

# X Encontro da SBPMat

*Gramado-RS*

25 to 29 | september  
2011

# Proceedings

English

Português

X Brazilian MRS Meeting



Brazilian Materials  
Research Society

*10 years*

**SP1-B43 - Development Of Nanoparticles Ionically Crosslinked Of Chitosan With Tripolyphosphate For Nasal Administration Of Albumin**

Liliane Neves Pedreiro<sup>1</sup>, Charlene Priscila Kiill, Maria Palmira Daflon Gremião; <sup>1</sup>Universidade Estadual Paulista - Araraquara

**SP1-B44 - Synthesis and thermal characterization of blends pectin+latex of Hancornia speciosa plasticized by glicerol**

Juranez Dantas, Carmem Milkas Corbellini Souza, Tiago Bruno Reis Araujo, Jair Marques Junior, Marcelo Freitas Lima, Aline Margarete Furuyama Lima<sup>1</sup>; <sup>1</sup>Universidade Federal de Mato Grosso/ Barra do Garças

**SP1-B45 - Antimicrobial Membrane Cellulose Acetate Containing Ionic Liquid and Metal Nanoparticles**

Carla Weber Scheeren<sup>1</sup>, Jairton Dupont; <sup>1</sup>Universidade Federal do Rio Grande

**SP1-B46 - The influence of polymer molecular weight on the drug encapsulation in lipid core nanocapsules**

Catiúscia Padilha Oliveira, Cristina de Garcia Venturini<sup>1</sup>, Silvia Guterres, Adriana Raffin Pohlmann; <sup>1</sup>Universidade Federal do Rio Grande do Sul

**SP1-B47 - Thermoplastic starch-polyethylene blends**

Gisela Kloc Lopes, Mario Marques Figueira-Junior, Diego de Holanda Saboya Souza, Cristina Tristão Andrade<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio de Janeiro

**SP1-B48 - Inclusion of pigments from red pepper in beta-cyclodextrin: comparison between magnetic and ultrasonic stirring**

Lidiane Mendes Gomes<sup>1</sup>, Nicolly Petito, Francine Albernaz Lobo, Deborah Quintanilha Falcão<sup>1</sup>, Kátia Gomes de Lima Araújo; <sup>1</sup>Universidade Federal Fluminense

**SP1-B49 - UV light irradiation on poly (lactic acid): surface modifications**

Franciele Nicole Dos Santos<sup>1</sup>, Walter Ruggeri Waldman, Antonio Jose Felix Carvalho; <sup>1</sup>Universidade Federal de São Carlos - Campus Sorocaba

**SP1-B50 - Potential evaluation of extraction whiskers from natural fiber of theTypha domingensis**

Natália Reigota César<sup>1</sup>, Paola Mulazani, Natali Dandara de Jesus, Fabio Lima Leite, Vagner Roberto

Botaro, Aparecido Junior de Menezes; <sup>1</sup>Universidade Federal de São Carlos - Campus Sorocaba

**SP1-B51 - The effect of the molecular weight of the polymer on the imiquimod release from lipid core nanocapsules**

Cristina de Garcia Venturini<sup>1</sup>, Franciele Aline Bruinsmann<sup>1</sup>, Renata Platcheck Raffin, Adriana Raffin Pohlmann, Silvia Guterres; <sup>1</sup>Universidade Federal do Rio Grande do Sul

**SP1-B52 - Partial characterization of polyssacharides microbeads loaded with antibiotic**

Gizele Cardoso Fontes, Hans Fernando Rocha Dohmann, Maria Helena Rocha Leão, Alexandre Malta Rossi

**SP1-B53 - Suitability of vegetable oils as pharmaceutical ingredient for lipid core nanocapsules**

Franciele Aline Bruinsmann<sup>1</sup>, Cristina de Garcia Venturini<sup>1</sup>, Adriana Raffin Pohlmann, Silvia Guterres; <sup>1</sup>Universidade Federal do Rio Grande do Sul

**SP1-B54 - A kinetic study on thermal degradation in corn straw cellulose**

Maria Inez Graf Miranda<sup>1</sup>, Simone Leal Rosa, Noor Rehman, Vinicius Martins, Sonia M B Nachtigall, Clara I D Bica; <sup>1</sup>Universidade Federal do Rio Grande do Sul

**SP1-B55 - Bioadhesive force of hydrogels containing C971P® and C974P® carbomer polymers**

Mariane Hiromi Hirata<sup>1</sup>, Gabriela Marielli da Luz, Hilris Rocha E Silva, Maria Palmira Daflon Gremião; <sup>1</sup>Universidade Estadual Paulista - Araraquara

