sheared over the range of 10 to 500 sec-1 inside the recirculating loop. As compared to other HPAMs, an associative polymer i.e., Superpusher P329 significantly amplified foam longevity and provided a more prolonged liquid drainage. A shear thinning behavior was observed for the entire range of shear rate tested and for both kind of polymer. HPAMs were found ineffective and the PEF viscosity was found equivalent to that of polymer free foam. Superpusher P329 showed interesting combination with AOS and significant viscosity enhancement has been reported in this paper.

khaled.elraies@utp.edu.my

J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

MAICE: A tool for model and make available expert knowledge

Leizer Schnitman, Jose Francisco dos Santos Correa and **Fabricio Mota**
Federal University of Bahia, Brazil

In many areas, expert knowledge is usually associated to a little number of specialists. Big companies, such as the petroleum companies, naturally employ a lot of specialists. However, the knowledge of these specialists is not fully available to support the whole company at the same time. The software MAICE is a tool which can be used to model and keep expert knowledge. Being storage, the expert knowledge can be used in order to provide expertise and support operational decisions, without requiring the specialist presence since it represents the specialist opinion. The tool may be applied in various areas like medicine, logistics and many engineering applications. It was originally developed as partnership with Petrobras (2007-2011) and its first applications refer to artificial lift methods. The objective of this work is to present some examples of MAICE applications and also presenting this software as a tool to be applied in a general context of oil and gas.

leizer@ufba.br

The numerical simulation for multistage fractured horizontal well in low-permeability reservoirs based on modified Darcy's equation

Liu Hailong, Li Chuanxi, Sun Jianfang and **Xu Ting**
SINOPEC Ltd., China

Based on the nonlinear percolation theory, a new nonlinear seepage model of low-permeability reservoir was established and an ideal three-phase and three-dimensional numerical reservoir simulation model for the multistage fractured horizontal well was built. By taking the impacts of pressure-sensitive effect and the threshold pressure gradient into consideration, the quasi-linear numerical model, Darcy numerical model and the non-Darcy numerical model were conducted. Meanwhile, the effects of parameters were fully investigated. The study shows that compared to the results of Darcy model, when taking nonlinear flow into consideration, the result shows higher energy consumption, lower pressure level, smaller liquid production and slower water cut rising rate. When the injected fluid reaches the wellbore, the flowing bottom hole pressure increases quickly. However, the time of water front reaching the wellbore is different. Hence, when using non-Darcy flow expression, the process can be present precisely. The recovery ratio is positive with the starting pressure gradient of the water phase, but negative with the oil phase. With pressure-sensitive coefficient decreasing, recovery ratio increases quickly. If producing pressure differential is maintained at a proper value, then the effect of the pressure-sensitive coefficient on the permeability is reduced. With the threshold pressure gradient becoming smaller, the recovery ratio becomes higher.

478277608@qq.com

J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

Heat stress management for workers in hot climates

Neil Hokins
Healthfit International, Australia

Statement of the Problem: Heat stress illnesses and deaths are still occurring in the oil/gas/mining sectors worldwide. Companies have a duty of care to their workforce to ensure controls are in place to reduce risks/hazards in the work place.

Methodology & Theoretical Orientation: Heat stress management plans are set up in many industries like construction/mining/oil and gas/maritime etc., in Australia, Papua New Guinea and also in the Danakil desert in Ethiopia. These plans are country/project specific to meet the needs of employees working in these austere environments.

Findings: On every project that we have rolled out these heat stress management plans, we have been able to reduce all heat stress related illnesses to nil. We also found that we can reduce fatigue conditions thereby reducing accident/incidents from occurring and also decrease minor sprains and strains, thereby decreasing MTI's/LTI's. The plan also reduces down time such as work rest cycling via the use of the thermal work limit heat stress indices and engineering controls that we can introduce, this is a win-win situation for any company and its employees, as it reduces lost production costs to the company and also reduces the chance of an employee having a heat stress illness event and also increases productivity of the worker because the comfort ability rating to the body is much higher, which means they will be able to burn off more energy with a reduced risk of heat stress illness.

Conclusion & Significance: Heat stress management plans are easy to set up and cost effective, they can if instigated effectively reduce heat stress illness to nil and reduce fatigue and workplace incidents.

Neil@healthfit.net.au

Wellbore stability analysis model including poro-elastic, chemical and thermal effect during underbalanced drilling operation for fractured reservoir

Reda Rabiee Abdel Azim, Ahmed Elbagir and **Saad Balhasan**
American University of Ras Al Khaimah, UAE

Before drilling operation, rock stress is described by the *in situ* stress, which includes effective overburden stress, effective maximum horizontal stress and effective horizontal stress. As the drilling continues and the hole has been drilled the support provided by the rock will be removed as a result of the drilling operation and supposed to be replaced by the hydrostatic pressure. The statues of the rock surrounding the wellbore will be alter which will redistribute the in situ stress around the wellbore due to the excavation, causing mechanical wellbore stability problems such as hole enlargement, hole reduction, lost circulation and may leads to serious well control problems specially in fractured reservoirs. Therefore preventive measurement should be taken in order to planning stable wellbore and identification of stability problems in the field. In addition, to evaluate the potential for wellbore stability a realistic model is recommended to be used to calculate the stresses and strains around the borehole. Therefore, this paper presents an approach to simulate the wellbore stability under chemo-thermo-poro-elastic conditions. This approach incorporates finite element modeling technique and effective permeability tensor for small to medium generated fractures (length <20 m). The simulation of wellbore stability process is running in underbalance drilling (UBD) technique conditions. This is to prevent formation damage, avoid lost circulation and increase rate of penetration. Where, UBD is also dangerous and may lead to wellbore failure due to absence of positive support created by the hydrostatic of the drilling fluid column. Hence, the application of UBD should be assessed throughout the use of *in situ* stresses and rock mechanical properties to estimate under which hydraulic drilling conditions in the wellbore is stable. Analytical solutions for stress distribution for isotropic and anisotropic rocks are presented. In addition, a solution for the upper limit for the mud window to prevent tensile failure is developed.

