

Abstract Submitted
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Reversible pH-Induced Structural Transition in a Polyelectrolyte-Surfactant System: from Semi-flexible Rod to String of Spheres VIET LAM, LYNN WALKER, Carnegie Mellon University — We have characterized a polyelectrolyte-surfactant system that forms stable rod-like aggregates in aqueous solution. While this structure is stable to most changes in solution condition, we have observed a reversible change in behavior with pH. This is due to a pH-induced structural transition from the original semi-flexible rod at neutral pH to a more flexible object at acidic conditions. A simple model of polyelectrolyte chain crossing multiple surfactant spherical micelles, or a string of spheres, has been proposed as the structure of the aggregates at low pH. This represents a novel rod-like nanoscale system that goes through a reversible gelation with pH, with possible use in oil drilling (matrix acidification aid), liquid flow control, or transport of hydrophobic materials. Here, we will present a simple model of the structural change and experimental justification.

Viet Lam
Carnegie Mellon University

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