GIS For Petroleum: Case of UAE University

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Oil revenues represent the main source of national income in UAE and this indicates that large number of jobs is available in this sector. Generally, the field of petroleum industry is dominated by geology and engineering graduates. The Geography Department at the College of Humanities and Social Sciences, UAE University had renovated its curriculum recently to meet the market demand. Among the vibrant and promising markets that had been identified is the field of petroleum industry and based on this a new course entitled “GIS for Petroleum” was introduced. Although the course opens new job opportunities for geography graduates there are some problems related to a suitable textbook that fits the course, heterogeneity of students enroll in the course, language constraint, difficulty in obtaining local petroleum data to train students on, the need for specialized GIS and subsurface 3D software, and harshness of the petroleum environment. Meetings with customers (where graduates seek employment) helped in reshaping the course to meet the skills needed by the market. This paper will share experience on teaching GIS for petroleum course.

Biography:
Yagoub is an Associate Professor of Remote Sensing and GIS at the Department of Geography, UAE University. He is the chair of Graduate Studies at the Department (2015-2017), Chair of the Department (2005-2007), and Director of the Master Program of Remote Sensing and GIS at the UAE University (2002-2005). He teaches various courses related to GIS/GPS/Remote Sensing. Dr. Yagoub supervised nine master students in the Remote Sensing and GIS Master program during the period 2007-2014 and one PhD student (2015-2017). He secured many research grants related to the application of GIS and remote sensing. His scholarship work is indexed in Scopus and in the American Society of Civil Engineers Abstracts CSA/ASCE Illumina. He is a referee for many organizations/journals such as Emirates Foundation and Qatar National Research Fund.
Accumulation trend of dispersed petroleum products in filter feeder organism:
(Mytilusgalloprovincials L., 1819)

Fatma Telli Karakoc* and Güldeniz Karadag*
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Petroleum hydrocarbons in aquatic environments have different origin such as biogenic, natural and anthropogenic. The amount of oil in the sea may vary from small amount and continuous spill to large amounts and sudden spill. According to the spill amount, ecological and biological interaction and reaction of the environment may change from catastrophic sudden damage to the chronic, long lasting damage. The first contact of petroleum to organisms start from outside of the body then move through inside of the body. During this biochemical process of the petroleum products could be sometimes end up with cell damage and cell death. The effects of the petroleum products, dispersant and dispersed oil were very harmful for living organisms. In the present study, the ecological effects of spilled fuel oil and dispersed-fuel oil on mussels were studied under the laboratory condition for the showing adhesive effect of the dispersed diesel oil. Accumulation differences among diesel oil and dispersed-diesel oil of mussels were investigated in the laboratory conditions with three repetitive experimental design. Mussels were exposed with diesel oil and dispersed-diesel oil for 5 days. As a result, dispersed-diesel oil were more suitable for accumulation by mussel than diesel only. The stability of the dispersed diesel oil in the aquarium were more longer than diesel oil itself.

Biography
Fatma Telli Karakoc is a scientist at Karadeniz Technical University Marine Sciences Faculty. Her main research interests are marine pollution and ecotoxicology. She received her PhD on "carcinogenic effects of polycyclic aromatic hydrocarbons on fishes and changes their physiological responses". After that, she has concentrated on illegal discharges from ships and marine pollution based on petroleum hydrocarbons and emergency response for the accidental spills

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Experimental and theoretical analysis of a supercritical carbon dioxide jet on wellbore temperature and pressure

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Shale gas is considered to be one of the best clean alternative fuels with the most potential because of large reserves all over the world. However, hydraulic fracturing, a widely-used technology in shale gas exploitation, may cause serious environment issues. Therefore, the application of supercritical carbon dioxide (SC-CO2) instead of water to fracture shale has been mentioned. To investigate the use of a SC-CO2 jet on the wellbore pressure and temperature, a series of experiments based on impinging theory have been conducted in the present study. In the first experiment, a specially designed apparatus with four visual windows was used to intuitively observe the jet's structure and character with a high-speed video system recording the entire experimental process. In the second experiment, a high precision sensor was assembled in the vessel to measure the impinging pressure. The result shows that: (1) a SC-CO2 jet has a similar structure as a water jet, while a SC-CO2 jet dissipates slowly due to its low viscosity; (2) the impinging pressure increases with the increasing jet pressure, but the increasing rate is different because dissipation ratio decreases; (3) the ambient pressure affects the jet energy transfer rate though flow resistance and the ambient density. Under present experimental conditions, the critical pressure is 14.5 MPa; (4) a predictive equation is listed to calculate the impinging pressure based on the jet pressure and ambient pressure. These results help optimize the parameters of the SC-CO2 jet and promote the application of SC-CO2 in shale gas exploitation.

