

SPE International Conference on Oilfield Chemistry 2017

Montgomery, Texas, USA
3 – 5 April 2017

Volume 1 of 2

ISBN: 978-1-5108-4204-5

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© (2017) by Society of Petroleum Engineers
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact 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: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Volume 1

An Advanced, Balanced, and High-Performance Displacement Spacer System for Deepwater Formations	1
<i>S. Gunawan, D. Fowler, A. Mack</i>	
Analysis and Optimization of H₂S Scavenger Systems Using X-Ray Fluorescence Spectroscopy	8
<i>D. Horton, D. Bakuska, J. Soderberg</i>	
Aspects of Scale Deposition in a Compositional Coupled Wellbore/Reservoir Simulator	28
<i>A. Abouie, A. Korrani, K. Sepehmoori</i>	
Automatic Optimisation of Oilfield Scale Inhibitor Squeeze Treatments Delivered by DSV	45
<i>O. Vazquez, G. Ross, M. Jordan, D. Angga, A. Baskoro, E. Mackay, C. Johnson, A. Strachan</i>	
Benign Use of Inclusion Complex Formation Property of Cyclodextrin and Its Application in Cement Fluid-Loss Control	57
<i>A. Remitha, S. Agashe, B. Reddy</i>	
Case Study: A Two-Part Salt-Tolerant Friction Reducer System Enables the Reuse of Produced Water in Hydraulic Fracturing	66
<i>L. Xu, P. Lord, K. He, H. Riley, J. Koons, T. Wauters, S. Weiman</i>	
Characterization of Filter Cake Generated by Nanoparticle-Based Drilling Fluid for HP/HT Applications	74
<i>O. Mahmoud, H. Nasr-El-Din, Z. Vryzas, V. Kelessidis</i>	
Combining Advanced Biocide Evaluation and Microbial Monitoring to Optimise Microbial Control	93
<i>R. Johnson, J. Crane</i>	
Development of Structure-Property Relationships for Oilfield Water Clarifiers	105
<i>K. Young, F. D'Ottaviano, L. Rhodes, W. Gao, W. Young, J. Behles, G. Khan</i>	
Development, Testing and Field Application of a Novel Combination Foamer-Iron Sulfide Scale Inhibitor-Corrosion Inhibitor in East Texas	121
<i>J. Wylde, N. Turner, M. Austill, C. Okocha, N. Obeyesekere</i>	
Effect of Fe III and Chelating Agents on Performance of New VES-Based Acid Solution in High-Temperature Wells	139
<i>F. Zebarjad, H. Nasr-El-Din, D. Badraoui</i>	
Effect of Nitrate on Carbon Steel Corrosion	152
<i>S. Vargas, R. Woollam, W. Durnie, M. Hodges, D. Betancourt</i>	
The Effect of Turbulence on Mineral Scale Control in Oilfield	170
<i>F. Yan, F. Zhang, N. Bhandari, G. Ruan, H. Alsaiani, Z. Dai, Y. Liu, Z. Zhang, Y. Lu, G. Deng, A. Kan, M. Tomson</i>	
Effective Removal of Hydrogen Sulfide and Mercaptans in Oilfield Applications	181
<i>S. Chakraborty, S. Lehrer, S. Ramachandran</i>	
Effectiveness of Polycarboxylate Dispersants in Enhancing the Fluid Loss Performance of Cellulose Ethers	193
<i>M. Moumin, J. Plank</i>	
Employing an Arrhenius Rate Law to Predict the Lifetime of Oilfield Resins	202
<i>P. Jones, C. Boontheung, G. Hundt</i>	
Experimental Study of Switchable Nonionic to Cationic Surfactants for Acid Diversion in High-Temperature Matrix Stimulation	211
<i>A. Ameri, B. Ho, M. Smout, V. Doorn, C. Boeije</i>	
Fast and Accurate Screening and Evaluation of Halite Scale Inhibitors by Two Novel Static Bottle Testing Methods	225
<i>G. Ruan, A. Kan, Z. Dai, Y. Fan, F. Zhang, N. Bhandari, H. Alsaiani, Y. Liu, Z. Zhang, Y. Lu, G. Deng, M. Tomson</i>	
Fresh Insight into the H₂S Scavenging Mechanism of MEA-Triazine vs. MMA-Triazine	236
<i>G. Taylor, J. Wylde, T. Muller, J. Murison, F. Schneider</i>	
Geopolymer - Synthetic Based Mud Hybrid Cements for Primary Cementing and Lost Circulation Control	246
<i>X. Liu, K. Aughenbaugh, H. Lee, S. Nair, E. Oort</i>	
How Do Nanoparticles Stabilize Shale?	259
<i>B. Hoxha, E. Oort, H. Daigle</i>	
Hydrophobically Associating Polymer Water-in-Oil Emulsions Used in Multi-pad Fracking for Tight Oil Reservoir: The First Example in China	281
<i>Y. Lv, Y. Feng, Z. Wang, A. Li, Q. Zhang, B. Huang, J. Zuo, Z. Ren, Y. Chen</i>	

