

Department of Chemistry

Chair: Dr. Kenneth Turnbull, 937-775-2855

<http://www.chm.wright.edu/>

Refereed publications and book chapters

Dr. Fossum

Himmelberg, P.; Fossum, E., "Development of an Efficient Route to Hyperbranched Poly(aryleneether sulfone)s," *Journal of Polymer Science, Part A: Polymer Chemistry*, 43(13), 3178 – 3187 (2005).

Fossum, E.; Tan, L.S., "Geometrical Influence of AB_n Monomer Structure on the Thermal Properties of Linear-Hyperbranched Ether-Ketone Copolymers Prepared via an AB + AB_n Route," *Polymer*, 46, 9686 – 9693 (2005).

Dr. Gilpin

Gilpin, R.K., Zhou, W., "Infrared Studies of the Thermal Conversion of Mefenamic Acid Between Polymorphic States," *Vibrational Spectroscopy*, 37, 53-59 (2005).

Gilpin, R.K., Zhou, W., "Infrared Studies of the Polymorphic States of the Fenamates," *J. Pharmaceutical and Biomedical Sci.*, 37, 509-515 (2005).

Gilpin, R. K., Pachla, L.A., "Pharmaceuticals and Related Drugs," *Anal. Chem.*, 77, 3755-3769, (2005).

Bose, A.B., Gangoda, M., Jaroniec, M., Gilpin, R.K., Bose, R.N., "TwoDimensional Solid State NMR Characterization of Physisorbed Siloxane Polymer (OV225) on Silica," *Surface Sci.*, 600, 143-154 (2006).

Gilpin, R.K., "Effect of Different Binary Eluents on Operating Pressure, LC Problem Solving and Troubleshooting," *J. Chromatogr. Sci.*, 43, 53-54 (2005).

Gilpin, R.K., "Influence of Eluent Conditions on Fluorimetric Detection, LC Problem Solving and Troubleshooting," *J. Chromatogr. Sci.*, 43, 163-164 (2005).

Gilpin, R.K., "Separation of Conformational Isomers, LC Problem Solving and Troubleshooting," *J. Chromatogr. Sci.*, 43, 330-331 (2005).

Gilpin, R.K., "Poly(Styrene-Divinylbenzene) Reversed-Phase HPLC Columns, LC Problem Solving and Troubleshooting," *J. Chromatogr. Sci.*, 43, 442-443 (2005).

Dr. Grossie

Hu, X.; Grossie, D.A.; Higgins, S.R., "Growth and Dissolution Kinetics at the Dolomite-Water Interface: An In-Situ Scanning Probe Microscopy Study," *American Mineralogist*, 90, 963-968 (2005).

Dr. Higgins

Higgins S.R.; Hu, X., "Self-Limiting Growth on Dolomite: Experimental Observations with In-Situ Atomic Force Microscopy," *Geochimica et Cosmochimica Acta*, 69, 2085-2094 (2005).

Hu X.; Grossie D.A.; Higgins S.R., "Growth and Dissolution Kinetics at the Dolomite-Water Interface: An In-Situ Scanning Probe Microscopy Study," *American Mineralogist*, 90, 963-968. (2005)

Dr. Katovic

Caja, J.; Dunstan, D.; Dyar, H. Krall, A.; H.; Katovic, V., "Ionic Liquids as Electrolyte in Lithium-Ion Batteries: Imidazolium and Pyrazolium Tetrafluoroborate in LiMn₂O₄/ Metal Oxide Cells," *Kem. Ind.*, 54 (4), 205-214 (2005).

Dr. Lunsford

Lunsford, S.K.; Zhang, H., "Electrochemistry and Detection of Catechol at a Conducting Poly(3-methylthiophene) Electrode In the Presence of a Common Interferent, Ascorbic Acid," *Chem. Educator*, 1, 10-14 (2005).

Lunsford, S.K., "Variable Effects During Polymerization," *J. Chem. Ed.*, 82 (12), 1830-1832 (2005)

Dr. McGowin

Leo M.L. Nollet, Editor, "Polycyclic Aromatic Hydrocarbons" a chapter (69 pages) in *Chromatographic Analysis of the Environment*, 3rd Ed. Revised and Expanded, Taylor & Francis, 2005

Dr. Seybold

Kier, L.B.; Seybold, P.G.; Cheng, C.K., "Modeling Chemical Systems Using Cellular Automata," Springer: Dordrecht, The Netherlands, 2005.

