

CUMARASWAMY VIPULANANDAN, Ph.D., P.E.

EDUCATION

Ph.D.	Northwestern University	1984	Civil Engineering
M.S.	Northwestern University	1981	Civil Engineering
B.Sc.	University of Moratuwa, Sri Lanka	1980	Civil Engineering

PROFESSIONAL EXPERIENCE

1995- Present	Professor of Civil Engineering, University of Houston, Houston, Texas, USA
2001-09	Chairman, Department of Civil and Environmental Engineering, University of Houston, Houston, Texas, USA
1990-95	Associate Professor of Civil Engineering, University of Houston, Houston, Texas, USA
1984-90	Assistant Professor of Civil Engineering, University of Houston, Houston, Texas, USA
1981-84	Teaching Assistant, Department of Civil Engineering, Northwestern University, Evanston, Illinois, USA
1980	Instructor, Department of Civil Engineering, University of Moratuwa, Sri Lanka
1978-79	One year of In-Plant training at the State Engineering Corporation, Sri Lanka.

Others

1994- Present	Director, Center for Innovative Grouting Materials and Technology (CIGMAT), University of Houston, Houston, Texas, USA.
2009- Present	Director, Texas Hurricane Center for Innovative Technology (THC-IT), University of Houston, Houston, Texas, USA.

AWARDS AND HONORS

2015	Best Paper Presentation, 2 nd Global Well Cementing Conference, Houston, Texas.
2013	Abraham Duckler Award, Distinguished Professor, University of Houston Engineering Alumni Award.

- 2011 Most Valuable Professional (MVP) for the Underground Infrastructure Industry, Underground Construction Technology Association (UCTA) and Underground Construction Magazine.
- 2009 Hawley Award for Best Paper for 2009, "LEED Concrete for Construction Applications," Materials Engineering, American Society of Civil Engineers, Texas Section.
- 2005 Fluor Daniel Faculty Excellence Award, Highest Award Given by the Cullen College of Engineering, University of Houston, Houston, Texas USA.
- 2002 Senior Faculty Research Excellence Award, Cullen College of Engineering, University of Houston, Houston, Texas USA.

Recent Patents (U.S. & Global)

1. (WO2017011460) CHEMO-THERMO—PIEZORESISTIVE HIGHLY SENSING SMART CEMENT WITH INTEGRATED REAL-TIME MONITORING SYSTEM

C. Vipulanandan - International Patent App. PCT/US2016/041905, 2016

US Patent App. 62/192,010, 2015

The chemo-thermo-piezoresistive behavior of so-called "smart cement," or cement modified with conductive fillers, is useful as a bulk sensor for monitoring the changes in the cement due to stresses, cracks, contamination, fluid loss, and temperature change that affect its performance. The smart cement utilizes special conductive or semi-conductive filler and is useful as a bulk sensor that allows real-time monitoring of its properties.

2. (WO2017015199) RAPID DETECTION AND QUANTIFICATION OF SURFACE AND BULK CORROSION AND EROSION IN METALLIC AND NON-METALLIC MATERIALS WITH INTEGRATED MONITORING SYSTEM

C. Vipulanandan - International Patent App. PCT/US2016/042766, 2016

US Patent App. 62/195,233, 2015

Systems and methods for real-time detecting and quantification of surface and bulk corrosion and erosion in materials involve measuring and characterizing the electrical resistances, capacitances, and/or inductances of the materials and their interfaces, preferably by using an impedance analyzer precision LCR meter. The materials may be metals, non-metals (such as plastics, polymers, cements, concrete, ceramics, rocks and soils) and composite materials with various types of material constituents (such as metals, plastics, polymers, and cements).