Biography

Yi Hu services as a researcher at Hubei Key Laboratory of Waterjet Theory and New Technology, Wuhan University, Wuhan 430072, China. His research interests focus on shale gas and coal bed methane exploitation by Supercritical Carbon Dioxide (SC-CO2)

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Impact of biodiesel and Ethanol on fossil fuel droplets in IC engines

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The importance of modelling the multi-component fuel droplets heating and evaporation has been recognised in many studies within this field. Studies on the heating and evaporation of automotive fuel droplets are crucial to the design of internal combustion engines and to ensuring their good performance. Accurate modelling is essential to the understanding of these processes and ultimately to the improvement of engine design and reducing emission. The interest in fossil/biodiesel fuel blends has been mainly stimulated by depletion of fossil fuels and the need to reduce carbon dioxide emissions that contribute towards climate change.

This work presents a review of recent investigations into the heating and evaporation of multi-component blended fuel droplets in real IC engine conditions. The models consider the contribution of all groups of hydrocarbons in fossil fuels and methyl esters in biodiesel fuels. Diffusion of these components, temperature gradient, and recirculation within droplets are accounted for. The original modelling approach is based on the analytical solutions to the heat transfer and species diffusion equations, which is validated against experimental data.

The key features of new application to the analysis of blended-fuel droplets in engine-like conditions is described. In this review, up to 20 types of biodiesel fuels with up to 21 methyl esters and 98 components of hydrocarbons are considered, accounting for the differences in their levels of saturation, and thermodynamic and transport properties.

Biography
Mansour Al-Qubeissi (BSc Hons, MSc, MPhil, PhD, PGCert HE, FHEA, CEng MIMechE, SM IAENG) is a Senior Lecturer in Fluid Dynamics with expertise in CFD development and modelling of thermal-fluid applications. His research efforts have resulted in dissemination of 62 publications in internationally refereed journals, conferences, workshops and two monographs. His career accumulates above 10 years in research, 5 years in industry, and 5 years in academia.
Development and industrial application of high liquid yield delayed coking technology

Aiguo Lin, Zhang Dongming
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Delayed coking process is one of the efficient methods to convert heavy oil to lights. Generally vacuum residue is fed into the delayed coking unit as feed stock, in which it is cracked to reject carbon to produce rich gas, gasoline, diesel, and gas oil. Coke is produced as by product. There is no limitation on feed stock property for delayed coking process.

As the crude oil resource is becoming heavy and poor in the world, the volume of heavy oil for refinery is becoming large. Therefore, delayed coking process for heavy oil is especially concerned. PetroChina Petrochemical Research Institute has finished research work on high liquid yield delayed coking technology for poor heavy oil, and the process is used in industrial units. The results from industrial units show that the liquid yield is increased by 1-3%wt, and the coke yield is decreased by more than 1.0%wt.

Biography
Zhang Dongming, is a Principal Engineer at Petrochemical Research Institute(PRI), PetroChina, Beijing, China. He is engaged in R&D of heavy oil processing. He has issued 6 national patents. He has published 6 articles in international journals.
Solid acid-base and redox heterogeneous catalysts in petrochemical reactions.

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Most of the industrially important organic transformations especially those in petrochemical industry are catalyzed reactions. Applications of heterogeneous catalysts in petrochemical industries outweigh those of homogeneous catalysts, due to several advantages of the former associated with low cost of the process and environment compatibility. There are several industries/companies all over the world, who have invested heavily on research and development of catalytic process, implying the importance of catalysis in industry. Heterogeneous catalysis research in general encompasses three broad areas: preparation/synthesis of catalytic materials, characterization of materials and investigation on their catalytic activity. Some of the important types of materials that have been extensively investigated for their catalytic activity in petrochemical industry include Zeolites, Mesoporous solids (MCM-41, SAPOs etc.), HPAs, Clays, single/binary metal oxides and their modified forms. The petrochemical processes catalyzed by these material are of different kinds: such as selective oxidation of hydrocarbons, alkene hydrodeformylation, deep desulphurization of petroleum fractions, hydrotreating and O-xylene isomerisation, ethanol to olefins, ethyl benzene oxidation, FCC light oil gasoline etherification etc.

