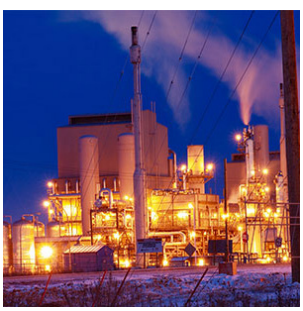
Scientific Tracks & Sessions
December 02, 2019

Oil and Gas 2019





2nd International Conference and Expo on

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December 02-03, 2019 | Dubai, UAE

Majid Bizhani et al., J Ind Environ Chem, Volume:3
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Plug and abandonment practices and trends: A British Columbia perspective

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University of British Columbia, Canada

We present a review of Plug and Abandonment (P&A) practices in onshore wells, with a particular focus on British Columbia (BC). Regulatory and operational practices are reviewed as well as data on the wells of BC. This data set (of approximately 25,000 wells) has wider significance as it consists most recently of pad-drilled unconventional gas wells, with significant horizontal extent, multi-stage fractured. The oldest of these wells and other vertical/deviated well stock are currently being abandoned. The data reveals a large wave of abandonments coming in the next decade and a significant increase in reported Surface Casing Vent Flow (SCVF) over the past decade, which will lead to rising P&A costs.

Speaker Biography

Majid Bizhani was awarded with Ph.D. in petroleum engineering from the University of Alberta in Canada. He is currently a postdoctoral researcher at the University of British Columbia. Majid's research experience and interests are closely related to different aspects of Drilling & Completion engineering. He studied hole cleaning during his Ph.D. and M.Sc. studies. For the past two years, Majid has been working on projects related to wellbore cementing. Primary cementing is his main research area; however, he is also actively engaged in research pertaining to Plug & Abandonment activities.

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Ahmed Mohamed Al Dhuhoori, J Ind Environ Chem, Volume:3
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Introduction to oilfield chemicals: Production chemicals used in Zakum field

Ahmed Mohamed Al Dhuhoori
ADNOC Offshore, UAE

The introduction of oilfield chemicals and production chemicals used in Zakum field represents the topic and explanation of general problems with the oil production, problems caused by fouling, souring, problems caused by physical properties foaming, emulsion, viscous flow, problems caused by incompatibility of mixing fluids, problems that affect the structural integrity of the facilities, and safety of workforce, environmental issues, chemical injection solution, only trace amount of residual chemical will remain in the solution these chemicals can be injected as batch or continuous. The topic for the presentation also represents with the production chemicals used in typical package in the oil field and it also explains the production water impurity and how to track and it will also explain the produced water reinjection, productivity and cost of chemicals.

Speaker Biography

Ahmed Mohamed Al Dhuhoori- Corrosion Engineer working in ADNOC Offshore. He Holds a bachelor degree in Chemical Engineering (2008) and NACE Certificate in CP, coating inspection, Internal corrosion of pipeline. He works as field engineer as Integrity engineer in the department of Plant Asset Integrity in different fields (upper Zakum , Zirku field).

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Mineralogy of siliceous concretions, cretaceous of Ionian zone, western Greece: Implication for diagenesis and porosity

Avraam Zelilidis[1], Nicolina Bourli[1], Maria Kokkaliari[1], Ioannis Iliopoulos[1], Georgia Pe-Piper[2], David Piper[3], Angelos Maravelis[1]

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XRPD analysis, in selected samples, in both nodules and siliceous beds, showed the presence of moganite and Opal-A minerals and introduce mostly an amorphous silica. The presence of maghemite may be evidence for the importance of redox-controlled pore-water boundaries in the initial precipitation of amorphous silica, as maghemite can form by dehydration and transformation of certain iron oxyhydroxide minerals.

Results showed different calcite content or the presence/absence of halite and anhydrite, from different age and different areas, from both nodules and siliceous beds, suggesting great differences between areas, due to different sources, and introduce different tectonic activity between areas with more intense tectonic activity in NW Peloponnesus than in Kastos Island.