Dr. Turnbull

Weisner A.J.; Cooper, T.M.; Turnbull, K., "Routes to Sydnone-containing Oligomeric Arenynes," *Synth. Commun.*, 35, 671-83 (2005).

Cooper, T.M.; Hall, B.C.; McLean, D.G.; Rogers, J.E.; Burke, A.R.; Turnbull, K.; Weisner, A.; Fratini, A.; Liu Y.; Schanze, J., "Structure-Optical Property Relationships in Organometallic Sydnones," *J. Phys. Chem.*, A109, 999-1007 (2005).

Presentations and Invited Talks

Dr. Dolson

Brumfield, B.E., Dolson, D.A., "A Kinetic Study of the $\text{Cl}^*(2P_{1/2})/\text{N}_2\text{O}(v_1)$ E-V Channel," Presented at the XXth Conference on the Dynamics of Molecular Collisions, Asilomar Conference Center, Pacific Grove, CA. July 10-15, 2005.

Dolson, D.A., Munson, B.R., "Electronic-to-Vibrational Energy Transfer from $\text{Cl}^*(2P_{1/2})$ to $\text{CH}_4(v_4)$ and $\text{CD}_4(v_4)$ ", Presented at the XXth Conference on the Dynamics of Molecular Collisions, Asilomar Conference Center, Pacific Grove, CA. July 10-15, 2005.

Brumfield, B.E., Dolson, D.A., "A Kinetic Study of the $\text{Cl}^*(2P_{1/2})/\text{N}_2\text{O}(v_1)$ E-V Channel," Presented at the ACS Dayton Section 75th Anniversary Meeting, University of Dayton, Dayton, OH. March 1, 2005.

Dolson D. A., "Molecular Billiards: Infrared Fluorescence Studies of Collisional Energy Transfer," Presented at the Chemistry Department of Youngstown State University, Youngstown State University, Youngstown, OH. Invited seminar April 8, 2005.

Dr. Feld

Scanlon, L.G., Balbuena, P.B., Zhang, Y., Sandi, G., Back, C.K., Feld, W.A., Mack, J., Rottmayer, M.A., Riepenhoff, J.L., "Investigation of Corannulene for Molecular Hydrogen Storage via Computational Chemistry and Experimentation," 208th Meeting of The Electrochemical Society, Los Angeles, CA, October 16-21, 2005.

Scanlon, L.G., Balbuena, P.B., Zhang, Y., Sandi, G., Back, C.K., Feld, W.A., Mack, J., Rottmayer, M.A., Riepenhoff, J.L. "Investigation of Corannulene as Molecular System for Hydrogen Storage," 2005 Annual Meeting-American Institute of Chemical Engineers, Cincinnati, OH, October 30 - November 4, 2005.

Dr. Fossum

"Controlled Synthesis of Hyperbranched Materials via Polycondensation Chemistry: Membrane Applications" presented at the Institute for Macromolecular Chemistry, Czech Academy of Sciences, Prague, Czech Republic. Invited talk, January 7, 2005.

Himmelberg, P., Fossum, E., "Development of a Simple Route to Hyperbranched Poly(arylene ether sulfone)s," presented at the 229th ACS National Meeting, San Diego, CA, March 15, 2005.

Dang, T.D., Venkatsubramanian, N., Williams, L.D., Fries-Carr, S., Fossum, E. "Advanced Polyester Dielectrics for High Energy Density Capacitor Applications" presented at the 229th ACS National Meeting, San Diego, CA, March 15, 2005.

“Exploring Some Fundamental Aspects of Kinetically Controlled Polycondensation Reactions” presented at the Gordon Research Conference – Polymers East, Mount Holyoke College, MA; June 20 – 21, 2005.

“Using Kinetics to Control Polycondensation Reactions” Invited talk presented at the Kentuckiana Undergraduate Research Symposium, University of Louisville, April 2, 2005.

Sellers, A., Fossum, E., Beach, C., “Thermally Stable, Highly Branched Polymers via an A2 + B3 Polycondensation of Phosphine Oxide-Based Monomers” presented at the Kentuckiana Undergraduate Research Symposium, University of Louisville; Awarded 3rd Place Poster. April 2, 2005.

