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Supporting Information for:

Determination of both wet and dry mass of water-soluble polymers adsorbed on planar silica using a quartz crystal microbalance

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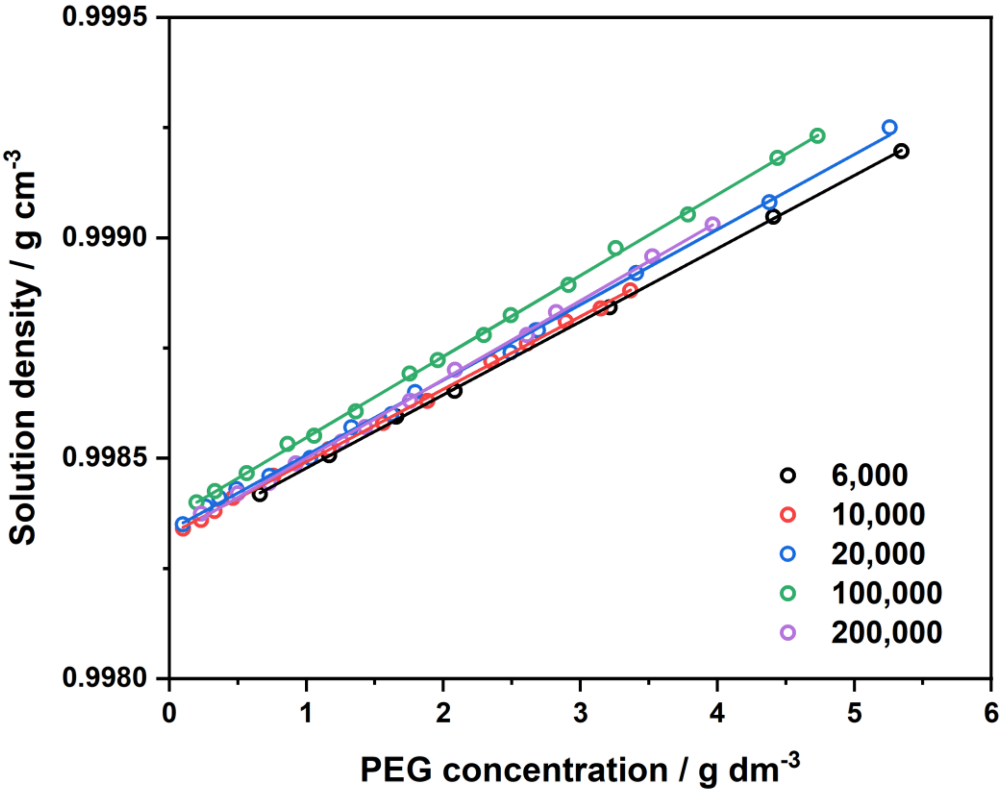

Figure S1. Calibration plots of solution density against PEG concentration for a series of five PEG molecular weights. These plots were used to calculate the excess PEG concentration remaining in the supernatant after adsorption onto 250 nm diameter silica nanoparticles.

