Passivated Porous Silicon Membranes and their Application to Optical Biosensing

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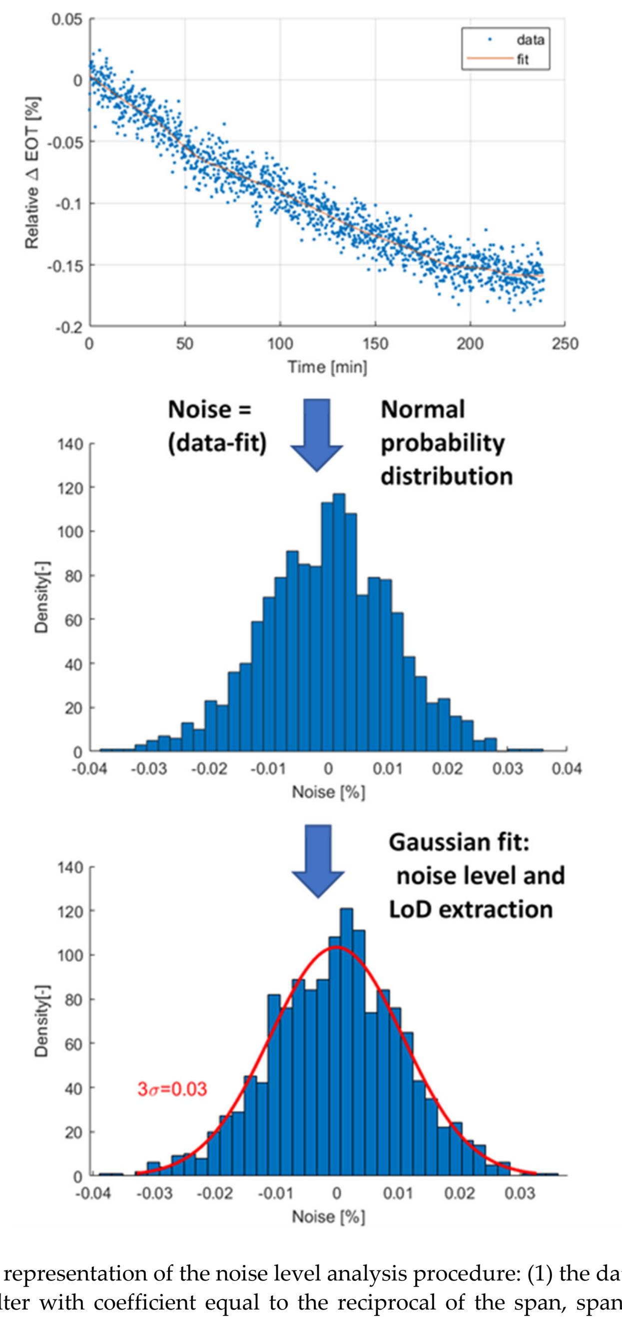

Figure S1. Schematic representation of the noise level analysis procedure: (1) the data is fit using a moving average (low pass filter with coefficient equal to the reciprocal of the span, span=0.15), (2) the noise is calculated by taking the difference between the data and the fit, (3) a normal probability distribution is plotted from the calculated noise, (4) a Gaussian fit is applied to the distribution, allowing to extract the noise level σ_N.

