

RHEOLOGY, RHEO-PHYSICS AND FLOW-INDUCED STRUCTURES OF LIQUID CRYSTALLINE POLYMERS, SURFACTANTS AND BLOCK COPOLYMERS (EURORHEO 99-1) IN SOPHIA - ANTIPOLIS, FRANCE, MAY 3RD-7TH, 1999

During the very first week of May 1999, around 100 participants came to the South of France to attend a meeting devoted to "Rheology, Rheo-Physics And Flow-Induced Structures Of Liquid Crystalline Polymers, Surfactants And Block Copolymers". A long title for an intense week. Patrick Navard from the Centre de Mise en Forme in Sophia-Antipolis and Claudia Schmidt from University of Freiburg were the organizers of this meeting hosted by the Centre de Mise en Forme. The meeting covered some of the major fields of rheology and rheophysics.

One has to go back by one year to trace the original idea of organizing such a conference. It was during one of the semi-annual meetings of the eight European groups belonging to a "Training and Mobility for Researchers" Network*. In Lauret (France), lost in the middle of the mediterranean Garrigue, in June 1998, the participants of the network on "Rheology of Liquid Crystals" decided to organize an international meeting, extended to topics closely connected to liquid crystals such as polymer blends and block copolymers. This idea was realized successfully, since 20 different countries were represented at Sophia-Antipolis. The meeting was endorsed by the "Macromolecular Section of the European Physical Society" and by the European Society of Rheology (EURORHEO 99-1).

The highlights of the conference were the keynote lectures. Two of them were devoted to NMR spectroscopy of complex fluids under flow. Claudia Schmidt started with the deuteron NMR spectroscopy that enables one to investigate the

director reorientations of a liquid crystal subjected to shear flow. Applied to liquid crystalline polymers and to nematic mesophases as well, this can be a means to determine the viscosity (Leslie) coefficients. The second NMR keynote lecture was given by Paul T. Callaghan from Massey University (New Zealand). NMR is used there as a microscope and the velocity profiles of complex fluids in different geometries can be determined with accuracy. Fascinating shear-banded flows could be evidenced with this velocimetry imaging technique, as in the self-assembled worm-like micelles systems, but also in semidilute polymer solutions. Wesley R. Burghardt from Northwestern University (USA) focused his lecture on the powerful technique of time-resolved x-ray scattering, especially used in the contexts of liquid crystals and complex flow geometries. Thanks to the synchrotron sources which enable to collect data within seconds (and often less), the transient orientation behaviors of liquid crystals in well-defined rheological schemes can be traced accurately. Hydrodynamic simulations in surfactant mesophases were the subject of the lecture given by Mike E. Cates from the University of Edinburgh (UK). The difficulty of simulating complex fluids undergoing various flows was here overcome by using the so-called Dissipative Particle Dynamics approach. Equilibrium and dynamical phase behavior could be successfully constructed in order to mimic lyotropic smectic phases of membranes. The keynote lectures emphasized the main interests of the attendees. But the conference was more than that. Fifty-four oral contributions and twenty-five posters were presented during the week, covering the field of rheology of complex fluids. The conference also provided the opportunity for us to appreciate the evenings in the ancient harbor of Antibes, which was a pleasant refuge to prepare for the next day.

* The TMR-Network "Rheology of Liquid Crystals" (contract number FMRX-CT96-0003) is financially supported by the European Community.

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