

SUPPORTING INFORMATION

Roughness and Salt Annealing in a Polyelectrolyte Multilayer

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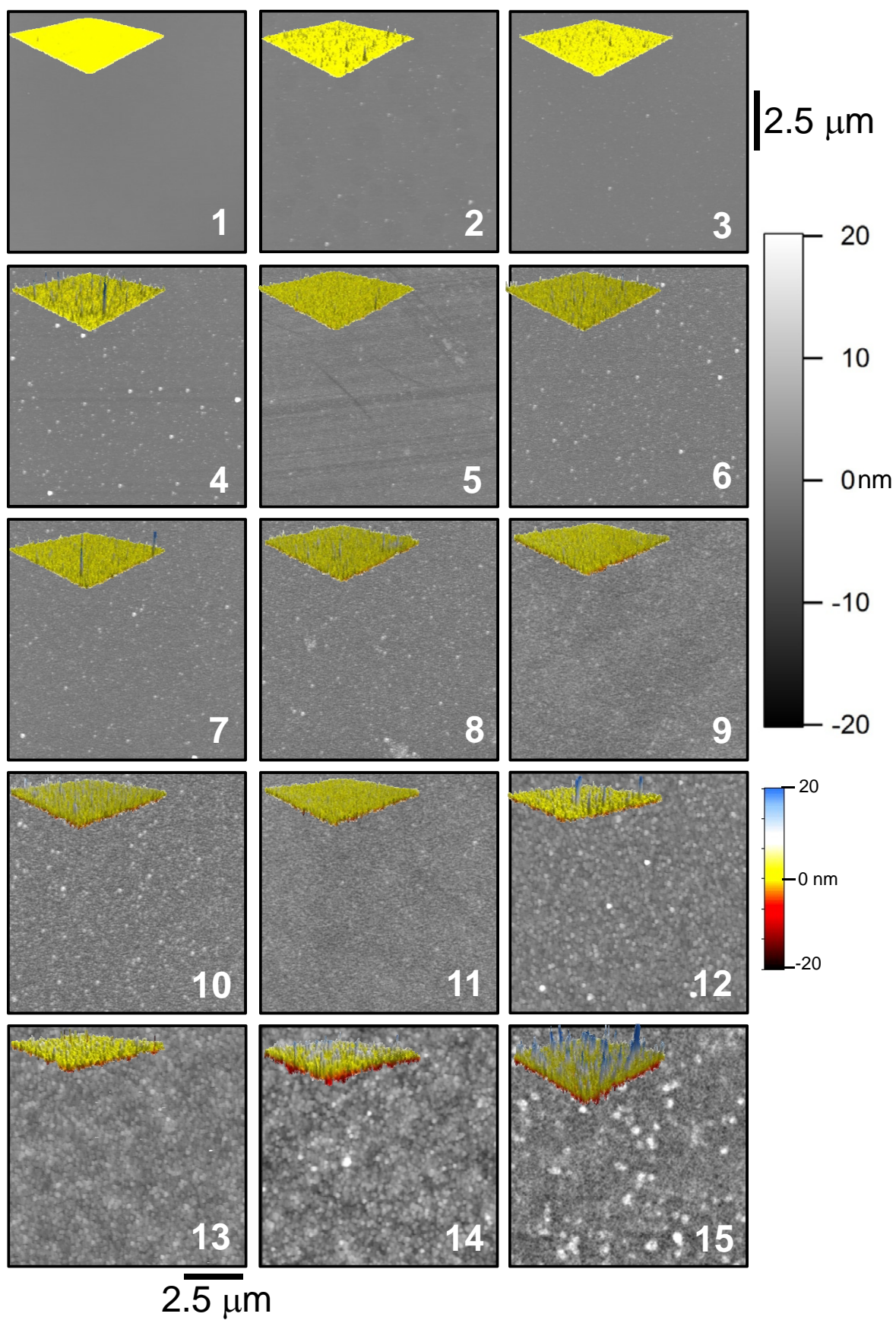


Figure S1 AFM images, $10\ \mu\text{m} \times 10\ \mu\text{m}$, of the surface of PDADMA/PSS multilayer after each layer deposited from 0.5 M NaCl (from 1 to 15 layers). The number of layers is given on each panel. The 3D plot is shown in yellow at the upper corner of each image.

