

CURRICULUM VITA
DOUGLAS E. RAYNIE

Department of Chemistry and Biochemistry
South Dakota State University
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PROFESSIONAL EXPERIENCE

- South Dakota State University Department of Chemistry and Biochemistry, Brookings, SD.
 - ⇒ August 2009 – present. Associate Research Professor.
 - ⇒ May 2005 – August 2009. Research Assistant Professor.
Research interests in green chemistry, supercritical fluid processing and separations, analytical sample preparation, and high resolution chromatography. Teaching responsibilities primarily for survey course and upper division and graduate analytical courses.
 - ⇒ August 2001 – May 2005. Assistant Professor (Temporary Teaching Appointment).
Instructional interests in general and analytical chemistry, especially problem-based learning in analytical chemistry.
- Blue Sky Analytical, LLC, Brookings, SD. March 2003 – Present. President and Chief Scientist.
Technical and organizational development consulting, chemical measurement problem solving, and technical training in analytical separations, supercritical fluids, green chemistry, leadership, and creativity.
- The Procter & Gamble Company, Cincinnati, OH. September 1990 – July 2001. Senior Scientist, Corporate Research Division.
Fundamental development, problem-solving applications, and technology transfer of supercritical fluid technology (*e.g.*, extraction, chromatography, processing, and related technology), accelerated solvent extraction, enhanced sample preparation, and microcolumn chromatography, including experimental design, data interpretation and reporting, and instrument operation and maintenance. Initiated project collaborations which spanned all P&G business areas. Direct supervision of a staff of technicians and student interns. Prepared several proprietary R&D reports and presentations. Organized company-wide Analytical Chemistry symposium and seminar program.
- Brigham Young University Department of Chemistry, Provo, UT. August 1985 - August 1990. Graduate Student.
Graduate study on instrumentation and applications of capillary supercritical fluid chromatography to environmental samples, particularly coal-derived materials. Served as teaching assistant, research assistant, and graduate intern. Partial support from the University of North Dakota Energy Research Center.
- University of North Dakota Energy Research Center, Grand Forks, ND. July 1984 - May 1986. Research Associate, Separations and Characterization.
Separation and analysis of coal liquefaction products, gasifier tar, and other coal-derived products by column chromatography, capillary gas chromatography, and other chromatographic methods. Development of a supercritical fluid chromatographic system.
- Associated Western Universities, Inc., Salt Lake City, UT. June 1983 - June 1984. Post-Graduate Fellowship at University of North Dakota Energy Research Center.

Performed chromatographic analysis and research (column chromatography, capillary GC, and LC) on coal-derived materials for Organic Analysis Branch.

- South Dakota State University Department of Chemistry, Brookings, SD. August 1981 - June 1983. Graduate Teaching Assistant.
Instructed undergraduate chemistry labs while pursuing Master's degree.

EDUCATION

- Brigham Young University, Provo, UT, Ph. D., 1990.
Major: Analytical Chemistry. Dissertation: "Development of Supercritical Fluid Chromatographic Methods for Fossil-Fuel Derived Materials." Advisor: Milton L. Lee.
- South Dakota State University, Brookings, SD, M. S., 1983.
Major: Analytical Chemistry. Thesis: "Environmental Factors Influencing the Degradation of Carbofuran." Advisors: David C. Hilderbrand and Duane P. Matthees.
- Augustana College, Sioux Falls, SD, B. A., 1981.
Majors: Biology and Chemistry.

RESEARCH SUPPORT

- Current Grants:
 - ⇒ U.S. Department of Energy (via North Central Sun Grant), "Torrefaction and Pyrolysis of Grasses and Related Biomass to Fungible Fuels," Project Director: D. E. Raynie, Co-PIs: L. Wei, and J. Julson, January 2012 – December 2014, \$140,000.
 - ⇒ National Science Foundation, "Dakota Bioprocessing Consortium," SDSU Co-PIs: W. Gibbons, D. E. Raynie, Z. Gu, C. Zhang, August 2013 – July 2016, \$1,041,998 (Raynie portion)
- Prior Grants:
 - ⇒ U.S. Food & Drug Administration, "Development of Innovative Regulatory Inspection Methods: The Assessment of Aminoglycoside Antimicrobials in Animal Feeds," Co-PIs: N. Thiex and D. E. Raynie, Oct. 1, 2002-Sept. 30, 2003, \$45,927.70.
 - ⇒ U.S. Department of Energy (via North Central Sun Grant), "Extrusion/Extraction-Based Biorefinery," Project Director: W. R. Gibbons, Co-PIs: D. Raynie, K. Muthukumarappan, J. Julson, T. West, B. Dalaly, C. Schmidt, P. Krishnan, and V. Owens, Aug. 1, 2005-July 31, 2008, \$132,000.
 - ⇒ U. S. Department of Agriculture, "Biopolymers and Other Value-Added Products from Distillers' Dried Grains," Project Director: Robert Brown (Iowa State University), SDSU Co-PIs: J. Julson, P. Krishnan, C. Wang, W. Gibbons, T. West, D. Raynie, F. Halaweish, R. Gelderman, T. Hanson, and M. Twedt, Oct. 1, 2003-September 30, 2006, \$1,000,000.
 - ⇒ U.S. Environmental Protection Agency, "Liquid Carbon Dioxide-Based Leather Processing," PI: D.E. Raynie, September 2006 – August 2009. \$322,950.
 - ⇒ United Soybean Board, "Fermentation of Soybean Meal to Make Ethanol and Value-Added High Protein Products," Project Director: Douglas Raynie, Co-PIs: W. R. Gibbons, K. Muthukumarappan, J. Julson, P. Krishnan, C. Y. Wang, R. Nelson (VeraSun), and J. Martin (OmniTech, Intl.), Oct. 1, 2008-Jan. 31, 2010, \$119,090 (Raynie portion \$14,417).
 - ⇒ SDSU Technology Transfer Office, "Beeswax Refining with Liquid or Supercritical Carbon Dioxide," PI: D. E. Raynie, Jan. 1, 2011-June 30, 2011, \$31684.
 - ⇒ State of South Dakota, "Center for Bioprocessing Research and Development," Project Director: Robb Winter, South Dakota School of Mines and Technology; SDSU Co-Principal Investigators: W. Gibbons, K. Muthukumarappan, D. Raynie, and M. Twedt, July 1, 2006-June 30, 2012, \$2,500,000.

- ⇒ U.S. Department of Transportation (via North Central Sun Grant), “Developing a Prairie Biorefinery,” Principal Investigators: W. Gibbons, V. Owens, A. Boe, J. Gonzales, K. Muthukumarappan, D. Raynie, M. Twedt, J. Julson, K. Bassett, and A. Moutsoglou, Feb. 2007-Jan. 2012, \$600,000 (\$165,674 Raynie portion).
- ⇒ U.S. Department of Transportation (via North Central Sun Grant), “Developing a Sustainable Feedstock and Next-Generation Processing Technologies for Biofuels Production,” Project Director: W. R. Gibbons, Co-PIs: J. Gonzales, M. Twedt, D. Raynie, J. Julson, K. and Muthukumarappan, July 1, 2007-June 30, 2012, \$1,812,243 (\$99,008 Raynie portion).
- ⇒ U.S. Department of Transportation (via North Central Sun Grant), “Develop Sustainable Energy Systems for Practical Utilization of Bulky Biomass,” Project Director: R. Ruan (University of Minnesota), SDSU Co-PIs: W. Gibbons, K. Muthukumarappan, D. Raynie, July 1, 2007-June 30, 2012, \$1,186,084 (\$145,500 Raynie portion).
- ⇒ U.S. Department of Education, “Chemistry National Needs Doctoral Fellowships at South Dakota State University,” Project Director: James Rice, Co-PIs: F. Halaweish, M. Miller, D. E. Raynie, P. Tille, July 1, 2010-June 30, 2013, \$525,060.
- ⇒ SDSU Research Support Fund, “Graphene Synthesis during Biomass Pyrolysis,” PI: D. E. Raynie, March 2012-March 2013, \$7500.
- ⇒ U.S. Department of Defense, “Development of Renewable Jet Fuel from Lignocellulosic Feedstocks,” Project Director: Jim Doolittle. SDSU Co-PIs: J. Gonzales, A. Moutsoglou, and D. Raynie, September 1, 2009-December 31, 2013, \$513,704.
- ⇒ United Soybean Board, “High Value Protein Replacers for Aquaculture Feeds from Defatted Soybean White Flakes,” Project Director: Michael Brown, Co-PIs: W. Gibbons, Z. Gu, P. Krishnan, K. Muthukumarappan, and D. Raynie, January 2012 – December 2013, \$152,309.

