

GERMAN SOCIETY OF RHEOLOGY, WORKSHOP
APRIL 22-23, 2004
BERLIN (GERMANY)

The workshop "Rheology of Disperse Systems", organized by the German Society of Rheology, took place in Berlin at the Federal Institute for Materials Research and Testing (BAM) from April 22nd until April 23rd 2004. With this seminar the German Society of Rheology tried to find a new way for a fruitful communication amongst German rheologists at a time which sees European and international activities growing. Prof. Dr. H. Münstedt (University of Erlangen-Nürnberg), Dr. N. Willenbacher (BASF Ludwigshafen), and Prof. Dr. W. Mielke (BAM) organized a meeting that highlighted different aspects of disperse systems from the theoretical background to practical aspects, from characterization methods to rheological properties of polymer blends, nanocomposites, dispersions, suspensions and emulsions.

Eleven speakers from universities and companies presented their results and ideas to a highly interested and competent audience of representatives from academic institutions, industrial companies, instrument manufacturers and national laboratories. The 45 minutes presentations followed by 15 minutes for discussion offered the possibility to go into detail of a subject and to intensively discuss a topic.

The first day of the workshop was opened by Prof. Dr. H. Münstedt, chairman of the German Society of Rheology. He emphasized the outstanding structure of the seminar, which

offers the possibility to broaden and intensify the rheological knowledge in a more focused way than it would be feasible at big events like the European Conferences on Rheology. After his welcome the participants were asked to introduce themselves and to state their expectations. This procedure eased the way to get into contact with each other. The first lecturer Prof. Dr. M. Fuchs from the University of Konstanz (Germany), spoke about non-linear rheology of concentrated dispersions. Starting with the structure of fluids and taking into account the cage effect he expanded theoretical models to simulate shear advection phenomena. Experiments and simulations showed satisfying agreement. Dr. M. Schmidt from Bayer AG (Germany) introduced the rheological behavior of filled polymers under shear strain. With the help of model suspensions it is possible to systematically analyze features and results can be used to improve the handling of complex commodities. Prof. Dr. H.-J. Radusch from the University of Halle-Wittenberg (Germany) showed, that the basis for the understanding of the formation of morphological structures of polymer blends during melt mixing lies in thermodynamical functions and in the rheological behavior. If one can understand those building mechanisms it may be possible to obtain specific morphologies. Dipl.-Ing. M. Heindl from the University Erlangen-Nürnberg (Germany) talked about blends, too, but focused on the formation of morphological structures in polymer blends under elongational strain. He showed that the deformation of polyethylene particles dispersed in a polystyrene matrix can be described by a modified capillarity number. The last lecture of the first day led the audience into the world of nano-fillers. Prof. Dr. Dr. Chr. Friedrich from the University of Freiburg (Germany) reported about liquid-solid-transitions in disperse materials. Such transitions can be observed with nano-scaled fillers at already low concentrations and become visible through the appearance of strong thixotropy.

In the evening most of the delegates took the chance to join the evening program organized by Prof. Dr. W. Mielke. It started with a two hours guided tour over the Potsdamer Platz, Berlin's new cultural and architectural focus after the fall of the Berlin Wall. The two guides, both art-historians, fascinated the group

Organizer of the
DRG workshop:
Prof. Dr. W. Mielke,
Dr. N. Willenbacher,
Prof. Dr. H. Münstedt.



with so much interesting information about the history of the square, the elegant Sony Center and the huge Daimler-Chrysler area, that time went by very fast. The day was closed with a dinner at the noble Cafè/Restaurant Josty, located in the Sony Center.

On the second day Dr. Th. Reisinger from Ticona GmbH (Germany) took up the nano-topic of the last lecture of the day before. He showed, that the rheological characterization of nanocomposites consisting of clay in polymer lead to shear thinning exponents that can be used as a semi-quantitative correlation for the exfoliation of the layers. Prof. Dr. J. Mellema from the University of Twente (The Netherlands) talked about emulsions and rheology. He made clear that surfactants play a role in the flow behavior and that the breakup phenomena is crucial in emulsion flow, in particular in emulsification. The next lecture was about controlled structuring of dispersed food systems. Dr. Peter Fischer from the ETH Zürich (Switzerland) showed that droplet generation, deformation and gelation in complex flow depend on the kinetic structure building. The Farris model describes rheological measurements of sphere-fiber suspensions very well. Dr. N. Willenbacher from BASF AG (Germany) introduced the audience to the rheology of colloidal polymer dispersions and related formulations by presenting different experimental data. He talked about colloidal interactions, the effect of ionic strength, particle size and temperature as well as binder-thickener interactions. After the lunch-break Dipl.-Phys. R. Brummer from Beiersdorf AG (Ger-

many) presented rheological phenomena of cosmetic products. He made his talk very vivid with illustrating rheological examples from daily life by short videos. The seminar closed with a lecture of Prof. Dr. W. Richtering from RWTH Aachen (Germany). He talked about rheo-optical investigation of shear-induced structures in surfactant mesophases. The process of vesicle formation is shear induced and influenced by the temperature. Different to pure systems he found that at high stresses lamellar spacing, Caillé parameter and vesicle size decrease. This might be due to shear induced microphase separation.

Recapitulating the workshop it can be said that this new type of seminar organized by the German Society of Rheology was successful. There was enough time for the speakers to go into detail and thus stimulating intense discussions resulting in a fruitful exchange of ideas. In spite of the specific topic of the workshop "Rheology of Disperse Systems" a great variety of topics were addressed and a lot of knowledge and experience was offered to the audience.

The next workshop of this kind organized by the German Society of Rheology will take place on June 18th 2005 in Leipzig preceding the 21st Annual Meeting of the Polymer Processing Society. It's topic is "Rheology and Processing".

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