SiO_2 SURFACE CHARACTERIZATION BY ATOMIC FORCE MICROSCOPY (AFM)

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ABSTRACT

Nowadays a number of Atomic Force Microscopy (AFM) imaging modes are available. The most widely used imaging mode is the contact mode, in which sample topography can be measured in different ways. Measuring the force acting between the AFM probe and the sample, by means of force-distance curves, is important in defining the imaging force and thus in optimizing the image resolution. AFM force measurements can be used to probe the physical properties of the sample, that it could be biomolecules or pieces of microorganisms layers or entire living cells of microorganisms which could be immobilized on a flat surface like glass, mica or silicon oxide. The aim of this work is to study the properties of a SiO_2 surface by means of AFM. The study is based on the fact that the microroughness (RMS) affects directly the sorption of biomolecules onto highly selective sites. The RMS of the SiO_2 surface was measured before and after a rinsing with the piranha solution, the results shows how the surface was modified. After the rinsing treatment, a 37.550nm Au layer was deposited, the topographical characterization is shown.

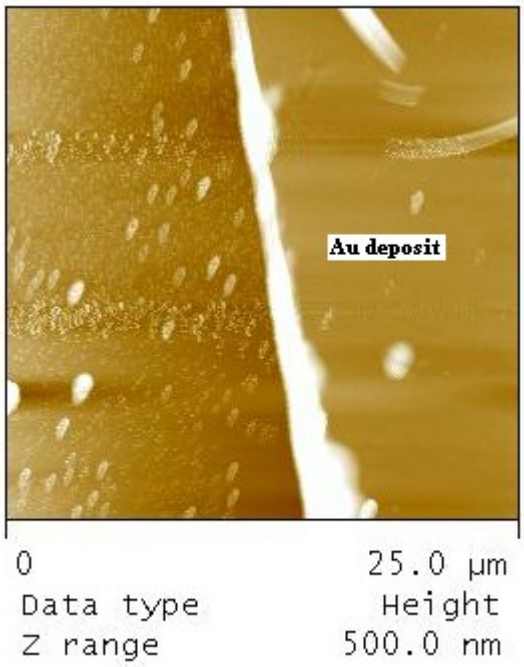

Figure 1. AFM image of the SiO_2 surface after the vapor deposition of an Au layer

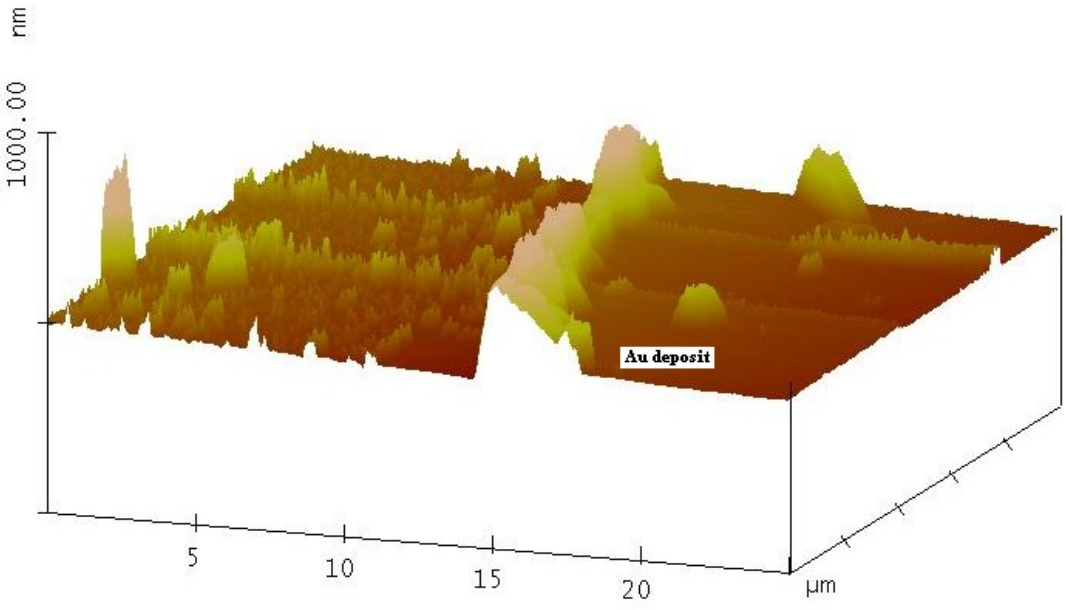

Figure 2. AFM 3D image of the SiO_2 surface after the vapor deposition of an Au layer