

FALL 2008

Contents

ACS National Meetings			
Photos from the Spring 2008 mtg p. 1			
Spring 2009 Meeting Symposia p. 3			

PMSE Awards

2008 Doolittle awardp. 4
ICI student award in Applied Polymer Science
ACS Applied Polymer Science award p. 6
National Starch & Chemical Award for Outstanding Graduate Research in Polymer Chemistry p. 9
Features
Book Review - Polymers for Biomedical Applications p. 8
ACS Events - 2009 short courses, Regional Meetings schedule p. 10

Photos from the Spring 2008 ACS National Meeting (New Orleans)



Winners of the 2008 Cooperative Research Award (LtoR): PMSE Division Chair Dean Webster, Winners Frank Bates, Stephen Hahn, Ed Kramer, Dennis Hucul



Winners of the Fall 2007 (Boston) Meeting Doolittle award (LtoR): Chair Dean Webster, Frank Bates, Marc Hillmeyer, A. Meuller



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ACS 2009 Spring National Meeting Program SALT LAKE CITY March 22-26, 2009

PMSE events at the Sheraton

ACS Award in Applied Polymer Science - Symposium in Honor of Benny D. Freeman. Donald R. Paul, Department of Chemical Engineering, University of Texas at Austin, (512) 471-5392, <u>drp_at_che.utexas.edu</u>.

Adaptive and responsive surfaces. Ryan Hayward, Dept. of Polymer Science and Eng., University of Massachusetts, Amherst, 413-577-1317, <u>rhayward_at_mail.pse.umass.edu</u>; Wilhelm T. S. Huck, Department of Chemistry, University of Cambridge, Cambridge, CB2 1EW, UK, +44 (0) 1223 334370/336404, <u>wtsh2_at_cam.ac.uk</u>.

Cooperative Research Award Symposium in Honor of Professor Robert Waymouth and Dr. James Hedrick. Kurt Wiegel, Department of Chemistry, University of Wisconsin - Eau Claire, 715-836-4815, <u>wiegelkn_at_u.wec.edu.</u>

Degradable Polymers: From Synthesis to Nanotechnology. Andrew P. Dove, Department of Chemistry, University of Warwick, Coventry CV4 7AL, United Kingdom, +44 (0)24 7652 4107, <u>a.p.dove_at_warwick.</u> <u>ac.uk.</u>

Functional Polymer Nanocomposites for Energy Storage and Conversion. Lei Zhu, Polymer Program, Institute of Materials Science and Department of Chemical, Materials, and Biomolecular Engineering, University of Connecticut, 860-486-8708, <u>lei.zhu_at_uconn.edu</u>; Qing Wang, Department of Materials Science and Engineering, The Pennsylvania State University, 814-863-0042, <u>wang_at_matse.psu.edu</u>.

General Papers/New Concepts in Polymeric Materials and **Joint PMSE/POLY Poster Session.** Julie Jessop, Univ. of IA, Dept. of Chemical & Biochemical Engg., (319) 335-0681, julie-jessop_at_uiowa.edu.

Micro- and Nano-Fibers from Renewable Materials (Cosponsored with CELL, CELL is primary). Gordon Selling, USDA-ARS-NCAUR, 1815 North University Street, Peoria, IL 61605, 309-681-6338, gordon.selling_at_ars.usda. gov; Margaret W. Frey, Cornell University, 607-255-1937, mfw24_at_cornell.edu.

Multiphase Polymer Materials — From Fundamentals to Applications. Howard Wang, Department of Mechanical Engineering, Center for Advanced Microelectronics, Binghamton University, State University of New York, 607-777-3743, <u>wangh_at_binghamton.edu</u>; Joachim Loos, Department of Chemical Engineering and Chemistry, Eindhoven University of Technology, P.O. Box 513, Eindhoven 5600MB Netherlands, +31-(0)40-247-3034, <u>j.loos_at_tue.nl</u>; Cheol Park, National Institute of Aerospace, 100 Exploration Way, Hampton, VA 23666, 757-864-8360, <u>cheol.park-1_at_nasa.gov.</u>

Nanostructured Block Copolymer Materials. Daniel A. Savin, School of Polymers and High Performance Materials, University of Southern Mississippi, 601-266-5395, <u>daniel.</u> <u>savin_at_usm.edu.</u>

Novel Applications of Supramolecular Materials. Christopher Bielawski, University of Texas at Austin, Department of Chemistry and Biochemistry, (512) 232-3839, <u>bielawski_at_cm.utexas.edu.</u>

Polymers for Microencapsulation and Coating Technologies. Lirong Bao, Akzo Nobel, 10 Finderne Avenue, Bridgewater, NJ 08807, 908-685-5385, <u>lirong.</u> <u>bao_at_akzonobel.com</u>; Daniel Duffy, Henkel Corporation, 10 Finderne Avenue, Bridgewater, NJ 08807, 908-685-5267, <u>daniel.duffy_at_nstarch.com</u>.