ADDITIONAL ACADEMIC OR PROFESSIONAL EDUCATION

- 5/14 Transformative Teaching Practices: Using Team-Based Learning, 1 day (Saundra Y. McGuire, Louisiana State University Center for Academic Success)
- 5/13 Grant Writing Workshop, 1 day (Grant Writers’ Seminars and Workshops)
- 5/13 Classroom Flipping Workshop, 1 day (SDSU Teaching Learning Center and Flip-It Consulting)
- 3/11 Faculty Leadership in Sustainability Workshop, 2 days (Upper Midwest Association for Campus Sustainability and Association for the Advancement of Sustainability in Higher Education)
- 7/10 Active-Learning Cloud, 1 week (SDSU Instructional Technology)
- 12/08 Leadership Forum: Leadership-Influence-Diversity, 1 day (SDSU Office of Diversity Enhancement)
- 5/08 Big Picture/Small World Globalization Workshop, 1 day (Buckminster Fuller Institute)
- 4/08 Eco-Efficiency Analysis Workshop, 2 days (BASF)
- 7/07 Green Chemistry in Education Workshop Success Story, 1 week (University of Oregon and NSF Chemistry Workshops Center)
- 7/06 Train the Trainers, 1 day (American Chemical Society Green Chemistry Institute)
- 5/06 Service-Learning Workshop, 1 week (SDSU Office of Diversity Enhancement)
- 6/05 Green Chemistry and Engineering Education, 1 day (American Chemical Society Green Chemistry Institute)
- 5/04 Improving Productivity with Microsoft Outlook, 1 day (SDSU Educational Technology Center)

- 5/04 Digital Video Production, 1 day (SDSU Educational Technology Center)
- 5/04 Creating Improved PowerPoint Presentations, ½ day (SDSU Educational Technology Center)
- 5/04 Introduction to Digital Photography, ½ day (SDSU Educational Technology Center)
- 6/02 Practical Aspects of Process Analytical Chemistry, 1 week (National Science Foundation)
- 3/02 Problem-Based Learning in Analytical Chemistry, 1 day (PittCon 2002)
- 5/01 Partnering Skills, 3 days (Procter & Gamble)
- 6/98 Introduction to Internet Searching, 1 day (Procter & Gamble)
- 9/96 Processing with Supercritical Fluids, 1 week (Phasex Corporation)
- 1/96 Introduction to PowerPoint, 1 week (Procter & Gamble)
- 10/94-5/95 Advanced Learning Conference, 3 weeks (Procter & Gamble)
- 6/94 Leadership Conference, 1 week (Procter & Gamble)
- 6/93 Staff Communication Skills, 3 days (Procter & Gamble)
- 10/92 Introduction to Toxicology, 1 week (University of Cincinnati)
- 8/92 Americans with Disabilities Act Training, 1 day (Procter & Gamble)
- 4/92 Introduction to Excel, ½ day (Procter & Gamble)
- 2/92 Introduction to Word, ½ day (Procter & Gamble)
- 1/92 Dialog Literature Searching, ½ day (Dialog)
- 11/91 Effective Management Skills, 1 day (Procter & Gamble)
- 9/91 Drug and Alcohol Abuse Awareness Training, ½ day (Procter & Gamble)
- 8/91 Employee Relations Seminar, 1 day (Procter & Gamble)
- 7/91 Sexual Harassment Awareness, ½ day (Procter & Gamble)
- 5/91 Corporate New Hire Orientation, 3 days (Procter & Gamble)
- 4/91 Improving Reading Skills, 1 day (PACE)
- 4/91 Improving Total Quality, 3 days (Procter & Gamble)
- 3/91 Interpersonal Managing Skills, 2 days (Procter & Gamble)
- 2/91 Quadrant II Time Management, 1 day (Covey Institute)
- 10/90-9/91 Basic Learning Conference, 2 weeks (Procter & Gamble)
- 2/84 High Resolution Gas Chromatography, 1 day (Hewlett-Packard)

PROFESSIONAL ACTIVITIES AND HONORS

- Subject Matter Expert, American Chemical Society Separations Sci-Mind Training, 2014
- Leo and Elaine Spinar Award for Excellence in Undergraduate Teaching, SDSU Department of Chemistry and Biochemistry, 2013
- Association of Official Analytical Chemists International, Single-Laboratory Method Validation of the Year, 2009
- Plain Resolve competitive award, Plain Green 2008 Conference
- 2006 Dean's Team Award, SDSU College of Agriculture and Biological Sciences
- Nominated for TRiO Student Choice Award, 2006

- 86th American Oil Chemists' Society Annual Meeting, 1995, Outstanding Presentation
- BYU College of Mathematics and Physical Sciences, Spring Research Conference
 - ⇒ Outstanding Presentation: 1986, 1988, 1990
- *Pharmaceutical Formulation and Quality*, Editorial Advisory Board, 2011 – present
- *Encyclopedia of Separation Science*, Editorial Advisory Board, 2000 – present
- Guest editor, special issue of *Journal of Chromatography A* (Vol. 1261, Oct. 26, 2012)
- Guest editor, special issue of *Analytica Chimica Acta* (Vol. 667, No. 1, Sept 10, 2010)
- *Journal of Microcolumn Separations* (now merged with *Journal of Separation Science*)
 - ⇒ Assistant to the Editor, 1990-1991
 - ⇒ Editorial Advisory Board, 1992-2001
- International Symposium on Advances in Extraction Technology
 - ⇒ Symposium Chairman, 2009
 - ⇒ Scientific Committee, 2011
- 5th International Symposium on Supercritical Fluids, Scientific Committee
- 15th Green Chemistry and Engineering Conference, Organizing Committee
- Procter and Gamble Analytical Symposium
 - ⇒ Organizing Committee, 1994
 - ⇒ Program Chairman, 1995
 - ⇒ Symposium Chairman, 1996
- Organized Technical Symposia:
 - ⇒ 1995 Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) Conference
 - ⇒ 1997, 2008 Pittsburgh Conference on Analytical Chemistry
 - ⇒ 1997 American Chemical Society Fall Annual Meeting
 - ⇒ 1997, 2010 Eastern Analytical Symposium
 - ⇒ 2000 Central Region Meeting of the American Chemical Society
 - ⇒ 2012 American Chemical Society Spring Annual Meeting
- Coordinated Green Chemistry for High School Teachers Workshop at 2010 Eastern Analytical Symposium
- Member, American Chemical Society
 - ⇒ Division of Analytical Chemistry
 - Chromatography and Separations Subdivision
 - ⇒ Division of Industrial and Engineering Chemistry
 - Green Chemistry and Engineering Subdivision
 - Separation Science and Technology Subdivision
 - ⇒ Sioux Valley Section
- Tri-State Supercritical Fluids Discussion Group, Founder and Past-President
- Member, International Society for the Advancement of Supercritical Fluids
- Member, Phi Lambda Upsilon, National Chemistry Honor Society
- Past Member, American Association for the Advancement of Science
- Past Member, Sigma Xi
- Past Member, Phi Kappa Phi
- Short Course Instructor (Eastern Analytical Symposium, Pittsburgh Conference on Analytical Chemistry, Minnesota Chromatography Forum, Procter and Gamble):
 - ⇒ “Concepts in Sustainability and Green Chemistry”

- ⇒ Procter & Gamble "Professional Analytical Chemists in Industry: A Short Course in Problem-Solving"
- ⇒ "Supercritical Fluid Extraction"
- ⇒ "Accelerated Solvent Extraction: Method Development, Applications, and Troubleshooting"
- ⇒ "Sampling and Sample Preparation"
- ⇒ "Solid-Phase Microextraction"
- ⇒ "Chromatography Troubleshooting"
- Peer Reviewer:
 - ⇒ *Analytical Chemistry*
 - ⇒ *Journal of Separation Science*
 - ⇒ *Journal of Agricultural and Food Chemistry*
 - ⇒ *Journal of Chromatography A*
 - ⇒ *Analytica Chimica Acta*
 - ⇒ *Journal of American Oil Chemists Society*
 - ⇒ *Environmental Science and Technology*
 - ⇒ *Separation Science and Technology*
 - ⇒ *Journal of Chromatographic Science*
 - ⇒ *Chromatographia*
 - ⇒ *Journal of Microcolumn Separations*
 - ⇒ *Analyst*
 - ⇒ *Electrophoresis*
 - ⇒ National Science Foundation Grants Program
 - ⇒ Battelle/Pacific Northwest Laboratories' Homeland Security Initiative
 - ⇒ California Energy Commission Energy Innovations Small Grant Program
 - ⇒ U.S. Civilian Research & Defense Foundation Cooperative Grants Program
 - ⇒ McGraw-Hill Textbooks
 - ⇒ Wiley & Son Textbooks
 - ⇒ W. H. Freeman & Co. Textbooks
- Undergraduate Chemistry Scholarship
- Who's Who Among Students in American Colleges and Universities

UNIVERSITY AND DEPARTMENTAL SERVICE

- Environmental Stewardship and Sustainability Governance Committee
 - ⇒ Member Fall 2010 – 2014
 - ⇒ Chair, 2011-2012, 2013-2014
- Administrative Review Committee for Vice-President Kephart, 2010-2011
- Programs and Curricula Committee, University Self-Study, Higher Learning Commission – North Central Association accreditation (2007-2008)
- SDSU Biofuels Research Representative to USD Law School Review Symposium, Feb. 2008
- Graduate Assistantships in Areas of National Need, Advisory Committee and Mentor, Fall 2010 – Spring 2013
- Departmental Seminar Committee, Fall 2011 – Spring 2014
- Departmental Graduate Advisory Committee, Fall 2007 – Spring 2013
- Departmental Research Committee, Fall 2007 – Spring 2010
- Departmental Curriculum Committee, Fall 2005 – Spring 2011

