

# SCHEDULE AT A GLANCE

**TUESDAY, JUNE 24, 2003**

## **OPENING REMARKS – 8:45–9:00 AM**

Carla Sullivan, Program Chair, National Oceanic and Atmospheric Administration

## **SUSTAINABILITY PLENARY – 9:00–10:00 AM**

Chair: Barbara Karn, U. S. Environmental Protection Agency

Speaker: Berkeley W. Cue, Jr., Vice President, Pharmaceutical Sciences, Pfizer Inc.

## **PRESIDENTIAL GREEN CHEMISTRY CHALLENGE AWARDS TECHNICAL SESSION - 10:00 AM–11:00 AM**

Session Chair: Larry Koskan, Donlar Corporation

## **Break – 11:00–11:30 AM**

## **PRESIDENTIAL GREEN CHEMISTRY CHALLENGE AWARDS TECHNICAL SESSION (Cont'd.) - 11:30 AM–1:00 PM**

## **LUNCH AND EXHIBITS – 1:00–2:00 PM**

### **Exhibitors:**

American Chemical Society

- Green Chemistry Institute

American Institute of Chemical Engineers

Environmental Protection Agency

- Green Chemistry Program
- Green Engineering Program
- Office of Research and Development
- Technology for a Sustainable Environment

National Institute of Standards and Technology

## **SUSTAINABILITY ROUNDTABLE – 2:00–3:30 PM**

Chair: Paul Anastas, White House Office of Science and Technology Policy

### **Speakers**

- Steve Bradfield, Vice President Marketing– Environmental Development, Shaw Industries, Inc.
- Mark Harmer, Senior Research Associate, DuPont Central Research and Development
- Greg Keoleian, Co-Director, Center for Sustainable Systems, University of Michigan

## **BREAK – 3:30–4:00 PM**

## **SESSION I: BENIGN SYNTHESIS AND PROCESSING – 4:00– 6:05 PM**

Session Chair: Jo Rogers, American Institute of Chemical Engineers

### **Speakers**

1. Chemical Reactions in Supercritical Carbon Dioxide:  
From Laboratory to Commercial Plant  
**P. Licence**, The University of Nottingham, UK
2. An Investigation of Biodegradable Polylactic  
Acid/Montmorillonite Blown Film Nanocomposites  
**C. T. Thellen**, United States Army Soldier and Biological Chemical Command
3. Processing and Characterization of Low Density  
Polyethylene/Montmorillonite Recyclable Nanocomposites  
**E. M. Culhane**, United States Army Soldier and Biological Chemical Command
4. Direct Synthesis of Propylene Oxide from H<sub>2</sub>, O<sub>2</sub>, and Propylene in CO<sub>2</sub>  
**S. Jones**, University of Pittsburgh
5. Organophosphorous Compounds as Halogen-Free Flame Retardants  
in Polymers  
**M. Doering**, Institute for Technical Chemistry, Germany

## **SESSION II: GREENER SOLVENTS**

Session Chair: Robin Rogers, The University of Alabama

### **Speakers**

6. Atom Transfer Radical Polymerization in Aqueous Systems: Possibilities and Limitations  
**N. V. Tsarevsky**, Carnegie Mellon University
7. Low Molecular Weight Polyglycols as Benign Solvents for Pharmaceutical Processing  
**D. J. Kirwan**, University of Virginia
8. Development of Ionic Liquids Containing Environmentally Acceptable and Sustainable Components  
**J. D. Holbrey**, The University of Alabama
9. Liquid Phase Behavior of Ionic Liquids with Organics and Water  
**J. M. Crosthwaite**, University of Notre Dame
10. Greener Dissolution of Cellulose: Can Ionic Liquids Compete with *N*-Methylmorpholine-*N*-Oxide in the Lyocell Process?  
**R. P. Swatloski**, The University of Alabama

**CONFERENCE RECEPTION – 6:05 PM**

## WEDNESDAY, JUNE 25, 2003

### SESSION III: BIOBASED SYNTHESIS AND PROCESSING – 8:30–10:35 AM

Session Chair: Mark Holtzapple, Texas A&M University

#### Speakers

11. Novel Aspartic Acid Copolymers: New Opportunities for Renewable Resources  
**G.H. Redlich**, Folia Inc.

12. Biodiesel for Puerto Rico  
**J. A. Colucci**, University of Puerto Rico Mayaguez

13. Multifunctional Polymer Produced by Bacterial Fermentation  
**J. D. Combie**, Montana State University

14. Realization of Large-Scale Resource and Environmental Benefits via Biologically-Based Processes  
**L. Lynd**, Dartmouth College