reda.abdelazim@aurak.ac.ae

J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

On the gas-oil relative permeabilities of the southern Algerian shales rock samples

Rezki Akkal[1], **Mohamed Khodja**[2], **Sid Ahemd Hadjsadok**[1] and **Slimane Azzi**[2]
[1]Ecole Nationale Polytechnique, Algeria
[2]Sonatrach, Algeria

The gas-oil relative permeability behavior of different plugs from the southern Algeria Hassi-Messaoud reservoir has been experimentally studied in order to understand the fundamental processes of two-phase flow taking place within the macro-structure of different rock samples. The experiments have been achieved on the cylindrical Hassi-Messaoud plugs using the unsteady state method to measure the gas-oil relative permeabilities due to its operational simplicity. The impact of factors such as overburden pressure and rock characteristics based on the relative permeabilities curves has been carefully assessed. A great variation in the relative permeability curves trend has been experimentally seen for different rocks extracting from Hassi-Messaoud reservoir. This would be the consequence of the heterogeneous nature of the studied reservoir. This is closely related to either the rock nature or composition. The extracted parameters such as the initial oil in place (IOIP), water saturation and oil and gas relative permeabilities are strongly related to the above-addressed factors. The oil recovery rate at breakthrough is approximately 10-20% of the original oil in place (IOIP); the average is about 15%. The final oil recovery rate, obtained by moving at constant pressure is about 29.4-49% of the original oil in place (IOIP), the average is around 35%. The residual oil saturations (Sor) vary from 44-60% relative to pore volume (Vp); the average is about 53%.

rezkidzmin@yahoo.fr

Characterization of black powder found in sales gas pipes

Tariq Saeed Khan and **Mohamed S Alshehhi**
Petroleum Institute, UAE

Black powder (BP) is a typical contaminant usually found in sales gas pipelines. Its presence may cause major operational and maintenance issues including blockage of sensors and filters, erosion of pipeline bends and compromise the sales gas quality. There has been little known about its composition and sources of formation in the gas pipelines. Understanding its characteristics is considered crucial for appropriate mitigation planning and execution of smooth pipelines operations. Black powder samples collected from sales gas pipelines network of a Middle Eastern gas company are analyzed using semi electron microscopy with energy dispersive X-ray spectroscopy (SEM- EDX) and X-ray diffraction (XRD) methods for surface analysis and phase identification of the crystalline material. These analyses revealed variation in size distribution and shape of the BP samples. Likewise most of the BP particles were found agglomerated. Elemental analyses of the sample have shown presence of iron as the most abundant element after sulfur. XRD patterns can be indexed with both iron oxides and sulfides suggesting presence of moisture and hydrogen sulfide in the gas.

tkhan@pi.ac.ae

conferenceseries.com

J Pet Environ Biotechnol 2017, 8:4 (Suppl)
DOI: 10.4172/2157-7463-C1-035

Magnetic basement and its petroleum geological significance in Sichuan Basin

Tianyao Hao[1], **Weijian Hu**[1], **Kang Liu**[1] and **Hui Yang**[2]
[1]Chinese Academy of Sciences, China
[2]PetroChina Research Institute of Petroleum Exploration & Development, China

Sichuan Basin is the basin with the largest number of proven gas reserves in China. The study of basement structure of the basin is very important in the deep oil and gas exploration. The research concerned on the structure of Sichuan basin's basement based on aeromagnetic data. We improved the method of determining the residual magnetization direction by the maximum cross-correlation method based on the vertical gradient and the total gradient of the magnetic anomaly. This reduction to the pole (RTP) method of magnetic anomalies considering the residual magnetization direction makes the result more reliable. We obtained residual basement magnetic anomaly (RBMA) from aeromagnetic data, then inverted the undulating magnetic basement and its susceptibility distribution, divided the magnetic basement of Sichuan Basin into 7 parts and discussed the controlling effect of Sichuan basin's magnetic basement on oil and gas migration and accumulation. Besides, the basement faults system was patterned with the help of the directional derivative, vertical derivative and horizontal gradient of the RBMA. The magnetic basement obtained in this paper is the top interface of lower mesoproterozoic with a depth of 3~10 km, which reflects the tectonic morphology and undulating characteristics of the deep metamorphic crystalline basement in the basin. The large inherited paleo-uplift developed on the magnetic basement uplift provides the conditions for the formation and aggregation of the pre-Cenozoic oil and gas. Leshan-Longnv temple paleo-uplift inherited the magnetic basement depth of about 3~6 km. Luzhou paleo-uplift inherited paleo-uplift with 3.5~5.8 km magnetic basemen depth; the gas layer is the Jialing River group of lower Triassic.

tyhao@mail.iggcas.ac.cn