

Witold Brostow¹ and Poonam Tandon²REPORT FROM 16TH POLYCHAR WORLD FORUM ON ADVANCED MATERIALS, WORLD UNITY CONVENTION CENTRE, LUCKNOW, INDIA, FEBRUARY 17–21, 2008

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As in past years, the POLYCHAR Forum was preceded by the popular (16th) Course on Polymer Characterization. This time the Course was held on February 14 at the Indian Institute of Technology (IIT), New Delhi. In the following we list the contents of the Course, some of the presentations made at the Forum, the award winners, new members of the POLYCHAR Scientific Committee and the dates for POLYCHAR 17 in 2009.

The Course on Polymer Characterization has been integral part of POLYCHAR from the very beginning. It has been organized by VEENA CHOUDHARY this year. The Course provides basic information on important characterization techniques. Students, newcomers to materials science and others take advantage of it. Well established researchers also find the Course useful - to get updated information on recent developments outside their own field. The areas covered were: Basic Theory, Instrumentation and Application of Vibration Spectroscopy in Polymer Science (H.W. Siesler, Essen); Liquid Chromatography of Synthetic Copolymers (Dusan Berek, Bratislava); Dynamic Mechanical Properties of Polymers (Michael Hess, Siegen and Kwangju); Light-, Neutron-, and X-Ray Scattering by Polymer Systems (Jean-Michel Guenet, Strasbourg); Glass Transition in Glassy Polymers and other Disordered Materials (Jean-Marc Saiter, Rouen); Electron Microscopy of Polymers (Goerg Michler, Halle); Polymer Tribology (Witold Brostow, Denton, TX); and Hyper Differential Scanning Calorimetry (Prem Chand Jain, Mumbai). The instructors were available for questions and discussions during the Course and during the entire Forum. The Course is a 'distinguished education project' of the International Union of Pure & Applied Chemistry (IUPAC). Support by Polymer Division of IUPAC enabled to cover the expenses for all hand-outs and to waive the fees for a fair number of students.

POLYCHAR 16 was organized by the outgoing Vice Chancellor of the University of Lucknow RAM P. SINGH and coordinated by POONAM TANDON. Poonam Tandon

seemed to be everywhere at once – as were her collaborators led by ALKA MISHRA. The new Vice Chancellor AJAIB S. BRAR and JAGDISH GHANDI, Chairman of World Unity Convention Centre, provided full support for organization of POLYCHAR 16. We, as participants, would like to thank them all for good organization.

As in past years, POLYCHAR puts emphasis on the quality of research presented – in contrast to maximizing the number of participants. This allows in recent years to avoid parallel sessions, and there have been none this year. The areas covered include *Nanomaterials and Smart Materials*; *Natural and Biodegradable Materials and Recycling*; *Materials Synthesis*; *Polymers for Energy*; *Rheology, Solutions and Processing*; *Mechanical Properties and Performance*; *Characterization and Structure-Property Relationships*; *Biomaterials and Tissue Engineering*; *Dielectric and Electrical Properties*; *Surfaces, Interfaces and Tribology*; *Predictive Methods*. Symptomatically, the number of papers on 'green' science was higher than at POLYCHAR 15 last year in Búzios, Rio de Janeiro.

There was a total of 292 registered participants from 35 countries (Austria, Bangladesh, Belgium, Brazil, China, Colombia, Croatia, Czech Republic, Egypt, Fiji, UK, France, Germany, India, Iran, Israel, Japan, Korea, Kuwait, Mauritius, Malaysia, Mexico, Nepal, Netherlands, New Zealand, Poland, Portugal, Russia, Sri Lanka, Slovakia, South Africa, Ukraine, USA, Uzbekistan, and Venezuela) who have contributed 48 oral presentations and 170 posters. Many contributions were presented by students (a number of oral presentations and the majority of posters). This reflects the philosophy of POLYCHAR to provide international forum for encourage young scientists and advanced students to present their scientific work and give them the opportunity to meet with colleagues and well-known scientists to discuss their results, exchange experiences, and make new contacts, in particular international ones. Many industrial contacts

and international cooperations with exchange of students and scientists have resulted from this and earlier POLYCHAR meetings.

Once again, it is virtually impossible to make a selection from the multitude of excellent oral or poster presentations from universities, research institutes, and industry without overlooking important contributions. A few representative contributions (*pars pro toto*, but see also prizes below) are:

ABDEL-AZIM A. ABDEL-AZIM, Egyptian Petroleum Research Institute, Cairo: Polymeric Additives for Removal of Petroleum Sludge from Crude Oil Storage Tanks

HANS-JUERGEN P. ADLER, Andrij Pich, Dirk Kuckling and Veena Choudhary, Technical University of Dresden and Indian Institute of Technology New Delhi: Stimuli-sensitive Nano-, Micro- and Macrogels

HANS-WERNER BEWERSDORFF, Lausitz University of Applied Sciences, Senftenberg: Drag Reduction by Additives: Fundamentals and Applications

