



UNIVERSITY OF MINNESOTA

2007
MRSEC
Summer Undergraduate Research Expo

Thursday, August 9, 2007
4:00-7:00 p.m.
Memorial Hall, McNamara Alumni Center

Chemistry Poster Presentations

Listed by presenting author and sponsoring program

- 1. Maari Hanson, Joe Scanlon, Dr. Chris Cramer, Dr. Steve Kass**
Are carboxyl groups the most acidic sites in amino acids? From gas phase to solution, considering the thermodynamic properties of variable deprotonation sites.
Home Institution: Gustavus Adolphus/UMN
- 2. Mallory Richards, Amanda Nienow**
Photolysis of Sulfonyl Group Herbicides
Home Institution: Gustavus Adolphus College
- 3. Tegan Presley, Dr. Dan Besemann**
Investigation of Liquid Phase Structure: Analysis of Methanol by Raman Spectroscopy
Home Institution: Hamline University
- 4. Anthony Stender, Dan Besemann**
Separation of Racemic Tryptophan using Hollow-Fiber Membranes
Home Institution: Hamline University
- 5. Thomas Chapman, Feng Jing, Marc Hillmyer**
Synthesis and Characterization of Alkyl-substituted Polylactides
Home Institution: University of Minnesota
- 6. Christopher Hale, R. Lee Penn**
Oriented Aggregation of Iron Oxide Nanoparticles
Home Institution: University of Minnesota
- 7. Angela Holmberg, David A. Olson, Marc A. Hillmyer***
Synthesis of New Diblock Copolymer, Poly(4-Bromostyrene)-b-Poly(D,L-Lactide), for High Temperature Nanoporous Templates
Home Institution: University of Minnesota
- 8. Patrick Konold, Dr. Aaron Massari**
Electrical and Optical Characterization of Processible Polyaniline Gels
Home Institution: University of Minnesota
- 9. Kristen Seim, Joseph Scanlon, Shana Sturla, Christopher Cramer**
Evaluation of Selective Adduct-Binding Nucleoside Probes
Home Institution: University of Minnesota
- 10. Amanda S. Wicker, Svetlana G. Nudler, Valerie C. Pierre**
Fluorescent Iron Oxide Nanoparticles for Use as Contrast Agents for Magnetic Resonance Imaging
Home Institution: University of Minnesota
- 11. Erik Davis, Christopher Cramer**
Understanding the Mechanism of Nucleophilic Addition to Cyclic Oxocarbenium Ions
Home Institution: St. Olaf College/UMN

12. **Jon Athmann, Mary Hammer, Dr. Boyd**
In Pursuit of Luminescent Ruthenium Compounds
Home Institution: University of St. Thomas
13. **Barjeta Balidemaj, William H. Ojala, Ph.D. (advisor)**
Effect of Substitution on the Molecular Conformations and Crystal Structures of Some Centrosymmetric Benzylideneanilines
Home Institution: University of St. Thomas
14. **Logan Bodnia, Tony Borgerding**
Analysis of Atrazine in Shallow Lakes Using GC-MS and LC-MS
Home Institution: University of St. Thomas
15. **Nathaniel Brandt, Dr. Joseph Brom**
Transient Absorption Spectroscopic Studies of Photoinduced Electron Transfer Reactions of Pyrromethene Laser Dyes
Home Institution: University of Saint Thomas
16. **Amanda Hixon, Dr. Joseph M. Brom**
Fluorescence Quenching of Pyrromethene 546
Home Institution: University of St. Thomas
17. **Matthew Humbert, Anthony Borgerding**
Gas Phase Microdialysis Extraction in Diverse Environments
Home Institution: University of St. Thomas
18. **Andrew Korte, Dr. Kristine H. Wammer**
Environmentally-Relevant Photodegradation of Two Fluoroquinolone Antibiotics
Home Institution: University of St. Thomas
19. **Marika Kuspa, William H. Ojala, Ph.D. (advisor)**
Crystal Structure of a Centrosymmetric Benzylideneaniline: N, N-bis(3-chlorobenzylidene)-p-phenylenediamine
Home Institution: University of St. Thomas
20. **Katherine Motz**
Using alkyl ammonium cations to facilitate G-DNA self-assembly and stabilization
Home Institution: University of St. Thomas
21. **Andrew Rischall, Dr. Tony Borgerding**
Increasing Sensitivity of Gas Phase Microdialysis Probes using Carbon Nanotubes
Home Institution: University of Saint Thomas
22. **Jenna Schroeder, Dr. Kristine H. Wammer, Rachel A. Lundeen**
Analysis of Enrofloxacin Degradation & Photoproduct Antibacterial Activity
Home Institution: University of St. Thomas
23. **Louis Sigtermans, Kris Wammer**
Triclosan resistance levels in environmental bacteria
Home Institution: University of St. Thomas
24. **Matthew Turner, Dr. T.C. Marsh**
In situ self-assembly of G-DNA molecular scaffolds nucleated by a polymeric template
Home Institution: University of Saint Thomas

