PHASE EQUILIBRIA OF POLYDISPERSE POLYMER AND COLLOID SYSTEMS

PETER SOLLICH
Department of Mathematics, King's College, University of London, Strand, London WC2R 2LS, UK

Abstract:

I describe recent work on the effects of polydispersity, in e.g. the length or chemical composition of polymer chains, or the size of colloidal particles on equilibrium phase behaviour. The main challenge for predicting such phase behaviour theoretically is that the free energy depends on an effectively infinite number of conserved densities, one for each particle size (or chain length, ...). I will outline the moment free energy method which allows one, without further approximation, to predict most features of phase behaviour from an appropriately simplified free energy that depends on only a finite number of conserved densities. Applications to homo- and co-polymers and suspensions of spherical and rod-like colloids are described