Formation and spectroscopic analysis of a conditioning film

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Biofouling is a ubiquitously occurring phenomenon in tidal zones worldwide [1]. To prevent unwanted effects caused by biofouling, suitable non-toxic coatings for these environments are required. Changing the surface chemistry and the composition of a coating changes not only its properties but also the formation and composition of a conditioning layer. In our study self-assembled monolayers (SAMs) on gold are used as highly controlled surface chemistries which allow to fine tune the physicochemical surface properties. In order to correlate colonization with surface conditioning, the surface chemistry and thus their wetting properties were varied. In agreement with previous work, chemical termination of the surface affects the settlement kinetics of spores of the macrofouler *Ulva linza* [2]. As different SAMs have different affinity towards macromolecules, settlement is controlled by both, surface chemistry itself and an adsorbed conditioning layer. To disentangle both effects, formation of conditioning layers depending on the surface chemistry was investigated in greater detail. Therefore different analytical methods were used like spectral ellipsometry, contact angle measurements, IRRAS and XPS. It also could be shown, that organism settlement is significantly changed if pristine chemistries are compared to conditioned surfaces.

[1] M.E. Callow, J.A. Callow, J.D. Pickett-Heaps, R. Wetherbee, “Primary Adhesion of Enteromorpha (Chlorophyta, Ulvales) Propagules: Quantitative Settlement Studies and Video Microscopy”, *J. Phycol*., **1997**, *33*, 938.

[2] M. E. Callow, J. A. Callow, L. K. Ista, S. E. Coleman, A. C. Nolasco, G. P. López, “Use of self-assembled monolayers of different wettabilities to study surface selection and primary adhesion processes of green algal (*Entero-morpha*) zoospores“, *Appl. Environ. Microbiol*., **2000**, *66*, (8), 3249-3254.