

SPE EOR Conference at Oil and Gas West Asia 2012 (OGWA)

EOR: Building Towards Sustainable Growth

**Muscat, Sultanate of Oman
16-18 April 2012**

Volume 1 of 2

ISBN: 978-1-62276-047-3

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2012) by the Society of Petroleum Engineers
All rights reserved.

Printed by Curran Associates, Inc. (2012)

For permission requests, please contact the Society of Petroleum Engineers
at the address below.

Society of Petroleum Engineers
P. O. Box 833836
Richardson, Texas 75083-3836

Phone: (800) 456-6863
Fax: (972) 952-9435

books@spe.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

SPE 150634 - Experimental Study for Optimizing Injected Surfactant Volume in a Miscible Carbon Dioxide Flood	1
<i>Gbolahan Afonja, Richard G. Hughes, Shrinidhi Shetty</i>	
SPE 150938 - Miscible Gas Injection and Asphaltene Flow Assurance Fluid Characterization: A Laboratory Case Study for a Black Oil Reservoir	10
<i>Afzal Memon, Bashar Qassim, Moudi Al-Ajmi, Asok Kumar Tharanivasan, Jinglin Gao, John Ratulowski, Basel Al-Otaibi</i>	
SPE 151126 - Best Practices for Conducting CO₂-EOR Lab Study	26
<i>Fawaz M. Al-Otaibi, Saad M. Al-Mutairi, Sunil L. Kokal, James J. Funk, Jassi F. Al-Qahtani</i>	
SPE 151777 - Supercritical CO₂ Interaction with Montmorillonite Clay	38
<i>Fawaz M. Al Otaibi, Mohammed H. Al Khaldi, Jim J. Funk, Shouwen X. Shen, Jassi F. Al Qahtani</i>	
SPE 151976 - A Cyclic-Steam Injection in Fuyv Reservoir, Daqing	47
<i>Xiuluan Li, Yongbin Wu, Xin Zhao, Panqing Gao, Qingsong Qin, Ming Yu</i>	
SPE 152010 - Studies On Nitrogen Foam Flooding For Conglomerate Reservoir	58
<i>Hou Qingfeng, Zhu Youyi, Luo Yousong, Weng Rui, Jian Guoqing</i>	
SPE 152025 - Colloidal-suspension Flow in Rocks: A New Mathematical Model, Laboratory Study, IOR	63
<i>K. Aji, C. McLindin, A. Saha, K. Le, Z. You, A. Badalyan, P. Bedrikovetsky</i>	
SPE 152978 - Feasibility of High Pressure Air Injection in Heterogeneous Light Oil Reservoir by Thermal Simulation	81
<i>Aarshavi Shah, Kaushal Modi</i>	
SPE 152988 - Novel Method for Characterizing Single-phase Polymer Flooding	105
<i>Wenjie Sun, Fen Li, Yantao Qu, Yaozhong Yang, Kewen Li</i>	
SPE 153216 - Micro-tomographic Characterization of Dissolution-induced Local Porosity Changes including Fines Migration in Carbonate Rock	117
<i>Jafar Qajar, Nicolas Francois, Christoph H. Arns</i>	
SPE 153323 - Simulation Study of Displacement Mechanisms in Microbial Improved Oil Recovery Experiments	135
<i>Mehdi Shabani-Afrapoli, Christian Crescente, Shidong Li, Samaneh Alipour, Ole Torsaeter</i>	
SPE 153343 - Achieving Low Interfacial Tension with Industrial Available Surfactants	146
<i>Guy Biesmans, Luis Salazar, Angie Miller</i>	
SPE 153493 - Non-Petrochemical Surfactant for Enhanced Oil Recovery	161
<i>S. Majidaie, M. Mushtaq, I. M Tan, B. Demiral, S. Y. Lee</i>	
SPE 153869 - Low Salinity EOR in Carbonates	169
<i>J. Romanuka, J. P. Hofman, D. J. Ligthelm, B. M. J. M. Suijkerbuijk, A. H. M. Marcelis, S. Oedai, N. J. Brussee, H. A. Van Der Linde, H. Aksulu, T. Austad</i>	
SPE 153967 - A Reservoir Management System for the World's First Thermal Gas Oil Gravity Drainage Project	185
<i>Keith Rawnsley, Augustine Ilkwumonu, Solemn Bettembourg, Pristwanto Putra, Ibrahim Al-Ismaili</i>	
SPE 153997 - Can Injection of Low Temperature Air-Solvent (LTASI) Be a Solution for Heavy Oil Recovery in Deep Naturally Fractured Reservoirs?	201
<i>Jose Ramon Mayorquin-Ruiz, Tayfun Babadagli</i>	
SPE 154044 - Stable Emulsion and Demulsification in Chemical EOR Flooding: Challenges and Best Practices	219
<i>Duy Nguyen, Nicholas Sadeghi</i>	
SPE 154077 - The Impact of the Injection Water Chemistry on Oil Recovery from Carbonate Reservoirs	228
<i>Ali A. Yousef, Salah Al-Saleh, Mohammed Al-Jawfi</i>	
SPE 154152 - A Simulation Study of Chemically Enhanced Water Alternating Gas (CWAG) Injection	242
<i>S. Majidaie, A. Khanifar, M. Onur, Isa M. Tan</i>	
SPE 154197 - Foam-Oil Interaction in Porous Media: Implications for Foam Assisted Enhanced Oil Recovery	251
<i>R. Farajzadeh, A. Andrianov, R. Krastev, G. J. Hirasaki, W. R. Rossen</i>	