- Departmental Library Committee, Fall 2005 – Spring 2008
⇒ Chair 2007-2008

COMMUNITY SERVICE

- Leadership Brookings
⇒ Participant, 2003-2004
- Brookings County Community Emergency Response Team
⇒ Team Leader, 2004-2005
⇒ Member, 2004-2006
- Boy Scouts of America
⇒ Assistant Council Commissioner, Sioux Council, 2010-present
⇒ District Commissioner, Sioux Council, 2004-2010
⇒ Scoutmaster of Fairfield, OH Troop 960, 1991-2001
⇒ Life Member, National Eagle Scout Association
⇒ Variety of Local, Regional, and National Offices, Leadership Positions, and Recognitions since 1974
- American Red Cross
⇒ Current First Aid and CPR certification
⇒ Past certification as First Aid Instructor and Lifesaving

INSTRUCTIONAL ACTIVITIES

- CHEM 106: Chemistry Survey (lecture and laboratory)
- CHEM 108: Organic and Biochemistry (lecture and laboratory)
- CHEM 112: General Chemistry I (lecture and laboratory)
- CHEM 114: General Chemistry II (lecture and laboratory)
- CHEM 332: Analytical Chemistry (lecture and laboratory)
- CHEM 433: Bioanalytical Chemistry (lecture only)
- CHEM 434: Instrumental Analysis (lecture and laboratory)
- CHEM 484: Chemical Toxicology (lecture only)
- CHEM 492: Special Topics in Chemistry (Supercritical Fluids, Green Chemistry)
- CHEM 632: Advanced Analytical Chemistry (Graduate)
- CHEM 735: Analytical Spectroscopy (Graduate)
- CHEM 736: Chromatography and Separations (Graduate)
- CHEM 792: Special Topics in Chemistry (Green Chemistry)

ADVISING

- 38 Undergraduate Academic Advisees
- High School Students:
⇒ Kelsey Arthur, Summer 2007
⇒ Arthy Muthukurappan, Summer 2008
- High School Teachers:
⇒ Julie Benson, Summer 2009
⇒ Jim Musil, Summer 2010
⇒ Jane Hamze, Summer 2010
⇒ Ellen Hansen, Summer 2012

- ⇒ Jamie Flint, Summer 2014
- ⇒ Emily Woon, Summer 2014
- Undergraduate Students:
 - ⇒ Amanda DuPay, Summer 2003 – Spring 2004
 - ⇒ Andrew Schreiber, Spring 2007
 - ⇒ Daniel Briet, Fall 2008 – Fall 2010
 - ⇒ Kali Odegaard, Spring 2009 – Summer 2009
 - ⇒ Luke Zimney, Spring 2009 – Summer 2009
 - ⇒ Brian Eckrich, Summer 2009 – Fall 2010
 - ⇒ Michael Collins, Tanaka Fellowship, Spring 2009-present
 - ⇒ Brian Eckrich, Summer 2009-Summer 2010
 - ⇒ Brad Anderson, Nelson Undergraduate Research Fellow, Summer 2009-present
 - ⇒ Meredith Sauer, Tanaka Fellowship, Nelson Undergraduate Research Fellow, Spring 2010-Spring 2013
 - ⇒ Bryce Wilen, Tanaka Fellowship, Honors in Agriculture Fellowship, Spring 2011 – Spring 2013
 - ⇒ Keeli Eberhart, Tanaka Fellowship, Summer 2011
 - ⇒ James Cassidy, Tanaka Fellowship, Fall 2011 – Spring 2013
 - ⇒ Bethany Foy, Summer 2013 – present
 - ⇒ Andrew Robison, Fall 2013 – Spring 2014
- Graduate Students:
 - ⇒ Julee Driver (Ph.D., 2009)
 - ⇒ Lisette Ngo Tenlep (Ph.D., 2009)
 - ⇒ Jeremy Kroon (now at SD State Health Lab)
 - ⇒ Tunde Dioszegi (Ph.D., 2012)
 - ⇒ Ganesh Degam (Ph.D. candidate)
 - ⇒ Victor Essel (Ph.D., 2013)
 - ⇒ Kan Shen (Ph.D. program, transferred to Penn State during summer 2010)
 - ⇒ Vinod Bathula (Ph.D., 2013)
 - ⇒ George Gachumi (Ph.D. candidate)
 - ⇒ Hiran Kandala (Ph.D. candidate)
 - ⇒ Vara Sakampally (M. S., 2013)
 - ⇒ John Kiratu (Ph.D. candidate)
 - ⇒ Changling Qiu (Ph.D. candidate)
 - ⇒ Eric Boakye (Ph.D. candidate)
 - ⇒ Shanmugapriya Dharmarajan (Ph.D. candidate)
 - ⇒ Tanvir Amit (M.S. program)
 - ⇒ Sampson Asara (Ph.D. program)

INVENTION DISCLOSURE

- D. E. Raynie, “Beeswax Refining with Liquid or Supercritical Carbon Dioxide.”
- W. Gibbons, J. Javers, and D. Raynie, “Suspended/Dissolved Solids Recovery Method from Corn Processing Streams.”
- D. E. Raynie and W. R. Gibbons, “Foodborne Pathogen Sensor.”
- D. E. Raynie and J. L. Gonzales, “Integration of processing technologies for biofuels production from lignocellulosic feedstocks”

PUBLICATIONS

Y. R. Potts, S. A. Farnum, and D. E. Raynie, "Gas Chromatographic Techniques for the Analysis of Hydrocarbons in Low-Rank Coal Liquefaction Products. Part I. Data Treatment." *Proc. N. D. Acad. Sci.* **38**, 69 (1984).

D. E. Raynie, S. A. Farnum, and Y. R. Potts, "Gas Chromatographic Techniques for the Analysis of Hydrocarbons in Low-Rank Coal Liquefaction Products. Part II. Instrumental Aspects." *Proc. N. D. Acad. Sci.* **38**, 70 (1984).

D. E. Raynie, S. M. Fields, N. M. Djordjevic, K. E. Markides, and M. L. Lee, "A Method for the Preparation of Binary Mobile Phase Mixtures for Capillary Supercritical Fluid Chromatography," *J. High Resolut. Chromatogr.* **12**, 51-52 and 409 (1989).

D. E. Raynie, K. E. Markides, M. L. Lee, and S. R. Goates, "Back-Pressure Regulated Restrictor for Flow Control in Capillary Supercritical Fluid Chromatography," *Anal. Chem.* **61**, 1178-1181 (1989).

D. E. Raynie, "Definition and Description of Supercritical Fluid Chromatography," "Historical Development of SFC," "Fluorescence Detection," "Variable Restriction for Flow Control," and "Preparation of Mixed Mobile Phases," **Analytical Supercritical Fluid Chromatography and Extraction**, M. L. Lee and K. E. Markides (eds.), Brigham Young University Press (1990).

D. E. Raynie, "In Praise of Microcolumn Abstracts," *J. Microcol. Sep.* **2**, 264-265 (1990).

D. E. Raynie, M. L. Lee, D. R. Nelson, K. T. Harper, E. W. Mead, and F. R. Stermitz, "Alkaloids of *Arctomecon* spp. (Papaveraceae). 12-Methoxyalloycryptopine, a New Protopine-type Alkaloid," *Biochem. Syst. Ecol.* **18**, 45-48 (1990).

S. H. Page, D. E. Raynie, S. R. Goates, M. L. Lee, D. J. Dixon, and K. P. Johnston, "Predictability and Effect of Phase Behavior of CO₂/Propylene Carbonate in Supercritical Fluid Chromatography," *J. Microcol. Sep.* **3**, 355-369 (1991).

D. E. Raynie, K. E. Markides, and M. L. Lee, "Boiling Range Distribution of Petroleum and Coal-Derived Heavy Ends by Supercritical Fluid Chromatography," *J. Microcol. Sep.* **3**, 423-433 (1991).

D. E. Raynie, D. R. Nelson, and K. T. Harper, "Alkaloidal Relationships in the Genus *Arctomecon* (Papaveraceae) and Herbivory in *A. humilis*," *Great Basin Natural.* **51**, 397-403 (1991).

T. L. Chester, J. D. Pinkston, and D. E. Raynie, "Supercritical Fluid Chromatography and Extraction," *Anal. Chem.* **64**, 153R-170R (1992).

H. Liu, L. M. Cooper, D. E. Raynie, J. D. Pinkston, and K. R. Wehmeyer, "Combined Supercritical Fluid Extraction/Solid-Phase Extraction with Octadecylsilane Cartridges as a Sample Preparation Technique for the Ultratrace Analysis of a Drug Metabolite in Plasma," *Anal. Chem.* **64**, 802-806 (1992).

