

PHYSICAL CHEMISTRY & FORMULATION

M. Ballauf, Helmholtz-Zentrum Berlin, Germany

Flow Behavior of Colloidal Suspensions

Soft Matter and Functional Materials, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, 14109 Berlin, Germany, and Institut für Physik, Humboldt-Universität zu Berlin, 12489 Berlin, Germany

Colloidal suspensions consist of colloidal particles with diameters in the range of 50 - 500nm that are dispersed in a solvent, mostly water. These systems have acquired a tremendous technical importance and colloidal suspensions have found applications that range from wall points to cosmetics. The flow behavior of such suspensions is often of central importance when considering applications. In my lecture I shall discuss our recent rheological studies on suspensions of well-defined particles in water. Special emphasis is laid on concentrated systems that exhibit a viscoelastic behavior together with shear-thinning. We demonstrate that all findings can be rationalized in terms of a fluid-to-glass transition within the suspensions brought about by raising the volume fraction of the particles. Practical implications of these finding will be discussed as well.