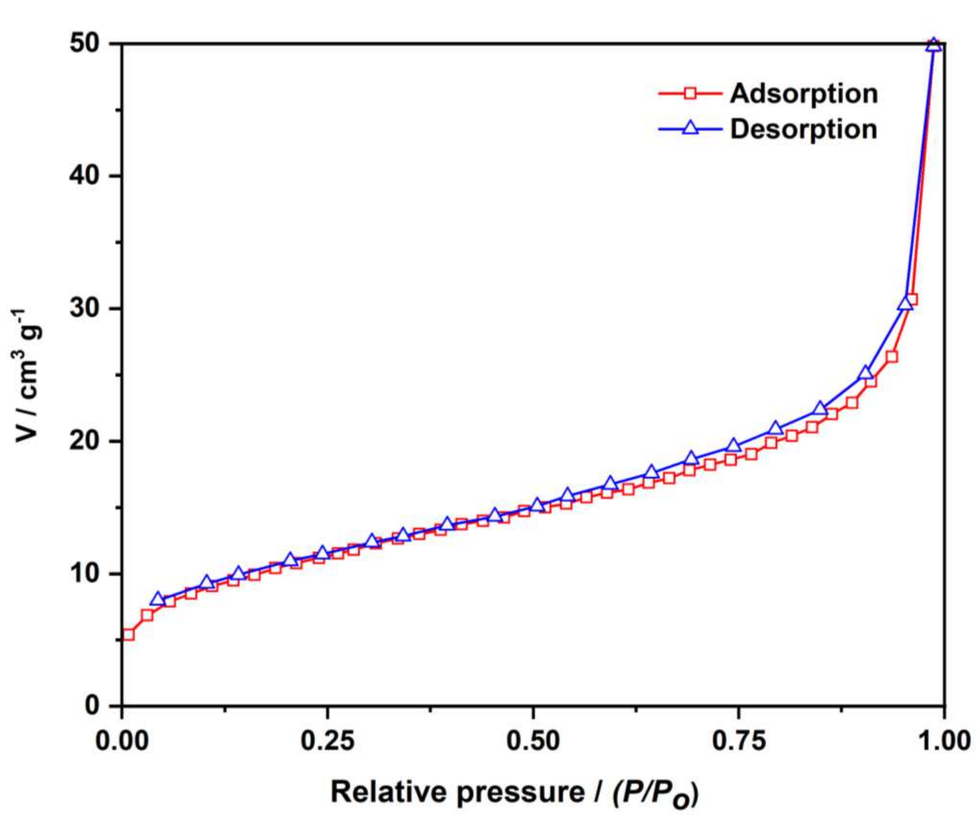

Figure S2. Adsorption/desorption BET isotherm used to calculate the specific surface area of 10.1 m^2 g^{-1} for the silica nanoparticles (nominal diameter = 250 nm) used in this study.

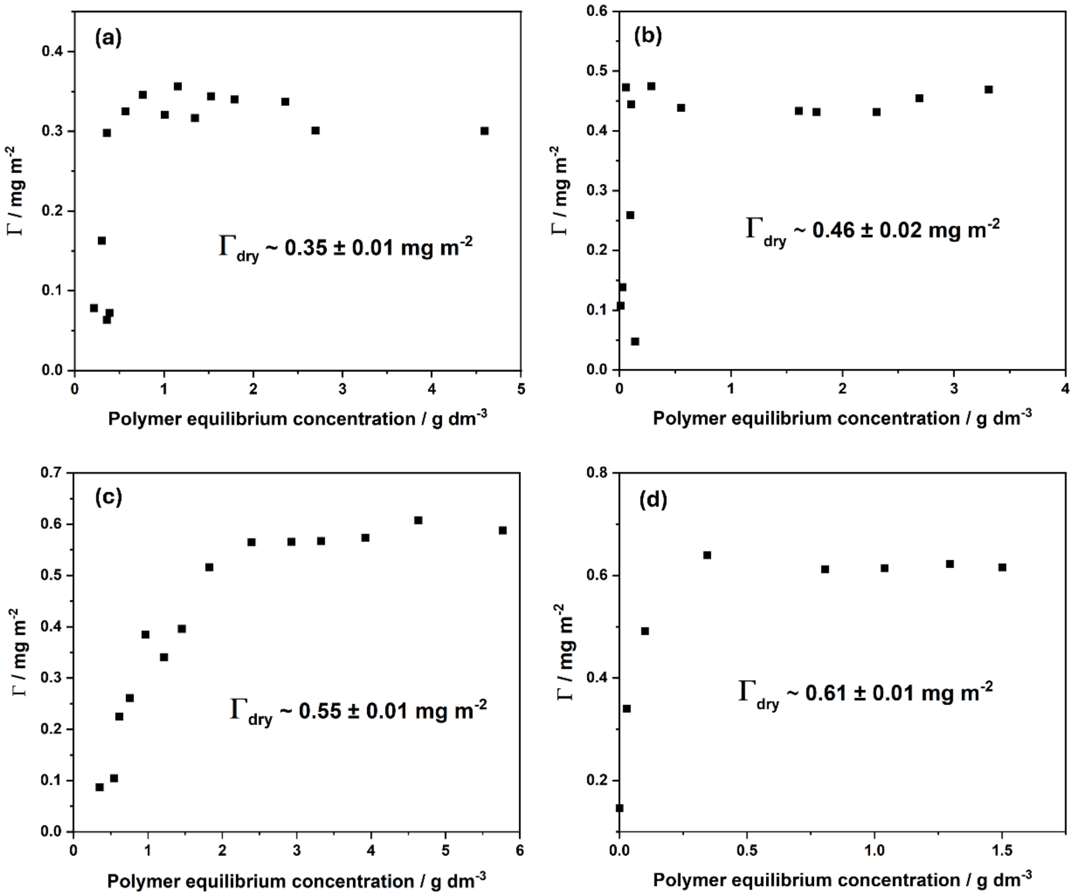

Figure S3. Adsorption isotherms constructed via supernatant depletion assay (using solution densitometry) for a series of four commercial PEG samples with nominal molecular weights ranging from 10,000 to 200,000 adsorbed in turn onto 250 nm silica nanoparticles. The adsorbed amount, Γ_{dry}, is estimated by averaging the data points in the plateau region of the isotherm and the error is calculated from the standard deviation in these plateau values.

