

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

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16 symposia with oral, poster and invited lecture presentations

Plenary lectures

Exhibits

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

Contact

Secretariat
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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



Credit of photos: Leonid Streltsov

Study of exfoliated nanocomposites by SEM and X-ray techniques

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The investigation of polymer/clay nanocomposites received considerable scientific and technological attention during the last years due to important clay properties, such as: the high availability; the reinforcement effect even added into polymeric matrix in small quantities (1-5 wt%) and the huge knowledge regarding clay-polymeric matrix intercalation chemistry [1,2]. The aim of this work is to obtain informations about the dispersion degree of the laponite clay layers into the thermoplastic starch (TPS) matrices. The nanocomposites were prepared by melt processing in a Haake Rheocord. Glycerol was used as plasticizer agent. The analyses of the fractured surfaces were obtained using Field Emission Scanning Electron Microscopy (FE-SEM) technique. A homogeneous and continuous surface is observed for TPS and TPS-laponite nanocomposites, indicating that the starch granules were completely disrupted and the laponite was well dispersed in the polymeric matrix. The electronic micrographs also indicated that there was no phase separation between TPS-laponite materials; and no clay aggregation can be seen even at higher magnifications. This is indication of good interaction, compatibility and miscibility between them [3]. X-ray diffraction technique was also employed to investigate the degree of the exfoliation of the nanocomposites. The diffraction pattern of laponite is consistent with a montmorillonoid-type powder. The basal spacing of laponite and their nanocomposites were calculated from Bragg's equation, $\lambda = 2 d \sin\theta$. Laponite shows an intensive peak at $2\theta = 6.40^\circ$, corresponding to an interlayer basal spacing (d_{001}) of 1.38 nm. In all XRD patterns of the nanocomposites, no diffraction peaks between $2\theta = 3-12^\circ$ were observed, confirming a good nanodispersion and exfoliation of the clay platelets.

Keywords: Laponite clay, thermoplastic starch, exfoliated nanocomposites, FE-SEM, X-ray technique.

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- [3] F. A. Aouada, L. H. C. Mattoso, E. Longo, *J. Thermoplast. Compos. Mater.* *submitted* (2011).

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