X Encontro da SBPMat

Gramado-RS

25 to 29 | september 2011

16 symposia with oral, poster and invited lecture presentations

Plenary lectures

Exhibits

Celebration of 10 years of Brazilian MRS

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) Supramomolecular 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

Prospects for Materials Science with Synchrotron Radiation in Brazil

1st Brazilian Symposium in Friction Stir Welding and Processing

Graphene

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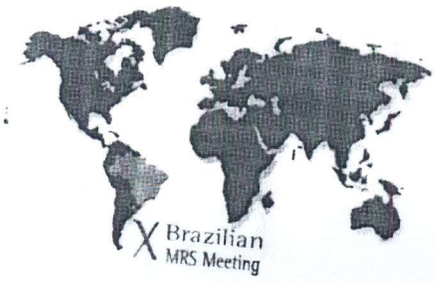

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10 years of excellence in the congregation of science and research in materials technology in Brazil

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Important Dates

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

Support

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Improvement in thermal stability of the nanocomposites by adding of the laponite clay

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The new group of composites, named as nanocomposites, is receiving a great deal of attention from different researchers in different fields [1]. In the nanocomposite materials at least one dimension of the particles is in the nanometer size (1-100 nm) [2]. Additionally, when the domain size is equivalent to the dimension of a molecule, the atomic and molecular interactions can have a significant influence on the macroscopic properties of that material [3]. In this work, the effect of the laponite clay on the thermal properties of the thermoplastic starch (TPS) nanocomposites was investigated by thermogravimetric analysis (TGA). The nanocomposites were prepared, using glycerol as plasticizer agent, by melt processing in a Haake Rheocord mixer with controlled parameters, i.e.: residence time, temperature and rotor speed. From TGA results showed in Table 1, it was possible to see that the addition of the clay (a material more thermally stable than polymeric materials) into the polymeric matrix increased the onset temperature ($T_{d\ initial}$) of degradation from 175°C to around 200°C. Probably, the strong interaction between the clay and the polymeric matrix also difficult the degradation of the matrix. The decomposition activation energies calculated from TGA curves by the integral method adapted from Horowitz and Metzger [4] confirmed the increase in the thermal stability of the nanocomposites by adding of the laponite clay.

Table 1: Thermal stability parameters of TPS and TPS-laponite nanocomposites.

Nanocomposites	$T_{d\ initial}$ (°C)	$T_{d\ maximum}$ (°C)	$T_{d\ final}$ (°C)
TPS	174.9	310.0	353.1
TPS_1% laponite	201.8	305.4	355.5
TPS_2% laponite	193.1	309.7	356.6
TPS_3% laponite	199.5	306.9	357.4
TPS_5% laponite	195.7	301.8	357.1

Keywords: Thermal stability, TGA, Haake mixer, nanocomposites.

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