

## Supplementary Information

### Thermal Transitions in Layer-by-layer Assemblies Studied Using Electrochemical Impedance Spectroscopy

**Choonghyun Sung, Katelin Hearn, and Jodie L. Lutkenhaus\***

*Artie McFerrin Department of Chemical Engineering at Texas A&M University,  
College Station, TX 77843*

To which all correspondences should be addressed: [jodie.lutkenhaus@che.tamu.edu](mailto:jodie.lutkenhaus@che.tamu.edu)

#### CONTENTS

---

Figure S1. Bode plots for bare and LbL-modified ITO electrodes.....	S2
Figure S2. CPE-P as a function of temperature .....	S3
Figure S3. $C_{dl}$ as a function of temperature .....	S3
Figure S4. Diffusion coefficient of the redox probe as a function of temperature.....	S4
Figure S5. PDAC/PSS LbL film thickness vs. number of layers.....	S4
Figure S6. The relative amount of PSS in a PDAC/PSS LbL film after annealing in the supporting electrolyte (0.5 M NaCl) at varying temperatures .....	S5
Figure S7. UV spectra of PDAC/PSS coated quartz slides taken after annealing in the supporting electrolyte as a function of temperature .....	S6
Figure S8. Relative dry LbL film thickness after annealing in the supporting electrolyte.....	S7

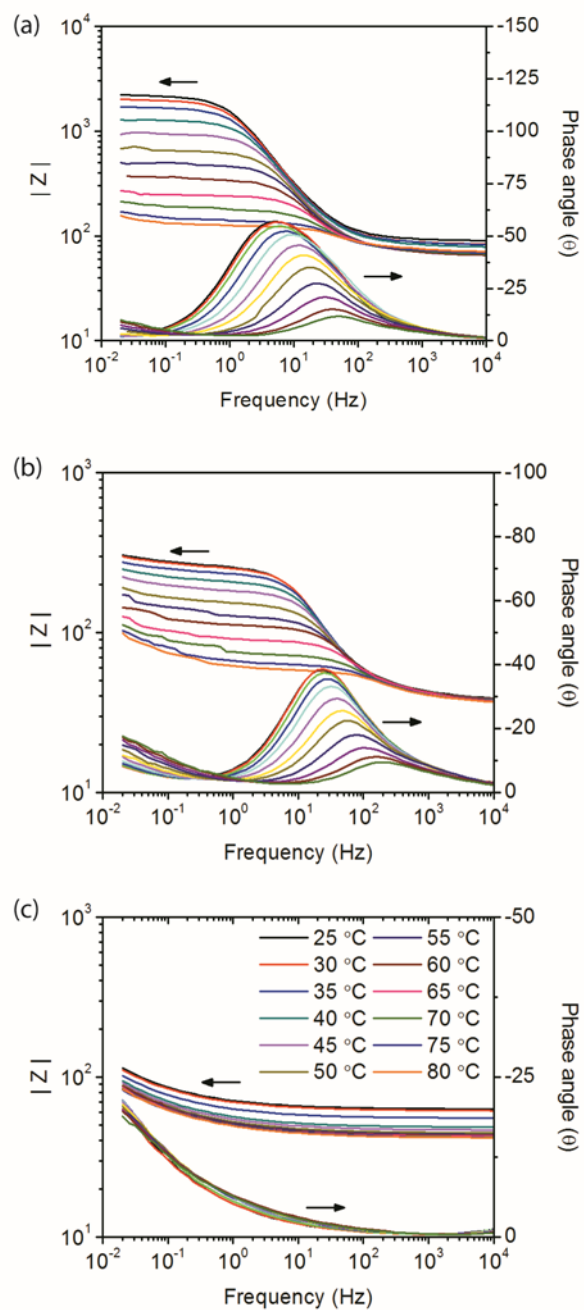


Figure S1. Bode plots for the ITO electrode modified with (a)  $(\text{PDAC}/\text{PSS})_{11}$  LbL film assembled at 0.5M NaCl, (b)  $(\text{PDAC}/\text{PSS})_7$  LbL film assembled at 1.0M NaCl, and for (c) bare ITO electrode. The legend in panel (c) applies to all panels.