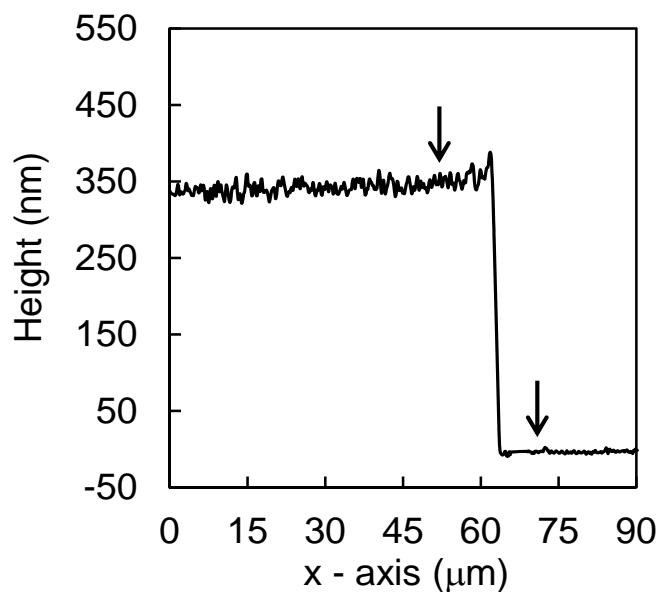


Figure S2. Step height of a 30-layer PDADMA/PSS multilayer built from 1.0 M NaCl scratched after annealing in 1.0 M NaCl for 20 h. The tip was scanned over the scratch to obtain the thickness of the film (marked by the arrows).

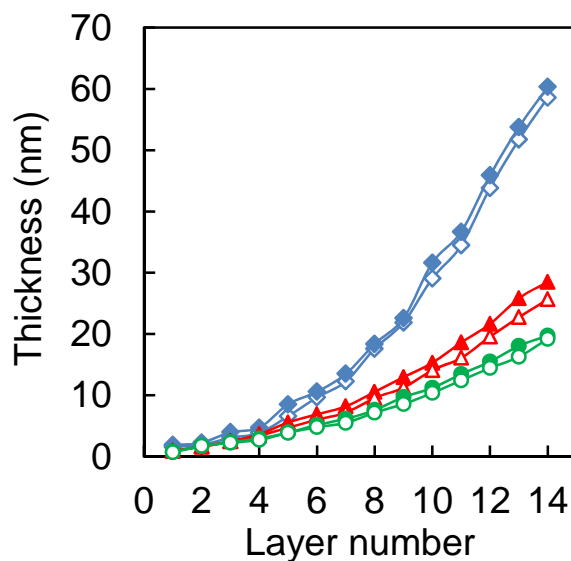


Figure S3 Thickness of PDADMA/PSS polyelectrolyte films built separately on different Si wafers until the desired number of layers was reached. PDADMA and PSS in 0.5 (◆;◇), 0.25 (▲;△), and 0.1 (●;○) M NaCl solution. The solid symbols correspond to the thicknesses directly after buildup, and the open symbols correspond to those after annealing in 1.0 M NaCl for 20 h.

PSS M _w	Initial Thickness (nm)	Thickness after Annealing in 1.0M NaCl	Thickness after Annealing in 1.4M NaCl
58,000	601	598	597
65,000	505	503	503
126,700	230	222	216
262,600	93	90	89
505,100	100	108	100
2,260,000	78	78	77

Table S1. Ellipsometric thickness in nm *versus* molecular weight of PSS in (PDADMA/PSS)₂₂ PEMUs built from 1.0 M NaCl. Initial thickness and the thicknesses after annealing in 1.0 M NaCl for 24 h then further annealing in 1.4M NaCl for 24 h are tabulated.

