Supplementary Material (ESI) for Journal of Materials Chemistry
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Supplementary information for

Control and stability of self assembled monolayers under biosensing conditions

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Effect of Plasma treatment on the SiO_2 layer investigated by IR spectroscopy.

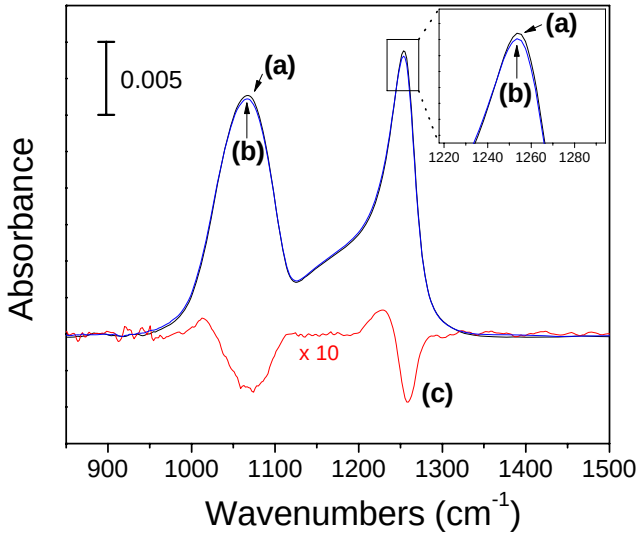

Figure S1: Absorption spectra of freshly cleaned SiO_2/Si substrate before (a) and after (b) O_2 plasma treatment. Spectrum (c) is the difference absorption emphasizing the changes due to the plasma treatment. A removal/disturbance of the SiO_2 absorption bands occurs during the treatment.

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Estimation of the SiO_2 damages due to the O_2 plasma treatment

Previous infrared spectroscopy investigations in our laboratory on silicon samples (Fz, double sides polished) have shown that for samples with 10 Å silicon oxide (on each side) gives an integrated area of 0.33 cm^{-1}. The measurement is performed in transmission (~70° incidence) and the thickness is measured by ellipsometry. The integrated area is measured between 900 cm^{-1} and 1300 cm^{-1}, which covers the LO and TO modes of the SiO_2 present.

According to the SiO_2 absorption spectra shown in Fig. S1, recorded before and after O_2 plasma treatment, an integrated area of 2.86 cm^{-1} and 2.84 cm^{-1} is estimated, respectively. These areas correspond to thicknesses before and after treatment of 8.6 nm and 8.1 nm, respectively. Note that these thicknesses are in good agreement with the 6.7 nm SiO_2 thickness (ellipsometry thickness) of our starting wafers. We can then conclude that the O_2 plasma treatment leads to SiO_2 removal/damage in the top 5 Å of the SiO_2 layer. Considering the large range of thickness found in the literature corresponding to a 1 monolayer of SiO_2 (from 0.2 to 0.47nm), the damages are confined in the two first monolayers.