

IEC

DIVISION OF INDUSTRIAL AND ENGINEERING CHEMISTRY

Final Program, 231st ACS National Meeting, Atlanta, GA, March 26-30, 2006

M. A. Gonzalez, *Program Chair*

OTHER SYMPOSIA OF INTEREST:

Nanotechnology in Catalysis IV (see *CATL*, Mon, Tue, Wed)

Advances in Pesticide Environmental Fate and Exposure Assessments (see *AGRO*, Tue, Wed, Thu)

2006 ACS Award in Industrial Chemistry - Award Symposium in Honor of James Stevens (see *BMGT*, Mon, Tue)

Crossing the Barriers to Nanotechnology Commercialization (see *BMGT*, Tue)

Nanotechnology A Fiber Perspective (see *CELL*, Mon, Tue, Wed)

Curricular Innovations in Green Chemistry: Organic and Beyond (see *CHED*, Sun, Mon)

The Life of a Patent Application in the United States (see *CHAL*, Wed)

Creative Advances in Environmental Science and Technology (in memory of Joseph J. Breen): In Honor of Rene P. Schwarzenbach (see *ENVR*, Tue, Wed)

Chemistry of Carbon Materials and Nanomaterials (see *FUEL*, Sun, Mon, Tue, Wed)

Environmental Issues in Energy and Fuels (see *FUEL*, Wed, Thu)

Nanoparticles in Energy Processes: Friend and Foe: Combustion Synthesis: From Pollutants to Advanced Materials (see *FUEL*, Mon, Tue)

Nanoparticles in Energy Processes: Friend and Foe: Environmental and Health Effects (see *FUEL*, Tue, Wed)

Nanoparticles in Energy Processes: Friend and Foe: Nanoparticle-based Catalysts

and Sorbents (see *FUEL*, Wed, Thu)

Nanotechnology for Contaminated Soil and Groundwater Remediation (see *GEOC*, Sun, Mon)

Environmental Inorganic Chemistry (see *INOR*, Thu)

Inorganic Catalysts (see *INOR*, Tue, Thu)

Archaeological Chemistry: Analytical Techniques and Archaeological Interpretation (see *NUCL*, Sun, Mon)

George A. Olah Award in Hydrocarbon or Petroleum Chemistry (see *ORGN*, Wed)

Materials, Devices, and Switches (see *ORGN*, Thu)

New Reactions and Methodology (see *ORGN*, Mon, Tue)

Chemistry of Petroleum and Emerging Technologies (see *PETR*, Thu)

1st International Symposium on Hydrogen from Renewable Sources and Refinery Applications (see *PETR*, Sun, Mon, Tue)

Nano-structured Polymers (see *POLY*, Sun, Mon, Tue)

Ensuring the Future: Sustaining and Strengthening Basic and Applied Research
(see *PRES*, Sun)

SOCIAL EVENT:

Social Hour: Sun

SUNDAY MORNING

Section A

Unknown Site -- Unknown Room

Detection of Biological and Chemical Agents in Warfare and Food Safety
(Sponsored by Novel Chemistry with Industrial Applications)

Detection of Biological Materials

Cosponsored with ANYL

C. A. Wells, Organizer

9:00 — Introductory Remarks.

9:10 —**1.** Detection of Ebola glycoprotein using quartz crystal microbalance immunosensor. **A. E. Gerdon**, B. J. Huffman, D. W. Wright, D. E. Cliffl

9:35 —**2.** Bacteriophage modified biosensor for Bacillus anthracis spore detection. **J. Wan**, H. Yang, I -H. Chen, V. A. Petrenko, B. A. Chin

10:00 —**3.** Quantitative determination of natamycin in fermentation broth with an RP-HPLC method. J. Luo, Z. Jin, P. Cen, **M. Wang**

10:25 — Intermission.

10:40 —**4.** Biofunctionalized carbon nanotubes for detection and immunomagnetic separation of pathogens. **Y. Lin**, L. Gu, H. Li, T. Elkin, S. Taylor, H. Wang, H. Yang, X. Jiang, Y -P. Sun

11:05 —**5.** Multiplexed peptide nanotube pathogen assays. **R. I. MacCusprie**, I. A. Banerjee, S. Gummalla, H. Mostowski, P. Krause, H. Matsui

11:30 — Concluding Remarks.

Section B

Unknown Site -- Unknown Room

Ionic Liquids: Not Just Solvents Anymore OR Ionic Liquids: Parallel Futures (Sponsored by Green Chemistry and Engineering, Separation Science and Technology and Novel Chemistry with Industrial Applications Sub-Divisions)

Why are Ionic Liquids Liquid?

Cosponsored with INOR, ORGN, ANYL, ENVR, PHYS, and POLY

J. F. Brennecke and K. R. Seddon, *Organizers*

R. D. Rogers, *Organizer, Presiding*

8:15 — Introductory Remarks.

8:30 —**6.** Interplay between cationic head-groups and oxygen-containing side-chains and the effects on the physicochemical properties of ionic liquids. **W. Pitner**, A. Amann, J. Eichhorn, I. Skupch-Martinez

8:50 —**7.** Crystal packing and the hows and whys of ionic liquids. **W. A. Henderson**, S. Passerini, V. G. Young Jr., H. C. De Long, P. C. Trulove

9:10 —**8.** New ionic liquids for exploring molecular-scale interactions. H. Shirota, **E. W.**

Castner Jr., S. H. Chung, S. G. Greenbaum, J. F. Wishart

9:30 —**9.** How to make ionic liquids more liquid. **N. V. Ignat'ev**, H. Willner

9:50 —**10.** Report on IACT/IUPAC project: Thermodynamics of ionic liquids, ionic liquid mixtures, and the development of standardized systems. **K. N. Marsh**

10:10 —**11.** Some technology applications of ionic liquids based on physical properties. **J. S. Wilkes**, T. R. Ewy, K. A. Gardner, D. F. Pickett, R. F. Reich, M. J. Wilcox

10:30 — Intermission.

10:45 —**12.** Flammability properties of ionic liquids. **J. W. Gilman Sr.**, D. M. Fox, P. C. Trulove, H. C. De Long, J. D. Stenger-Smith

11:05 —**13.** Thermodynamic and transport characteristics of gases and organic solutes in ionic liquids. **R. E. Baltus**, Y. Hou

11:25 —**14.** Ionic liquids as vehicles for reactions and separations. **C. L. Liotta**, C. A. Eckert, J. P. Hallett, P. Pollet, E. A. John, C. A. Thomas, X. Li, P. G. Jessop

11:45 —**15.** Low frequency Raman Spectroscopy and liquid structure of imidazolium based ionic liquids. H. Okajima, **H -O. Hamaguchi**

12:05 —**16.** Ionic liquids: New versatile media. **A -V. Mudring**

Section C

Unknown Site -- Unknown Room

Nanotechnology and the Environment (Sponsored by Advanced Materials and Nanotechnology Sub-Division)

Plenary Session

Cosponsored with FUEL, and INOR

N. F. Savage, *Presiding*

9:30 —**17.** Nanotechnology and the environment: Where we've come and where we're going. **B. Karn**

10:15 —**18.** Green nanoscience. **J. E. Hutchison**

11:00 —**19.** Assessing life cycle environmental performance of bioplastic-montmorillonite clay nanocomposites. **S. V. Joshi**, L. T. Drzal, A. K. Mohanty, M. Misra

11:45 —20. Green chemistry and green nanotechnology. **P. T. Anastas**

SUNDAY AFTERNOON

Section A

Unknown Site -- Unknown Room

Detection of Biological and Chemical Agents in Warfare and Food Safety (Sponsored by Novel Chemistry with Industrial Applications)

Detection of Chemicals

Cosponsored with ANYL

C. A. Wells, Organizer

1:30 — Introductory Remarks.

1:35 —21. Detection of agents in water: Requirements and practical considerations. **C. Cleland**, A. Deshpande, K. M. Omberg

2:00 —22. Biosensor based on layer-by-layer assembly of acetylcholinesterase on carbon nanotubes for amperometric detection of organophosphate pesticides and nerve agents. **Y. Lin**, G. Liu

2:25 —23. Metal-polythiophene hybrid sensors for the detection of biogenic amines. **M. S. Maynor**, J. J. Lavigne

2:50 —24. Luminescent detection of chemical agents with europium functionalized mesoporous silica. **R. J. Wiacek**, A. E. Bjerke, J. T. Bays, R. D. Champion, M. Shoulders, G. E. Fryxell, R. S. Addleman

3:15 — Intermission.

