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Chain Dynamics and Layering within Spin-Assisted versus Dip-Assisted Polyelectrolyte Multilayer Assemblies ALIAKSANDR ZHUK, VICTOR SELIN, Department of Chemistry, Chemical Biology and Biomedical Engineering, Stevens Institute of Technology, Hoboken, New Jersey 07030, JOHN F. ANKNER, Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, USA, SVETLANA SUKHISHVILI, Department of Chemistry, Chemical Biology and Biomedical Engineering, Stevens Institute of ology and Biomedical Engineering, Hoboken, New Jersey 07030 — We report on the effect of deposition technique on polyelectrolyte (PE) chain dynamics within layer-by-layer (LbL) films, and on the stability of these films in salt solutions. Spin-assisted LbL (SA-LbL) films demonstrated a higher degree of film stratification, as well as greater salt stability, compared to dip-coated assemblies. Lateral and vertical polyelectrolyte diffusion of PE chains within LbL films, measured by fluorescence recovery after photobleaching (FRAP) and neutron reflectometry (NR), respectively, revealed a much higher degree of anisotropy for SA-LbL films as compared to dip-coated multilayers, with diffusion coefficients $\sim 10^6$ larger in parallel to the substrate versus those in the perpendicular direction. The data suggest that the degree of PE chain flattening and film stratification significantly affects PE chain dynamics and film behavior in salt solutions.

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