



Molecular Crystals and Liquid Crystals

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Guest Editor's Foreword

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Guest Editor's Foreword

This special issue contains the selected papers presented at the IXth International Conference on “Frontiers of Polymers and Advanced Materials: *Emerging Technologies and Business Opportunities*” held in Krakow, Poland, July 8–12, 2007. The conference in was a sequel to the very successful series of international meetings held in Cancun (Mexico, 2005), Bucharest (Romania, 2003), Pernambuco (Brazil, 2001), Poznan (Poland, 1999), Cairo (Egypt, 1997), Kuala Lumpur (Malaysia, 1995), Jakarta (Indonesia, 1993) and in New Delhi (India, 1991).

The conferences focused on the most recent and important progress in the field of advanced materials, their science and technology and in new business opportunities resulting from the recent technological developments. Similarly to the preceding meetings the conference held in Krakow benefited of a wide international attendance, gathering around 400 participants coming from 44 countries and representing all continents.

The main conference objectives were:

- To highlight advances and new findings in polymers and advanced materials and their impact on new technologies;
- To facilitate technology transfer and new business opportunities by bringing together representatives from academia, research centers, industries and business;
- To foster international collaborations and joint ventures;
- To facilitate the growth of private sector business in Poland and in Eastern Europe;
- To promote the growth of scientific and technical infrastructure in the field of polymers and advanced materials technologies.

The presentations at the conference were split into 8 symposia:

(i) General and tutorial lectures on New Materials and Advanced Technologies (Chairs: Prof. K. S. Lee (Hannam University, Korea) and Prof. M.S. Kolwas (Institute of Physics, PAN, Warsaw, Poland)).

Lectures covering the main conference topics and emphasizing their impact on educational, scientific, technological and business trends.

(ii) New Generation Nanostructured Materials, Hybrid Materials, Glass and Ceramic, Dental Materials, Exotic Materials (Chairs: Prof. J. Mark (University of Cincinnati, OH, USA) and Prof. K. Haberkro (AGH University of Science and Technology, Krakow, Poland)).

Lectures present a new areas of application and latest results in research and development.

(iii) Natural Fibres, Composites and Environmentally Friendly Materials (Chairs: Prof. R. Kozłowski (Institute of Natural Fibres, Poznan, Poland) and Prof. R. M. Rowell (USDA Forest Service, Madison, WI, USA)).

Natural fibres and composites based on cellulosic fibres, natural textiles, agro-fine chemicals; applications in pulp and paper industry, biodegradable materials.

(iv) Polymeric Materials and Composites for Plastic Electronics and Solar Energy Conversion (Chairs: Prof. A. Pron (CEA Grenoble, France) and Prof. M. Zagorska (Warsaw University of Technology, Warsaw, Poland)).

Conducting polymers, field effect transistors, light emitting devices; organic light detectors, polymer lasers; organic solar cells.

(v) Advanced Materials and Composites for Photonics, Nano- and Biophotonics (Chairs: Prof. I. C. Khoo (The Pennsylvania State University, University Park, USA) and Prof. A. Miniewicz (Wrocław University of Technology, Wrocław, Poland)).

Photorefractive polymers, nonlinear optical materials; materials for image and information processing, optical storage; polymer light amplifiers; liquid crystals and liquid crystalline polymers; materials for integrated optics.

(vi) Biomaterials and Biotechnology (Chairs: Dr. G. Bidan (CEA Grenoble, France) and Dr. D. Crissey (Rensselaer Polytechnic Institute, New York, USA)).

Polymers and composites as implant in body for structural members and as replacements of flexible tissue in reconstructive surgery, bioimaging, nanomedicine drug delivery, bioMEMS, biofilms, tissue engineering.

(vii)–(viii) New Polymers in Ecology & Thermal Degradation, Stabilization and Flame Retardancy of Polymeric Materials (Chairs: Prof. K. Pielichowski (Cracow University of Technology, Krakow, Poland) and Prof. S. Bourbigot (Ecole Nationale Supérieure de Chimie de Lille, France)).

Synthesis and application of polymers for environmental protection. Environmentally – Safe technologies for sustainable developments in polymer technology. Thermal- and photo-degradation, stabilization and flame retardancy of polymeric materials-(co)polymers, blends, natural polymers, (nano)composites. Fundamentals and applications.

In parallel two Workshops were organized:

(i) Contribution of FP6 ToK-NANOTEC-EST project to enhance European mobility and researcher career opportunities offered by new FP7 programme (Chair: Prof. A. Meghea, University Politehnica of Bucharest, Romania).

(ii) Molecular nano- and biophotonics for telecommunications and biotechnology (Chair: Prof. A. Miniewicz, Wroclaw University of Technology, Poland).

Two poster sessions were organized. The total number of papers presented during the oral session was 212: keynote, plenary, invited and contributed and 170 poster contributions were done. Invited plenary lectures on interdisciplinary topics were given by distinguished scientists and representatives of U.S. Air Force, European and Asian research institutions and speakers representing industry.

This book is a collection of selected and refereed papers presented at the conference. The typical presentation is multidisciplinary, containing a blend of chemistry, physics, materials processing and technology applications. The result is a comprehensive overview of polymer-related topics including innovative synthetic techniques, nanostructured materials for photonics and optics, multi-functional polymers, new composite, exotic, hybrid materials, sol-gels, device applications and environmental friendly materials and technologies. Both review and research papers are included. The review papers should assist in the cross-fertilization of different areas and training of young researchers, while the research papers will serve as useful reference materials summarizing the current status of individual topics and projecting future developments and future trends.

We wish to thank the various institutions, agencies and corporations which provided support for the conference:

Cracow University of Technology (Poland)

Institute of Natural Fibers, Poznan (Poland)

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Asian Office for Aerospace Research and Development (Tokyo)

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Institute of Glass and Ceramic, Warsaw (Poland)

Institute for Sustainable Technologies, Radom (Poland)

International Union for Pure and Applied Chemistry

Polymer Institute, Hannam University (Korea)

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