



## FINAL PROGRAM

### THIRD INTERNATIONAL SYMPOSIUM ON ADHESION ASPECTS OF THIN FILMS (INCLUDING ADHESION MEASUREMENT AND METALLIZED PLASTICS)

To be held November 7-9, 2007 in Orlando, Florida, USA

This symposium is the third in a series dealing with adhesion aspects of thin films, adhesion measurement and metallized plastics. The first symposium with this title was held in Orlando, FL in 2003 with the intent of integrating key aspects of three separate symposia which had treated these topics singly in the past. The main idea was to provide a broader venue for the discussion and exploration of these three closely related fields of endeavor. The main part of the symposium focuses on those aspects of thin film technology that have a direct bearing on film adhesion to the substrate. This is a topic of both fundamental interest to all aspects of thin film technology and of great practical concern in applications where films of high stress are involved. The coating of diamond films onto machine tools is one of many applications where thin film adhesion is a critical factor in coating durability. The second part of the symposium will deal with the ability to accurately measure the adhesion of coatings to surfaces.

#### **SESSION I: 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 H<sub>2</sub>/O<sub>2</sub> Fuel Cell Applications**

**9:00-9:30: Anne Jonquière**s, Michel Awkal, Robert Clément, and Pierre Lochon; 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**

This is always a crucial part of development and manufacturing processes dealing with coatings and films. Finally, metallized plastics are a burgeoning technology heavily dependent on thin film adhesion with applications ranging from decorative design to optical coatings to advanced thin film wiring schemes in the microelectronics industry. Metallized plastic films allow the technologist to capitalize on the favorable properties of two disparate classes of materials to create new and unique products which transcend the performance and usefulness that can be obtained by either class alone.

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.

**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 II: 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:** **Dezhen 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**

**SESSION III: THURSDAY, NOVEMBER 8, 2007**

**8:30-8:35: INTRODUCTION**

**8:35-9:05:** **R. J. Narayan**; Department of Biomedical Engineering, University of North Carolina, Campus Box 7575, Chapel Hill, NC 27599-7575; **Biofouling- Resistant Materials for Medical Applications**

**9:05-9:35:** **J. Friedrich**; Bundesanstalt für Materialforschung und Prüfung, Unter den Eichen 87, D-12200 Berlin, GERMANY; **New Plasma Techniques for Polymer Surface Modification with Monotype Functional Groups**

**9:35-10:05:** **D. G. Abreu** T. Debies, A. Entenberg and G. A. Takacs; Chemistry, Center for Materials Science and Engineering, School of Physical Sciences, Rochester Institute of Technology, Rochester, NY 14623; **Modification of Fluoropolymer Surfaces to Contain Copper Fluoride: Relevance to Adhesion**

**10:05-10:35:** **Seok-Keun Koh**, Jun-Sik Cho, Sung Han, Ki-Hwan Kim, Younggun Han, Junghwan Lee, ChulSoo Lee, Jinwoo Seok and Jaeho Joo; R&D Center, P&I Corporation, Shinnae Technotown #405, 485 Sangbong-Dong, Jungrang-Gu, Seoul 131-221, KOREA; **Industrialization and New Applications of Ion Assisted Reaction**

**10:35-10:55: COFFEE BREAK**

**10:55-11:25:** **Brigitte Mutel**; Laboratoire GÉPIFRÉM, Bâtiment C5, Université des Sciences et Technologies de Lille, 59655 Villeneuve d'Ascq cedex, FRANCE; **Polymer Functionalization and Thin Film Deposition by Cold Remote Nitrogen Plasma Process**

**11:25-11:50: J K Quamara**, Maneesha Garg and Geetika Goyal; Department of Applied Physics, National Institute of Technology, Kurukshetra-136119, INDIA; **Multiple Relaxation Processes in Swift Heavy Ion Irradiated Kapton-H Polyimide**