Undergraduate Research Poster Session: Polymer Chemistry (Co-sponsored with CHED and Society Committee on Education; CHED is primary). Nancy Bakowski, Department of Higher Education, American Chemical Society, 1155 Sixteenth Street, N.W., Washington, DC 20036.

Christopher Soles

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WINNERS OF THE 2008 DOOLITTLE AWARDS

The Arthur K. Doolittle Award, established by the Union Carbide Corporation, is given to the authors of an outstanding paper presented before the Division at each national meeting of the ACS. A prize in the amount of \$1,000 is financed with the gift of royalties from A. K. Doolittle's book, *Technology of Solvents and Plasticizers*. All papers appearing in the Preprint Book are evaluated on the basis of content, with emphasis on originality and development of new concepts, and on the quality of presentation. Recipients are selected by an anonymous panel of judges appointed by the Chairman of the Doolittle Award Committee.

The winners of the 2008 award for papers presented at the Spring meeting are:

L. Hutchings, A. P. Namainen, N. Clarke, R. L. Thompson and I. A. Insari (Durham University, UK)," Modifying and repairing polymer surfaces with well defined multi end-functionalized polymers."

The winners of the 2008 award for papers presented at the Fall meeting are: J. Long, A. Fischer, T. McEvoy, M. Bourg, J. Lytle and D. Rolison (Naval Research Laboratory), "Self-limiting electro polymerization en route to ultrathin conformal polymer coatings for energy storage applications."

2008 ICI STUDENT AWARD IN APPLIED POLYMER SCIENCE

The Division is pleased to announce that **Erin B. Vogel** is the winner of the **2008 ICI Student Award in Applied Polymer Science**. This Award, which is sponsored by ICI and administered through the Joint Polymer Education Committee of the ACS Divisions of Polymeric Materials: Science and Engineering (PMSE) and Polymer Chemistry (POLY), is given for the best paper presented at the ICI Award Symposium as part of the PMSE program at the 2008 Fall ACS Meeting.

Dr. Vogel is a recent graduate of Michigan State University where her thesis advisor was Professor Gregory L. Baker. The title of her paper, which was presented at the recent Fall ACS Meeting in Philadelphia, Pennsylvania, was *"Unimolecular Biodegradable Nanoparticles from Comb Polymers"*.

The other finalists who presented papers at the Award Symposium were: Alejandro L. Briseno (University of Washington); Jarrod A. Hanson (University of California, Los Angeles); Sung Gap Im (Massachusetts Institute of Technology); Meredith Mintzer (Texas A&M University); and Xiao-Yu Sun (North Carolina State University). The Award, consisting of \$1600 and a plaque, will be presented to Dr. Vogel at the PMSE Award's Reception at the Spring 2009 ACS Meeting in Salt Lake City, Utah.





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- Will be of great interest to all those engaged in the subject in industry, university research establishments and general education

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American Chemical Society Applied Polymer Science Award in Honor of Anne Hiltner



Anne Hiltner, winner of the 2008 American Chemical Society Award in Applied Polymer Science, is cited for her *"contributions in the development of the field of research in polymer and materials science."*

Anne Hiltner is the Herbert Henry Dow Professor in Macromolecular Science and Engineering at Case Western Reserve University School of Engineering. Her initial training was in chemistry with a B.A. (1963) from Reed College in Portland, Oregon, followed by a Ph.D. (1967) in physical chemistry from Oregon State University, Corvallis, Oregon and a research fellowship (1967-1971) at Case Western Reserve University in polymer science.