25. **Marti M. Joyer**, Chun-Ze Lai, Melissa A. Fierke, Nicholas Petkovich, Andreas Stein, Philippe Bühlmann

Three-Dimensionally Ordered (3DOM) Carbon as Solid Contacts for Ion Selective Electrodes: Low Detection Limit Applications

Summer Advisor: Philippe Bühlmann, Andreas Stein

Sponsor: Chemistry

Home Institution: Truman State University

26. **Nicholas Petkovich**, Melissa Fierke, Chun-Ze Lai

Effects of Surface Composition and Morphology of Porous Carbon Electrodes on Ion-Selective Sensing

Summer Advisor: Andreas Stein

Sponsor: Chemistry

Home Institution: Duquesne University

27. **Chris Leonard**, Kari McGee, Dr. Michael Burand

Synthesis and Characterization of Crystalline Ruthenium Complexes for Use as Semiconductors

Summer Advisor: Prof. Kent R. Mann

Sponsor: MRSEC REU

Home Institution: Gustavus Adolphus College

28. **Carrie Stephani**

Precursors in Gas-Phased Silicon Nanoparticle Production

Summer Advisor: Jeff Roberts

Sponsor: MRSEC REU

Home Institution: University of Minnesota

29. **Lisa Wang**

Polymerization of γ -butyrolactone Using Zn(II) Alkoxide Catalyst

Summer Advisor: Marc A. Hillmyer and William B. Tolman

Sponsor: MRSEC REU

Home Institution: Carleton College

30. **Morgan Wells**

Controlled Release Polymer/Drug Conjugates

Summer Advisor: Tom Hoyer and Chris Macosko

Sponsor: MRSEC REU

Home Institution: Gustavus Adolphus College

31. **Anmarie Argiros**, Dr. Marian Navratil, Dr. Edgar A. Arriaga

Detection of Mismatched Mitochondrial DNA by MutS Using Capillary Electrophoresis

Sponsor: LANDO

Home Institution: University of Minnesota

32. **Evgeny Beletskiy**, Christopher J. Douglas

New approach to linear polyacenes

Sponsor: LANDO

Home Institution: University of Minnesota

33. **Nick Calandra**, Zhixin Tian, Lev Lis, Steven R. Kass

Synthesis and H/D Exchange Studies of Selected Dipeptides

Sponsor: LANDO

Home Institution: University of Minnesota

- 34. Darren Ceckanowicz, Kyle Schwartz, Kent Mann**
Luminescent cyclometalated iridium complexes for use as sensors of CO₂
Sponsor: LANDO
Home Institution: University of Minnesota
- 35. Paul Erickson, Dr. Kris McNeill, Dr. Jim Cotner, Dr. Rose Cory**
Detection of photochemically produced peroxides from Dissolved organic matter
Sponsor: LANDO
Home Institution: University of Minnesota– Twin Cities
- 36. Jason Garness, David Blank, Adam Huss, Evan Estrine**
Can Poly-3-hexylthiophene fluoresce in a solid film as it does in solution?
Sponsor: LANDO
Home Institution: University of Minnesota
- 37. Jonathan Hennek, Dr. Wayne Gladfelter**
Combinatorial Low-Pressure Chemical Vapor Deposition of High-k Strontium-doped Hafnium Dioxides
Sponsor: LANDO
Home Institution: University of Minnesota
- 38. John Kromer, Dwight R. Stoll, Yu Zhang, Peter W. Carr**
Chromatographic Characterization of a Carbon-Clad Zirconia Stationary Phase for HPLC
Sponsor: LANDO
Home Institution: University of Minnesota
- 39. Lucas Monkkonen, Emily Skowronek, Renee Mosing**
In Vitro Selections for Catalytic Mesoporphyrin IX Metallation Aptamers Using Capillary Electrophoresis
Summer Advisor: Professor Michael T. Bowser
Sponsor: LANDO/NSF Program
Home Institution: Grinnell College
- 40. Dave Pearson, William Tolman, Aalo Gupta**
Synthesis and dioxygen reactivity of bio-inspired copper(I) complexes
Sponsor: LANDO
Home Institution: University of Minnesota
- 41. Daniel Tiegs, Lawrence Que Jr.**
Olefin cis-dihydroxylation catalyzed by bioinspired non-heme Iron compounds
Sponsor: LANDO
Home Institution: University of Minnesota
- 42. Sarah Weinreis, Audrey Eigner, Dr. Aaron Massari**
Infrared Pump-Probe Investigation of Melanin Vibrational Relaxations
Sponsor: LANDO
Home Institution: University of Minnesota
- 43. Patrick Willoughby, Aaron E May, and Thomas R Hoye**
Heterocycles Made Via Decarboxylation of Cyclic Carbamates. Scope and Limitations
Sponsor: LANDO
Home Institution: University of Minnesota

