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How Neutrons Help Understanding the Behavior of Adaptive Microgels

Wednesday, December 8, 2021 9:30 AM (45 minutes)

Microgels are macromolecular networks swollen by the solvent they are dissolved in. They are unique systems that are distinctly different from common colloids, such as, e.g., rigid nanoparticles, flexible macromolecules, micelles or vesicles. When swollen, they are soft and have a fuzzy surface with dangling chains and the presence of cross-links provides structural integrity - in contrast to linear and (hyper-) branched polymers. Finally, microgels reveal interface activity without being amphiphilic. Due their properties, microgels can be used to tune the particle-to-polymer transition.

We will discuss properties of stimuli-sensitive microgels of different architecture (as e.g. ultra-low crosslinked, hollow, multi-shell, anisotropic) in solution. The structure of microgels is investigated by means of scattering methods, especially exploiting the technique of contrast variation in small angle neutron scattering. We will discuss properties of individual microgels as well as the effect of crowding in dense solutions and we compare experimental results to computer simulations.

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