



FINAL PROGRAM

FIFTH INTERNATIONAL SYMPOSIUM ON POLYIMIDES AND OTHER HIGH TEMPERATURE POLYMERS

SYNTHESIS, CHARACTERIZATION AND APPLICATIONS
To be held November 5-7, 2007 in Orlando, Florida, USA

This symposium is the fifth in a series the first of which was held in Newark, NJ in 1999. As with its predecessors, this symposium will be concerned with all aspects of polyimides and other high temperature polymers. These materials have found applications in such diverse areas as the aerospace industry and microelectronic components. A unique combination of physical and chemical properties makes these materials highly attractive for demanding applications where chemical inertness, high temperature stability, low dielectric constant, mechanical toughness and processability are primary concerns. This symposium is organized to bring together scientists, technologists and engineers interested in all aspects of high temperature

polymers, to review and assess the current state of knowledge, to provide a forum for exchange and cross-fertilization of ideas, and to define problem areas which need intensified efforts. The invited speakers have been selected so as to represent widely differing disciplines and interests, and they hail from academic, governmental and industrial research laboratories. This meeting is planned to be a truly international event both in geographic coverage as well as in spirit. The technical program will contain both invited overviews and contributed original research papers. It is planned to chronicle the transactions in a hard-bound volume of archival quality (to match or exceed the standards of the journal literature) which will serve as a reference work for future generations of investigators.

SESSION I: MONDAY NOVEMBER 5 2007 (SYNTHESIS AND ELECTRONIC APPLICATIONS I)

8:00-8:05: INTRODUCTORY REMARKS

8:05-8:35: Dennis W. Smith, Jr.; Department of Chemistry, Clemson University, Clemson, SC 29634; **Semi-Fluorinated Polymers Derived from Aromatic Trifluorovinyl Ethers**

8:35-9:05: Yusuke Tsuda; Department of Biochemistry & Applied Chemistry, Kurume National College of Technology, Kurume, Komorino 1-1-1, Fukuoka 830-8555, JAPAN; **Soluble Polyimides Based on Aromatic Diamines Bearing Long-Chain Alkyl Groups**

9:05-9:35: Tomonori Minegishi and Noriyuki Yamazaki; Hitachi Chemical Co., Ltd., 13-1 Higashi-cho 4-chome, Hitachi-shi, Ibaraki 317-8555, JAPAN; **A Novel Photodefinable Poly(benzoxazole) Using a Negative-working Chemical Amplification System**

9:35-10:05: Masayuki Ohe, Tomoko Kawamura, Kohji Katoh, Hiroshi Matsutani and Takashi Hattori; Hitachi Chemical DuPont MicroSystems Ltd, Hitachi-shi, Ibaraki 317-8555, JAPAN; **Low Temperature Curable, Positive-tone, Photo-definable Poly (benzoxazole)**

10:05-10:20: COFFEE BREAK

10:20-10:50: Ying-Ling Liu and Shi-Yih Chen; Department of Chemical Engineering, Chung Yuan Christian University, Chung-Li, Tao-Yuan 32023, TAIWAN; **Temperature-Responsive Polyimides from Diels-Alder Reactions**

10:50-11:20: H. S. Patel and S.N.Desai; Department of Chemistry, Sardar Patel University, Vallabh Vidhyanagar - 388120, Gujarat - INDIA; **Novel Polyimide System Based on Nitro Displacement/Diels-Alder Reaction - III**

11:20-11:50: M. Sarojadevi, R. Hariharan and N. Amutha; Department of Chemistry, Anna University, Chennai - 600025, INDIA; **Synthesis and Properties of Novel Bismaleimides, Polyaspartimides and Organosoluble Polyimides**

11:50-12:10: E. T. Krut'ko, T. A. Zharskaya and **I. N. Prokopchuk**; Byelorussian State Technological University; **Chemical Modification of Polyimides with Alkylphenolformaldehyde and Epoxy Resins**

12:10-1:30: LUNCH

SESSION II: MONDAY, NOVEMBER 5, 2007
(SYNTHESIS AND ELECTRONIC APPLICATIONS II)

1:30-2:00: Thuy. D. Dang and N. Venkatasubramanian; Nanostructured and Biological Materials Branch, AFRL, Bldg 654, 2941 Hobson Way, Wright-Patterson Air Force Base, OH 45433; **Rigid-rod Polybenzimidazoles (PBIs): A Review of Their Synthesis, Properties, Processing and Applications**

