Curriculum Vita
Rebecca K. Toghiani, Ph.D.

EDUCATION

B.S. Chemical Engineering	University of Missouri-Columbia	December 1978
M.S. Chemical Engineering	University of Missouri-Columbia	August 1980
Ph.D. Chemical Engineering	University of Missouri-Columbia	August 1988

EMPLOYMENT

8/96 - present	**Associate Professor of Chemical Engineering (with tenure)**, Department of Chemical Engineering, Mississippi State University
1/91 - 8/96	**Assistant Professor of Chemical Engineering**, Department of Chemical Engineering, Mississippi State University.
8/89 - 12/90	**Visiting Assistant Professor of Chemical Engineering**, Department of Chemical Engineering, Mississippi State University.
1/89 - 9/89	**Assistant Professor of Chemical Engineering**, Department of Mechanical Engineering, University of Alabama in Huntsville.
8/88-12-88	**Visiting Assistant Professor of Mechanical Engineering**, Department of Mechanical Engineering, University of Missouri-Columbia.
8/85 - 5/88	**Instructor**, Department of Chemical Engineering, University of Missouri-Columbia.
1/82 - 5/85	**Research Assistant**, Department of Chemical Engineering, University of Missouri-Columbia.
6/80 - 1/82	**Research Engineer II**, Separations Research Group, Environmental and Technology Planning Division, Monsanto Industrial Chemicals Co., St. Louis, Missouri.
5/78 - 8/78	**Summer Engineer**, Paper Products Research and Development Division, Proctor & Gamble Company, Cincinnati, Ohio.

AWARDS AND HONORS

- ***2009 Thomas C. Evans Instructional Paper Award*** from the Southeastern Section of the American Society of Engineering Education.
- ***Bagley College of Engineering Academy of Distinguished Teachers***, inaugural member, inducted Spring 2007.
- Recipient of the ***2004 Outstanding Teaching Award*** from the Southeastern Section of the American Society of Engineering Education.
- Selected as ***Professor of the Year '03-'04***, by Chemical Engineering undergraduates.
- Recipient of the ***2001 Outstanding Faculty Woman*** award, from the President's Commission on the Status of Women, Mississippi State University.
- Recipient of ***2000-2001 Hearin Professor of Engineering*** award.
- Recipient of the ***1999 Outstanding Engineering Educator for the College of Engineering*** award, elected by the College of Engineering Faculty.

- Selected as ***Professor of the Year '97-'98***, by Chemical Engineering B.S. graduates of December 1997, May 1998, and August 1998.
- Selected as ***Outstanding Faculty Member of the Month*****,** by the Golden Key National Honor Society, February 1997.
- Recipient of the ***Joseph J. Martin Award*** from the Chemical Engineering Division of the American Society of Engineering Education, 1997, awarded for the best paper presented at the 1996 ASEE Annual Conference, "**Entropy: Esoteric Concept or Utility Infielder?**"
- ***John Grisham Master Teacher Award*** for 1996-1998, from Mississippi State University, 1996.
- Recipient of the ***Dow Outstanding New Faculty Award*** for the Southeastern Section of the American Society of Engineering Education, 1996 (one of 12 awards made nationwide).
- ***Honorary Member, Golden Key National Honor Society***, (one of five faculty members inducted) 1995.
- Participant, ***National Effective Teaching Institute***, June 1994, Edmonton, Alberta, Canada.
- Co-author of ***1993 Outstanding Instructional Paper for the College of Engineering***
- Participant, ***National Science Foundation Teaching Effectiveness Workshop for New Faculty***, Bozeman, Montana, August 1992.
- Member, ***Phi Lambda Upsilon***, Chemistry Honor Society.
- ***Superior Graduate Achievement Award*** for the Department of Chemical Engineering, University of Missouri-Columbia, 1985/86.
- ***Outstanding Teaching Assistant*** for the Department of Chemical Engineering, University of Missouri-Columbia, 1979/80, 1981/82, 1985/86.
- ***Who's Who Among Students in American Universities and Colleges***, 1983.

PROFESSIONAL ACTIVITIES

American Institute of Chemical Engineers; American Society for Engineering Education; Society of Women Engineers; Women in Engineering Program Advocate Network; Instrument Society of America; Golden Key National Honor Society; American Association of University Women; Mississippi Academy of Science

AREAS OF TEACHING AND RESEARCH SPECIALIZATION

Teaching: Thermodynamics, Separations, Process Simulation, Mathematical Analysis and Modeling of Chemical Engineering Processes, Unit Operations Laboratory, Membrane Separations Processes, Reactor Design, Process Design

Research: Thermodynamics of Aqueous Electrolyte Systems, Vapor-Liquid Equilibrium, Supercritical Fluid Extraction

PUBLICATIONS

Toghiani, R.K., Henington, C.D., **Simulated Moving Bed Reactors - An Instructional Module for Incorporation of Process Intensification Concepts into the Senior Reactor Design Course**, *2011 ASEE Annual Conference Proceedings*, AC 2011-1068.

