

Abstract Submitted
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Kinetics of Swelling and Collapse in Polyelectrolyte Systems¹

ARINDAM KUNDAGRAMI², SOUMIK MITRA³, SWATI SEN⁴, Indian Institute of Science Education and Research (IISER) Kolkata, Mohanpur 741246, India — Equilibrium phase behaviors of polyelectrolyte systems have been well-studied over past several decades. Our group has been working on to explore the kinetic processes which take the system from non-equilibrium to such equilibrium configurations. Specifically, we will present recent results on the kinetics of swelling and collapse of a single, isolated, and flexible polyelectrolyte chain, which is described by a theoretical model considering charge-regularization, in both salt-free and salty conditions. The equation of motion of the kinetics is developed from the osmotic and viscous forces, and the numerical solutions provide the temporal profiles for size and charge of the chain for swelling and de-swelling in good solvent, and collapse in poor solvent. Analytical expressions are explored in suitable limits. The results obtained for the single chain are put in perspective to those obtained for polyelectrolyte gels.

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