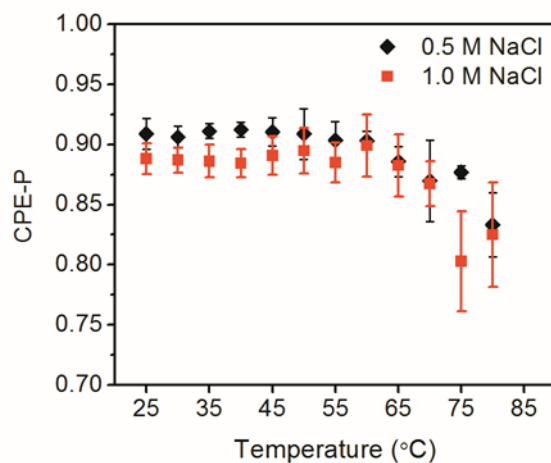


Figure S2. CPE-P as a function of temperature for (PDAC/PSS)<sub>11</sub> LbL film assembled at 0.5 M NaCl and (PDAC/PSS)<sub>7</sub> LbL film assembled at 1.0 M NaCl. PSS is the outermost layer.

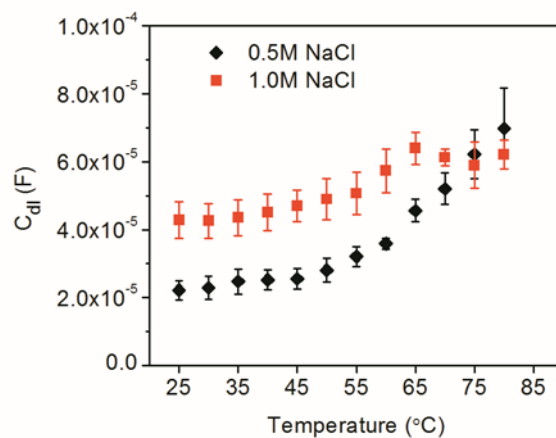


Figure S3.  $C_{dl}$  as a function of temperature for (PDAC/PSS)<sub>11</sub> LbL films assembled at 0.5 M NaCl and (PDAC/PSS)<sub>7</sub> LbL film assembled at 1.0 M NaCl. PSS is the outermost layer.

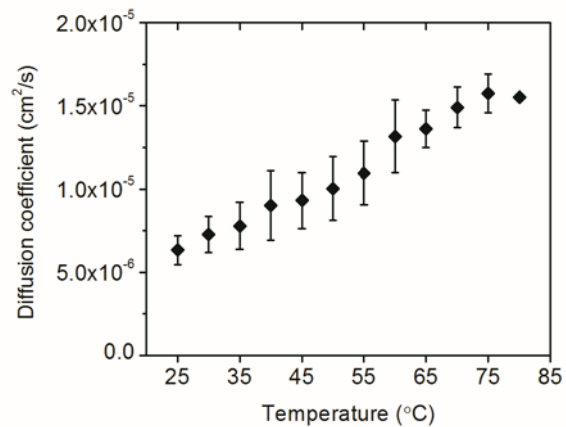


Figure S4. Diffusion coefficient of the redox probe as a function of temperature for (PDAC/PSS)<sub>7</sub> LbL films assembled at 1.0 M NaCl.

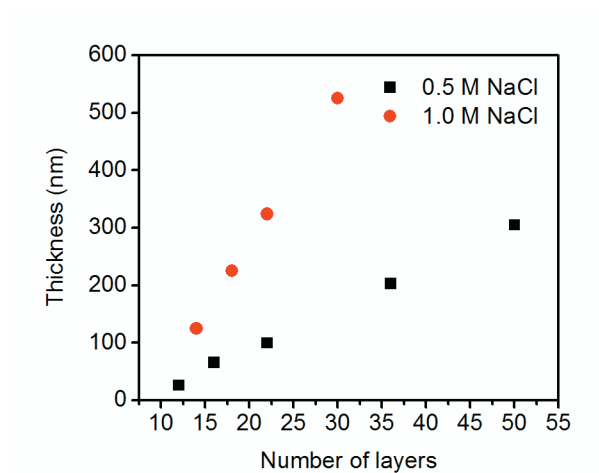


Figure S5. Dry PDAC/PSS LbL film thickness vs. the number of layers measured via ellipsometry.

