Encontro da SBP Mat X
Gramado RS
25 to 29 September 2011

Conference Details and Registration
All attendees are encouraged to visit the conference website http://www.sbpmat.org.br for further and updated information such as registration, submission of abstracts, important links for traveling (visas, travel agencies) and hotel reservation.

Symposia
A) Magnetic and Superconducting Materials
B) Biodegradable Polymer Materials
C) Electronic Materials
D) Surface Engineering: Fabrication, Characterization, Properties and Applications of Protective Coatings and Modified Surfaces
E) Materials with Negative Properties
F) Nanomaterials: Functional Materials for Advanced Energy and Environmental Applications
G) Molecular Modeling Materials Science
H) Structure-property Relationship of Advanced Metallic Materials
I) Sol-gel Route to Prepare New Inorganic, Hybrid and Multifunctional Materials
J) Solidification of Metals and Alloys
K) Supramolecular Organic Materials for Electronic, Photonics and Nanotechnology
L) Structure-Property Relationship of Ceramic Materials: Theoretical and Experimental Aspects
M) Advances and Applications of Electron Microscopy

Prospects for Materials Science with Synchrotron Radiation in Brazil
1st Brazilian Symposium in Friction Stir Welding and Processing

Graphene

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10 years of excellence in the propagation of science and research in materials and materials technology in Brazil

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Important Dates
April 5th - Registrations open
May 30th - Submissions deadline
June 13th - Acceptance

Support
ELECTROSPINNING OF BIODEGRADABLE NANOFIBERS AND NANOCOMPOSITE FIBERS: A REVIEW OF APPLICATIONS IN AGRICULTURE

C. Ribeiro¹, Rodrigo G. F. Costa², Juliano E. Oliveira³, Gustavo de Paula⁴ and Luiz H. C. Mattoso⁴

¹Embrapa Instrumentation, São Carlos, SP, Brazil.
²Universidade Federal de São Carlos, Departamento de Química, São Carlos, SP, Brazil.
³Universidade Federal de São Carlos, Departamento de Engenharia de Materiais, São Carlos, SP, Brazil.

The development of a viable nanotechnology passes through the development of processing techniques, which can be used in desired production scales with reproducibility, especially in the cases where the final product is still in the nanoscale. This is the case of nanofibers, which can be used in nonwoven products, sensors and recently, those materials were showed as a possible system for coat different polymers. Several processes are used to produce polymer nanofibers, however, one of the most successfully is the electrospinning process, based in the Corona effect developed when a high voltage is applied to a polymer solution or melt. The fibers processed in this condition can easily attain diameters ranging from 10 to 500 nm and high surface area-to-volume ratio. The processing of nanocomposite solutions (polymer matrices with synthetic nanoparticles) using this technique shows an interesting physical confinement effect, since the loaded materials are of the same size order of the final fiber. In the case of reinforced materials, as electrospinned fibers reinforced by nanocellulose whiskers, the results are especially interesting to understand the effect of nanoscale confinement in the final fiber property. However, this feature is also interesting to join the surface properties of the loaded nanoparticles with general applications of nanofibers. Then, some bactericidal nanoparticles, such as anatase TiO₂ or metallic Ag nanoparticles, may be tested. In our studies, several electrospinned nanofibers from different biodegradable polymers, as PVA and PLA, beside others, were produced, and some composites, as PVA/TiO₂ [1] and (PVA)/silver (Ag) [2], were prepared successfully in different conditions. The nanoparticles used as loadings were extracted or synthesized, showing effective sizes below 20 nm. The nanofibers were characterized by SEM, EDS, XRD and UV-Vis diffuse reflectance spectroscopy, showing that the technique can be used to produce fibers in diameters below 100 nm with good reproducibility. The antibacterial and catalytic activities of the nanofibers were investigated, showing some oxidative active against Rhodamine B dye (in the case of PVA/TiO₂ nanofibers) and good bactericidal activities against Staphylococcus aureus (87.8%) and Escherichia coli (85%) (for PVA/Ag nanofibers). An overview of applications for those materials was also showed, focusing in many possibilities to improve the competitiveness of agriculture.

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Corresponding author: Caue Ribeiro, E-mail: caue@cpdija.embrapa.br. Address: Rua Quinze de Novembro 1452, São Carlos, SP