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INTERNATIONAL SCIENTIFIC CONFERENCE ON "POLYMERIC MATERIALS – 2012"

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International Scientific Conference on "Polymeric Materials - 2012" was held on September, 12 – 14 2012 in Halle (Saale), Germany. This conference was organized by Martin Luther University Halle-Wittenberg and Polymer Competence Center Halle-Merseburg in cooperation with Innovation Center Polymer Technology.

Prof. Joerg Kressler was the conference chairman. World well known scientists were included in the Program Committee: Hans-Joachim Radusch, Wolfgang Paul and Wolfgang H. Binder.

About 300 participants from 75 research centers of 23 countries (Germany, Russia, Vietnam, France, Georgia, Czech Republic, Romania, India, Belgium, Holland, Slovakia, China, Sweden, Iran, Nepal, Austria, USA, Hungary, South Africa, Algeria, South Korea, Ukraine and UK) took part in this conference.

"Polymeric Materials-2012" covered the scientific results in the field of:

- Polymer Chemistry
- Polymer Physics
- Polymer Engineering
- Polymers in Energy Engineering
- Polymers in Life Science

The program of the conference included 4 plenary lectures, 20 invited lectures, 85 reports and poster sessions.

The topic "Big Things Come in Small Packages" was discussed in the first plenary lecture (Thomas P. Russell, Amherst). The second plenary lecture was about living carbocationic polymerization (Judit E. Puskas, Akron). The topic of the third plenary lecture was "Structure of Alzheimer's beta-amyloid fibrils" (Marcus Fändrich, Halle). The last plenary lecture was devoted to the processing of biodegradable polymers for medical applications (S.-J. Liu, Tao-Yuan / Taiwan)

Symposium "Polymer Chemistry" was focused on the following topics:

- Applied Polymer Chemistry
- Polymer Synthesis
- Controlled Polymer Architectures
- Biomedical Materials
- Hybrid Polymers

This symposium included 5 invited lectures and 20 short lectures. André Laschewsky (Potsdam) presented lecture about designing smart associative hydrogels. New ring opening catalysts for original polyester materials were discussed in the lecture of Jean-François Carpentier (Rennes); Oren Scherman (Cambridge) spoke about cucurbiturils at the interface between supramolecular chemistry and materials science. The next invited lecture was devoted to amphiphilic reactive block copolymers for the surface modification of retinal prostheses (Carmen Scholz, Huntsville). The topic of the last lecture of this symposium was "Molecules as Mediators: the Role of the Interface in Inorganic-Organic Nanocomposites" (Guido Kickelbick, Saarbrücken).

The symposium's reports were devoted to the next problems: novel class of eco-flame retardants based on renewable raw materials; sensitive nanocomposite hydrogels by photo-polymerization; self healing polymers; bioactive hyperbranched polymers; mapping of the mechanical properties of silicone breast implants; formation of core-shell nanoparticles for self-healing materials; spontaneous formation of giant bioactive protein-block copolymer vesicles in water.

Symposium "Polymer Physics" included topics:

- Structure / Morphology
- Confinements
- Dynamics
- Experimental Methods
- Theory / Modeling

5 invited lectures and 21 reports were done during this symposium. The title of the first invited lecture was "Orientation of conjugated polymers: epitaxy versus mechanical rubbing" (Martin Brinkmann, Straßburg). Friedrich Kremer (Leipzig) spoke about Molecular dynamics in nanometer thin polymer layers. Bio-inspired adhesives and coatings were discussed in the lecture of Ali Dhinojwala (Akron). The fourth lecture was devoted to polymer friction and adhesion (Thorsten Hugel, München). The last lecture of this symposium was about liquid crystal mediated self assembly (Juan de Pablo, Madison).

The symposium's reports were devoted to the next problems: small angle light scattering for morphology cont-

rol; dynamics of polymer under confinement; crystallization kinetics of PET/MWCNT nanocomposites studied by fast scanning calorimetry; multiple-quantum NMR observations of constraint release and contour-length fluctuation; determination of mechanical properties of PEO macromonomer based hydrogels by piezorheology; sub-affine Behavior in strained elastomers as revealed by low-field NMR; the zeta potential as indicator for surface modifications with polyelectrolytes; one- and two-particle microrheology studied by molecular dynamics simulations and polymer electrolytes and nano-networks.