The catalytic performance of the heterogeneous catalysts depends on several of their pre and post synthesis modification as well as on their intrinsic acid-base and redox properties. In the present presentation it is propose to highlight the basic structural features of a few solid catalysts, which contribute towards their catalytic activity, by taking results from some of our own research works.

Biography:
N. Nagaraju, is a professor of Chemistry at St.Joseph's college Research centre, Bangalore India. He has 30 years of research experience in the area of heterogeneous catalysis. He has guided 9 Ph.D students and has been teaching Post graduate and graduated students, various topics of chemistry He did his postdoctoral research at Namur University, Belgium. He has published more than 80 research articles and has two patents to his credit.

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Numerical study of $\text{Al}_2\text{O}_3$ nanofluid coolant for pebble bed reactor

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Recently nanofluids have been investigated as coolants for chemical and nuclear reactors. In this work, a thermal-hydraulic investigation of $\text{Al}_2\text{O}_3$ nanofluid as a coolant in a pebble bed reactor core has been performed using a porous media approach. Three different volume fractions of $\text{Al}_2\text{O}_3$ have been employed for the numerical simulation. The pebble bed reactor is a kind of packed bed reactors whose core is a long right circular cylinder with a height of 4.5m and an outer diameter of 3.7 m. The finite volume method was used to solve the governing equations using ANSYS FLUENT 14.5. Several important thermal hydraulic parameters have been investigated consisting of the coolant and solid temperatures, thermal conductivity of the packed bed, and the coolant temperature. Results show that the heat transfer increases with nanoparticle volume concentrations. The conclusion of the analysis is that the nanofluids would be suitable coolants for using in pebble bed reactors due to its heat transfer characteristic.

Biography
Masoumeh Sadat Latifi is an instructor at Kish Institute. She did her research at Amirkabir University of Technology. She has published several research articles, one handbook in mechanical and chemical engineering field. She has been serving as a reviewer for reputed journals like Powder Technology and Thermal Engineering.
Imaging techniques in Oil-Water and Air-Water Multiphase flows in Pipelines

Vivek K Premanadhan
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Ubiquitous in flowlines, multiphase flow has been onerous to operators and researchers alike. Posing several flow assurance challenges, progress in multiphase flow has eluded engineers for decades. The advent of innovative measurement techniques and improved computational capabilities harbinger augmented understanding in this field.

Multiphase research at National University of Singapore, is centered around 2 experimental facilities, one for industrial scale testing (3-Phase loop) and another for a finer laboratory scale testing (HO loop). The 3 phase loop is first of its kind in Asia Pacific, boasting testing capabilities of high flow rate, high pressure of oil, water and air, scalable to 1”, 2”, 4” and 6” stainless steel pipelines. The HO Loop, constructed entirely out of transparent acrylic, possess finer flow control and a myriad of instrumentation capabilities including high speed camera, laser doppler velocimeter, conductance measurement, pressure drop and quick closing valves. Image processing software developed in-house were deployed for measurements on the flow line. Advantages of this technology is inherent non-intrusiveness and applications where conductance and conductivity measurements fails due to fluid adherence.

Experiments were conducted into flow regimes where flow assurance softwares such as OLGA and PIPESIM, strain to give accurate results. High speed photography and image processing techniques facilitated flow pattern identification and characterization of transitional states. Interfacial deformations under steady and unsteady conditions of oil-water and air-water flows were captured using this tool, facilitating further quantification, which shall be presented, providing refreshing data for engineers and academicians alike.