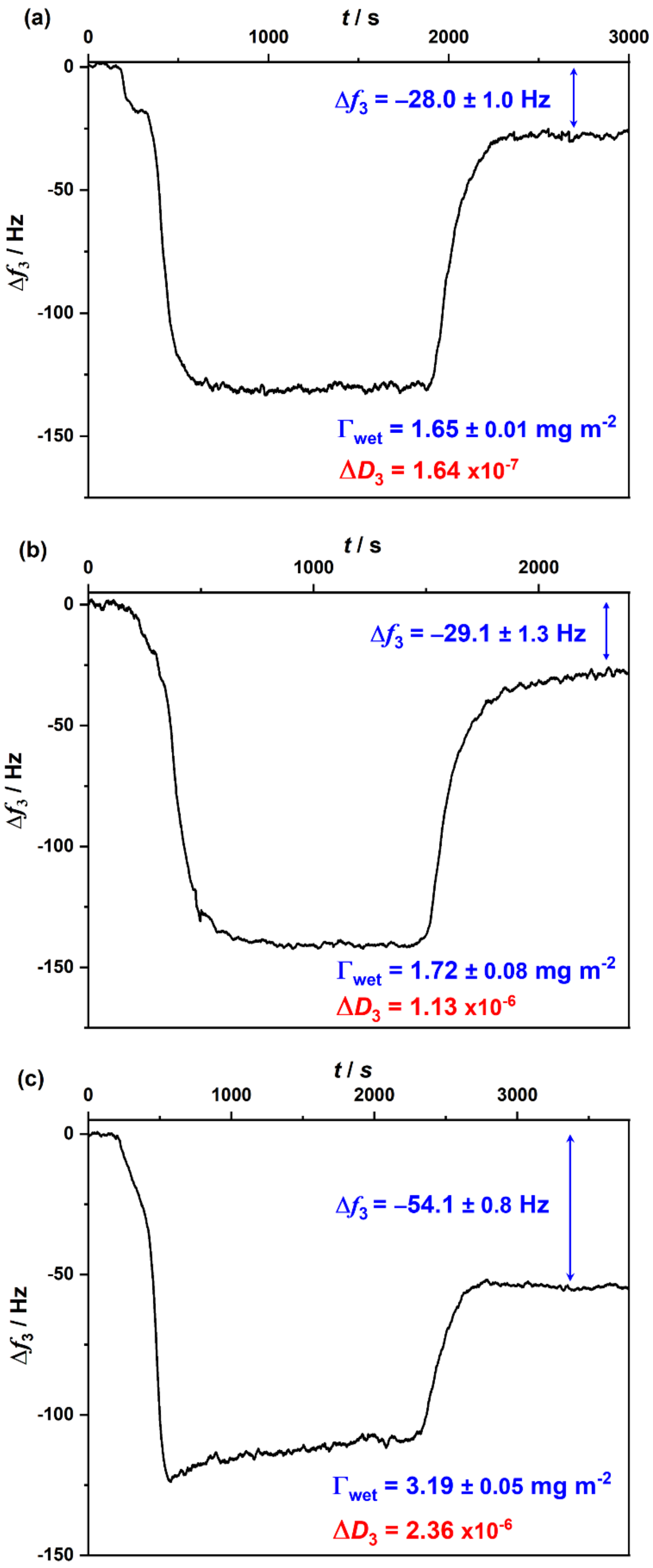

Figure S4. Change in QCM frequency observed over time during the adsorption of a series of three commercial PEGs with nominal MW values of (a) 10,000, (b) 20,000 and (c) 100,000. Adsorbed amounts were calculated for a planar silica sensor using the Sauerbrey equation. [N.B. Each QCM experiment was run in triplicate for each PEG. A typical representative run for each sample is shown here].