SPE 154204 - Fundamental Investigations into Wettability and Low Salinity Flooding by Parameter Isolation	271
<i>B. M. J. M. Suijkerbuijk, J. P. Hofman, D. J. Ligthelm, J. Romanuka, N. Brussee, H. A. Van Der Linde, A. H. M. Marcelis</i>	
SPE 154293 - World's First Combination Of Acid & Steam Provides A New Dimension To Heavy Oil Enhanced Recovery Process	294
<i>Tarek Shaheen, Wael Hassan, Irfan Siddiqi, Salah Kamal</i>	
SPE 154331 - Potential For Inhibitor Squeeze Application For Silicate Scale Control In ASP Flood	309
<i>Jennifer Sonne, Kirk Miner, Scot Kerr</i>	
SPE 154457 - Water Injection Subsurface Challenges and Reactive Transport Modelling	316
<i>Najma Al Mayahi, Jeroen Snippe, Facundo Rucci</i>	
SPE 154465 - Developing a Layered Heterogeneous Precambrian Reservoir by Polymer Flooding	336
<i>Issa Abu-Shiekh, Robbert A Nieuwenhuijs, Ryan Ross, Gary Lanier, Abdulaziz Belushi, Faisal Saadi, Sami Nofli, Said Harthi, John Van Wunnik</i>	
SPE 154570 - Water-Based Enhanced Oil Recovery (EOR) by "Smart Water" in Carbonate Reservoirs	349
<i>S. Jafar Fathi, Tor Austad, Skule Strand</i>	
SPE 154598 - Biosurfactant Producing Microorganisms and Its Application to Enhance Oil Recovery at Lab Scale	363
<i>E. J. Gudiña, L. R. Rodrigues, J. A. Teixeira, J. F. Pereira, J. A. Coutinho, L. P. Soares</i>	
SPE 154603 - Heavy Oil Secondary Production Optimization - Successful Application of New Horizontal Well Drilling Pattern Strategy and Fit for Purpose Technology in Nearly Obsolete Mature Heavy Oil Reservoir in North East China	371
<i>Ren Fang Xiang, Sun Yan, Yu Tian Zhong, Fan Hong Zhao, Lv Jian Yun, Parlindungan Monris Halomoan, Yang Bin, Xu Chong Hui, Roc Xiaopeng Xie, Wang Ruo</i>	
SPE 154606 - Thermal Development of Thick Heavy Oil Fields: Phase II Development Options, Challenges and Solutions	382
<i>S. M. S. Al-Hinai, J. N. Van Wunnik, M. Thum, S. J. Brissenden, M. Mukmin, S. Nofli, A. Rabaani, J. P. Strauss, M. Al-Breiki</i>	
SPE 154608 - Polymer Trial Using Horizontal Wells: Conceptual Well Completion Design and Surveillance Planning Aspects	401
<i>Mukmin, N. Al-Azri, R. Al-Mjeni, A. Morshidi, S. Douma</i>	
SPE 154616 - Time-Lapse Diffusion Logs to Discriminate Reservoir Oil from Miscible Gas	407
<i>John Edwards, Albina Mutina, Yuesheng Cheng, Jinglin Gao, Edmund Fordham, Denise Freed, Nate Bachman, Sean Dolan, Yaqoob Al Rashdi, Ove Bjorn Wilson, Byron Haynes, Wim Looyestijn</i>	
SPE 154620 - EOR Field Management Through Well-Planned Surveillance	420
<i>Marcel Zwaan, Rob Hartmans, Stan Schoofs, Bert Rik De Zwart, Guillermo Rocco, Rashid Adawi, Faisal Saadi, Khalfan Shua'ili, Jorge Lopez, Joel Ita, Tanguy L'Homme, Tibi Sorop, Yuan Qiu, Paul Van Den Hoek, Fahad Al Kindy, Said Busaidi, John Fraser</i>	
SPE 154625 - Study on High-Concentration Polymer Flooding in Lamadian Oilfield, Daqing	427
<i>Lei Wang, Yingwei Wang, Chengli Zhang, Daiyin Yin, Liping Wang</i>	
SPE 154627 - Enhanced Computer-Assisted Model Calibration of Mukhaizna Heavy Oil Field	434
<i>Taruna Pillai, Agusandi Isdiawan, Dalilah Al Kindy</i>	
SPE 154631 - Challenges and Risk Management Strategy for Enhanced Oil Recovery Projects in Carbonate Reservoirs of a Giant Field in Middle East	457
<i>Muhammad A. Choudhary, Mohamad R. Wani, Ali Al-Mahmeed, Hussain Al-Rashidi</i>	
SPE 154640 - Flow Characteristics of Viscoelastic Polymer Solution in Micro-Pores	470
<i>H. J. Yin, D. M. Wang, H. Y. Zhong, S. Y. Meng, H. M. Jiang, E. G. Tang</i>	
SPE 154659 - Numerical Simulation of Surfactant-Polymer Coreflooding Experiments for Carbonates	479
<i>Abdulkareem M Alsofi, Jim S Liu, Ming Han</i>	
SPE 154665 - Polymer Flooding in a Large Field in South Oman - Initial Results and Future Plans	493
<i>Faisal Salim Al-Saadi, Badr Ali Amri, Sami Nofli, John Van Wunnik, Henri F Jaspers, Said Harthi, Khalfan Shua'ili, Pradeep Kumar Cherukupalli, Ravula Chakravarthi</i>	