The content of calcite in cherts is likely a consequence of the amount of early amorphous silica precipitation. The siliceous beds in Gianiskari have a higher calcite content than nodules of Araxos, both in NW Peloponnesus, suggesting increased replacement mostly in nodules, whereas in both areas, there is no difference in calcite content between upper Cretaceous siliceous bed and nodules. The calcite content of upper Cretaceous chert is higher in Kastos Island than in NW Peloponnesus. The major source for Kastos Island was the Apulian platform whereas for NW Peloponnesus was the Gavrovo platform, so the physical properties of the two sediment successions might differ, thus affecting diagenesis. The clearest evidence for the role of later fluids is the presence of halite and anhydrite only in NW Peloponnesus, where there are fault pathways for basinal fluids from underlying Triassic evaporites that include halite and gypsum. The erosion of Triassic evaporites, only in the eastern part of the basin, could be related with intense tectonic activity in this part of the basin. This difference is because it was influenced by the first stages of compression (late Eocene to early Oligocene), situated between Gavrovo and internal Ionian thrusts, that the western parts of the basin, which influenced by later stages (late Oligocene-early Miocene), situated between middle Ionian and Ionian thrusts.

The characteristic presence of dolomite in lower Cretaceous siliceous bed is in accordance with the presence of dolomitized limestones at the lower parts of early Cretaceous Vigla formation. Either the dolomite replaced calcite before final growth of the siliceous bed horizons, or chert was replaced by dolomite. The size and the abundance of nodules was related with mostly with primary porosity of the hosted deposits and in relation with the fact that Early Cretaceous nodules are smaller and in abundance that these of Late Cretaceous support the idea that the porosity of Late Cretaceous hosted limestones is greater that in Early Cretaceous hosted limestones. The fact that now both present equivalent porosities support the idea that the development of nodules increased secondarily the porosity of Early Cretaceous limestones.

Speaker Biography

Avraam Zelilidis was graduate Geologist in 1984 and a PhD in 1988 in the Department of Geology of the University of Patras. He was appointed as a lecturer in 1993 and since 2009 as a full professor in the Department of Geology of the University of Patras. He served as Dean of the Faculty of Natural Sciences at the University of Patras from 2006 to 2010. Research deals with the Analysis of Sedimentary Basins, Sequence Stratigraphy, Seismic Stratigraphy and Petroleum Geology. Have produced many research projects for oil companies using data in both surface and subsurface, while he organized many field seminars for foreign oil companies. He has published more than 100 papers in international journals, most of which refer to the hydrocarbon potential in Greece and have been presented in international conferences in an effort to highlight the issue of existence-exploitation of hydrocarbon fields in Greece.

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A discussion on seismic reservoir characterization of tight reservoir: Scope to further research combining fiber optics

Arijit Chattopadhyay, Misfera Al-Qahtani and **Rachid Sablit**
Kuwait Oil Company, Kuwait

In North Kuwait, Najmah Formation hosts fractured tight carbonates and organic-rich kerogen layer, with average thickness of about 50 feet at average depth of 14000 feet below surface, characterized by low porosity and ultra-low permeability. This unit is overlain by alternating Gotnia salts and anhydrite layers. Destructive interference of coherent noise in 3D seismic affects the consistency of seismic reservoir characterization within Najmah interval, requires attenuation to exploit seismic data. Application of model-based interbed multiple attenuation reduces coherent noise interference, improves imaging and characterization of the Najmah formation.

Integration of rock physics modeling, full-azimuth P-wave seismic analysis and pre-stack simultaneous seismic inversion reveals that pore geometry can affect seismic anisotropy. In fractured tight carbonates, low Vp/Vs ratio correlates with relatively porous intervals, low pore aspect ratio and high brittleness index / higher fracture density. Higher organic richness of Najmah kerogen correlates with lower acoustic impedance. Azimuthal seismic analysis highlights existence of multi-azimuth fracture sets within Najmah interval and fast interval velocity coincides with direction of maximum horizontal stress. Combination of brittleness index and fast velocity azimuth can help identifying “sweet spots” within Najmah formation.

