# Supporting Information

# Deposition of $TiO_2$ Nanoparticles onto Silica Measured Using a Quartz Crystal Microbalance with Dissipation Monitoring

*Langmuir*

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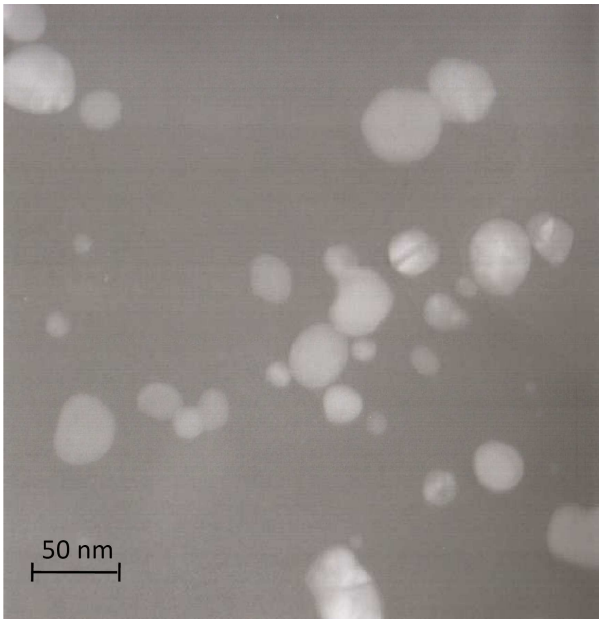


**Figure S1.** Representative TEM image taken at 230,000× magnification of $TiO_2$ particles suspended in 10 mM $NaNO_3$ electrolyte at pH 3, deposited and dried on a formvar grid.