“Controlled Synthesis of Linear and Branched Materials via Polycondensation Reactions” Invited talk at the University of Cincinnati, May 12, 2005.

Dr. Gilpin

Zhou, W., Gilpin, R.K., “Reversed-Phase HPLC Method for the Determination of Nitrosoglyphosate in Commercial and Environmental Samples,” Pittcon2005, Orlando, FL, March, 2005.

Gilpin, R.K., Zhou, W., “A Simple Infrared Method for Characterizing the Polymorphic States of Tolfenamic Acid,” Pittcon2005, Orlando, FL, March 2005.

Gilpin, R.K., Solch, J.G., Farai, R.L., “Comparison of HRGC/HRMS and HRGC/LRMS for Measuring Polybrominated Diphenyl Ethers in Environmental Samples,” Pittcon 2005, Orlando, FL, March 2005.

Osborne, J.S., Solch, J.G., Gilpin, R.K., “A Seamless System for Automated Data Backup,” Pittcon 2005, Orlando, FL, March 2005.

Solch, J.G., Gilpin, R. K. “Course Development Tools for Use with an Open Source Distance Learning Platform,” Pittcon 2005, Orlando, FL, March 2005.

Gilpin, C.S., Solch, J.G., Gilpin, R.K., “On-line Evaluation of Training Needs and Customizable Modular Courses to Meet Them,” Pittcon 2005, Orlando, FL, March 2005.

Dr. Grossie

Grossie, D.A., Feld, W.A., Scanlon, L., Sandi, G., Wawrzak, Z.A., “Crystallographic and Computational Examination of Helical Aromatic Compounds and their Precursors,” 20th. Congress of the International Union of Crystallography, Florence, Italy, August 2005.

Dr. Higgins

Higgins S. R., Hu, X., Bose S., Dynamics at Mineral-Water Interfaces. Invited speaker at the American Chemical Society National Meeting, San Diego, CA. (2005)

Hu X., Bose S., Higgins S. R. Length and Time Dependent Properties at Mineral-Water Interfaces. Keynote speaker at the V. M. Goldschmidt Conference, Moscow, ID. (2005)

Fenter P., Zhang Z., Park C., Sturchio N.C. Hu, X., Higgins S.R. Probing the Reactivity of the Dolomite-Water Interface using High Resolution X-ray Reflectivity. Contributed oral presentation at the V. M. Goldschmidt Conference, Moscow, ID. (2005)

Dr. Ketcha

Ketcha, D., Cooke, S., "Comparative Study of the Effects of Acid 'Promoters on the Microwave and Thermal Friedel-Crafts Acylations of 1-(Phenylsulfonyl)pyrroles" 229th ACS National Meeting, San Diego, CA, March 13-18, 2005.

Ketcha, D., Charlesworth, C.E., Cooke, S. N., Malwitz, D.J., Southerland, B.K., Grossie D.A. "Heterocyclic Chemistry in the Multi-Parallel Mode," Gordon Research Conference on Combinatorial Chemistry, Proctor Academy, Andover, NH., July 21-26,2005.

Dr. Lunsford

"Tools for Science Education-Partners in Environmental Science," Pittcon 2005 Analytical Conferences, 3/2/05

Wright State University Seminar, "Chemical Education and Modular Programs Developed," 2/11/05.

Pacificchem Conference "Professional Development Program Encourage Females In Science," 12/15/05.

"New Teaching Approaches for the In-Service Teacher To Encourage Students in Science," Pacificchem Conference 12/18/05.

"Interferent Studies and The Advantages of Potentiometric Flow Injection Analysis," Pacificchem Conference, 12/20/05.

Lunsford, S., Nedunuri, K., Sandy, M., "Integrated Inquiry Based Investigations on Mad River, Greene County: Chemistry, Earth Science and A New Evaluation Tool For Pre-Service Teachers," Ohio Higher Education Network Meeting for Science and Math Educators, Wright State University 10/20/05

Dr. McGowin

Dean, G.L., Kadiri, P., McGowin A.E. "Temperature Programming in the High-Performance Liquid Chromatographic Separation of 20 Polycyclic Aromatic Hydrocarbons in Soil, Sediment, and Sewage Sludge," presented at the FACSS meeting in Quebec City, October 13, 2005.