Distributed Acoustic Sensing (DAS) fiber optics cable can acquire 1D and 3D borehole seismic. S/N ratio of raw DAS data is lower than geophone data and DAS is sensitive only to the axial deformation of fiber optic cable. This has downgraded DAS to a 1C geophone. DAS data can be acquired continuously throughout length and life of well, in contrast to geophones. Smart downhole deployment of helically wound DAS can enhance permanent monitoring and reservoir characterization by cross-well tomographic imaging and recording of microseismic events in tight reservoirs like Najmah Formation. Pragmatic use of fiber optics has potential to illuminate fracture systems, identifying the coherent noises of subsurface in evaluation unconventional reservoirs around the world.

Speaker Biography

Arijit Chattopadhyay has completed his M.Sc. at the age of 25 years from Indian Institute of Technology, Bombay, India. He is working in R&D Programmes Team of KOC, Kuwait. He has several publications and US Patent in recent years. He is a fellow of Geological Society of London and has over 14 years of global experience in E&P industry collaborative research in reputed academic institutions in India and USA.

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Optimization of multistage Hydraulic fracturing technologies in reservoirs with close oil-gas and water-oil contacts and the presence of weak barriers with low stress contrast

Kazakov Evgenii, Fayzullin Ildar and **Sayfutdinov Elnar**
GAZPROM NEFT Science & Technology Centre, Russia

For effective stimulation of wells by hydraulic fracturing requires deep engineering and technological research work. The paper shows various ways of optimization multistage fracturing operations in reservoirs with weak barriers with low stress contrast. One of the solutions of the tasks is to optimize the existing guar fluid systems to control the fracture height. To achieve the maximum effect was carried out gradual decrease the polymer concentration, used low-viscosity liquids and combined "pad" stages. Additionally, had been performing works to optimize the pumping schedule and increase its aggressiveness. To achieve the maximum effect for cleaning of the created fracture, the concentration of enzyme destructor was gradual increasing. As an alternative approach to stimulation, was chosen hydraulic fracturing on a non-polymer fluid system (surface active agent). To minimize the risks associated with STOP regime, has been implemented multi-stage completion system with reusable sleeves, which controlled by special key with involvement of coil tubing and bottom-hole pressure monitoring. As in addition methods of control had been using microseismic monitoring and different geophysical studies. Analysis of actual oil production rate showed the success of the applied approaches to achieve maximum efficiency of the stimulated wells.

Speaker Biography

Kazakov Evgenii is who as an Head specialist, Department of fracture designs in GAZPROM NEFT Science & Technology Center, Saint-Petersburg, Russia.

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The influence of the quality of deep samples on the results of studies of the phase behavior of paraffins and formation oil asphaltenes

Stanislav Fedorovskiy
GAZPROM NEFT Science & Technology Centre, Russia

The paper illustrates the influence of the quality of downhole samples on the results of studies of the phase behavior of paraffins and asphaltenes in reservoir oil. The results of studies of a conditionally representative sample of reservoir oil and deep samples taken under multiphase flow conditions (with different volumes of free gas, formation water and solid phase of asphaltenes, resins and paraffins in the sampler) were compared. For each sample, a set of PVT studies was carried out according to all required standards – PVT test, flash separation, determination of viscosity and density. Phase behavior of paraffins and asphaltenes was studied by methods of acoustic resonance (registration of the moment of phase transition), high pressure microscopy (determination of the number and geometric dimensions of solid phase particles), gravimetric and filtration methods (determination of the group composition of the solid phase). To prepare samples of oil with free gas in the chambers, a procedure was carried out to release free gas to the current bubble-point pressure. The results of the analysis revealed that the procedure of free gas release has little effect on the PVT-characteristics of reservoir fluid samples. However, it is not possible to study the phase behavior of paraffins and asphaltenes, since the deviation of different parameters reaches 70% (the content of asphaltenes, resins and paraffins; paraffin saturation temperature; asphaltene saturation pressure, etc.) As a result, the sample of fluids with multiphase flow conditions, if it is impossible to use other methods, may be acceptable for a standard PVT-analysis. But it is not possible to study the phase behavior of paraffins and asphaltenes for such samples, since these studies are highly dependent on the quality of sampling.