3:30 —25. Aqueous alum as a green method of chemical warfare agent destruction. **D. J. Williams**, V. L. H. Bevilacqua, W. R. Creasy, C. A. S. Brevett, D. J. McGarvey, J. S. Rice, B. J. McKinney, A. Mitra, D. A. Atwood, H. D. Durst

3:55 —26. Photometric determination of Mercury(II) with 4-(5-chloro-2-pyridylazo)-1,3-diaminobenzene in water. Z. Yi, **Y. Bei**, Y. Huanhuan

4:20 — Concluding Remarks.

Section B

Unknown Site -- Unknown Room

Nanotechnology and the Environment (Sponsored by Advanced Materials and Nanotechnology Sub-Division)

Green Chemistry: Synthesis of Nanomaterials Using Green Chemistry Principles, e.g., Solid State Manufacturing, Low Energy Manufacturing, Self-assembly

Cosponsored with FUEL, and INOR

S. S. Wong, *Presiding*

1:30 — Introductory Remarks.

1:35 —**27.** Gas-phase functionalization of carbon nanotubes. **E. V. Basiuk**, V. A. Basiuk

2:00 —**28.** Green synthesis of metallic nanorods and nanowires. **C. J. Murphy**

2:25 —**29.** Synthesis of quantum dots: From greener methods to greener products. **X. Peng**

2:50 —**30.** Low-temperature solution synthesis and benchtop processing of metallurgical nanomaterials. **R. E. Schaak**

3:15 —**31.** Toward greener nanomanufacturing: Greener approaches to functionalized gold nanoparticles and nanoscale patterns of metals. **J. E. Hutchison**

3:40 —**32.** Preparation of porous carbon from petroleum coke and control of its pore size by chemical vapor deposition. **M. Wu**, Q. Zha, **J. Qiu**, Y. Zhang

4:05 —**33.** Synthesis of luminescent and magnetic nanoparticles and their use in materials- and life sciences. **H. Weller**

Section C

Unknown Site -- Unknown Room

Ionic Liquids: Not Just Solvents Anymore OR Ionic Liquids: Parallel Futures (Sponsored by Green Chemistry and Engineering, Separation Science and Technology and Novel Chemistry with Industrial Applications Sub-Divisions)

Ionic Liquid Structure Activity Relationships and Modeling

Cosponsored with INOR, ORGN, ANYL, ENVR, PHYS, and POLY

J. F. Brennecke, R. D. Rogers, and K. R. Seddon, *Organizers*

E. J. Maginn, *Organizer, Presiding*

1:30 —34. Force fields and simulation on imidazolium based ionic liquids. **W. Wang, Z. Liu**

2:00 —35. Nanostructural organization in ionic liquids. **A. A. H. Pádua**, J. N. A. Canongia Lopes

2:30 —36. Glassy solvation dynamics and spectroscopy in room-temperature ionic liquids. **C. J. Margulis**, Z. Hu, X. Huang, Y. Li, B. J. Berne

3:00 —37. Multiscale simulation of ionic liquids: An emerging picture of their unique dynamical and structural behavior. **G. A. Voth**

3:30 — Intermission.

3:45 —38. Solvation structure and transport of acidic protons in ionic liquids: Insights from computer simulations. **M. G. Del Popolo**, J. Kohanoff, R. M. Lynden-Bell

4:15 —39. Theoretical investigation of ionic liquids in the catalysis of the Diels-Alder reaction. **O. Acevedo**, W. L. Jorgensen, J. D. Evanseck

4:45 —40. Molecular dynamics study of the mechanism of cellulose dissolution in the ionic liquid 1-n-butyl-3-methylimidazolium chloride. **Z. Liu**, R. C. Remsing, P. B. Moore, G. Moyna

5:15 —41. Atomistic simulation of ionic liquids containing pyridinium and triazolium cations. **E. J. Maginn**

Alternative Careers in Chemistry

Sponsored by YCC, Cosponsored with WCC, SCHB, PROF, IEC, CHAL, BMGT, SOCED, and CHED

SUNDAY EVENING

Section A

Unknown Site -- Unknown Room

IEC Poster Session

H. Jacobs, *Organizer*

8:00 - 10:00

42. Join the Industrial and Engineering Chemistry Division. **D. Hjeresen**
43. Join the Advanced Materials and Nanotechnology subdivision. **F. J. Schattenmann**
44. Join the Green Chemistry and Engineering subdivision. **P. G. Jessop**
45. Join the Industrial Biobased Technology subdivision. **G. Swift**
46. Join the Novel Chemistry with Industrial Applications subdivision. **J. R. Zoeller**
47. Join the Separations Science and Technology subdivision. **G. J. Lumetta**
48. New rechargeable biocidal N-halamine siloxanes. **J. Liang**, K. Barnes, Y. Chen, S. D. Worley, J. Lee, R. M. Broughton, T. S. Huang
49. Coating new N-halamine siloxanes on silica gel to prepare biocidal silica gels. **J. Liang**, T. S. Huang, S. D. Worley
50. Synthesis and applications of 5,5'-ethylenebis[5-methyl-3-(3-triethoxysilylpropyl)imidazolidin-2,4-dione] for durable and regenerable antimicrobial surfaces. **K. Barnes**, J. Liang, S. D. Worley, J. Lee, R. M. Broughton, T. S. Huang
51. Increase in the viscosity of water with temperature under the influence of magnetic field. **S. A. Ghauri**, M. S. Ansari, H. Rehman
52. Towards elucidation the mechanism of catalysis by Fe-TAML activators. **D -L. Popescu**, A. D. Ryabov, T. J. Collins
53. A comparative study of supported MoO₃ catalysts and activity in transesterification of dimethy oxalate with phenol. **F. Pan**
54. Photocatalytic hydrogen production with new metal oxide catalysts. **J -O. Baeg**, C. W. Lee, S -J. Moon, H. Chang
55. Development of a catalytic shift reactor for gasification processes. **S. H. Lee**, J. G. Lee, J. H. Kim
56. Attrition characteristics of anthracite ash in fluidized beds. **S. H. Lee**, J. M. Lee, D. W. Kim, J. S. Kim
57. Semi-continuous gas-liquid phase-transfer catalyzed reaction of o-phenylene diamine and carbon disulfide by tetrabutylammonium hydroxide. **M. L. Wang**, B -L. Liu
58. Electronic structure of fullerene-like cages and capped nanotubes containing up to two thousand atoms from analytic density functional theory. **R. R. Zope**, B. I. Dunlap

- 59.** Simultaneous determination of partial molar volumes, partial molar refractions, mean electronic polarizabilities and molecular radii from dilute multi-component data alone: Experimental methods and response surface models. **M. Tjahjono**, M. Garland
- 60.** Study on the adsorption of sulfur dioxide in carbon slit pores by non-local density functional theory and Yukawa potential. **L. Liang**, S. Yan, T. Liao, D. Fu
- 61.** Adhesive energy of separating single single-walled carbon nanotube from bundles. **D. Cao**
- 62.** Infrared imaging for forensic analysis of various materials. **W. Gardinier**, R. A. Larsen
- 63.** Passive conducting polymer based hydrazine sensor. **H. Yang**, J. Wan, H. Shu, B. A. Chin
- 64.** Determination of aniline in dye wastewater by the method of J-acid spectrophotometry. W. Shi, **W. Song**, W. Wen, J. Li
- 65.** Probing the formation of Pb(II)-disulfonamide complexes by ESI-MS. **W. Zhang**, R. J. Alvarado, Y. Cai, K. Kavallieratos
- 66.** NO_x storage and reduction characteristics of Pt/Ba/Al₂O₃. **Y. J. Noh**, K. S. Yoo, J. S. Park, S. H. Lee, S. Y. Park, F. J. Wen
- 67.** Process research of E2100, a new indoline anti-spastic agent. **M. Miyazawa**
- 68.** Mass transfer mechanism of anthraquinone during alkaline wood pulping. C. Qing, H -X. Zhu, H. Song, H. Yan, **X -S. Chai**
- 69.** Epoxidation of small organic molecules using a spinning tube-in-tube reactor. **J. T. Ciszewski**, M. A. Gonzalez
- 70.** Optimization of fast pyrolysis of *Quercus Acutissima* in a bubbling fluidized bed reactor. **S. J. Kim**, **K. S. Yoo**, M. S. Eom, S. H. Lee, S. H. Lee, J. G. Lee
- 71.** A new separation method: Distillative freezing. **L -D. Shiau**
- 72.** Adsorption kinetics and intraparticulate diffusivities for bioremediation of Co(II), Fe(II) and Cu(II) ions from waste water using modified and unmodified maize cob. **J. C. Igwe**, B. C. Gbaruko, A. A. Abia
- 73.** TNT remediation with zero valent iron emulsions. **T. Colcord**, C. King, K. M. Carvalho-Knighton, C. L. Geiger, C. A. Clausen
- 74.** Dehalogenation of PCBs with zero valent bimetallic systems. **B. R. Halle**, L. Talalaj,