44. Alyce Anfang, Paul Boswell, Phil Buhlmann

Anion Coordination to Electron-Deficient Phosphonium Compounds

Summer Advisor: Phil Buhlmann

Sponsor: Heisig/Gleysteen Summer Research Program

Home Institution: University of Minnesota

45. Martin Donakowski

Organic Ligand Synthesis for Bound Nanoparticle Ruthenium Complexes

Summer Advisor: Wayne Gladfelter

Sponsor: Glaystein\Heisig

Home Institution: University of Minnesota

46. Daniel Johnson, Dr. Jason England

The Wide World of Cyclam Derivatives: More Options for Iron Complexes

Summer Advisor: Dr. Larry Que

Sponsor: Heisig/Gleysteen Summer Research Program

Home Institution: University of Minnesota

Materials Poster Presentations

Listed by presenting author and sponsoring program

47. Amarpreet Bains, Zeeshan Syedain

Effect of Calcium Concentration Variations on Fibrin Gel Mechanics

Summer Advisor: Dr. Robert Tranquillo

Sponsor: MRSEC REU

Home Institution: University of Pennsylvania

48. David Bunck, Zach Thompson

Influence of Nanometer Sized Silica Particles on Epoxies with Tunable Crosslink Density

Summer Advisor: Frank Bates

Sponsor: MRSEC REU

Home Institution: University of Wisconsin–Madison

49. Melissa Burford

The improvement of Synthetic Vectors for the Delivery of Plasmid DNA

Summer Advisor: Chun Wang

Sponsor: MRSEC REU

Home Institution: Howard University

50. Christina Cowman, William B Gleason

Sulfated Carbohydrate Polymers: Theory and Practice

Summer Advisor: William B Gleason

Sponsor: Lab Medicine and Pathology

Home Institution: University of Minnesota

51. Kathleen Crawford, Vladimir Makarov

Fabrication on Bit Patterned Media Using Anodic Aluminum Oxide

Summer Advisor: Prof. Beth Stadler

Sponsor: MRSEC REU

Home Institution: University of Florida

52. Samuel Eisenberg, C. He, M. Sharma, M. Torija, J. Wu, H.M. Aarbogh, L. Wang, H. Zheng, J.F. Mitchell, C. Leighton

Hall Effect and Transport Measurements of $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$ Single Crystals

Summer Advisor: Chris Leighton

Sponsor: MRSEC REU

Home Institution: Harvey Mudd College

53. Dan Hawk

Minimizing the Staebler–Wronski Effect in Amorphous Silicon (a-Si) film

Summer Advisor: James Kakalios

Sponsor: MRSEC REU / Physics Department

Home Institution: College of Menominee Nation

54. Patrick Hawk, Dr. Thomas C. Marsh

Alignment of Surface–Anchored Supramolecular Nucleic Acids via a Static Alternating Current (AC) Field