Her work in exploring the structure-processing-property relationships in polymeric materials has made pioneering contributions in understanding the connections between hierarchical structure and irreversible deformation and damage processes, and fracture of polymer blends and composites. She has worked to develop effective industry/academic research cooperation. As an example, with Dr. S. P. Chum of The Dow Chemical Company, a unique and comprehensive study of the structure-property relationships of metallocene-catalysed ethylene-octene copolymers was carried out that led to a definitive theoretical understanding of the connections between microstructure, morphology and mechanical properties. This work in turn has produced predictive models which have assisted the development of a new commercially successful family of ethylene-based elastomers.

Motivated by the need for new processing technologies for creating engineered microstructures of incompatible polymers, she has worked on ground-breaking studies to explore the unique advantages that can be achieved with microlayering coextrusion. This layer-multiplying technology permits continuous processing of sheet or film with hundreds or thousands of alternating layers of two or more polymers. This technology has resulted in the ability to create engineered microstructures with unique electrical, mechanical and barrier properties. With Eric Baer, she has explored the hierarchical structure-function relationships in collagenous tissues. She has worked with J. M. Anderson on a further area of interest in understanding mechanisms of biocompatibility and biodegradation of biomaterials with a view to enhancing their biostability.

She was recently awarded the directorship of a new, multi-million dollar NSF Science and Technology Center named the Center for Layered Polymeric Systems (CLiPS). The Center, led by Case Western Reserve, combines the technological and educational efforts of researchers at the University of Texas, Fisk University, the University of Southern Mississippi, and the Naval Research Laboratory. A partner relationship also exists with the Cleveland Municipal School District. CLiPS affiliates include Rochester Institute of Technology, SUNY Fredonia, Pennsylvania State University at Erie, Ohio Northern University, and Rose-Hulman Institute of Technology. CLiPS research is focused on 1) innovations for creating the next generation of nanolayered polymer-based structures and systems; particularly identifying and characterizing the unique properties of the polymer interface in nanolayers; 2) discovering and exploiting membrane and barrier phenomena that lead to material systems with unique transport properties, and 3) exploring one-dimensional photonic bandgap structures, combined with other property enhancement strategies to impart superior optical responses on a new generation of photonic devices. Dr. Hiltner developed the educational mission of the Center to provide training opportunities for under-served minority students, from high school through post doctoral education, leading toward careers in science and technology in the American workforce.

Anne Hiltner was the recipient of the 2005 Spotlight Series Prize for Women's Scholarship sponsored by the Flora Stone Mather Center for Women Alumnae Association. In 2005 she was recipient of the Outstanding Achievement Award from the Society of Plastics' Engineers (SPE) and was named an ACS PMSE Division Fellow. In 2001, she was the recipient of the ACS Cooperative Research Award in Polymer Science and Engineering.



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PMSE Book Review

Polymers for Biomedical Applications ACS Symposium Series 977

Anil Mahapatro and Ankur S. Kulshrestha, Eds. Oxford University Press, 2008

Reviewed by Rao S. Bezwada This book, based on a 2006 PMSE symposium, is a welcome compilation of current thinking and presents recent research advances made in the rapidly growing field of polymeric biomaterials. The coverage of the



field is quite comprehensive. The flow of the information is good, beginning with an overview chapter before getting into specific topics. The first few chapters provide excellent examples of either new synthetic strategies or polymers, the building blocks of polymer-based medical devices. The development of new characterization tools and techniques is very important for understanding how the physical, chemical and structural properties of polymers affect the functional performance of such devices. To that end, the next few chapters are focused on modeling tools and characterization techniques being developed and used to obtain information on bulk and surface properties of polymeric biomaterials.

Furthermore, the successful and safe performance of polymers in biosensing, diagnostics, and medical devices requires an in-depth understanding of surfaces and interfacial interactions occurring on polymer surfaces. Additional chapters provide excellent reviews on the biocompatibility of different types of polymeric surfaces and their interactions with proteins, cells and blood platelets. Other chapters review applications of polymeric biomaterials in tissue engineering and biosensors.

The overall impression is of a well-produced volume with an effective editorial touch. The book is remarkably coherent, and provides an excellent and balanced overview of polymeric biomaterials and their applications. It is suitable for those already involved or embarking on research in this rapidly growing field.

About the reviewer: Rao S. Bezwada is President and CEO of Bezwada Biomedical LLC, a research company with operations in the U.S. and India, which he established in 2003 after 20 years of service at Ethicon, Inc. He received his Ph.D. from the Stevens Institute of Technology and holds more than 72 U.S. patents. In 1996 he was awarded the Johnson Medal for his role in the invention and development of Monocryl[®] absorbable sutures.