R. DeVor, K. M. Carvalho-Knighton, C. L. Geiger, C. A. Clausen

75. Studies on a green process for Friedel-Crafts acylation using carboxylic acids. **M. A. Walker**

76. Volatile aromatics removal from nonionic coacervate phase solution by vacuum stripping. **S. Kungsanant**, B. Kitiyanan, T. Rirksomboon, S. Osuwan, J. F. Scamehorn

77. Continuous cloud point extraction for removal of aromatic contaminants from wastewater in a multi-stage rotating disc contactor. **P. Taechangam**, S. Osuwan, T. Rirksomboon, J. F. Scamehorn

78. Multi-tier approach toward risk assessment of waste disposal. **S. R. Al-Abed**

79. Mechanism study into the combined de-SO₂ and de-NO_x process in the aqueous solution of heteropoly compound. **R. Wang**, H. Enqiu

80. Detoxification and recycling of pesticides and germicides for safe disposal or reuse. **M. F. Okechukwu Jr.**

81. Flotation de-inking of recycled paper aided with electric field technology. **A. Shemi**, J. Hsieh

82. Green chemistry synthesis of oxindole derivatives: 3-Bromooxindole acetic acid and 3-methyleneoxindole. **E. J. Brush**, J. Miller

83. Dual gradient composite film of polyaniline and copper in polyvinyl alcohol matrix. **X. Wang, J. Tang**, Y. Wang

84. Nanomorphological design and confirmation of incompatible components in polymer matrix composites. **J. Tang**, Y. Wang, X. Huang, J. Liu

85. Structure and thermomechanical properties of thermoplastic polymers with shape memory effect. J. Liang, **J. Tang**, Y. Wang

86. All organic high dielectric constant polyaniline/epoxy composites for embedded capacitor applications. **J. Lu**, K -S. Moon, C. P. Wong, B -K. Kim

87. Ordered mesoporous carbon coated with polypyrrole: Enhancing interfacial conductivity for DMFC application. **S. H. Joo**, Y. S. Choi, C. Pak, H. Chang, D. Seung

88. Precise on-line measurements of continuous permeation through dense polymeric membranes using a novel pervaporation apparatus. **C. Zeng, J. Li**, T. Chen, C. Chen Sr.

89. Synthesis of mesoporous carbon composite and its electric double-layer formation behavior. **C -T. Hsieh**, Y -T. Lin

- 90.** Reversible ultrasonic scission of coordination polymers: Towards catalysis. **J. M. Paulusse**, R. P. Sijbesma, E. W. Meijer
- 91.** Water soluble self-doped polyaniline nanocomposites: Unique roles of DNA wrapped SWNTs. Y. Ma, S. K. Ali, **H. He**
- 92.** Novel chemical approaches for advanced nanotechnology. **K. M. Choi**, J. A. Rogers
- 93.** Comparative study of pure and multi-component adsorption of nitrogen, oxygen and moisture on Zeolites. **P. Chitta**, B. J. Tatarchuk
- 94.** Multiscale modeling of coupled curing and drying in sol-gel silica films. **X. Li**, S. E. Rankin
- 95.** Laser-induced damage of composite materials. **C. T. Lloyd**, J. H. Wynne, R. F. Cozzens
- 96.** Synthesis and characterization of zeolite FAU single crystals. **W. T. Lim**, G. H. Kim, H. S. Lee, S. M. Seo, Y. H. Kim, S. O. Ko
- 97.** Synthesis and characterization of zeolite from mineral wastes in NaOH-KNO₃ system. **W. T. Lim**, Y. H. Kim, M. Park
- 98.** Effect of molecular weight and solution properties on morphology of chitosan-poly(ethylene oxide) composite electrospun ultrafine fibers. S. Wongsasulak, **J. Weiss**, K. Kit, D. J. McClements
- 99.** Influence of solution properties on electrospun egg albumen-PEO composite nanofibers. **S. Wongsasulak**, **J. Weiss**, K. Kit, D. J. McClements
- 100.** Palladium-catalyzed synthesis of tripodal arylamines in tetraalkylphosphonium ionic liquids. **P. M. Smith**
- 101.** Efficient synthesis of 5'-*O*-propionyl 1- β -D-arabinofuranosylcytosine via highly regioselective acylation catalyzed by Novozym 435 in co-solvent mixtures. X -F. Li, **M - H. Zong**, H. Wu
- 102.** Fluorescence-photoswitchable nanoparticles as water-soluble nano-ink for optical memory. **M. Zhu**

Section B

Unknown Site -- Unknown Room

**Ionic Liquids: Not Just Solvents Anymore OR Ionic Liquids: Parallel Futures
(Sponsored by Green Chemistry and Engineering, Separation Science and
Technology and Novel Chemistry with Industrial Applications Sub-Divisions)**

Poster Session

Cosponsored with INOR, ORGN, ANYL, ENVR, PHYS, and POLY

J. F. Brennecke and K. R. Seddon, *Organizers*

R. D. Rogers, *Organizer, Presiding*

8:00 - 10:00

103. Combustible ionic liquids by design: Destroying another ionic liquid myth. **M. Smiglak**, W. M. Reichert, J. D. Holbrey, J. S. Wilkes, L. Sun, J. S. Thrasher, R. D. Rogers

104. Ionic liquids via reaction of the zwitterion 1,3-dimethylimidazolium-2-carboxylate with protic acids. **M. Smiglak**, W. M. Reichert, S. T. Griffin, J. D. Holbrey, R. D. Rogers, K. Kirichenko, D. Zhang, A. R. Katritzky

105. Ionic liquid mediated metal-ligand complexation. **C. C. Hines**, W. M. Reichert, S. T. Griffin, R. D. Rogers

106. Ionic liquids: The next generation of sweeteners. **W. Hough**, T. Wilson, M. Smiglak, J. Pernak, S. K. Spear, J. H. Davis Jr., R. D. Rogers

107. Salts of boronium cations with long aliphatic tails: Ionic liquid and liquid crystalline behaviors. **J. H. Davis Jr.**, M. Tickell, A. Smith, C. Collins, C. Odom

108. Sulfoxide, sulfone and urea functionalized TSILs and their interesting phase behaviors with organic solvents: Interesting systems for organic separations. **J. H. Davis Jr.**, M. Tickell

109. The preparation of Bombyx Mori silk nanocomposites using room temperature ionic liquids. **D. M. Fox**, J. M. Green III, S. Bellayer, J. W. Gilman Sr., D. M. Phillips, R. A. Mantz, P. C. Trulove, H. C. De Long

110. Thermo-sensitivity of polymers and polymer gels in ionic liquids. **T. Ueki**, M. Watanabe

111. Ionicity of room temperature ionic liquids: A parameter controlling the physicochemical properties. **H. Tokuda**, M. Watanabe

112. Acidic ionic liquids. **P. A. Fylstra**, W. A. Henderson, H. C. De Long, P. C. Trulove

113. Using well known methods in unprecedented ways: The dissolution/reconstitution of

chitin and chitosan using room temperature ionic liquids. **J. M. Green III**, D. M. Fox, H. C. De Long, P. C. Trulove

114. Biocatalysis in novel functionalized ionic liquids. **F. Falcioni**, A. J. Walker, N. C. Bruce

115. Effects of anion and cation selection on the physical properties of ammonium based ionic liquids. **E. R. Gimpel**, A. J. Walker

116. Ionic liquids for safe high performance lithium ion batteries. **M. Pascaly**, A. Prodi-Schwab, M. Holzappel, P. Novak

117. Redox biocatalysis in ionic liquids. **H. C. Stubbley**, A. J. Walker, N. C. Bruce

118. Study of 1-butyl-3-methylimidazolium tetrafluoroborate for lithium battery electrolyte. **N. M. Giroud**, H. Rouault, E. Chainet, J.-C. Poignet

119. Synthesis of needle-like pyramid ZnF(OH) microstructures by microwave-assisted heating in ionic liquids. **J. Cao**, B. Fang, H. Wang, X. Ma, S. Hu, X. Zhang

120. Using ionic liquids to improve Novozym 435-catalyzed regioselective acylation of 1- β -D-arabinofuranosylcytosine. X.-F. Li, **M.-H. Zong**, R.-D. Yang

121. Mutual solubilities between water and ionic liquids. **M. G. Freire**, P. J. Carvalho, A. M. A. Dias, A. J. Queimada, L. M. N. B. F. Santos, A. M. Fernandes, I. M. Marrucho, J. A. P. Coutinho