D. E. Raynie, K. M. Payne, K. E. Markides, and M. L. Lee, "Evaluation of Microbore and Packed Capillary Column Chromatography with an Ethylvinylbenzene-Divinylbenzene Polymeric Packing Material and Supercritical Ammonia as the Mobile Phase," *J. Chromatogr.* **638**, 75-83 (1993).

D. E. Raynie, "Warning Concerning the Use of Nitrous Oxide in Supercritical Fluid Extractions," *Anal. Chem.* **65**, 3127-3128 (1993).

D. E. Raynie and T. E. Delaney, "Effect of Entrained Helium on the Kinetics of Supercritical Fluid Extraction with Carbon Dioxide," *J. Chromatogr. Sci.* **32**, 298-300 (1994).

T. L. Chester, J. D. Pinkston, and D. E. Raynie, "Supercritical Fluid Chromatography and Extraction," *Anal. Chem.* **66**, 106R-130R (1994).

T. L. Chester, J. D. Pinkston, and D. E. Raynie, "Supercritical Fluid Chromatography and Extraction," *Anal. Chem.* **68**, 487R-514R (1996).

D. E. Raynie, "Meeting the Natural Products Challenge with Supercritical Fluids," *ACS Symp. Ser.* **670**, 68-75 (1997).

T. L. Chester, J. D. Pinkston, and D. E. Raynie, "Supercritical Fluid Chromatography," *Anal. Chem.* **70**, 301R-319R (1998).

D. E. Raynie, "A Fundamental Understanding of the Chemical Extraction Process," **Encyclopedia of Separation Science**, I. D. Wilson, T. R. Adlard, C. F. Poole, and M. Cooke (eds.), Academic Press (2000).

D. E. Raynie, "Modern Extraction Techniques," *Anal. Chem.* **76**, 4659-4664 (2004).

A. Dupay, N. Thiex, D. Ferris, and D. E. Raynie, "Method Development for the Determination of Neomycin in Animal Feed," *Proc. S. D. Acad. Sci.* **83**, 269 (2004).

A. H. Ullman and D. E. Raynie, "Problem Solving and Guidelines for Method Selection" in *Comprehensive Analytical Chemistry*, S. Ahuja and N. Jespersen (editors), **47**, 799-848 (2006).

D. E. Raynie, "Modern Extraction Techniques," *Anal. Chem.* **78**, 3997-4004 (2006).

J. L. Driver and D. E. Raynie, "Method Development for Biomolecules," **HPLC Method Development for Pharmaceuticals**, S. Ahuja and H. Rasmussen (eds.), Academic Press, 425-439 (2007).

J. L. Driver, N. Thiex, D. Raynie, M. Ofitserova, and M. Pickering, "Single-Laboratory Validation for the Quantification of Neomycin B and Neomycin C in Animal Feeds by Liquid Chromatography Fluorescence Detection with Post-Column Derivatization," *J. AOAC Intl.* **92**, 34-41 (2009).

J. J. Kroon, and D. E. Raynie, "Supercritical Fluid Extraction," **Handbook of Sample Preparation**, J. Pawliszyn and H. Lord (editors), Wiley, 191-196 (2010).

L. N. Tenlep, D. E. Raynie, and N. Thiex, N., "Compositional Analysis of Microwave Chemically Pretreated Biomass Samples," *Journal of ASTM International*, **7** (4), DOI: 10.1520/JAI102489 (2010).

D. E. Raynie, "Modern Extraction Techniques," *Anal. Chem.* **82**, 4911-4916 (2010).

D. E. Raynie, "Green Analytical Chemistry" chapter and experiment modifications, **Quantitative Chemical Analysis**, D. C. Harris, Freeman, (2010).

D. E. Raynie, "Supercritical Fluids" and "Biofuels" essays, **Chemistry for Changing Times**, 12th edition, J. W. Hill, T. W. McCreary, and D. K. Kolb, Prentice-Hall (2010).

J. L. Young and D. E. Raynie, "Replacement of Hazardous Solvents and Reagents in Analytical Chemistry," **Challenges in Green Analytical Chemistry**, M. de la Guardia and S. Garrigues (editors), Royal Society of Chemistry, 44-62 (2011).

R. E. Majors and D. E. Raynie, "The Greening of the Chromatography Laboratory," *LC/GC*, **29** (2), 118-134 (2011).

T. A. Dioszegi and D. E. Raynie, "Kinetic performance comparison of a capillary monolithic and a fused-core column in micro-scale liquid chromatography," *J. Chromatogr.*, **1261**, 107-112, (2012). DOI: 10.1016/j.chroma.2012.08.030.

M. Zhang, F. L. P. Resende, A. Moutsoglou, and D. E. Raynie, "Pyrolysis of lignin extracted from prairie cordgrass, aspen, and Kraft lignin by Py-GC/MS and TGA/FTIR," *J. Anal. Appl. Pyrol.*, **98**, 65-71, (2012). DOI: 10.1016/j.jaap.2012.05.009.

B. E. Richter and D. E. Raynie, "Accelerated Solvent Extraction and High-Temperature Water Extraction," **Comprehensive Sampling and Sample Preparation**, H. Lord and J. Pawliszyn (editors), Elsevier, 105-115 (2012).

V. Essel and D. E. Raynie, "Green Chemistry Perspectives on Analytical Extractions," *LC/GC*, **31** (11), S18-S21 (2013).

D. E. Raynie and R. E. Majors, "Exploring the Possibilities of High-Throughput Sample Preparation," *LC/GC*, **32** (2), 92-97 (2014).

D. E. Raynie, "The Role of Selectivity in Extractions: A Case Study," *LC/GC*, **32** (6), 396-403 (2014).

D. W. Watson and D. E. Raynie, "Understanding and Improving Solid-Phase Extraction," *LC/GC*, **32** (12), 908-915 (2014).

PRESENTATIONS

D. E. Raynie, S. A. Farnum, and Y. R. Potts, "Automated Capillary Gas Chromatographic Analysis of Low-Rank Coal-Liquefaction Products," Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN 1984.

S. A. Farnum, R. C. Timpe, D. J. Miller, J. R. Rindt, D. E. Raynie, and Y. R. Potts, "Startup Solvent Effects on Products from Low-Rank Coal Bottoms Recycle Liquefaction after 40 Passes," Western Research Institute Confab '84 Fossil Fuels Conference, Saratoga, WY, 1984.

D. E. Raynie, S. A. Farnum, R. C. Timpe, Y. R. Potts, D. J. Miller, and S. B. Hawthorne, "Analytical Characterization of Coal Liquefaction Products at UNDERC," 27th Oak Ridge National Laboratory Conference on Analytical Chemistry in Energy Technology," Knoxville, TN, 1984.

D. E. Raynie, S. A. Farnum, and Y. R. Potts, "Comparison of Low-Rank Coal Liquefaction Products by Automated Capillary Gas Chromatography," 27th Rocky Mountain Conference, Denver, CO, 1985.

K. E. Markides, D. E. Raynie, and M. L. Lee, "Simulated Distillation of Petroleum and Coal-Derived Heavy Ends by Supercritical Fluid Chromatography," 38th Pittsburgh Conference and Exposition on Analytical Chemistry and Applied Spectroscopy, Atlantic City, NJ, 1987.

K. D. Bartle, S. Wallace, N. Taylor, M. Raynor, A. Grint, G. Proud, D. Raynie, and M. L. Lee, "Characterization of Pitches by Novel Spectroscopic, Electrochemical, and Chromatographic Methods," Society of Chemical Industry Industrial Carbon and Graphite Group Conference, Newcastle-upon-Tyne, UK, 1987.

D. E. Raynie, N. M. Djordjevic, K. E. Markides, and M. L. Lee, "Determination of the Preferred Mobile Phase for Capillary Supercritical Fluid Chromatography of Large Polycyclic Aromatic Hydrocarbons," 39th Pittsburgh Conference and Exposition on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA, 1988.

I. J. Koski, D. E. Raynie, K. E. Markides, and M. L. Lee, "The Analysis of Alkaloids with Supercritical Fluid Extraction Coupled to Capillary Supercritical Fluid Chromatography," Course in Postgraduate Education: Application of Supercritical Fluid Chromatography to Food Science, Turku, Finland, 1988.

D. E. Raynie, K. E. Markides, M. L. Lee, and S. R. Goates, "Back-Pressure Regulated Restrictor for Flow Control in Capillary SFC," Symposium/Workshop on Supercritical Fluid Chromatography, Snowbird, UT, 1989.

D. E. Raynie, K. E. Markides, and M. L. Lee, "Evaluation of Mixed Mobile Phases in Capillary SFC for Fossil Fuel-Derived Materials," Symposium/Workshop on Supercritical Fluid Chromatography, Snowbird, UT, 1989.

M. L. Lee, K. E. Markides, K. M. Payne, Z. Juvanz, D. E. Raynie, D. Johnson, and J. S. Bradshaw, "New Selective Stationary Phases for Microcolumn Chromatography," 41st Pittsburgh Conference and Exposition on Analytical Chemistry and Applied Spectroscopy, New York, NY, 1990.