Toghiani, R.K., Minerick, A.R., Walters, K.B., Hill, P.J., Henington, C.D., **Engineering Future Chemical Engineers: Incorporation of Process Intensification Concepts into the Undergraduate Curriculum - Year 2**, *2011 ASEE Annual Conference Proceedings*, AC 2011-1239.

Minerick, A.R., Toghiani, R.K., Dawson, C., **Survey of the Unique Challenges that Minority Engineering and Science Students Encounter**, *2011 ASEE Annual Conference Proceedings*, AC 2011-2319.

Toghiani, R.K., Elmore, B.B., **Examining Current and Historical Events in an Freshman Chemical Engineering Seminar**, *2011 ASEE Annual Conference Proceedings*, AC 2011-1227.

Naik, P.P., Toghiani, R.K., Lindner, J.S., Smith, L.T., Pearson, L.E., **Kinetics of Aluminum Formation in the Caustic Side Solvent Extraction (CSSX) Process**, *WM'2011 Conference Proceedings*.

Toghiani, R.K., Elmore, B.B., **Freshman Seminar in Chemical Engineering: Strategies for Student Success**, *2011 ASEE-Southeastern Section Meeting Conference Proceedings*.

Toghiani, R.K., Toghiani, H., Boddu, V.M., Maloney, S.W., **Prediction of Physicochemical Properties of Energetic Materials**, book chapter in Energetic Materials: Thermophysical Properties, Predictions and Experimental Measurements, (CRC Press, 2010).

Boddu, V.M., Toghiani, R.K., Toghiani, H., **Prediction of Solubility and Phase Behaviorof ε-CL20 in Supercritical Carbon Dioxide**, book chapter in Energetic Materials: Thermophysical Properties, Predictions and Experimental Measurements, (CRC Press, 2010).

Toghiani, R.K., Minerick, A.R., Walters, K.B., Hill, P.J., Hennington, C.D., **Engineering Future Chemical Engineers: Incorporation of Process Intensification Concepts into the Undergraduate Curriculum,** *2010 ASEE Annual Conference Proceedings.*

Pearson, L.E., Toghiani, R.K., Lindner, J.S. **Savannah River Site Saltcake Retrieval Simulation,** *WM2010 Conference Proceedings.*

Minerick, A., Walters, K.B., Elmore, B., Toghiani, R.K., Hill, P.J., Hernandez, R., Toghiani, H., French, W.T., **Cross-Curricular Topic Inventory: Strategic Topic Placement and Resulting Student Accountability**, *2009 ASEE Annual Conference Proceedings.*

Selvaraj,D.O., Toghiani, R.K., Lindner, J.S., **Solubility in the Na + F + NO_3 and Na + PO_4 + NO_3 Systems in Water and in Sodium Hydroxide Solutions**, *J. Chem. Engr. Data,* 53(6), 1250-1255, (2008).

Toghiani, R.K., Minerick, A.M., Walters, K.B., **Making the Connection: Facilitating Student Integration of Chemical Engineering Concepts into a Coherent Framework**, *2008 ASEE Conference Proceedings*.

Ruff, T.J., Toghiani, R.K., Smith, L.T., Lindner, J.S., **Studies on the Gibbsite to Boehmite Transition**, *Separation Science and Technology*, 43(9-10), 2887-2899, (2008).

Toghiani, R.K., Lindner, J.S., **Modeling of Unsaturated Saltcake Dissolution for S-109 Simulant**, *WM08 Conference Proceedings.*

Toghiani, R.K., Phillips, V.A., Smith, L.T., Lindner, J.S., **Solubility in the Na + SO_4 + NO_3 and Na + SO_4 + NO_2 Systems in Water and in Sodium Hydroxide Solutions**, *J. Chem. Engr. Data*, 53(3), 798-804, (2008).

Toghiani, R.K., Toghiani, H., Maloney, S.W., Boddu, V.M. **Prediction of physicochemical properties of energetic materials,** *Fluid Phase Equilibria*, 264(1-2), 86-92, (2008).

Zhang, Jieling, Toghiani, Hossein, Mohan, Dinesh, Pittman, Charles U., Jr., Toghiani, Rebecca K. **Product Analysis and Thermodynamic Simulations from the Pyrolysis of Several Biomass Feedstocks**, *Energy & Fuels*, 21(4), 2373-2385, (2007).

Smith, L.T., Toghiani, R.K., Antonyraj, A., Phillips, V., Lindner, J.S., **SRS Low-Curie Process Modeling and Experiments**, *Separation Science and Technology*, 41(11), 2341-2360, (2006).

Toghiani, R.K., Smith, L.T., Lindner, J.S., Tachiev, G.I., Yaari, G., **Modeling of Pilot-Scale Salt Cake Dissolution**, *WM'06 Conference Proceedings*.

Toghiani, R.K., Phillips, V.A., Lindner, J.S., **Solubility of Na-F-SO_4 in Water and in Sodium Hydroxide Solutions**, *J. Chem. Engr. Data*, 50(5), 1616-1619, (2005).

Boddu, V.M., Toghiani, R.K., Damavarapu, R., **Solubility and Phase Behavior of Cl-20 and RDX in Supercritical Carbon Dioxide**, 24th Army Science Conference Proceedings, 2004.