AJAIB S. BRAR, University of Lucknow: NMR Studies of Acrylated Copolymers

MICHAEL BRATYCHAK, Lviv Polytechnic National University: Functional Petroleum Resins Based on By-products of Hydrocarbon Pyrolysis to Ethylene

WITOLD BROSTOW, University of North Texas: Prediction of Long Term Service Performance and Reliability of Polymer-Based Materials (PBMs) from Short Term Tests

YOSHIKI CHUJO, Kyoto University: New Pi-conjugated Organoboron Polymers

VERA CIMROVA, D. Věprachtická, P. Pavlačková, I. Kmínek and H.-H. Hörhold, Institute of Macromolecular Chemistry of the Academy of Sciences of the Czech Republic, Prague: Photophysical and Electrochemical Properties of Advanced Polymeric Materials for Optoelectronics

PIOTR CZUB, Cracow University of Technology: Characterization of Epoxy Resins Compositions with Modified Natural Oils

ULMAS GAFUROV, Institute of Nuclear Physics, Tashkent: Molecular Structure, Local Loads Distribution and Elastic Modulus Connection in a Deformed Oriented Crystalline Polymer

ANUP K. GHOSH, Indian Institute of Technology, New Delhi: Process Rheology and Characterization of Polypropylene-based Nanocomposites

VIRENDRA K. GUPTA, Reliance Industries, Mumbai: Polymer Research and Technology

HALEY E. HAGG LOBLAND, Witold Brostow, Miriam Estevez, J. Rogelio Rodriguez and Susana Vargas, University of North Texas, Denton, and National Autonomous University of Mexico, Queretaro: Synthesis

and Characterization of Novel Porous Hydroxyapatite-Based Dental Obturation Materials

ALEX M. VAN HERK, Eindhoven University of Technology: The Origin of Molecular Mass Distributions in Free Radical Polymerization Seen from a Kinetic Standpoint

MICHAEL HESS, Stefan Wunderlich and Byoung-Wook Jo, Siegen University and Chosun University, Kwangju: Fluorescence Studies of the Interaction of Serum Albumin with Polymer-modified Drugs

BYOUNG-WOOK JO, Chosun University, Kwangju: Processable Polybenzoxazole Precursors with Flame Retardancy

DYLAN D.B. JUNG, D. Bhattacharyya and A.J. Easteal, University of Auckland: Rotational Moulding of Flax and Glass Fibre Composites

ALAMGIR KARIM, B.C. Berry, A.W. Bosse, R.L. Jones, J.F. Douglas, R.M. Briber and H.-C. Kim, National Institute of Standards and Technology, Gaithersburg, MD, and IBM Almaden Research Center, San Jose, CA: Guided Self-assembly of Block Copolymer Thin Films

YUSUKE KAWAKAMI, Japan Advanced Institute of Science and Technology, Ishikawa: Formation and Inter-conversion of Polyhedral Oligomeric Silsesquioxanes

JAGJIT KHURMA, University of the South Pacific, Suva: Miscibility and Molecular Interactions in Polymer Blends Containing Chitosan

ELIZABETE F. LUCAS, Federal University of Rio de Janeiro: Polymeric Additives for Petroleum Industry

PETER E. MALLON, University of Stellenbosch, Matieland: Inorganic-Organic Hybrid Copolymer Nanofibers

GONZALO MARTINEZ-BARRERA, Enrique Viguera-Santiago and Witold Brostow, Autonomous University of the State of Mexico, Toluca, and University of North Texas, Denton:

Mechanical Properties of Gamma Irradiated Concrete

AKIRA MATSUMOTO, Kansai University, Osaka: Molecular Design of Advanced Vinyl-Type Network Polymers

MASARU MATSUO, Nara Women's University: Gelation/Crystallization Mechanism of Polymer + Carbon Nanotubes Systems in terms of Thermodynamic and Morphological Aspects

GOERG H. MICHLER, Martin Luther University, Halle: Mechanical Properties of Nanostructured Polymers

SARAH E. MORGAN and R. Misra, University of Southern Mississippi, Hattiesburg: Surface Modification via Polyhedral Oligomeric Silsesquioxane Nanostructured Chemicals

SUBRAMANIAM RADHAKRISHNAN, National Chemical Laboratory, Pune: Conducting Polymer Hybrid

Composites as Smart Materials for Sensitive and Protective Coatings

JEAN-MARC SAITER, University of Rouen: Influence of the Crystallization on the Average Volume of the Cooperative Rearrangement Region in the Amorphous Poly(l-lactic acid)

IRENE SCHNOELL-BITAI, Frank Hinkelmann and Oscar F. Olaj, University of Vienna: Determination of the Radical Reactivity Ratios in Restricted Penultimate Copolymerization Systems by a New Linearization Procedure

RAM P. SINGH, University of Lucknow: High Technology Materials Based on Modified Polysaccharides