Identification of New Chemical Formulation for Control of Metal Sulfides FeS, ZnS and PbS Scale Deposition	294
<i>N. Bhandari, G. Ruan, Y. Liu, F. Zhang, F. Yan, H. Saiari, Z. Zhagn, Z. Dai, Y. Lu, G. Deng, A. Kan, M. Tomson</i>	
Improved Disproportionate Permeability Reduction of Silicate-Gelant Treatments: A Laboratory Scale Approach	306
<i>R. Askarinezhad, D. Hatzignatiou</i>	
In-Depth Analysis of How Chemical Treatments Work to Improve Conductivity in Shale Formations	320
<i>D. Benoit, A. Recio III, R. Gashimov, D. Hu, K. Holan, K. Hoeman</i>	
Inhibition of Calcium Carbonate Scale in the Presence of EOR Chemicals	333
<i>Q. Wang, W. Al-Nasser, F. Al-Dawood, T. Al-Shafai, H. Al-Badairy, S. Shen, H. Al-Ajwad, F. Liang</i>	
Investigation of Oil Adhesion to Shale Rocks for EOR	347
<i>D. Nguyen, T. Phan, J. Phan, T. Hsu</i>	
Iron Sulfide Precipitation and Deposition under Different Impact Factors	361
<i>Y. Liu, Z. Zhang, N. Bhandari, F. Yan, F. Zhang, G. Ruan, Z. Dai, H. Alsaiari, A. Lu, G. Deng, A. Kan, M. Tomson</i>	
Iron Sulfide Scale Dissolver for Downhole Application: Where Are We Now?	377
<i>Q. Wang, T. Chen, F. Chang, W. Nasser, S. Shen, H. Al-Badairy, S. Zaidi, F. Liang, J. Leal, I. Syafii, A. Al-Mukhles</i>	
Isothermal Titration Calorimetry: A New Tool for the Development of Structure Activity Relationships for Sulphide Scale Control	396
<i>L. Ackermann, M. Klapper, C. Kayser, A. Kaiser</i>	
Low-Interfacial-Tension Foaming System for Enhanced Oil Recovery in Highly Heterogeneous/Fractured Carbonate Reservoirs	410
<i>P. Dong, M. Puerto, K. Ma, K. Matten, G. Ren, G. Bourdarot, D. Morel, M. Bourrel, S. Biswal, G. Hirasaki</i>	
Matrix Acidizing of Carbonate Rocks Using New Mixtures of HCl/Methanesulfonic Acid	430
<i>S. Kankaria, H. Nasr-El-Din, S. Rimassa</i>	
Mechanisms of Cement Degradation in HPHT Carbonic Acid Environment	448
<i>O. Omosebi, R. Ahmed, S. Shah</i>	
Method for Estimating and Analyzing for TOC of Hydraulic Fracturing Fluids	469
<i>D. Harry, M. Mallory, S. Tucker</i>	
Microemulsion Phase Behavior Model Using Empirical Trends in Chemical Potentials	482
<i>V. Torrealba, R. Johns</i>	
A Microfluidic Technique for the Evaluation of Demulsifiers	498
<i>D. Loufakis, A. Schmitt, C. Nelson, S. Hoyles, J. Goodwin, B. White, C. Ayers</i>	
Modeling H₂S Partitioning in Deep Water Production Systems	507
<i>A. Kan, M. Garcia-Bermudes, Z. Dai, Y. Liu, Y. Lu, N. Bhandari, F. Vargas, M. Tomson, N. Tataavalli-Mittadar, R. French, S. Ashtekar</i>	