D. E. Raynie, K. M. Payne, K. E. Markides, and M. L. Lee, "Microbore and Packed Capillary SFC with Ammonia as the Mobile Phase," 3rd International Symposium on Supercritical Fluid Chromatography and Extraction, Park City, UT, 1991.

T. L. Chester, J. D. Pinkston, D. E. Raynie, D. J. Bowling, R. T. Hentschel, and D. P. Innis, "Recent Applications of Supercritical Fluid Chromatography Capabilities in an Industrial Environment," 18th Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies, Anaheim, CA, 1991.

H. Liu, K. R. Wehmeyer, L. M. Cooper, D. E. Raynie, and J. D. Pinkston, "Supercritical Fluid Extraction of Ultratrace Levels of Drugs/Metabolites from Plasma Using Octadecylsilane (ODS) Solid-Phase Cartridges," 22nd Ohio Valley Chromatography Symposium, Hueston Woods, OH, 1991.

J. D. Pinkston, D. J. Bowling, T. L. Chester, T. E. Delaney, R. T. Hentschel, D. P. Innis, and D. E. Raynie, "Principles and Industrial Applications of Supercritical Fluid Chromatography (SFC), SFC-Mass Spectrometry, and Supercritical Fluid Extraction," Chemistry Department Seminar, Purdue University, West Lafayette, IN, 1991.

K. R. Wehmeyer, H. Liu, L. M. Cooper, D. E. Raynie, and J. D. Pinkston, "Supercritical Fluid Extraction (SFE) of Ultratrace Levels of Drugs/Metabolites from Plasma Using Octadecylsilane (ODS) Solid-Phase Cartridges," 3rd International Bioanalytical Workshop, Lawrence, KS, 1991.

D. E. Raynie, "Industrial Applications of Supercritical Fluid Extraction," Analytical Discussion Group, Cincinnati Section, American Chemical Society, Cincinnati, OH, 1991 (Invited).

D. E. Raynie and T. E. Delaney, "Factors Influencing the Efficient Collection of Volatile Analytes Following SFE," 4th International Symposium on Supercritical Fluid Chromatography and Extraction, Cincinnati, OH, 1992.

T. E. Delaney and D. E. Raynie, "Effect of Particle Size and Solvent Modifier on the SFE of Fats from Ground Roast Coffee," 4th International Symposium on Supercritical Fluid Chromatography and Extraction, Cincinnati, OH, 1992.

D. E. Raynie, "Considerations for the Practice of Supercritical Fluid Extraction," Meeting-in-Miniature, Cleveland Section, American Chemical Society, Cleveland, OH, 1993 (Invited).

D. E. Raynie, "Professional Scientists in Industry," Physical and Life Science Division Seminar, Claflin College, Orangeburg, SC, 1993.

D. E. Raynie, "Enhancing the Extraction Selectivity of Pharmaceuticals Through the Use of SFE and Solid-Phase Sorbents," Midwest Supercritical Fluids Discussion Group, Chicago, IL, 1993 (Invited).

K. L. Kostel, T. E. Delaney, and D. E. Raynie, "Effect of Supercritical Fluid Extraction on Sample Residues -- Enzyme Inactivation," 205th American Chemical Society National Meeting, Denver, CO, 1993 (Invited).

D. E. Raynie, T. E. Delaney, R. M. Deibel, and B. L. Merkt, "Supercritical Fluid Extraction and Fractionation of Neutral Sterols and Bile Acids," 45th Southeast Region American Chemical Society Meeting, Johnson City, TN, 1993 (Invited).

D. E. Raynie, T. E. Delaney, and P. A. Rodriguez, "Comparison of Extraction Techniques for the Analysis of Liquid Samples," 5th International Symposium on Supercritical Fluid Chromatography and Extraction, Baltimore, MD, 1994.

B. L. Merkt, R. M. Deibel, D. E. Raynie, and T. E. Delaney, "Analysis of Fecal Bile Acids and Fecal Neutral Steroids Using Supercritical Fluid Extraction (SFE) and Gas Chromatography With a Mass Selective Detector," 208th American Chemical Society National Meeting, Washington, DC, 1994.

D. E. Raynie, "Use of Physical Chemical Principles to Enhance Analytical Extractions," 17th International Symposium on Capillary Chromatography and Electrophoresis, Wintergreen, VA, 1995 (Invited).

D. E. Raynie, "Use of Physical Chemical Principles to Enhance Analytical Extractions," 26th Ohio Valley Chromatography Symposium, Hueston Woods, OH, 1995 (Invited).

D. E. Raynie, D. P. Innis, and S. M. Culbertson, "Use of Reduced-Solvent Extraction Methods for Fat Determination," 3rd European Symposium on Analytical SFC and SFE and 6th International Symposium on Supercritical Fluid Chromatography and Extraction, Uppsala, Sweden, 1995.

D. E. Raynie, D. P. Innis, and D. L. Duval, "Characterization of Detergent Products with Supercritical Fluids," 3rd European Symposium on Analytical SFC and SFE and 6th International Symposium on Supercritical Fluid Chromatography and Extraction, Uppsala, Sweden, 1995.

D. E. Raynie, D. P. Innis and D. A. Schul, "Comparison of Extraction Methodologies for Total Fat Determination," American Oil Chemists' Society Annual Meeting, San Antonio, TX, 1995 (Invited).

D. E. Raynie, T. E. Delaney, D. P. Innis and D. L. Duval, "Use of Reduced-Solvent Extraction Methods for the Characterization of Detergent Products," American Oil Chemists' Society Annual Meeting, San Antonio, TX, 1995 (Invited).

D. E. Raynie, "Enhancing Extractions through Enhanced Mass Transfer," Chemistry Department Seminar, Wright State University, Dayton, OH, 1995 (Invited).

D. E. Raynie, "Enhancing Extractions Through Enhanced Mass Transfer," 22nd Annual Conference of the Federation of Analytical Chemistry and Spectroscopy Societies, Cincinnati, OH, 1995 (Invited).

D. E. Raynie, S. M. Culbertson, and D. P. Innis, "A Comparison of Sample Preparation Considerations for Foods Analysis Using Supercritical Fluid Extraction, Microwave Extraction, and Accelerated Solvent Extraction," 109th AOAC International Annual Meeting, Nashville, TN, 1995 (Invited).

D. E. Raynie, "Addressing the Analytical Sample Preparation Needs in Industry," 19th International Symposium on Capillary Chromatography and Electrophoresis, Wintergreen, VA, 1996 (Invited).

D. E. Raynie and R. P. Gregory, IV, "Understanding the Basis of Analytical Extractions Through the Use of Concept Mapping," 19th International Symposium on Capillary Chromatography and Electrophoresis, Wintergreen, VA, 1996.

D. E. Raynie and D. P. Innis, "The Complementary Nature of Enhanced Extraction Methods," 7th International Symposium on Supercritical Fluid Chromatography and Extraction, Indianapolis, IN, 1996 (Invited).

D. P. Innis, B. S. Haynes, T. L. Chester, and D. E. Raynie, "Characterization of Waxes in Lipsticks by Supercritical Fluid Extraction and Open-Tubular Supercritical Fluid Chromatography," 7th International Symposium on Supercritical Fluid Chromatography and Extraction, Indianapolis, IN, 1996.

D. E. Raynie, S. M. Culbertson, and D. P. Innis, "Development of Accelerated Solvent Extraction for the Determination of Fats in Food Products," American Oil Chemists' Society Annual Meeting, Indianapolis, IN, 1996 (Invited).

D. E. Raynie, "Consumer Products Applications of ASE," ASE Special Interest Workshop, Annapolis, MD, 1996 (Invited).

D. E. Raynie, "Application of Pressurized Fluid Extraction to Consumer Products," 48th Pittsburgh Conference and Exposition on Analytical Chemistry and Applied Spectroscopy, Atlanta, GA, 1997 (Invited).

D. E. Raynie, "An Overview of Sample Preparation," 214th American Chemical Society National Meeting, Las Vegas, NV, 1997 (Invited).

D. E. Raynie, "An Overview of Sample Preparation," 36th Eastern Analytical Symposium, Somerset, NJ, 1997 (Invited).

D. E. Raynie, "Solving Industrial Problems with Extraction Methodologies," 25th Annual Conference of the Federation of Analytical Chemistry and Spectroscopy Societies, Austin, TX, 1998 (Invited).

D. E. Raynie, "Comparison of Enhanced Extraction Methods for Use in Industrial Analytical Laboratories," Analytical Separations 2000, Vaals, Netherlands, 1999 (Invited).

D. E. Raynie, "Scaling Parameters for Accelerated Solvent Extraction," 10th International Symposium on Supercritical Fluid Chromatography and Extraction, Myrtle Beach, SC, 2001 (Invited).

D. E. Raynie, "Determination of the Alkaloids in a Genus of Endangered Poppies," Biology and Chemistry Department Seminars, Augustana College, Sioux Falls, SD, 2001 (Invited).

D. E. Raynie, "Use of Physical Chemical Principles to Enhance Analytical Extractions," Viste Retirement Symposium, Augustana College, Sioux Falls, SD 2002.