Speaker Biography

Stanislav Fedorovskiy is the team leader of reservoir fluids studies of the GAZPROM NEFT Science and Technology Center. By academic professional education, he is a refinery engineer, but his career is all about studying reservoir fluids. He worked as an engineer in a PVT-laboratory of one of the research centers of PJSC Gazprom, where he mastered all the fundamental knowledge and skills in the culture of working with downhole and separator samples. Next, he became the head of the laboratory of physical and chemical analysis of degassed (wellhead) samples in the research center of JSC SibNIINP, having gained experience of research and management of the team, he went to work directly at the GAZPROM NEFT Science and Technology Center, where for 4 years he has made the way from leading specialist to team leader. The specificity of their work lies in the absolute diversity of properties and phase states of the fluid – from heavy oil to supercritical fluids.

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Hydrodynamic studies of wells as a tool for adjusting geological data and assessing the influence of underlying water on the development of Reservoir PK1-3 of the East-Messoyakhskoye Field

Kovalenko Igor Victorovich, Listoykin Dmitriy and **Aleksandrovich**
GAZPROM NEFT Science & Technology Centre, Russia

The paper presents the experience of well test results for geological and simulation models correction at the stages of experimental industrial exploitation and industrial exploitation of the heavy oilfield with a system with horizontal wells. The potential for each borehole can be influenced by the geological structure of the reservoir (boundaries, facies, water-oil contact, gas-oil contact, etc.) and the perfection of technological completion (contamination of the bottom zone, lack of inflows from the horizontal segment, etc). An instrument to clarify the structure of the reservoir and the perfecting of the autopsy is the conduct of the well test. As a result of the studies carried out, the PK1-3 reservoirs were characterized by characteristics contrary to the standard approaches of the well test in horizontal wells. The theoretical reasons for these features are discussed in the paper.

The most important issue for decision-making on the further development of the deposit is the introduction of a reservoir-pressure system. The question of the need to introduce the injection wells or to work in elastic mode? In the case of pumping, drilling to the target well reservoir or to the water of the saturated power? At the initial stage of development, these issues are one of the main concerns in connection with the active drilling of the field and significant selection of the mining fund. Thus, the process of reducing pressure on the reservoir may lead to irreversible phase transitions associated with the allocation of gas. This article discusses a comprehensive assessment of the well test structure of the reservoir, an approach to estimating the aquifer. In the joint work of the wells, there is a parallel influence between the boreholes and the interference of the pressure through the well. In relation to the relationship and response value, the "total" capacity was calculated and the areas with the greatest influence of the aquifer were identified, and the geological relationship of the neighboring Wells was refined. Similarly, the rate of pressure drop in the work of the aquifers has been calculated and conclusions reached. A conceptual strategy has been developed for reservoirs of similar abundance in order to reduce prematurely the risks of reduced reservoir pressure. In addition, the latest achievements in the field of hydrodynamic studies of wells designed for the study of horizontal wells with multistage hydraulic fracturing in a low-permeability reservoir will be presented.

Speaker Biography

Kovalenko Igor Victorovich working as the Head of programs of Nadym-Pur-Tazovskiy region (projects: Yamburg, Pestsovoe, En-Yaha, and Arcticgaz) in GAZPROM NEFT Science & Technology center, Tyumen city, Russia. And he also involved in Management of projects Yamburg, Pestsovoe, En-Yaha, and Arcticgaz in the area of geology and reservoir engineering and Building efficient interactions between license holders of these oil and gas fields and science & technology center.

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Microbial origin biosurfactants in Enhanced Oil Recovery and their production strategies: A review

Tapas Medhi and **Saurav Haloi**
Tezpur University, India

Microbial enhanced oil recovery (MEOR) is an alternative to EOR methods having advantages like low toxicity, bioequivalence, biodegradability, and economic feasibility for field implementation. The in-situ and ex-situ production of microbial metabolites and their application in laboratory scale study as well as in actual oil field condition, have their own merits and demerits, which require a multidisciplinary effort comprising of tools from Geophysics, Microbiology, Biochemistry, Soil Science, Chemical Engineering and Mechanical Engineering. Biosurfactants are amphipathic substances produced by a group of microbes like *Bacillus sp., Pseudomonas sp., Alcaligenes sp., Achromobacrers sp., Burkholderia sp., Clostridium sp., Rhodococcus sp*., etc., which play an imperative role in effecting efficient enhanced oil recovery through surface and interfacial tension (IFT) mitigation, wettability alteration, and viscosity reduction to increase permeability, etc. But, the main drawbacks to using biosurfactants of microbial origin in MEOR are their higher production cost and low production rates. Therefore, in this article, we primarily focused on different biotechnological approaches for incrementing biosurfactant production. Also, we have summarized the success story of biosurfactant based MEOR technology in laboratory scale as well as in the field scale highlighting the economics crude oil recovery.

