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5TH INTERNATIONAL CONFERENCE ON
"TIMES OF POLYMER (TOP) AND COMPOSITES"

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5th International Conference on "Times of Polymer (TOP) and Composites" was held on June 20-23, 2010 on the Ischia Island in Hotel "Continental Terme" (Naples Bay), Italy.

This conference was organized by Department of Aerospace and Mechanical Engineering, Second University of Naples – SUN, Department Materials and Production Engineering and University of Naples Federico II.

Prof. Domenico Acierno (Department of Materials and Production Engineering University of Naples Federico II) and Prof. Alberto D'Amore (Engineering Schools of II University of Naples – SUN Department of Aerospace and Mechanical Engineering) were the Co-Chairmen of the conference.

World well known scientists were the members of the Scientific Committee. Domenico Acierno (University of Naples, Italy), Alberto D'Amore (II University of Naples SUN, Italy), David Kranbuhel (College of William and Mary, USA), Gregory B. McKenna (Texas Tech University, USA), Jovan Mijovic (Polytechnic University, Brooklin, USA), Luigi Nicolais (University of Naples, Italy), George Papanicolaou (University of Patras, Greece), Sindee Simon (Texas Tech University, Usa), Graham Williams (University of Wales Swansea, U.K.), Guennadi E. Zaikov (Inst. of Bioch. Phy. Moscow, Russia), Carla Minarini (ENEA-Italy), Francesco Ciardelli (University of Pisa, Italy), Jane Lipson (Dartmouth College, USA), Anne Hiltner (Oregon State University, USA), Jean Luc Gardette (CNRS, France), Igor Emri (University of Ljubljana, Slovenia) were members of Scientific Committee of conference.

The conference provided a forum for scientists and engineers throughout the world interested in the timescales of polymers and composites processing, structure and properties.

As time is the driving concept in the polymer science community, TOP-Conferences included sessions on various topics and provided opportunities for exchanging ideas and opinions on both fundamental science and industry-relevant subjects.

The conference program was focused on the recent advances in the following topics:

- Viscoelasticity/Rheology
- Glass Transition
- Adhesion
- Processing
- Durability/Degradation
- Biomaterials
- Fracture/Yielding
- Sensors
- Thin Films
- Composites/Nanocomposites
- New Techniques
- Transport phenomena

The program of the conference included 1 plenary lecture, 20 invited lectures, 64 oral presentations and poster sessions.

Plenary lecture was done by Prof. G. B. McKenna (Texas Tech University, USA) and was devoted to interrogating the physics of materials: mechanics of materials from glass to rubber and from the macro to the nano.

20 invited lectures were included in program. M.Q. Zhang (Zhongshan University, P. R. China) gave presentation about self-healing polymers and composites, preparation and characterization and D. Papaspyrides (National Technical University of Athens) spoke about nanotechnology and food contact materials.

Tailoring the structure and dynamics of polymer/brush-coated nanoparticle systems was discussed in the lecture of P. F. Green (University of Michigan, USA) and swelling the molecular entanglement network in polymer glasses were presented by K. Dalnoki-Veress (McMaster University, Canada).

M. Roland (Naval Research Laboratory, USA) gave information about prediction of elastomer service lifetimes and J. Lipson (Dartmouth College, USA) spoke about predicting glass transitions in thin film polymers.

The next two invited lectures were devoted to the problem of elastic and viscoelastic behavior of polymer matrix MWCNT nanocomposites (G. Papanicolaou, University of Patras, Greece) and intermolecular effects

in the dynamics of polymer melts: interplay of cooperative dynamics and entanglements (M. G. Guenza, University of Oregon, USA). The title of the lecture of V. Kulichkin (Russian Academy of Sciences, Russia) was “From rheology of nanocomposites to rheology of polymer melts: step back or forward?”

The lecture of K. Friederich (University of Kaiserslautern, Germany) had a title “On sliding wear of nanoparticle modified polymer composites” and J. Seferis (USA) reported about nano free volume: a concept for blurring the solid liquid and gaseous states in polymeric composites.

The invited lecture of A. Hiltner (Case Western Reserve University, USA) was devoted to confined crystallization of polymers in coextruded nanolayer assemblies and reaction in the melt of post-consumer poly(ethylene terephthalate) (PET) with ester functionalized polyolefins was discussed in the report of F. Ciardelli (University of Pisa, Italy).

J.-L. Gardette (CNRS, France) spoke about predicting the ageing and the long-term durability of organic polymer solar cells and I. Emri (University of Ljubljana, Slovenia) gave presentation under the title “On the behaviour of dynamically loaded polymeric”.

The viscoelastic bulk modulus and effect of macromolecular structure were discussed in the invited lecture of S. Simon (Texas Tech University, USA) and creating a uniform dispersion of surface functionalized graphene nanosheets in polymers, characterizing the polymer-particle interface and mechanical properties were

presented by D. Kranbuhel (College of William and Mary, USA).

The titles of the two last invited lectures were “On the universal properties of relaxation and diffusion in complex interacting systems” (K. L. Ngai, Naval Research Laboratory, USA) and “Elasticity and inelasticity of hard-phase reinforced polyurethane elastomers: from sensitivity to chemical and physical structure to time dependent phenomena” (C. Prisacariu, Institute of Macromolecular Chemistry Petru Poni, Romania).

The oral presentations were devoted to the problems of using polarized neutrons for elastic and dynamic studies on protein systems; nucleation of polyethylene crystals; twinkling fractal theory of the glass transition and yield stress; Au based nanocomposites towards plasmonic applications; comparing nanofillers in polylactide nanocomposites; design of novel polymeric materials by controlled selfassembly; investigation of model fuel effects on thermal oxidation of polyethylene; mass transport in nanocomposite materials for membrane separations; predicting the photoageing and photostabilization of polymer nanocomposites; effect of the compounding procedure on the structure and viscoelasticity of polymer nanocomposites.

The conference confirmed that synthesis, properties and application of polymers and polymer composites are very important things for pure and applied chemistry and for material science first of all.

The next 6th conference will be held in the same place in two years (June, 2012).