

The 6th International Symposium “Molecular Order and Mobility in Polymer Systems” was held in Saint-Petersburg, Russia, 2–6 of June 2008. It was a continuation of the series of Symposia organized by the Institute of Macromolecular Compounds of RAS and titled alternatively as “Molecular Mobility and Order in Polymer Systems (I – 1994, III – 1999, and V – 2005) and “Molecular Order and Mobility in Polymer Systems” (II – 1996, IV – 2002, VI – 2008). This Symposium was dedicated to the 60th anniversary of the Symposium organizer the Institute of Macromolecular Compounds RAS (see the following article p. I)

The co-organizers of the Symposium were the Department of Chemistry and Material Science of RAS and the Scientific Polymer Council of RAS. The Symposium was supported and sponsored by the International Union of Pure and Applied Chemistry (IUPAC), Russian Foundation for Basic Research (RFBR), Saint-Petersburg Research Center of RAS and ZAO L'Oreal.

Following the tradition started in 1994, the Symposium took place in the House of Scientists (the former Palace of Great Duke Vladimir) with an impressive view of the Neva River not far from the Hermitage Museum. Interior of the Palace coming from the XIXth century is beautiful and attractive. Lectures took place in the White Hall, which is richly decorated with wall sculpture and mirrors, while Poster session was organized in the not less beautiful Oak Hall (see photo).

The main aim of Symposium was to discuss the modern problems of physics and chemistry of complex stimuli-responsive polymer systems with nano-structure organization and “soft” order preserving a pronounced molecular mobility. Both the experimental data and the results of theory and simulation were presented. The main attention at Symposium was paid to the equilibrium properties of polymer systems.

The leading scientists in polymer physics from all over the world participated in the Symposium. At the opening ceremony all participants congratulated the academician of RAS. A.R.Khokhlov was awarded by the National Prize of Russian Federation in 2008 and Professor V.P. Shibaev (Russia) and Professor M. Cohen-Stuart (the Netherlands) were elected to their National Academies of Sciences.

At the Symposium opening the participants gave a memory minute to the large-scale, outstanding researchers who left us in last years and who actively participated at former Symposia. They were the Nobel Prize Winner P.-G. de Gennes and the academicians of RAS V. Kabanov and N. Plate.

The Symposium involved a very wide range of participants not only in terms of the countries, universities and laboratories but also the positions in polymer science, age and qualification.

18 invited lectures, 63 oral communications and 266 poster presentations were presented at the Symposium. Well known active major scientist from all over the world hold invited lectures: Russia was presented by A. Khokhlov, A. Muzafarov, V. Shibaev (all three members of RAS), as well as by A. Lezov, Yu. Gotlib, A. Darinsky, I. Eruchimovich, N. Fatkullin, E. Zhulina and others; Germany by K. Binder, France by M. Renaudo and F. Leroy, the Netherlands by G. Fleer, M. Cohen-Stuart and F. Leermakers, Greece by K. Karatasos, Bulgaria by C. Tsvetanov, Finland by H. Tenhu, USA by K. Matyjaszewski, A. Grosberg and M. Tirrell, Canada by F. Winnik, Chile by L. Gargallo, Mexico by A. Robledo etc. Young scientists and students, making their first steps in science, participated at the Symposium as authors of poster presentations.

This issue contains the work from invited speakers. Unfortunately, not all of the speakers could present their work here

since some materials had been published or submitted elsewhere. Nevertheless, it seems to us that this issue provides a more or less complete picture of the Symposium topics.

When the first Symposium was organized it was named “Molecular Mobility and Order in Polymer Systems”, the second Symposium and all the following even numbers have got their name in the inverted order: “Molecular Order and Mobility in Polymer Systems”, and odd Symposia have saved original title. Thus Symposia of different parity emphasize investigation either of molecular mobility or of the structure of analogical polymer systems. In the middle of the nineties of the last century the prefix “nano” was not as popular as nowadays, in the first decade of XXI century. Nevertheless, in reality the title of Symposia showed the direction of the investigation of partly structuralized polymer systems with remaining mobility and, in fact, exactly this type of polymer systems contains nanostructural elements. During the time passed, polymer nanostructures and corresponding polymer mobility appear to be in the focus of the discussions at the Symposia in Saint-Petersburg.

This tendency is perfectly seen in the papers which are represented in this volume. The majority of the contributions are devoted to the systems which contain topologically complicated macromolecules with different functional groups, this resulting in a variety of interactions and possibilities of nanostructure formation. We endeavor to set the papers in accordance to the complication of the structure of the polymers under consideration. Contributions presented in this issue summarize both experimental and theoretical studies and include computer simulations. With exception of two last papers, publications are devoted to the

investigation of equilibrium characteristics of the systems under consideration.

The volume opens with the paper of K. Binder and al. [1] devoted to the quantitative computer simulation of classical system which is the solution of linear uncharged polymer. Further, [2–5] topologically more complicated macromolecules are under investigation. In [2]: these are cyclic macromolecules, in [3] and [5] dendrimers are described, in [4] the star-like macromolecules are under consideration. The variety of interactions is growing as well. In [4, 5] authors deal with polyelectrolytes of mentioned above topology while in [6] complex of linear and star-like polyelectrolytes is considered. The results of copolymers self-assembling are described in [7] and [8]. Ionomers self-association is studied in [7]. The paper [8] is devoted to micelles of diblock-copolymers with the core stabilized by hydrogen bonds between soluble blocks, the longer one being included both in the core and in the crown. The two following papers deal with polymer adsorption. In the work [9] stabilization of liposomes by polyelectrolytes is examined and in [10] formation of polymer complexes and its adsorption at interfaces is under consideration. The work [11] is devoted to the polymer nanocapsule organization. In the last two papers of this volume the dynamic theory of interpenetrating polymer networks [12] and results of simulation of the mechanical unfolding of protein globule [13] are represented.

The contents of this issue reflect the progress of the investigators' interests towards complicated systems with nanostructure organization. By no means this trend will be even more pronounced at the next 7th Saint - Petersburg Symposium “Molecular Mobility and Order in Polymer Systems” which is planned to take place in 2011.

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2nd line: O. V. Rud', L. I. Klushin, M. I. Charlaganov, V. P. Toschevnikov, E. B. Zhulina, S. V. Larin,  
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