Volume 2

Modeling the Effect of Engineered Water Injection on Oil Recovery from Carbonate Cores	528
<i>J. Adegbite, E. Al-Shalabi, B. Ghosh</i>	
Nanocellulose and Its Derivatives for High-Performance Water-Based Fluids	561
<i>L. Hall, J. Deville, C. Araujo, S. Li, O. Rojas</i>	
Nanomaterials-Enhanced High-Temperature Viscoelastic Surfactant VES Well Treatment Fluids	575
<i>S. Ozden, L. Li, A. Al-Muntasheri, F. Liang</i>	
A New Application of Potassium Nitrate as an Environmentally Friendly Clay Stabilizer in Water-Based Drilling Fluids	585
<i>J. Zhou, H. Nasr-El-Din</i>	
A New Approach to Combined Sulphide and Carbonate Scale Predictions Applied to Different Field Scenarios	601
<i>G. Verri, K. Sorbie, M. Singleton, D. Silva, C. Hinrichsen, Q. Wang, F. Chang</i>	
A New In-Situ Generated Acid System for Carbonate Dissolution in Sandstone and Carbonate Reservoirs	614
<i>K. Sokhanvarian, T. Pummrapanthu, E. Arslan, H. Nasr-El-Din, N. Shimek, K. Smith</i>	
New Polymeric High Temperature Cement Retarder with Synergistic Suspending Aid Property in Fluid Loss Control Polymers	634
<i>R. Pernites, J. Clark, A. Santra</i>	
A New Theoretical Model for the Induction Time and Scale Inhibitor Dosage Predictions for Calcite and Barite Over Wide Ranges of Temperature, Inhibition Concentration and Saturation Index	647
<i>Z. Dai, F. Zhang, F. Yan, N. Bhandari, G. Ruan, Z. Zhang, Y. Liu, H. Alsaiari, Y. Lu, G. Deng, A. Kan, M. Tomson</i>	

