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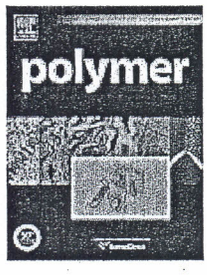

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[P1-163]

A new methodology to study the conductivity of flexible polymer composites

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Conducting polymers deposited onto flexible substrates, as plastics or elastomers, have been studied, since the properties from both components lead to new electrically conducting materials, which are transparent, flexible and with low cost. These materials can take use as displays, rechargeable batteries, microelectronic devices, and so on. Polyaniline (PANI) was extensively studied, because of its special properties like ease doping by protonic acids and good environmental stability [1].

In this work, PANI films, synthesized by the chemical synthesis at room temperature and deposited onto poly(ethylene terephthalate) PET films, were obtained [2]. The composites were dedoped with 0.1 M NH_4OH and redoped with HCl vapours, negative and positive corona discharge. The materials were characterized by ultraviolet and visible absorption spectroscopy (UV-vis). Such composites were highly transparent and good electrically conductors. The electrical conductivity of the composites doped with HCl vapours was around 2 S/cm and those doped with corona discharge was around 0.3 S/cm.

A *kdl* v.1.0 computer program and *software* SIARCS 3.0 (twice developed by Lúcio A.C. Jorge, Embrapa Instrumentação Agropecuária/CNPDIA) were applied, for the first time, to analyse the stability of the PANI doped. It was observed that the doping with corona discharge was more stable than the samples doped with protonic acids. Due these results, we observed that the process by corona discharge doping, showed interesting results to a period of one month (reduction of the doping less than 0.6%). This seems to qualify the doping method (by corona discharge) in electronic industry, for example, as microelectronic devices.

Keywords: Polyaniline; conductivity.

References:

1. Mattoso, L.H.C. *et all.* Synthetic Metals, V. 132, Issue 2, 2003, Pages 109-116.

2. Vaz, D.O.; Mattoso, L.H.C. in Proceedings of MoDeSt Conference-2000, Palermo Italy, September/2000.
Keywords: conducting polymers, polyaniline, composite, doping

[P1-164]

Using Microfluidics for Combinatorial Characterization of Photocrosslinked Materials. Interaction with Valvular Interstitial Cells

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High-throughput methods allow rapid examination of parameter space to characterize materials and develop new polymeric formulations. Favorable cell–material interactions are critical to the success of polymeric materials used in biological applications.[1] The polymerization of typical multimethacrylate monomers produces a complex crosslinked polymeric network. In this work, we have utilized microfluidic-based systems incorporating a unique gradient maker channel that can be used to fabricate PEG-based materials with gradients of topography and cross-linking densities. Recent studies have used this high-throughput analysis to determine the reaction kinetics.[2]

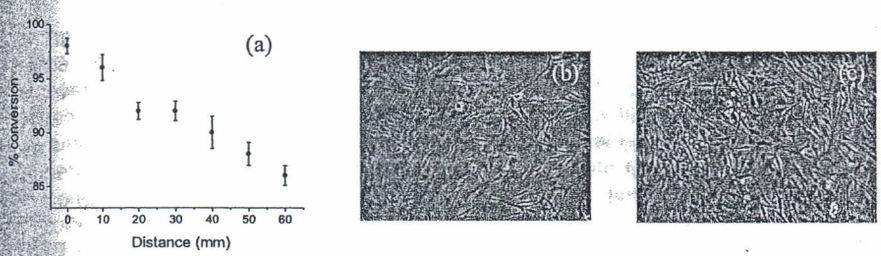

Figure 1. The methacrylate final conversion as increasing hyperbranched crosslinker (P1000MA) concentration (a). Representative light micrographs of valvular interstitial cells attached (48h after seeding) to the surface of photopolymerized samples fabricated from PEGDMA with a gradient concentration of P1000MA. Distance increases from b to c, corresponding to 25 and 65 mm.