# Influence of physico-chemical properties of surfaces on the morphology of maleic anhydride plasma polymer

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Plasma polymerisation is a dry process in which organic species from a plasma phase assemble on a substrate, generally resulting in the deposition of functional thin films. This phenomenon can be exploited to modify surface properties in a direct and technologically simple process. Plasma polymerisation therefore has two main scientific interests: one related to the physico-chemical phenomena occurring in the plasma phase and the other related to the properties of the deposited plasma-polymer films. Regarding the latter, one aspect which is particularly unexplored and could be useful in nanotechnologies is the spontaneous formation of nanostructures during plasma polymerisation. The formation of such nanostructures has been reported from various precursors, like maleic anhydride for example. They form spontaneously in randomly distributed locations They can be obtained by adjusting various parameters, such as the operating conditions during plasma deposition (power, duty cycle, frequency) [1] or the surface chemistry of the substrate [2]. This work aims to carefully isolate the effect of surface chemistry either on the formation of nanostructures or on the deposition of smooth thin films. Our selected strategy explores the use of functional self-assembled monolayers (SAMs) with different chemistries on silicon wafers. This approach enables a controlled variation of the surface chemistry without affecting other properties like the surface stress, the surface roughness or the uneven distribution of functional groups. In fact, the current work shows a way of tailoring the physico-chemical properties of model substrates through the generation of reactive self-assembled monolayers (SAMs) and post-functionalization via photo-chemistry [3],[4]. These model surfaces, once well characterised, are subjected to plasma deposition. The morphology of the coatings is then analysed by AFM in an attempt to correlate the surface chemistry of the substrate with the morphology of the plasma polymer obtained.

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