TABLE OF CONTENTS

1. Polymers for Biomedical Applications: Introduction

Synthesis of Biomaterials

Preface & Overview

- From Drug-Eluting Stents to Biopharmaceuticals: Poly(Ester Amide), a Versatile New Bioabsorbable Biopolymer
- 3. Chitosan Water-Soluble System: An Approach to Prepare Superabsorbent Gel
- 4. The Cyclization and Functionalization of Styrenic Polymers
- 5. High Strength, Melt Processable Aromatic Poly(anhydride)s
- 6. Fluorescently Labeled Protein-Polymer Bioconjugates Using Protein Derived Macroinitiators From Living Radical Polymerization
- 7. Adapting Polymeric Metal Complexes for Biomedical Applications

Characterization of Polymeric Biomaterials

- 8. Beyond Trial and Error: Tools to Advance the Engineering of Biomaterials
- 9. Broadband Dielectric Spectroscopic Characterization of the Hydrolytic Degradation of Hydroxyl-terminated Poly(D,L-lactide) Materials
- 10. The Expanding Role of Mass Spectrometry as a Tool for Polymer Chemistry

Polymers for Drug Delivery

- 11. Synthesis and Properties of Functional Poly(vinylpyrrolidinone) Hydrogels for Drug Delivery
- 12. Enzymatically Synthesized Pegylated Polymers as Nano-Micellar Drug Delivery Systems
- Novel Two-Photon Activated Photodynamic Therapy Agents Design, Synthesis and Preclinical Studies on Subcutaneous Cancerous Tumor
- 14. Synthesis and Characterization of Carborane Functionalized Dendronized Polymers as Potential BNCT Agents
- 15. Biodegradable lonomers for the Loading and Release of Proteins Formation, Characterization, Mechanism, and Consequence of Water Uptake

Polymeric Surfaces

- 16. An Overview of Biocompatibility of Polymeric Surfaces
- 17. Reactive Polymer Coatings for Biological Applications
- 18. Optimization of Microdomain Structure to Control Osteoblast Attachment on PEG-PCL Polyurethanes

Other Biomedical Applications

- 19. Polymers for Tissue Engineering
- 20. Cell-Container Prepared with Cytocompatible Phospholipid Polymers for Cell and Tissue Engineering
- Evaluation of a Bioabsorbable Polyester Blend for use in Medical Devices: CRANIOSORB[™], a Novel Cranial Fixation System
- 22. Biopolymers for Biosensors: Polypeptide Nanotubes for Optical Biosensing

National Starch & Chemical Award for Outstanding Graduate Research in Polymer Chemistry



Dr. Nicolay (Nick) Tsarevsky

The recipient of the **2008 National Starch and Chemical Award for Outstanding Graduate Research in Polymer Chemistry** is **Dr. Nicolay (Nick) Tsarevsky** who received his doctorate in 2005 from Carnegie Mellon University under the direction of Professor Krzysztof (Kris) Matyjaszewski.

Tsarevsky studied the synthesis of functional polymers by atom transfer radical polymerization (ATRP). Various synthetic approaches were used to prepare polymers with polar functional groups, including post-polymerization modification of the repeating units or the end groups. Efficient chemical transformations employed included the nitrile-azide and alkyne-azide cycloaddition ("click" chemistry) and the reversible redox coupling of thiol to disulfide groups.

Tsarevsky also studied mechanistic aspects of ATRP, emphasizing the development of rules for rational catalyst selection for "challenging" reaction media, including water-borne systems. He established that several side reactions of the copper-based ATRP catalyst with protic/aqueous solvents led to poor polymerization control, namely loss of halide ligand from the higher oxidation state radical deactivator or disproportionation of the lower oxidation state activator. The ideal catalyst mediating well-controlled ATRP in protic media is characterized by i) a high ratio ßII/ßI of the stability constants of the Cu(II) and Cu(I) states of the catalyst to guarantee high catalytic activity; ii) high halidophilicity of the Cu(II) complex, which is related to the degree of control; and iii) a low ratio ßII/(ßI)2 to avoid disproportionation. His mechanistic studies led to the development of two new initiation techniques, ICAR and ARGET ATRP, that allow the process to be carried out with very low amounts of catalyst. The scope of ATRP has now expanded significantly, particularly with regard to aqueous solvents and coordinating monomers. Importantly, ATRP has become a truly "green" method with markedly increased utilization in industry.

