K E I T H L . G A W R Y S

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OBJECTIVE

To reach a leadership position within an R&D team of an innovative company with a global awareness. Specific interests include: colloidal aggregation and interfacial phenomena, chemistry of complex fluids, petroleum engineering.

EDUCATION

North Carolina State University Raleigh, NC 1998–present

- Ph.D., Chemical Engineering expected 08/04; GPA 3.82/4.00
- M.S., Chemical Engineering 12/00
- Thesis topic: Generating a Chemical Distribution Function for Petroleum Asphaltenes
- Advisor: Dr. Peter K. Kilpatrick

Florida State University Tallahassee, FL 1994–1998

- B.S., Chemical Engineering with Honors/Chemistry, GPA 4.00/4.00
- Graduated Summa Cum Laude

Davidson College Davidson, NC 1993–1994

EXPERIENCE

North Carolina State University Raleigh, NC 1998–present

Research Assistant

- Determination of the effects of solvent, temperature, and the influence of solvating additives on the aggregate size, molecular weight, second virial coefficient, and fractal dimension of asphaltene aggregates as measured by Small-Angle Neutron Scattering (SANS).
- Profiling the chemical distribution of functional moieties and aggregate sizes within asphaltene solubility fractions as measured by elemental analysis, UV-vis absorption spectroscopy, Fourier transform infrared spectroscopy (FTIR), and SANS
- Predictive modeling of the solubility behavior of polyaromatic solutes in multicomponent solvent mixtures measured by UV-vis absorption spectroscopy.
- Probing the orientation of alkyl- and aromatic thiols on gold surfaces using Near Edge X-ray Absorption Spectroscopy (NEXAFS)
- Laboratory organization and management for the research group of Dr. Peter Kilpatrick, including ordering of supplies, waste disposal, instrument upkeep and repair, instrument training, and laboratory safety training.
- Graduate student mentor for the NSF Green Processing REU Program (1999-2003) and Minority Graduate Education Program (2002-2003), summer programs designed to provide research experience to highly motivated undergraduate students

Teaching Assistant

- Thermodynamics of Chemical and Phase Equilibria (1998)
- Chemical Process Systems (1999)

Additional Training

- Received radiological, safety, and instrument training on the U7A beamline at the National Synchrotron Light Source of Brookhaven National Laboratory (Upton, NY).
- Received radiological, safety, and instrument training on the Small-Angle Neutron Diffractometer (SAND) at the Intense Pulsed Neutron Source at Argonne National Laboratory (Argonne, IL).
- Received radiological, safety, and instrument training on the 30 m SANS (NG7) and 8 m SANS (NG1) at the NIST Center for Neutron Research (Gaithersburg, MD).
- Successfully completed National School on Neutron and X-ray Scattering held at Argonne National Laboratory (August 12-25, 2001)

Florida State University Tallahassee, FL 1997–1998

Undergraduate Research Assistant

- Performed experimental studies on the flow behavior of water droplets in a viscous, miscible fluid medium.
- Advisor: Dr. Pedro Arce

HONORS & ACTIVITIES

- National Science Foundation Graduate Research Fellowship
- North Carolina State University Andrews Fellowship
- Third Place ACD/Scientific Scholar of the Year (2000)
- Florida Bright Futures Academic Scholarship
- Memberships: A.I.Ch.E., Golden Key International Honor Society
- Activities: Intramural Soccer, Raleigh Jaycee Sand Volleyball League

PUBLICATIONS

P. M. Spiecker, K. L. Gawrys, C. B. Trail, P. K. Kilpatrick; "Effects of petroleum resins on asphaltene aggregation and water-in-oil emulsion formation;" *Colloids and Surfaces A: Physiochem. Eng. Aspects*, **220**, 9 (2003).

P. M. Spiecker, K. L. Gawrys, P. K. Kilpatrick; "Aggregation and solubility behavior of asphaltenes and their subfractions;" *Journal of Colloid and Interface Science*, **267**, 178 (2003).

K. L. Gawrys, P. M. Spiecker, P. K. Kilpatrick; "The role of asphaltene solubility and chemistry on asphaltene aggregation;" *Petroleum Science and Technology*, **21**(3-4), 461 (2003).

K. L. Gawrys, P. K. Kilpatrick; "Asphaltene Aggregation: Techniques for Analysis;" *Instrumentation Science and Technology*, **32**(3), 247 (2004).

K. L. Gawrys, G.A. Blankenship, P. K. Kilpatrick; "Generation of chemical and colloidal distribution functions for petroleum asphaltenes;" *in preparation.*

K. L. Gawrys, P. K. Kilpatrick; "Calculation of second virial coefficients for asphaltenic aggregates by small-angle neutron scattering;" *in preparation.*

K. L. Gawrys, P. K. Kilpatrick; "Estimation of percent flocculation and solvent entrainment in asphaltenic aggregates by small-angle neutron scattering;" *in preparation.*

K. L. Gawrys, P. K. Kilpatrick; "UV-vis spectroscopic determination of the three-dimensional solubility parameters for polyaromatic compounds;" *in preparation.*

PRESENTATIONS

K. L. Gawrys, P. K. Kilpatrick; "Asphaltene Aggregation: Role of Solvent, Resins, Temperature, and Dimensionality;" AICHE National Meeting, Symposium on "Petroleum Emulsions," New Orleans, LA, March 13, 2002.

K. L. Gawrys, P. K. Kilpatrick; "Aggregation and Solubility Behavior of Asphaltenes and Their Sub-fractions;" ACS National Meeting; Symposium on *Conversion Chemistry of Petroleum Residua*, Boston, MA, August 21, 2002.

K. L. Gawrys, P. K. Kilpatrick; "Aggregation and Solubility Behavior of Asphaltenes and their Subfractions;" AIChE Annual Meeting, Symposium on Self Assembly in Solution I, Indianapolis, IN, November 5, 2002.

K. L. Gawrys, M. -H. Ese, P. K. Kilpatrick; "Asphaltene and Naphthenate Mechanisms of Emulsion Stabilization in water-in-crude oil Emulsions;" ACS National Meeting, Symposium Honoring Clay Radke, New Orleans, LA, March 25, 2003.

K. L. Gawrys, G. A. Blankenship, P. K. Kilpatrick; "Solubility and Aggregation Behavior of Asphaltene Fine Fractions," 4th International Conference on Petroleum Phase Behavior and Fouling, Trondheim, Norway, June 23-26, 2003.