PUBLICATIONS

Refereed Publications

Journal Articles

1. Vipulanandan, C., and Mohammed, A., (2017) "Rheological Properties of Piezoresistive Smart Cement Slurry Modified With Iron Oxide Nanoparticles for Oil Well Applications." Journal of Testing and Evaluation, ASTM, Vol. 45 Number 6, pp. 2050-2060.
2. Liu, J. and Vipulanandan, C.(2017) "Effects of Fe, Ni and Fe/Ni Metallic Nanoparticles on Power Production and Biosurfactant Production from Used Vegetable Oil in the Anode Chamber of a Microbial Fuel Cell," Waste Management, Vol. 66, pp. 169-177.
3. Vipulanandan, C. and Guezo, Y. J. (2017) "Effects of temperature and strain rate in the tensile behavior of polypropylene composites insulator coatings used in offshore deepwater pipelines, Journal of Applied Polymer Science, Vol. 134, No. 36, pp. 18-27.
4. Vipulanandan, C. and Ali, K. (2016) "Smart Cement Piezoresistive Behavior with and without Sodium Meta-silicate Under Temperature and Curing Environments for Oil Well Applications," Journal of Civil Engineering Materials, American Society of Civil Engineers (ASCE), doi 10.1061/MT.1943-055330001667
5. Vipulanandan, C., and Mohammed, A., (2015) "Smart Cement Modified With Iron Oxide Nanoparticles to Enhance the Piezoresistive Behavior and Compressive Strength for Oil Well Applications." Journal of Smart Materials and Structures, Vol. 24 Number 12, pp. 1-11.
6. Vipulanandan, C., and Mohammed, A., (2015) "Smart Cement Rheological and Piezoresistive Behavior for Oil Well Applications" Journal of Petroleum Science and Engineering, Vol. 135, pp. 50-58.
7. Vipulanandan, C., and Mohammed, A., (2015) "Effect of Nanoclay on the Electrical Resistivity and Rheological Properties of Smart and Sensing Bentonite Drilling Muds" Journal of Petroleum Science and Engineering, Vol. 130, pp. 86-95.
8. Vipulanandan, C. and Mohammed, A., S. (2014) " Hyperbolic Rheological Model with Shear Stress Limit for Acrylamide Polymer Modified Bentonite Drilling Muds " Journal of Petroleum Science and Engineering, Vol. 122, pp.38-47.
9. Jia, L., Vipulanandan, C., Cooper, T. and Vipulanandan, G. "Effect of Fe Nanoparticles on Bacterial Growth and Biosurfactant Production," Journal of Nanoparticle Research, Vol. 15, No. 1 , pp. 1-13, 2013.
10. Harendra, S. and Vipulanandan, C. "Determination of Sodium Dodecyl Sulfate (SDS) and Biosurfactant Sorption and Transport Parameters on Clay Soil," Journal of Surfactants and Detergents, Vol. 24, No. 3 , pp. 1-6, 2012.

11. Harendra, S. and Vipulanandan, C. (2011) "Solubilization and Degradation of Perchloroethylene (PCE) in Cationic and Nonionic Surfactant Solutions," Journal of Environmental Science, Vol. 23, No. 8, pp. 1240-1248.
12. Harendra, S. and Vipulanandan, C. "Kinetics and Reductive Degradation of Surfactant-Solubilized CCl₄ in Water Using Bimetallic Particles," Industrial Engineering Chemistry Research, Vol. 49, No. 18, pp. 8812-8820, 2010.
13. Vipulanandan, C., and Garas, V. "Electrical Resistivity, Pulse Velocity and Compressive Properties of Carbon Fiber Reinforced Cement Mortar," Journal of Materials in Civil Engineering, Vol. 20, No. 2 , pp. 93-101, 2008.
14. Nam, M. S. and Vipulanandan, C. "Roughness and Unit Side Resistances of Drilled Shafts Socketed in Clay Shale and Limestone," Journal of Geotechnical and Geoenvironmental Engineering, Vol. 134, No. 9 , pp. 1272-1279, 2008.
15. Harendra, S, and Vipulanandan, C. "Degradation of High Concentrations of PCE Solubilized in SDS and Biosurfactant with Bimetallic Fe/Ni Particles," Colloids and Surfaces A: Physicochemical and Engineering Aspects, Vol. 322, No. 3, pp. 6-13, 2008.
16. Vipulanandan, C., and Kulkarni, S. P. "Shear Bonding and Thermal Properties of Particle-Filled Polymer Grout for Pipe-in-Pipe Application," Journal of Materials in Civil Engineering, Vol. 19, No. 7, pp.583-590, 2007.
17. Li, F. Vipulanandan, C, Zhou, X. Y. and Salama, K. "Nanoscale Y₂BaCuO₅ Particles for Producing Melt-textured YBCO Large Grains," Journal of Superconductor Science and Technology, Vol. 19, pp.589-595, 2006.
18. Li, F. and Vipulanandan, C. "Characterization of Y₂BaCuO₅ Nanoparticles Synthesized by Nano-emulsion Method," Journal of Nanoparticle Research, Vol. 10, pp.1007-1016, 2006.
19. Kulkarni, S. P. and Vipulanandan, C. "Hot Wire Method to Characterize the Thermal Conductivity of Particle-filled Polymer Grouts Used in Pipe-in-Pipe Application," Journal of Testing and Evaluation, ASTM, Vol. 34, No. 3, pp.224-232, 2006.
20. Li, F., Vipulanandan, C. and Mohanty, K. "Microemulsion and Solution Approaches to Nanoparticle Iron Production for Degradation of Trichloroethylene," Colloids and Surfaces A: Physicochemical and Engineering Aspects, Vol. 223, No. 1, pp. 103-112, 2003.
21. Vipulanandan, C., and Li, F. "Production and Characterization of YBCO Nanoparticles," IEEE Transactions on Applied Superconductivity, Vol. 3, pp. 2980-2984, 2003.