2:00-2:30: Rong-Ho Lee, Hsun-Lien Lin, Shenghong A. Dai, and Ru-Jong Jeng; Department of Chemical Engineering, National Yunlin University of Science & Technology, Yunlin 640, TAIWAN; **Thermally Stable NLO Poly(amide-imide)s via Acylurea Intermediates**

2:30-3:00: Xiaojuan Zhao, Shiyong Yang and **Lin Fan**; Laboratory of Advanced Polymer Materials, Institute of Chemistry, Chinese Academy of Sciences, Zhongguancun, Beijing 100080, CHINA; **Synthesis and Characterization of Multifluorinated Aromatic Polyimides for Photonic Applications**

3:00-3:30: Wai Kin Chan; Department of Chemistry, The University of Hong Kong, Pokfulam Road, Hong Kong, CHINA; **Heterocyclic Aromatic Conjugated Polymers For Opto-Electronic Applications**

3:30-3:45: COFFEE BREAK

3:45-4:15: Bao-Ku Zhu and You-Yi Xu; Institute of Polymer Science, Zhejiang University, Hangzhou Yuquan 310027, P. R. CHINA; **Preparation of Ultra-low Dielectric Constant Polyimide Foam via Phase Inversion Process**

4:15-4:45: Hongjun Zuo, Jiansheng Chen, Lin Fan and **Shiyang Yang**; Laboratory of Advanced Polymer Materials, Institute of Chemistry, Chinese Academy of Sciences, Zhongguancun, Beijing 100080, CHINA; **Aromatic Polyimide Resins for High Density Packaging Substrates**

4:45-5:15: Susanta Banerjee; Materials Science Centre, Indian Institute of Technology, Kharagpur - 721302, INDIA; **Synthesis of Novel Semifluorinated Poly(ether imide)s and Structure- Property Relationship**

5:15-5:35: M. Sarojadevi and S. Bhuvana; Department of Chemistry, Anna University, Chennai - 600025, INDIA: **Structure Property Relationship of Processable Heat Resistant Poly (amide-imide)s for High Temperature Applications**

5:35-5:55: Evgeniya Sanzhieva, Fedosya Kalinina, Larisa Radnaeva, Vladislav Borovik, Oleg Shkurko and Dmitry Mognonov; Buryat State University, Smolina St., 24a, Ulan-Ude, RUSSIA; **Novel Pyrimidine Containing Polyimide and Films for Fuel Cells**

SESSION III: TUESDAY, NOVEMBER 6, 2007
(COMPOSITES, NANOCOMPOSITES AND OTHER NOVEL APPLICATIONS)

8:00-8:30: R. Misiego, C. Cano and R.B. Pipes; School of Chemical Engineering, Purdue University, West Lafayette, IN; **Polyimide Foam Nanocomposites from Powder Precursors**

8:30-9:00: Wan-Jung Chou and Chuh-Yung Chen; Department of Chemical Engineering, National Cheng-Kung University, Tainan 70101, TAIWAN; **Characteristic of Polyimide-based Nanocomposites Containing Nano-scale Filler**

9:00-9:30: Martha K. Williams, **Trent M. Smith**, James E. Fesmire and Erik S. Weiser; NASA, Kennedy Space Center, FL 32899; **Polyimide Foam Composites for Enhanced Thermal and Acoustical Insulation**

9:30-10:00: Ying Du, **Guo-Dong Dang**, Hong-Wei Zhou and Chun-Hai Chen; Department of Chemistry, Alan G. Macdiarmid Institute, Jilin University, Changchun 130012, P R CHINA; **New Kind of Carbon-Fiber-Reinforced Phenylethynyl-Terminated Polyimide Composites**

10:00-10:15: COFFEE BREAK

10:15-10:45: Thomas Bahners, Uwe Schloßer and Eckhard Schollmeyer; Deutsches Textilforschungszentrum Nord-West e. V., Adlerstr. 1, 47798 Krefeld, GERMANY; **Some Aspects of Aging of High-Performance Fibers and Lifetime Prediction and Enhancement**

10:45-11:15: Satoru Iwamori and Akihiro Uemura; Graduate School of Natural Science & Technology, Kanazawa University, Kakuma-machi, Kanazawa City 920-1192, JAPAN; **Polymer Thin Films Sputtered with Polyimide Targets**

