Supporting Information

Swelling of Polyelectrolyte and Polyzwitterion Brushes by Humid Vapors

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Figure S1. Neutron reflectivity profiles of PDMAEMA brush at different RH levels (open circles) showing fits (solid lines) using the SLD profiles in Figure 1a. The data for RH higher than 10% have been shifted vertically downward for clarity.
Figure S2. Solid lines denote predicted swelling factors as a function of the weight fraction of modified repeat units. Purple = PDMAEMA-Mel; Green = PDMAEMA-PrI; Black = PDMAEMA-PS. These lines are calculated following a previously described procedure\(^1\). The solid symbols represent measured swelling factors. The quaternized samples are well-described by this model. PDMAEMA-PS follows a trend requiring a lower density.
Figure S3. FT-IR data of polymer brush samples collected at ambient conditions (≈45 % RH). Orange = PDMAEMA; Purple = PDMAEMA-Mel; Green = PDMAEMA-PrI; Black = PDMAEMA-PS. Noise at ≈1500 cm\(^{-1}\) and ≈3750 cm\(^{-1}\) originates from atmospheric water due to the open setup of the FT-IR microscope. A break in the abscissa has been inserted to omit peaks associated with CO\(_2\) that result from the open setup of the FT-IR microscope. Carbonyl peaks at 1730 cm\(^{-1}\) indicate the presence of polymer after PPM reactions. Signals associated with tertiary amine in PDMAEMA\(^2\) appear as sharp peaks in the unmodified sample at ≈2850 cm\(^{-1}\) and ≈2750 cm\(^{-1}\). Disappearance of these peaks provides a qualitative measure of conversion extent. In all cases, residual peaks are on the order of detector noise, consistent with the conversion levels calculated in Figure S2. PDMAEMA-PS exhibits a sharp peak at 1050 cm\(^{-1}\) associated with the sulfonate group in the zwitterion side-chain. All modified samples show significant water peaks near 3500 cm\(^{-1}\).
References