"Water as a Tunable Solvent," presented to the Science Department at Mount Saint Joseph College, invited, April 8, 2005.

Panel members were, McGowin, A., Tebbins, S., Steele-Johnson, D., Zaytoun, K. "Effective Presentations for Women Scientists: A Panel Discussion," Special Brown Bag seminar for graduate students and faculty, April 22, 2005.

Dr. Seybold

Seybold, P.G., O'Malley, M.J., "QSPR Studies of PBDEs," (Invited talk), American Chemical Society National Meeting, San Diego, CA, March 16, 2005.

Seybold, P.G., "Molecular Structure-Property Relationships," Muskingum College, New Concord, OH, April 11, 2005.

Seybold, P.G., "Cellular Automata Models of Complex Dynamic Systems," International Chemical Congress of Pacific Basin Societies, (PacifiChem 2005) Honolulu, HI, Dec. 15, 2005.

Dr. Turnbull

Turnbull, K., Fisher, J., "Bismuth Triflate Catalyzed Friedel-Crafts Acylations of Sydnonones," 229th National American Chemical Society Meeting, San Diego, CA, March 13-17, 2005.

Turnbull, K., Fisher, J., "Bismuth Triflate Catalyzed Friedel-Crafts Acylations of Sydnonones" Dayton Section of the American Chemical Society, March 1, 2005.

Turnbull, K., Fisher, J., "Bismuth Triflate Catalyzed Friedel-Crafts Acylations of Sydnonones," Wright Patterson Air Force Base, Materials Lab., MLPJ/Research Group 8.1 Laser Hardened Materials Seminar Series 05-06, April 6, 2005.

Invitations to Participate in or Chair Symposia

Dr. Higgins

Organized the "Advances in experimental and theoretical methods for characterization of mineral-fluid interfaces" Symposium held at the 2005 V.M. Goldschmidt Conference in Idaho, U.S.A., May 20-25, 2005.

Editorial Board memberships

Dr. Gilpin

Associate Editor for the Journal of Chromatographic Science.

Dr. Seybold

Editorial Advisory Board of Chemistry & Biodiversity, published by Verlag Helvetica Chimica Acta, Zurich.

Editorial Advisory Board, Current Computer-Aided Drug Design, published by Bentham Science Publishers, The Netherlands & the U.S.A.

Seybold, P.G., Advisory Board, Ohio Molecular Computational and Simulation Network.

Dr. Turnbull

ARKIVOC (electronic journal), scientific editor & Control Board member.

Comprehensive Heterocyclic Chemistry, Volume Editor for Volume 8, Elsevier.

Granting Agency Study Section Memberships

Dr. Turnbull:

U.S. Civilian Research and Development Foundation (CRDF), Chemistry (Washington D.C.).

Offices in Professional Organizations

Dr. Bombick:

American Chemical Society/Analytical Division Awards committee.

Dr. Feld:

Ohio NMR Consortium, Chair, 2003 – present.

Dr. Turnbull:

Chair of American Chemical Society (ACS) Dayton Section, Long Range Planning Committee.

Special Events, Symposia, or Colloquia in 2005

Dr. Higgins

Higgins, S.R., organized the “Advances in experimental and theoretical methods for characterization of mineral-fluid interfaces” Symposium held at the 2005 V.M. Goldschmidt Conference in Idaho, U.S.A., 20-25 May 2005.

Dr. Ketcha

Ketcha, D.M., Workshop Co-Organizer, National Science Foundation Workshop in the Chemical Sciences, “*Solid Phase Synthesis and Combinatorial Chemistry*”, Miami University, July 31 - August 5, 2005 (with Taylor, R.T., Miami University)

Dr. Lunsford

Take your Sons and Daughters to Work Day, S. Lunsford “Chemistry in Our Everyday Lives” April 27, 2005.

Lunsford, S. and Pitzer, E., Exploring Science, "Adventures in Chemistry; A Crime Scene Investigation Mystery", WSU, Nov. 29-Dec. 2.

