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**ABSTRACTS**

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Program Number: HH3.27

Day / Time: Monday, Nov. 29, 8:00 PM - 11:00 PM

## Influence of the pH on the Surface and Optical Properties of the Thin Film of Polyaniline Polyethylene Teraphthalate Composite. The AFM and Spectroscopies Studies.

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In this work we are using atomic force microscopy (AFM) and spectroscopies techniques to investigate the influence of pH of the solution in the surface morphology and optical response of the PANI in the emeraldine oxidation state composite with polyethylene teraphthalate (PET). The PET/PANI strip was developed using in-situ chemical polymerization, using polyaniline in the emeraldine oxidation state, doped with HCL, used to measure the pH of solution. The absorption of UV-Vis spectra was used to evaluate the optical response to pH change of natural water. The strip showed a reversible color change upon variation of the pH. The shift is characteristic of dedoping of polyaniline, similarly to that which occurs for PANI dedoped by other methods. The pH ranges used to calibrate the optical sensor were from 2.0 to 12.0. With the UV-Vis-NIR spectroscopy was possible to observe the influence of the pH at the molecular level of the PET/PANI composite, that showing a molecular coil conformation. The repeat unit of PANI is composed of three phenylene rings that present an aromatic character, which was investigated using the Attenuated Total Reflection Fourier Transform Infrared (ATR-FTIR), and one another ring adopting a quinoid character. Since the extent of electron delocalization and conjugation is reflected by the behavior of bond-length alternation along the backbone of the conjugated polymers. It can be observed that the differences between the PANI/ dedoped and doped are related mainly to the effects of interaction between rings benzenoid/quinoid polymers with the solution. In basic pH bands showed further enlargement to be due to interaction of the OH group. From the AFM images, the Ra and rms roughness values and the average height were obtained and calculated. The roughness showing different behaviour in acid and basic regime. The hypothesis is that hydrogen bond play a key role, and could be explain the modification in the morphology.

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