122. Surface tension measurements of imidazolium based ionic liquids. P. J. Carvalho, **M. G. Freire**, A. J. Queimada, I. M. Marrucho, J. A. P. Coutinho

123. Accelerated cationic ring opening polymerization of 2-ethyl-2-oxazoline in ionic liquids under microwave irradiation. **C. Guerrero-Sanchez**, R. Hoogenboom, U. S. Schubert

124. Application of ionic liquids for permanent silica surface modification in capillary electrophoresis. **M. Koel**, M. Borissova, M. Kaljurand

125. Green reaction media for the Passerini reaction. **C. K. Z. Andrade**, S. C. S. Takada, P. A. Z. Suarez, V. C. Soares

126. Close the gap: Synthesis of highly unsymmetrical ionic liquids. **N. V. Ignat'ev**, U. Welz-Biermann, A. I. Kucheryna, H. Willner

127. Poly(ionic liquid)s as microwave absorption materials. J. Tang, W. Sun, M. Radosz, **Y. Shen**

- 128.** CO₂ sorption of poly(ionic liquid)s. J. Tang, W. Sun, M. Radosz, **Y. Shen**
- 129.** Conformers of 1-alkyl-3-methylimidazolium cations contained in ionic liquids. **J. N. A. Canongia Lopes**, A. A. H. Pádua
- 130.** Electrodeposition of nanomaterials in air and water stable ionic liquids. **S. Zein El Abedin**, F. Endres
- 131.** Extraction of an oxidative enzyme from waste material using room temperature ionic liquids. A. Fall, **A. T. Cooper**
- 132.** Functional ionic compounds for asymmetric catalysis and separation: Application on the synthesis of nanostructured silica bearing ionic substructures. **P. Hesemann**, B. Gadenne, J. J. Moreau, A. Ouadi, I. Billard, C. Gaillard, G. Moutiers
- 133.** Grignard reactions in imidazolium ionic liquids. **S. T. Handy**
- 134.** Henry's law constants for methane and ethane series of hydrofluorocarbons in 1-n-butyl-3-methylimidazolium hexafluorophosphate. **M. B. Shiflett**, A. Yokozeki
- 135.** High pressure solubility data for carbon dioxide in polymerized ionic liquids using a magnetic suspension balance: P[VBTMA][BF₄] and P[VBMI][BF₄]. A. Blasig, J. Tang, X. Hu, Y. Shen, **M. Radosz**
- 136.** Hofmeister series and individual ion contribution of ionic liquids to the enzyme activity and enantioselectivity. **H. Zhao**, S. Campbell, L. Jackson, O. Olubajo, Z. Song
- 137.** How to analyze imidazolium ionic liquids in environmental samples. **P. Stepnowski**
- 138.** Interactions of ionic liquids with anionic clays. **M. Xanthos**, N. H. Kim, S. V. Malhotra
- 139.** LCST-type phase separation of linear polymers and volume phase transition of polymer gels in ionic liquids. **T. Ueki**, M. Watanabe
- 140.** Polyethylene glycol-grafted poly(ionic liquid) membranes for CO₂ separation from methane and from nitrogen. **X. Hu**, J. Tang, A. Blasig, Y. Shen, M. Radosz
- 141.** Reactions in Lewis acidic zinc based ionic liquids. **T. J. Bell**, A. P. Abbott, S. Handa, B. Stoddart
- 142.** Solution chemistry of Cm(III) and Eu(III) in ionic liquids. **S. Stumpf**, I. Billard, P. J. Panak
- 143.** Zwitterionic silver complexes as carriers for the facilitated olefin transport membranes. **H. S. Kim**, H. W. Choi, D. K. Choi, H. Lee, M. Cheong, S. J. Park, B. S.

Ahn

144. Corrosion behavior of metals and alloys in Ionic Liquid, the 1-butyl-3-methylimidazolium bis-(trifluoromethanesulfonyl)-imide. I. Perissi, **S. Caporali**, U. Bardi, A. Lavacchi, A. Tolstoguzov

145. One-dimensional ion conduction of ionic columnar liquid crystals. **M. Yoshio**, T. Mukai, H. Ohno, T. Kato

Section C

Unknown Site -- Unknown Room

Joe Breen Student Poster Session in Green Chemistry (Sponsored by Green Chemistry and Engineering Sub-Division)

Cosponsored with CEI

M. Kirchhoff and K. Parent, *Organizers*

8:00 - 10:00

146. Joe Breen: The heart and soul of green chemistry. M. M. Kirchhoff, **K. E. Parent**

147. Winning over environmentalists, and undergraduates, with green environmental chemistry. **J. R. Merritt**, L. Gron

148. *Green Chemistry Metrics Calculator* (GCMC): A JavaScript application for green chemistry education. **A. R. Luhrs**, **J. J. Stoeckle**, D. Hendrickson, A. Schiffer, I. J. Levy

149. *Daphnia* ecotoxicology: An interdisciplinary green chemistry laboratory exercise for concurrent organic chemistry and animal physiology courses. **E. R. Mehlberg**, K. L. Sterrett, S. E. Gleeson, T. J. Deyesso, H. L. Ferland III, L. A. Potts, L. R. Hasiuk, J. Kerry, S. E. Massanari, C. M. Story, I. J. Levy

150. Development of a partnership with TDEC to promote green chemistry experiments in Tennessee high schools. S. A. Henrie, **K. M. Lindsey**

151. Use of ionic liquids for the processing and analysis of lignocellulosic materials. **R. C. Remsing**, D. A. Fort, R. P. Swatloski, P. Moyna, R. D. Rogers, G. Moyna

152. A molecular dynamics simulation study of structure and dynamics of CO₂ dissolved in a room temperature ionic liquid. **X. Huang**, C. J. Margulis, Y. Li, B. J. Berne

153. Application of ionic liquid technologies: The Knoevenagel reaction and pollution prevention. **A. M. Law**, D. C. Forbes, S. A. Patrawala

- 154.** Phase transfer catalysis in tunable solvents. **N. Maxey**, J. P. Hallett, C. L. Liotta, C. A. Eckert
- 155.** Kinetically probing the solvent properties of gas-expanded liquids. **J. W. Ford**, J. Lu, C. A. Eckert, C. L. Liotta
- 156.** Biocatalysis and CO₂-induced separation and recycle using organic-aqueous tunable solvents (OATS). **E. M. Hill**, J. M. Broering, J. P. Hallett, C. A. Eckert, C. L. Liotta, A. S. Bommaris
- 157.** Polyethylene glycol: A greener solvent for ring-closing metathesis. **T. J. Barker**, G. O. Spessard
- 158.** Green chemistry in the automotive industry: Positive environmental impacts of collaborative research efforts between academe and industry. **A. R. Brank**, D. L. Armstrong, K. A. Kneas, M. Fontinell, Ö. Sezer
- 159.** Investigation of non-platinum based electrocatalysts for proton exchange membrane fuel cell cathodes. **M. W. Amolins**, X. Wang
- 160.** Recoverable, metal-free catalyst for the production of cyclic carbonate from epoxide and CO₂. **R. A. Shiels**, C. W. Jones
- 161.** Toward catalysts for environmentally benign oxidation of organic substrates by N₂O. M. Fujita, **C. Knight**, A. M. Ribera, D. C. Maybern, M. Blosser
- 162.** Mild electrocatalytic hydrogenation of alpha functionalized carboxylic acids. **T. S. Dalavoy**, J. E. Jackson, G. M. Swain, D. J. Miller
- 163.** Kinetics of quaternary ammonium methyl carbonates with differing chain lengths. **E. M. Villa**, J. L. Paumen
- 164.** Effect of Mo loading on transesterification activities of MoO₃/Al₂O₃ catalysts prepared slurry impregnation methods. **F. Pan**

MONDAY MORNING

Section A

Unknown Site -- Unknown Room

Advanced Materials for Microelectronic Packaging (Sponsored by Advanced Materials and Nanotechnology Sub-Division)

Organic Electronics

A. Zhong, J. M. Hurley, and C. Wong, *Organizers*

8:30 — Introductory Remarks.

8:35 —165. Developing metrology to enable the realization of organic electronics devices. **E. K. Lin**

8:55 —166. Memory effects in organic thin-film transistors. **G. Gu**, M. G. Kane, J. E. Doty, A. H. Firester

9:15 —167. Organic semiconductor materials for high performance transistors. **Z. Bao**

9:35 —168. Nonlinear charge transport in semiconducting polythiophene. **J. Obrzut**

9:55 — Intermission.