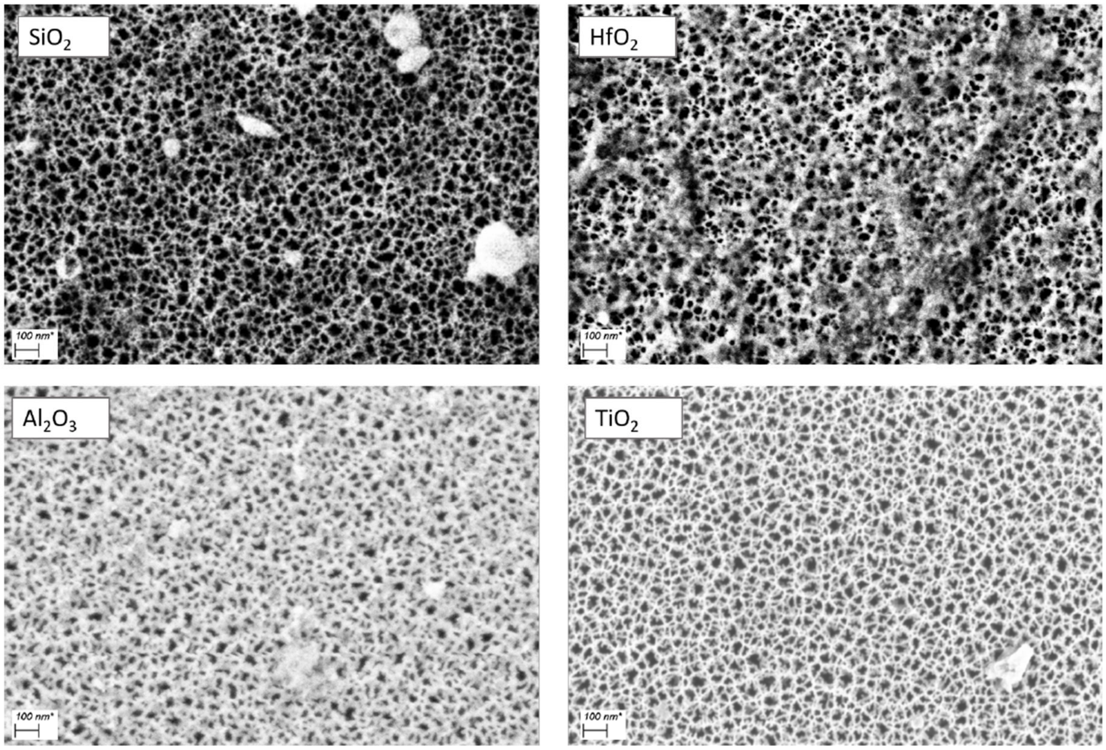

Figure S2. SEM images of the surface of porous silicon membranes: $PSiO_2$, $PSiO_2/HfO_2$, $PSiO_2/Al_2O_3$ and $PSiO_2/TiO_2$.

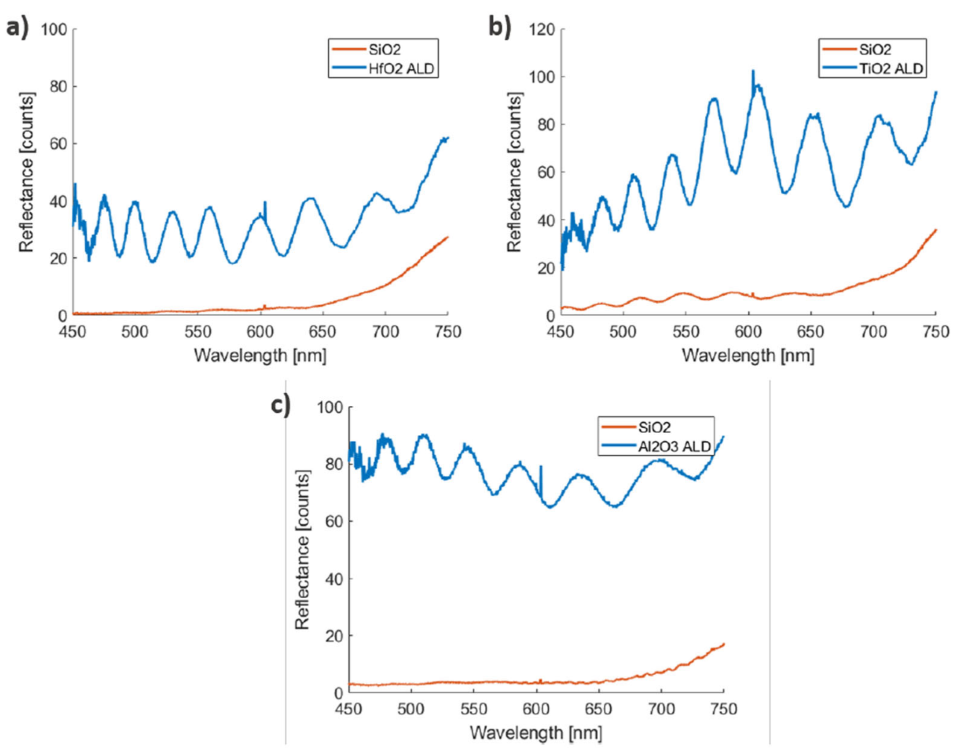

Figure S3. Interferometric spectra obtained for (a) $PSiO_2/HfO_2$, (b) $PSiO_2/TiO_2$, and (c) $PSiO_2/Al_2O_3$, before and after the ALD, at same integration time (t = 1s).