15. Biobased Structural Composite Materials: A “Green” Alternative to Petroleum-Based Materials  
**L. T. Drzal**, Michigan State University

### SESSION IV: PROCESS DESIGN AND MEASUREMENT

Session Chair: Darlene Schuster, American Institute of Chemical Engineers

#### Speakers

16. Reactions” and “Processes: A Framework for Generating Process Chemistry Alternatives  
**G. C. Lin**, ExxonMobil Research and Engineering

17. Environmentally Friendly Preparation of Semifluorinated Monolayers and Surface-Initiated Polymer Films  
**G. K. Jennings**, Vanderbilt University

18. Bio-Gas Reforming Process for Solid Oxide-Fuel Cell Power Generation  
**S. Vasileiadis**, Zivatech Institute

19. Supercritical CO<sub>2</sub> Polymer Plasticization: New Measurement Method and Post-Plasticization Structural Effects  
**K. J. Wynne**, Virginia Commonwealth University

20. Towards Copper Chemical Mechanical Planarization with Carbon Dioxide  
**G. M. Denison**, University of North Carolina at Chapel Hill

**BREAK - 10:35-11:00 AM**

**SECURITY PLENARY – 11:00 AM– 12:00 PM**

Chair: Michael Eichberg, American Chemical Society

Speaker:

Tim Oppelt, Director, EPA National Homeland Security Research Center

**POSTER SESSION I AND LUNCH – 12:00–1:00 PM**

21. A New Index for Chemical Process Security Assessment  
**H. H. Lou**, Lamar University
22. A “Green” Process for Photochemical Purification and Reuse of Copper Electroplating Solutions  
**J. R. Clark**, BOC Edwards
23. CO<sub>2</sub>-Based Microlithography  
**M. K. Boggiano**, University of North Carolina at Chapel Hill
24. Acid Catalysed Reactions in Supercritical Carbon Dioxide  
**P. Licence**, The University of Nottingham, UK
25. Toward the Current Best Practice Metric for Assessing Environmental Sustainability of Manufacturing Processes  
**X. Jin**, Oklahoma State University
26. Introducing Green Chemistry into Organic Chemistry Teaching and Research at Bridgewater State College  
**E. J. Brush**, Bridgewater State College
27. Making Instructional Laboratories Greener  
**S. W. Gordon-Wylie**, University of Vermont
28. Industrial Relevance in Green Chemistry at the University of Massachusetts Boston Center for Green Chemistry  
**J. C. Warner**, University of Massachusetts Boston
29. Fe Metallopeptide Complexes and TBHP: A Benign Way to Oxidize Alcohols Without Using Cr, Pb, or Os  
**S. M. McCarthy**, University of Vermont
30. The Effect of Sulfonic Ligands in the Sn-Catalyzed Transesterification of Dimethyl Carbonate with Phenol  
**H. Sik Kim**, Korea Institute of Science and Technology, Korea
31. Iron-TAML Activators of Hydrogen Peroxide: A Kinetic Study of Their Intramolecular Deactivation and Its Relevance Towards Oxidation Catalyst Designing  
**A. Chanda**, Carnegie Mellon University
32. Controlling the Aqueous Miscibility of Hydrophilic Ionic Liquids by Addition of Water-Structuring Salts: Novel Aqueous Biphasic Systems for Separations and Recycle

**K. E. Gutowski**, The University of Alabama

33. Experimental, Modeling and Simulation Studies of Ionic Liquids

**J. M. Crosthwaite**, University of Notre Dame

34. X-Ray Crystallography of Novel Ionic Liquids Based on *N*-alkylmorpholinium Salts

**D. M. Brown**, Davidson College

35. Phosgene-Free Synthesis of Aromatic Polycarbonate by Oxidative Carbonylation of Bisphenol A Using Supported Palladium Catalysts

**K. Takeuchi**, National Institute of Advanced Industrial Science and Technology, Japan

## SECURITY ROUNDTABLE – 1:00–2:30 PM

### Security Roundtable

Chair: Stephen Lingle, U.S. Environmental Protection Agency

#### Speakers:

- Jeremiah Baumann, Toxics and Environmental Health Advocate, U.S. Public Interest
- Research Group
- Scott Berger, Director, Center for Chemical Process Safety
- John Bresland, Member, Chemical Safety and Hazard Investigation Board
- Dave Mason, Vice President of Regulatory Affairs, Hatco Corporation