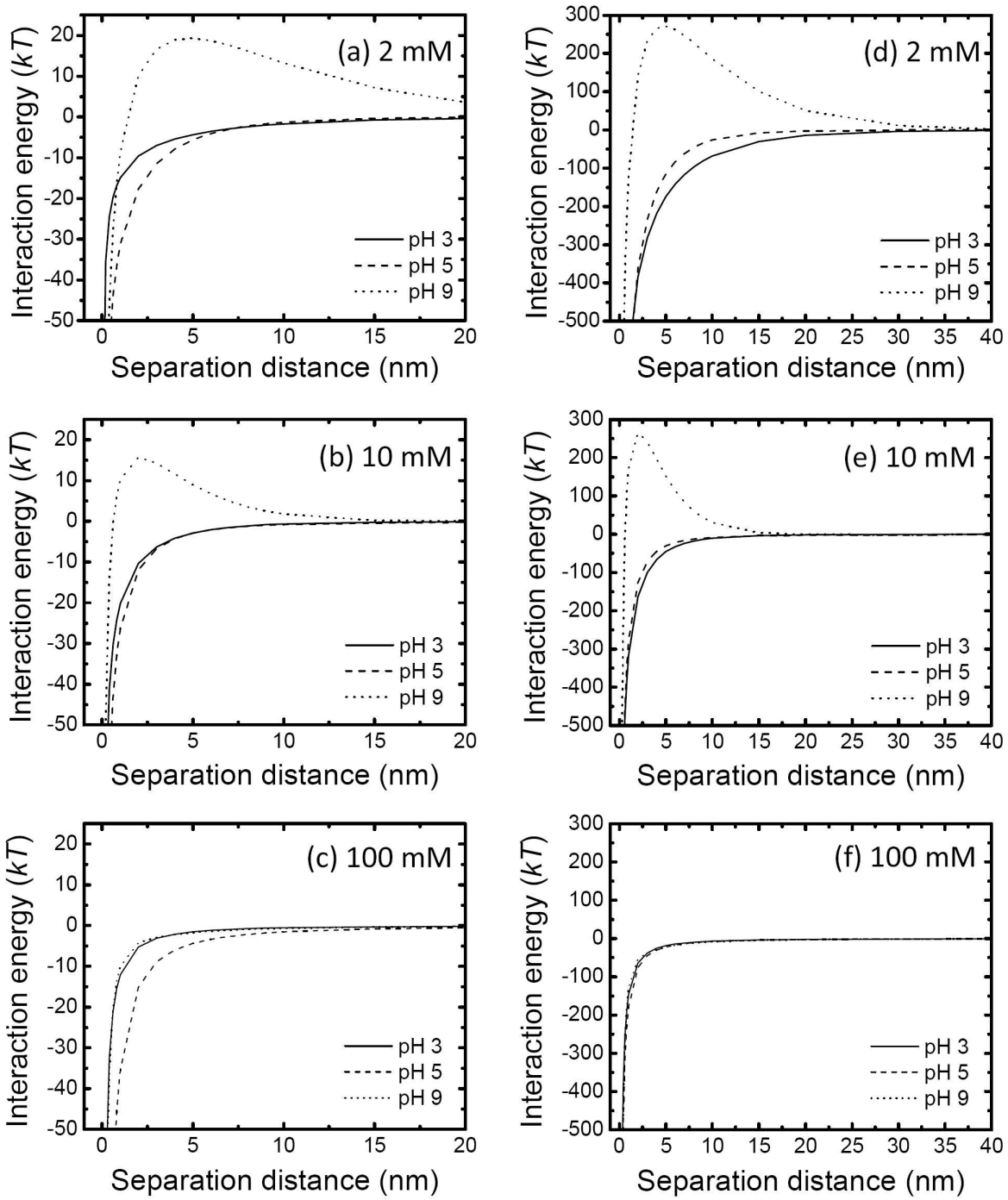


**Figure S2.** Calculated DLVO interaction energy profiles for a $TiO_2$ nanoparticle approaching a flat $SiO_2$ surface at (a) 2 mM, (b) 10 mM, and (c) 100 mM for different pH values: pH 3 (solid lines), pH 5 (dashed lines) and pH 9 (dotted lines). Nanoparticle sizes were taken from values obtained from the FCS measurements (Fig. 1b) and are listed in Table S2. Calculated DLVO interaction energy profiles for a $TiO_2$ particle approaching a flat $SiO_2$ surface at (d) 2 mM, (e) 10 mM, and (f) 100 mM for different pH values using sizes obtained from the DLS measurements (Fig. 1a) as listed in Table S2.

**Table S1.** $TiO_2$ deposition rates onto the silica surface estimated using Eq. 2.

| pH | salt | $I$ (mM) | $f_{slope}$ (Hz/min) | deposition rate (ng/cm$^2$min) |
|---|---|---|---|---|
| | | | | |
| 3 | $NaNO_3$ | 2 | -0.52 | 3.0 |
| 3 | $NaNO_3$ | 3 | -0.36 | 2.1 |
| 3 | $NaNO_3$ | 4 | -0.26 | 1.5 |
| 3 | $NaNO_3$ | 7 | -0.33 | 1.9 |
| 3 | $NaNO_3$ | 11 | -0.15 | 0.87 |
| 5 | $NaNO_3$ | 2.5 | -0.31 | 5.4 |
| 5 | $NaNO_3$ | 3.5 | -0.19 | 3.4 |
| 5 | $NaNO_3$ | 4.5 | -0.019 | 0.34 |
| 5 | $NaNO_3$ | 7.5 | -0.012 | 0.20 |
| 3 | $Ca(NO_3)_2$ | 2.5 | -0.60 | 3.5 |
| 3 | $Ca(NO_3)_2$ | 4.0 | -0.53 | 3.1 |
| 3 | $Ca(NO_3)_2$ | 16 | -0.39 | 2.3 |
| 3 | $Ca(NO_3)_2$ | 31 | -0.36 | 2.1 |
| 3 | $Ca(NO_3)_2$ | 101 | -0.07 | 0.43 |
| 9 | $Ca(NO_3)_2$ | 3.5 | -0.017 | 0.10 |
| 9 | $Ca(NO_3)_2$ | 5.0 | -0.022 | 0.13 |

**Table S2.** $TiO_2$ particle diameters ($d_p$) used in the calculation of the DLVO interaction energy profiles presented in Figures 6 and S2.

| pH | $I$ (mM) | $d_p$ by FCS (nm) | $d_p$ by DLS (nm) |
|---|---|---|---|
| 3 | 2 | 9.43 | 378 |
| 3 | 10 | 27.1 | 428 |
| 3 | 100 | 44.7 | 545 |
| 5 | 2 | 22.8 | 467 |
| 5 | 10 | 56.3 | 592 |
| 5 | 100 | 128 | 638 |
| 9 | 2 | 25.5 | 358 |
| 9 | 10 | 33.4 | 565 |
| 9 | 100 | 53.6 | 688 |