Faculty who were awarded professional development leave

(None)

Faculty, Staff, and Student Awards

Faculty

David Dolson, CoSM Outstanding Teaching Award

Steven Higgins, WSU Presidential Early Achievement Award

Suzanne Lunsford, CoSM Outstanding Teaching Award

Paul G. Seybold, External Fellow of the *Center for the Study of Biological Complexity* at Virginia Commonwealth University

Students

Ben Southerland - 2004 Patterson Award winner (outstanding Chemistry junior) & Analytical Chemistry Award

Zara Rhone – CRC Outstanding Freshman Chemistry Student Award

Sridevi Kaiti - Best Graduate Poster award at the Dayton ACS Patterson Awards meeting

Brian Brumfield – HyperCube Scholar Award & Outstanding Graduate Student

Laura Bedrossian – American Institute of Chemistry Award

Candace Beach and Angie Sellers - Third Place Undergraduate Poster at the Kentuckiana Student Research Meeting

Shingirai Chirisa – Outstanding Graduate Teaching Assistant

Stephanie Cooke – Outstanding Graduate Teaching Assistant

Pragathi Kadiri – Outstanding Graduate Teaching Assistant

Laura Sennet – Outstanding Graduate Teaching Assistant

Outreach Programs

Chem Demo Program. This program, led by Profs. Emeriti Rubin Battino and John Fortman, with the assistance of Andrea Burns, students, and staff, reaches roughly 7500-8000 high school, junior high, and grade school students each year with multiple presentations in December and March. It is, so far as we can determine, the largest chemistry outreach program in the nation (and possibly the world). Students are shown demonstrations of exciting chemical phenomena, with a lively dialog of information and humor.

Student clubs and activities

Chemistry Club. The Chemistry Club is a highly active student organization. Its activities include 30-minute meetings every other week, a monthly calendar available to all students, presentations of posters at scientific meetings, field trips to chemical companies, an active Demo Team that presents shows to area elementary schools; plus assorted volunteer and social events.

Undergraduate honors students

(none)

Off campus or special interest courses

Steven Higgins

Acted as a science Olympiad coach for Tower Heights Middle School, Centerville.

Suzanne Lunsford

Directed teachers around the greater Cincinnati and Dayton, Ohio area with chemistry lessons that were inquiry-based.

Graduate Students Graduated in 2005 (Advisor):

Amin Aleem, "Electrophilic Aromatic Substitution on 3-(Dimethoxyphenyl)sydnone," November 2005. (Kenneth Turnbull)

Brian Brumfield, "Electronic to Vibrational Energy Transfer from Cl*(2P1/2) to N2O(v1): Failure of a Simple Kinetic Mechanism," August, 2005. (David Dolson)

Stephanie Cooke, "Comparative Study of the Effects of Acid Promoters on the Microwave and Thermal Friedel-Crafts Acylations of 1-(Phenylsulfonyl)pyrroles", June 2005 (Daniel Ketcha)

Tina Dancevic, "Synthesis of Phenylated Poly(arylene ether)s: Phenylated Poly(ether ether Ketone Ketone)s," August, 2005. (William Feld)

Jennifer Fisher, "Bismuth Triflate Catalyzed Friedel-Crafts Acylations of Sydnones," June, 2005.

Christina Gilpin, "On-line Interactive Training Simulation for Laboratory Technicians," June, 2005 (M.S.T. in Earth Science). (Suzanne Lunsford)

Sridevi Kaiti, "Effect of Reaction Conditions on the Molecular Weight and Polydispersity of Linear Poly(arylene ether phosphine oxide)s Prepared from an AB Monomer," December 2005. (Eric Fossum)

Patrick Himmelberg, "Development of an Efficient Route to Hyperbranched Poly(arylene ether sulfone)s," July, 2005.

Li Hong Sun, "Lithiation of Mono- and Di- Methoxy Substituted Arylsydnonees," December, 2005.

Travis Wherry, "Degradation and End-Capping Reactions of Hyperbranched Poly(arylene ether)s," August, 2005. (Eric Fossum)

Undergraduate honors students

(none)

Other

The Chemistry Department conducted a Self-Study, culminating in a substantial report document (>100 pages) Feld, W. (chair), Fossum, E. and Higgins, S. Fossum, E. initiated (in 2005), organized and maintained the weekly journal club, "PubClub."