D. E. Raynie, "The Evolution of the Chemistry of Cleaning," North Dakota Education Association, Bismarck, ND, 2002 (Invited).

D. E. Raynie, "How Much Chemistry is Really in a Basket of Laundry," National Chemistry Week Speaker, Bismarck State College, Bismarck, ND, 2002 (Invited).

D. E. Raynie, J. Javers, and W. Gibbons, "Selective Separation of Biopolymers from Microbial Fermentation," 54th Pittsburgh Conference and Exposition on Analytical Chemistry and Applied Spectroscopy, Orlando, FL, 2003.

D. E. Raynie, "A Simplified Method for the Comparison of the Quality of Independent Chromatographic Methods," 26th International Symposium on Capillary Chromatography and Electrophoresis, Las Vegas, NV, 2003 (Invited).

D. E. Raynie, J. Javers, and W. Gibbons, "Modern Extraction Techniques for the Isolation of Biopolymers from Microbial Fermentation," 227th American Chemical Society National Meeting, Anaheim, CA, 2004 (Invited).

A. DuPay, D. Ferris, N. S. Thiex, and D. E. Raynie, "Chromatographic Determination of Aminoglycoside Antibiotics in Animal Feeds," 89th Annual Meeting of the South Dakota Academy of Science, Chamberlain, SD, 2004.

D. E. Raynie, "A Simplified Method for the Comparison of the Quality of Independent Chromatographic Methods," Milton Hanson Retirement Symposium, Augustana College, Sioux Falls, SD 2004.

J. E. Javers, W. R. Gibbons, and D. E. Raynie, "Production of Polyhydroxyalkanoates from Industrial Waste Streams," National Corn Utilization Technology Conference, Indianapolis, IN, 2004.

D. E. Raynie, J. Javers, and W. R. Gibbons, "Supercritical Fluid Extraction of Biopolymers and Other Value-Added Products from Agricultural Products," 11th International Symposium on Supercritical Fluid Chromatography, Extraction, and Processing, Pittsburgh, PA, 2004 (Invited).

D. E. Raynie, "Problem-Based Learning and Forensic Case Study in the Instrumental Analysis Laboratory," 56th Pittsburgh Conference and Exposition on Analytical Chemistry and Applied Spectroscopy, Orlando, FL, 2005.

A. M. Gensmer, D.M. Wulf, T. J. Koger, B.J. McFarlane, D. E. Raynie, and R.J. Maddock, "Use of High Pressure for Application of Carbon Monoxide in Case-Ready Packaging Systems for Fresh Beef," International Congress of Meat Science and Technology, Baltimore, MD, 2005.

D. E. Raynie and W. R. Gibbons, "Green Processing of Biopolymers and Other Value-Added Products from Agricultural Products," 9th Annual Green Chemistry and Engineering Conference, Washington, DC, 2005.

D. E. Raynie, "Green Processing of Biopolymers and Other Value-Added Products from Agricultural Products," University of Nebraska-Kearney, Chemistry Department Seminar, Kearney, NE, 2005.

J. Driver, N. Thiex, D. Raynie, M. Ofitserova, and M. Pickering, "Single-Laboratory Validation for Neomycin in Animal Feeds by Liquid Chromatography Fluorescence Detection with Post-Column Derivatization," Association of Official Analytical Chemists National Meeting, Minneapolis, MN, 2006 (Invited).

J. L. Driver, N. S. Thiex, D. E. Raynie, M. Ofitserova, and M. Pickering, "Single-Laboratory Validation for Neomycin in Animal Feeds by Liquid Chromatography-Fluorescence Detection with Post-Column Derivatization," AOAC National Meeting, Minneapolis, MN, 2006 (invited).

L. N. Tenlep and D. E. Raynie, "Near-Critical Fluid Hydrolysis of Lignocellulosic Biomass," 233rd American Chemical Society National Meeting, Chicago, IL, 2007.

J. L. Driver, N. S. Thiex, D. E. Raynie, M. Ofitserova, and M. Pickering, "Single-Lab Validation Results and Collaborative Study Protocol Details for the Method of Analysis of Neomycin and Apramycin in Animal Feeds," AOAC National Meeting, Anaheim, CA, 2007 (invited).

J. L. Driver, N. S. Thiex, D. E. Raynie, M. Ofitserova, and M. Pickering, "Method Development for the Quantification of Neomycin in Animal Feeds by Liquid Chromatography-Fluorescence Detection with Post-Column Derivatization," Midwest AOAC Meeting, Chicago, IL, 2007 (invited).

J. L. Driver, D. E. Raynie, N. S. Thiex, M. Pickering, and M. Ofitserova, "Single Laboratory Validation for Neomycin and Apramycin in Animal Feeds by High Performance Liquid Chromatography with Post-Column Derivatization and Fluorescence Detection," Midwest Region Meeting of the American Chemical Society, Kansas City, MO, 2007.

L. N. Tenlep and D. E. Raynie, "Renewable Energy: Pioneering Chemistry in Biofuels," Midwest Region Meeting of the American Chemical Society, Kearney, NE, 2008.

T. Dioszegi and D. E. Raynie, "Innovations in Sample Preparation," Midwest Region Meeting of the American Chemical Society, Kearney, NE, 2008.

J. L. Driver, D. E. Raynie, and P. Jackson, "A Green Chemistry Assessment for Analytical Methods," Midwest Region Meeting of the American Chemical Society, Kearney, NE, 2008.

J. J. Kroon and D. E. Raynie, "Comparison of ASE to Soxhlet Extraction in the Extraction of Hexane Soluble Materials from Leather," Midwest Region Meeting of the American Chemical Society, Kearney, NE, 2008.

D. E. Raynie, "Instructional Resources for the Teaching of Green Analytical Chemistry," Green Chemistry and Engineering Symposium, Washington, DC, 2008.

J. L. Driver, D. E. Raynie, and P. Jackson, "A Green Chemistry Assessment for Analytical and Chemical Processes," Green Chemistry and Engineering Conference, Washington, DC, 2008.

L. N. Tenlep and D. E. Raynie, "Fractionation of Lignocellulosic Biomass Feedstocks," 12th International Green Chemistry and Engineering Conference. Washington, DC, 2008.

D. E. Raynie and J. J. Kroon, "Liquid Carbon Dioxide-Based Production of Leather," Green Chemistry and Engineering Conference, Washington, DC, 2008.

L. N. Tenlep, D. E. Raynie, and N. S. Thiex, "HPLC Analysis of Hydrolysates from Subcritical Fluid Hydrolysis of Biomass," 29th Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN, 2008.

T. A. Dioszegi and D. E. Raynie, "Innovations in Sample Preparation," 29th Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN, 2008.

D. E. Raynie and J. L. Driver, "The Role of Diffusion in Enhanced Extraction Methods," ExTech 2008 International Symposium on Sample Preparation, Brugges, Belgium, 2008 (invited).

D. E. Raynie, "Green Analytical Chemistry: A Convergence of Thought Processes," Pittsburgh Conference on Analytical Chemistry, New Orleans, LA, 2008 (invited).

L. N. Tenlep and D. E. Raynie, "Development of Analytical Methods for the Characterization of Biomass Processing Streams" 59th Pittsburgh Conference on Analytical Chemistry, New Orleans, LA, 2008.

J. L. Driver, D. E. Raynie, N. S. Thiex, and M. Ofitserova, "Quantification of Neomycin B, Neomycin C, and Apramycin in Animal Feeds by Liquid Chromatography-Fluorescence

Detection with Post-Column Derivatization,” Pittsburgh Conference on Analytical Chemistry, New Orleans, LA, 2008.

L. N. Tenlep and D.E. Raynie, “Hydrolysis of Biomass Samples in Subcritical Water and Carbonic Acid,” Spring National Meeting of the American Chemical Society, Salt Lake City, UT, 2009.

L. N. Tenlep and D.E. Raynie, “Fractionation of Lignocellulosic Biomass Feedstocks with Organosolv Processes,” 60th Pittsburgh Conference on Analytical Chemistry, Chicago, IL, 2009.

J. J. Kroon and D. E. Raynie, “Comparison of ASE to Soxhlet in the Extraction of Hexane-Soluble Materials from Leather,” 60th Pittsburgh Conference on Analytical Chemistry, Chicago, IL, 2009.

D. E. Raynie and J. L. Driver, “The Role of Diffusion in Enhanced Extraction Methods,” 11th International Symposium on Advances in Extraction Technologies, Rapid City, SD, 2009 (invited).

L. N. Tenlep and D. E. Raynie, “Fractionation of Lignocellulosic Biomass Feedstocks Using Room Temperature Ionic Liquids and an Aqueous-Organic Solvent,” 11th International Symposium on Advances in Extraction Technologies, Rapid City, SD, 2009.

K. Shen, B. A. Anderson, and D. E. Raynie, “The Use of Ionic Liquids in Bioprocessing,” 11th International Symposium on Advances in Extraction Technologies, Rapid City, SD, 2009.

T. A. Dioszegi and D. E. Raynie, “Hydrolysis and Extraction of Fats in Dairy Products,” 11th International Symposium on Advances in Extraction Technologies, Rapid City, SD, 2009.