A Next Generation Peracid for Onshore and Offshore Water Treatment Applications	658
<i>R. Balasubramanian, J. Li, I. Yunus, T. Tidwell, V. Keasler, R. Staub</i>	
A Novel Solid Inhibitor for Anhydrite Scale Control Under Extreme Well Conditions	669
<i>D. Shen, S. Bhaduri, M. Vo, P. Carman, D. Gupta, Y. Pandey</i>	
Novel Studies on Precipitated Phosphate Ester Scale Inhibitors for Precipitation Squeeze Application	682
<i>A. Valiakhmetova, K. Sorbie, M. Jordan, S. Boak</i>	
A Novel Versatile LDHI to Treat Multiple Conditions	700
<i>Q. Lan, D. Monteiro, M. Ceglie, P. Krishnamurthy</i>	
Numerical Prediction of Reservoir Souring under the Effect of Temperature, Ph, and Salinity on the Kinetics of Sulfate-Reducing Bacteria	713
<i>P. Hosseinoooshi, H. Lashgari, K. Sepehmoori</i>	
Oilfield Biocide Performance in the Presence of Shale Formation Rock	730
<i>J. Moore, E. Massie-Schuh, D. Doshi, C. Schultz, C. Castillo, B. Patel, M. Moore, J. Rajan, B. Ajayi</i>	
On the Bio-Chimo-Mechanical Characterization of Eagleford Shale-Part I	745
<i>A. Hayatdavoudi, M. Mokhtari, R. Nizamutdinov, K. Sawant, A. Parrish</i>	
On-Demand Water Control: Molecular Host-Guest Interaction for In-Situ Modification of Formation Fluid Permeability	760
<i>A. Recio III, L. Eoff, C. Lewis, B. Reddy</i>	
Optimization of Scale Treatment Program of a CO₂ Water-Alternating-Gas System for Enhanced Oil and Gas Production	777
<i>H. Lu, P. Stewart, D. Jones, J. Penkala, J. Brooks</i>	
Polyethylene Glycol PEG Functionalized Silane for Highly Efficient Silicate Scale Control	793
<i>F. Meng, C. Aftin</i>	
A Predictive Equation-of-State for Modeling Microemulsion Phase Behavior with Phase Partitioning of Co-Solvent	804
<i>E. Basilio, B. Mu, L. Jin, A. Jamili</i>	
Preparation and Evaluation of Thermo- and Salinity-Responsive Hydrogel as Intelligent Plugging Agent	825
<i>Y. Xue, X. Wang, B. Zhang, B. Wei, Z. Ye</i>	
A Re-Evaluation of Reservoir Souring Patterns and Effect of Mitigation in a Mature North Sea Field	834
<i>A. Mitchell, I. Skjevrak, J. Waage</i>	
A Safer Generation of Wettability Alteration Chemical Treatments	844
<i>M. Sayed, G. Al-Muntasheri</i>	
Scale and Corrosion Inhibitor Evaluation under High Shear Flow Conditions	869
<i>D. Nichols, H. Thomson, C. Simpson, G. Graham</i>	
Scaling Risk and Inhibition Prediction of Carbonate Scale at High Temperature	884
<i>F. Zhang, Z. Dai, Z. Zhang, H. Al-Saiari, F. Yan, N. Bhandari, G. Ruan, Y. Liu, Y. Lu, G. Deng, A. Kan, M. Tomson</i>	
Short Term Gas Migration Control in Well Cementing: Comparative Behavior of Fluid Loss Control Polymers	897
<i>A. Cadix, K. Thant, J. Neufeld, T. Nelson, L. Auneau, C. Phan, J. Wilson</i>	
Squeezing the Bakken: Successful Scale Squeeze Programs Lead to Shift in Bakken Scale Control	916
<i>K. Spicka, I. Littlehales, J. Fidoe, M. Jordan, Z. Zosel, S. Glasser</i>	
Synthesis, Properties and HT Performance of a Novel Cement Fluid Loss Polymer Modified with Phosphate Groups	930
<i>T. Hurnaus, T. Echt, J. Plank</i>	
Ultra HPHT Solubility of Calcium Sulphate and Other Minerals	943
<i>N. Goodwin, G. Graham, D. Frigo</i>	
Understanding Fluid Transport Mechanisms of Fracture Shale Formations by Modelling Squeeze Treatments	959
<i>A. Kaur, D. Frigo, R. Stalker, G. Graham</i>	
Unique Mixtures of Anionic/Cationic Surfactants: A New Approach to Enhance Surfactant Performance in Liquids-Rich Shale Reservoirs	969
<i>K. He, L. Xu</i>	
Using Properties in Nature to Modify Proppant Surfaces and Increase Flow	979
<i>N. Bestaoui-Spurr, S. Sun, V. Williams, A. Volk, S. Nguyen</i>	
Wax and Paraffin Control by Fracturing Fluids: Understanding Mode of Actions and Benefits of Water-Dispersible Wax Inhibitors	995
<i>A. Mahmoudkhani, M. Feustel, W. Reimann, M. Krull</i>	
Which Cations are Detrimental to Shale Preservation?	1013
<i>A. Recio III, D. Benoit, K. Henkel, K. York</i>	

Zinc and Lead Interactions in Combined Sulphide Scales	1030
---	------

B. Al-Harbi, A. Graham, K. Sorbie

Author Index