Yan, Q.G., Wu, T.H., Weng, W.Z., Toghiani, H., Toghiani, R.K., Wan, H.L., Pittman, C.U., Jr., **Partial Oxidation of Methane to H_2 and CO over Rh/SiO_2 and Ru/SiO_2 Catalysts**, *Journal of Catalysis*, 226(2), 247-259, (2004).

Lindner, J.S., Toghiani, R.K., Smith, L.T., **Experimental and Modeling Studies of the SRS Low-Curie Salt Process**, 13th Symposium on Separation Science and Technology for Energy Applications, Conference Proceedings, 2003.

Antonyraj, A., Durve, T., Toghiani, R.K., Lindner, J.S., **Saltcake Dissolution Studies in Single-Shell Tank Retrieval**, WM'03 Annual Conference Proceedings, February 2003.

Mohammad, J., Ramsey, W.G., Toghiani, R.K., **Role of Boron Oxide (B_2O_3) in the Chemical Durability of Simulated High-level Waste Borosilicate Glasses**, WM'03 Annual Conference Proceedings, February 2003.

Yan, Q.G, Weng, W.Z., Wan, H.L., Toghiani, H., Toghiani, R.K., Pittman, C.U., Jr., **Activation of Methane to Syngas over a Ni/TiO_2 Catalyst**, *Applied Catalysis A*, 239(1-2), 43, (2003).

Toghiani, R.K., Lindner, J.S., Phillips, V., Selvaraj, D., **Experimental Measurements of Solid-Liquid Equilibria in Select Inorganic Systems**, 2002 AICHE Spring Meeting, Session 142, Thermodynamics for Process Design and Equilibrium.

Toghiani, R.K., Lindner, J.S., Herting, D.L., **Modeling of Hanford Saltcake Dissolution**, 2002 AICHE Spring Meeting, Session 140, Process Simulators in Sophisticated Process Modeling.

Rogers, R., Toghiani, R.K., **Gas-Hydrate Storage of Natural Gas**, *2001 ASEE Annual Conference Proceedings*, (published on CD-ROM).

Lindner, J.S., Toghiani, R.K., Barfield, C., Tan, M., **Validation and Application of a Thermodynamic Model for the Pretreatment of Hanford Waste**, *2000 Waste Management Conference Proceedings*, February 2000.

Toghiani, R.K., Sappington, T., **SEE for Kids: K-12 Outreach Efforts at Mississippi State University**, *2000 ASEE Annual Conference Proceedings*, (published on CD-ROM).

Toghiani, H., Toghiani, R.K., Hill, D.O., Wierenga, C., **Enhancement of Instrumentation and Process Control Studies at the Undergraduate Level**, *2000 ASEE Annual Conference Proceedings*, (published on CD-ROM).

Toghiani, R.K., **Chemical Engineering at Mississippi State University**, *Chemical Engineering Education*, 32(2), 82-87, (1998).

Toghiani, R.K., **Chemical Engineering Thermodynamics: Transforming "*Thermo*" Lectures into a "*Dynamic*" Experience for Undergraduates**, *1998 ASEE Annual Conference Proceedings* (published on CD-ROM).

Toghiani, R.K., Toghiani, H., Venkateswarlu, G., **Vapor-Liquid Equilibria for Methyl-*tert* Butyl Ether + Methanol and *tert*-Amyl Methyl Ether + Methanol**, *Fluid Phase Equilibria*, 122, 157-168, (1996).

Toghiani, R.K., Toghiani, H., Jones, J., **Supercritical Fluid Extraction in the Undergraduate Laboratory**, *1996 ASEE Annual Conference Proceedings* (published on CD-ROM).

Toghiani, R.K., **Entropy: Esoteric Concept or Utility Infielder?** *1996 ASEE Annual Conference Proceedings* (published on CD-ROM).

Toghiani, R.K., Wierenga, C., Toghiani, H., **Introduction of Novel Instrumentation and Control Topics Using an Industrial Style Control System**, *Advances in Instrumentation and Control*, 50(3), 1541-1548, (1995).

Venkateswarlu, G., Toghiani, R.K., Toghiani, H., **Measurement of Vapor Pressure and Vapor-Liquid Equilibria for Systems Containing Fuel Oxygenate Compounds**, *Proceedings of the Second International Symposium on Environmental and Chemical Engineering*, Dalian, PRC, 327-332, (The Dalian University of Technology Press, 1994).

Toghiani, H., Toghiani, R.K., Hill, D.O**., Advanced Process Control Using a PC-Based Digital Controller**, *Proceedings of the Second International Symposium on Environmental and Chemical Engineering*, Dalian, PRC, 178-192, (The Dalian University of Technology Press: 1994).

Hill, D.O., Toghiani, H., Toghiani, R.K., Koelling, H.A., Zheng, Y., **Value-Added Concepts for Scrap Tire Utilization**, *Proceedings of the Second International Symposium on Environmental and Chemical Engineering*, Dalian, PRC, 29-42, (The Dalian University of Technology Press: 1994).

