

Supramolecular Structures Probed by Rheology and Small Angle Scattering Methods

**W. Pyckhout-Hintzen¹, M. Staropoli^{1,2}, M. Kruteva¹, J. Allgaier¹,
A. Wischniewski¹, D. Richter¹**

¹*Forschungszentrum JCNS-1/ICS-1, D-52425 Jülich, Germany,*

²*Luxembourg Institute of Science and Technology, L-4422 Belvaux, Luxembourg*

E-mail: w.pyckhout@fz-juelich.de

A specific hetero-complementary and supramolecularly associating system, consisting of thymine- (Thy) and diaminotriazine- (DAT) -modified polyalkylene-oxide polymers in the bulk state is studied by means of a combination of linear rheology, dielectric spectroscopy, pulsed field gradient (PFG) NMR and especially small angle scattering using X-rays and neutrons.

A temperature range of about 100 degrees is covered. Linear chain extensions as well as comb- or star-like architectural variations by the functional group association are induced. From unentangled mono-functional model systems self-complementary interactions between the functional groups are shown to be less important than the hetero-association. With a Random-Phase Approximation model for the block-copolymer-like associates, aggregation degrees and Flory-Huggins parameters comparable to empirical estimates are revealed. Sophisticated combination of dynamical and structural properties allows the design of mixed transient/covalent networks with controllable properties for damage management.