

International Symposium on Oilfield Chemistry 2009

**The Woodlands, Texas, USA
20 – 22 April 2009**

Volume 1 of 2

ISBN: 978-1-61567-081-9

Printed from e-media with permission by:

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

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

Copyright© (2009) by the Society of Petroleum Engineers
All rights reserved.

Printed by Curran Associates, Inc. (2009)

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

TABLE OF CONTENTS

VOLUME 1

Kinetics of the Reaction of Citric Acid With Calcite	1
<i>M. H. Alkhaldi, H. A. Nasr-El-Din, H. Sarma</i>	
Re-commissioning of Mothballed Pipelines Offshore California: A Success Story of Cleaning, Pigging, Monitoring and Integrity Management	18
<i>J. J. Wyde</i>	
A New MIC Control Strategy in Low Velocity Gas Gathering Pipelines.....	28
<i>C. Smith, C. Li, T. Bedard, J. Kimler</i>	
An Innovative Cement Formula to Prevent Gas Migration Problems in HT/HP Wells.....	41
<i>A. S. Al-Yami, H. A. Nasr-El-Din, Ahmad Al-Humaidi</i>	
Low Dosage, High Efficiency and Environment Friendly Inhibitors: A New Horizon in Gas Hydrates Mitigation in Production Systems	51
<i>Krupa Kannan, Aarti Punase</i>	
Sandstone Cores as Reaction Vessels: Synthesis of Calcium Carbonate Particles for Artificial Formation Damage in the Qualification of Matrix Acidizing Solutions.....	59
<i>Michael J. Fuller</i>	
Successful Field Application of a High-Temperature Conformance Polymer in Mexico	68
<i>Modesto Mercado, Juan Carlos Acuna, Carlos Caballero, Julio Vasquez, Eduardo Soriano</i>	
Impact of Successive Squeezes on Treatment Lifetime and Well Productivity: Comparative Assessment of Viscosified and Non-Viscosified Treatments.....	76
<i>Niall Fleming, Kari Ramstad, Sam Kidd, Laurien Wickers Hoeth</i>	
Prevention of Vertical Gas Flow in a Collapsed Well Using	93
<i>I. Lakatos, Boromir Medic, Dragan Jovicic, Ivan Basic, Julianne Lakatos-Szabo</i>	
Identification and Analysis of Biocides Effective Against Sessile Organisms.....	107
<i>Victor Keasler, Brian Bennett, Raul Diaz, Paul Lindemuth, Dale Kasowski, Craig Adelizzi, Lory Z. Santiago-Vázquez</i>	
Sorel Cement for HPHT Downhole Applications.....	121
<i>Ashok Santra, Feng Liang, Rocky Fitzgerald</i>	
Reaction of CO₂ with Portland Cement at Downhole Conditions and the Role of Pozzolanic Supplements	127
<i>Ashok Santra, B. R. Reddy, Feng Liang, Rocky Fitzgerald</i>	
The Modelling, Application and Monitoring of Scale Squeeze Treatments in Heterogeneous Reservoirs, North Sea.....	136
<i>M. M. Jordan</i>	
Selection and Application of Scale Inhibitor for Application in Oxygenated Produced Water, Norwegian Sector, North Sea.....	153
<i>D. Marlow, A. Madden, L. Sutherland, M. M. Jordan, E. Sorhaug</i>	
Development of High-Performance Water-Based Mud Formulation Based on Amine Derivatives	169
<i>Nima Gholizadeh-Doonechaly, Koroush Tahmasbi, Ehsan Davani</i>	
New Polymer Technology for Sand Control Treatments of Gas Storage Wells	178
<i>Alain Zaitoun, Thierry Pichery</i>	
Core Flood Investigation into Asphaltene Deposition Tendencies in the Marrat Reservoir, South East Kuwait	188
<i>N. H. G. Rahmani, J. Gao, M. N. Ibrahim, S. Bou-Mikael, B. S. Al-Matar, F. Ruhamani</i>	
An Experimental Study of the Pore Blocking Mechanisms of Aphron Drilling Fluids using Micromodels.....	201
<i>N. Bjordalen, J. M. Alvarez, W. E. Jossy, E. Kuru</i>	
Forecasting the Effects of Reservoir Souring From Waterflooding a Formation Containing Siderite	217
<i>E. D. Burger, G. E. Jenneman</i>	
Chemistry and Mechanisms of Completion/Packer Fluids: Annular Environmentally Assisted Cracking (AEAC) of Martensitic Stainless Steel Tubing – Misconceptions Regarding the Chemical Role of Completion / Packer Fluids.....	232
<i>Jeffrey S. McKennis, Nam Bae, Enrico J. Termine, Ken Shimamoto, Mitsuo Kimura</i>	