Toghiani, H., Toghiani, R.K., Viswanath, D.S., **Vapor Liquid Equilibrium Data for the Methanol-Benzene and Methanol-Thiophene Systems**, *Journal of Chemical and Engineering Data*, 39(1), 63, (1994).

Toghiani, H., Toghiani, R.K., Wierenga, C., **Automated Process Control in the Undergraduate Laboratory: Utilization of the CAMILE Data Acquisition and Control System**, *Advances in Instrumentation and Control*, 48(3), 2151-2168, (1993).

Toghiani, R.K., Toghiani, H., King, R., Kosgi, M., **An On-Line Advisor for the Distillation Experiment: Expert Systems in the Chemical Engineering Laboratory**, *1993 ASEE Annual Conference Proceedings*, 1141-1147, (1993).

Toghiani, R.K., Toghiani, H., Wierenga, C., **Laboratory Automation with CAMILE**, *1991 ASEE Annual Conference Proceedings*, 1745-1750, (1991).

Research Reports

Toghiani, R.K., **Estimation of Physical Properties for Waste-Air Treatment Evaluation**, Final Project Report to ARM-CERL, 2009

Toghiani, R.K., Toghiani, H., **Prediction of Physicochemical Properties of Energetic Materials for Identification of Treatment Technologies for Generated Waste Streams,** Final Project Report to ARM-CERl, 2009.

Toghiani, R.K., **Solubility and Phase Behavior of CL20 in Supercritical Fluids**, Final Project Report, U.S. Army Construction Engineering Research Laboratory, March 2004.

Lindner, J.S., Zhong, Y., Toghiani, R.K., **Dissolution and Evaporative Processing of Salt Cake Waste from Hanford Tank 241-S-112**, DIAL Technical Report 41385, TR-2003-2, December 2003.

Lindner, J.S., Smith, L.T., Antonyraj, A., Toghiani, R.K., **Thermodynamic Simulations in Support of Savannah River Site Tank 41H Retrieval and Processing**, DIAL Technical Report 41385 TR-2003-1, May 2003.

Toghiani, R.K., Lindner, J.S., **Saltcake Dissolution Status Report, FY00**, DIAL Technical Report, October 2000.

Toghiani, R.K., Lindner, J.S., Weber, C.F., Hunt, R.D., **Modeling of Sulfate Double-salts in Nuclear Wastes**, ORNL/TM-2000/300, October 2000.

Lindner, J.S., Toghiani, R.K., **Thermodynamic Simulations on Hanford Tank 241-SY-101: Part 3: Crust Solids Dissolution Modeling and Associated Gas Release**, DIAL Technical Report DE-FC26-98FT40395-TR-98.1.3, August 1999.

Beahm, E.C., Toghiani, R.K., Weber, C.F., **Comparative Calculations of Solubility Equilibria**, ORNL Technical Report ORNL/TM-1999/127, October 1999.

Toghiani, R.K., Lindner, J.S., **Saltcake Dissolution Status Report, FY 99**, DIAL Technical Report, January 2000 (peer reviewed).

Toghiani, R.K., Lindner, J.S., Barfield, C., **Saltcake Dissolution Status Report, FY 98,** DIAL Technical Report, DE-FC26-98FT40395-TR-98-1.2, October 1998 (peer reviewed)

Lindner, J.S., Toghiani, R.K., Barfield, C., **Thermodynamic Simulation of Hanford Tank 241-SY-101 Dissolution - Part 2: Supernate Transfer Followed by In-Tank Dilution**, DIAL Technical Report, DE-FC26-98FT40395-TR-98-1.1, October 1998 (peer reviewed).

Lindner, J.S., Toghiani, R.K., Barfield, C., **Thermodynamic Simulation of Tank 241-SY-101 Dissolution – Part 1: In-Situ Crust Dissolution**, DIAL Technical Report, DE-FC26-98FT40395-TR-98-1, September 1998 (peer reviewed).

Toghiani, R.K., Toghiani, H., Lindner, J.S., DIAL Annual Report, **Subtask 1.6, Hybrid GC Method**, October 1997.

Toghiani, R.K., **Separation Strategies for Tire Pyrolysis Liquid Product: Application of Pervaporation to the Separation of Benzene/Toluene/Xylene Mixtures**, Final Research Report to the Mississippi Department of Environmental Quality, March 1995.

Lightsey, G.R., Toghiani, R.K., **Pelletization of Coal Fines Using Acid Hydrolysis Residue**, Quarterly Research Report to Tennessee Valley Authority, January 1995.

Toghiani, R.K., **Vapor Liquid Equilibria in the Ternary System: MTBE/TAME/Methanol**, Final Research Report to Texas Petrochemicals, October 1994.

Lightsey, G.R., Toghiani, R.K., Yusef, Z**., Pelletization of Coal Fines Using Acid Hydrolysis Residue**, Research Report to Tennessee Valley Authority, October 1994.

Lightsey, G.R. Toghiani, R.K., **Utilization of Acid Hydrolysis Residue as a Binder for Coal Fines**, Research Progress Report to Tennessee Valley Authority, May 1994.