## SESSION V: MODELING/COMPUTATIONAL METHODS – 2:30–3:45 PM

Session Chair: Lyn Beary, National Institute of Standards and Technology

#### Speakers

36. Monte Carlo Simulations of Gas Solubilities in Ionic Liquids

**J. K. Shah**, University of Notre Dame

37. A Decision-Making Framework for Studying Ozone Pollution in Urban Atlanta

**V. C. P. Chen**, The University of Texas at Arlington

38. A Numerical Modeling of the Dross Formation of Aluminum Melting Furnaces

**A. Kanti De**, University of Illinois at Chicago

## SESSION VI: BIOBASED SYNTHESIS AND PROCESSING

Session Chair: Ian Brindle, Brock University

#### Speakers

39. Biocatalytic Production of Biobased Sunscreen

**J. A. Laszlo**, USDA-ARS

40. Entrapment of Biologically Active Macromolecules in Cellulosic Films Regenerated from Ionic Liquids

**M. B. Turner**, The University of Alabama

41. Green Nanocomposites – Moving Towards Sustainability in Automotive and Packaging Applications

**A. K. Mohanty**, Michigan State University

**BREAK – 3:45– 4:10 PM**

**SESSION VII: BENIGN SYNTHESIS AND PROCESSING – 4:10–6:15 PM**

Session Chair: Dieter Lenoir, GSF Forschungszentrum

**Speakers**

42. Benign Processing of Thermally Unstable Acrylic Copolymers Using Supercritical Carbon Dioxide

**D. G. Baird**, Virginia Tech

43. Plasma Polymerization of Silica-Like Films: Green Process for Metal Pretreatment

**F. J. Boerio**, University of Cincinnati

44. Diminishing Air Pollution and Materials Use with Advanced Oxidation in the Foundry Industry

**F. S. Cannon**, The Pennsylvania State University

45. Carbon Dioxide Based Fluids for Post Plasma Etch Residue Removal in Integrated Circuit (IC) Fabrication

**D. W. Hess**, Georgia Institute of Technology

46. Benign Catalytic Synthesis of Pharmaceutical Intermediates in Supercritical Carbon Dioxide

**Y. G. Adewuyi**, North Carolina A&T State University

**SESSION VIII: CATALYSIS**

Session Chair: C. J. Li, Tulane University

**Speakers**

47. Development of Heterogeneous Catalysts for Hydroformylation of 1-Hexene in Supercritical CO<sub>2</sub>

**A. E. Marteel**, University of Toledo

48. Hydroxyapatite-Bound Ruthenium Complex Catalysts for Environmentally-Benign Organic Syntheses

**K. Kaneda**, Osaka University, Japan

49. Heterometallic Complexes as Green Oxidation Catalysts

**P. A. Shapley**, University of Illinois

50. A Relatively Green Way for the Preparation of Organophosphorous Compounds: Metal-Catalyzed Addition of H-P Bonds to Unsaturated C-C Bonds

**L. B. Han**, National Institute of Advanced Industrial Science and Technology, Japan

51. Semi-Combinatorial Development of Green Oxidation Catalysts: [O] Activation with Metallopeptide Complexes of Mn, Ru, and Fe

**S. W. Gordon-Wylie**, University of Vermont

## THURSDAY, JUNE 26

### SAFETY PLENARY – 8:30–9:30 AM

Session Chair: Jurgen Exner, JHE Technology Systems

**Speaker**

Dennis C. Hendershot, Senior Technical Fellow, Rohm and Haas Company

### SAFETY ROUNDTABLE – 9:30–11:00 AM

Chair: Dennis Hjeresen, Green Chemistry Institute, American Chemical Society

**Speakers:**

Terry Collins, Director, Institute of Green Oxidation Chemistry, Carnegie Mellon University

Jeffery Perl, President, Chicago Chem Consultants Corporation

Isadore Rosenthal, Member, U.S. Chemical Safety and Hazard Investigation Board

### BREAK - 11:00 – 11:30

### SESSION IX: PROCESS DESIGN AND MEASUREMENT — 11:30AM–12:20 PM

Session Chair: J. Perl, Chicago Chem Consultants Corporation

52. Anodic Stripping Voltammetric Determination of Trace Metal Ions Using Diamond Thin Film Electrodes

**P. Sonthalia**, Michigan State University

53. Alternative Processing for Achieving High Performance Green Adhesives: The Effects of Reaction and Miscibility Behavior

