Joint Symposium of the German Rheological Society and the Polymer Processing Society (PPS-29) "Fundamental and Applied Rheology"

Nürnberg, Germany
July 17, 2013

Polymer processing is intimately associated with the rheological properties of polymer materials. In order to strengthen the exchange between experts of academia and industry, the German Rheological Society (DRG) and the Polymer Processing Society (PPS) organised a joint symposium "Fundamental and Applied Rheology." The symposium was part of the 29th International Conference of the Polymer Processing Society (PPS-29) and took place in Nürnberg on July 17th, 2013.

Around 40 participants attended the symposium. The first keynote lecture was presented by Heinz Rehage (University of Dortmund). His very illustrative lecture was devoted to wrinkling, tumbling and swinging microcapsules in shear flows. The deformation of viscoelastic microcapsules was investigated using optical methods, and the experimental data were compared with theoretical predictions. In the second lecture, Günter Auernhammer (Max-Planck-Institute of Polymer Research, Mainz) discussed the rheological properties of reactive silica gels. Time- and frequency-dependent measurements were performed in order to analyse viscoelastic properties and structural relaxation phenomena. The third lecture of the symposium was inspired by research in food science. Yaman Edelby (Technical University of Berlin) thoroughly investigated the rheological

This is an extract of the complete reprint-pdf, available at the Applied Rheology website
http://www.appliedrheology.org

behaviour of methyl cellulose dispersions and hydrogels. The analysis of structural and mechanical properties of colloidal and granular materials was the topic of the lecture of Jennifer Wenzel (Max-Planck-Institute of Polymer Research Mainz). Using the technique of confocal light microscopy and nanoindentation tests, correlations between mechanical load and microstructure were established. The interesting lecture of Sima Balaghi (Technical University of Berlin) was devoted to gelation behaviour of different cellulose ether polymers. The experimental possibilities of a new rotational rheometer with two motors were presented by Patrick Heyer (Anton Paar Germany GmbH). In her comprehensive lecture, Miriam Siebenbürger (Helmholtz-Zentrum Berlin) explained the experimental possibilities of the instrument V16 for neutron scattering studies in shear flows in the field of soft matter. By varying the experimental parameters in a wide range, a large number of microstructural information can be attained using the Rheo-SANS technique. The extensional rheology of polymer solutions is of high relevance in different fields. Dirk Sachsenheimer (Karlsruhe Institute of Technology) presented his new results using the capillary breakup measurement technique. His presentation focused on the determination of the elongational relaxation time for semi-dilute polymer solutions and of the axial stress in the filament from the analysis of gravity driven filament bending.

The second keynote lecture of the symposium was given by Manfred Wilhelm (Karlsruhe Institute of Technology). His illustrative overview focused on the application of Fourier transform rheology in combination with further experimental techniques on the analysis of polymer materials. Víctor H. Rolón-Garrido (Technical University of Berlin) thoroughly discussed the influence of photo-oxidation on the shear and elongational properties of low density polyethylenes in the melt. He analysed failure and rupture during stretching and also compared experimental data with the results of different molecular theories. The inspiring lecture of Carina Gillig (Albert-Ludwigs-University of Freiburg i. Br.) was devoted to melts of hyperbranched polymers. The influence of molecular architecture on the thermorheological properties was studied in detail. Finally, the interplay of morphology and rheology in foaming of block copolymers was discussed by Ulrich Handge (Helmholtz-Zentrum Geesthacht). The phenomenon of microphase separation leads to nanostructured cell walls of the block copolymer foam.

The award of the German Rheological Society is given biannually to scientists for an outstanding PhD dissertation in the field of rheology. In this year, Marcel Roth (Max-Planck-Institute of Polymer Research, Mainz) and Michael Kempf (Karlsruhe Institute of Technology) achieved the award of the DRG. In the award ceremony, the laureates presented their works in two lectures. In his Ph.D. thesis, Marcel Roth discussed the rheological properties of colloidal systems with a strong focus on the structural dynamics. The Ph.D. dissertation of Michael Kempf was devoted to the synthesis and rheology of model comb polymer architectures. The rheological properties of the polymers were correlated with their molecular structure, i.e., the degree of branching. In 2014, the German Rheological Society organizes the Annual European Conference on Rheology 2014 from April 8 – 11 in Karlsruhe: http://www.aerc2014.kit.edu/.

Ulrich Alexander Handge for AR

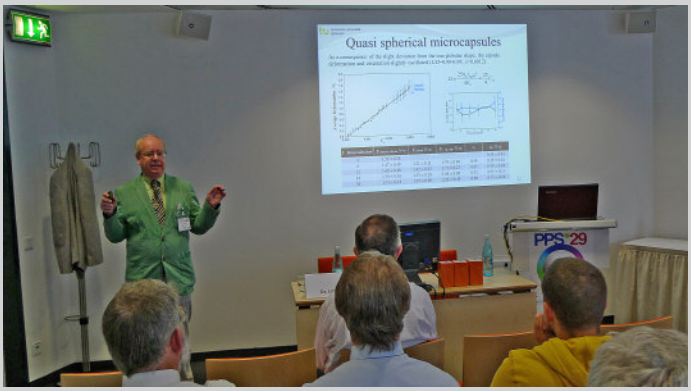

Figure 1 (left): Heinz Rehage gave a keynote lecture on deformation phenomena of microcapsules in shear flows.

Figure 2: The laureates of the award of the German Rheological Society (DRG), their supervisors, and the President of the DRG. From left to right: Günter Auernhammer, Marcel Roth, Michael Kempf, Manfred Wilhelm, and Norbert Willenbacher.

This is an extract of the complete reprint-pdf, available at the Applied Rheology website
http://www.appliedrheology.org