Toghiani, H., Toghiani, R.K., Madhukar P., Wang, L., **SKIP Project: Effect of Carbonyl Sulfide, Hydrogen Sulfide, Sulfur Dioxide, Carbon Dioxide on B-2 Isomerization**, MSSU-EIRS-CHE-93-18, Engineering Research and Industrial Station, Mississippi State University, November 1992.

Toghiani, H., Wang, J., Chen, D., Toghiani, R.K., **BLISS Project: Effect of Feed Impurities on Catalyst Performance**, MSSU-EIRS-CHE-93-12, Engineering Research and Industrial Station, Mississippi State University, June 1992.

Toghiani, H., Wang, J., Chen, D., Toghiani, R.K., **BLISS Project: Effect of Feed Impurities on Catalyst Performance**, MSSU-EIRS-CHE-93-11, Engineering Research and Industrial Station, Mississippi State University, March 1992.

Toghiani, H., Toghiani, R.K., **Measurement and Analysis of Vapor-Liquid Equilibria**, Final Report, Research Initiation Program, Office of Research, Mississippi State University, January 1992.

Toghiani, H., Hill, D.O., Wang, J., Chen, D., Toghiani, R.K., **Phoenix Project: Continuous Flow Studies, Final Report**, MSSU-EIRS-CHE-93-8, Engineering Research and Industrial Station, Mississippi State University, August 1991.

Toghiani, H., Toghiani, R.K., **BLISS Project: Automation of TPC Pilot Plant, Final Report**, MSSU-EIRS-CHE-93-7, Engineering Research and Industrial Station, Mississippi State University, February 1991.

Presentations

Simulated Moving Bed Reactors - An Instructional Module for Incorporation of Process Intensification Concepts into the Senior Reactor Design Course, presented at *2011 ASEE Annual Conference*, Vancouver, BC, Canada, June 29, 2011.

Engineering Future Chemical Engineers: Incorporation of Process Intensification Concepts into the Undergraduate Curriculum - Year 2, presented at *2011 ASEE Annual Conference*, Vancouver, BC, Canada, June 27, 2011.

Examining Current and Historical Events in an Freshman Chemical Engineering Seminar, presented at *2011 ASEE Annual Conference*, Vancouver, BC, Canada, June 28, 2011.

Freshman Seminar in Chemical Engineering: Strategies for Student Success, presented at *2011 ASEE-Southeastern Section Meeting,* Charleston, SC, April 12, 2011.

Kinetics of Aluminum Formation in the Caustic Side Solvent Extraction (CSSX) Process, *WM'2011 Conference*, Phoenix, AZ,.

Development of a Thermochemical Model for Waste Processing, Invited Presentation at the EM-31 Waste Processing Models, Material Property Standards, and Software V & V Training Workshop, 12/2/2010, Germantown, MD.

Thermodynamic Modeling of Waste Processing, 2010 EM Technical Exchange, Atlanta, GA, 11/19/2010.

Savannah River Site Saltcake Retrieval Simulation, WM10 Waste Management Symposium, 2/28/2010, Phoenix, AZ.

Making the Connections: Facilitating Student Integration of Chemical Engineering Concepts into a Coherent Framework, Invited talk for the Thomas C. Evans Outstanding Instructional Paper Award, April 6, 2009, Atlanta, GA.

On the Formation and Treatment of Trisodium Phosphate Plugs, presented at the Slurry Retrieval, Pipeline Transport and Plugging and Mixing Workshop, U.S. Department of Energy, Orlando, FL, January 2008.

Tasks 1.2 & 2.1, Process Chemistry and Waste Disposition Alternatives for DOE Sites, briefing to Steve Kraus, DOE Program Manager, EM-21, January 2008.

Modeling of Unsaturated Saltcake Dissolution for S-109 – 8294, WM2008 Conference, February 2008.

Effect of Supercritical Water Treatment on the Composition of Bio-oil, 2008 MSU Biofuels Conference, August 2008.

Events that Shaped the Chemical Industry, 2008 AIChE Annual Conference, November 2008.

Modeling of Saltcake Dissolution, 2008 AIChE Annual Conference, November 2008.

Nanoparticulation of CL20: A Feasibility Study to Produce Nanoparticles of CL20 with Supercritical Fluids, 2007 AIChE Meeting, November 2007, Salt Lake City, UT.

Studies on the Gibbsite to Boehmite Transition, 15th Symposium on Separation Science and Technology for Energy Applications, October 2007, Gatlinburg, TN.

Overview of ICET Capabilities in Nuclear Waste Processing, 2007 Hanford/SRS/Idaho Technical Exchange on Waste Processing, October 2007, Atlanta, GA.

DOE Chemistry Studies, 2007 Hanford/SRS/Idaho Technical Exchange on Waste Processing, October 2007, Atlanta, GA.

Improvement of Bio-oil Stability through Treatment with Subcritical/Supercritical Water, MSU Biofuels Conference, August 2007, Starkville, MS.

Prediction of Physicochemical Properties of Energetic Materials, 11th International Conference on Properties and Phase Equilibria for Product and Process Design PPEPPD 2007, May 2007.