Biography
Vivek Premanadhan is a Research Scholar at National University of Singapore. He did his B.E. (Hons) from BITS Dubai after which he pursued his M.Eng. in NUS specializing in offshore and subsea engineering. Working as a research engineering he designed and constructed the Heavy Oil Facility in NUS. In 2014, he joined as a PhD student under A/Prof. LOH Wai Lam, with prime research interest into oil-water transport in pipelines.
Energy gap analysis in production and desalination of crude oil field

Aminreza Ansari
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This study contributes the energy consumption of oil production in operational field. Process evaluation and industrial results illustrate that crude oil density or API, water cut (BS&W), hydrogen sulfide content, Gas to Oil ration, ambient temperature and type of process technology play significant role in energy consumption per ton of crude oil production. Data gathering of these parameters through different seasons has been obtained in an Iranian crude oil field (Asmari 4). The more underestimating of some conceptual factor, the more comprehensive large gap in energy consumption gained during the production of crude oil; which include disregarding sustainable solar and wind energy, non on time routine equipment check, non-optimized energy auxiliaries and non-scheduled flaring. Finally, in this study the regression and Pierson of main parameters has been reported to depict the SEC fluctuation and its effect on CO₂ emission, too. Not only, does this article emphasize on the opportunity to make the oil production more sustained profitable; but it also consider the potential to reduce environment pollution as a case study.

Biography
Aminreza Ansari is an Expert Process Engineer at Iran Petrochemical Company. He is PhD student at Iran University of Science & Technology. He has published more than 30 research articles, tutorials' and edited industrial report. He has carried out the optimization and evaluation of more than 20 petroleum plants. He is lecturer of Technical and Vocational University and lecturer and designer of new training presentation for industry and graduated engineers.
Ultrasound technologies for enhanced oil recovery in production and transportation

Mikhail Pavlov
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1. Objective and Scope
Purpose of work is to describe current methods for ultrasound oil well stimulations and possibility of ultrasound pipelines cleaning from asphaltene-paraffin deposits. This study based on theoretical process analysis, experimental investigations and field tests.

2. Methods, Procedures, Process Paraffines, asphaltenes, particles and other wellbore damage are plugging pore spaces. Oil wells are not producing at their potential capacity. Deposits are plugging inside surface of pipelines, what reduces their efficiency as well. By application of ultrasound, the cleaning mechanism of micro acoustic streaming begins in the pore space. The ultrasound’s high power disrupts the adhesive forces that hold the particles in place. Consequently, these particles get removed. Pore space and initial permeability are restored, resulting in an increasing oil flow and cost-effective production and transportation.

3. Results, Observations, Conclusions
In this work is proven that ultrasound:
- Remove paraffines, wax and asphaltenes deposits;
- Destruct salt formations in the capillaries;
- Reduce surface tension in the capillaries;
- Destruct colloid formations;
- Decontaminate borehole;
- Might be used for pipeline cleaning;
- Might be used for tank cleaning.
Field tests has shown real increase of oil production.
Pipeline application is possible, but new type of system required for more efficiency results.

4. Novel/Additive Information
Field tests demonstrate that theoretical and experimental studies are right, but should be improved.
According to current rules and regulations number of possible technologies for oil well stimulation is decreasing. The biggest advantage for petroleum industry is that this technology completely environmentally friendly.

Biography
Mikhail Pavlov is a scientific researcher at Petroleum Engineering, Mining University Leoben. He did his master in Oil and Gas Pipeline Engineering at Ufa Petroleum Technological University. After working as an engineer, he started his PhD at Mining University of Leoben. Nowadays he is supervising several projects in application of ultrasound for Petroleum Industry and holding lectures at University.

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Completion difficulties and countermeasures for HPHT and sour gas well with high-production in Anyue gas field

Li Yufei
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For safe and efficient development of the sour gas reservoirs of the Cambrian Longwangmiao Fm in the Anyue Gas Field, and reduction of safety barrier failures and annulus abnormal pressure which are caused by erosion, corrosion, thread leakage and improper well completion operations, a series of studies and field tests were mainly carried out, including optimization of well completion modes, experimental evaluation and optimization of string materials, sealing performance evaluation of string threads, structural optimization design of downhole pipe strings and erosion resistance evaluation of pipe strings, after the technical difficulties related with the well completion in this reservoir were analyzed. And consequently, a set of complete well completion technologies suitable for HTHP and high flow rate gas wells with acidic media was developed as follows. First, optimize well completion modes, pipe string materials and thread types. Second, prepare optimized string structures for different production allocation conditions. And third, formulate well completion process and quality control measures for vertical and inclined wells.

