

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!

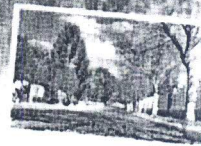
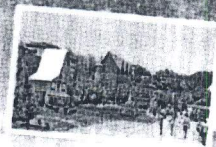
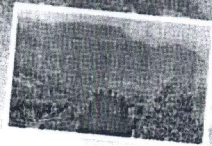
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X Brazilian MRS Meeting



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
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Contact

Secretariat
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Conference Chairs

Paulo F. P. Fichtner - UFRGS - RS
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Important Dates

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

Support



CELLULOSE NANOCRYSTAL AS REINFORCEMENT FOR BIODEGRADABLE FILMS

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Cellulose nanocrystal (CN) was obtained by acid hydrolysis from sisal fibers by H₂SO₄ at 60 % (w/w) and 50°C/30min. CN was evaluated by thermal degradation behavior by thermogravimetry (TG), morphological structure by field emission scanning electron microscopy (FESEM) and tensile strength (TS) analyses.

Keywords: cellulose, acid hydrolysis, nanocrystal, biodegradable film

Hybrid biomaterials are proposed as one of the promising future directions in biomaterial research in the development of new materials, such as cellulose nanocrystal (CN) as a reinforcement for corn starch/collagen matrix. The cellulose from sisal fibers was extracted using a pre-treatment with H₂O₂ and NaOH solution. CN was prepared by acid hydrolysis carried out with H₂SO₄ solution 60% (w/w) at 50°C/30 min under continuous mechanical stirring. CN shape was observed with a FESEM Zeiss Gemini SupraTM35 an acceleration voltage of 24 kV. Films were prepared by casting method from aqueous solution of corn starch/collagen at 2% (w/w), glycerol as plasticizer 30% (w/w) and CN from 0 to 10% (w/w). Thermogravimetric measurements were performed by using a TA Q500 instrument from 25 to 600°C at a heating rate of 10 °C/min. According Mutjé et al. [1] an aspect ratio (L/D) of the fiber of 10 is the minimum aspect ratio required for a good stress transfer from the matrix to the fibers to promote a significant reinforcement. By FESEM the L/D of CN was determined around 27, which explain the good reinforcement effect caused (Table 1). Table 1 is shown the improved after CN addition. According the results CN could be a viable alternative for new materials in which high performance as reinforcement agent. Biodegradable films are a possible response to the demand for environmentally friendly packaging materials.

Table 1 – Properties of nanocomposite films plasticized with glycerol at 30% (w/w)

Films	Tensile strength (MPa)	Elongation break (%)	Temperature initial T _i (°C)
NCNB0	10 ± 0,8	32 ± 14	195
NCNB2	12 ± 2,2	32 ± 4	221
NCNB5	14 ± 0,3	28 ± 5	225
NCNB10	18 ± 4,1	6 ± 2	253

[1] P. Mutjé, A. López, E. M. Vallejos, J. P. López, F. Vilaseca. *Compos Appl Sci. Manuf.* **77**, 38, 369 (2007).

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