⁴⁷Ca-Aided Studies of CaCO₃ Scaling Rates at Low Saturation Ratios	241
<i>S. Hassfjell, A. Haugan, T. Bjornstad</i>	
Development of Environmental Friendly Iron Sulfide Inhibitors for Field Application	259
<i>Tao Chen, Harry Montomerie, Ping Chen, Thomas Hagen, Stuart Kegg</i>	
Understanding the Mechanisms of Halite Inhibition and Evaluation of Halite Scale Inhibitor by Static and Dynamic Tests.....	269
<i>Tao Chen, Harry Montomerie, Ping Chen, Tim Jackson, Olav Vikane</i>	
Stability of Partially Hydrolyzed Polyacrylamides at Elevated Temperatures in the Absence of Divalent Cations.....	277
<i>R. S. Seright, A. R. Campbell, P. S. Mozley</i>	
The Corrosiveness of Nitrite in a Produced Water System.....	292
<i>Gary Jenneman, Mohsen Achour, Mike Joosten</i>	
A Study of Proppant-Formation Reactions.....	300
<i>Jim Weaver, Richard Rickman, Hongyu Luo, Ray Loghry</i>	
Effects of Hydrogen Sulfide on Gel Typed Plugging Agents.....	316
<i>Qing You, Yefei Wang, Wei Zhou, Fulin Zhao, Jian Zhang, Guang Yang</i>	
Successful Naphthenate Scale and Soap Emulsion Management	326
<i>Gerard Runham, Colin Smith</i>	
Physico-Chemical Interactions Perturbing The Effectiveness Of An ATBS-based Fluid Loss Polymer Used In Oil Well Cementing	338
<i>J. Plank, N. Recalde Lummer, F. Dugonji-Bili</i>	
Comparative Study of the Working Mechanisms of Chemically Different Cement Fluid Loss Polymers.....	354
<i>J. Plank, F. Dugonjic-Bilic, N. Recalde Lummer, D. Sadasivan</i>	
Experimental Methodology to Evaluate DRA: Effect of Water Content and Waxes on Their Efficiency	380
<i>I. Henaut, M. Darbouret, T. Palermo, P. Glenat, C. Hurtevent</i>	
Formate Brines for HPHT Well Control—New Insights into the Role and Importance of the Carbonate/Bicarbonate Additive Package.....	388
<i>Siv Howard, John D. Downs</i>	
Surfactant-Assisted Synthesis of Metal-Phosphonate Inhibitor Nanoparticles and its Transport in Porous Media	400
<i>Ping Zhang, Dong Shen, Chunfang Fan, Amy T. Kan, Mason B. Tomson</i>	
Molar Ratio of Ca²⁺ to Fe²⁺ in the Supersaturated Solution of Iron Carbonate and Calcium Carbonate and in the Precipitate: Relation and Interpretation.....	412
<i>H. A. Alsaifi, A. Kan, M. B. Tomson</i>	
Self-Healing Cements that Heal without Dependence on Fluid Contact.....	430
<i>B. R. Reddy, Feng Liang, Rocky Fitzgerald</i>	
Enhanced Effect of Transition Metal Ions on Inhibitor Squeeze Treatments	437
<i>Gongmin Fu, Amy T. Kan, Mason B. Tomson</i>	
Barite Nucleation and Inhibition at 0-200°C, With and Without Hydrate Inhibitors	450
<i>Chunfang Fan, Amy T. Kan, Mason B. Tomson</i>	
Effects of Monoethylene Glycol on Carbonate Equilibrium and Calcite Solubility in Gas/Monoethylene Glycol/Water/Salt Mixed Systems	466
<i>Haiping Lu, Amy T. Kan, Mason B. Tomson</i>	
Quantitative Evaluation of Calcium Sulfate Precipitation Kinetics in the Presence and Absence of Scale Inhibitors	485
<i>Amy T. Kan, Gongmin Fu, Chunfang Fan, Mason B. Tomson, Dong Shen</i>	
Testing Gas Well Deliquification Chemicals at Real Downhole Conditions	504
<i>Marek Pakulski</i>	
Chemistry of Injection Water and its Impact on Oil Recovery in Carbonate and Clastic Formations.....	512
<i>M. B. Alotaibi, H. A. Nasr-El-Din</i>	
Troubleshooting Nitrate Field Injections for Control of Reservoir Souring.....	522
<i>T. R. Jack, A. Grigoryan, A. Lambo, G. Voordouw, T. Granli</i>	
Viscometer for Opaque, Sealed Microemulsion Samples	534
<i>Jose Lopez Salinas, Clarence A. Miller, Kuy Hun Koh Yoo, Maura Puerto, George J. Hirasaki</i>	