22. Vipulanandan, C., and Lu, W. "Characterization of Superconducting BSCCO Tapes and Bulk Joints," IEEE Transactions on Applied Superconductivity, Vol. 3, pp. 3196-3200, 2003.
23. Salib, S., Iyer, A. N., Vipulanandan, Salama, K. and C. Balachandran, U. "Electromechanical Characterization of Silver-Clad BSCCO Tapes," Applied Superconductivity, Vol. 6, No. 1, pp. 1-9, 1998.
24. Salib, S. and Vipulanandan, C., "Tensile Stress-Strain-Critical Current Relationships for Silver Fiber Reinforced BPSCCO Composite Tapes," Materials Research Bulletin, Vol. 32, No. 10, pp. 1333-1340, 1997.
25. Salib, S. Manovich, P., Vipulanandan, C. and Salama, K., "Mechanical and TEM Studies on BPSCCO-2223-Ag Composite Tapes," Superconductivity Science and Technology, Vol. 9, pp. 1071-1076, 1996.
26. Vipulanandan, C. and Salib, S., " Mechanical and Physical Properties of Sintered YBCO-Metal Bulk Composites with Silver Powder and Fibers," Journal of Materials Science, Vol. 30, pp.763-769, 1995.
27. Salib, S. and Vipulanandan, C., "Property Relationships for Sintered YBCO/Ag Composites," Journal of Applied Superconductivity, Vol. 3, No. 5, pp.259-267, 1995.
28. Ghurye, G. L., Vipulanandan, C. and Willson, R. C., " A Practical approach to biosurfactant production using Nonaseptic fermentation of Mixed Cultures," Biotechnology and Bioengineering, Vol. 44, pp. 661-666, 1994.
29. Vipulanandan, C. and Salib, S.," Stainless Steel Fibers in High Temperature Superconductor Composite," Material Research Bulletin, Vol. 26, 951-958, August 1991.
30. Salib, S. and Vipulanandan, C., "Property-Porosity Relationships For Polymer-Impregnated Superconducting Ceramic Composite," Journal of American Ceramic Society, Vol. 73, No. 8, pp. 2323-2329, August 1990.
31. Vipulanandan, C., Salib, S., Ravi-Chandar, K., , "Performance of High Temperature Superconducting Ceramic-Polymer Composite," Materials Research Bulletin, Vol. 24, No., pp. 1059-1067, September 1989.
32. Vipulanandan, C. and Williams, A. N., "Effects of Interface Conditions on Dynamic Ice-Structure Interaction," Journal of Offshore Mechanics and Arctic Engineering, American Society of Mechanical Engineers, Vol. 111, No., pp. 70-77, 1989.
33. Williams, A. N. and Vipulanandan, C., "Steady-State Ice-Structure Interaction Analysis," Journal of Engineering Mechanics, American Society of Civil Engineers, Vol. 112, No. 10, pp. 989-1006, 1986.

Conference Proceedings (Referred)

