

# 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
- 3) Molecular Modeling Materials Science
- 1) Structure-property Relationship of Advanced Metallic Materials
- 2) Sol-gel Route to Prepare New Inorganic, Hybrid and Multifunctional Materials
- 4) Solidification of Metals and Alloys
- 5) Supramolecular Organic Materials for Electronic, Photonics and Nanotechnology
- 6) Structure-Property Relationship of Ceramic Materials: Theoretical and Experimental Aspects
- 7) Advances and Applications of Electron Microscopy
- 8) Prospects for Materials Science with Synchrotron Radiation in Brazil
- 9) 1st Brazilian Symposium in Friction Stir Welding and Processing
- 10) Graphene

### Official Travel Agency: Liga Turismo

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

Turismo also provides travel-hosting-tour combo options! Get in touch!

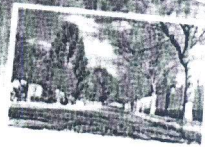
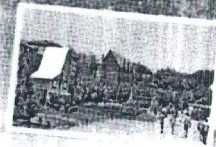
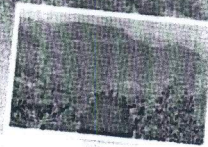
Phone: +55 51 3085-4466 or +55 54 3286-4048  
Email: [reservas@ligaturismo.com.br](mailto:reservas@ligaturismo.com.br)



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

### National Committee

Aldo Felix Craievich (USP-SP)  
Alcio Nélmo Klein (UFSC)  
Antonio Carlos Hernandes (USP-SC)  
Carlos Frederico de Oliveira Graeff (Unesp)  
Carlos Maurício Lepienski (UFPR)  
Dulce Maria de Araujo Melo (UFRN)  
Edgar Dutra Zanolto (UFSCar)  
Elisa Maria Baggio Saitovitch (CBPF)  
Elson Longo (Unesp)  
Fernando Cláudio Zawislak (UFRGS)  
Fernando Lazaro Freire Junior (PUC-RJ)  
Iêda Maria Garcia dos Santos (UFPA)  
Ivan Guillermo Solorzano (PUC-RJ)  
Jesiel Freitas Carvalho (UFG)  
José Alberto Giacometti (Unesp)  
José Antônio Eiras (UFSCar)  
José Arana Varela (Unesp)  
Julio Ricardo Sambrano (Unesp)  
Margareth Spangler (CETEC-MG)  
Raul José da Silva C. M. da Fonseca (UERJ)  
Renato de Figueiredo Jardim (USP-SP)  
Roberto Mendonça Faria (USP-SC)  
Sergio de Souza Camargo Junior (UFRJ)  
Waldemar Augusto A. Macedo (CDTN)  
Walter Jose Botta Filho (UFSCar)

### Local Committee

Adriana Pohmann (UFRGS)  
César Petzhold (UFRGS)  
Cristiano Krug (UFRGS)  
Daniel L. Baptista (UFRGS)  
Eduardo Ceretta Moreira (Unipampa)  
Fábio Teixeira Dias (UFPEL)  
Gustavo M. de Azevedo (UFRGS)  
Luiz F. Schelp (UFSCar)  
Márcia R. Gallias (UFRGS)  
Naira M. Balzaretto (UFRGS)  
Paulo F. P. Fichtner (UFRGS)  
Ricardo M. Papaleo (PUC-RS)

*10 years of excellence in  
the congregation of sciences  
and research in materials  
technology in Brazil*

### 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. Balzaretto - UFRGS - RS

### Important Dates

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

### Support



# Tensile properties of poly(glycerol succinate-co-maleate) nanocomposites reinforced with cellulose nanowhiskers

E. S. Medeiros<sup>1</sup>, L. H. C. Mattoso<sup>2</sup>, and W. J. Orts<sup>3</sup>

<sup>1</sup>UFPB, Departamento de Eng. de Materiais, João Pessoa, PB, Brazil

<sup>2</sup>EMBRAPA Instrumentação Agropecuária, São Carlos, SP, Brazil

<sup>3</sup>USDA, Bioproduct Chemistry and Engineering, Albany, CA, USA

The use of glycerol for the production of polymers goes back to the beginning of the 21<sup>st</sup> century, but the development of glycerol-based polymers was relatively “forgotten” due to subsequent discoveries of thermoplastic polymers that were more durable, easily processable, and offered a wide range of applications [1,2]. Recently, however, due to a constant search for biodegradable materials from renewable resources, significant attention has been given to the preparation and properties of new polymers from glycerol, because glycerol can be used to synthesize trifunctional branched structures with a wide range of properties with many potential applications in various branches of polymers and biopolymers industry. Thus, systematic studies on synthesis and characterization of glycerol-based polymers not only can result in the development of new materials but can also be a viable alternative to large-scale use of glycerol from biodiesel byproducts. In this sense, mechanical and thermal characterization of a biodegradable polymer based on glycerol, viz., poly(glycerol succinate-co-maleate) – Poly(GlySAMA), unreinforced and reinforced with 0, 0.5, 1 and 4wt.% of cellulose nanowhiskers (CNW) was studied, respectively, by tensile tests and thermogravimetric analyses. Results show that this novel glycerol-based polymer is very thermally stable, which is a consequence of its highly cross-linked structure. It was also found that the addition of materials with relatively low thermal resistance (CNW) did not decrease composite’s thermal properties. Moreover, addition of up to 4wt.% cellulose nanowhiskers caused tensile strength and Young’s modulus to increase, respectively, up to 20 and 40%, while elongation at break decreased by about 16%. These results show that CNW can be used to improve composites mechanical properties without decreasing their thermal properties.

CnF content (%)	Young’s Modulus (MPa)	Tensile Strength (MPa)	Elongation at break (%)
0	1527 ± 72	74 ± 5	8.8 ± 0.4
0.5	1565 ± 49	74 ± 4	7.3 ± 0.1
1	1861 ± 79	80 ± 4	7.3 ± 0.2
2	2060 ± 95	87 ± 5	7.2 ± 0.3
4	2140 ± 84	89 ± 4	7.5 ± 0.4

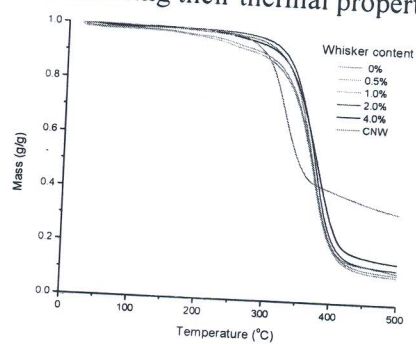


Fig. 1. Tensile (a) and thermal (b) characterization of poly(GlySAMA) polymer and nanocomposites. **Keywords:** poly(glycerol succinate-co-maleate), nanocomposites, cellulose nanowhiskers

Work supported by CNPq, CAPES, and ARS/USDA.

[1] M. Pagliaro, M. Rossi, “Future of Glycerol”, Royal Soc. Chem., London, U.K., 2008.

[2] G. Odian, “Principles of Polymerization”, Wiley-Interscience, New Jersey, USA, 2004.

e-mail: [eliton@ct.ufpb.br](mailto:eliton@ct.ufpb.br), UFPB/CT/PPCEM, Departamento de Engenharia de Materiais, Cidade Universitária, João Pessoa-PB, CEP: 58051-900.