VOLUME 2

Fractional-Flow Theory of Foam Displacements With Oil	553
<i>E. Ashoori, T. L. M. van der Heijden, W. R. Rossen</i>	
Chromatographic Separation of Chemicals in Alkaline Surfactant Polymer Flooding in Reservoir Rocks in the Daqing Oilfield	570
<i>Daoshan Li, Mingyi Shi, Demin Wang, Zhao Li, He Fei</i>	
Remediation of Naphthenate Stable Emulsion for Malaysian Oilfields	581
<i>Intan Khalida Salleh, Muhammad Nadeem, Khairul Mustaqim A. Aziz, Noraliza Alwi, Pauziyah A. Hamid, Arif Azhan</i>	
Spectroscopic Determination of Naphthenic Acid Composition from Various Calcium Naphthenates Field Deposits	595
<i>Mohammed Murtala Ahmed, K. S. Sorbie</i>	
Completion Fluids Challenges in Maximum Reservoir Contact Wells	605
<i>A. S. Al-Yami, H. A. Nasr-El-Din</i>	
A New Look at the Viscoelastic Fluid Flow in Porous Media—A Possible Mechanism of Internal Cake Formation and Formation Damage Control	617
<i>H. Dehghanpour, E. Kuru</i>	
The Application of Bioassays for Evaluating In-Situ Biocide Efficiency in Offshore Oil Production in the North Sea	632
<i>Lars Hvejsel Hansen, Jan Larsen, Michael Jensen, Uffe Sognstrup Thomsen, Ketil Sørensen, Thomas Lundgaard, Torben Lund Skovhus</i>	
New Method for Scale Inhibitor Testing	641
<i>Erling Notto Halvorsen, Anne Marie Koren Halvorsen, Kristin Reiersølmoen, Tore Røberg Andersen, Cecilie Bjørnstad</i>	
Qualification of Scale Inhibitors for Sub Sea Tie Backs With MEG Injection	652
<i>Erling Notto Halvorsen, Anne Marie Koren Halvorsen, Kristin Reiersølmoen, Tore Røberg Andersen, Cecilie Bjørnstad</i>	
Improved Oil Recovery With Chemicals in Carbonate Formations	666
<i>René Tabary, Antoine Fornari, Brigitte Bazin, Bernard Bourbiaux, Christine Dalmazzone</i>	
Development of a Methodology for the Optimization of Dehydration of Extra-Heavy Oil Emulsions	679
<i>C. Dalmazzone, C. Noïk, P. Glénat, F. Dang</i>	
Development of Fourier Transform-Ion Cyclotron Resonance Mass Spectrometry Protocol for the Analysis of Asphaltene Field Samples and Solubility Fractions	695
<i>W. Schrader, S. K. Panda, J. T. Andersson, M. Salisbury, M. Grutters, A. G. Shepherd</i>	
New Viscoelastic Fluid for Chemical EOR	702
<i>Mikel Morvan, Guillaume Degré, Jacques Leng, Chloé Masselon, Patrick Moreau, Jérôme Bouillot, Alain Zaitoun</i>	
An Improved Oil-Based Chemical Gel System for Wellbore Stabilization	717
<i>Jason T. Scorsone, Mark W. Sanders, Arvind D. Patel</i>	
Successful Scale Mitigation Strategies in Saudi Arabian Oil Fields	722
<i>Kris U. Raju</i>	
Integration of Kinetics into Scale Prediction Software, ScaleSoftPitzer	732
<i>Mason Tomson, Chunsang Fan, Haiping Lu, Ping Zhang, Hamad Alsaiari, Amy T. Kan</i>	
Modelling Staged Diversion Treatments and Chemical Placement in the Presence of Near-Wellbore Fractures	745
<i>Robert Stalker, Gordon M. Graham, Gbenga Oluwemi</i>	
pH-Sensitive Polymers for Novel Conformance Control and Polymerflood Applications	758
<i>Suk Kyoon Choi, Mukul M. Sharma, Steven L. Bryant, Chun Huh</i>	
Laboratory Measurement of pH of Live Waters at High Temperatures and Pressures	781
<i>S. G. Mathews, B. Raghuraman, D. W. Rosiere, W. Wei, S. Colacelli, H. A. Rehman</i>	
Evaluation of H₂S Scavengers for Matrix Acidizing Treatment	792
<i>Z. Xiao, L. N. Morgenthaler, M. K. Cowan, K. Aremu, J. G. Adams</i>	
Reacting Ions Method to Identify Injected Water Fraction in Produced Brine	801
<i>O. Ishkov, E. Mackay, Ken Sorbie</i>	
An Environmentally Friendly Stimulation Fluid for High Temperature Applications	817
<i>J. N. LePage, C. A. De Wolf, J. H. Bemelaar, H. A. Nasr-El-Din</i>	

