

# Encontro da X SBPMat

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/x-meeting> 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) Nanostructured 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
- N) Prospects for Materials Science with Synchrotron Radiation in Brazil
- O) 1st Brazilian Symposium in Friction Stir Welding and Processing
- P) Graphene

## Official Travel Agency: Liga Turismo

The agency provides excellent hosting, airline tickets (20% discount), Gramado-PoA airport shuttle options and sightseeing suggestions.

Liga Turismo also provides travel-hosting-tour combo options! Get in touch!  
phone: +55 51 3085-4466 or +55 54 3286-4048  
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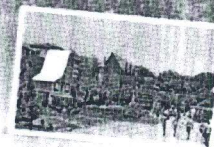
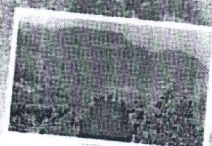


X Brazilian  
MRS Meeting

SBPMat  
Brazil-MRS

Brazilian Materials  
Research Society

## X Brazilian MRS Meeting



16 symposia with oral, poster and invited lecture presentations

Plenary lectures

Exhibits

Celebration of 10 years of Brazilian MRS

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*10 years of excellence in  
the congregation of science  
and research in materials  
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## Contact

Secretariat

[x-meeting@sbpmat.org.br](mailto:x-meeting@sbpmat.org.br)  
(55) (51) 3231-0311

## Conference Chairs

Paulo F. P. Fichtner - UFRGS - RS  
Naira M. Balzaretti - UFRGS - RS

## Important Dates

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

## Support



Credit of photos - Leonid Strelan



# Development of bactericidal nanocomposites for food packaging

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The antimicrobial properties of silver nanoparticles (AgNPs) have been increasingly exploited in consumer products such as deodorants, clothing, bandages, as well as in cleaning solutions and sprays as antimicrobial agents [1]. It has been reported that some antimicrobial agents may affect the physical properties, processability or machinability of the packaging material. Cellulose-based materials are being widely used as they offer advantages including edibility, biocompatibility, barrier properties, aesthetic appearance, non-toxicity, non-polluting and low cost [2]. Hydroxypropyl methylcellulose (HPMC) is a biopolymer approved by FDA (Food and Drug Administration) and the EU (EC, 1995) for food uses [3]. The objective of this study was to investigate the antibacterial activity of HPMC/silver nanoparticles nanocomposites for application as active packaging. Two sets of silver nanoparticles with diameters of 40 and 100 nm were employed. The nanocomposites were obtained by addition of HPMC in the nanoparticle solution (recently synthesized) under magnetic stirring. To investigate the antibacterial activity of films, 1 cm diameter disks were cut from different nanocomposite films and placed on inoculated nutrient medium content *Staphylococcus aureus* (*S. aureus*) and *Escherichia coli* (*E. coli*). The disks were incubated at 37 °C for 24 hours. Nanocomposites containing smaller nanoparticles exhibited antibacterial activity, as revealed by the formation of larger inhibition halos. Smaller particles can be better dispersed into the nanocomposites surface, thus favoring their interactions with the culture medium. Bactericidal potential of the HPMC/AgNPs nanocomposites against bacterial growth is indicative that the nanocomposites can be used in food packaging as active antimicrobial internal coatings.

Keywords: Hydroxypropyl methylcellulose, active films, packaging.

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[2] M. Imran, S. El-Fahmy, A.-M. Revol-Junelles, S. Desobry. *Carbohydrate Polymers*, 81, 219 (2010).

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