11:15-11:35: Satoru Iwamori and Masaaki Mizoguchi; Graduate School of Natural Science & Technology, Kanazawa University, Kakuma-machi, Kanazawa City 920-1192, JAPAN; **Adhesion of Poly(tetrafluoroethylene) (PTFE) and Poly(vinyl alcohol) (PVA) Composite Thin Films on the Nickel-Titanium Substrates**

11:35-11:55: M. Sarojadevi, P. Selvakumar and K. Padmini; Department of Chemistry, Anna University, Chennai - 600025, INDIA;

Phthalocyanine Terminated Polyimides for High Temperature Composites Applications

11:55-12:15: Elvira T. Krutsko, Tamara a .Zharskaj and Nicolai R .Prokopchuk
Belarussian State Technological University,
Department of Polymers, Minsk-220050, Sverdlova Str., 13a., BELARUS; **Polyimide Blends**

12:15-1:30: LUNCH

SESSION IV: TUESDAY, NOVEMBER 6, 2007
(AEROSPACE APPLICATIONS)

1:30-2:00: Kumiko Yokota, Masahito Tagawa, Eiji Miyazaki, Mineo Suzuki, Minoru Iwata, and Rikio Yokota; Department of Mechanical Engineering, Faculty of Engineering, Kobe University, 1-1 Rokko-dai, Nada, Kobe 657-8501, JAPAN; **Durability of a Silicon-Containing Polyimide in a Simulated Low Earth Orbit Space Environment**

2:00-2:30: Sandra J. Tomczak, Michael E. Wright, Vandana Vij, Timothy K. Minton, Amy L. Brunsvold, Brian J. Petteys, Andrew J. Guenther, Gregory R. Yandek and Joseph M. Mabry; AFRL/PRSM, Materials Applications Branch, Air Force Research Laboratory, 10 E. Saturn Blvd, Bldg. 8451, Edwards AFB, CA 93524; **Space-Survivability of Main-Chain and Side-Chain POSS-Kapton® Polyimides**

2:30-3:00: Theo J. Dingemans, Erik S. Weiser and Terry L. StClair; Delft University of Technology, Faculty of Aerospace Engineering, 20 Kluyverweg 1, 2629 HS Delft, THE NETHERLANDS; **Novel All-Aromatic Liquid Crystal Polyesters and Polyetherimides for Aerospace Applications**

3:00-3:30: Ching-Hsuan Lin; Department of Chemical Engineering, National Chung Hsing University, Taichung, TAIWAN; **Polyimides for Potential Space Applications**

3:30-3:45: COFFEE BREAK

3:45-4:15: Morton Litt and Yue Zhang, Case Western Reserve University, Macro. Sci. Dept., 10900 Euclid Ave, Cleveland, OH 44106-7202; **Rigid Rod Polyimide Polyelectrolytes: Comonomer Generated Free Volume**

4:15-4:35: M. Sarojadevi, L. S. Jayakumari, V. Thulasiraman, G. Anuradha and P. S. Sampath; Department of Chemistry, Anna University, Chennai - 600025, INDIA; **Structural Characterization and Mechanical and Thermal Properties of New Cyanate/ Epoxy and Cyanate/BMI Blends and Composites**

4:35-5:00: Benalia Kouini and Said Fellahi; Engineering Sciences Faculty, University of Boumerdès, Boumerdès 35000, ALGERIA; **The Effect of Nanoclays on the Properties and Morphology of Injection Molded Polypropylene/ Polyamide 66 Nanocomposites**

5:00-5:25: Saqiba Sheerazi; Quaid-e-Azam University, Islamabad, PAKISTAN; **Synthesis and Characterization of Polyimide Epoxy Hybrid Films**

SESSION V: WEDNESDAY, NOVEMBER 7, 2007
(JOINT SESSION OF POLYIMIDES AND THIN FILM ADHESION / METALLIZED PLASTICS SYMPOSIA I)

8:00-8:30: Kristopher E. Wise, Dennis C. Working, Jae-Woo Kim, Peter Lillehei, Sharon Lowther, Cheol Park, Godfrey Sauti, and Emilie J. Siochi; National Institute of Aerospace, Hampton, VA 23666; **Polymer Nanocomposites for Aerospace Applications**

8:30-9:00: Zongwu Bai, Shane B. Juhl, Narayanan Venkat, and Thuy D. Dang; University of Dayton Research Institute, University of Dayton, Dayton, OH 45469; **High Performance SPBI/SPTES Composite Proton Exchange Membranes for H₂/O₂ Fuel Cell Applications**