Summer Advisor: Dr. Daniel Frisbie

Sponsor: MRSEC REU

Home Institution: University of St. Thomas

55. Alison Heussler

Low Voltage Electrowetting on a novel dielectric

Summer Advisor: Xiaoyang Zhu

Sponsor: MRSEC REU

Home Institution: Augsburg College

56. Kyle Holmberg, Betul Bilgin

Molecular Engineering of Thermal-Responsive Bioactive Surfaces

Summer Advisor: Wei Shen

Sponsor: MRSEC REU

Home Institution: Northwestern University

57. Carrington L. Howard, Noelle Palumbo

The Improvement of Synthetic Vectors for the Delivery of Plasmid DNA

Summer Advisor: Dr. Chun Wang

Sponsor: MRSEC REU

Home Institution: Howard University

58. Amy LeVee

The Inspection of Gadolinium around the Curie Temperature

Summer Advisor: Dr. E. Dan Dahlberg

Sponsor: MRSEC REU

Home Institution: Yeshiva University

59. Jeremy Lois

pH-sensitive Liposomes and their Leakages within Ranging pH Environments

Summer Advisor: Efi Kokkoli

Sponsor: MRSEC REU

Home Institution: Macalester College

60. Robert Mohr

AC Detection of Spin Polarization in a Lateral Fe/GaAs Device

Summer Advisor: Paul Crowell

Sponsor: MRSEC REU

Home Institution: Swarthmore College

61. Tosin Odufuye, Wei Shen, Betul Bligin, Kyle Holmberg

Molecular Engineering of Thermally-Sensitive Bioactive Surfaces

Summer Advisor: Wei Shen

Sponsor: MRSEC REU

Home Institution: University of Minnesota

62. Christopher Sarra

Controlling the Architecture of Polythiophene Thin Films for Use in Ordered Bulk Heterojunction Photovoltaic Devices

Summer Advisor: Professor C. Daniel Frisbie

Sponsor: MRSEC REU

Home Institution: Cornell University

63. Kari Tanaka

Compatibility of Immiscible Polymers by Random Copolymer

Summer Advisor: Chris Macosko

Sponsor: MRSEC REU

Home Institution: Macalester College

64. John Tritsch, Ryan Gresbak
Sintering of Germanium Nanoparticles
Summer Advisor: Uwe Kortshagen
Sponsor: MRSEC REU
Home Institution: University of Wisconsin – Eau Claire

65. Matthew Wang, Carlos R. Lopez Barron
Coarsening of Immiscible Cocontinuous Blend
Summer Advisor: Chris Macosko
Sponsor: MRSEC REU
Home Institution: the University of Tennessee

66. Lynn Wolf, Christopher Ellison
Block Copolymer Bicontinuous Microemulsions
Summer Advisor: Frank Bates
Sponsor: MRSEC REU
Home Institution: Iowa State University

67. Nicholas Young, Yiyong He
Temperature-Dependent Transport of Block Copolymer Micelles between Immiscible Liquids
Summer Advisor: Tim Lodge
Sponsor: MRSEC REU
Home Institution: Bucknell University

Graduate Students

68. Steven Calder

Semiclassical Wavefunctions for Single-Electron Diatomic Molecules

Home Institution: University of Minnesota

69. Yan Jia, Carston R. Wagner

Toward the Design of Cell-permeable Cap-dependent Translation Inhibitors

Home Institution: University of Minnesota

70. Adam Chamberlin, Christopher J. Cramer; Donald G. Truhlar

SM8T: Accounting for the Temperature Dependence of Free Energies of Solvation

Home Institution: University of Minnesota

71. Leila Dato, Mike De Meuse, Carston Wagner

DESIGN AND SYNTHESIS OF 3'-AZIDO-3'-DEOXYTHYMIDINE NUCLEOSIDE ANALOGUES AS POTENTIAL ANTI-MICROBIAL AGENTS

Home Institution: University of Minnesota

72. Nicholas Denny, Sang Eon Han, David J. Norris. Andreas Stein

A Study of the Effects of Thermal Emission and Heating of Macroporous Tungsten Photonic Crystals

Home Institution: University of Minnesota

73. Elizabeth Lugert, Chun-Ze Lai, Paul G. Boswell, Philippe Buhlmann

Perfluoropolymers: Plasticization and Application in Ion-Selective Electrodes

Home Institution: University of Minnesota

74. Renee Mosing, Michael T. Bowser

Using Capillary Electrophoresis-SELEX for the Selection of Aptamers that Bind to HIV Reverse Transcriptase

Home Institution: University of Minnesota