10:15 —169. Tubes, ribbons and wires for flexible electronics. **J. A. Rogers**

10:35 —170. Large area printable electronics: Materials and processes. **G. B. Blanchet**

10:55 —171. Semiconductor inks for printed electronics manufacturing. **P. W. Brazis Jr.**, G. Dyrce, J. Zhang, D. Gamota

11:15 —172. Development of novel silver nanoparticles/polymer composites by in-situ photochemical method for embedded capacitor applications. **J. Lu**, K -S. Moon, C. P. Wong

11:35 —173. A paradigm of carbon nanotube interconnects in the microelectronics. **Y. Sun**, L. Zhu, C. P. Wong

11:55 — Concluding Remarks.

Section B

Unknown Site -- Unknown Room

Ionic Liquids: Not Just Solvents Anymore OR Ionic Liquids: Parallel Futures (Sponsored by Green Chemistry and Engineering, Separation Science and Technology and Novel Chemistry with Industrial Applications Sub-Divisions)

Ionic Liquid Environmental Fate and Toxicity

Cosponsored with INOR, ORGN, ANYL, ENVR, PHYS, and POLY

J. F. Brennecke, R. D. Rogers, and K. R. Seddon, *Organizers*

G. A. Lamberti and R. J. Bernot, *Organizers, Presiding*

8:15 —174. Assessing the toxicity and biodegradability of ionic liquids. **K. M. Docherty**, C. Kulpa

8:45 —175. Evaluating the greenness of ionic liquids via life cycle assessment. **Y. Zhang**, B. Bakshi, E. Sahle-Demessie

9:15 —176. Understanding the mechanism of ionic liquid toxicity to fish and *Daphnia*. **A. Y. O. Matsuo**, G. A. Lamberti

9:45 —177. Ionic liquids: Environmental, safety and public health issues. **B. C. Gbaruko**, J. C. Igwe, P. N. Gbaruko, C. Ogbonna

10:15 — Intermission.

10:30 —178. Silk regeneration with ionic liquids. **D. M. Phillips**, L. F. Drummy, R. R. Naik, P. C. Trulove, H. C. De Long, R. A. Mantz

11:00 —179. Environmental and toxicological assessment of imidazolium ionic liquids. **P. Stepnowski**

11:30 —180. Preliminary assessment of imidazolium-based ionic liquids for extraction of organic contaminants from soils. **A. P. Khodadoust**, S. Chandrasekaran, D. Dionysiou

12:00 —181. Toxicity of ionic liquids on freshwater organisms. **R. J. Bernot**, G. A. Lamberti

Section C

Unknown Site -- Unknown Room

Nanotechnology and the Environment (Sponsored by Advanced Materials and Nanotechnology Sub-Division)

Green Chemistry: Synthesis of Nanomaterials Using Green Chemistry Principles

Cosponsored with FUEL, and INOR

T. E. Mallouk, *Presiding*

8:30 — Introductory Remarks.

8:35 —182. Non-toxic nanomaterials: The role of surface chemistry. **V. Colvin**

9:00 —183. Rapidly functionalized, highly water-soluble carbon nanotubes. Y. Wang, Z. Iqbal, **S. Mitra**

9:25 —184. Green synthesis of carbon-supported nanoscale iron particles for in situ

environmental remediation. **L. B. Hoch**, E. J. Mack, J. M. Hershman, B. W. Hydutsky, B. Beckerman, T. E. Mallouk

9:50 —185. Approaches to carbon nanotubes self-assembly: Microwave induced reactions and chemical vapor deposition. Y. Wang, M. Karwa, C. Saridara, Z. Iqbal, **S. Mitra**

10:15 —186. Environmentally-friendly methodologies of metal oxide nanostructure synthesis. Y. Mao, T -J. Park, **S. S. Wong**

10:40 —187. Controlled growth of alpha-FeOOH nanorods by exploiting oriented aggregation. J. J. Erbs, D. M. Gulliver, **R. L. Penn**

11:05 —188. Nano catalysis: Design, synthesis, characterization and applications of nanoparticle catalysts with tailored activities. **M. S. El-Shall**

NASA and Chemistry in Aerospace Applications

Sponsored by YCC, Cosponsored with GEOC, IEC, and FUEL

ThermoML: Purpose, Structure, and Applications

Sponsored by CINF, Cosponsored with IEC, and PHYS

MONDAY AFTERNOON

Section A

Unknown Site -- Unknown Room

Advanced Materials for Microelectronic Packaging (Sponsored by Advanced Materials and Nanotechnology Sub-Division)

Emerging Materials, Development and Modeling

A. Zhong, J. M. Hurley, and C. Wong, *Organizers*

1:00 — Introductory Remarks.

1:05 —189. Molecular dynamics study of lead free interconnect materials for electronic packaging applications. **H. Dong**, K -S. Moon, L. Fan, C. P. Wong, M. I. Baskes

1:25 —190. A molecular-level approach to polymer flammability. **R. E. Lyon**, S. I. Stoliarov, R. N. Walters

1:45 —191. Predicting the glass transition temperature of phenolic-cured epoxy thermosets using additive group contributions. **J. M. Hurley**, V. Pai, A. Dhoble

2:05 —192. Cure kinetics of no-flow underfills: Effect of reflow profile. **P. Susarla**, M. LaTorre, J. F. Kelley, R. C. Mills

2:25 —193. Improved underfills for copper/low-k flip chip laminate packages. **J. Zhang**, P. Liu, Q. Ji, G. Shi, M. Todd

2:45 — Intermission.

3:05 —194. Materials science applications of near-field microspectroscopy. **R. A. Larsen**, W. Gardinier

3:25 —195. Assessing epoxy mold compound adhesion to microelectronic materials using surface energy measurements. **G. Kim**, J. M. Hurley, A. Dhoble, S. Avdic

3:45 —196. Superhydrophobic durable silica thin films from sol-gel processing for the application in antistiction of MEMS devices. **Y. Xiu**, L. Zhu, D. W. Hess, C. P. Wong

4:05 —197. Metallic single-walled carbon nanotubes for transparent conductive films. **Y. -P. Sun**, Y. Lin, K. A. S. Fernando, X. Wang, Y. Liu

4:25 —198. Effects of surface chelating on corrosion control in electronic packaging. **Y. Li**, K. -S. Moon, C. Wong

4:45 — Concluding Remarks.

Section B

Unknown Site -- Unknown Room

Ionic Liquids: Not Just Solvents Anymore OR Ionic Liquids: Parallel Futures (Sponsored by Green Chemistry and Engineering, Separation Science and Technology and Novel Chemistry with Industrial Applications Sub-Divisions)

New Industrial Applications of Ionic Liquids

Cosponsored with INOR, ORGN, ANYL, ENVR, PHYS, and POLY

J. F. Brennecke, K. R. Seddon, and R. D. Rogers, *Organizers*

R. T. Hembre, *Organizer, Presiding*

1:30 —199. Not always as black as Coca Cola: Ionic liquids are bright solutions to many kinds of industrial problems. **M. Maase**, C. J. Emanuel

2:00 —200. Carbonylation in ionic liquid media. **J. R. Zoeller**, G. C. Tustin, R. M. Moncier, M. K. Moore

2:30 —201. Ionic liquids for storage and delivery of hazardous gases. **D. J. Tempel**, P. B. Henderson, J. R. Brzozowski, R. M. Pearlstein

3:00 —202. Spectroscopic grade ionic liquids. **A. K. Burrell**, T. M. McCleskey, R. E. Del Sesto, G. A. Baker, S. N. Baker

3:30 — Intermission.

3:45 —203. Ionic liquids in industrial applications: A world of opportunities. B. Weyershausen, **P. F. H. Schwab**

4:15 —204. How understanding the ionic liquid/cellulose dissolution mechanism can guide the generation of advanced cellulose-based materials. **R. P. Swatloski**, R. M. Broughton, G. Moyna, D. T. Daly, S. K. Spear, R. D. Rogers

4:45 —205. Electrochemical applications of ionic liquids based on choline chloride. **A. P. Abbott**, K. J. McKenzie, K. S. Ryder

5:15 —206. Recent developments in deep desulfurization of oil refinery streams by extraction with ionic liquids. **C. Hilgers**, M. Uerdingen, A. Jess, J. Eßer, P. Wasserscheid, E. Sitsen

Section C

Unknown Site -- Unknown Room

Nanotechnology and the Environment (Sponsored by Advanced Materials and Nanotechnology Sub-Division)

Use of Nanomembranes and Nanocatalysts to Improve Environmental Performance of Current Processes

Cosponsored with FUEL, and INOR
E. S. Peterson, *Presiding*

1:30 — Introductory Remarks.