V. Essel and D. E. Raynie, “Recovery and Characterization of Protein and Cellulose from Soybean Meal and White Flakes Dissolved in Ionic Liquids,” 11th International Symposium on Advances in Extraction Technologies, Rapid City, SD, 2009.

G. Degam and D. E. Raynie, “Extraction of Fat in Peanut Butter,” 11th International Symposium on Advances in Extraction Technologies, Rapid City, SD, 2009.

J. J. Kroon and D. E. Raynie, “Use of Supercritical Fluid Extraction Equipment for the Impregnation of Dyes and Waterproofing into Leather,” 11th International Symposium on Advances in Extraction Technologies, Rapid City, SD, 2009.

L. N. Tenlep and D. E. Raynie, “Characterization of Biomass Hydrolyzates with HPLC using RI and ELSD,” 30th Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN, 2009.

T. A. Dioszegi and D. E. Raynie, “Hydrolysis and Extraction of Fats in Dairy Products,” 30th Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN, 2009.

K. Shen, B. A. Anderson, and D. E. Raynie, “The Use of Ionic Liquids in Bioprocessing,” 44th Midwest Region Meeting of the American Chemical Society, Iowa City, IA, 2009.

T. A. Dioszegi and D. E. Raynie, “Hydrolysis and Extraction of Fats in Dairy Products,” 44th Midwest Region Meeting of the American Chemical Society, Iowa City, IA, 2009.

D. E. Raynie, B. A. Anderson, and K. Odegaard, “Greener Chelating Agents for Analytical Titrations,” 44th Midwest Region Meeting of the American Chemical Society, Iowa City, IA, 2009.

V. Essel and D. E. Raynie, “Recovery and Characterization of Protein and Cellulose from Soybean Meal and White Flakes Dissolved in Ionic Liquids,” 44th Midwest Region Meeting of the American Chemical Society, Iowa City, IA, 2009.

B. J. Eckrich and D. E. Raynie, “Pyrolysis Bio-Oil Fractionation and Characterization via Accelerated Solvent Extraction,” 44th Midwest Region Meeting of the American Chemical Society, Iowa City, IA, 2009.

G. Degam and D. E. Raynie, “Extraction of Fat in Peanut Butter,” 44th Midwest Regional Meeting of the American Chemical Society, Iowa City, IA, 2009.

D. E. Raynie and J. L. Driver, “Optimizing Modern Extraction Techniques for Solid Samples,” Eastern Analytical Symposium, Somerset, NJ, 2009 (invited).

D. E. Raynie and J. L. Driver, “A Green Assessment of Chemical Methods,” 13th Annual Green Chemistry and Engineering Conference, College Park, MD, 2009.

D. E. Raynie, “Investigations toward Biorefinery Applications of Ionic Liquids,” 1st Bio-Fuels and Energy Independence Symposium, Superior, WI, 2009 (invited).

D. E. Raynie, G. Degam, B. A. Anderson, and K. Odegaard, “Greener Chelating Agents for Analytical Titrations,” 14th Green Chemistry and Engineering Conference, Washington, DC 2010.

D. E. Raynie, G. Degam, B. A. Anderson, and K. J. Odegaard, “Greener Chelating Agents for Analytical Titrations,” Eastern Analytical Symposium, Somerset, NJ 2010 (invited).

D. E. Raynie and M. P. Collins, “Carbonic Acid Hydrolysis of Cellulose,” 45th Midwest Region Meeting of the American Chemical Society, Wichita, KS, 2010.

J. J. Kroon and D. E. Raynie, “Use of Carbon Dioxide in Leather Tannery Operations,” 45th Midwest Region Meeting of the American Chemical Society, Wichita, KS, 2010.

D. E. Raynie and M. L. Sauer, “Determination of Resveratrol Content in Cold Hardy Grapes,” 45th Midwest Region Meeting of the American Chemical Society, Wichita, KS, 2010.

H. Kandala and D. E. Raynie, “A Systematic Approach to Upgrade and Characterize Bio-Oils,” 45th Midwest Region Meeting of the American Chemical Society, Wichita, KS, 2010.

V. Essel and D. E. Raynie, “Protein, Lignin, and Cellulose Recovery from Ionic Liquid-Dissolved Biomass: Biofuel Technology,” 45th Midwest Region Meeting of the American Chemical Society, Wichita, KS, 2010.

D. E. Raynie and K. Shen, “Synthesis, Properties, and Utilization of 1-Ethyl-3-Methylimidazolium Alkylbenzene Sulfonate Ionic Liquids,” 5th Green Solvents Conference, Berchtesgaden, Germany, 2010.”

D. E. Raynie, H. Kandala, B. A. Anderson, and K. Shen, “Synthesis, Properties, and Utilization of 1-Ethyl-3-Methylimidazolium Alkylbenzene Sulfonate Ionic Liquids,” 2nd Bio-Fuels and Energy Independence Symposium, Superior, WI, 2010 (invited).

D. E. Raynie and J. L. Driver, “Is the High-Throughput Preparation of Solid Samples a Fallacy?” Pittsburgh Conference and Exposition on Analytical Chemistry, Orlando, FL, 2010 (Invited).

D. E. Raynie, “With Knowledge Comes Responsibility: A Case for Green Chemistry,” Baltimore Section of the American Chemical Society, Towson, MD, 2010.

B. Wilen, D. E. Raynie, and M. L. Miller, “Environmentally Friendly Organic Synthesis,” Upper Midwest Honors Conference, Fargo, ND, 2011.

N. V. K. Bathula and D. E. Raynie, “Study of Lignin by Pyrolysis GC-MS,” 46th Midwest/39th Great Lakes Joint Regional Meeting of the American Chemical Society, St. Louis, MO, 2011.

G. Degam and D. E. Raynie, “Characterization of Deep Eutectic Solvents and Comparison with Room Temperature Ionic Liquids,” 46th Midwest/39th Great Lakes Joint Regional Meeting of the American Chemical Society, St. Louis, MO, 2011.

G. N. Gachumi and D. E. Raynie, “Beeswax Processing and Refining in Supercritical Carbon Dioxide,” 46th Midwest/39th Great Lakes Joint Regional Meeting of the American Chemical Society, St. Louis, MO, 2011.

V. Essel and D. E. Raynie, “Application of 1-ethyl-3-methylimidazolium Acetate in the Isolation of Lignin and Hemicellulose,” 46th Midwest/39th Great Lakes Joint Regional Meeting of the American Chemical Society, St. Louis, MO, 2011.

H. Kandala and D. E. Raynie, “Synthesis and Characterization of 1-ethyl-3-methylimidazolium Alkylbenzene Sulfonate Ionic Liquids,” 46th Midwest/39th Great Lakes Joint Regional Meeting of the American Chemical Society, St. Louis, MO, 2011.

B. A. Anderson and D. E. Raynie, “The Viscosity Lowering of Ionic Liquids,” 46th Midwest/39th Great Lakes Joint Regional Meeting of the American Chemical Society, St. Louis, MO, 2011.

D. E. Raynie, “Are Green Separations Possible?”, Chromatography Forum of the Delaware Valley, Philadelphia, PA, 2011.

B. E. Richter and D. E. Raynie, “Accelerated Solvent Extraction,” *LC/GC Magazine Webinar Series*, 2011.

D. E. Raynie, “Green Analytical Chemistry: A Convergence of Thought Processes,” *LC/GC Magazine Webinar Series*, 2011.

D. E. Raynie, G. Degam, K. Shen, H. Kandala, and B. A. Anderson, “Ionic Liquid and Deep Eutectic Solvents in Analytical Extractions,” 15th Green Chemistry and Engineering Conference, Washington, DC, 2011.

H. Kandala and D. E. Raynie, “A Systematic Approach to Upgrade and Characterize Bio-Oils,” 32nd Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN, 2011.

V. Essel and D. E. Raynie, “The Application of Ionic Liquids in the Production of Biofuels,” 32nd Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN, 2011.

G. Degam and D. E. Raynie, “Deep Eutectic Solvent Characterization and Comparison with Room Temperature Ionic Liquids,” 32nd Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN, 2011.

T. A. Dioszegi and D. E. Raynie, “Kinetic Performance Comparison of a Capillary Monolithic and a Fused-Core Column,” 32nd Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN, 2011.

T. A. Dioszegi and D. E. Raynie, “Kinetic Performance Comparison of a Monolithic and a Fused-Core Column,” Pittsburgh Conference and Exposition on Analytical Chemistry, Atlanta, GA, 2011.

N. V. K. Bathula and D. E. Raynie, “Characterization of Lignin from Prairie Cordgrass and Switchgrass by GC-MS Analysis of Cupric Oxide and Nitrobenzene Oxidation Products and by Pyrolysis-GC-MS,” Pittsburgh Conference and Exposition on Analytical Chemistry, Atlanta, GA, 2011.

H. Kandala and D. E. Raynie, “A Systematic Approach to Upgrade and Characterize Bio-oils,” Pittsburgh Conference and Exposition on Analytical Chemistry, Atlanta, GA, 2011.