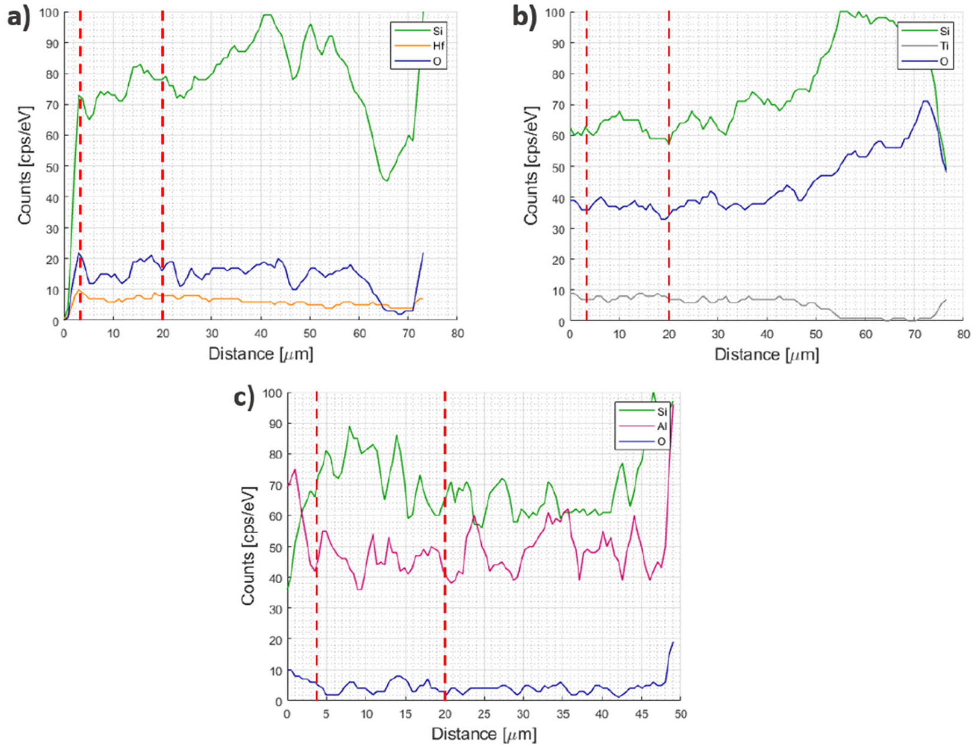

Figure S4. EDX line scan showing deposition on the full depth of the membrane: (a) $PSiO_2/HfO_2$, (b) $PSiO_2/TiO_2$, and (c) $PSiO_2/Al_2O_3$. The red dotted lines indicate the approximate location of the interfaces between first/second and second/third layers.

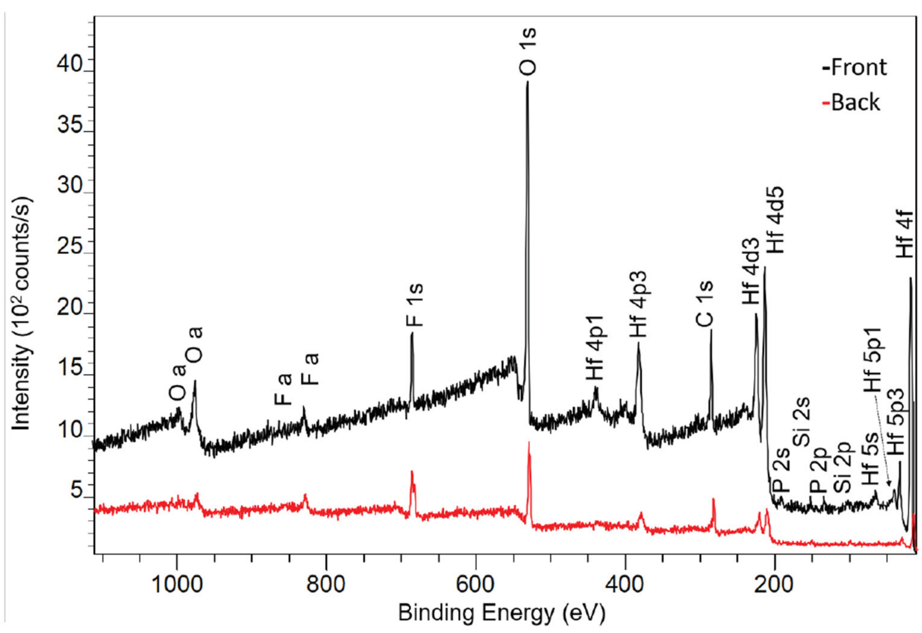

Figure S5. XPS survey spectra of the $PSiO_2/HfO_2$ membrane front (black) and back (red). The main core levels are labeled. The data are normalized to each C-(C,H) component of the C 1s peak and separated vertically.