Prediction of Phospholipid Solubilities in Conventional Solvents, 7th Southern School on Computational Chemistry and Materials Science, April 2007.

Preparation and Treatment of Hanford Tank Sludge, Mississippi Academy of Sciences, February 2007, Starkville, MS.

Solubility Investigations of (K+, Na+, Cs+)-NO_3-OH-H_2O Systems, Mississippi Academy of Sciences, February 2007, Starkville, MS.

Improved Process Chemistry for Legacy Nuclear Waste Remediation: 14th Symposium on Separation Science and Technology for Energy Applications, October 2005.

Process Chemistry Support for Hanford, 2005 SRS-Hanford Technical Exchange, March 2005.

NAS Database Development, Savannah River Site Presentation of Work, March 2004.

Modeling and Experimental Support for High-Level SRS Salt Disposition Alternatives, Savannah River Site Presentation of Work, March 2004.

Enhancement of ESP Thermodynamic Predictions through Experimental Measurements, Technology Exchange Briefing, Richland, WA, January 12-14, 2004.

Validation, Improvement and Application of ESP, Saltcake Dissolution Workshop, Richland, WA, May 2002.

Modeling of Hanford Saltcake Dissolution, 2002 AIChE Spring Meeting, New Orleans, LA, March 2002.

Experimental Measurements of Solid-Liquid Equilibria in Select Inorganic Systems, 2002 AIChE Spring Meeting, New Orleans, LA, March 2002.

Saltcake Dissolution Studies – Modeling Efforts, Savannah River Tank 37 Workshop, Aiken, SC, September 2001.

DOE Briefing – Hanford Tank Waste Chemistry, DOE-DIAL visit, Mississippi State, MS, July 2001.

Gas-Hydrate Storage of Natural Gas, 2001 ASEE Annual Conference, Albuquerque, NM, June 2001.

Mathematics in Chemical Engineering: From the 'Ball-Park' to the 'Lap-Top', 2001 ASEE Annual Conference, Albuquerque, NM, June 2001.

Overview of Saltcake Dissolution Modeling, Saltcake Dissolution Workshop, Richland, WA, May 2001.

Saltcake Dissolution Project, MYTR A9554 (Hanford Tank Waste Chemistry), 2000 Tanks Focus Area Midyear Review, Salt Lake City, UT, March 2001.

Enhancement of Instrumentation and Process Control Studies at the Undergraduate Level, 2000 ASEE Annual Conference, St. Louis, MO, June 2000.

SEE for Kids: K-12 Outreach Efforts at Mississippi State University, 2000 ASEE Annual Conference, St. Louis, MO, June 2000.

Exposure to Process Control Through Hands-on Activities in the Unit Operations Laboratory, 2000 ASEE Annual Conference, St. Louis, MO, June 2000.

Saltcake Dissolution, FY00 Progress Briefing, 2000 Saltcake Dissolution Workshop, Hanford Site, Richland, WA, May 2000.

ESP Comparison Studies, FY00 Progress Briefing, 2000 Saltcake Dissolution Workshop, Hanford Site, Richland, WA, May 2000.

DOE/TFA FY00 Saltcake Progress, DOE/TFA Site Visit, Starkville, MS, December 1999.

Thermodynamic Modeling of Hanford Waste, CHE Graduate Seminar, Starkville, MS, September 1999.

Gender Equity in the Classroom, Presentation at the New Engineering Faculty Orientation Program, Starkville, MS, September 1999.

Comparative Studies of ESP, Saltcake Dissolution Workshop, Knoxville, TN, May 1999.

ESP Benchmarking Studies, Saltcake Dissolution Workshop, Knoxville, TN, May 1999.

ESP Modeling to Support Operations at the Hanford Waste Site, presented to representatives of Savannah River Technology Corporation, Mississippi State, Mississippi, October 5, 1998. Also presented to representatives of GTS-Duratec, Mississippi State, Mississippi, October 6, 1998.

Crust Remediation Options for SY-101: Simulation Studies, presented to SY-101 Task Force, DOE-Richland, Richland, Washington, September 21, 1998.

Saltcake Dissolution Studies: Modeling of Select Hanford Tank Wastes, presented to representatives of British Nuclear Fuels, Ltd., Mississippi State, Mississippi, September 15, 1998.

ESP Modeling of Select Hanford Tank Wastes, presented to DIAL Faculty, Mississippi State, Mississippi, July 22, 1998.

Chemical Engineering Thermodynamics: Transforming "*Thermo*" Lectures into a "*Dynamic*" Experience for Undergraduates, presented at the 1998 ASEE Annual Conference, Seattle, Washington, June 28, 1998.

Saltcake Dissolution Modeling – Progress to Date, presented at the TFA Leachate Solids Workshop, Mississippi State University, Mississippi State, Mississippi., May 5, 1998.

Control of Leachate Solids, DIAL/MSU Component, presented at the DOE-Tanks Focus Area Midyear Review, Richland, Washington, March 11-15, 1998.