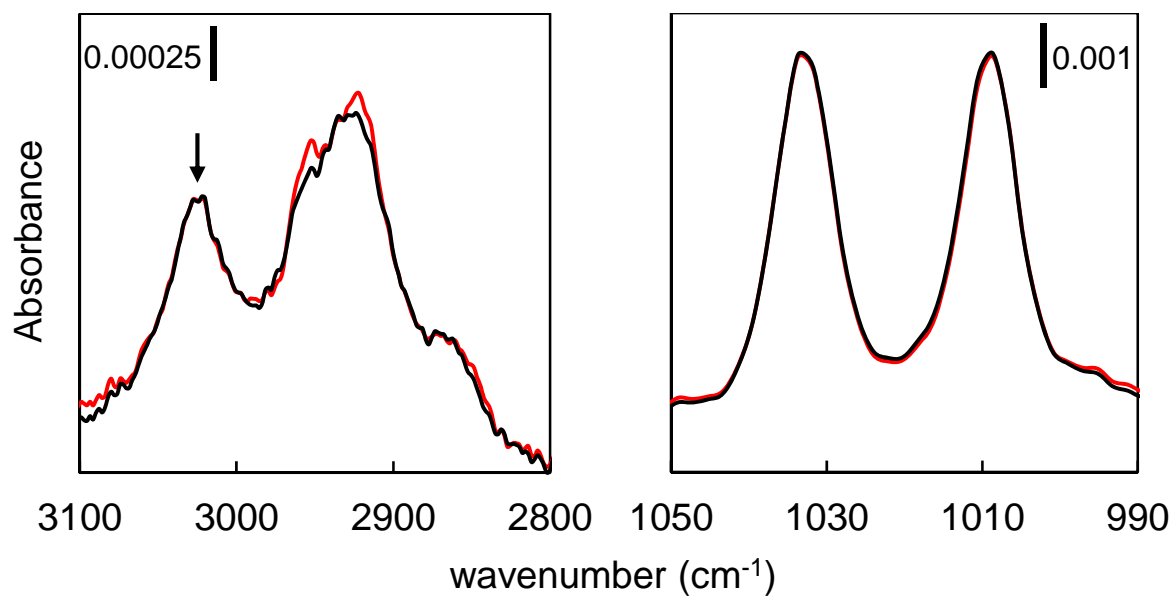


Figure S4. FTIR spectra of (PDADMA/PSS)₇PDADMA PEMU @ 0.5 M NaCl showing the C-H region that corresponds to PDADMA (left, marked with the arrow), and sulfonate bands that correspond to PSS (right), before (red) and after (black) annealing in 1.0 M NaCl for 20 h. Within error, no loss of material can be detected. Scale bars are absorbance units.

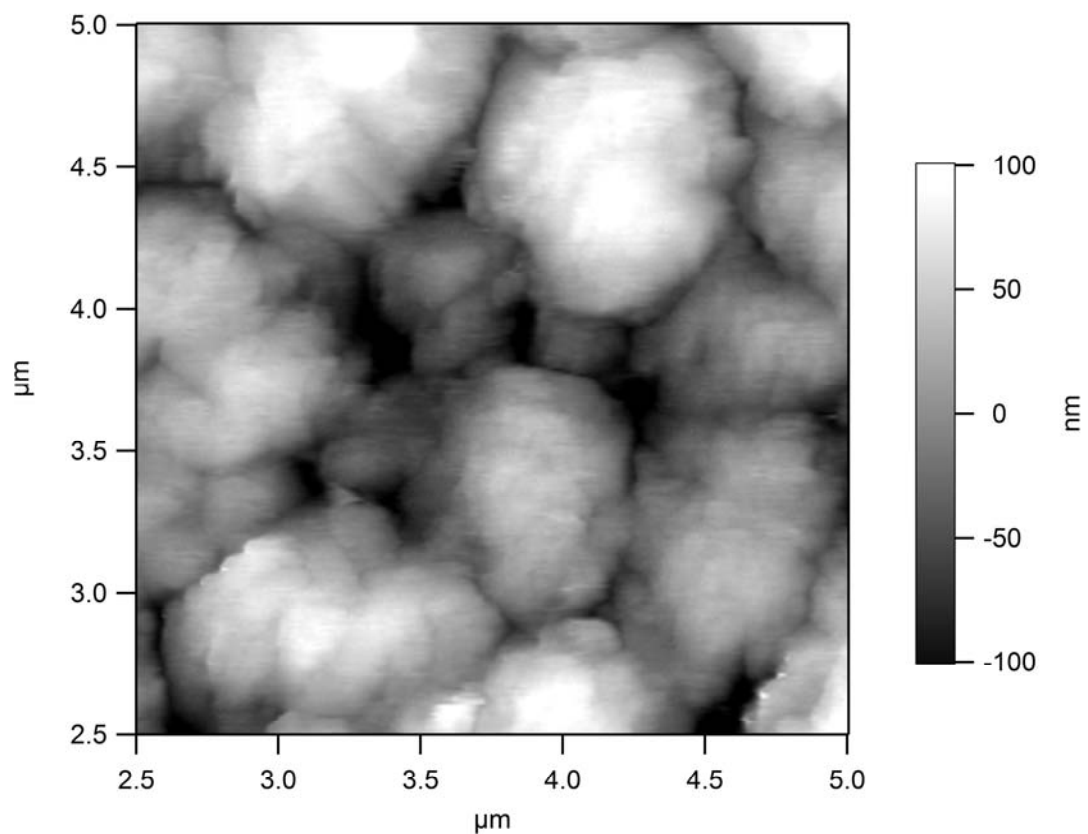


Figure S5. Zoom-in of the AFM image of the 15-layer (PDADMA-capped) PEMU from Figure 12, taken under 10 mM NaCl, showing additional detail.