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Adaptive microgels: to squeeze or not to squeeze?

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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. They find applications e.g., in biocatalysis and as sensors.
At high packing density, microgels can deswell, interpenetrate and deform, thus they can behave like particles or / and macromolecules. Due their properties, microgels can be used to tune the particle-to-polymer transition.
We will discuss properties of microgels of different architectures both in aqueous solution and at interfaces. In particular we will address ultra-low cross-linked microgels, hollow and anisotropic microgels which are sensitive to stimuli as, e.g. temperature and pH.
The structure of microgels is investigated by means of scattering methods, especially exploiting the technique of contrast variation in small angle neutron scattering. The results will be compared to data obtained from super resolved fluorescence microscopy, scanning force microscopy and computer simulations.

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