Supercritical Fluid Extraction in the Undergraduate Laboratory, presented at the 1996 ASEE Annual Conference, Washington, D.C, June, 1996.

Entropy: Esoteric Concept or Utility Infielder?, presented at the 1996 ASEE Annual Conference, Washington, D.C, June, 1996.

Production of Fuel Oxygenates: Phase Equilibria Needs for Process Design/Development, presented at Auburn University, invited contribution to the Auburn University Chemical Engineering Department Distinguished Lecture Series for 1995, Auburn, Alabama, October 20, 1995.

Introduction of Novel Instrumentation and Control Topics Using an Industrial Style Control System, presented at the ISA/95 Technical Conference, New Orleans, Louisiana, October 1-4, 1995.

Vapor Liquid Equilibrium in the Methanol/MTBE/TAME System, presented at the Seventh International Conference on Fluid Properties and Phase Equilibria for Chemical Process Design, Snowmass, Colorado, June 18-23, 1995.

Utilization of Acid Hydrolysis Residues as Adhesives for Size Enlargement of Fine Coal Particles, presented at the Seventeenth Symposium on Biotechnology for Fuels and Chemicals, Boston, Massachusetts, May 1995.

Remediation of Jet-Fuel Contaminated Soil Using Supercritical Extraction, presented at the Gulf Coast Hazardous Substance Research Center SAC/IAC Meeting, Beaumont, Texas, January 1995.

Production of Fuel Oxygenate Compounds: Needs for Process Design/Development, (invited), presented at the Alternate Fuels Expo, Jackson, Mississippi, September 1994.

Quantum Mechanical Approximations for the Determination of Gas Transport Properties, Chemical Engineering Graduate Seminar, Mississippi State University, Starkville, Mississippi, April 1994.

Transport Properties for Diatomic Gases - The IOS Approximation and Determination of Thermal Conductivity, presented at the AIChE 1993 Annual Meeting, St. Louis, Missouri, November 1993.

An On-Line Advisor for the Distillation Experiment: Expert Systems in the Chemical Engineering Laboratory, presented at the 1993 ASEE Annual Meeting, Champaign-Urbana, Illinois, June 1993.

Detoxification of Treated Wood Waste by Supercritical Extraction, presented at the Gulf Coast Hazardous Substance Research Center SAC/IAC Meeting, Beaumont, Texas, January 1993.

Laboratory Automation with CAMILE, presented at the 1991 ASEE Annual Meeting, New Orleans, Louisiana, June 1991.

Incorporation of ASPEN/SP Process Simulation into the Chemical Engineering Curriculum, presented at the 1991 ASEE Annual Meeting, New Orleans, Louisiana, June 1991.

<u>Chair and M.S. Thesis Director</u>

Ms. Jianping Leng, M.S. Chemical Engineering, May 1995, "Remediation of Jet-Fuel Contaminated Soil Using Supercritical Carbon Dioxide."

Mr. Venkateswarlu Gundapaneni, M.S. Chemical Engineering, (co-advisor), May 1995, "Vapor Liquid Equilibrium in the MTBE/TAME/Methanol System."

Mr. Zaki Yusef, M.S. Chemical Engineering, August 1996, "Use of Acid Hydrolysis Residues as Adhesives for Fine Coal Enlargement."

Mr. Alex Chen, M.S. Chemical Engineering , August 1996, "Application of Pervaporation to the Separation of Benzene/Toluene/Xylene Mixtures."

Mr. Michael Marino, M.S. Chemical Engineering, May 1997, "Removal of Heavy Metals from Soil Using Physical Separation Methods."

Ms. Dana Miles, M.S. Chemical Engineering, August 1997, "Removal of Trichloroethylene and Tetrachloroethylene from Soil Using Supercritical Extraction."

Mr. Xiaoming Xu, M.S. Chemical Engineering, August 1997, "Vapor Liquid Equilibrium Studies of MTBE/Benzene and MTBE/Toluene Systems."

Mr. Vijay Kumar Raju, M.S. Chemical Engineering, December 2001, "Experimental Studies of Saltwell Pumping and Slurry Transport."

Mr. Mohammad Javeed, M.S. Chemical Engineering, December 2002, "Optimization of High-level Waste Loading in a Borosilicate Glass Matrix by Using Chemical Durability Modeling Approach."

Ms. Vivianna Serrano-Benum, M.S. Chemical Engineering, August 2003, "Computer Simulation Studies for the Production of 7-Tetradecene by Reactive Distillation."

Mr. Dinesh Selvaraj, M.S. Chemical Engineering, August 2003, "Solubility Studies on Sodium Salts of Fluoride, Nitrate, Phosphate, and Hydroxide."

Mr. Tushar Durve, M.S. Chemical Engineering, August 2003, "A Physico-Chemical Characterization of Salt Cake Dissolution and Study of Sodium Phosphate Dodecahydrate Plug Remediation."

Ms. Mihee Jung, M.S. Chemical Engineering, December 2005, "Solubility Studies in the Aluminum-Sodium-Nitrate-Hydroxide System."