V. P. R. Sakampally and D. E. Raynie, “Production and Characterization of Bio-oil by Pyrolysis,” Pittsburgh Conference and Exposition on Analytical Chemistry, Atlanta, GA, 2011.

V. Essel and D. E. Raynie, “Protein, Lignin and Cellulose Recovery from Ionic Liquid-Dissolved Biomass: Biofuel Technology,” Pittsburgh Conference and Exposition on Analytical Chemistry, Atlanta, GA, 2011.

Douglas E. Raynie (symposium organizer) and Tunde A. Dioszegi (2012) “Kinetic Performance Comparison of a Monolithic and a Fused-Core Column in Micro-LC,” Spring National ACS Meeting, San Diego, CA.

Changling Qiu and Douglas E. Raynie (2012) “Determination of Water- and Fat-Soluble Vitamins in Gummies by Reversed-Phase Liquid Chromatography,” Midwest Regional ACS Meeting, Omaha, NE.

Bryce Wilen, Meredith L. Sauer, and Douglas E. Raynie (2012) “Microwave-Assisted Formation of Silver Nanoparticles using Grape Pomace,” Midwest Regional ACS Meeting, Omaha, NE.

James Cassidy, Bryce Wilen, Meredith L. Sauer, and Douglas E. Raynie (2012) “Metal Ion Reduction with Grape Pomace and Microwave Irradiation,” Midwest Regional ACS Meeting, Omaha, NE.

Hiranmayee Kandala and Douglas E. Raynie (2012) “Thermal Characterization of 1-ethyl-3-methylimidazolium alkylbenzenesulfonate (EMIM ABS) Ionic Liquids,” Midwest Regional ACS Meeting, Omaha, NE.

Ganesh Degam and Douglas E. Raynie (2012) “Solvent Polarities and Kamlet-Taft Parameters of Deep Eutectic Solvents Based on Choline Chloride, Urea and Glycerol,” Midwest Regional ACS Meeting, Omaha, NE.

Vara Sakampally and Douglas E. Raynie (2012) “Isolation and Identification of Linalool from Aqueous Samples,” Midwest Regional ACS Meeting, Omaha, NE.

Tunde A. Dioszegi and Douglas E. Raynie (2012) “Kinetic Performance Comparison of a Monolithic and a Fused-Core Column In UPLC,” Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN.

Vinod Bathula and Douglas E. Raynie (2012) “Characterization of Grass Lignins by Pyrolysis–GC-MS and MALDI/TOF-MS,” Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN.

Ganesh Degam and Douglas E. Raynie (2012) “Characterization of Deep Eutectic Solvents and Applications in Biomass Processing,” Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN.

Hiranmayee Kandala and Douglas E. Raynie (2013), “Characterization of 1-Methyl-3-ethyl-methylimidazolium Alkylbenzene (EMIM-ABS) Ionic Liquids,” Pittsburgh Conference on Analytical Chemistry, Philadelphia, PA.

G. N. Gachumi and D. E. Raynie (2013), “Supercritical Carbon Dioxide Extraction and Refining of Beeswax,” 44th Central Region Meeting of the American Chemical Society, Mt. Pleasant, MI.

Douglas E. Raynie (2013), “Explorations with Deep Eutectic Solvents for Chemical Extractions,” 9th Conference on Small Molecule Science, La Jolla, CA. (Invited)

Douglas E. Raynie (2013), panel discussion participant on developing green chemistry collaborations, 3rd Minnesota Green Chemistry Conference, Minneapolis, MN. (Invited)

George Gachumi and Douglas E. Raynie (2013), “Supercritical Carbon Dioxide Bleaching of Distiller's Dried Grain with Solubles,” Midwest Regional ACS Meeting, Springfield, MO.

Changling Qiu and Douglas E. Raynie (2013), “Determination of Perfluorooctanoic Acid (PFOA) from the Surface of Cookware under Simulated Cooking Conditions using Accelerated Solvent Extraction (ASE) and LC/MS/MS,” Midwest Regional ACS Meeting, Springfield, MO.

John Kiratu and Douglas E. Raynie (2013), “Supercritical Carbon Dioxide Extraction of Essential Oil from *chrysothamnus nauseosus* (Rabbit Brush) and *rhus aromatica* (Skunk Brush),” Midwest Regional ACS Meeting, Springfield, MO.

Hiranmayee Kandala and Douglas E. Raynie (2013), “Cytotoxicity and Genotoxicity Study of 1-Ethyl-3-methylimidazolium alkylbenzenesulfonate (EMIM-ABS) Ionic Liquids,” Midwest Regional ACS Meeting, Springfield, MO.

Ganesh Degam and Douglas E. Raynie (2013), “Assessment of Genotoxicity and Cytotoxicity of Deep Eutectic Solvents,” Midwest Regional ACS Meeting, Springfield, MO.

Bethany Foy, Sampson Asare, and Douglas E. Raynie (2013), “Physical Properties of Deep Eutectic Solvents of Choline Chloride with Acids and Sugars,” Midwest Regional ACS Meeting, Omaha, NE.

Eric A. Boakye and Douglas E. Raynie (2014), “Comparison of Pyrolysis Products of Prairie Cordgrass at Different Temperatures By Accelerated Solvent Extraction and GC-MS,” Pittsburgh Conference on Analytical Chemistry, Chicago, IL.

Ganesh Degam and Douglas E. Raynie (2014), “Deep Eutectic Solvents for Lignocellulosic Biomass Processing,” Pittsburgh Conference on Analytical Chemistry, Chicago, IL.

John Kiratu and Douglas E. Raynie (2014), “Supercritical Carbon Dioxide Extraction of Essential Oil from *Chrysothamnus nauseosus* (Rabbit Brush) and *Rhus aromatica* (Skunk Brush),” Pittsburgh Conference on Analytical Chemistry, Chicago, IL.

George Gachumi and Douglas E. Raynie (2014), “Supercritical Carbon Dioxide Bleaching of Distiller’s Dried Grains with Solubles,” Pittsburgh Conference on Analytical Chemistry, Chicago, IL.

Changling Qiu and Douglas E. Raynie (2014), “Determination of Perfluorooctanoic Acid (PFOA) from the Surface of Cookware Under Simulated Cooking Conditions Using Accelerated

Solvent Extraction and LC/MS/MS,” Pittsburgh Conference on Analytical Chemistry, Chicago, IL.

Eric Boakye and Douglas E. Raynie (2014), “Graphene Synthesis During Biomass Pyrolysis,” poster presented at SDSU Faculty Showcase, Celebration of Faculty Excellence.

S. Dharmarajan and D. E. Raynie (2014), “Comparison of Green Solvents during Chemical Extraction by Diffusion Studies,” Minnesota Chromatography Forum Spring Symposium, Minneapolis, MN.

Tanvir Amit and Douglas E. Raynie (2014), “Structural and Thermal Characterization of Lignin,” 49th Midwest Regional Meeting of the American Chemical Society,” Columbia, MO.

Changling Qiu and Douglas E. Raynie (2014), “Determination of Perfluorooctanoic Acid (PFOA) from the Surface of Cookware under Simulated Cooking Conditions Using ASE and LC/MS/MS,” Eastern Analytical Symposium, Somerset, NJ.

Eric A. Boakye and Douglas E. Raynie (2014), “Comparison of Pyrolysis Products of Prairie Cordgrass at Different Temperatures by Accelerated Solvent Extraction and GC-MS,” 49th Midwest Regional Meeting of the American Chemical Society, Columbia, MO.

S. Dharmarajan and D. E. Raynie (2014), “Comparison of Green Solvents during Chemical Extraction by Diffusion Studies,” Eastern Analytical Symposium, Somerset, NJ.

George Gachumi and D. E. Raynie (2014), “Isolation of High-Purity Lanolin from Waste Wool Using Supercritical Fluid Extraction,” 49th Midwest Regional Meeting of the American Chemical Society, Columbia, MO.

John Kiratu and D. E. Raynie (2014), “Trapping of Volatile Compounds after Supercritical Fluid Extraction and Application to Extraction of Essential Oils,” 49th Midwest Regional Meeting of the American Chemical Society, Columbia, MO.

J. Mishra, D. Raynie, G. Gachumi, H. W. Alraives, and P. Krishnan (2014), “Food Grade Distiller’s Grains,” Corn Utilization and Technology Conference, Louisville, KY.

D. E. Raynie (2014), “Investigations into Analytical Extractions using Green Solvents,” Eastern Analytical Symposium, Somerset, NJ. (Invited).

D. E. Raynie (2014), “Solvent Selection and Green Attributes in Sample Preparation,” Minnesota Chromatography Forum Spring Symposium, Minnesota, MN. (Invited).

D. E. Raynie (2014), “Bioprocessing Considerations with Deep Eutectic Solvents,” Departmental Seminar, South Dakota School of Mines and Technology, Rapid City, SD.

D. E. Raynie, L. Wei, and J. Julson (2014), “Torrefaction and Pyrolysis of Prairie Cordgrass to Fungible Fuels,” North Central Sun Grant Center Annual Meeting, Minneapolis, MN.