The award will be presented at a symposium honoring Nick Tsarevsky in the PMSE Division of ACS during the American Chemical Society National Meeting in Philadelphia, August 17-21, 2008. Administered by the Polymer Education Committee of the Polymer Chemistry and Polymeric Materials Science and Engineering Divisions, the National Starch & Chemical Award for Outstanding Graduate Research Award was established in 1991 to recognize and encourage outstanding graduate research in polymer science and engineering. It is sponsored by National Starch & Chemical Co., a global manufacturer of adhesives, specialty polymers, electronic materials and specialty starches.

For more information, please contact

Prof. Guy C. Berry Department of Chemistry

Carnegie Mellon University 4400 Fifth Avenue Pittsburgh, PA 15213 Queries to gcberry@andrew.cmu.edu

ACS EVENTS

ACS SHORT COURSES IN 2009

ACS Short Courses are one- to five-day, in-person seminars designed to help chemical scientists and technicians keep current in today's competitive marketplace. Please visit *www.acs.org/shortcourses* to register and for more information.

Short Course Circuits

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February 9 - 13, 2009 | Woodbridge, NJ

Courses in Analytical Chemistry, Organic Chemistry, Medicinal Chemistry, Laboratory Safety, Chemical Engineering, Management, and Cheminformatics

February 23 - 27, 2009 | San Francisco, CA

Courses in Analytical Chemistry, Organic Chemistry, Medicinal Chemistry, Biochemistry, Laboratory Safety, Chemical Engineering, Management, Quality Assurance, and Cheminformatics

Short Courses at the ACS National Meetings

Going to an ACS National Meeting? Short Courses are held at each National Meeting and offers the opportunity to take advantage of a wide range of course offerings before and during the meeting.

March 21 - 26, 2009 | Salt Lake City, UT ACS Spring National Meeting

Courses in Organic Chemistry, Chemical Engineering, Management, Cheminformatics, Spectroscopy, Polymer Chemistry, Intellectual Property, and Toxicology

Laboratory/Lecture Courses

Get in-class and hands-on experience with Laboratory/Lecture Courses from the ACS.

March 30 - April 3; July 13 - 17; October 5 - 9 | Chicago, IL

High Performance Liquid Chromatography: Fundamentals, Troubleshooting, and Method Development

April 20 - 24; July 20 - 24, November 9 - 13; | Chicago, IL

Gas Chromatography: Fundamentals, Troubleshooting, and Method Development

March 15 - 20; August 9 - 14; December 6 - 11 | Virginia Tech, Blacksburg, VA

Polymer Chemistry: Principles and Practice

ACS SPRING REGIONAL MEETINGS

The 2009 Regional Meetings are online and planning their programs. All three of the spring meetings will have programming pertaining to the environment, and GLRM and CERMACS have planned their meetings around an environmental theme. Plans are underway to open their abstract programs and advance registration in the immediate future.

The **Great Lakes Regional Meeting (GLRM)**, <u>http://www.glrm2009.org/</u> will take place in Lincolnshire, IL, just outside Chicago, **May 13 - 16**. Their theme is "A Better Environment through Chemistry." Symposia planned include plant biochemistry, material science/polymer chemistry, ethics in college education, non-crystalline x-ray structural chemistry and the environment, and molecular simulation in and for the environment.

The **Central Regional Meeting (CERMACS)**, hosted by the Cleveland Section, which will be celebrating its 100th anniversary. Mark the dates, **May 20 - 23**, and visit their website at <u>http://www.case.edu/cermacs/</u> for details. Their theme is "Meeting Energy and Environmental Challenges through Functional Materials." Four other societies will co-sponsor and submit programming to CERMACS. They are the Electrochemical Society, Society for Applied Spectroscopy, American Vacuum Society, and the Yeager Center for Electrochemical Science. Case Western Reserve University also is a contributor.

The **Northwest Regional Meeting (NORM)** will take place **June 28 - July 1** at Pacific Lutheran University, Tacoma, WA. Visit their website at <u>http://www.chem.plu.edu/norm2009/</u> for information on their plans. Included in their program are sessions on bioanalytical mass spectrometry, chemistry of the bioregion; chemistry, energy, and sustainability; clinical chemistry, and instruments for the teaching laboratory.



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