

XI Encontro da SBPMat

Florianópolis

Costão do Santinho Resort

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Brasil-MRS

Sociedade Brasileira de
Pesquisa em Materiais



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Sobre o evento

O XI Encontro da SBPMat é um tradicional fórum dedicado à divulgação e debate dos avanços e futuras direções da pesquisa e aplicações de engenharia e ciência dos materiais. [Saiba mais...](#)

Simposios

C) Organic electronics and spintronics

Organizador principal
- Ivo Alexandre Hummelgen (UFFR, Brazil)

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Printed circuit board electrodes modified with nanostructured films: use in the electronic tongue

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Several technologies for the evaluation of food and liquid samples have been proposed in the last decade. Such techniques aim at analyze samples regarding the presence of contaminants, such as pesticides, bacteria metabolites, heavy metals, etc. Moreover, the techniques also intend to distinguish and classify liquids of similar compositions. Among the techniques employed, the electronic tongue is of great importance, once it has been successfully applied to classify wines, juices, water, etc [1-3]. Among several methodologies of electronic tongue, one is based on an array of sensing units comprising interdigitated electrodes modified with nanostructured films of conductive polymer, which is employed to analyze and classify liquids based on measurements of electrical resistance and capacitance through an impedance analyzer. There are several available types of interdigitated electrodes and usually, the higher their sensibility, the higher their cost. In this work we tested the use interdigitated electrodes fabricated on substrates of printed circuit board (PCB). The method of fabrication follows that employed in industry, where the substrate is based on a composite of fiber with epoxy resin, and the gold electrode fingers are 100 μ m-wide. The electrodes based on PCB were covered with alternate nanostructured films of polyaniline (PANI) and polystyrene-sulfonate (PSS) by the layer-by-layer technique (LbL), with 1, 3, 5 and 7 bilayers. The array of sensing units was employed in the electronic tongue to evaluate its ability to discriminate and classify solutions of NaCl, KCl, MgCl₂, CaCl₂ dissolved in miliQ water, as a first experiment. The electrical resistance and capacitance of the solutions were collected by an impedance analyzer in a frequency range from 1 to 1 MHz, and the data treated using multivariate statistics. The results obtained show that the electronic tongue using electrodes based on PCB was able to distinguish the salt solutions. The low-cost interdigitated electrodes fabricated on printed circuit board could be an alternative to produce sensing units of the electronic tongue, which is useful to evaluate and classify liquids of varied composition.

Keywords: electronic tongue, interdigitated electrode, nanostructured polymeric film.

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