VOLUME 2

SPE 154675 - Viscosifying Surfactant Technology for Chemical EOR: A Reservoir Case	500
<i>G. Degré, M. Morvan, J. Beaumont, A. Colin, G. Dupuis, A. Zaitoun, R. S. Al-Maamari, A. R. Al-Hashmi, H. H. Al-Sharji</i>	
SPE 154679 - Improving Sweep Efficiency in Fractured Carbonate Reservoirs by Microbial Biomass	515
<i>R. Al-Hattali, H. Al-Sulaimani, Y. Al-Wahaibi, S. Al-Bahry, A. Elshafie, A. Al-Bemani, S. Joshi</i>	

SPE 154690 - New Frontiers In EOR Methodologies By Application Of Enzymes	527
<i>Tarang Jain, Akash Sharma</i>	
SPE 154702 - Modeling the Geological Controls on Steam Flood Performance; An Example from a Field in South Oman	533
<i>M. R. F. Shaikh, R Al Adawi, H Reiser, G Rocco, F Rodriguez, K Shuaili</i>	
SPE 154704 - Quantitative Remaining Oil Interpretation Using Magnetic Resonance: From the Laboratory to the Pilot	548
<i>Jonathan Mitchell, John Edwards, Edmund Fordham, John Staniland, Romain Chassagne, Pradeep Cherukupalli, Ove Wilson, Rien Faber, Ron Bouwmeester</i>	
SPE 154760 - Using a New Intelligent Well Technology Completions Strategy to Increase Thermal EOR Recoveries–SAGD Field Trial	559
<i>Mark Bedry, Joel Shaw</i>	
SPE 154763 - Improve Oil Recovery for Heavy Oil by Chemical Treatment Implementation as an Alternative, Cast Study Bentayan Field	570
<i>Leksono Mucharam, Wisnu Nugroho, Kunto Wibisono</i>	
SPE 154838 - Improved Oil Recovery by Chemical Flood from High Salinity Reservoirs-Single-Well Surfactant Injection Test	577
<i>Tzu-Ping Hsu, Prapas Lohateeraparp, Bruce L. Roberts, Wei Wan, Zhixun Lin, Xiaoguang Wang, Mahesh Budhathoki, B. J. Ben Shiau, Jeffrey H. Harwell</i>	
SPE 154839 - Macroscopic Recovery Mechanisms of In-Situ Combustion Process in Heavy Oil Fractured Systems: Effect of Fractures Geometrical Properties and Operational Parameters	593
<i>S. Mobeen Fatemi, Riyaz Kharrat, Shapour Vossoughi, Cyrus Ghotbi</i>	
SPE 154992 - The Integration of Miscible Gas Injection in Oil Reservoirs with the Development of a Sour Gas Condensate Field	618
<i>J. M. Vissers, Abdullah Alkindi, A Hassan</i>	
SPE 155059 - Wormlike Micelles for Mobility Control in EOR	627
<i>Mariyami Awang, Azuraen Japper, Iskandar Dzulkarnain</i>	
SPE 155106 - Design of a Surfactant/Polymer Process in a Hard Brine Context: A Case Study Applied to Bramberge Reservoir	635