Ms. Kristina Hogencamp, M.S. Chemical Engineering, December 2005, "Design and Evaluation of a Large Scale Aerosol Generator."

Mr. Tim Ruff, M.S. Chemical Engineering, August 2007, "Aluminum Chemistry and its Implications on Pretreatment and Disposition of Hanford Waste Sludge."

Mr. Ananda Sekar, M.S. Chemical Engineering, August 2008, "Improvement of Bio-oil Stability."

Mr. Punith N. Naik, M.S. Chemical Engineering, August 2010, "Kinetic Studies of Aluminum Formation in The Caustic Side Solvent Extraction (CSSX) Process"

SERVICE

Professional association service

- **Vice Chair,** Chemical Engineering Division, Southeastern Section of the American Society for Engineering Education (2004)**.**
- **Chair**, Chemical Engineering Division, Southeastern Section of the American Society for Engineering Education (2005).
- **2003 Technical Program Chair**, Chemical Engineering Division of the American Society for Engineering Education, (2001 – 2003).
- **Committee Member**, J.J. Martin Best Paper Award Selection Committee (2002, 2003).

- **National Membership Chairman**, Chemical Engineering Division of the American Society for Engineering Education (1996 - 1999)
- **Reviewer - Seventh International Conference on Fluid Properties and Phase Equilibria for Chemical Process Design**, Snowmass, Colorado, June 1995.
- **Reviewer,** *Fluid Phase Equilibria, J. Chem. Engr. Data*
- **Reviewer,** *ASEE Conference Proceedings*
- **Reviewer, ACS Symposium Series - Supercritical Fluid Extraction**, (1996)
- **Reviewer for SAGIAN Inc. Academic Excellence Program** - 1 of 3 faculty members nationwide selected to serve on the review panel for the SAGIAN program which requested proposals detailing projects using the CAMILE system in undergraduate Chemical Engineering and Chemistry laboratories. Reviewed and ranked 22 proposals submitted to the program.
- **Moderator** of CHE session at the 1998 ASEE Annual Conference entitled 'Academic Advising Issues.
- **Moderator** of CHE session at the 1997 ASEE Annual Conference entitled 'Case Studies in Chemical Engineering'.
- Served as judge for student technical presentations at the AIChE Southeastern Conference meeting, Atlanta, Georgia, April 1991.

University and departmental committee and administrative accomplishments

- Faculty Senate (2007 to present)
- Member, Search Committee for Associate Dean for Engineering, (2005)
- SACS Accreditation Internal Review Committee for Department of Chemistry (2005)
- Faculty Advisor, Omega Chi Epsilon student chapter, (2005 to present)
- Women in Engineering Steering Committee (2000 to 2003)
- Graduate Affairs Committee (2001 to 2003), chair
- Undergraduate Affairs Committee (2004 to present)
- Ad Hoc Computing Committee (2002-2003), chair
- Departmental Assessment Committee (2003-2004)
- Texas Olefins Professorship Selection Committee (2003)
- Faculty Search Committee (2001, 2003)
- University Faculty Grievance Committee (2001 to 2003)
- University Teaching Evaluation Committee (2000 to 2003)
- Mentor for CSEM Fellows Rochelle Smith and Christine Morrison (2001 – 2004)
- Mentor for CSEM Fellow Marleah Saul (2005 to present)
- Search Committee, Swalm School of Chemical Engineering Director (2000)
- Harry Simrall Outstanding Senior Award Selection Committee (1999)
- Hearin Team – Graduate and Research Component (1998)
- Hearin Team – Undergraduate General Component (1998)
- Engineering College Faculty Council, Department Representative (1992 - 1997); Chairman, (1996); Vice-Chairman, (1995); Secretary/Parlimentarian, (1994); Chair, Administrative Committee (1993); Chair, Ancillary Committee (1997).
- PACE Advisor
- Faculty Research Advisory Council (1994 to 2000)
- Mississippi State Steering Committee for the MAMP (Mississippi Alliance for Minority Participation) Project, Departmental Representative, (1992 to 2000)

- Women in Engineering Program Advocates Network, Campus Representative for Mississippi State University Institutional Membership (1994-present)
- Screening Committee for IMAGE Summer Bridge Applicants (1994, 1995)
- College of Engineering Research Initiation Proposal Review Committee (1995)
- Dean's Committee to Recruit K-12 Outreach Coordinator (1995)
- Patricia Roberts Harris Fellowship Committee (College of Engineering, 1994 to 2001)
- Oral Communications Skills Evaluator for 1995 International Teaching Assistant Workshop
- College of Engineering Research Initiation Proposal Review Committee (1995)
- College of Engineering Outstanding Instructional Paper Selection Committee (1996)
- GEM Proposal Development Committee (1994)
- Dean's Committee to Study Utilization of Graphics Capabilities at the Engineering Research Center (1993)
- Dean's Committee to Study Recruitment and Retention of Women and Minorities in Engineering (1992)
- Evaluation Committee for the Spring 1992 Otto Schillig Special Teaching Projects for the College of Engineering
- Participant - Site Evaluation for the IMAGE Program (November 1993)
- Department of Chemical Engineering Scholarship Committee