Processing of High Viscous Materials

June 16–17, 2005
Schkopau, Germany

The processing of high viscous material in the polymer, ceramics and food industry was main subject of the meeting organized by DECHEMA (German Society of Chemical Technology and Biotechnology) in collaboration with DOW. Taking place at their Schkopau plant near Merseburg the meeting attracted more than 70 participants. To keep the discussion lively the number of contributions was limited (academia 13 presentations, industry 7 presentations). The invited speakers though reported on various different aspects such as mixing, pumping, degassing, and high temperature analytics as important steps in polymer and ceramics industry.

The first day started with two keynote lectures on mixing /dispersing techniques for high viscous blend materials. Erich Windhab from ETH Zurich gave an overview on a coupled experimental, numerical, and modeling approach to understand mixed flow fields occurring in extruders and other blending devices. As outlined the technique eventually can be used to develop new tailor-made extruder screws for high precision dispersing and mixing. The second keynote lecture by Manfred Pahl from University Paderborn focused on the state-of-the-art of dynamic and static mixers. After a short coffee break M. Hötzel continued on the dispersion flows in twin-screw extruders while D. Bothe (University Paderborn) and A. Kilzer (University Bochum) changed gear towards spraying of polymer melts. The first talk focused on the simulation on powder paint generation in ultrasonic sonotrodes, in particular on the breakup of the liquid lamellae into droplets. The afternoon session started with a keynote lecture on production, characterization, and processing on high viscous ceramic pastes given by F. Clemens from EMPA Dübendorf (Switzerland). Keeping the subject, G. Schmidt (Bergakademie Freiberg/Germany) and C. Treul (University Erlangen-Nuremberg) reported on the rheology of highly concentrated ceramic suspensions and the influence on particle size distribution on the flow behavior. Finishing the first day, B.A. Wolf (University Mainz) and Peter Fischer (ETH Zurich) reported on subject as the rheology of polymer blends and milk protein suspension, topics with much more in comment as one might think at the first glance. Set with in the gardens and barn of Schloss Schkopau (Schkopau Castle) the meeting found its social highlights during dinner.

The second day very much focused on polymer blend technology. T. König from Bayer Corp. reported on recent developments in high viscous mixing from an industrial point of view. Similar to previous contributions he stressed the combined approach on CFD and experimental methods. Technological important aspects such as processing of temperature sensitive polymers, removal of solvents, and handling of raw materials were discussed by A. Diener (List Corp., Switzerland), R. Oertel (Dow Corp.), and S. Luther (Degussa Corp.), respectively. Wrapping up the meeting, contributions by N. Katsikis, A. Roosen, and S. Lambertz on the influence of filler material on the rheology of either polymers, elastomers, and pastes gave both new aspects but also a summary of previous contributions. Further information on DECHEMA meeting can be found at www.dechema.de

pf for AR, photographs by Ronald Oertel (DOW)

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