

Abstract Submitted  
for the MAR05 Meeting of  
The American Physical Society

**Polyelectrolyte Spin-Assembly: Effect of Ionic Strength and Spinning Rate on the Growth of Multilayered Thin Films** CHRISTOPHE LEFAUX, PRITESH PATEL, JUNHWAN JEON, Institute of Materials Science, University of Connecticut, ANDREY DOBRYNIN, Institute of Materials Science and Department of Physics, University of Connecticut, PATRICK MATHER, Department of Macromolecular Science and Engineering, Case Western Reserve University — Polyelectrolyte spin assembly (PSA) of multilayers is a sequential process featuring adsorption of oppositely charged polyelectrolytes from dilute solutions undergoing spin-coating flow. We investigated the dependence of multilayer film build-up of poly(sodium-4-styrene sulfonate) and poly(allylamine hydrochloride) on solution ionic strength and spin rate. We observed that at fixed spin rate the PSA growth rate shows a non-monotonic dependence on salt concentration. It first increases and then decreases with increasing the solution ionic strength. This observation is a manifestation of two competing mechanisms driven by electrostatic interactions and shear flow, which control film build up. This non-monotonic behavior is explained in the framework of a Flory-like theory of multilayer formation from polyelectrolyte solution under shear flow. We performed molecular dynamics simulations to further elucidate the factors controlling the film structure.

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Date submitted: 01 Dec 2004

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