Field application results show that the erosion of high-flowrate production on pipe strings and downhole tools and the effect of perforation on the sealing performance of production packers were reduced effectively, well completion quality was improved, and annulus abnormal pressure during the late production was reduced. This research provides a reference for the development of similar gas fields.

Biography
Li Yufei, born in 1981, senior engineer, graduated from Southwest Petroleum University in 2007, oil and gas engineering professional, mainly engaged in oil and gas well completion, well integrity and workover research, has published more than 20 papers, written 2 books.

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Use of correlation fractal dimension signatures for understanding the overlying strata dynamics in longwall coal mines

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The longwall mining is considered to be the major coal mining practices due to vast recovery of coal over other forms of underground as well as opencast mining methods. A main concern in this method is roof rock cavability behaviour. A reliable prediction of the roof strata behavior of longwall workings has always been a challenge. Irregular caving and sudden failure of roof rock, which are very hazardous for mine workers and equipment. Usually these are major problem faced by bulk of Indian longwall faces and which are due to the presence of thick sandstone beds as overlying strata. Thus to keep an eye on the rock sudden failure, it is very necessary to monitor the stressed zones in the hanging overlying strata above and behind the panel. Earlier Correlation Integral ‘C’ and Correlation Fractal Dimension ‘Dc’ has been very helpful in monitoring the stressed zones for several great earthquakes in past. Following the same way, in the present study we have used the mine-induced microseismic data obtained from the retreating longwall panel using various monitoring instruments to calculate the Correlation Fractal Dimension ‘Dc’ for monitoring the stress levels and fractures in the overlying strata and also for spatio-temporal forecasting of roof-falls. The variation of blast charge size with Fractal Dimension is also studied. The use of Fractal Dimension has been very effective in obtaining the precursory signatures for roof-fall, thus ensuring safety in the mines.

Biography

P. K. Behera is an associate professor of Mining Engineering at the Indian Institute of Technology (Indian School of Mines), Dhanbad, India. He has been involved in research, consulting and education for more than 38 years at various organizations. Having worked for a short spell with Coal India Ltd, he joined Indian School of Mines, Dhanbad. Subsequently he joined B.H.U. Varanasi as a faculty member and shifted to the Indian School of Mines. He worked as Dy. Chief Scientist at Bharat Gold Mines, KGF as well as a Deputy Director at National Institute of Rock Mechanics, KGF, India. He is the author or co-author of several scientific papers published in international and national journals and conference proceedings. His major areas of research interest include rock mass characterization, strata control, support design, and stability assessment for underground & surface structures in rock. He has contributed to the industries and government through various sponsored courses and consultancies.

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Experimental investigation of CO\textsubscript{2} removal from gas mixtures using membrane contactor system

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Several techniques have been used to minimize the emission of Carbon Dioxide (CO\textsubscript{2}) from Natural Gas. An alternative technique for the conventional gas absorption is Gas–liquid hollow fiber membrane contactors (HFMCs). Experiments were carried out to investigate the performance of high pressure modules containing polytetrafluoroethylene (PFA) membranes, similar to shell and tube heat exchangers. The mixture of gas (5% CO\textsubscript{2} and 95% CH\textsubscript{4}) was fed to the tube side of the membrane module, whereas, different solvents (MEA, DEA, EDA, DETA and NaOH) were used in the shell side of the module in a counter current arrangement. The transport of CO\textsubscript{2} through the membrane modules was investigated as a function of gas and liquid flow rates, solvent types and concentrations. The results showed that CO\textsubscript{2} removal increased with increasing the liquid flow rates and decreasing gas flow rates. In addition, the CO\textsubscript{2} removal was enhanced with increasing the solvent concentration. DETA showed better removal efficiency among the solvents used.

Biography
Farah O. S. Abu Hatab is a research assistant at UAE University who has been working on CO\textsubscript{2} capture using Gas–liquid hollow fiber membrane contactors (HFMCs).

