

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**Mechanism of polymer nanoparticle formation by nanoprecipitation** CHEN ZHAO, TINGTING LI, EDWARD VAN KEUREN, Georgetown Univ — Nanoprecipitation method is a simple and convenient way to produce nanoparticles from polymers in solution. The control of nanoparticle size and size distribution plays a pivotal role in the use of nanoprecipitation for drug delivery. We investigated various factors and initial conditions that affect the particle size, such as the initial solute concentration, solvent/non-solvent ratio and the molecular weight of the polymer samples. The results shed light on the mechanisms of particle formation and phase separation which occurs in nanoprecipitation. Spinodal decomposition, which takes place as a result of a quench to a sufficiently high supersaturation, is believed to be the main mechanism that governs the phase separation. In addition, the glass transition of the polymers will also be a key factor that contributes to the thermodynamics and kinetics of the phase separation and the resulting particle size and morphology.

Chen Zhao  
Georgetown Univ

Date submitted: 05 Nov 2015

Electronic form version 1.4