

Short Course on Suspension Rheology ICR

MONTEREY, CA, USA
AUGUST 2–3, 2008

Conference Report I

At the occasion of the XVth International Congress on Rheology in Monterey CA, the Society of Rheology organized two short courses before the meeting. This continues a successful tradition of the SOR to have short courses before their Annual Meetings. The present one on Suspension Rheology was taught by Prof. N. Wagner from the University of Delaware and Prof.-Em. J. Mewis from the K.U.Leuven, Belgium. The course attracted a large audience (see picture), actually a record crowd for such a course, with not only academia but also industry well represented. The goal was to provide people with a qualitative understanding of the various phenomena that govern suspension rheology. Wherever possible useful quantitative laws and/or scaling relations were presented to help predict the rheological properties of various types of suspensions. Finally, participants were introduced to strategies and problems involved in characterizing suspensions for formulation, processing and applications.

After a brief introduction to rheological and colloidal concepts, the course started with an extensive discussion of the different mechanisms that can contribute to the complex rheology of suspensions. First the possible results of purely hydrodynamic effects on structure and rheology were reviewed. Then colloidal phenomena were systematically added, by presenting Brownian hard spheres, colloidally stable systems and finally flocculated suspensions. Each time the starting point was a set of representative data. It was followed by a qualitative explanation of the results, providing insight in the possible role of the various mechanisms and in the underlying microstructure. Non-Newtonian viscosities, yield stress, viscoelasticity and thixo-

tropy were all covered. Available tools and relations to support rational design of suspensions were included. Because of the divergent background of the audience the presentations were interspersed and followed up with questions and discussions that covered a wide range of topics. At the end of the first day the participants were even challenged with a problem for homework!

With the basic elements of suspension rheology mapped out, some important problems were tackled in the second part. The specific problems that arise when measuring suspensions took central position here. This resulted in recommendations for developing measurement strategies. To illustrate how the available know-how could be applied, a case study for designing a suspension with given behavior was presented. In a final session on advanced topics there was time left to discuss suspensions in viscoelastic media, covering the important cases of filled polymers and nanocomposites.

From the evaluations of the participants it is obvious that the course was timely and well appreciated. As there is an initiative to coordinate and exchange successful courses between the SOR and the European Society of Rheology, the course might perhaps be repeated at the next annual meeting of the ESR.

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Figure 1:
A picture of the participants
of the short course, taken on
August 2, 2008.



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