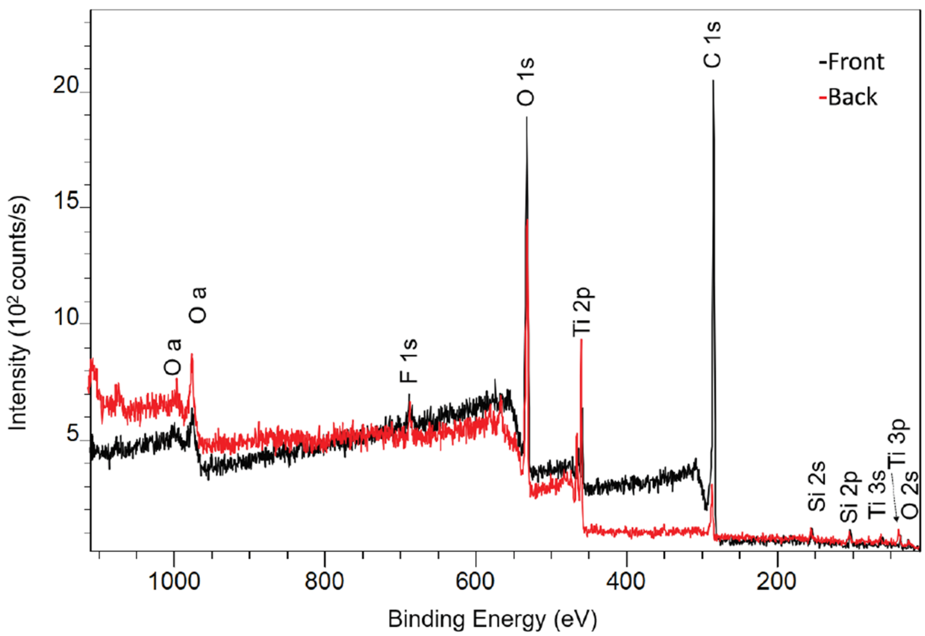

Figure S6. XPS survey spectra of the $PSiO_2/TiO_2$ membrane front (black) and back (red). The main core levels are labeled. The data are normalized to each C-(C,H) component of the C 1s peak and separated vertically.

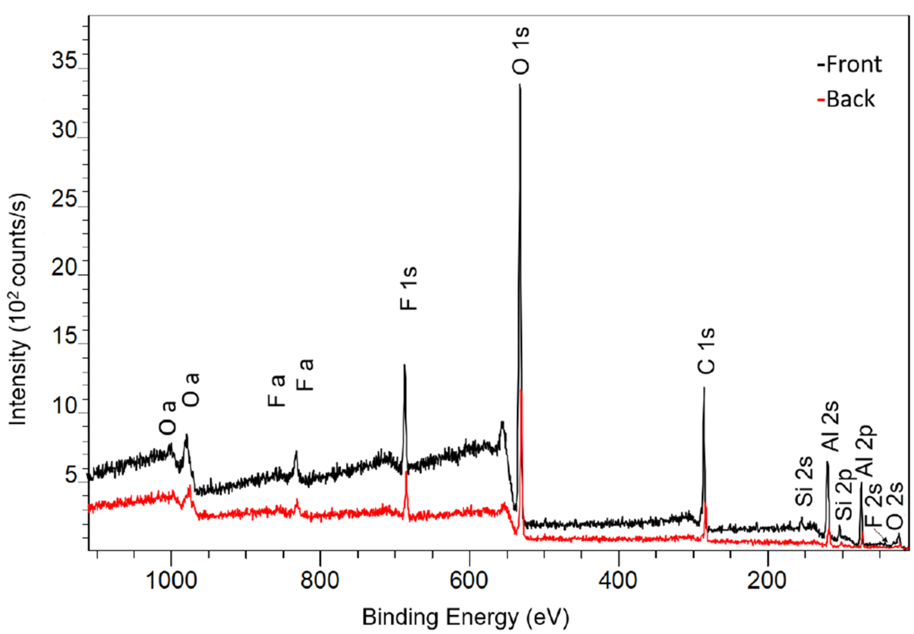

Figure S7. XPS survey spectra of the $PSiO_2/Al_2O_3$ membrane front (black) and back (red). The main core levels are labeled. The data are normalized to each C-(C,H) component of the C 1s peak and separated vertically.