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*Supplementary information for*

# Control and stability of self assembled monolayers under biosensing conditions

Oliver Seitz[1], Poornika G. Fernandes[1], Ruhai Tian[1],Nikhil Karnik[1], Huang-Chun Wen[2], Harvey Stiegler[1], Richard A. Chapman[1], Eric M. Vogel[1], Yves J. Chabal[1#]

[1] University of Texas at Dallas, Richardson, TX, USA

[2] Texas Instrument Inc., Dallas, TX, USA

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

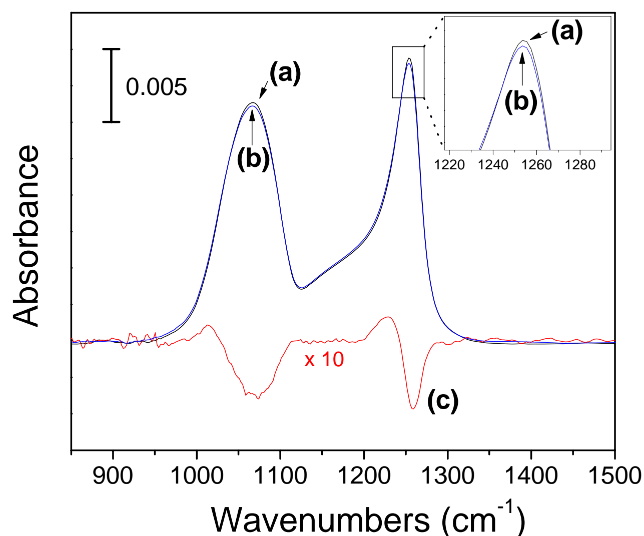


Figure S1: Absorption spectra of freshly cleaned $SiO_2$/Si substrate before (a) and after (b) $O_2$ plasma treatment. Spectrum (c) is the difference absorption emphasizing the changes due to the plasma treatment. A removal/disturbance of the $SiO_2$ absorption bands occurs during the treatment.

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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.