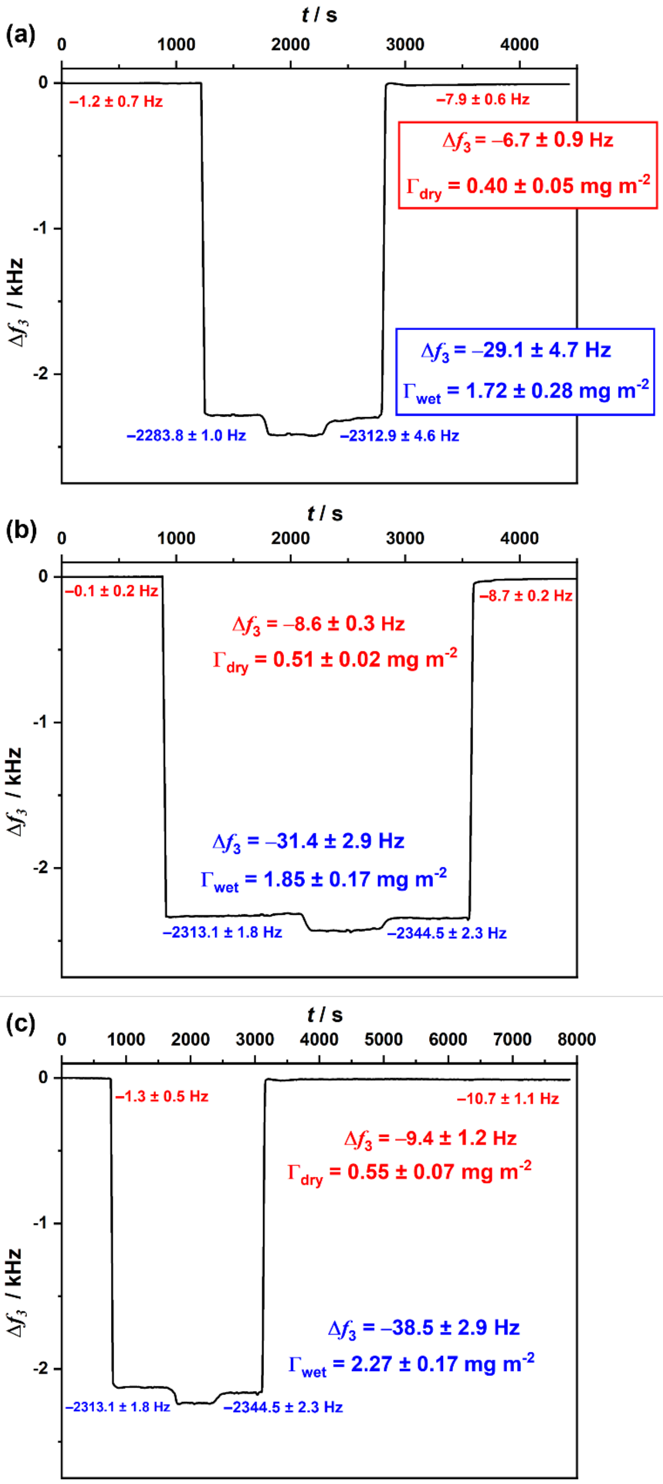

Figure S5. Change in QCM frequency observed over time during the adsorption of (a) PEG 10,000, (b) PEG 20,000 and (c) PEG 100,000 onto a planar silica sensor at 20 °C. Γ_{wet} is calculated from the change in frequency observed for the hydrated adsorbed PEG chains before and after wash-off to remove any weakly-adhering PEG. In contrast, Γ_{dry} is calculated from the frequency difference between the initial baseline observed for the bare QCM silica sensor under a flow of N_2 gas and the final baseline obtained after drying the adsorbed PEG chains to constant mass under a N_2 gas flow for 20-80 min. Data obtained for three other PEG homopolymers of differing molecular weight are summarized in **Table 1**. [N.B. The experimental error associated with Γ_{dry} and Γ_{wet} is estimated from the noise in their respective baselines].