1:35 —207. Using magnetic nanoparticles in water treatment. **V. Colvin**

2:00 —208. Low-temperature SCR of NO with NH₃ over MnO_x-TiO₂ mixed oxides

prepared by sol-gel method. B. Jiang, **Z. Wu**, **W. Zhao**, B -H. Guan

2:25 —209. Preparation, characterization and photoelectrocatalytic activity of nanosized TiO₂ anode by metal-organic chemical vapor deposition. **M. Zhou**, J. Zhang

2:50 —210. Multifunctional mesoporous silica nanoparticles for environmentally friendly catalysis and delivery applications. **V. S -Y. Lin**

3:15 —211. Environmentally-friendly fabrication of polymeric and organic nanomaterials for bionanotechnology and materials science using Particle Replication in Non-wetting Templates (PRINT). L. E. Euliss, **J. M. DeSimone**

3:40 —212. Shape-dependent nanocatalysis and the effect of catalysis on the nanoparticle shape and size in colloidal solution. **M. A. El-Sayed**

ThermoML: Purpose, Structure, and Applications

Sponsored by CINF, Cosponsored with IEC, and PHYS

MONDAY EVENING

Section A

Unknown Site -- Unknown Room

Sci-Mix

H. K. Jacobs and M. A. Gonzalez, *Organizers*

8:00 - 10:00

52, 62-63, 69, 75-77, 82, 86, 90, 92-93, 103, 106-107, 109, 126, 131, 133, 137, 142, 145, 155, 157, 160, 162, 164. See previous listings.

TUESDAY MORNING

Section A

Unknown Site -- Unknown Room

E.V. Murphree Award in Industrial Engineering and Chemistry (Sponsored by ExxonMobil Research and Engineering Company, ExxonMobil Chemical Company and Industrial Engineering and Chemistry Division)

D. T. Wasan, *Organizer*
R. Pfeffer, *Organizer, Presiding*

8:30 — Introductory Remarks.

8:35 —213. Contact mechanics of bubble, droplet and particle in gas-liquid-solid fluidization. **L. S. Fan**

9:10 —214. Coarse-graining of two-fluid models for fluidized gas-particle suspension. **S. Sundaresan**, A. T. Andrews IV, Y. Igci

9:35 —215. Segregation in particulate flows during hopper discharge. **J. S. Curtis**, C. R. Wassgren

10:00 — Intermission.

10:15 —216. Novel fluid-particle interaction mechanisms in dispersions. **D. T. Wasan**, A. D. Nikolov

10:40 —217. Distinguishing between flame-made hard- and soft-agglomerates by high pressure dispersion of their aqueous suspensions. **S. E. Pratsinis**

11:05 —218. Challenging the limits for the design and scale-up of catalytic fluid bed reactors. **A. P. Steynberg**, A. P. Vogel

Section B

Unknown Site -- Unknown Room

Ionic Liquids: Not Just Solvents Anymore OR Ionic Liquids: Parallel Futures (Sponsored by Green Chemistry and Engineering, Separation Science and Technology and Novel Chemistry with Industrial Applications Sub-Divisions)

Really New Ionic Liquids

Cosponsored with INOR, ORGN, ANYL, ENVR, PHYS, and POLY

J. F. Brennecke, R. D. Rogers, and K. R. Seddon, *Organizers*

J. H. Davis Jr., *Organizer, Presiding*

8:15 —219. New class of ionic liquids synthesized from amino acid and other bio-derived materials. **H. Ohno**, K. Fukumoto, J. Kagimoto

8:45 —220. Boronium ion based ionic liquids: Surprises abound. **J. H. Davis Jr.**, A. Smith, M. Tickell, R. D. Rogers, W. M. Reichert, S. T. Griffin, A. Wierzbicki, E. A. Salter

9:15 —221. Designing ionic liquids for CO₂ capture. **J. K. Dixon**, M. J. Muldoon, S. N. Aki, J. L. Anderson, J. F. Brennecke, E. J. Maginn

9:45 —222. Highly efficient synthetic approaches towards really new ionic liquids. **P. Wasserscheid**, S. Himmler, E. Sitsen, D. Gerhard, M. Medved

10:15 — Intermission.

10:30 —223. Electron rich ionic liquids: New chemistry and applications. **J. Clyburne**, T. Ramnial, M. Hauser, W. Bryan

11:00 —224. Novel difunctional and multi-functional perfluoro sulfonimide anions in ionic liquids. D. D. DesMarteau, **T. D. Hickman**, J. Zhang, R. Rajagopal, A. Dukes

11:30 —225. The synthesis and characterization of novel ionic liquids with dual-functional groups on imidazolium cations. **Y. Deng**

12:00 —226. Trialkylsulfonium dicyanamides: A new family of ionic liquids with very low viscosities. **D. Gerhard**, P. Wasserscheid

Section C

Unknown Site -- Unknown Room

Nanotechnology and the Environment (Sponsored by Advanced Materials and Nanotechnology Sub-Division)

Nano-enabled Green Energy: Synthesis of New Materials for Energy Applications

Cosponsored with FUEL, and INOR
L. N. Lewis and K. E. Litz, *Presiding*

8:30 — Introductory Remarks.

8:35 —227. High performance environmental friendly nano-composite for lead-free interconnect. **Y. Li**, K -S. Moon, C. P. Wong

9:00 —228. Development of new nanocrystal based solar cells. **A. P. Alivisatos**

9:25 —229. Template synthesis of a 3-D, nanostructured, solid-state Li-ion battery. F. Xu, W. Mino, **C. R. Sides**, C. R. Martin

9:50 —230. Improving organic-inorganic hybrid solar cells with interface modification and energy transfer. **M. D. McGehee**

10:15 —231. Nano titania for dye-sensitized solar cells. **L. N. Lewis**, J. Gui, S. James, A. Yakimov, S. Gasaway, E. D. Williams, V. Manivannan, O. Siclovan

10:40 —232. Nano-structured, Cu-based catalysts for the synthesis of methanol and the conversion of methanol to fuels and chemicals. **A. T. Bell**

11:05 —233. Applying nanotechnology to high surface area fuel cells. Z. Zhao, **J. M. DeSimone**

11:30 —234. Green synthesis of metallic nanoscale patterned features on semiconductor interfaces. **J. M. Buriak**

TUESDAY AFTERNOON

Section A

Unknown Site -- Unknown Room

E.V. Murphree Award in Industrial Engineering and Chemistry (Sponsored by ExxonMobil Research and Engineering Company, ExxonMobil Chemical Company and Industrial Engineering and Chemistry Division)

R. Pfeffer, *Organizer*

D. T. Wasan, *Organizer, Presiding*

1:30 —235. Fluidization of nanoparticles. **R. Pfeffer**

1:55 —236. Magnetic resonance imaging of particulate and multiphase flows. **L. F. Gladden**

2:20 —237. The layer inversion phenomenon. **N. Epstein**, R. Escudié, J. R. Grace, H. T. Bi

2:45 —238. NO_x formation in regeneration of FCC catalyst and its remedies. **Y -M. Chen**

3:10 — Intermission.

3:25 —239. Gas by-passing in deep fluidized beds of Group A particles. **T. Knowlton**, A. Issangya, S. Reddy Karri

3:50 —240. Micron and nanoparticle coating using atomic layer deposition. **A. W. Weimer**

4:15 —241. Exergy recuperative gasification technology for hydrogen and power co-

production. **A. Tsutsumi**

4:40 — Concluding Remarks.

Section B

Unknown Site -- Unknown Room

Ionic Liquids: Not Just Solvents Anymore OR Ionic Liquids: Parallel Futures (Sponsored by Green Chemistry and Engineering, Separation Science and Technology and Novel Chemistry with Industrial Applications Sub-Divisions)

Ionic Liquids and Education

Cosponsored with INOR, ORGN, ANYL, ENVR, PHYS, and POLY

J. F. Brennecke, R. D. Rogers, and K. R. Seddon, *Organizers*

R. D. Singer, *Organizer, Presiding*

1:30 —242. Ionic liquids and education: Where teaching and research intersect. **T. H. Chan**

2:00 —243. Beasts of burden: Ionic liquids as carriers of reactive reagents. **J. A. C. Clyburne**, T. Ramnial

2:30 —244. Green solvents gone bananas: Use of ionic liquids for the processing and analysis of biomass. R. C. Remsing, D. A. Fort, R. P. Swatloski, P. Moyna, R. D. Rogers, **G. Moyna**

3:00 —245. Ionic liquids in chemistry education: What role? **M. M. Kirchhoff**

3:30 — Intermission.

