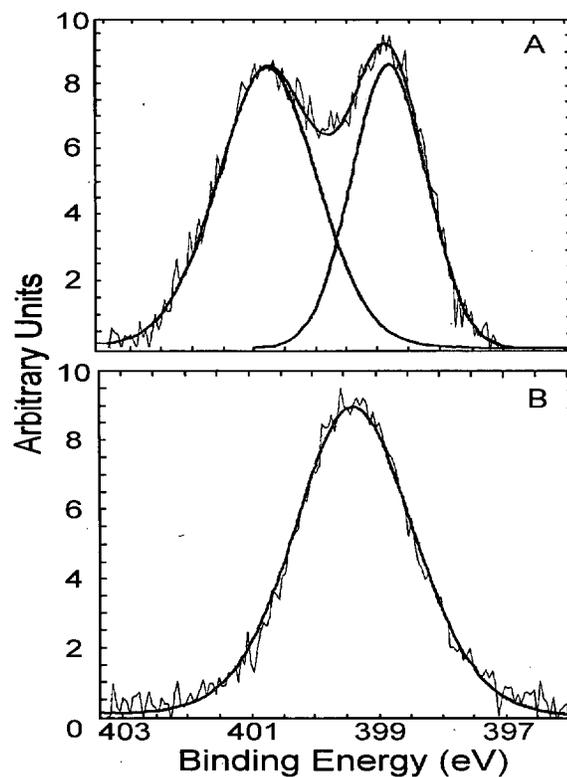


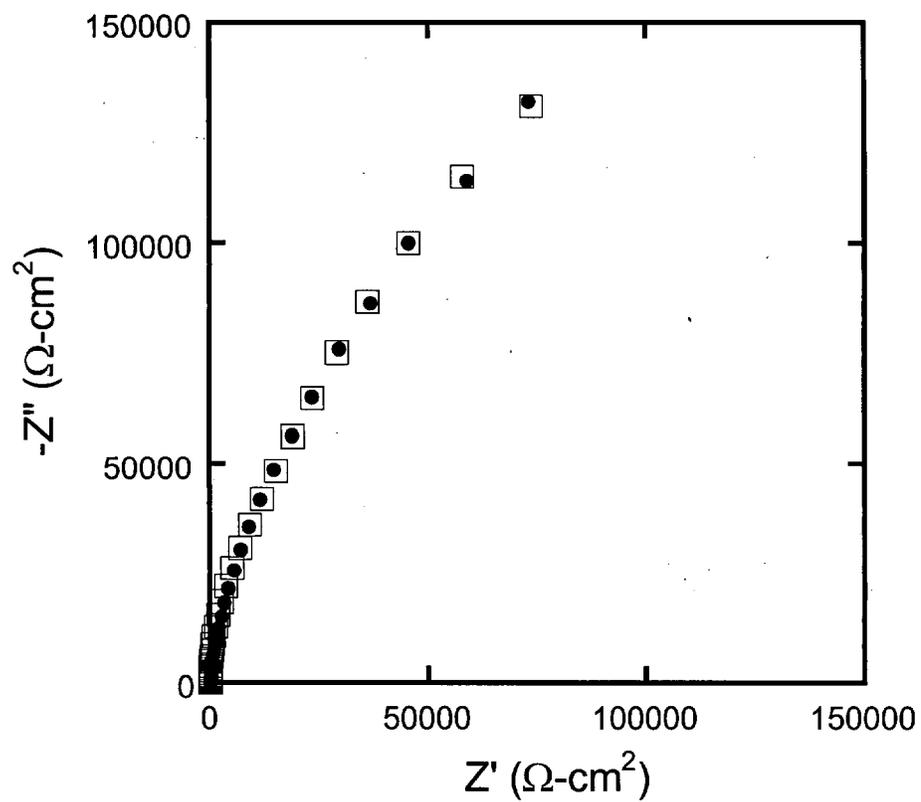
Supporting Information

Figure 1. XPS spectra of the N_{1s} region of a 9 layer PAH/PAA film before (A) and after heating for 2 hours at 215 °C (B). Binding energy is referenced to the C_{1s} peak for hydrocarbons (284.6 eV). Figure 2A exhibits two peaks that we attribute to amino (398.8 eV) and ammonium (400.8 eV) nitrogens. . (Wagner, C.D.; Riggs, W.M.; Davis, L.E.; Moulder, J.F.; Muilenberg, G.E. *Handbook of X-Ray Photoelectron Spectroscopy*; Perkin Elmer: Eden Prairie, MN, 1979.) After heating (215 °C for 2 hours) the XPS spectrum (Figure 2B) shows a single peak at 399.4 eV, which we assign to an amide nitrogen. The peak in Figure 2B probably also contains a small contribution from residual ammonium and amino nitrogens. XPS (survey spectra) was unable to detect the inclusion of either Na^+ or Cl^- ions into the polyelectrolyte film. We thank Dr. Simon Garrett for help in interpreting the XPS data and Dr. Per Askeland for performing the XPS analysis.

Figure 2. Impedance plot ($0.005\text{ M Fe(CN)}_6^{3-/4-}$ in $0.025\text{ Na}_2\text{HPO}_4$, $0.025\text{ NaH}_2\text{PO}_4$, $1\text{ M Na}_2\text{SO}_4$, pH 6.3) for a gold electrode coated with a nine-bilayer PAH/PAA film after heating the film for 2 hours at 215 °C. Solid circles represent experimental data and squares correspond to the simulated data using the modified Randles' circuit in Figure 4. Frequency range $1-10^5\text{ Hz}$. Sinusoidal voltage: 5 mV about E° . The electrode was immersed for 5 minutes prior to data acquisition. Simulations were performed using LEVM 7.01 software (authored by J. Ross Macdonald of the University of North Carolina, Chapel Hill, distributed by Solartron).



Supporting Information Figure 1: Harris et al.



Supporting Information Figure 2: Harris et al.