1. Vipulanandan, C, Ali, K. and Ariram, P. (2016) "Nanoparticle and Surfactant Modified Smart Cement and Smart Polymer Grouts" ASCE Geotechnical and Structural Engineering Congress-2016, <http://dx.doi.org/10.1061/9780784479742>.
2. Ahossin Guezo, Y. J.. and Vipulanandan, C, "Fracture Behavior of Multilayer Insulation Coatings Used in Subsea Pipelines" Pipeline Conference 2014, ASCE, Portland Oregon, CD Proceeding, August 2014
3. Kheiri, P. and Vipulanandan, C, "New Model to Predict the rate of Pipeline Penetration into the Very Soft Clays Simulating Deepwater Subsea Conditions," Pipeline Conference 2014, ASCE, Portland Oregon, , CD Proceeding, August 2014.
4. Vipulanandan C.and Yanhouide, A. J. (2013) "Tensile Behavior of Polypropylene Composite Insulator for Deepwater Pipelines" Proceedings, ASCE Pipeline Conference 2013, CD, June 2013.
5. Vipulanandan, C., Harendra, S. and Hariharan, S. G.(2008)"Performance of Biosurfactant Produced form Used Vegetable Oil," Proceedings, GeoCongress 2008, Geotechnics of Waste Management and Remediation, ASCE, GSP 177, pp. 328 -335.
6. Vipulanandan, C. and Mamidi, B. (2008)"Biosurfactant Flushing of PCE Contaminated Clayey Soils," Proceedings, GeoCongress 2008, Geotechnics of Waste Management and Remediation, ASCE, GSP 177, pp. 495-502.
7. Vipulanandan, C. and Elesvwarapu, P.(2008)"Index Properties and Compaction Characteristic of Kerosene Contaminated Clayey Soil," Proceedings, GeoCongress 2008, Geotechnics of Waste Management and Remediation, ASCE, GSP 177, pp. 804-811.
8. Vipulanandan, C., and Kulkarni, S. "Single Lap Joint Testing with Analytical and FEM Verification for Pipe-in-Pipe Application", Proceedings, Pipelines 2005, ASCE, Houston, TX, pp. 84-100, August 2005.
9. Vipulanandan, C., and Liu, J. "Polyuretane Based Grouts for Deep Off-Shore Pipe-in-Pipe Application", Proceedings, Pipelines 2005, ASCE, Houston, TX, pp. 216-227, August 2005.
10. Vipulanandan, C., and Kulkarni, S. "Thermal and Bonding shear strength of Polymer Based and Cementitious Grouts for Pipe-in-Pipe and Geothermal Heat pump System", Proceedings, Pipelines 2005, ASCE, Houston, TX, pp. 371-389, August 2005.
11. Vipulanandan, C., Lu, W. and Iyer, A. N. "Factors Affecting the Joining of Superconducting BSCCO Tapes," Proceedings, International Conference on Materials and Mechanisms of Superconductivity High Temperature Superconductors VI, PHYSICA C, Vol. 341-348, 2445-2446, 2000

12. Vipulanandan, C. and Martinz, B. "Reprocessing of Sintered and Melt High Temperature Superconducting Materials," Proceedings, Pollution Prevention, Materials Research Society, Vol. 334, 1994.
13. Vipulanandan, C. and Salib, S., "Microprobe, XPS Analysis and Properties of Ceramic-Polymer Composite," Proceeding, Superconductivity and Applications, ASME, pp. 21-28, November 1990.
14. Salib, S. Vipulanandan, C. and Stone, T., "Processing and Performance of Metal Fiber Reinforced High Temperature Superconductor," Proceeding, High Temperature Superconductor: Fundamental Properties and Novel Material Processing, Material Research Society, Vol. 169, pp. 187-193, May 1990.
15. Vipulanandan, C. and Salib, S., "Behavior of Ceramic-Polymer Composite," Proceeding, Multi-Functional Materials, Material Research Society, Vol. 175, pp. 325-330, March 1990.
16. Vipulanandan, C., Ravi-Chandar, K., Salib, S. and Dharmarajan, N., "Influence of Compaction and MMA Modification on High Temperature Superconductor," Proceedings, Superconductivity Applications and Developments, American Society of Mechanical Engineers, MD-Vol. 11, pp. 51-60, 1988.

