

X Encontro da 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 Graphene

Official Travel Agency: Liga Turismo

Liga Turismo agency provides excellent hosting, airline tickets (20% discount), mado-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

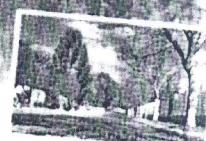
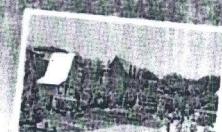
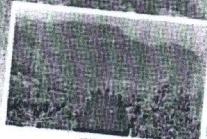


X Brazilian MRS Meeting

SBPMat
Brazil-MRS

Brazilian Mater
Research Societ

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)
- Alcizio Nelmo Klein (UFSC)
- Antônio Carlos Hernandez (USP-SC)
- Carlos Frederico de Oliveira Graeff (Unesp)
- Carlos Maurício Lepienski (UFPR)
- Dulce Maria de Araújo Melo (UFRN)
- Edgar Dutra Zanotto (UFSCar)
- Elisa Maria Baggio Saitovitch (CBPF)
- Elson Longo (Unesp)
- Fernando Cláudio Zawislak (UFRGS)
- Fernando Lazaro Freire Junior (PUC-SC)
- Iêda Maria Garcia dos Santos (UFPB)
- Ivan Guillermo Solorzano (PUC-RJ)
- Jesiel Freitas Carvalho (UFG)
- José Alberto Giacometti (Unesp)
- José Antônio Eiras (UFSCar)
- José Arana Varela (Unesp)
- Júlio 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)
- Sérgio de Souza Camargo Junior (UFRJ)
- Waldemar Augusto A. Macedo (CDTN)
- Walter Jose Botta Filho (UFSCar)

Local Committee

- Adriana Pohlmann (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. Scheff (UFSM)
- Márcia R. Galas (UFRGS)
- Naira M. Balzaretti (UFRGS)
- Paulo F. P. Fichtner (UFRGS)
- Ricardo M. Papaleo (PUC-RS)

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

Contact

Secretariat

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 Streicher

Preparation of nanostructured hydrogels based on montmorillonite, polyacrylamide and methylcellulose: hydrophilic and spectroscopic characterization

Elaine I. Pereira¹, Cauê R. de Oliveira², Adriel Bortolin¹, Fauze A. Aouada³, Luiz H. C. Mattoso²

¹Universidade Federal de São Carlos, Campus São Carlos, SP, Brazil.

²EMBRAPA Instrumentação Agropecuária, São Carlos, SP, Brazil.

³Universidade Estadual Paulista, Campus Araraquara, SP, Brazil.

Composite materials reinforced at a molecular scale are called nanocomposites and these systems have become increasingly popular. These polymer/clay nanocomposites frequently exhibit excellent physical, mechanical, and other properties [1]. The purpose of present study is the preparation and characterization of the new nanostructured hydrogel composed of polyacrylamide (PAAm), methylcellulose (MC) and calcium montmorillonite (Mt). Composites were prepared at different mass ratios of montmorillonite and hydrogel: HMt1 (50% de Mt), HMt2 (25% de Mt), HMt3 (12.5% de Mt), HMt4 (6.25% de Mt) and HMt5 (pure hydrogel). The composites were characterized by swelling measurements and infrared spectroscopy (FTIR). We also calculated the kinetic parameters using the model developed by Ritger and Peppas $M/M_{eq} = k \cdot t^n$ [2]. The values of swelling degree at equilibrium (Q_{eq}) were also determined. The results of the degree of swelling show that as the concentration of Mt increases the degree of swelling reduced considerably, because the chains of hydrogels become more dense and resistant, thus hindering its expansion. There was also an increase of rate constant k, which shows that the presence of clay caused the hydrogel to absorb water more quickly, but in small quantities. For hydrogels containing Mt (HMt1-4), the values of n lie between 0.5 and 1.0, which indicates that diffusion, occurs by anomalous transport. Accordingly, the diffusion process is governed, at the same time, by diffusion and relaxation of the chains of the hydrogel. As for the clay without composite (HMt5) the value of n was approximately equal to 0.5, corresponding diffusion Fickiana [3]. The incorporation of montmorillonite by the polymeric matrix of the hydrogel could be confirmed in the FTIR spectra. The composite HMt1 showed characteristic bands as of both the pure clay minerals in the regions 400-800 cm^{-1} refers to angular deformations of Si-O-M (M = metal), 900 to 1110 cm^{-1} regarding the different frequencies of vibration angular Al-OH-Al, axial strain of the link Si-O, asymmetric and symmetrical, and the region between 3620-3630 cm^{-1} in which refers to the axial deformation of structural hydroxyl; as the HMt5 regions of 1466 cm^{-1} , 1606 cm^{-1} , 1668 cm^{-1} and 2990-3600 cm^{-1} .

Keywords: nanostructured hydrogel, montmorillonite, swelling degree, FTIR.

Work supported by CNPq, FAPESP, CAPES, Embrapa Instrumentação.

[1] F. Santiago, A. E. Mucientes, M. Osório, C. Rivera. Eur. Polym. J., **43**, 1 (2007).

[2] P. Ritger, N. Peppas, J. Control. Release, **5**, 37 (1987).

[3] F. A. Aouada, M. R. de Moura, W. T. da Silva, E. C. Muniz, L. H. C. Mattoso, J. Appl. Polym. Sci., **120**, 3004 (2011).