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Investigation of contact angle and physical properties of the polyaniline (*in-situ* and interfacial polymerization) coated silicon, with potential application as sensitive layer.

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The investigations of the mechanical and physical properties of polymers onto silicon, are considered important in the view point of technological applications, and open a new possibility as sensitive materials, such as quartz microbalance (QMB) oscillators, interdigital capacitors and thermopiles [1]. In this study, the evaluation of hydrophilic and hydrophobic surfaces using contact angle, the morphology of the thin film using atomic force microscopy (AFM) and UV-Visible are presented. The experiments were performed in the silicon surface and silicon with polyaniline (PANI) coating by *in-situ* and interfacial polymerization. The silicon surface with and without polyaniline was evaluated by contact angle (KSV Instruments), all images were obtained in tappingTM mode with scan rate of 1 Hz by atomic force microscopy (Dimension 5000 SPM) and UV-Visible spectra of polyaniline was performed using Shimadzu Spectrophotometer (UV-1601PC) at wavelengths from 900 to 200 nm. The results are showing that silicon present 78° of contact angle, there is more hydrophobic than in-situ and interfacial polymerization, 34° and 64° respectively .AFM images showing a deposition of very thin film of polyaniline and granular morphology onto silicon (Fig. 1 b and c). The roughness of silicon surface was 2.02 nm (Fig. 1a), 133.0 and 104.0 nm for the interfacial and *in-situ* polymerization, respectively (Fig. 1 b and c). Figure 2 shows the spectra of doped polyaniline and was observed two bands around 420 and 800 nm, related to the polaron absorptions, these are due to the cations radicals of poly (semiquinone), typical of conducting polymers. The PANI onto silicon are showing potentiality to apply as a specific sensitive layer.

Keywords: polyaniline, thin film, sensitive layer, AFM.

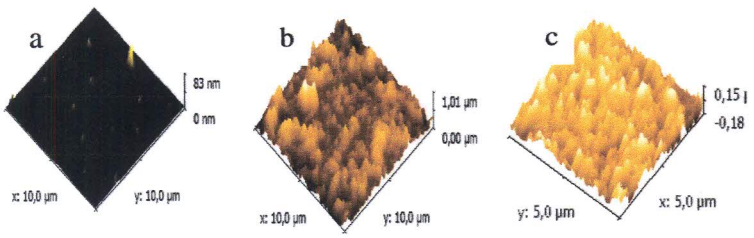

Figure 1 – AFM images cantilever: a) silicon surface, b) interfacial polymerization and c) *in-situ* polymerization.

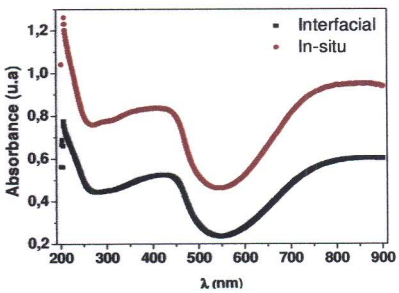

Figure 2- Spectra of UV/Vis of polyaniline.

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