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Effect of pH and Temperature on CO$_2$ Capture and Brine Salinity during CO$_2$ Reaction with Reject Brine

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The CO$_2$ capture efficiency and brine salinity reduction at different pH values and temperature ranges for the traditional and the modified Solvay processes have been studied using a novel gas-liquid contactor system. The use of different concentrations of ammonium hydroxide and calcium oxide allows investigating the reaction efficiency up to pH = 11.2 and 12.1, respectively. The buffering capacity of calcium oxide was found to exceed the buffering capacity of ammonium hydroxide at the same buffer (NH$_4$OH/CaO) concentration and temperature. The maximum reaction efficiency can be related to the effect of buffering reagents by shifting the reaction towards bicarbonate formation.

In addition, controllable water circulation through the jacket of the gas-liquid contactor system was performed in order to demonstrate the effect of temperature on CO$_2$ capture and brine salinity reduction. The results showed the CO$_2$ solubility in the brine and hence the reaction with dissolved salts to form salt bicarbonate increased when decreasing the temperature. At the same time, reduction in the temperature reduces the solubility of sodium bicarbonate and consequently enhances salinity reduction.

Biography

Ameera Mohammad has been working on CO$_2$ capture and reduction of water salinity as a research assistant at UAE University since 2011. This was part of her Master thesis and now continuing in the same area for her PhD. She has published numerous journal papers and made many conference presentations in this area.

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Desulfurization of diesel using biomass

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In today's world, environmental regulations have been introduced by many countries around the world to reduce sulfur content in liquid fuels to low levels with the intention of improving air quality. Beginning in 2001, the U.S environmental protection agency passed rules requiring use of ultra-low sulfur diesel fuel. To protect the environment most of the countries have limited their sulfur content up to 10 ppm. In India, sulfur level in fuel less than 50 ppm in capitals and 350 ppm sulfur in the rest of India. Generally, a liquid fuel contains a mixture of hydrocarbon with small amount of sulfur compounds, present in the form of free sulfur, sulfides, disulfides, mercaptan, thiophene, benzothiophene, dibenzothiophene etc. The sulfurous materials have many direct and indirect negative effects on the environment and the economy. Combustion of sulfur compounds result in air pollution, acid rain as well as cardiovascular disease, cancer and asthmatic symptoms in human health etc. Desulfurization is a process which involves reducing the sulfur content in liquid fuels. Currently existing methods for desulfurization are hydro desulfurization, oxidative desulfurization, adsorptive desulfurization, bio-desulfurization and extractive desulfurization.

The present commercial desulfurization methods have the major disadvantage like critical operating conditions, expensive catalyst and require high initial cost. Adsorptive desulfurization is the only alternative method for effective removal of sulfur from liquid fuels. Desulfurization by adsorption is a process that depends on the ability of a solid sorbent to selectively adsorb organo sulfur compound from fuels. Various adsorbents like natural, synthetic, carbon based, non carbon based, nano materials were used. Sulfur removal from diesel oil has been the big challenging task over last decades. In this study, Tamarindous indica shell powder was used as an adsorbent for effective removal of sulfur from diesel. The prepared shell powder was characterized by FTIR- Spectral analysis.

The effect of various conditions such as adsorbent dosage, contact time & temperature were studied in this work. By using 3 gm of Tamarindous indica shell powder for 100 mL of diesel, the removal efficiency was achieved 72 % at 38°C for 0 to 60 minutes. The adsorption behavior was studied on the basis of adsorption isotherms and kinetics. The equilibrium data were fitted to the Freundlich isotherm and pseudo second order model. This study provides the effective and economical adsorptive desulfurization process for sulfur removal from diesel. Such as the concentration of the adsorbent increases the amount of sulfur removed or adsorbed also increases but the uptake capacity of the adsorbent per gm reduces. The amount of sulfur adsorb also increases with the increasing time. The amount of sulfur adsorb decreases as adsorption is an exothermic process, where as with the size of adsorbent, as small as it is the more adsorption will take place. Thus, desulfurization of diesel by adsorption process using Tamarindous indica shell powder shows a reduction in amount of by more than half of the original amount of sulfur.