**SP1-B56 - Obtaining organoclay for use in biodegradable polymer nanocomposites**

Dayanne Diniz de Souza Morais<sup>1</sup>, Renata Barbosa, Keila Machado de Medeiros, Edcleide Maria Araújo, Tomás Jeferson Alves de Mélo; <sup>1</sup>Federal University Of Campina Grande

**SP1-B57 - Bacterial Cellulose/Polycaprolactone "Green" Composites.**

Hernane Silva Barud, Carlos L. P Carone, Rosane Ligabue, Jeane Dullius, Sandra Einloft, Sidney José Lima Ribeiro

**SP1-B58 - Synthesis of polymer-metal nanocomposites**

Josivandro do Nascimento Silva<sup>1</sup>, Jamil Saade, Patrícia Maria de Albuquerque Farias; <sup>1</sup>Universidade Federal de Pernambuco

**SP1-B59 - Controlled desorption of potassium from**

### **polysaccharide hydrogels**

Adriel Bortolin<sup>1</sup>, Fauze Ahmad Auada<sup>2</sup>, Caue Ribeiro de Oliveira, Luiz Caparelli Mattoso; <sup>1</sup>Embrapa-Cnpdia, <sup>2</sup>Instituto de Química de Araraquara-Unesp

### **SP1-B60 - X-ray diffraction study on crystallinity degree of chitin treated by two different processes**

Laidson Paes Gomes, Eduardo Mere Del Aguila<sup>1</sup>, Cristina Tristão Andrade<sup>1</sup>, Joab Trajano Silva, Vania M Flosi Paschoalin; <sup>1</sup>Universidade Federal do Rio de Janeiro

### **SP1-B61 - Edible films based on over-ripe bananas, pectin and chitosan nanoparticles**

Milena Martelli Tosi<sup>1</sup>, Marcia Regina de Moura<sup>2</sup>, Tais Teo de Barros, Odilio Assis; <sup>1</sup>Embrapa-Cnpdia, <sup>2</sup>Instituto de Física de São Carlos

### **SP1-B62 - Synthesis and characterization of nanocomposite of cornstarch and titanium dioxide by low field NMR**

Roberto Neto<sup>1</sup>, Leonardo Augusto Moreira, Maria Inês Tavares; <sup>1</sup>Instituto de Macromoléculas Professora Eloisa Mano

### **SP1-B63 - In vitro characterization of encapsulation of DNA by chitosan particles**

Juliana Baiense, Nara Oliveira Borges, Laidson Paes Gomes, Eduardo Mere Del Aguila<sup>1</sup>, Cristina Tristão Andrade<sup>1</sup>, Joab Trajano Silva, Vania M Flosi Paschoalin; <sup>1</sup>Universidade Federal do Rio de Janeiro

### **SP1-B64 - Preparation of nanostructured hydrogels based on montmorillonite, polyacrylamide and methylcellulose: hydrophilic and spectroscopic characterization**

Elaine Inácio Pereira<sup>1</sup>, Caue Ribeiro de Oliveira, Adriel Bortolin<sup>2</sup>, Luiz Caparelli Mattoso, Fauze Ahmad Auada<sup>3</sup>; <sup>1</sup>Universidade Federal de São Carlos, <sup>2</sup>Embrapa-Cnpdia, <sup>3</sup>Instituto de Química de Araraquara-Unesp

### **SP1-B65 - Comparative study between the compatibilization of PP homopolymer and high impact PP with natural fibers**

Priscila Ferreira Oliveira, Maria de Fátima Vieira Marques<sup>1</sup>; <sup>1</sup>Macromolecules Institute - Federal University Of Rio de Janeiro

Palova Santos Balzer<sup>1</sup>, Alessandra Pereira<sup>2</sup>, Airton Rosa, Maurus Joenk, Leandro Apolinário; <sup>1</sup>Pontifícia Universidade Católica de Minas Gerais, <sup>2</sup>Universidade Federal de Santa Catarina

### **SP2-B67 - Replacement Study of Dioctyl Phthalate (DOP) formulation of Stretch Film of Poly(Vinyl Chloride) by Polycaprolactone**

Palova Santos Balzer<sup>1</sup>, Cristiano Dias, Fabio Murilo Garcia, Daniela Becker, Valdir Soldi; <sup>1</sup>Pontifícia Universidade Católica de Minas Gerais

### **SP2-B68 - In vitro release and skin permeation studies of retinyl palmitate nanocapsules containing bioactives**

Wandeberg Aranha Diniz, Zaine Teixeira

### **SP2-B69 - Thermal and mechanical characterization of starch-cellulose matrices prepared via hot melt extrusion**

Karine Modolon Zepon<sup>1</sup>, Luiz Fernando Vieira, Gean Vitor Salmoria, Luiz Alberto Kanis; <sup>1</sup>Universidade Federal de Santa Catarina

