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Microgel Particles: Absorption of Surfactants

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This lecture is concerned with some recent studies of dispersions of microgel dispersions and of monolayers of microgel particles deposited on surfaces [1]. Microgel particles are particles of cross-linked polymers, copolymers or polyelectrolytes, dispersed in a solvent medium (in this case water), which swell (with solvent molecules) and deswell in response to changes in the local thermodynamic conditions. Triggers for such a response include temperature, solvent composition and light, and in addition, for polyelectrolyte-based systems, pH and ionic strength. In this lecture several types of microgel system will be discussed, including those based on poly(N-alkylacrylamides), poly(vinyl pyridine), amphoteric and core-shell systems. Both equilibrium swelling and swelling/deswelling kinetics will be discussed.

Microgel particles provide interesting systems for the study of controlled aggregation and rheologically-responsive dispersions, and for controlled uptake / release. With respect to the latter topic, this lecture will focus on the uptake and release of non-ionic [2], cationic [3] and anionic surfactants [4] into and from the different types of microgel particles referred to above. This could have various applications, such as the release of drugs and bactericides.

References

[1] V. Nerapusri, J.L. Keddie, B.Vincent and I. Bushnak, *Langmuir*, 2006 **22** 5036.
[2] M. Bradley and B.Vincent, *Langmuir*, 2005 **21** 8630.
[3] V. Nerapusri, J.L. Keddie, B.Vincent and I. Bushnak, *Langmuir*, in press, 2007.
[4] M. Bradley and B.Vincent, *Langmuir,* to be submitted.