

Fluoropolymer 2008

Current Frontiers and Future Trends
Charleston, South Carolina October 19-22, 2008

Lecture Table of Contents

Abstract
Number

SUNDAY, OCTOBER 19, 2008

- 1:00 pm **REGISTRATION DESK OPENS**, [Registration desk will remain open throughout meeting]
- 2:45 pm **OPENING REMARKS by CONFERENCE CHAIR**
Dennis W. Smith, Jr. (Clemson University)
- 3:00 pm **OPENING TUTORIAL I: Darryl D. DesMarteau** (Clemson University)
Fluorocarbons and the Origin of Extreme Materials 1
- 3:40 pm **OPENING TUTORIAL II: Bruno Ameduri** (CNRS, Montpellier, France)
Recent Advances in the Controlled Radical Copolymerization of Vinylidene Fluoride with Fluorinated Comonomers 2
- 4:30 pm **BREAK**

SESSION 1: Synthesis and Properties – Part I
DISCUSSION LEADER: Dennis W. Smith, Jr. (COMSET, Clemson University)

- 4:45 pm **T. C. Mike Chung** (The Pennsylvania State University)
Synthesis of Chain End Functionalized Fluoropolymers using Functional Borane Initiators and their Applications 3
- 5:15 pm **Viacheslav A. Petrov** (DuPont CRD, Experimental Station)
Living Polymerization of Partially Fluorinated Epoxides 4
- 5:45 pm **END DAILY SESSION**
- 6:00 pm **WELCOME RECEPTION**
- 7:00 pm **DINNER ON YOUR OWN**

MONDAY, OCTOBER 20, 2008

- 7:00 am **CONTINENTAL BREAKFAST**

SESSION 1: Synthesis and Properties - Part I
DISCUSSION LEADER: Kenneth J. Wynne (Virginia Commonwealth University)

- 8:00 am **Marek W. Urban** (The University of Southern Mississippi)
Aqueous Synthesis and Film Formation of Fluorine-Containing Colloidal Particles; Self-Repairing Surfaces 5

MONDAY, OCTOBER 20, 2008, CONT'D

8:30 am	<u>Paul A. Deck</u> (Virginia Tech) <i>Progress Toward Fluorinated Diels-Alder Polyphenylenes</i>	6
9:00 am	<u>TBA</u>	7
9:30 am	BREAK	
9:45 am	<u>Wolfgang Hierse</u> (Merck KGaA, Darmstadt, Germany) <i>Novel Fluorosurfactants with Improved Mineralization Properties</i>	8
10:15 am	<u>Emilio Bucio</u> (UNAM, Mexico) <i>Synthesis and Characterization of New Fluorine-Containing Polyethers and Polyesters</i>	9
10:45 am	<u>Harry R. Allcock</u> (The Pennsylvania State University) <i>Fluorine in Polyphosphazenes: A Major Tool for the Development of New Science and Technology</i>	10
11:15 am	<u>James E. McGrath</u> (Virginia Tech) <i>Partially Fluorinated Multi Block Copolymers</i>	11
11:45 am	LUNCH	

SESSION 2: Coatings and Surfaces

DISCUSSION LEADER: Bruno Ameduri (CNRS, Montpellier, France)

1:00 pm	<u>Kenneth J. Wynne</u> (Virginia Commonwealth University) <i>Fluorous Polyoxetanes: Novel Surface Science from Versatile Telechelics</i>	12
1:30 pm	<u>Scott Iacono</u> (US Air Force Research Laboratory) <i>Ultrahydrophobic and Oleophobic POSS/ Fluoropolymer Composites</i>	13
2:00 pm	<u>Atsushi Takahara</u> (Kyushu University, Japan) <i>Control of Surface Nanotexture and Wettability of Fluoropolymers</i>	14
2:30 pm	<u>Richard R. Thomas</u> (OMNOVA Solutions) <i>Adsorption and Relaxation Properties of Oligo(fluorooxetane)-b-Poly(ethylene oxide)-b-Oligo(fluorooxetane) ABA Triblock Copolymers with Short Perfluoroalkyl Groups and Different End Groups at the Air-Water Interface</i>	15
3:00 pm	<u>Karen K. Gleason</u> (Massachusetts Institute of Technology) <i>Functional Initiated Chemically Vapor Deposited (iCVD) Fluoropolymers for Ligand Attachment and Patterning</i>	16
3:30 pm	BREAK	
3:45 pm	<u>Masamichi Morita</u> (Daikin Industries, LTD, Japan) <i>Lyophobic and Development Properties of Fluorine Lyophobic Resist</i>	17

MONDAY, OCTOBER 20, 2008, CONT'D

- 4:15 pm **Thomas J. McCarthy** (University of Massachusetts)
Teflon® PTFE is Hydrophilic. Comments on Definitions of Hydrophobic, Shear Versus Tensile Hydrophobicity and Wettability Characterization 18
- 4:45 pm **Keiji Tanaka** (Kyushu Univ., Japan)
Enrichment of Higher Energy Component at Polymer Blend Surface Using Fluoroalkyl Chain Ends..... 19
- 5:15 pm **Emmanuel P. Giannelis** (Cornell University)
Hierarchically Structured Nanocomposites based on Fluoropolymers..... 20
- 5:45: pm **Alex Jen** (University of Washington)
Fluorinated Materials in Electro-Optics 21
- 6:15 pm **DAILY SESSIONS END**
- 6:30 pm **SOCIAL AND POSTER SESSION**
- 7:30 pm **DINNER ON YOUR OWN**

