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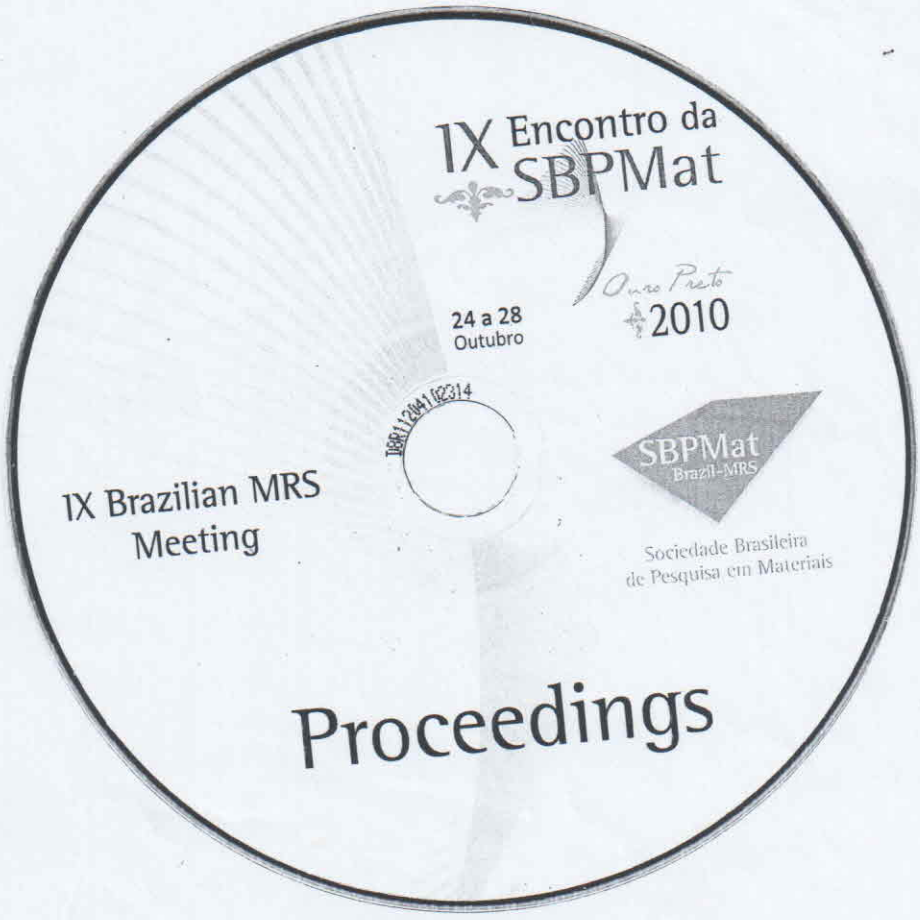

New electronic tongue design for the qualitative analysis of natural waters

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In the last few years a great deal of work has been devoted to the development of electronic tongues. This term refers to an array of non-specific liquid sensors that combined with pattern-recognition techniques can be used to obtain information from complex solutions [1]. Here the strategy relies on the use of a set of non-specific sensors that responds differentiatly toward a group of related chemical species [2]. The main drawback of these systems is the huge amount of previous measurements needed for modeling, calibration or learning stage. It is for this reason that techniques such as flow analysis offer advantages in the development of electronic tongues [3]. In this work we were interested in further developing new electronic tongues by exploring the use of sensors modified with polymeric nanofibers obtained by solution blow spinning [4] and flow analysis as a set for the qualitative analysis of natural waters. Interdigitated electrode-base sensors were modified with poly(D,L-lactic acid) nanofibers with and without multiwalled carbon nanotubes (MWCNTs) incorporation. Fig. 1 shows the fiber morphology of the nanocomposite of PLA contained 1% wt of MWCNT. The principal component analysis plot for the qualitative analysis of different waters is shown in Fig.2.

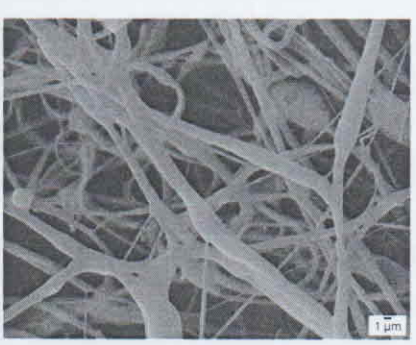

Figure 1: SEM of nanocomposite fibers of PLA contained 1% wt of MWCNT.

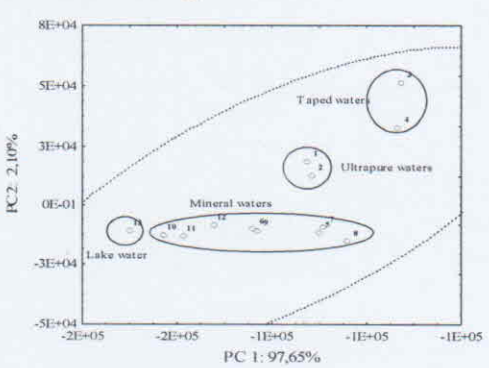

Figure 2: PCA plot of samples from different water types.

Keywords: nanofiber, carbon nanotube, electronic toungue, interdigitated microelectrodes, sensors.
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[1] Máñez, R.M.,et al., Sensors and Actuators B, **104**, p.302–307, (2005).
[2] Riul, A.Jr., et al., Biosensors and Bioelectronics, **18**,p. 1365-1369, (2003).
[3] Gutés, A.,Céspedes, F., and Valle,M., Analytica Chimica Acta, **600**, p.90–96, (2007).
[4] Medeiros, E.S., et al., J.of Appl. Polymer Science, **113**(4): p. 2322-2330, (2009).
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