Biography
Vanrajsinh Gadhai is a student at Pandit Deendayal University, India. He is pursing his Bachelores in Technology in Petroleum Engineering (Downstream)

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Efficient Algorithm for modeling asphaltene phase behavior using PC-SAFT equation of state

Ali AlHammadi
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A new algorithm is presented for modeling asphaltene phase behavior using the Perturbed Chain version of the Statistical Associating Fluid Theory Equation of State (PC-SAFT EoS). The new algorithm enables a quick and efficient optimization of parameters required to predict asphaltene phase behavior in case of enhanced oil recovery. Such approach is useful especially in cases of parallel optimizations which are otherwise lengthy and complex. Previous work have shown crashing errors of existing thermodynamic simulators. The current paper aims to automate the characterization to be implemented side by side with PC-SAFT EoS without the need to depend on a background simulator. Simulation results for 6 crude oils with different gas injections are presented in the paper.

Biography:
Ali Al Hammadi received his B.Sc. in Chemical Engineering (CE) from the Petroleum Institute, Abu Dhabi (Honors with Distinction, 2011) and received his PhD from the Department of Chemical and Biomolecular Engineering (CHBE) at Rice University, Houston, TX, U.S.A. (2016). His research is focused mainly on the challenges facing the oil industry as more heavy crude oils are produced; in particular, the clogging of wellbores, chocks, pumps and reservoirs caused by the presence of asphaltene. The effect of asphaltene is an example of how both the thermodynamics and kinetics can contribute to a problem. On the thermodynamic part, it mainly concerns with how asphaltene presence in a mixture or crude oil can affect the phase behavior and PVT properties. On the kinetics part, it mainly emphasizes the precipitation, aggregation and deposition interactions and the prediction of the extent of such deposit.
Innovative underwater robotic vehicle for offshore petroleum exploration and environmental evaluation

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One of the safest and most efficient ways to explore and operate in deep marine environments is through underwater robotics systems where they become the diver's eyes and hands without jeopardizing the diver's safety or the aquatic life. Submersible technologies, such as Remotely Operated Vehicles (ROV), can safely explore and work around oil, sewage and other industrial words. An ROV’s motion can be classified as either autonomous or manual operation, depending on the operator’s degree of input.

This project aspires to enable an innovative automated robotic vehicle that was designed, engineered and constructed at Khalifa University of Science and Technology to tackle the safety challenges faced by offshore petroleum exploration and environmental assessment of fields. Current methodologies are associated with health and occupational hazards in addition to high cost. The remotely-operated robot is equipped with an end effector that will ignite Ni-Al reactive multilayers (Nanofoil®) which are structurally modified with holes that will increase the integrity of the welds created. Innovative technologies are transferred to a startup business incubated for marine operations. This multi-disciplinary, inter-institutional project aims at world research leadership in robotic assisted operations of offshore platforms.

Biography
Abdelaziz Alzaabi holds a BSc. Of Mechanical Engineering from Khalifa University of Science, Technology & Research (KUSTAR). He is a Graduate Research Assistant focused in various underwater robotics design and manufacturing for industrial purposes. He led a team to develop and design the first Remotely Operated Underwater Vehicle (ROV) – Observation Class- that was completely engineered and manufactured in the UAE. Abdelaziz also is a recipient of Society of Petroleum Engineering (SPE) award 2016 for Oil and gas innovation. HH Sheikh Khalifa Award for excellence in academic achievements, Gold medals of the local Chemistry and Physics Olympics, H.H Sheikh Hamdan Bin Rashid Award for Excellence in academic performance, Sharjah Award for excellence in academic achievements. Currently, Abdelaziz is undertaking his MSc of Mechanical Engineering at KUSTAR and is working to develop an underwater remotely operated robot that will actively assist in the offshore Oil and Gas sector.

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Operating experiences of Glycol inhibitor for hydrate and dew point control in gas production facility offshore and onshore

Atef Abdelhady
British University in Egypt

Glycols are widely used to prevent hydrate formation in subsea pipelines and in the gas processing industry to control dew point. Operating experiences of Diethylene glycol and monoethylene glycol for preventing hydrate in gas pipelines and dew point control have been performed to evaluate the unexpected operational problems in gas processing system. Field test and laboratory experiments were carried out to investigate the type of glycol, the fluid solidification condition for Monoethylene glycol and Diethylene glycol in the presence of hydrocarbons and salts. Results led us to make modification in the gas plant and choose the right type of glycol with optimum dose to simplify operation and save costs in gas processing in Egypt. This paper covers all aspects of the process from type of glycol to nozzle placement and locations in low temperature separators to enhance the performance and quality control of gas processing. This study will address the operational issues with practical solutions are presented. These deals with glycol contaminated by a high salt content from completion fluids and hydrate formation in offshore gas line, design modification to process equipment and changing from DEG to MEG for sales gas specification. This paper also addresses the proper glycol type to fit gas composition, proper glycol injection rates, nozzle sizing, placement and location according to actual field data not textbook data that is central in the designed recommended process parameters.