<i>René Tabary, Frédéric Douarhe, Brigitte Bazin, Pierre Maxime Lemouzy, Patrick Moreau, Mikel Morvan</i>	
SPE 155355 - Evaluation of the Efficient Displacement Pressure in a CO2 Pilot Feasibility Study in a Giant Carbonate Oil Reservoir	648
<i>Cédric Clara, Ahmed Elsayed Ali, Ilhan Sener</i>	
SPE 155390 - Laboratory Investigation of the Injectivity of Sulfonated Polymer Solutions into Carbonate Reservoir Rocks	660
<i>Ming Han, Xianmin Zhou, Fuzeni B. Alhasan, Badr Zahrani, Abdulkareem M. Alsofi</i>	
SPE 155403 - Alkali-Surfactant-Polymer Flooding Pilot Test in Southern Oman	674
<i>Jose Finol, Said Al-Harthy, Henri Jaspers, Ahlam Batrani, Hatim Al-Hadhrani, John Van Wunnik, Martin Stoll, Rien Faber, Alexander De Kruijff</i>	
SPE 155447 - 1D Asphaltene Deposition Simulator for Reservoir Fluids Undergoing Gas Injection	686
<i>Karen Schou Pedersen, Jawad Azeem Shaikh, Claus P. Rasmussen</i>	
SPE 155449 - Modelling and Monitoring Experience on a 3-Year CO2 and Water Injection Pilot in a Mature Carbonate Field	695
<i>Marcel J. Bourgeois, Pascal Gauer, Jerome Long, Catherine Prinnet</i>	
SPE 155454 - Minimum Miscibility Pressure Determination: Modified Multiple Mixing Cell Method	707
<i>Tadesse Weldu Teklu, Shawket G. Ghedan, Ramona M. Graves, Xiaolong Yin</i>	
SPE 155468 - Stretching the EOR Boundaries: Thermal Trial in One of Petroleum Development Oman's Deep Reservoirs Containing Heavy Oil	720
<i>Musallam S. Mandhari, Sulaiman Hinai, R. Hinai, R. Abdkadir, M. Salhi</i>	
SPE 155515 - Design of SWTT at High Salinity and High Temperature: Where are the Limits?	735
<i>Aymen Mechergui, Carolina Romero, Alejandro Ganzo</i>	
SPE 155527 - Process Design Aspects for Taking CO2 Enhanced Oil Recovery Offshore	752
<i>Mohammed Salim, John Harley, Zairin Faizal</i>	
SPE 155541 - Alkaline Surfactant Polymer Flooding To Revitalize Oil Production from a Mature Water Flooded Field	767
<i>M. M. Ansarizadeh, P. M. Weatherstone, J. B. Strong</i>	
SPE 155546 - PDOs EOR Screening Methodology for Heavy-Oil Fractured Carbonate Fields – A Case Study	777
<i>Georg Warrlich, Ibrahim Al-Waili, Dhiya Said, Mohamed Diri, Nabil Al-Bulushi, Jonathan Strauss, Mohammed Al-Kindi, Fahad Al-Hadhrani, Ton Van Heel, John Van Wunnik, Bert-Rik De Zwart, Carl Blom, Rifaat Al-Mjeni, Paul Boerrigter</i>	