Non-Refereed Conference and Journal Publications

1. Vipulanandan, C. and Mohammed, A. and Samuel R.G. (2017) "Smart Bentonite Drilling Muds Modified with Iron Oxide Nanoparticles and Characterized Based on the Electrical Resistivity and Rheological Properties with Varying Magnetic Field Strengths and Temperatures," ,” Offshore Technology Conference (OTC) 2017, OTC-27626, (OTC-2017), CD Proceeding, Houston, Texas, May 2017.
2. Vipulanandan, C. and Mohammed, A. (2017) "Smart Cement Modified with Laponite for Real Time Monitoring of Oil Well Cementing Applications,” American Association of Drilling Engineers (AADE), 2016, AADE-17-NTCE-126, CD Proceeding, Houston, Texas, April 2017.
3. Vipulanandan, C., Ali, K., Basirat, B., A. Reddy, Amani, N., Mohammed, A. Dighe, S., Farzam, H. and W. J. Head (2016), "Field Test for Real Time Monitoring of Piezoresistive Smart Cement to Verify the Cementing Operations ,” Offshore Technology Conference (OTC) 2016, OTC-27060-MS, (OTC-2016), CD Proceeding, Houston, Texas, May 2016.
4. Vipulanandan, C., Ali, K., Basirat, B., Reddy, A. and Callahan, D. (2016), "Field Study on Piezoresistive Smart Cement and Drilling Mud for Real Time Monitoring the Installation and Performance of the Cemented Well,” American Association of Drilling Engineers (AADE), 2016, AADE-16-FTCE-73, CD Proceeding, Houston, Texas, April 2016.

5. Vipulanandan, C, Krishnamoorti, R. Mohammed, A., G. Narvaez, Head, B. and Pappas, J. (2015) "Iron Nanoparticle Modified Smart Cement for Real Time Monitoring of Ultra Deepwater Oil Well Cementing Applications", Offshore Technology Conference (OTC) 2015, OTC-25842-MS, CD Proceeding, Houston, Texas, May 2015. (Over 100,000 attendees from around the world).
6. Vipulanandan, C. and Amani, N. (2015) "Behavior of Nano Calcium Carbonate Modified Smart Cement Contaminated with Oil Based Drilling Mud," Offshore Technology Conference (OTC) 2015, OTC-25845-MS, CD Proceeding, Houston, Texas, May 2015. (Over 100,000 attendees from around the world).
7. Vipulanandan, C, Ramanathan, P. Ali, M., Basirat, B. and Pappas, J. (2015) "Real Time Monitoring of Oil Based Mud, Spacer Fluid and Piezoresistive Smart Cement to Verify the Oil Well Drilling and Cementing Operation Using Model Tests", Offshore Technology Conference (OTC) 2015, OTC-25851-MS, CD Proceeding, Houston, Texas, May 2015. (Over 100,000 attendees from around the world).
8. Vipulanandan, C. and Mohammed, A. "Nanoparticle Modified Smart Oil Well Cement for Monitoring Cementing Applications," American Association of Drilling Engineers (AADE), 2015, AADE-15-NTCE-06, CD Proceeding, San Antonio, Texas, April 2015.
9. Vipulanandan, C. and Mohammed, A. "Hydraulic Fracturing Fluid Modified with Nanosilica Proppant and Salt Water for Clay Shale Rock," American Association of Drilling Engineers (AADE), 2015, AADE-15-NTCE-38, CD Proceeding, San Antonio, Texas, April 2015.
10. Vipulanandan, C., Ramanathan, P., Ali, M. and Basirat, B. "Real Time Monitoring of Piezoresistive Smart Cement to Verify Oil Well Cementing Operations Using Simulated Physical Model Tests," American Association of Drilling Engineers (AADE) 2015, AADE-15-NTCE-33, CD Proceeding, Houston, Texas, April 2015.
11. Vipulanandan, C, Krishnamoorti, R. Saravanan, R. Qi, Q. and Pappas, J. (2014) "Development of Smart Cement for Oil well Applications", Offshore Technology Conference (OTC) 2014, OTC-25099-MS, CD Proceeding, Houston, Texas, May 2014. (Over 100,000 attendees from around the world),
12. Vipulanandan, C, Hedi, M., Farmi, H. and Pappas, J. "Characterizing Smart Cement Contaminated with Oil Based Drilling Mud," Offshore Technology Conference (OTC) 2014, OTC-25200-MS, CD Proceeding, Houston, Texas, May 2014. (Over 100,000 attendees from around the world),
13. Vipulanandan, C, Raheem, A. and Pappas, J. "Modeling Filter Cake Formation," Offshore Technology Conference (OTC) 2014, OTC-25100-MS, CD Proceeding, Houston, Texas, May 2014. (Over 100,000 attendees from around the world),
14. Vipulanandan, C, Ali, K. and Pappas, J. "Developing Smart Cement For Oil Well Cementing," American Association of Drilling Engineers (AADE), 2014, AADE-14-NTCE-03, CD Proceeding, Houston, Texas, April 2014.

