

Preface

The Fourth International Conference on Polymer Behavior was held on September 20–23, 2010, in Lodz, Poland. The preceding conferences in the series were:

- 1st International Symposium in the framework of the Kargin Conference “Polymers-2004,” Moscow, January, 2004
- 2nd the EUROMECH Colloquium 487 “Structure Sensitive Mechanics of Polymer Materials: Physical and Mechanical Aspects,” Strasbourg, October, 2006
- 3rd International Conference on Polymer Behavior, Multiphysics Approaches for the Behavior of Polymers and Polymer-Based Nanomaterials, Marrakech, Morocco, November, 2008.

The series of meetings was initiated jointly by the Institute of Mechanics of Fluids and Solids UdS/CNRS, Strasbourg (France) and Semenov Institute of Chemical Physics of the Russian Academy of Sciences, Moscow (Russia). The 4th International Conference on Polymer Behavior was organized by the Centre of Molecular and Macromolecular Studies, Polish Academy of Science, Lodz, Poland. The conference was also sponsored by International Union of Pure and Applied Chemistry.

The main goal of the conference was to discuss fundamentals, applications and experiences within the field of behavior of polymers and polymer-based nanomaterials related to their structure, both in academia and in industry. Conference was aiming also at facilitating the communication between various laboratories. The conference covered recent developments and future targets and also considered global trends and events in properties–structure relation-

ships at multiscale levels and the modeling to get the linkage between different length scales. The following topics were discussed:

- Mechanical and thermal behavior of polymers and polymer-based nanomaterials;
- Properties–structure relationship at multiscale levels;
- Linkage between different length scales;
- Microstructure sensitive materials design;
- Micromechanics;
- Computational methods, modeling, and theory;
- Molecular dynamics modeling of structural transformations;
- Innovative methods for characterization at multiscale levels;
- Nanofilled, crystalline, and nanostructured polymer materials.

Ten plenary lectures were presented during the conference (H.H. Kausch – Blecken von Schmeling, G. Mitchell, M. Hütter, G. Julius Vancso, F.J. Baltá-Calleja, B. Lotz, E. Oleinik, S. Piccarolo, R. Séguéla, and G. Michler). Thirty-six invited lectures and 32 posters were also communicated. The original papers published in this special issue of the Journal of Applied Polymer Science were selected as representative of various aspects of polymer behavior and on the basis of the scientific quality of the results.

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