

Abstract Submitted
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The observation and evaluation of cross-linking inhomogeneity from the displacement of nanoparticles embedded in polymer network by small angle scattering under elongation KENGO NISHI, Goettingen University, MITSUHIRO SHIBAYAMA, The University of Tokyo — We have investigated the effect of polymer/filler interaction on the displacements of silica nanoparticles in gels by introducing them into poly (N,N-dimethylacrylamide) gels (PDAM-NP gels), and polyacrylamide gels (PAM-NP gels). It is well known that PDAM chains in gels are strongly adsorbed onto silica nanoparticles while PAM chains are not. We carried out SAXS measurements on these gels under uniaxial elongation. Interestingly, we found that the SAXS scattering profiles of PDAM-NP gels and PAM-NP gels were totally different. A four-spot pattern was observed in the 2D structure factors of PDAM-NP gel and was assigned to a movement of the nanoparticles in an affine way. On the other hand, as for PAM-NP gels, sharp peaks were observed in much lower q region than affine deformation, indicating that the peak corresponds to the correlation peak of high cross-linking region. Furthermore, we propose a new analysis method to evaluate concrete and detailed information from anisotropic scattering patterns.

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