3:45 —246. Synthesis of siloxy ionic liquids. **D. M. Brown**, J. M. Hanna Jr., J. Varon

4:15 —247. A web research tool for ionic liquids: ILThermo. **Q. Dong**, C. D. Muzny, R. D. Chirico, J. Widegren, V. V. Diky, J. W. Magee, K. N. Marsh, M. Frenkel

4:45 —248. Reference electrode for use in ionic liquids. **A. H. Saheb**, J. A. Janata, M. Josowicz

5:15 —249. Teaching the principles and practical applications of green chemistry in undergraduate organic chemistry. **S. B. Abhyankar**

Section C

Unknown Site -- Unknown Room

Nanotechnology and the Environment (Sponsored by Advanced Materials and Nanotechnology Sub-Division)

Nano-enabled Green Energy: Hydrogen Economy Related to Nanotechnology

Cosponsored with FUEL, and INOR

J. K. Johnson, *Presiding*

1:30 — Introductory Remarks.

1:35 —250. First principles investigation of adsorption and dissociation of hydrogen on the Mg₂Si surface. **B. Dai**, J. K. Johnson, D. Sholl, S. Alapati

2:05 —251. Spectroscopic characterization of surface-modified multi-wall carbon nanotube and its hydrogen storage capacity. **K -S. Lin**, R -B. Li, L -C. Lou, S -W. Chiu, C -N. Ku

2:35 —252. Understanding of hydrogen storage in the NBH_x materials through computational studies. **M. S. Gutowski**, R. A. Bachorz, J. Li, G. K. Schenter, S. M. Kathmann

3:05 —253. Low-valent microporous titanium oxides as novel hydrogen storage materials with enthalpy tuning functionality. **D. M. Antonelli**

3:35 —254. Synthesis and characterization of nanoscale Mg₂Si for hydrogen storage applications. **A. F. Gross**, S. L. Skeith, C. Ahn, J. J. Vajo, G. L. Olson

4:05 —255. Microporous Metal Organic Framework (MMOF) materials for hydrogen storage. L. Pan, J. Lee, L. Olonski, R. Heddy, J. Li, B. Zande, R. T. Obermyer, S. Simizu, **S. Sankar**

4:35 —256. Nanocatalysts for synthetic fuels to support biorefineries and the hydrogen economy. **H. W. Rollins**, L. M. Petkovic, D. M. Ginosar, D. N. Thompson

Nanoparticles in Energy Processes: Friend and Foe: Environmental and Health Effects

Sponsored by FUEL, Cosponsored with IEC

WEDNESDAY MORNING

Section A

Unknown Site -- Unknown Room

**Ionic Liquids: Not Just Solvents Anymore OR Ionic Liquids: Parallel Futures
(Sponsored by Green Chemistry and Engineering, Separation Science and
Technology and Novel Chemistry with Industrial Applications Sub-Divisions)**

Ionic Liquids Applications Based on Physical Properties

Cosponsored with INOR, ORGN, ANYL, ENVR, PHYS, and POLY

J. F. Brennecke, R. D. Rogers, and K. R. Seddon, *Organizers*

J. S. Wilkes, *Organizer, Presiding*

8:30 —257. Ionic liquids for space propulsion. **Y -H. Chiu**, G. Gaeta, T. Heine, R. A. Dressler, D. J. Levandier

8:55 —258. Taylor cones of ionic liquids as ion sources in vacuum: The role of electrical conductivity and surface tension. **J. Fernandez de la Mora**, S. Castro, W. Martino, Y. Yoshida, G. Saito, J. S. Wilkes

9:20 —259. Bronsted acid-base ionic liquids as novel fuel cell electrolytes. **M. Watanabe**

9:45 —260. Lithium ion conducting ionic liquids as electrolytes for lithium rechargeable batteries. **H. Tokuda**, H. Lee, H. Shobukawa, M. Watanabe, M. Watanabe

10:10 —261. High efficiency dye sensitized solar cells using ionic liquid electrolytes. D. Kuang, S. Ito, **S. M. Zakeeruddin**, M. Graetzel

10:35 — Intermission.

10:50 —262. Chemical and electrochemical applications of ionic liquid fluorohydrogenates. **R. Hagiwara**, T. Nohira, K. Matsumoto, T. Shimada, T. Fujinaga, J. Otsuki, R. Ueno

11:15 —263. Research and development of energetic ionic liquids. **T. W. Hawkins**, G. W. Drake

11:40 —264. ¹³C NMR relaxation and viscosity studies of the ionic liquid 1-ethyl-3-methyl-imidazolium butanesulfonate. **W. R. Carper**, P. G. Wahlbeck, N. E. Heimer, J. S. Wilkes

12:05 —265. Paramagnetic ionic liquids. **R. E. Del Sesto**, T. M. McCleskey, A. K. Burrell, G. A. Baker, J. S. Wilkes, J. D. Thompson

Section B

Unknown Site -- Unknown Room

Nanotechnology and the Environment (Sponsored by Advanced Materials and Nanotechnology Sub-Division)

Bio-inspired Nanotechnology

Cosponsored with FUEL, and INOR

J. C. Warner, Presiding

8:30 — Introductory Remarks.

8:35 —**266.** Challenges and progress in the production of electrospun biopolymer nanofibers. **J. Weiss**, K. Kit, S. Zivanovic, M. Davidson

9:10 —**267.** Maltose-responsive protein nanoparticles: Using ligand gated. M. G. Sandros, **D. E. Benson**

9:45 —**268.** Synthesis of thymine-functionalized nano core-crosslinked micelles by poly(vinylbenzylthymine)-b-poly(styrene sulfonic acid sodium salt). **K. Saito**, J. C. Warner

10:20 —**269.** Synthesis, characterization and properties of pharmaceutical co-crystals. **M. B. Hickey**, M. L. Peterson, J. F. Remenar, H. R. Guzman, Ö. Almarsson

Section C

Unknown Site -- Unknown Room

Automated Separations (Sponsored by Separation Science and Technology)

Automated Analytical Systems

M. J. O'Hara, Organizer

J. W. Grate, Presiding

8:30 — Introductory Remarks.

8:35 —**270.** Separation-based approaches to automated radiochemical analysis and sensing. **J. W. Grate**, O. B. Egorov, M. J. O'Hara

9:00 —**271.** Development of radiochemical sensor system for in-situ monitoring of Tc-99 in Hanford groundwater. **M. J. O'Hara**, O. Egorov, J. W. Grate

9:25 —**272.** Separations performed by automated field instrumentation. **S. R. Burge**

9:50 — Intermission.

10:05 —273. Comparison of automated gravity flow separation techniques of safeguard samples. **H. Ziegler**

10:30 —274. Automated measurement of actinides in environmental samples by ICP-MS in case of nuclear emergency: Developments and performances. **D. Larivière**, V. N. Epov, K. Benkhedda, S. Kiser, C. Li, R. J. Cornett, R. D. Evans

10:55 —275. Characterization of SuperLig® 620 solid phase extraction resin with applications for automated process monitoring. **J. P. Clements**, T. A. DeVol, M. J. O'Hara, O. B. Egorov

11:20 —276. Automated separation of ultra-trace actinides from urine by ion chromatography ICP-MS. **R. L. Jones**, K. L. Caldwell, E. R. Gonzales, D. S. Peterson, P. J. Walter

Nanoparticles in Energy Processes: Friend and Foe: Environmental and Health Effects

Sponsored by FUEL, Cosponsored with IEC

WEDNESDAY AFTERNOON

Section A

Unknown Site -- Unknown Room

Ionic Liquids: Not Just Solvents Anymore OR Ionic Liquids: Parallel Futures (Sponsored by Green Chemistry and Engineering, Separation Science and Technology and Novel Chemistry with Industrial Applications Sub-Divisions)

Functional Ionic Liquids/Ionic Liquid Materials

Cosponsored with INOR, ORGN, ANYL, ENVR, PHYS, and POLY

J. F. Brennecke, R. D. Rogers, and K. R. Seddon, *Organizers*

H. Ohno, *Organizer, Presiding*

1:30 —277. Brønsted acid–base ionic liquids based on PAMAM dendrimers with high proton conductivity and blue photoluminescence. **J -F. Huang**, H. Luo, G. A. Baker, S. Dai

2:00 —278. Chelating ionic liquids: Imidazolium salts containing ethylamine diacetic acid moieties. **J. Harjani**, R. D. Singer

2:30 —279. New electrochemical actuators based on polymer gels containing ionic liquids. **M. Watanabe**

3:00 —280. New task-specific ionic liquids incorporating amine groups and their use for reactive capture. **J. H. Davis Jr.**, M. Tickell, R. D. Rogers, W. M. Reichert, S. T. Griffin

3:30 — Intermission.

