

Abstract Submitted
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Diffusional Response of Assembled Polyelectrolyte Chains to Salt Annealing¹ 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, SVETLANA SUKHISHVILI, Department of Chemistry, Chemical Biology and Biomedical Engineering, Stevens Institute of Technology, Hoboken, New Jersey 07030 — We report on the effect of salt on the diffusion of polyelectrolyte (PE) chains within electrostatically assembled polyelectrolyte multilayers. Layer-by-layer (LbL) films were assembled using poly(methacrylic acid) (PMAA) as a polyanion and quaternized poly-2-(dimethylamino)ethyl methacrylate as a polycation. Fluorescence recovery after photobleaching and neutron reflectometry were used to monitor the center-of-mass diffusion of PMAA chains in directions parallel and perpendicular to the substrate ($D_{//}$ and D_{\perp} , respectively). In both directions, the diffusion coefficient was exponentially dependent on salt concentration, with significantly faster diffusion in the direction parallel to the substrate. At the same time, $D_{//}$ dramatically decreased with salt annealing time as the films became increasingly intermixed, reflecting strong coupling between internal layering and PE chain dynamics within LbL films.

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Victor Selin
Dept of Chemistry, Chemical Biology and Biomedical Engineering,
Stevens Institute of Technology, Hoboken, New Jersey 07030

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