610d Growth Kinetics of Polyamine/Salt Coacervates

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Coacervates have been loosely described as a separate phase formed when either oppositely charged polymers interact or when a single polymer is forced to phase segregate from its solution due to desolvation. Little is known about this phase separation phenomenon and even less work has been done to harness coacervation as a route to construct functional materials. We demonstrate that the polyamines can be induced to form spherical coacervates by addition of simple multivalent ions like EDTA4-. Interestingly, these coacervates can direct the assembly of charged nanoparticles to form robust organic/inorganic hybrid microcapsules (Rana et al., Adv. Mater., 2005, 17(9), 1145-1150). In this presentation, we will discuss the details of formation mechanism and growth kinetics of poly(allylamine)/Citrate3- coacervates. Through dynamic light scattering and confocal microscopy, we have established that the growth process takes place by droplet-droplet coalescence wherein the coacervates grow bigger with time. We will discuss growth kinetics, as a function of pH, polymer concentration, salt concentration, and temperature.