JOHN TEXTER, Eastern Michigan University, Ypsilanti: Advanced Porous Materials from Ionic Liquid-based Copolymers

CHUNYE XU, S. Kim and C. Ma, University of Washington, Seattle: Electrochromic Polymer Windows and Lenses

The POLYCHAR Prize Committee chaired by Goerg Michler, Martin Luther University, Halle, has awarded the following Prizes:

Paul J. Flory Research Prize: JIASONG HE, Institute of Chemistry, Chinese Academy of Sciences, Beijing, for a large ensemble of his contributions including his lecture on Rheological Hybrid Effect and its Conditions in Filled Polymer Melts

International Materials Science Prize: RAMESHVAR ADHIKARI, Tribhuvan University, Katmandu, for his contributions to cooperation between European materials scientists and their colleagues in Nepal and for his presentation on Etching of Polycarbonate by DC Glow Discharge

Bruce Hartmann Award for a Young Scientist (not older than 32 years): ARCHANA BHAW-LUXIMON, University of Mauritius, Reduit, and Station Biologique, Roscoff, for her presentation on Oligosaccharose-Grafted PCL or PDMAEMA Polymers: Synthesis and Characterization

Juergen Springer Award for a Young Scientist (not older than 32 years): ROHIDAS AROTE, Seoul National University, for his presentation on Novel Biodegradable and Branched Poly(ester amine)s Based on Glycerol Dimethacrylate and Low Molecular Weight Polyethyleneimine as a Gene Carrier

Carl Klason Award for the Best Student Paper: Victor H. Orozco, University of Antioquia, Medellin, for his presentation on Preparation and Characterization of Poly(lactic acid)-g-Maleic Anhydride Starch Copolymers (advisor: Betty L. Lopez)

IUPAC Student Poster Prizes went ex aquo to:

POOJA CHHABRA, Indian Institute of Technology New Delhi, for her poster on Effects of Structure on

Thermal Behaviour of Polyimides (advisor: Veena Choudhary)

R. DHANYA, Cochin University of Science and Technology, for a poster on Photophysical and Electrochemical Investigations on Photocoducting Poly(6-tertiarybutyl-3,4-dihydro-2H-1,3-benzoxazine) (advisor: Rani Joseph)

DEWYANI PATIL, North Maharashtra University, Jalgaon, for a poster on Organic/Inorganic Hybrid of Poly(o-anisidine) and SnO₂: Study of Humidity Sensing Properties (advisor: Patil Pradip)

Diplomas of Distinction for Student Presentations:

LOPAKSHI BARBORA, Indian Institute of Technology Guwahati, for her presentation on Composite Polymer Electrolyte Membranes for Direct Ethanol Fuel Cell (advisor: A. Verma)

DUSTIN ENGLAND, Eastern Michigan University, Ypsilanti, for his poster on Reversibly Porating Materials and Coatings (advisor: John Texter)

JACOB SAMUEL, Kuwait University, Safat, for his presentation on Microporous Network Polymers Based on Cobalt-phthalocyanines (advisor: Saad Makhseed)

DOMAGOJ VRSALJKO, University of Zagreb, for his presentation on Effect of Filler Surface Modification on Properties of Filled Polyurethane + Poly(vinyl acetate) Blends (advisor: Vera Kovacevic)

Special Prof. Brar's 60th Birthday Celebration Awards were given to IUPAC Poster Prize winners and to Domagoj Vrsaljko.

During the Forum there was a meeting of the POLYCHAR Scientific Committee. Several new Members have been elected - who have all since agreed to serve:

RAMESHVAR ADHIKARI, Tribhuvan University, Katmandu

AJAIB S. BRAR, University of Lucknow

JIASONG HE, Institute of Chemistry, Chinese Academy of Sciences, Beijing

ALEX M. VAN HERK, Eindhoven University of Technology

MD. MOZAFFOR HOSSAIN, Rajshahi University

ALEJANDRO J. MÜLLER, Simon Bolivar University, Caracas

IRENE SCHNOELL-BITAI, University of Vienna

POONAM TANDON, University of Lucknow

JOHN TEXTER, Eastern Michigan University, Ypsilanti

At this time 53 countries are represented on the POLYCHAR Scientific Committee.

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POLYCHAR 17 will be held at the University of Rouen, April 20 – 24, 2009. Again there will be first a one day Course on Polymer Characterization. The Forum format will be similar to that this year and in the past years. The European Organizing Committee consists of:
Jean-Marc SAITER, University of Rouen, Chair,
Gisèle BOITEUX, University of Lyon
Jean-François FELLER, University of Lorient
Josñ Luis GOMEZ RIBELLES, University of Valencia

Jean-Michel GUENET, University of Strasbourg
Colette LACABANNE, University of Toulouse
Françoise LAUPRETRE, University of Paris Est
Jean-Marc LEFEBVRE, University of Lille
Helmut MUENSTEDT, University of Erlangen
Jean-Jacques PIREAUX, University of Namur

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