3:45 —281. Self-organization of ionic liquids: Low-dimensionally ion-conductive liquid crystals. **T. Kato**, M. Yoshio, T. Mukai, H. Ohno

4:15 —282. Task-specific ionic liquids for biomolecular applications. **A. J. Walker**, N. C. Bruce

4:45 —283. Modification of cationic nanoclays with ionic liquids. **S. V. Malhotra**, N. H. Kim, M. Xanthos

5:15 —284. Why do ionic liquids make good media for zeolite synthesis? **R. E. Morris**

Section B

Unknown Site -- Unknown Room

Nanotechnology and the Environment (Sponsored by Advanced Materials and Nanotechnology Sub-Division)

Environmental Uses of Nanotechnology

Cosponsored with FUEL, and INOR

B. Karn, *Presiding*

1:30 — Introductory Remarks.

1:35 —285. Compound specific imprinted polymer nanospheres for optical sensing. **B. K. Lavine**, D. J. Westover, N. Kaval

2:00 —286. Comparison of two apparatuses for aerosol generation from single walled carbon nanotubes. S. Teague, J. D. Carter, **T. Guo**, K. Pinkerton

2:25 —287. Nanocomposite permeable reactive barriers: “Green” nanotech for environmental remediation. **M. K. Harrup**, M. G. Jones, L. A. Polson, B. White

2:50 —288. Characterization and adhesion study of poly(ethylene terephthalate) single polymer composites prepared by rapid hot lamination. **R. Li**, D. Yao, P. Nagarajan

3:15 —289. Kow values and solvent/iron degradation kinetics: A predictive tool for

solvent degradation efficiency with emulsified, nano-scale, zero-valent iron. **C. L. Geiger**, C. A. Clausen, K. M. Milum, J. Quinn

3:40 —290. Emulsified nanoscale iron particles for environmental remediation of heavy metals. **R. DeVor**, C. L. Geiger, C. A. Clausen, J. Quinn, K. M. Milum

4:05 —291. Reaction rates for the dehalogenation of trichloroethylene using various forms of nanoscale and microscale, zero-valent iron. **N. Stewart**, C. L. Geiger, C. A. Clausen

THURSDAY MORNING

Section A

Unknown Site -- Unknown Room

Advanced Materials for Separation and Recovery of Metals (Sponsored by Separation Science and Technology)

Solid Phase Materials

R. S. Addleman, *Organizer*

8:30 — Introductory Remarks.

8:35 —292. Engineering metal ion selectivity into polymer-supported reagents with the primary ligand/auxiliary group concept. **S. D. Alexandratos**, X. Zhu

9:05 —293. Interaction of M³⁺ lanthanide cations with diamide ligands on polymer-supported reagents. **Y. Yang**, S. D. Alexandratos

9:25 —294. Iminodiacetate chelating resin of bifunctional type. **A. Jyo**, M. Akino

9:45 — Intermission.

9:55 —295. Heavy metal separations using functional nanoporous sorbents: Hierarchical assemblies of ligand arrays. **G. E. Fryxell**, S. V. Mattigod, Y. Lin, H. Wu, K. E. Parker, J. Xu, K. Raymond

10:25 —296. Improvements in anion exchange activity of quaternary ammonium functionalized mesoporous silica with multicomponent surface chemistry. R. J. Wiacek, M. J. O'Hara, L.-Q. Wang, R. D. Champion, O. Egorov, G. E. Fryxell, **R. S. Addleman**

10:45 —297. Use of a thiol-functionalized nanoporous sorbent for removal of mercury from off-shore produced waters. **S. V. Mattigod**, R. Skaggs, K. Parker, A. Karkamkar, G.

E. Fryxell

11:05 —298. Detoxification of heavy metals in waste water using ligno-cellulosic agricultural by-products. **J. C. Igwe**, B. C. Gbaruko, A. A. Abia

Section B

Unknown Site -- Unknown Room

Ionic Liquids: Not Just Solvents Anymore OR Ionic Liquids: Parallel Futures (Sponsored by Green Chemistry and Engineering, Separation Science and Technology and Novel Chemistry with Industrial Applications Sub-Divisions)

Analytical Applications of Ionic Liquids

Cosponsored with INOR, ORGN, ANYL, ENVR, PHYS, and POLY

J. F. Brennecke, R. D. Rogers, and K. R. Seddon, *Organizers*

D. W. Armstrong, *Organizer, Presiding*

8:15 —299. Characterization of phosphonium ionic liquids. **T. Chang**, A. Robertson, C. Rivera, M. Piquette, L. Du, D. Harris, D. Nucciarone, E. Kamenetzky, R. Bagwe

8:45 —300. Tailoring ionic liquids for separation and sensing. **S. Dai**, H. Luo

9:15 —301. Investigations of subnanosecond to nanosecond room temperature ionic solvation. **J. W. Petrich**

9:45 —302. Ionic liquids as an attractive alternative solvent for thermal lens measurements. **C. D. Tran**, S. Challa, M. Franko

10:15 — Intermission.

10:30 —303. Synthesis, optimization and application of tailor-made ionic liquids for heterogeneous polymerization processes. **C. Guerrero-Sanchez**, T. Erdmenger, F. Wiesbrock, U. S. Schubert

11:00 —304. Ionic liquids as stationary phases for gas chromatography. **D. W. Armstrong**

11:30 —305. Engineering ionic liquids for microextractions. **J. L. Anderson**

12:00 —306. Ionic liquids for matrices in MALDI mass spectrometry. **M. L. Gross**, Y. Li

THURSDAY AFTERNOON

Unknown Site -- Unknown Room

Advanced Materials for Separation and Recovery of Metals (Sponsored by Separation Science and Technology)

Chemistry and Methods

R. S. Addleman, *Organizer*

1:30 — Introductory Remarks.

1:35 —307. Supramolecular approach to ligand design: Developing chelators selective for arsenic. **D. W. Johnson**, W. J. Vickaryous, T. G. Carter, M. A. Pitt, O. B. Berryman

2:05 —308. Recent developments in applying coordination chemistry for radiochemical separations. **G. J. Lumetta**

2:35 —309. Coordination chemistry and solvent extraction as tools for designing sensors for Pb(II) and other toxic metals. **K. Kavallieratos**, R. J. Alvarado, J. M. Rosenberg

3:05 — Intermission.

3:20 —310. Separation of metals dissolved in ionic liquids using supercritical carbon dioxide. **C. M. Wai**

3:50 —311. Selective extraction of metals from mixed oxide matrixes using choline-based ionic liquids. A. P. Abbott, G. Capper, **D. L. Davies**, R. K. Rasheed, P. Shikotra

Unknown Site -- Unknown Room

Ionic Liquids: Not Just Solvents Anymore OR Ionic Liquids: Parallel Futures (Sponsored by Green Chemistry and Engineering, Separation Science and Technology and Novel Chemistry with Industrial Applications Sub-Divisions)

Micro-engineering with Ionic Liquids

Cosponsored with INOR, ORGN, ANYL, ENVR, PHYS, and POLY

J. F. Brennecke, R. D. Rogers, and K. R. Seddon, *Organizers*

R. W. K. Allen, *Organizer, Presiding*

1:30 —312. Fine-chemical and initial ionic-liquid syntheses in microstructured reactors. **V. Hessel**, P. Löb, H. Löwe, M. Uerdingen

2:00 —313. Novel alkylation of indole and pyrrole derivatives using Iron(II)tetrafluoroborate as a catalyst in an ionic liquid solvent. **T. Itoh**

2:30 —314. A microchannel device for studying chemical kinetics in ionic liquid solutions. **R. W. K. Allen**, B. O'Sullivan, Z. Chen, P. Goodrich, J. Birbeck, J. M. MacInnes

3:00 —315. Scaling down kinetic measurements in ionic liquids. **D. W. Rooney**, C. Hardacre, P. Goodrich, A. Brennan, B. O'Sullivan

3:30 — Intermission.

3:45 —316. Hydrogenation of anthraquinone derivatives in a microreactor. **R. Halder**, A. Lawal

4:15 —317. Spectroscopic imaging for high-throughput analysis of ionic liquids and other materials under controlled environment. **S. G. Kazarian**, T. Welton, K. L. A. Chan

4:45 —318. Supported ionic liquid phase (SILP) catalysis: A promising new industrial process design? **A. Riisager**, B. Jørgensen, R. Fehrmann, M. Haumann, P. Wasserscheid

5:15 —319. Commodity scale synthesis of 1-methylimidazole based ionic liquids using a spinning tube-in-tube reactor. **J. T. Ciszewski**, M. A. Gonzalez

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