**11:50-1:30: LUNCH**

**SESSION IV: THURSDAY, NOVEMBER 8, 2007**

**1:30-2:00: J. Friedrich**, R. Mix, A. Meyer-Plath, S. Wettmarshausen and H. Sturm; Bundesanstalt für Materialforschung und -prüfung, Unter den Eichen 87, D-12200 Berlin, GERMANY; **A new Concept of Adhesion Promotion in Metal-Polymer Composites by Introduction of Covalently Bonded Hydrophobic Spacers at Interface**

**2:00-2:30: Willem-Pier Vellinga**, Alexander Fedorov and Jeff De Hosson; Department of Applied Physics, Netherlands Institute of Metals Research, University of Groningen, Nijenborgh 4, 9747 AG, Groningen, THE NETHERLANDS; **Residual stress and Delamination Front Geometry on Polymer-metal Interfaces**

**2:30-3:00: Robert C. Cammarata**; Department of Materials Science and Engineering, Johns Hopkins University, 102 Maryland Hall, 3400 North Charles Street, Baltimore, MD 21218-2689; **Recent Advances in the Theory and Measurement of Thin Film Stress**

**3:00-3:30: Brian W. Sheldon**; Division of Engineering, Brown University, Providence, RI 02912; **Grain Boundary Induced Stresses in Polycrystalline Coatings and Thin Films**

**3:30-3:45: COFFEE BREAK**

**3:45-4:15: Alexander Fedorov**, Willem-Pier Vellinga and Jeff De Hosson; Department of Applied Physics, Netherlands Institute for Metals Research, University of Groningen, Nijenborgh 4, 9747 AG Groningen, THE NETHERLANDS; **Degradation of Adhesion in Deformed Polymer-metal Interfaces Studied by Laser Induced Delamination Technique**

**4:15-4:45: H. Willeck**, W. Eberhardt and H. Kueck; Hahn-Schickard-Institute of Microassembly Technology HSG-IMAT, Stuttgart, GERMANY; **A New Device for Testing the Adhesion of Conductors on Polymers**

**SESSION V: FRIDAY, NOVEMBER 9, 2007**

**8:30-9:00: K. S. Kim**; Department of Mechanics, Division of Engineering, Box D, Brown University, Providence, RI 02912; **Nano-scale Solid-interface Strength Measured by Hybrid Method of Nano-testing and Finite Element Analysis**

**9:00-9:30: M. Ignat**, C. Malhaire, G. Ravel and E. Quesnel; SIMAP INP Grenoble, FRANCE; **Cracking and Deadhesion of Thin Metal Films on Mechanically Modified Polymer Surfaces**

**9:30-10:00: Noboru Kyouno**; RHESCA Co. Ltd., 15-17, Hino-Honmachi 1 Chome, Hino-Shi 191-0011, JAPAN; **Application of FFT-based Signal Analysis to Micro-Scratch Testing for Adhesion Strength Measurement of Thin Films and Measured Results Based on Different Measuring Parameters**

**10:00-10:20: R. Iskakov**, T. Akhmetov, I. Razumovskaya, A. Perichaud, B. Muttel and M. Abadie; Institute of Chemical Sciences, 106 Walikhanov Str., Almaty, 050010, KAZAKHSTAN; **New Combined Plasma-Wet Method of Metal Impregnation into Polyimide Films**

**10:20-10:40: E. T. Krut'ko**, T.A. Zharskaya and **I.N. Prokopchuk**; Byelorussian State Technological University; **A New Method of Obtaining Epoxy Waterproof Coatings**

**10:40-11:00: Meruert Nurakhmetova**, Maria Abilova, Victor Solomin, Valentina Kravtsova and **Rinat Iskakov**; Kazakh British Technical University, 55 Tolebi Avenue, 050000 Almaty, KAZAKHSTAN; **A New Heat-resistant Alicyclic Polyimide on the Basis of Simple Oil-Refined Hydrocarbons**