Speaker Biography

Tapas Medhi is currently working as Assistant Professor of Biochemistry and Bioprocess Engineering in the Department of Molecular Biology and Biotechnology, Tezpur University, Assam, India. He received his PhD from the Indian Institute of Technology (IIT), Kharagpur, India. He completed his Master of Science in Agriculture from the College of Agriculture, Assam Agricultural University, India. He then worked at the Institute of Biochemistry, Leipzig University, Germany as Postdoctoral Fellow in a DFG funded project on "Functionalisation of Hydrocarbons" for two years and as Assistant Professor at Tezpur University in India since 2006. He also acted as Head of the Oil and Natural Gas Corporation Ltd (ONGC) sponsored Centre for Petroleum Biotechnology (CPBT) for a three years term. He has authored several publications in various journals. His publications reflect his research interests in Cytochrome P 450 Biochemistry, biopesticides and bioremediation of crude oil contaminated soil. He is currently in charge of two ongoing scholarly projects on Phytoremediation and Microbial enhanced oil recovery.

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A comprehensive study on causes of oil spills and remediation

Ansh Kapoor
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Objectives/Scope: This review describes the recent progress concerning oil spills caused due to carelessness of workers, crashing of systems, natural disasters or vandalism, etc. by incorporating remediation techniques based on applications of super hydrophobicity, superoleophobicity and surfactants.

Methods, Procedures, Process: A number of preventive measures are discussed in this study that includes- treatment of oil spillage using temporary floating barriers/booms, scattering of oil by dispersants or emulsifiers, development of nano fibrillated cellulose sponge that soaks up oil and omits water, natural disintegration of oil by bacterial species present in Spartina plant tissues, dispersion of lodestone particles that stick to the oil and isolate it from water through magnetism, development of MnO2 coated inverse wetting meshes or of Cu surfaces with laser induced micro holes and CuO nanowires, biosorption involving Nao materials that help in getting rid of spilled oil, etc.

Results, Observations, Conclusions: Oil spill causes heavy economic loss and has long term effects on ecological system along with habitation and vegetation at coastal regions. The oil slick blocks the pathway of oxygen and harms the aquatic life. The dispersed oil combines with marine snow and form oil-related marine snow which is larger than natural marine snow and is consumed by aquatic animals, this leads to oil sedimentation. Exposure to chemicals during the containment process can cause cardiac arrest or arterial congestion in workers. Some other hazardous effects may include exposure to crude oil that causes heart electrophysiology dysfunction and nervous system breakdown in fish and collection of crude oil in intertidal region that intoxicate the intertidal species.

Novel/Additive Information: An oil tanker spilled 240-260 million gallons oil, near Kuwait as a result of deliberate act by Iraq. Environmental Protection Agency (EPA) in the US handles law enforcement regarding oil spillage. Most laws established by it carry criminal charges. The International convention for prevention of pollution caused by ships set in 1973, modified by the protocol of 1978 which is MARPOL, governing marine pollution via discharge or spillage comes under an International regulation.

Speaker Biography

Ansh Kapoor pursuing B.Tech in petroleum engineering and STPO (Student Training & Placement Officer) at DIT university, India. He completed summer internship at Directorate General of Hydrocarbons and completed IWCF Level 1 Programme with 99.17% (793.33 out of 800 marks). He secured 3rd position in Transcendence (Paper presentation) during JIGYASA 2019, the Annual Colloquium of UPES FIPI Student Chapter. He was the Campus ambassador for JIGYASA 2019, the Annual Colloquium of UPES FIPI Student Chapter.

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