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Surface Energy Effects on Polyelectrolyte Adsorption RYAN J. MURPHY, VIVEK M. PRABHU, DENIS PRISTINSKI, ERIC K. LIN, N.I.S.T. - Polymers Division — Fluid-based directed assembly of functional nanoparticles is a promising approach to rapid fabrication of future devices. Current approaches of precise placement of these nanoscale building blocks onto pre-defined positions formed by lithography are of current interest. These methods allow for designer surfaces containing feature sizes both chemical and topological on the nanometer length scale. However, little is known about the kinetics of self assembly of charged macromolecular building blocks. Here, we investigate the adsorption kinetics of cationic polyelectrolytes as a function of surface energy, prepared by combinatorial methods. Ellipsometry and quartz crystal microbalance are used to understand the equilibrium and dynamic behavior. Constructing the adsorption phase diagram is a crucial first step towards developing a process mechanism for the directed assembly of nanoscale building blocks with polymers and nanoparticles as model systems.

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