Biography

Atef Abdelhady is Academic staff in the British University in Egypt. He holds a B.SC. and M.S degree in Petroleum Engineering. He holds a PhD degree in the specialty of Petroleum Production Engineering. He has 40 years in oil and gas industry as a manager for all activities associated with treatment and processing of oil and gas onshore and offshore locations. Also during my carrier in oil and gas business was responsible to transfer field experience to all engineers and others. I represent Egypt in oil and gas conferences outside Egypt as speaker. An SPE active member for more than 35 years. During his career, he has authored several technical papers in Egypt and USA. He has been selected as a qualified candidate for inclusion in the 1998 edition of International Who’s Who Membership. He has training skills and experience inside and outside Egypt. He has 25 year in oil and gas condition in gas&oil fields offshore and onshore. He has many years in oil and Gas activities advance safety technologies to enhance and optimize operations. Did some workshop for Society Petroleum Engineering in production optimization in Egypt and Kuwait.
Nuclear magnetic resonance relaxation time as a diagnostic parameter for reservoir characterization

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Field observations have been reported and stratigraphic column was constructed. Porosity was measured and permeability was calculated from capillary pressure data. Transverse nuclear magnetic resonance relaxation time was derived from capillary pressure data. NMR fractal dimensions were calculated. Based on the results the sandstones of the Shajara Reservoirs of the Shajara Formation of the Permo-Carboniferous Unayzah Group were divided here into three units. The obtained units from base to top are: Lower Shajara Nuclear Magnetic Resonance relaxation Time Fractal Dimension unit, Middle Shajara Nuclear Magnetic Resonance relaxation Time Fractal Dimension unit, Upper Shajara Nuclear Magnetic Resonance relaxation Time Fractal Dimension unit. It was found that the permeability increases with increasing relaxation time fractal dimension.

Biography
Khalid Elyas Mohamed Elameen Alkhidir is a researcher at King Saud University. He did his postdoctoral research at King Saud University, College of Engineering Al-Amoud Research Chair in Petroleum, enhanced oil recovery. He published papers in sandstone reservoirs characterization, tight carbonate reservoirs characterization, and in an enhanced oil recovery.
Legal issues on environmental hazard of petroleum

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Section 37 of the National Environmental Standards and Regulations Enforcement Agency (Establishment) Act 2007 defines "pollution" thus: "Pollution means man-made or man aided alteration of chemical, physical or biological quality of the environment beyond acceptable limits and pollutants shall be construed accordingly." The same Section defines the Environment in this manner: "Environment includes water, air, land and all plants and human beings or animals living therein and the inter-relationships which exist among these or any of them." This is the current legislation governing environmental matters in Nigeria. It repealed the Federal Government Protection Agency Act of 1988 (See Section 36 of the Act) from the above definitions, it is clear that any human intervention which affects the natural state of the environment to such an extent that the society finds it unacceptable, qualifies as pollution. I think that the law does recognise that in our modern industrial society, pollution of some kind or to some degree is inevitable. What is objectionable and intolerable however is that it does not exceed certain limits where it would pose hazardous and deleterious effect on man and his surroundings? And this is what the law aims to prevent or control. Here in Nigeria, there is a constitutional provision which guarantees the protection of the environment by the State. Section 20 of the Constitution of the Federal Republic of Nigeria 1999 states: “The State shall protect and improve the environment and safeguard the water, air and land and wildlife of Nigeria.” This paper discusses the nature, causes and incident of pollution, Global Perspective on environmental, pollution from gas flaring, discharging of hazardous substances establishment of anti-pollution agency for the oil and gas sector in Nigeria. The effects of these operations on the environments were also discussed while the summary and conclusion were also given with a view to assisting the stakeholders, the governments and all the operators in this industry to adhere to the legal norms.

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