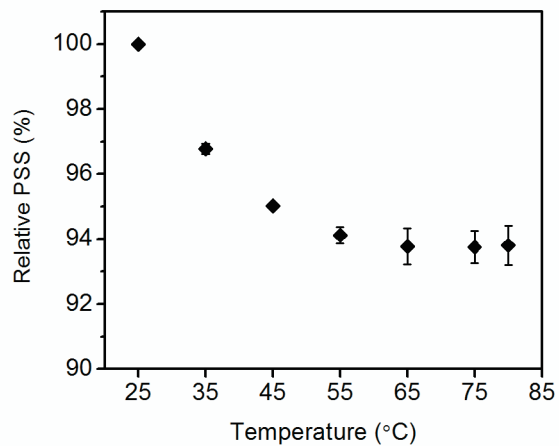


Figure S6. The relative amount of PSS in a PDAC/PSS LbL film after annealing in supporting electrolyte (0.5 M NaCl) at varying temperatures for 30 min. The relative amount was calculated from the absorbance at 225 nm from UV-vis absorbance spectra.

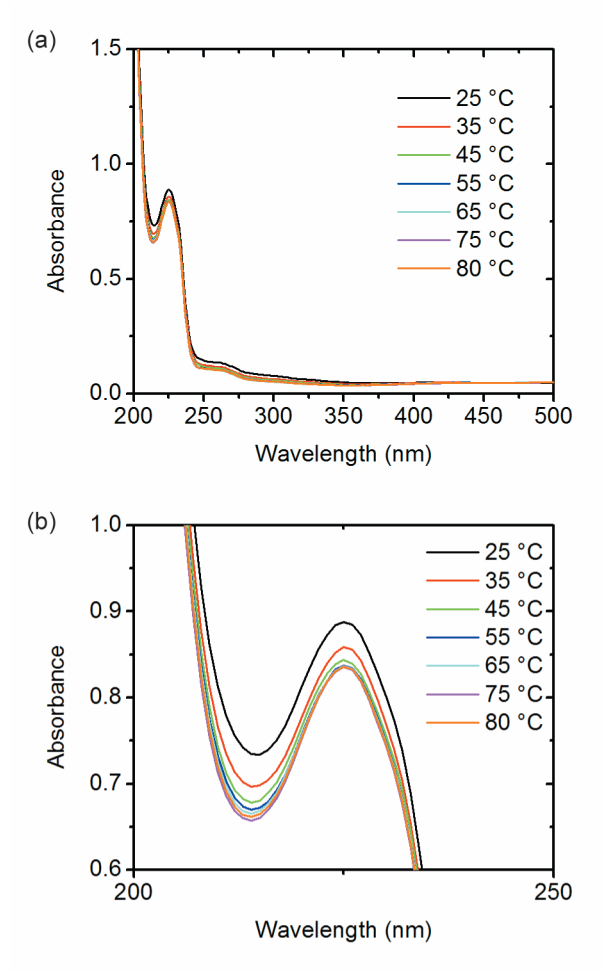


Figure S7. UV spectra of PDAC/PSS-coated quartz slides taken after annealing in the supporting electrolyte as a function of temperature. Figure S7(b) is magnification of Figure S7(a) at the wavelength from 200 nm to 250 nm.

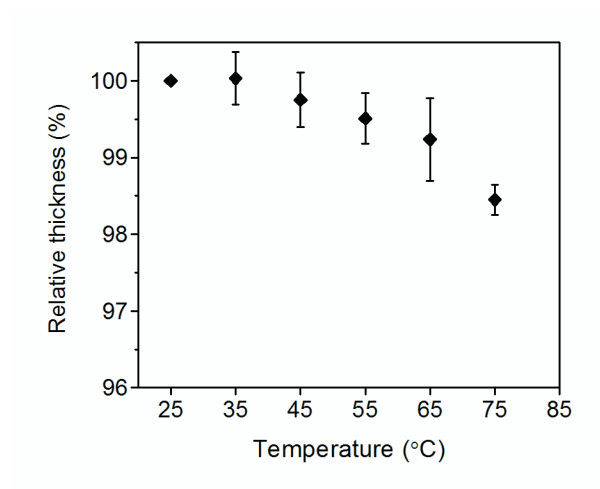


Figure S8. The relative dry LbL film thickness after annealing in the supporting electrolyte (0.5 M NaCl) at varying temperatures for 30 min. The thickness was measured using ellipsometry.