MI 5: International Year of Light

Time: Tuesday 10:30–11:15 Location: EMH 225

Invited Talk MI 5.1 Tue 10:30 EMH 225

Dynamic Light Scattering on Polymer Gels — •Bernhard Ferse[1], Franziska Krahl[2], Doreen Beyer[3], Karl-Friedrich Arndt[4], and Andreas Richter[1] — [1]TU Dresden, Institut für Halbleiter- und Mikrosystemtechnik, Polymere Mikrosysteme, D-01062 Dresden, Germany — [2]Institut für Luft- und Kältetechnik gGmbh, Bertolt-Brecht-Allee 20, D-01309 Dresden, Germany — [3]TU Dresden, Molekulare Funktionsmaterialien, D-01062 Dresden, Germany — [4]TU Dresden, Physikalische Chemie der Polymere, D-01062 Dresden, Germany

Polymer gels, especially hydrogels, form a class of soft matter between liquids and solids. In swollen state more than 99% of the gel can consist of the swelling agent, nevertheless, it can still keep in an elastical way its predestined shape and geometry. Under pressure, the swelling agent stored in the gel will not be released into the environment. Therefore gels can be regarded as solids.

Due to the fact that hydrogels are not homogenous, fully-connected polymer networks, but contain several types of spatial inhomogeneities, the mechanical properties of gels are two weak to withstand large deformations.

Remarkable progress in understanding the gelation mechanism and moreover the network structure leads to the development of hydrogels with enhanced mechanical properties.

The crosslinking of macromolecules is associated with a change in the mobility of the network chains due to the collective diffusion of gels. This can be observed by dynamic light scattering, which is a non-destructive method to monitor the formation of network structures. The investigation of the gelation mechanism and the inhomogeneities of polymer gels is of recent scientific interest in order to better understand the structure-property relationship of gels.