**S. L. Hsu**, University of Massachusetts – Amherst

### SESSION X: CATALYSIS

Session Chair: R. Miranda, U.S. Department of Energy

54. Life Cycle Implications of Precious Metal Cluster Stabilization in Catalytic Converters

**S. M. Lloyd**, Carnegie Mellon University

55. A Study on Crystallization of Titanium Silicalite Zeolite (TS-1)

**L. Min**, Research Institute of Petroleum Processing, Sinopec, China

**POSTER SESSION II AND LUNCH – 12:20–1:20 PM**

56. Catalysis in Environmentally Friendly Solvents

**S. K. Kandola**, University of Leicester, UK

57. Ultraviolet Light Surface Treatment as an Environmentally Benign Surface Preparation Method for Adhesive Bonding and Painting

**L. T. Drzal**, Michigan State University

58. A Stable  $\mu$ -Oxo Iron(IV) Dimer: Reaction of Fe(III)-TAML Activators with Oxygen

**A. Ghosh**, Carnegie Mellon University

59. QSAR Modeling of VOC Emissions from Surfactant-Based Cleaning Solutions: LSER Tools for Designing Low Emission Detergents

**R. Helburn**, Research Triangle Institute

60. Room Temperature Ionic Liquids as Environmentally Benign Plasticizers and Reaction Media for Polymerization Reactions

**M. Rahman**, The University of Alabama

61. Oxidative Deactivation of Bacterial Spores as Surrogates of Microbial Contaminants of Drinking Water Using TAML Technology

**D. Banerjee**, Carnegie Mellon University

62. Sustainable Green Composites from Natural Fibers and Bacterial Bioplastic for Automotive Applications

**M. Misra**, Michigan State University

63. Imidazolium and Phosphonium Alkylselenites for the Catalytic Oxidative Carbonylation of Amines: Mechanistic Studies

**H. S. Kim**, Korea Institute of Science and Technology, Korea

64. Integrated Process Design and Control for Environment: A System Approach for Economically and Environmentally Optimal Manufacturing

**Y. Huang**, Wayne State University

65. Advanced Chemical Oxidation Process: Use of Fe-TAML<sup>®</sup> Activators for the Effective Removal of Sulfur Compounds from Automotive Fuels

**S. Mondal**, Carnegie Mellon University

66. CerOx Cost-Effective Treatment of Organic Hazardous Waste/Mixed Waste with a Safe, Non-Thermal, RCRA Exempt System

**A. Harris**, CerOx Corporation

67. Converting Waste Vegetable Oil into Biodiesel: An Adventure in Teaching/Learning Chemistry Outside the Classroom

**S. M. McCarthy**, University of Vermont

68. Preparation and Properties of a Series of Esters from Soybean Oil as a Pedagogic Green Chemistry Laboratory Experiment



**R. Comer**, The University of Tennessee at Martin

69. Green Chemistry in ACS Educational Materials

**M. A. La Merrill**, American Chemical Society

<b>SESSION XI: DESIGNING SAFER CHEMICALS – 1:20–3:00 PM</b>
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Session Chair: Richard Engler, U.S. Environmental Protection Agency

**Speakers**

70. Redesigning Laminate Components to Reduce the Environmental Impact of Hot Melt Pressure Sensitive Adhesive Products

**S. J. Severtson**, University of Minnesota and **Mark S. Kroll**, H.B. Fuller Co.

71. Formaldehyde Free Binding of Plywood Made with Lignin-Copolymer-Coupled, Polystyrene Binder

**G. Y. Choi**, Forest Products Research Center

72. On-Site Generation of Mixed Oxidants Using Sodium Chloride Brine as a Safe Alternative for Chlorine Gas Disinfection

**R. E. Herrington**, MIOX Corporation

73. Monuments Conservation: Monitoring of the Effects of Cleaning Methods Alternative to Chemicals

**A. Sansonetti**, CNR-ICVBC, Italy

<b>SESSION XII: GREENER SOLVENTS</b>
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Session Chair: Mary Kirchoff, Green Chemistry Institute, American Chemical Society

**Speakers**

74. Structural Understanding of Copper Catalyzed Atom Transfer Radical Polymerization in Aqueous Media

**T. Pintauer**, Carnegie Mellon University

75. Solvent Properties and Liquid Clathrate Behavior of Ionic Liquids Determined by Partitioning Experiments and Linear Solvent Energy Relationships

**W. M. Reichert**, The University of Alabama

76. Direct Formation of 2,4-Disubstituted Tetrahydropyrans in Water Catalyzed by an Acidic Solid Resin

**Z. Li**, Tulane University

77. Supercritical Fluid Aided Encapsulation of Particles

**K. Sunol**, University of South Florida