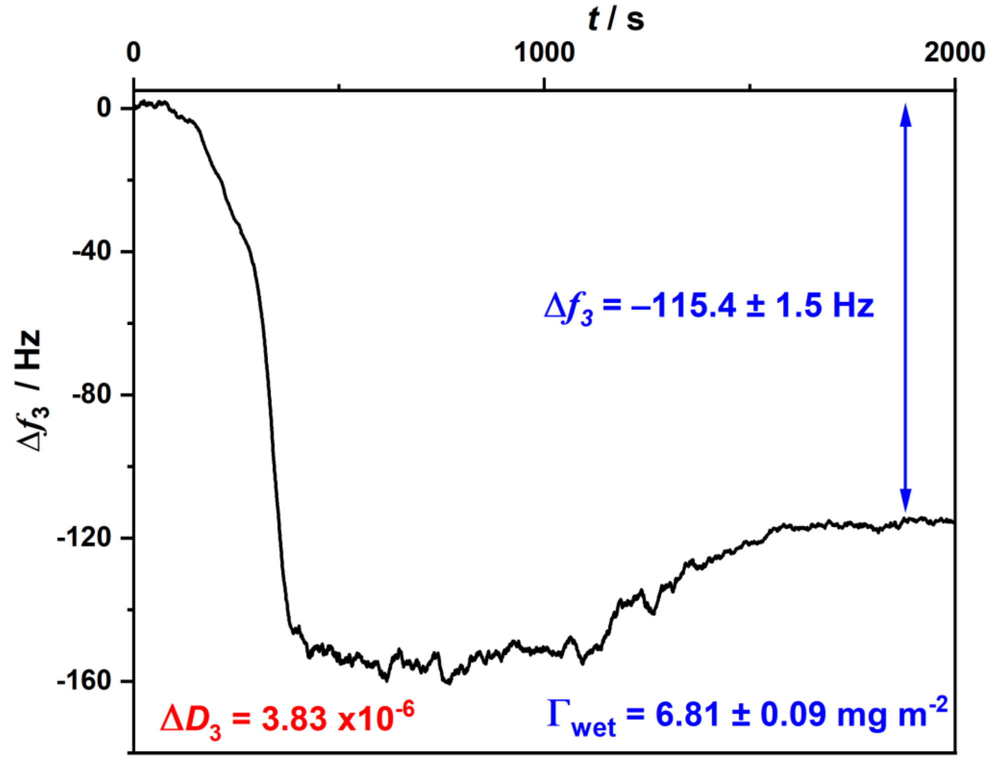

Figure S6. Change in QCM frequency observed over time during the adsorption of PNVP 360,000 onto a planar silica sensor at 20 °C during a conventional QCM experiment. Γ_{wet} is calculated from the change in frequency observed for the hydrated adsorbed PNVP chains before and after wash-off to remove any weakly-adhering polymer.

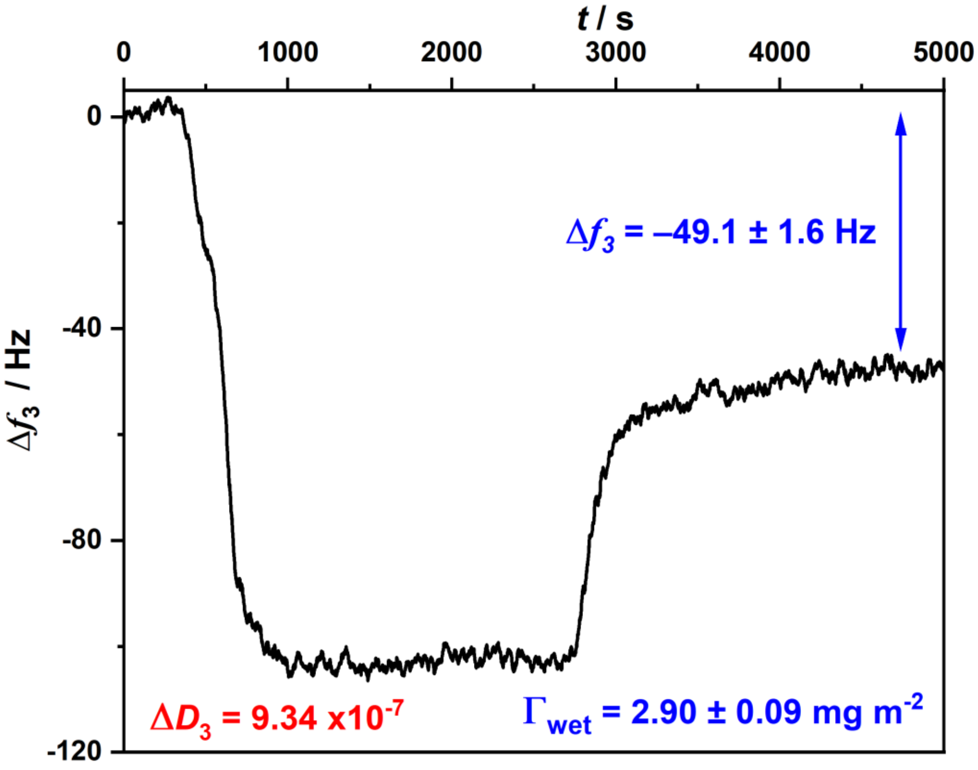

Figure S7. Change in QCM frequency observed over time during the adsorption of PNVP 67,000 onto a planar silica sensor at 20 °C during a conventional QCM experiment. Γ_{wet} is calculated from the change in frequency observed for the hydrated adsorbed PNVP chains before and after wash-off to remove any weakly-adhering polymer. [N.B. This QCM experiment was run in triplicate; a typical representative run is shown here].