SPE 155560 - Investigating Low Salinity Waterflooding Recovery Mechanisms in Carbonate Reservoirs	797
<i>Ahmad Aladasani, Baojun Bai, Yu-Shu Wu</i>	
SPE 155600 - Integrated Surveillance and Modelling to Monitor Risk of Fault Re-activation During Steam Injection	818
<i>Mohamed Hassan Ali Al-Lawati, Fahad Kindy, Said Busaidi, Stan Schoofs, Joel Jacob Ita, Frank Van Der Heyden</i>	
SPE 155608 - Single Well Chemical Tracer Tests - Fast and Accurate Simulations	823
<i>Olaf Huseby, Jan Sagen, Øyvind Dugstad</i>	
SPE 155625 - Experimental Studies of Low Salinity Water Flooding in Carbonate Reservoirs: A New Promising Approach	835
<i>Adeel Zahid, Alexander Shapiro, Arne Skauge</i>	
SPE 155626 - Acceleration of Oil Production in Mixed-wet Reservoirs by Alteration of Relative Permeability Curves using Surfactants	849
<i>Kumuduni Prasangika Abeysinghe, Ingebret Fjelde, Arild Lohne</i>	
SPE 155633 - A CT Scan Study of Immiscible Foam Flow in Porous Media for EOR	859
<i>M. Simjoo, Y. Dong, A. Andrianov, M. Talanana, P. L. J. Ziitha</i>	
SPE 155643 - Novelty in Smart-Water Screening and Designing	878
<i>Billal Sultani, Geza Horvath-Szabo, Huang Zeng, Wael Abdallah</i>	
SPE 155651 - Wettability and Oil Recovery by Low Salinity Injection	887
<i>Behruz Shaker Shiran, Arne Skauge</i>	
SPE 155653 - Development of New Polymers with Better Performance under Conditions of High Temperature and High Salinity	902
<i>Yongfu Wu, Amir Mahmoudkhani, Philip Watson, Thomas Fenderson, Mohan Nair</i>	
SPE 155658 - Crude Oil, Brine Salinity and Sandstone Interaction - Nanoscale Resolution	913
<i>Talal Al-Aulaqi, Quentin Fisher</i>	
SPE 155665 - Challenges in Implementing an EOR Project in the Pre-Salt Province in Deep Offshore Brasil	954
<i>Jorge Oscar De Sant'anna Pizarro, Celso Cesar Moreira Branco</i>	
SPE 155676 - Low-Tension Polymer Flooding Using Amphoteric Surfactant in High Salinity/High Hardness and High Temperature Conditions in Sandstone Cores	967
<i>M. A. Bataweel, A. K. Yadhalli Shivaprasad, H. A. Nasr-El-Din</i>	
SPE 155679 - ASP vs. SP Flooding in High Salinity/Hardness and Temperature in Sandstone Cores	990
<i>M. A. Bataweel, H. A. Nasr-El-Din</i>	
Author Index	