9:00-9:30: Anne Jonquières, Michel Awkal, Robert Clément, and Pierre Lochon; Laboratoire de Chimie Physique Macromoléculaire, UMR CNRS-INPL 7568, Nancy Université, ENSIC, 1 rue Grandville, BP 20451, 54 001 NANCY cedex, FRANCE; **New Ion-containing Polyimides for the Purification of One of the Most Promising Bio-fuels by a Membrane Separation Process**

9:30-10:00: Christine Allen; NASA Goddard Space Flight Center, Code 553, Bldg. 11, Rm E28A, Greenbelt, MD 20771; **Application of Polyimide Microwires for Thermal Isolation of a Cryogenic Transistor Module**

10:00-10:15: COFFEE BREAK

10:15-10:45: Sara R. Halper, Shabnam Virji and Randy M. Villahermosa; Space Materials Laboratory, The Aerospace Corporation, El Segundo, CA 90245; **Metal-containing Polyimides for Contamination Sensing and Prevention in Space Applications**

10:45-11:15: Shabnam Virji, Sarah Halper, Judy Ying, Rika Anderson, and Randy Villahermosa; The Aerospace Corporation, Space Materials Laboratory, 2350 E. El Segundo Blvd., M2-248, El Segundo, CA 90245; **Zeolite Modified Polyimides as Absorption Materials for Molecular Contamination**

11:15-11:45: Ryousuke Tamura, Eunju Lim, Shuhei Yoshita, Takaaki Manaka and **Mitsumasa Iwamoto**; Department of Physical Electronics, Tokyo Institute of Technology, 2-12-1 O-okayama, Meguro-ku, Tokyo 152-8552, JAPAN; **Organic Field Effect Transistor as a Maxwell Effect Element Using Polyimide and Poly(vinylidene Fluoride) Films**

11:45-12:15: Young-Bae Park, Sung-Cheol Park, Su-Hwan Cho, Hyun-Cheol Jung, Jae-Woo Joung and Kyu-Hwan Lee; School of Materials Science and Engineering, Andong National University, KOREA; **Interfacial Adhesion of Inkjet-Printed Ag on Flexible Polyimide Substrate**

12:15-1:35: LUNCH

SESSION VI: WEDNESDAY, NOVEMBER 7, 2007 (JOINT SESSION OF POLYIMIDES AND THIN FILM ADHESION / METALLIZED PLASTICS SYMPOSIA II)

1:35-2:05: Brigitte Mutel and Philippe Supiot; Laboratoire GÉPIFRÉM, Bâtiment C5, Université des Sciences et Technologies de Lille, 59655 Villeneuve d'Ascq cedex, FRANCE; **Thermochemical Behavior of Organosilicon Films Elaborated by a Cold Plasma Polymerization Process**

2:05-2:35: Kunigunde H. Cherenack, Alex Z. Kattamis, Bahman Hekmatshoar, I-Chun Chen, James C. Sturm, and Sigurd Wagner; Department of Electrical Engineering and Princeton Institute for the Science and Technology of Materials (PRISM), Princeton, NJ 08544; **Developing a 300°C Silicon Transistor Fabrication Process on Clear Plastic Substrates for Flexible Display Backplanes**

2:35-3:05: Masahito Tagawa and Kumiko Yokota; Department of Mechanical Engineering, Faculty of Engineering, Kobe University, 1-1 Rokko-dai, Nada, Kobe 657-8501 JAPAN; **Fluorination of PMDA-ODA Polyimide using Hyperthermal Atomic Fluorine Beams**

3:05-3:35: H. Schmidt, A. Arpac and K. Endres; EPG Engineered nanoProducts Germany, Inc., Zweibr C3 BCcken, GERMANY; **High Abrasion Resistant Low Surface Free Energy Amide-Imide Coatings**

3:35-4:05: Dezheng Wu; Collage of Materials Science and Engineering, Beijing University of Chemical Technology, Beijing 100029, CHINA; **Preparation of Highly Reflective and Conductive PI/Ag Composite Films by Ion-exchange and Self-Metallization Techniques**

4:05-4:30: B K Kaushik, Geetika Goyal and Randhir Singh; Department of Applied Physics, National Institute of Technology, Kurukshetra-136119, INDIA; **TSDC Spectroscopy of Polyetherimide**