15. Vipulanandan, C, and Mohammed, A, J. "Hydraulic Fracturing Fluid with Nano Silica Proppants for Sandstone Rocks American Association of Drilling Engineers (AADE) 2014, AADE-14-NTCE-33, CD Proceeding, Houston, Texas, April 2014.
16. Salib, S., and Vipulanandan, C., "Effect of Metal Fibers and Powder on the Processing and Performance of High Temperature Superconducting Composite", Proceeding, TCSUH Workshop, pp. 153 - 163, February 1992.
17. Vipulanandan, C., and Ghurye, G., "Recycling of Used Oil: Review and Laboratory Verification ", Proceeding, HWHM/HMC-South '92, HMCRI, pp. 343 - 346, February 1992.

PAPERS PRESENTED AT TECHNICAL MEETINGS

1. "Smart Bentonite Drilling Muds Modified with Iron Oxide Nanoparticles and Characterized Based on the Electrical Resistivity and Rheological Properties with Varying Magnetic Field Strengths and Temperatures," ,” Offshore Technology Conference (OTC) 2017, OTC-27626, (OTC-2017), CD Proceeding, Houston, Texas, May 2017.
2. "Smart Cement Modified with Laponite for Real Time Monitoring of Oil Well Cementing Applications,” American Association of Drilling Engineers (AADE), 2016, AADE-17-NTCE-126, CD Proceeding, Houston, Texas, April 2017.
3. "Field Test for Real Time Monitoring of Piezoresistive Smart Cement to Verify the Cementing Operations ,” Offshore Technology Conference (OTC) 2016, OTC-27060-MS, (OTC-2016), CD Proceeding, Houston, Texas, May 2016.
4. "Field Study on Piezoresistive Smart Cement and Drilling Mud for Real Time Monitoring the Installation and Performance of the Cemented Well,” American Association of Drilling Engineers (AADE), 2016, AADE-16-FTCE-73, CD Proceeding, Houston, Texas, April 2016.
5. "Iron Nanoparticle Modified Smart Cement for Real Time Monitoring of Ultra Deepwater Oil Well Cementing Applications”, Offshore Technology Conference (OTC) 2015, OTC-25842-MS, Houston, Texas, May 2015. (Over 100,000 attendees from around the world).
6. "Behavior of Nano Calcium Carbonate Modified Smart Cement Contaminated with Oil Based Drilling Mud,” Offshore Technology Conference (OTC) 2015, OTC-25845-MS, Houston, Texas, May 2015. (Over 100,000 attendees from around the world).
7. "Real Time Monitoring of Oil Based Mud, Spacer Fluid and Piezoresistive Smart Cement to Verify the Oil Well Drilling and Cementing Operation Using Model Tests”, Offshore Technology Conference (OTC) 2015, OTC-25851-MS, Houston, Texas, May 2014. (Over 100,000 attendees from around the world).

8. "Nanoparticle Modified Smart Oil Well Cement for Monitoring Cementing Applications," American Association of Drilling Engineers (AADE), 2015, AADE-15-NTCE-06, San Antonio, Texas, April 2015.
9. "Hydraulic Fracturing Fluid Modified with Nanosilica Proppant and Salt Water for Clay Shale Rock," American Association of Drilling Engineers (AADE), 2015, AADE-15-NTCE-38, San Antonio, Texas, April 2015.
10. "Real Time Monitoring of Piezoresistive Smart Cement to Verify Oil Well Cementing Operations Using Simulated Physical Model Tests," American Association of Drilling Engineers (AADE) 2015, AADE-15-NTCE-33, Houston, Texas, April 2015.
11. "Development of Smart Cement for Oil well Applications", Offshore Technology Conference (OTC) 2014, OTC-25099-MS, Houston, Texas, May 2014. (Over 100,000 attendees from around the world),
12. "Characterizing Smart Cement Contaminated with Oil Based Drilling Mud," Offshore Technology Conference (OTC) 2014, OTC-25200-MS, Houston, Texas, May 2014. (Over 100,000 attendees from around the world),
13. "Modeling Filter Cake Formation," Offshore Technology Conference (OTC) 2014, OTC-25100-MS, Houston, Texas, May 2014. (Over 100,000 attendees from around the world),
14. "Developing Smart Cement For Oil Well Cementing," American Association of Drilling Engineers (AADE), 2014, AADE-14-NTCE-03, Houston, Texas, April 2014.
15. "Hydraulic Fracturing Fluid with Nano Silica Proppants for Sandstone Rocks American Association of Drilling Engineers (AADE) 2014, AADE-14-NTCE-33, Houston, Texas, April 2014.