TUESDAY, OCTOBER 21, 2008

7:00 am **CONTINENTAL BREAKFAST**

SESSION 3: Photonic, Optical, and Electronic Applications
DISCUSSION LEADER: Joseph Thrasher (The University of Alabama)

- 8:00 am **Dennis W. Smith, Jr.** (COMSET, Clemson University)
Fluoropolymers in Photonics for Optical Applications 22
- 8:30 am **Mark D. Watson** (University of Kentucky)
Organic Electronic Materials from Fluorinated Aromatics 23
- 9:00 am **Jin-Kyun Lee** (Cornell University)
Acid-Sensitive Semi-Perfluoroalkyl Resorcinarene: An Imaging Material for Organic Electronics..... 24
- 9:30 am **Mel Toub** (Momentive Performance Materials)
Comparison of Highly Fluorinated Liquid Silicone Rubber and High Consistency Fluorosilicone Elastomer 25
- 10:00 am **BREAK**
- 10:15 am **C. Allan Guymon** (University of Iowa)
Fluorinated Polymer Nanostructure Formation during Photopolymerization in Liquid Crystalline Systems..... 26

TUESDAY, OCTOBER 21, 2008, CONT'D

- 10:45 am **Chad Booth** (Texas State University)
Fluorinated Aliphatic Polyimides 27
- 11:15 am **Rafal Korlacki** (University of Nebraska-Lincoln)
Experimental and Computational Studies of Ferroelectric Oligomers 28
- 11:45 am **Susanta Banerjee** (Indian Institute of Technology, India)
Novel Semi-Fluorinated Poly (ether imide) s with Cardo Unit in the Main Chain 29
- 12:15 am **LUNCH**

**SESSION 4: Synthesis and Properties– Part II & Fluoropolymer 2008 Sponsor’s Award for
Outstanding Contribution and Innovation in Fluoropolymer Science honoring Paul R.
Resnick, FluoroScience, LLC
DISCUSSION LEADER: Heidi Burch (DuPont Company)**

- 1:30 pm **Joseph S. Thrasher** (The University of Alabama)
Accelerating Rate Calorimetry Studies of Poly-hexafluoropropylene Oxide 30
- 2:00 pm **George W. Roberts** (North Carolina State University)
Continuous Synthesis of Poly(Vinylidene Fluoride) and Poly(Vinylidene Fluoride-co-Hexafluoropropylene) in Supercritical Carbon Dioxide 31
- 2:30 pm **Hideaki Yokoyama** (The University of Tokyo, Japan)
Fluorinated Block Copolymers with Carbon Dioxide: A Novel Method to Fabricate Nano-Cellular and Porous Structures 32
- 3:00 pm **Mark McHugh** (Virginia Commonwealth University)
Fluoropolymer Electrospinning in Compressed CO₂ 33
- 3:30 pm **BREAK**
- 3:45 pm **Vincenzo Arcella** (Solvay Solexis, Italy)
Zero Post Cure Fluoroelastomers: A New Generation of Fluoropolymers with Higher Resistance to Thermal De-Hydrofluorination 34
- 4:15 pm **Yoshiyuki Okamoto** (Polytechnic Institute of New York University)
Synthesis, Characterization and Application of Perfluoro Poly (2-methylene-1,3-dioxolane) s 35
- 4:45 pm **Georges Kostov** (Institute Charles Gerhardt, France)
Advances in Chlorotrifluoroethylene Copolymers: Synthesis, Properties and Applications 36
- 5:15 pm **Paul R. Resnick** (FluoroScience, LLC, DuPont, ret.)
Award Address: Fluoromonomers: Requirements for Fluoropolymers 37
- 5:45 pm **DAILY SESSIONS END**
- 6:30 pm **Sponsor’s Award Reception in honor of Paul R. Resnick AND POSTER SESSION**
- 7:30 pm **DINNER ON YOUR OWN**

WEDNESDAY, OCTOBER 22, 2008

7:00 am **CONTINENTAL BREAKFAST**

SESSION 5: Membrane and Energy Conversion Applications
DISCUSSION LEADER: Atsushi Takahara (Kyushu University, Japan)

8:30 am	<u>Morton Litt</u> (Case Western Reserve University) <i>An Alternate Approach to Nafion® Morphology</i>	38
9:00 am	<u>Robert B. Moore</u> (Virginia Tech) <i>The Crystalline Component in Perfluorosulfonate Ionomers</i>	39
9:30 am	<u>Stephen Creager</u> (Clemson University) <i>Semi-fluorinated Electrolytes for Energy Conversion</i>	40
10:00 am	BREAK	
10:15 am	<u>Walter Navarrini</u> (Politecnico di Milano, Italy) <i>Functionalization of Conductive Carbon Black with High Fluorine Content Organic Peroxides</i>	41
10:45 am	<u>TBA</u>	42
11:15 am	<u>Janick Bigarré</u> (CEA Le Ripault, France) <i>Composite PVDF-HFP-Based Proton-Exchange Membranes Embedding Sulfonated or Phosphonated Polymer-Grafted Silica Particles</i>	43
11:45am	CLOSING REMARKS	