### **SP2-B70 - Relevance of the phosphorous and nitrogen in the Polyhydroxyalkanoates structure**

Diana Marcela Vanegas Hernández<sup>1</sup>, Margarita Enid Ramírez Carmona; <sup>1</sup>Universidad Pontificia Bolivariana

### **SP2-B71 - Development Of A Porous Plga Conduit For Biomedical Applications**

Mariane Giacomini Schardosim, Rúbia Young Sun Zampiva, André Luís Marin Vargas, Roberto Hübler

### **SP2-B72 - Characterization of chemically modified biofilms of gelatin/galactomannan**

Nataly Machado Siqueira, Ítalo Ribeiro Barros, Ricardo Vinicius Bof de Oliveira, Rosane Michele Duarte Soares

### **SP2-B73 - Tensile properties of poly(glycerol succinate-co-maleate) nanocomposites reinforced with cellulose nanowhiskers**

Eliton Souto Medeiros<sup>1</sup>, William J. Orts, Luiz Caparelli Mattoso; <sup>1</sup>Universidade Federal da Paraíba

### **SP2-B74 - A New Product From The Papaya Tree Shafts**

Uine Lima Oliveira, Jorge Fernando Silva de Menezes, José Gilberto da Silva, Regilany P Colares, Rodrigo de Paula, Aluísio Marques da Fonseca, Camila Grossi Vieira

### **SP2-B75 - Studies of polymer micro and nanofibers obtained by Solution Blow Spinning**

Eliton Souto Medeiros<sup>1</sup>, Walter W. B. Pessoa, Gabriel Ferraz, Rolmualdo Rodrigues Menezes, Luiz Caparelli Mattoso, Thamyscira H. S. Silva; <sup>1</sup>Universidade Federal da Paraíba

**TUESDAY, SEPTEMBER 27TH**

**SESSION SP2**

**14:00 - 16:00 - Exhibition Hall**

**SP2-B66 - Composites of Polyolefins with Wood Powder from Furniture Industry – Mechanical Properties**

# Controlled desorption of potassium from polysaccharide hydrogels

A. Bortolin<sup>1,3</sup>, F. A. Aouada<sup>1,2</sup>, C. Ribeiro<sup>1</sup>, L. H. C. Mattoso<sup>1</sup>

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With development of new technologies, researches related to the “smart” materials increased considerably [1]. In the last two decades, special attention have been intended in superabsorbent polymers [2], which are materials composed of polymeric networks that have the ability to absorb large amounts of water and/or nutrient solution and release it in a controlled and sustained manner [3]. Thus, the present study aimed to investigate the effect of the biodegradable carboxymethyl cellulose polysaccharide (CMC) on sorption and desorption potassium phosphate nutrient processes from a new hydrogel based on acrylamide (AAm) and methacrylic acid (MAA). Measures of sorption and desorption potassium phosphate nutrient were quantified by a conductivity meter. The results indicated that the presence of CMC causes more interaction between the hydrogel and nutrient and also influences the ability of the desorption of nutrient from hydrogel. Thus, the ability of the controlled release nutrient by hydrogel is directly related to the amount of CMC, and it is also linked to the swelling degree. The values of swelling degree at equilibrium stage, amount of nutrient sorbed and released increased with the CMC concentration in the hydrogel up to 0.5%. From this CMC concentration, it was observed a considered decrease in these properties. This is an indication of the increase in compaction of the polymer chains, probably favored by increasing of possible interaction points between CMC-PAAm and/or CMC-PMAA. This fact difficult the process of diffusion of water molecules and nutrients, as well as the chain relaxations of the hydrogel. In addition, the presence of CMC has significantly improved the process of desorption time. The hydrogel without CMC released all potassium nutrient in 4 hours. For all hydrogels containing CMC, the desorption time was extended to 24-30 hours and desorption kinetics remained sustained until the end of the study, around 50 hours. Therefore, the hydrogels synthesized are potentially viable for use in controlled-release systems of nutrients.

**Keywords:** Controlled Release, hydrogel, CMC, Potassium Phosphate.

Work supported by FAPESP/CMDMC, CNPq/INCTMN, MCT/FINEP and EMBRAPA.

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[2] I. R. Oviedo, N. A. N. Mendez, M. P. G. Gomes, H. C. Rodrigues, A. R. Martinez, *Int. J. Polym. Mater.* **57**, 1095 (2008).

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