The topics of Symposium "Polymer Engineering" were:

- Polymer Blends & Nanocomposites
- Polymer Processing & Rheology
- Polymer Characterization
- Processing and Testing
- Advanced Polymer Materials
- Polymer Properties & Testing

This symposium included 7 invited lectures and 25 reports. Sabu Thomas (Kottayam) spoke about viscoelastic phase separation process and the development of micro- and nanomorphologies in epoxy based blends. The title of the second invited lecture was "Electron induced reactive processing: an advanced technique to produce thermoplastic vulcanizates (TPVs)" (Udo Wagenknecht, Dresden). The challenges of silica-silane reinforcement of natural rubber were discussed in the lecture of Wilma K. Dierkes (Twente). The topic of the next invited lecture was "Relevant process parameters for twin screw extruding" (B. Jacob, Karlsruhe). The lecture of Gernot Oreski (Leoben) was about service life testing of polymers for photovoltaic module encapsulation. The lecture of Bela Pukanszky (Budapest) was devoted to impact modification of PLA with polyurethane elastomers. The last invited lecture of this symposium was about mechanical, electrical and thermal properties of rotational moulded LDPE/graphite composites (Walter W. Focke, Pretoria).

The symposium's reports were devoted to the next problems: the fatigue behaviour of ZnO nano-modified thermoplastics; rheological and morphological properties of composites of PS-PMMA block copolymers and silica nanoparticles; modeling the molecular weight loss in single screw extrusion; influence of processing conditions on morphology and mechanical properties of PP particulate composites, drive power calculation for single screw extruders; effect of heat ageing on the morphology of thermoplastic polyurethanes; viscoelastic behavior of thermoplastic vulcanizate based on PP/EPDM; models, simulation, and optimization of plastic waste processing; filler transfer in rubber blends under kinetic and thermodynamic aspects and new composites based on spruce wood, PP and PLA.

Symposium "Polymer in Energy Engineering" was focused on the topics:

- Solar Cells (Phys. Aspects)
- Solar Cells (Chem. Aspects)
- Technical Aspects

This symposium included 3 invited lectures and 13 reports. Sabine Ludwigs (Stuttgart) gave the lecture about controlled crystallization of semiconducting. The topic of the second invited lecture was "Template-assisted fabrication of free-standing organic semiconductor nanorod arrays for organic solar cells" (Patrick Theato, Hamburg). The last lecture was about service life testing of polymers for photovoltaic module encapsulation (Gernot Oreski, Leoben).

The symposium's reports were devoted the next problems: assembly molding for resistant media tight molded interconnect devices; morphological development of conductive nanofillers in polymer melts; electrical conductivity of composites as a tool for investigation of reinforcing filler physical network; diffusion nature of electrical conductivity behavior in polymer composites containing carbon nanotubes; flow properties of an epoxy system prior conditioning in humid atmosphere and Strain-induced nucleation as to produce highly oriented iPP.

Symposium "Polymers in Life Science" was focused on the topics:

- Biomaterials
- Pharmacy

This symposium included 2 invited lectures and 6 reports. Carsten Werner (Dresden) spoke about biohybrid polymer hydrogels for regenerative medicine and Beom-Jin Lee (Suwon) discussed utilization of polymers and pharmaceutical excipients for controlled release of poorly soluble drugs.

The symposium's reports were devoted to the next aspects: formulation of stimuli responsive hydrogels based on polymer mixtures; PLA-based biodegradable and cytocompatible implant materials; fatty acid esters of starch - bio-based materials; protein and cell adhesion to chiral polymer brushes; enzymatic synthesis of amphiphilic polyesters and their application in pharmacy and solubilization of hydrophobic drugs with blockcopolymers based on poly(2-oxazoline)s.

Poster session included about 100 presentations. Scientists from Russia presented 22 posters, which were devoted to the next problems: ecologically friendly flame retardants; nanofibrous materials on the basis of biopolymer-polyhydroxybutyrate; ozone and its reactions with elastomers and rubbers; prediction of reinforcement degree for nanocomposites polymer/carbon nanotubes; the stability and destruction of composite materials based on polyethylene with natural fillers and biodegradation and medical application of poly(3-hydroxybutyrate).

The next conference will be held in 2014 again in Halle-Saale.