Nonaggressive Matrix Stimulation Fluids for Simultaneous Stimulation of Heterogeneous Carbonate Formations	832
<i>Xiaolan Wang, Jennifer Cutler, Joel L. Boles</i>	
Propagation of Viscoelastic Surfactant-Based Acids in Carbonate Cores	849
<i>Abdulwahab H. Al-Ghamdi, Mohamed A. Mahmoud, A. D. Hill, Hisham A. Nasr-El-Din</i>	
Quantitative Analysis of an Amphoteric Surfactant in Acidizing Fluids and Coreflood Effluent	865
<i>M. Yu, Mohamed A. Mahmoud, H. A. Nasr-El-Din</i>	
Rheological Properties of a New Class of Viscoelastic Surfactant	879
<i>L. Li, H. A. Nasr-El-Din, K. E. Cawiezel</i>	
Fast-Inverting, Brine and Additive-tolerant Friction Reducer for Well Stimulation	902
<i>Andrei S. Zelenov, Gydeon A. Gilzow, Phillip B. Kaufman</i>	
ab initio and Molecular Simulation Studies of Organic and Inorganic Counterions' Effect on Anionic Viscoelastic Surfactant	913
<i>A. S. Sultan, P. B. Balbuena, A. D. Hill, H. A. Nasr-El-Din</i>	
Biodegradable Alternatives for Scale Control in Oilfield Applications	922
<i>Stuart Holt, Jannifer Sanders, Klin Rodrigues, Matthew Vanderhoof</i>	
Effect of Salinity on Wettability Alteration of Porous Media From Liquid Wetting to Intermediate Gas Wetting	932
<i>Stanley Wu, Abbas Firoozabadi</i>	
Review and Evaluation of Corrosion Inhibitors Used in Well Stimulation	961
<i>A. Rostami, H. A. Nasr-El-Din</i>	
Theoretical Study on the Properties of Cationic, Amidoamine Oxide and Betaine Viscoelastic Diverting Surfactants in Gas and Water Solution	978
<i>A. S. Sultan, P. B. Balbuena, A. D. Hill, H. A. Nasr-El-Din</i>	
New Insights into the Viscosity of Polymer-Based In-Situ Gelled Acids	985
<i>A. M. Gomaa, H. A. Nasr-El-Din</i>	
Mitigation of Reservoir Souring by Nitrate in a Produced Water Re-Injection System in Alberta	999
<i>J. J. Arendorf, K. Miner, R. Ertmoed, B. Clay, P. Stadnicki, G. Voordouw</i>	
Design and Development of Quaternary Amine Compounds: Shale Inhibition With Improved Environmental Profile	1007
<i>Arvind D. Patel</i>	
Design and Development of a Novel Process to Treat Drilling Fluid Slops: A Positive Environmental and Economic Impact	1016
<i>Rahul Dixit, Arvind Patel</i>	
Foams and Emulsions Stabilized With Nanoparticles for Potential Conformance Control Applications	1024
<i>Tiantian Zhang, Matthew R. Roberts, Steven L. Bryant, Chun Huh</i>	
A New Shear-Tolerant High-Temperature Fracturing Fluid	1041
<i>Mike Parris, Andrey Mirakyan, Carlos Abad, Yiyuan Chen, Fred Mueller</i>	
Incremental Oil Success From Waterflood Sweep Improvement in Alaska	1054
<i>Danielle Ohms, Jennifer McLeod, Craig J. Graff, Harry Frampton, Jim C. Morgan, Stephen Cheung, Katrina Yancey, K. T. Chang</i>	
Lab and Field Study of New Microemulsion-Based Crude Oil Demulsifier for Well Completions	1065
<i>Y. Yang, K. I. Dismuke, G. S. Penny, J. Paktinat</i>	
Environmentally Friendly Water-Based Fluid for HPHT Drilling	1079
<i>A. Tehrani, D. Gerrard, S. Young, J. Fernandez</i>	
Low Molecular Weight Co-Polymer for Calcium Scale Inhibition at High Temperature	1087
<i>B. Senthilmurugan, B. Ghosh</i>	
Author Index	