Spectroscopic Study of Water Adsorption on Oligo(ethylene glycol)-Substituted Alkanethiolate Self-Assembled Monolayers

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Motivation
To get a better understanding of the mechanism behind the inertness of oligo(ethylene glycol), with respect to biofouling and protein repelling.

Model system
The key factor for the bio-inertness is presumably the extent of hydration adsorption properties related to protein repelling.

OEG-SAM Preparation
SAMs were prepared on 30nm Au coated silicon wafer substrates by immersion of substrates (L) into 1mM ethanolic solutions of corresponding thiol to form SAMs.

XPS/NEXAFS Endstation at BESSY II
Characterization of the pristine SAMs

D₂O adsorption

D₂O Thermodesorption

Conclusions
- The OEG adsorption is found to occur exclusively onto the SAM surface, with no indications for the formation of Au-OEG molecules into the hydrophilic OEG part of the molecules.
- The absorption can be decreased reversibly with the D₂O dose, but the same rate for all OH-terminated monolayers and formation of 3D clusters, in contrast to 2D ones in the same rate for all OH-terminated monolayers and formation of 3D clusters, in contrast to 2D ones.
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